Electronic Filing: Received, Clerk's Office 04/08/2025

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

MIDWEST GENERATION, LLC	)	
	)	
Petitioner,	)	
	)	
v.	)	**PCB 2025-03**
	)	**(Permit Appeal -- CCR)**
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,	)	
	)	
Respondent.	)	

NOTICE OF FILING

To: See Attached Service List (Via Electronic Filing)

PLEASE TAKE NOTICE that the undersigned filed today with the Office of the Clerk of the Illinois Pollution Control Board by electronic filing the following NOTICE OF FILING, CERTIFICATE OF SERVICE, CERTIFICATE OF RECORD ON APPEAL, and RECORD ON APPEAL, copies of which are attached hereto and hereby served upon you.

Respectfully submitted,

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

By: /s/Mallory Meade

Mallory Meade, #6345981
Assistant Attorney General
Environmental Bureau
500 South Second Street
Springfield, Illinois 62706
(217) 299-8343
mallory.meade@ilag.gov

Dated: April 8, 2025

SERVICE LIST

Susan M. Franzetti
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Carol Webb
Hearing Officer
Illinois Pollution Control Board
1021 North Grand Avenue East
P.O. Box 19274
Springfield, IL 62794-9274
carol.webb@illinois.gov

CERTIFICATE OF SERVICE

The undersigned hereby certifies that on April 8, 2025, before 5:00 PM, she caused to be served by electronic mail, a true and correct copy of the following instruments entitled Notice of Filing, Certificate of Service, Certificate of Record on Appeal, and Record on Appeal to:

Susan M. Franzetti
Kristen Laughridge Gale
Genevieve J. Essig
Nijman Franzetti LLP
10 South LaSalle Street, Suite 3400
Chicago, Illinois 60603
sf@nijmanfranzetti.com
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Attorneys for Midwest Generation, LLC

Carol Webb
Hearing Officer
Illinois Pollution Control Board
1021 North Grand Avenue East
P.O. Box 19274
Springfield, IL 62794-9274
carol.webb@illinois.gov

This email transmission contains 1,601 pages.

/s/ Mallory Meade
Assistant Attorney General
Environmental Bureau

Under penalties as provided by law pursuant to Section 1-109 of the Code of Civil Procedure, the undersigned certifies that the statements set forth in this Certificate of Service are true and correct, except as to matters therein stated to be on information and belief and as to such matters the undersigned certifies as aforesaid that she verily believes the same to be true.

/s/ Mallory Meade
Assistant Attorney General
Environmental Bureau

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

MIDWEST GENERATION, LLC	)	
	)	
Petitioner,	)	
	)	
v.	)	**PCB 2025-03**
	)	**(Permit Appeal -- CCR)**
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,	)	
	)	
	)	
Respondent.	)	

CERTIFICATE OF RECORD ON APPEAL

Respondent, ILLINOIS ENVIRONMENTAL PROTECTION AGENCY ("Illinois EPA"), in accordance with the procedural rules of the Illinois Pollution Control Board ("Illinois PCB") as set forth in 35 Ill. Adm. Code 105.212 and 105.116, files in this cause the Illinois EPA's record of Coal Combustion Residual Surface Impoundment Construction Permit 2024-CC-100030 ("Powerton Construction Permit"), which is attached and consists of the following documents:

Document #	Description	Date	Pages
1	Final NPDES Permit	8/27/2021	R000002 – R000018
2	Email from Darin LeCrone titled "FW: Public Meeting Notification – Powerton Generating Station (W1798010008) Bypass Basin and Former Ash Basin"	4/18/2022	R000020 – R000023
3	Email from EPA.CCR.Part845.Coordinator titled "FW: Public Meeting Notification – Powerton Generating Station (W1798010008) Bypass Basin and Former Ash Basin"	4/19/2022	R000025 – R000028
4	Powerton Bypass Basin Retrofit Construction Permit Application	7/15/2022	R000030 – R000488
5	Email from EPA.CCR.Part845.Coordinator titled "FW: MWG Powerton Station – ASB/BB/FAB/MCB 3rd Quarter 2022 Groundwater Data"	10/26/2022	R000490 – R000708
6	Email from Lynn Dunaway titled "FW: MWG Powerton Station – ASB/BB/FAB/MCB 3rd Quarter 2022 Groundwater Data"	10/26/2022	R000710 – R000711

Document #	Description	Date	Pages
7	Email from Sara Samson titled "RE: MWG Powerton Station – ASB/BB/FAB/MCB 3rd Quarter 2022 Groundwater Data"	10/26/2022	R000713 – R000714
8	Powerton FEMA Flood Insurance Map	10/31/2022	R000716
9	Email from Josiah Seif titled "4th quarter 2022 Powerton Station groundwater data packages"	1/17/2023	R000718
10	Email from Lynn Dunaway titled "RE:4th quarter 2022 Powerton Station groundwater data packages"	1/17/2023	R000720
11	Email from Sharene Shealey titled "[External] MWG CCR impoundment invoices"	6/9/2023	R000722
12	Email from Joseph Kotas titled "[External] CCR fee invoice"	6/12/2023	R000724 – R000726
13	Email from Mark Liska titled "FW: CCR fee invoice"	6/12/2023	R000728 – R000730
14	Email from Josiah Seif titled "2nd quarter 2023 groundwater data packages for the Ash Surge Basin, Bypass Basin, Former Ash Basin, and Metal Cleaning Basin at Powerton Station (W1798010008)"	7/17/2023	R000732
15	Email from EPA.CCR.Part845.Notify titled "Midwest Generation, LLC- Powerton Generating Station - Application for Retrofit Construction Permit (W1798010008-03)"	7/31/2023	R000734
16	Email from EPA.CCR.Part845.Notify titled "FW: MWG Powerton Station - ASB/BB/FAB/MCB 2nd Quarter 2023 Groundwater Data - please advise"	8/30/2023	R000736 – R001034
17	Powerton Bypass Basin Retrofit Review Letter	2/22/2024	R001036 – R001034
18	Letter Requesting Additional Information on Liner Replacement	2/22/2024	R001036 – R001056
19	MWG Response to Powerton Bypass Basin Retrofit Review Letter	2/26/2024	R001058 – R001188
20	Email from Sharene Shealey titled "[External] MWG Response to Powerton Bypass Basin Retrofit Letter"	2/26/2024	R001193
21	MWG Powerton Bypass Basin Retrofit Plan	3/5/2024	R001195 – R001204
22	Letter from Thomas Dehlin re: MWG Powerton Bypass Basin Retrofit Plan	3/5/2024	R001206 – R001207
23	Email from Thomas Dehlin titled "[External] 12661-181-SL-IEPA-0001: Amended Written Retrofit Plan for Powerton Bypass	3/5/2024	R001209 –

Document #	Description	Date	Pages
	Basin (Rev. 1)"		
24	Email from Lauren Hunt titled "FW: [External] 12661-181-SL-IEPA-0001: Amended Written Retrofit Plan for Powerton Bypass Basin (Rev. 1)"	3/5/2024	R001211 – R001212
25	Email from Lauren Hunt titled "RE: 12661-181-SL-IEPA-0001: Amended Written Retrofit Plan for Powerton Bypass Basin"	3/5/2024	R001214 – R001215
26	Email from Derek Rompot titled "Most recent draft permit"	3/22/2024	R001217 – R001238
27	Email from Mark Liska titled "RE: Powerton CCR Permits"	4/1/2024	R001240 – R001241
28	Public Notice for Draft Permit for Retrofit Construction of a Coal Combustion Residual Surface Impoundment	4/2/2024	R001243 – R001251
29	Public Notice Fact Sheet for Draft Permit for Retrofit Construction of a Coal Combustion Residual Surface Impoundment	4/2/2024	R001253 – R001256
30	Public Notice Number MEL:24032601	4/2/2024	R001258
31	Public Notice for Draft Permit for Retrofit Construction of a Coal Combustion Residual Surface Impoundment Review Notes	4/2/2024	R001260 – R001268
32	Email from Jeff Guy titled "RE: Powerton CCR Permits"	4/2/2024	R001270 – R001274
33	Document from MWG titled "Geosynthetic Materials for Bypass Basin Retrofit"	4/5/2024	R001276 – R001327
34	Letter from Thomas Dehlin titled "Re: Revised Design Drawings and Liner Design Certification for Bypass Basin Retrofit Project"	4/5/2024	R001329 – R001330
35	Document from MWG titled "Alternative Composite Liner Design Certification for Retrofitted Bypass Basin	4/5/2024	R001332 – R001338
36	Email from Derek Rompot titled "FYI: CCR 1st permit to public notice; second draft permit getting close"	4/8/2024	R001340 – R001370
37	Email from Jeff Guy titled "CCR Public Notices - error on date"	4/10/2024	R001372 – R001397
38	Email from Lauren Hunt titled "DRAFT Powerton Geotech Memo.docx"	4/18/2024	R001399 – R001415
39	Letter from Thomas Dehlin titled "Re: Revised Technical Specifications for Bypass Basin Retrofit Project"	4/19/2024	R001417 – R001418
40	Document from MWG titled "Earthwork for Bypass Basin Retrofit"	4/19/2024	R001420 – R001504

Document #	Description	Date	Pages
41	Document from MWG titled "Construction Quality Assurance for Bypass Basin Retrofit"	4/19/2024	R001506 – R001552
42	Email from Lauren Hunt titled "DRAFT Powerton GWS Opening Statement.docx"	4/23/2024	R001554 – R001555
43	Letter from Sharene Shealey titled "Re: Midwest Generation, LLC – Powerton Generating Station CCR 2024-CO-100030"	5/16/2024	R001557 – R001559
44	Email from Lauren Hunt titled "Draft Powerton Geotech Memo for permit record"	6/5/2024	R001561
45	CCR Permit Responsiveness Summary	6/5/2024	R001563 – R001590
46	Letter from Todd Mundorf titled "RE: Midwest Generation LLC-Powerton Generating Station W1798010008 CCR Permit No. 2024-CC-100030 Special Condition 13"	9/26/2024	R001592

I, Darin LeCrone, of the Illinois EPA, hereby certify that the documents of the Record on Appeal filed in the above reference matter and summarized in the above Index are complete to the best of my knowledge, information, and belief.

BY: _____

Darin LeCrone, P.E.

Manager, Permit Section

Illinois Environmental Protection Agency

Respectfully submitted,

KWAME RAOUL,
Attorney General of the
State of Illinois,

MATTHEW J. DUNN, Chief
Environmental Enforcement/Asbestos
Litigation Division

By: /s/Mallory Meade
Mallory Meade

/s/Samuel Henderson
Samuel Henderson

Assistant Attorney Generals
Illinois Attorney General's Office
Environmental Bureau
500 South Second Street
Springfield, IL 62706
(217) 720-9820

Dated: April 7, 2025

DOCUMENT

1

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 · (217) 782-3397

JB PRITZKER, GOVERNOR JOHN J. KIM, DIRECTOR

217/782-0610

August 27, 2021

MAJOR

Midwest Generation, LLC
13082 East Manito Road
Pekin, Illinois 61554

IEPA-Division of Records Management
Releasable

MAR 21 2022

Reviewer KAP

Re: Midwest Generation, LLC
Powerton Generating Station
NPDES Permit No. IL0002232
Bureau ID: W1798010008
Final Permit

Gentlemen:

Attached is the final NPDES Permit for your discharge. The Permit as issued covers discharge limitations, monitoring, and reporting requirements. Failure to meet any portion of the Permit could result in civil and/or criminal penalties. The Illinois Environmental Protection Agency is ready and willing to assist you in interpreting any of the conditions of the Permit as they relate specifically to your discharge. Due to comments from USEPA Region V, the following changes have been made to the permit since the public notice:

1. Special Condition 19 has been combined with Special Condition 15 and now provides more clear direction on how to operate the facility.

2. A new Special Condition 19 has been added to the permit. This condition requires intake monitoring for flow.

3. Special Condition 20 has been added to the permit. This condition requires that the permittee conduct visual inspections of the cooling water intake and closed cycle recirculating cooling system.

4. Special Condition 21 has been added to the permit. This condition requires annual certification for the cooling water intake structure and defines how and when reduced information may be required when renewing your NPDES permit.

5. Special Condition 22 has been added to the permit. This condition requires that the permittee retain all records supporting the determination of BTA for Entrainment.

6. Special Condition 23 has been added to the permit. This condition requires that the permittee meet the new technology-based effluent limitations guidelines and standards for the steam electric power generating point source category applicable to flue gas desulfurization wastewater and bottom ash transport water.

7. The concentration limit for total residual chorine at outfall 004 was inadvertently removed in the public notice. The limit of 0.05 mg/L has been corrected in the permit.

Pursuant to the Final NPDES Electronic Reporting Rule, all permittees must report DMRs electronically unless a waiver has been granted by the Agency. The Agency utilizes NetDMR, a web-based application, which allows the submittal of electronic Discharge Monitoring Reports instead of paper Discharge Monitoring Reports (DMRs). More information regarding NetDMR can be found on the Agency website, https://www2.illinois.gov/epa/topics/water-quality/surface-water/netdmr/Pages/quick-answer-guide.aspx. If your facility has received a waiver from the NetDMR program, a supply of preprinted paper DMR Forms.

will be sent to your facility during the interim period prior to your registration in the NetDMR program. Additional information and instructions will accompany the preprinted DMRs. Please see the attachment regarding the electronic reporting rule.

The attached Permit is effective as of the date indicated on the first page of the Permit. Until the effective date of any re-issued Permit, the limitations and conditions of the previously-issued Permit remain in full effect. You have the right to appeal any condition of the Permit to the Illinois Pollution Control Board within a 35 day period following the issuance date.

Should you have questions concerning the Permit, please contact Mark E. Liska at 217/782-0610.

Sincerely,

Darin E. LeCrone, P.E.
Manager, Permit Section
Division of Water Pollution Control

DEL:MEL:20090101.docx

Attachment: Final Permit

cc: Records Unit
Compliance Assurance Section
Peoria Region
USEPA

NPDES Permit No. IL0002232

Illinois Environmental Protection Agency

Division of Water Pollution Control

1021 North Grand Avenue East

Post Office Box 19276

Springfield, Illinois 62794-9276

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

Reissued (NPDES) Permit

Expiration Date: August 31, 2026

Issue Date: August 27, 2021
Effective Date: September 01, 2021

Name and Address of Permittee:
Midwest Generation, LLC
13082 East Manito Rd.
Pekin, IL 61554

Facility Name and Address:
Powerton Generating Station
13082 East Manito Rd.
Pekin, IL 61554
(Tazewell County)

Discharge Number and Name:	Receiving Waters:
001 Ash Treatment System Effluent	Illinois River
A01 Metal Cleaning Waste Treatment System Effluent	Internal Outfall
002 Cooling Pond Emergency Overflow	Unnamed tributary to the Illinois River
A02 Coal Pile Runoff Treatment System Effluent	Internal Outfall
B02 West Yard Treatment System Effluent	Internal Outfall
004 RBC Sewage Treatment Plant Effluent	Illinois River

In compliance with the provisions of the Illinois Environmental Protection Act, Title 35 of Ill. Adm. Code, Subtitle C and/or Subtitle D, Chapter 1, and the Clean Water Act (CWA), the above-named permittee is hereby authorized to discharge at the above location to the above-named receiving stream in accordance with the standard conditions and attachments herein.

Permittee is not authorized to discharge after the above expiration date. In order to receive authorization to discharge beyond the expiration date, the permittee shall submit the proper application as required by the Illinois Environmental Protection Agency (IEPA) not later than 180 days prior to the expiration date.

Darin E. LeCrone, P.E.
Manager, Permit Section
Division of Water Pollution Control

DEL:MEL:20090101

NPDES Permit No. IL0002232

Effluent Limitations and Monitoring

From the effective date of this permit until the expiration date, the effluent of the following discharge(s) shall be monitored and limited at all times as follows:

	LOAD LIMITS lbs/day DAF (DMF)		CONCENTRATION LIMITS mg/l			
PARAMETER	30 DAY AVERAGE	DAILY MAXIMUM	30 DAY AVERAGE	DAILY MAXIMUM	SAMPLE FREQUENCY	SAMPLE TYPE
Outfall: 001 Ash Treatment System Effluent (DAF = 7.33 MGD)*						
This discharge consists of:				Approximate Flow		
1. Bottom Ash and Economizer Ash Sluice Wastewater				10.9 MGD		
2. Alternate Route for Boiler Room Sump				Intermittent		
3. Intermittent Route for Boiler Room Floor and Roof Drains				Intermittent		
4. Slag Tank Overflow Sump Wastes; Tripper Room Dust Extractor; Tail End and Tripper Room Washdown; Alternate Route for Boiler Room Floor Drains; Alternate Route for RO Reject and Cleaning Wastes				6.2 MGD		
5. Demineralizer Sand Filter Backwash				0.1 MGD		
6. East Yard Runoff Basin Effluent				Intermittent		
a. East Yard Area Runoff				1.0 MGD		
b. Boiler Room Sump Wastes				0.3 MGD		
c. Boiler Room Roof and Building Drains				Intermittent		
d. Polymer Building Floor Drains				0.01 MGD		
e. Condensate Storage Tank				Intermittent		
f. Sorbent System Water				1600 GPD		
g. Sorbent System Building Roof Drains				Intermittent		
7. Demineralizer Regenerant, RO Reject and Cleaning Wastes to South Equalization Basin; Alternate Route direct to Ash Treatment				0.3 MGD		
8. Metal Cleaning Wastes Treatment System Effluent				0.50 MGD		
Flow (MGD)	See Special Condition 1				1/Week	24 Hour Total
pH	See Special Condition 2				1/Week	Grab/Continuous
Total Suspended Solids			15	30	2/Month	24 Hour Composite
Oil and Grease			15	20	2/Month	Grab

*See Special Condition 16.

NPDES Permit No. IL0002232

Effluent Limitations and Monitoring

From the effective date of this permit until the expiration date, the effluent of the following discharge(s) shall be monitored and limited at all times as follows:

PARAMETER	LOAD LIMITS lbs/day DAF (DMF) 30 DAY AVERAGE	LOAD LIMITS lbs/day DAF (DMF) DAILY MAXIMUM	CONCENTRATION LIMITS mg/l 30 DAY AVERAGE	CONCENTRATION LIMITS mg/l DAILY MAXIMUM	SAMPLE FREQUENCY	SAMPLE TYPE
Outfall: A01 Metal Cleaning Waste Treatment System Effluent (DAF = 0.5 MGD)						
This discharge consists of:				Approximate Flow		
1. Boiler and Air Heater, Precipitator, and Economizer Wash Water; (Gas Side Boiler Wash Water)				Intermittent		
2. Water Side Boiler Cleaning Water				Intermittent		
3. Alternate Route for Demineralizer Regenerant Waste and RO Reject and Cleaning Wastes				Intermittent		
Flow (MGD)	See Special Condition 1				Daily	24 Hour Total
Total Suspended Solids			30	100	2/Week	24 Hour Composite
Oil and Grease			15	20	2/Week	Grab
Iron			1.0	1.0	2/Week	24 Hour Composite
Copper			0.5	1.0	2/Week	24 Hour Composite

NPDES Permit No. IL0002232

Effluent Limitations and Monitoring

From the effective date of this permit until the expiration date, the effluent of the following discharge(s) shall be monitored and limited at all times as follows:

PARAMETER	LOAD LIMITS lbs/day DAF (DMF) 30 DAY AVERAGE	LOAD LIMITS lbs/day DAF (DMF) DAILY MAXIMUM	CONCENTRATION LIMITS mg/l 30 DAY AVERAGE	CONCENTRATION LIMITS mg/l DAILY MAXIMUM	SAMPLE FREQUENCY	SAMPLE TYPE
Outfall: 002 Cooling Pond Emergency Overflow (Intermittent Discharge)						
This discharge consists of:				Approximate Flow		
1. Condenser Cooling Water				497 MGD/Unit		
2. House Service Water				Intermittent		
3. Intermittent Ash Treatment System Effluent (Approximately 15%)				7.33 MGD		
4. Coal Pile Runoff System Effluent				1.64 MGD		
5. West Yard Runoff System Effluent				1.14 MGD		
6. Pond Intake Screen Backwash				Intermittent		
7. Boiler Drains				Intermittent		
Flow (MGD)	See Special Condition 1				Daily When Discharging	Estimate
pH	See Special Condition 3				Daily When Discharging	Grab
Temperature	See Special Condition 5				Daily When Discharging	Measure

NPDES Permit No. IL0002232

Effluent Limitations and Monitoring

From the effective date of this permit until the expiration date, the effluent of the following discharge(s) shall be monitored and limited at all times as follows:

PARAMETER	LOAD LIMITS lbs/day DAF (DMF) 30 DAY AVERAGE	LOAD LIMITS lbs/day DAF (DMF) DAILY MAXIMUM	CONCENTRATION LIMITS mg/l 30 DAY AVERAGE	CONCENTRATION LIMITS mg/l DAILY MAXIMUM	SAMPLE FREQUENCY	SAMPLE TYPE
Outfall: A02 Coal Pile Runoff Treatment System Effluent (Intermittent Discharge)*						
This discharge consists of:				Approximate Flow		
1. Crusher Building Area Runoff				Intermittent		
2. East & West Coal Pile Runoff				2.0 MGD		
3. Equipment Building Area Runoff				Intermittent		
4. Reclaim Hopper and Car Dumper Sumps				Intermittent		
5. Fuel Oil Tank Area Runoff				Intermittent		
Flow (MGD)	See Special Condition 1				Daily	24 Hour Total
Total Suspended Solids			15	30	1/Week	24 Hour Composite
Oil and Grease			15	20	1/Week	Grab

*See Special Condition 16.

NPDES Permit No. IL0002232

Effluent Limitations and Monitoring

From the effective date of this permit until the expiration date, the effluent of the following discharge(s) shall be monitored and limited at all times as follows:

	LOAD LIMITS lbs/day DAF (DMF)		CONCENTRATION LIMITS mg/l			
PARAMETER	30 DAY AVERAGE	DAILY MAXIMUM	30 DAY AVERAGE	DAILY MAXIMUM	SAMPLE FREQUENCY	SAMPLE TYPE
Outfall: B02 West Yard Runoff Treatment System Effluent (DAF = 1.14 MGD)						
This discharge consists of:				Approximate Flow		
1. West Yard Area Runoff				0.115 MGD		
2. North and South 345kV Switchyard Oil Separator Effluents				0.377 MGD		
3. Oil Tank Area Oil Separator Effluent				0.205 MGD		
4. Crib House Roof and Floor Drains				0.09 MGD		
5. Units 5 and 6 Turbine Room Roof and Floor Drains to Oil Separators				0.134 MGD		
6. 138kV Switchyard Area Runoff				0.176 MGD		
7. Condenser Pit Oil Separator Effluents				Intermittent		
8. Parking Area Runoff				0.39 MGD		
9. Administration Building Roof and Area Drains				Intermittent		
Flow (MGD)	See Special Condition 1				Daily	24 Hour Total
Total Suspended Solids			15	30	2/Month	24 Hour Composite
Oil and Grease			15	20	2/Month	Grab

NPDES Permit No. IL0002232

Effluent Limitations and Monitoring

From the effective date of this permit until the expiration date, the effluent of the following discharge(s) shall be monitored and limited at all times as follows:

	LOAD LIMITS lbs/day DAF (DMF)		CONCENTRATION LIMITS mg/l			
PARAMETER	30 DAY AVERAGE	DAILY MAXIMUM	30 DAY AVERAGE	DAILY MAXIMUM	SAMPLE FREQUENCY	SAMPLE TYPE
Outfall: 004 RBC Sewage Treatment Plant Effluent (DAF = 0.036 MGD)						
Flow (MGD)	See Special Condition 1				Continuous	
pH	See Special Condition 2				1/Week	Grab
Total Suspended Solids	10	20	30	60	2/Month	24 Hour Composite
BOD_5	10	20	30	60	2/Month	24 Hour Composite
Total Residual Chlorine	See Special Condition 4			0.05	Daily When Chlorinating	Grab

NPDES Permit No. IL0002232

Special Conditions

SPECIAL CONDITION 1. Flow shall be measured in units of Million Gallons per Day (MGD) and reported as a monthly average and a daily maximum value on the monthly Discharge Monitoring Report.

SPECIAL CONDITION 2. The pH shall be in the range 6.0 to 9.0 for the discharge from outfalls 001 and 004. The monthly minimum and monthly maximum values shall be reported on the DMR form. At outfall 001, if the permittee is monitoring continuously, the permittee shall maintain the pH of such wastewaters within the range except excursions from the range are permitted subject to the following limitations:

1. The total time during which the pH values are outside the required range of pH values shall not exceed 7 hours and 26 minutes in any calendar month; and

2. No individual excursion from the range of pH values shall exceed 60 minutes.

SPECIAL CONDITION 3. The pH shall be in the range 6.5 to 9.0 for the discharge from outfall 002. The monthly minimum and monthly maximum values shall be reported on the DMR form.

SPECIAL CONDITION 4. All samples for TRC shall be grab samples and analyzed by an applicable method contained in 40 CFR 136, equivalent in accuracy to low-level amperometric titration. Any analytical variability of the method used shall be considered when determining the accuracy and precision of the results obtained.

SPECIAL CONDITION 5. This facility meets the allowed mixing criteria for thermal discharges from outfall 002 pursuant to 35 IAC 302.102. No reasonable potential exists for the discharge to exceed thermal water quality standards. The permittee shall monitor the flow and temperature of the discharge prior to entry into the receiving water body. Monitoring results shall be reported on the monthly DMR. This permit may be modified to include formal temperature limitations should the results of the monitoring show that there is a reasonable potential to exceed a thermal water quality standard. Modification of this permit shall follow public notice and opportunity for comment.

SPECIAL CONDITION 6. Debris collected on pond make-up intake screens is prohibited from being discharged back to the pond. Debris does not include living fish or other living aquatic organisms.

SPECIAL CONDITION 7. The Agency has determined that the effluent limitations in this permit constitute BAT/BCT for storm water which is treated in the existing treatment facilities for purposes of this permit reissuance, and no pollution prevention plan will be required for such storm water. In addition to the chemical specific monitoring required elsewhere in this permit, the permittee shall conduct an annual inspection of the facility site to identify areas contributing to a storm water discharge associated with industrial activity, and determine whether any facility modifications have occurred which result in previously-treated storm water discharges no longer receiving treatment. If any such discharges are identified the permittee shall request a modification of this permit within 30 days after the inspection. Records of the annual inspection shall be retained by the permittee for the term of this permit and be made available to the Agency on request.

SPECIAL CONDITION 8. There shall be no discharge of polychlorinated biphenyl compounds. The permittee shall conduct sampling of PCBs as part of Form 2C with their next permit renewal application so that compliance with this prohibition can be evaluated.

SPECIAL CONDITION 9. The bypass provisions of 40 CFR 122.41(m) and upset provisions of 40 CFR 122.41(n) are hereby incorporated by reference.

SPECIAL CONDITION 10. Samples taken in compliance with the effluent monitoring requirements of outfalls 001, 002, 004 and 006 shall be taken at a point representative of the discharge, but prior to entry into the receiving stream.

Samples taken in compliance with the effluent monitoring requirements of outfalls A01, A02 and B02 shall be taken at a point representative of the discharge, but prior to comingling with other wastestreams.

SPECIAL CONDITION 11. The Permittee shall record monitoring results on Discharge Monitoring Report (DMR) electronic forms using one such form for each outfall each month.

In the event that an outfall does not discharge during a monthly reporting period, the DMR Form shall be submitted with no discharge indicated.

The Permittee is required to submit electronic DMRs (NetDMRs) instead of mailing paper DMRs to the IEPA unless a waiver has been granted by the Agency. More information, including registration information for the NetDMR program, can be obtained on the IEPA website, https://www2.illinois.gov/epa/topics/water-quality/surface-water/netdmr/Pages/quick-answer-guide.aspx.

The completed Discharge Monitoring Report forms shall be submitted to IEPA no later than the 25th day of the following month, unless otherwise specified by the permitting authority.

NPDES Permit No. IL0002232

Special Conditions

Permittees that have been granted a waiver shall mail Discharge Monitoring Reports with an original signature to the IEPA at the following address:

Illinois Environmental Protection Agency
Division of Water Pollution Control
Attention: Compliance Assurance Section, Mail Code # 19
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

SPECIAL CONDITION 12. The effluent, alone or in combination with other sources, shall not cause a violation of any applicable water quality standard outlined in 35 Ill. Adm. 302.

SPECIAL CONDITION 13. The use or operation of this facility shall be by or under the supervision of a Certified Class K operator.

SPECIAL CONDITION 14. In the event that the permittee shall require a change in the use of water treatment additives, the permittee must request a change in this permit in accordance with the Standard Conditions -- Attachment H.

SPECIAL CONDITION 15. In accordance 40 CFR 125.3 it is the Agency's Best Professional Judgment that the intake structure is considered the Best Technology Available for minimizing adverse environmental impact because utilization of a closed-cycle recirculating system was considered the best technology available for minimizing adverse environmental impact pursuant to 40 CFR 125.94(a)(1)(i),

The permittee shall at all times properly operate and maintain the closed-cycle recirculating cooling system (CCRS) including the surface water intake structure and 1,426-acre cooling pond, the operation of which has been determined to be the equivalent of Best Technology Available (BTA) described at 40 CFR 125.94(c) and 40 CFR 125.94(d). The permittee shall withdraw the amount of make-up water needed only to replenish losses that have occurred due to evaporative loss and incidental loss from the cooling system.

The permittee has submitted information on the cooling water intake structure operation in accordance with Section 316(b) of the Clean Water Act. This permit may also be revised or modified in accordance with any laws, regulations, or judicial orders pursuant to Section 316(b) of the Clean Water Act.

Nothing in this permit authorizes take for the purpose of a facility's compliance with the Endangered Species Act.

SPECIAL CONDITION 16. The Permittee shall monitor the effluent from outfalls 001 and A02 for the following parameters on a semi-annual basis. This Permit may be modified with public notice to establish effluent limitations if appropriate, based on information obtained through sampling. The sample shall be a 24-hour effluent composite except as otherwise specifically provided below and the results shall be submitted to the address in special condition 11 in June and December. The parameters to be sampled and the minimum reporting limits to be attained are as follows:

STORET CODE	PARAMETER	Minimum reporting limit
01002	Arsenic	0.05 mg/L
01007	Barium	0.5 mg/L
01022	Boron	0.1 mg/L
01027	Cadmium	0.001 mg/L
00940	Chloride	1.0 mg/L
01032	Chromium (hexavalent) (grab)	0.01 mg/L
01034	Chromium (total)	0.05 mg/L
01042	Copper	0.005 mg/L
00718	Cyanide (grab) (available *** or amendable to chlorination))	5.0 ug/L
00720	Cyanide (grab not to exceed 24 hours) (total)	5.0 ug/L
00951	Fluoride	0.1 mg/L
01045	Iron (total)	0.5 mg/L
01046	Iron (Dissolved)	0.5 mg/L
01051	Lead	0.05 mg/L
01055	Manganese	0.5 mg/L
71900	Mercury (grab)**	1.0 ng/L*
01067	Nickel	0.005 mg/L
00556	Oil (hexane soluble or equivalent) (Grab Sample only)	5.0 mg/L
32730	Phenols (grab)	0.005 mg/L
01147	Selenium	0.005 mg/L

Special Conditions

00945	Sulfate	10 mg/L
01077	Silver (total)	0.003 mg/L
01092	Zinc	0.025 mg/L

Unless otherwise indicated, concentrations refer to the total amount of the constituent present in all phases, whether solid, suspended or dissolved, elemental or combined, including all oxidation states.

*1.0 ng/L = 1 part per trillion.
**Utilize USEPA Method 1631E and the digestion procedure described in Section 11.1.1.2 of 1631E. This Permit may be modified with public notice to establish effluent limitations if appropriate, based on information obtained through sampling.
***USEPA Method OIA-1677

SPECIAL CONDITION 17. A zone of initial dilution (ZID) is recognized for ammonia, with dimensions of 1.0 feet outward across the river from the point where the canal/ditch receiving the effluent from outfall 004 flows into the Illinois River, and 1.0 feet downstream from this point. Within the ZID 11:1 dilution is afforded. A mixing zone is recognized with dimensions of 1.2 feet outward across the river from the outfall and 1.2 feet downstream from this point. Within the mixing zone 88:1 dilution is afforded.

SPECIAL CONDITION 18. A plan of study must be submitted to IEPA no later than 30 days from the effective date of the permit for a bacteria die-off demonstration. Fecal coliform bacteria must be measured at the end of the treatment process for Outfall 004 (the usual sampling location) and at points in the canal receiving the effluent leading to the Illinois River. The sampling for this demonstration must occur on at least three occasions, at least one week apart, during the months of July, August and/or September, 2015. A final report on the results of the study is due to the IEPA no later than October 15, 2015. IEPA will use the results of this demonstration to determine if the year-round disinfection exemption remains valid for this Outfall. If the IEPA finds that the Illinois River receives water at fecal coliform concentrations above the water quality standard (geometric mean of 200 cells per 100 mL) a modified permit will be issued that revokes the year-round exemption and requires seasonal disinfection.

SPECIAL CONDITON 19. The permittee shall measure intake flow from the intake structure on a daily basis and report it as a monthly average and daily maximum on a monthly basis on the DMR form.

SPECIAL CONDITION 20. The permittee shall conduct visual or remote inspections of the cooling water intake structure and closed cycle recirculating cooling system on a weekly basis at minimum to ensure that these items are maintained and operating to function as designed. If the permittee cannot perform the inspection due to inclement weather or a similar reason, the permittee shall perform the inspection as soon as possible afterwards.

SPECIAL CONDITON 21. Pursuant to 40 CFR 125.97(c), the permittee shall submit an annual certification statement signed by the responsible corporate office as defined in 40 CFR 122.22 subject to the following:

1. If the information contained in the previous year's annual certification is still pertinent, you may simply state as such in a letter to the Agency and the letter, along with any applicable data submission requirements specified in this section shall constitute the annual certification.

2. If you have substantially modified operation of any unit at your facility that impacts cooling water withdrawals or operation of your cooling water intake structures, you must provide a summary of those changes in the report. In addition, you must submit revisions to the information required at 40 CFR 122.21(r) in your next permit application.

The permittee may request to reduce the information required, if conditions at the facility and in the waterbody remain substantially unchanged since the previous application so long as the relevant previously submitted information remains representative of current source water, intake structure, cooling water system, and operating conditions. Any habitat designated as critical or species listed as threatened or endangered after issuance of the current permit whose range of habitat or designated critical habit includes waters where a facility intake is located constitutes potential for a substantial change that must be addressed by the owner/operator in subsequent permit applications, unless the facility received an exemption pursuant to 16 U.S.C 1537 (o) or a permit pursuant to 16 U.S.C. 1539(a) or there is no reasonable expectation of take. The permittee must submit its request for reduced cooling water intake structure and waterbody application information to the Agency at least two years and six months prior to the expiration of this NPDES permit. The Permittee's request must identify each element in this subsection that it determines has not substantially changes since the previous permit application and the basis for the determination.

SPECIAL CONDITION 22. The permittee shall retain all records supporting the Agency's determination of BTA for entrainment until such time as the Agency revises the Determination of BTA for Entrainment in the permit.

SPECIAL CONDITION 23. USEPA finalized the regulation to revise the technology-based effluent limitations guidelines and standards

(ELGs) for the steam electric power generating point source category applicable to flue gas desulfurization (FGD) wastewater and bottom ash (BA) transport water on October 13, 2020.

The permittee discharges bottom ash and economizer ash sluice wastewater, slag tank overflow sump wastes, and several low volume waste sources which includes boiler evaporation and blowdown, floor drains and equipment drains, and coal pile runoff. Midwest Generation, LLC – Powerton Generating Station shall comply with the effluent limitations based on Best Available Technology Economically Achievable (BAT) per 40 CFR 423.13 as soon as possible on or after October 13, 2021 , but no later than December 31, 2025 after this permit is issued.

The permittee shall, as soon as possible but no later than December 31, 2024, inform the Agency that the permittee shall either:

1. Cease the discharge of bottom ash transport water in accordance with 40 CFR 423.13(k)(1), or

2. Discharge pollutants in bottom ash transport water from a properly installed, operated, and maintained bottom ash system in accordance with 40 CFR 423.13(k)(2). If this option is chosen, the permittee shall submit information pertaining to all subparts to requirements listed in 40 CFR 423.13(k)(2) by the date listed above.

Attachment H

Standard Conditions

Definitions

Act means the Illinois Environmental Protection Act, 415 ILCS 5 as Amended.

Agency means the Illinois Environmental Protection Agency.

Board means the Illinois Pollution Control Board.

Clean Water Act (formerly referred to as the Federal Water Pollution Control Act) means Pub. L 92-500, as amended. 33 U.S.C. 1251 et seq.

NPDES (National Pollutant Discharge Elimination System) means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 402, 318 and 405 of the Clean Water Act.

USEPA means the United States Environmental Protection Agency.

Daily Discharge means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurements, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

Maximum Daily Discharge Limitation (daily maximum) means the highest allowable daily discharge.

Average Monthly Discharge Limitation (30 day average) means the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

Average Weekly Discharge Limitation (7 day average) means the highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the State. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Aliquot means a sample of specified volume used to make up a total composite sample.

Grab Sample means an individual sample of at least 100 milliliters collected at a randomly-selected time over a period not exceeding 15 minutes.

24-Hour Composite Sample means a combination of at least 8 sample aliquots of at least 100 milliliters, collected at periodic intervals during the operating hours of a facility over a 24-hour period.

8-Hour Composite Sample means a combination of at least 3 sample aliquots of at least 100 milliliters, collected at periodic intervals during the operating hours of a facility over an 8-hour period.

Flow Proportional Composite Sample means a combination of sample aliquots of at least 100 milliliters collected at periodic intervals such that either the time interval between each aliquot or the volume of each aliquot is proportional to either the stream flow at the time of sampling or the total stream flow since the collection of the previous aliquot.

(1) **Duty to comply**. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or for denial of a permit renewal application. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirements.

(2) **Duty to reapply**. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. If the permittee submits a proper application as required by the Agency no later than 180 days prior to the expiration date, this permit shall continue in full force and effect until the final Agency decision on the application has been made.

(3) **Need to halt or reduce activity not a defense**. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

(4) **Duty to mitigate**. The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

(5) **Proper operation and maintenance**. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up, or auxiliary facilities, or similar systems only when necessary to achieve compliance with the conditions of the permit.

(6) **Permit actions**. This permit may be modified, revoked and reissued, or terminated for cause by the Agency pursuant to 40 CFR 122.62 and 40 CFR 122.63. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

(7) **Property rights**. This permit does not convey any property rights of any sort, or any exclusive privilege.

(8) **Duty to provide information**. The permittee shall furnish to the Agency within a reasonable time, any information which the Agency may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with the permit. The permittee shall also furnish to the Agency upon request, copies of records required to be kept by this permit.

(9) **Inspection and entry**. The permittee shall allow an authorized representative of the Agency or USEPA (including an authorized contractor acting as a representative of the Agency or USEPA), upon the presentation of credentials and other documents as may be required by law, to:

(a) Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records

must be kept under the conditions of this permit;

(b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

(c) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

(d) Sample or monitor at reasonable times, for the purpose of assuring permit compliance, or as otherwise authorized by the Act, any substances or parameters at any location.

(10) **Monitoring and records.**

(a) Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

(b) The permittee shall retain records of all monitoring information, including all calibration and maintenance records, and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of this permit, measurement, report or application. Records related to the permittee's sewage sludge use and disposal activities shall be retained for a period of at least five years (or longer as required by 40 CFR Part 503). This period may be extended by request of the Agency or USEPA at any time.

(c) Records of monitoring information shall include:

(1) The date, exact place, and time of sampling or measurements;

(2) The individual(s) who performed the sampling or measurements;

(3) The date(s) analyses were performed;

(4) The individual(s) who performed the analyses;

(5) The analytical techniques or methods used; and

(6) The results of such analyses.

(d) Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit. Where no test procedure under 40 CFR Part 136 has been approved, the permittee must submit to the Agency a test method for approval. The permittee shall calibrate and perform maintenance procedures on all monitoring and analytical instrumentation at intervals to ensure accuracy of measurements.

(11) **Signatory requirement.** All applications, reports or information submitted to the Agency shall be signed and certified.

(a) **Application.** All permit applications shall be signed as follows:

(1) For a corporation: by a principal executive officer of at least the level of vice president or a person or position having overall responsibility for environmental matters for the corporation:

(2) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

(3) For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official.

(b) **Reports.** All reports required by permits, or other information requested by the Agency shall be signed by a person described in paragraph (a) or by a duly authorized representative of that person. A person is a duly authorized representative only if:

(1) The authorization is made in writing by a person described in paragraph (a); and

(2) The authorization specifies either an individual or a position responsible for the overall operation of the facility, from which the discharge originates, such as a plant manager, superintendent or person of equivalent responsibility; and

(3) The written authorization is submitted to the Agency.

(c) **Changes of Authorization.** If an authorization under (b) is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of (b) must be submitted to the Agency prior to or together with any reports, information, or applications to be signed by an authorized representative.

(d) **Certification.** Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

(12) **Reporting requirements.**

(a) **Planned changes.** The permittee shall give notice to the Agency as soon as possible of any planned physical alterations or additions to the permitted facility.
Notice is required when:

(1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source pursuant to 40 CFR 122.29 (b); or

(2) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements pursuant to 40 CFR 122.42 (a)(1).

(3) The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.

(b) **Anticipated noncompliance.** The permittee shall give advance notice to the Agency of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

(c) **Transfers.** This permit is not transferable to any person except after notice to the Agency.

(d) **Compliance schedules.** Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

(e) **Monitoring reports.** Monitoring results shall be reported at the intervals specified elsewhere in this permit.

(1) Monitoring results must be reported on a Discharge Monitoring Report (DMR).

(2) If the permittee monitors any pollutant more frequently than required by the permit, using test procedures approved under 40 CFR 136 or as specified in the permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR.

(3) Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified by the Agency in the permit.

(f) **Twenty-four hour reporting.** The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24-hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and time; and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. The following shall be included as information which must be reported within 24-hours:

(1) Any unanticipated bypass which exceeds any effluent limitation in the permit.

(2) Any upset which exceeds any effluent limitation in the permit.

(3) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Agency in the permit or any pollutant which may endanger health or the environment.

The Agency may waive the written report on a case-by-case basis if the oral report has been received within 24-hours.

(g) **Other noncompliance.** The permittee shall report all instances of noncompliance not reported under paragraphs (12) (d), (e), or (f), at the time monitoring reports are submitted. The reports shall contain the information listed in paragraph (12) (f).

(h) **Other information.** Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application, or in any report to the Agency, it shall promptly submit such facts or information.

(13) **Bypass.**

(a) Definitions.

(1) Bypass means the intentional diversion of waste streams from any portion of a treatment facility.

(2) Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

(b) Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs (13)(c) and (13)(d).

(c) Notice.

(1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.

(2) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in paragraph (12)(f) (24-hour notice).

(d) Prohibition of bypass.

(1) Bypass is prohibited, and the Agency may take enforcement action against a permittee for bypass, unless:

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

(iii) The permittee submitted notices as required under paragraph (13)(c).

(2) The Agency may approve an anticipated bypass, after considering its adverse effects, if the Agency determines that it will meet the three conditions listed above in paragraph (13)(d)(1).

(14) **Upset.**

(a) Definition. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

(b) Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph (14)(c) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

(c) Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(1) An upset occurred and that the permittee can identify the cause(s) of the upset;

(2) The permitted facility was at the time being properly operated; and

(3) The permittee submitted notice of the upset as required in paragraph (12)(f)(2) (24-hour notice).

(4) The permittee complied with any remedial measures required under paragraph (4).

(d) Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

(15) **Transfer of permits.** Permits may be transferred by modification or automatic transfer as described below:

(a) Transfers by modification. Except as provided in paragraph (b), a permit may be transferred by the permittee to a new owner or operator only if the permit has been modified or revoked and reissued pursuant to 40 CFR 122.62 (b) (2), or a minor modification made pursuant to 40 CFR 122.63 (d), to identify the new permittee and incorporate such other requirements as may be necessary under the Clean Water Act.

(b) Automatic transfers. As an alternative to transfers under paragraph (a), any NPDES permit may be automatically transferred to a new permittee if:
(1) The current permittee notifies the Agency at least 30 days in advance of the proposed transfer date;
(2) The notice includes a written agreement between the existing and new permittees containing a specified date for transfer of permit responsibility, coverage and liability between the existing and new permittees; and
(3) The Agency does not notify the existing permittee and the proposed new permittee of its intent to modify or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement.

(16) All manufacturing, commercial, mining, and silvicultural dischargers must notify the Agency as soon as they know or have reason to believe:
(a) That any activity has occurred or will occur which would result in the discharge of any toxic pollutant identified under Section 307 of the Clean Water Act which is not limited in the permit, if that discharge will exceed the highest of the following notification levels:
(1) One hundred micrograms per liter (100 ug/l);
(2) Two hundred micrograms per liter (200 ug/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/l) for 2,4-dinitrophenol and for 2-methyl-4,6 dinitrophenol; and one milligram per liter (1 mg/l) for antimony.
(3) Five (5) times the maximum concentration value reported for that pollutant in the NPDES permit application; or
(4) The level established by the Agency in this permit.
(b) That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant which was not reported in the NPDES permit application.

(17) All Publicly Owned Treatment Works (POTWs) must provide adequate notice to the Agency of the following:
(a) Any new introduction of pollutants into that POTW from an indirect discharge which would be subject to Sections 301 or 306 of the Clean Water Act if it were directly discharging those pollutants; and
(b) Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.
(c) For purposes of this paragraph, adequate notice shall include information on (i) the quality and quantity of effluent introduced into the POTW, and (ii) any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

(18) If the permit is issued to a publicly owned or publicly regulated treatment works, the permittee shall require any industrial user of such treatment works to comply with federal requirements concerning:
(a) User charges pursuant to Section 204 (b) of the Clean Water Act, and applicable regulations appearing in 40 CFR 35;
(b) Toxic pollutant effluent standards and pretreatment standards pursuant to Section 307 of the Clean Water Act; and
(c) Inspection, monitoring and entry pursuant to Section 308 of the Clean Water Act.

(19) If an applicable standard or limitation is promulgated under Section 301(b)(2)(C) and (D), 304(b)(2), or 307(a)(2) and that effluent standard or limitation is more stringent than any effluent limitation in the permit, or controls a pollutant not limited in the permit, the permit shall be promptly modified or revoked, and reissued to conform to that effluent standard or limitation.

(20) Any authorization to construct issued to the permittee pursuant to 35 Ill. Adm. Code 309.154 is hereby incorporated by reference as a condition of this permit.

(21) The permittee shall not make any false statement, representation or certification in any application, record, report, plan or other document submitted to the Agency or the USEPA, or required to be maintained under this permit.

(22) The Clean Water Act provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Clean Water Act is subject to a civil penalty not to exceed $25,000 per day of such violation. Any person who willfully or negligently violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318 or 405 of the Clean Water Act is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than one year, or both.
Additional penalties for violating these sections of the Clean Water Act are identified in 40 CFR 122.41 (a)(2) and (3).

(23) The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

(24) The Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

(25) Collected screening, slurries, sludges, and other solids shall be disposed of in such a manner as to prevent entry of those wastes (or runoff from the wastes) into waters of the State. The proper authorization for such disposal shall be obtained from the Agency and is incorporated as part hereof by reference.

(26) In case of conflict between these standard conditions and any other condition(s) included in this permit, the other condition(s) shall govern.

(27) The permittee shall comply with, in addition to the requirements of the permit, all applicable provisions of 35 Ill. Adm. Code, Subtitle C, Subtitle D, Subtitle E, and all applicable orders of the Board or any court with jurisdiction.

(28) The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit is held invalid, the remaining provisions of this permit shall continue in full force and effect.

DOCUMENT 2

From: EPA.CCR.Part845.Coordinator
To: LeCrone, Darin
Subject: FW: Public Meeting Notification - Powerton Generating Station (W1798010008) Bypass Basin and Former Ash Basin
Date: Monday, April 18, 2022 2:50:59 PM
Attachments: Powerton Station CCR Public Notice (poster).pdf
Powerton Station CCR Public Notice (mailer).pdf

Darin,
Attached is a copy of the public notice for the Powerton meeting on May 18, 20222 and May 19, 20222 that MWG sent me.
I will have this sent out to the listserv today.

Tabitha K. Bernhardt
CCR Coordinator
Illinois Environmental Protection Agency
Bureau of Water
Division Water Pollution Control
Groundwater Section
1021 N. Grand Avenue
Springfield, IL 62702
tabitha.k.bernhardt@illinois.gov
D: 217-558-0347

Build a better tomorrow.

Please consider the environment before printing this e-mail

From: Shealey, Sharene
Sent: Thursday, April 14, 2022 5:44 PM
To: EPA.CCR.Part845.Coordinator
Cc: Bernhardt, Tabitha K. (EPA) ; Buckley, Jill
Subject: [External] Public Meeting Notification - Powerton Generating Station (W1798010008) Bypass Basin and Former Ash Basin

Greetings,
Please find attached electronic copies of the public meeting notices prepared and circulated per the requirements of 35 IAC 845.240(b) for Powerton Generating Station, Facility ID No. W1798010008. The poster format notice has been posted to our IL CCR Compliance website. A hardcopy of the mailer format has been submitted to the Agency via certified mail (Certified Mail No. 7019 0160 0000 5140 4930).
Please contact me if you need additional information.
Thank you,
Sharene

Sharene Shealey
Director, Environmental
Will County Generating Station – 529 E. 135th Street – Romeoville, IL 60446
(724) 255-3220

State of Illinois - CONFIDENTIALITY NOTICE: The information contained in this communication is confidential, may be attorney-client privileged or attorney work product, may constitute inside information or internal deliberative staff communication, and is intended only for the use of the addressee. Unauthorized use, disclosure or copying of this communication or any part thereof is strictly prohibited

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MWG
Midwest Generation, LLC

Public Notice

Midwest Generation to Host Public Meetings on Closure of the Former Ash Basin and Retrofit of the Bypass Basin at Powerton Generating Station

---

What: Midwest Generation is hosting two public meetings to share information and engage with the community about its proposed plans for its Former Ash Basin and Bypass Basin at Powerton Generating Station. Midwest Generation's plans are to (1) close the Former Ash Basin and (2) retrofit the Bypass Basin. Neither basin currently receives coal-combustion residuals, or CCR. Consistent with state and federal regulations, MWG is proposing to close the Former Ash Basin through capping and long-term monitoring. The proposal for the Bypass Basin entails removing the remaining CCR, installing a new composite liner system, installing a new leachate collection and removal system, and continuing to use the Bypass Basin as a CCR surface impoundment. MWG anticipates filing construction permit applications for each basin with the State of Illinois in June 2022. Following a presentation at the meetings, there will be an opportunity to participate in a question-and-answer session.

When: Wednesday, May 18, 2022, 6 p.m. to 8 p.m.
Thursday, May 19, 2022, 10 a.m. to 12 p.m.

Where: Avanti's Dome*
3401 Griffin Ave
Pekin, IL 61554
**Accessible to persons with disabilities.*

Livestream: The meeting will be streamed live online. Please check **midwestgenerationllc.com** for log-in details and updated information closer to the meeting dates.

Information on closure construction permit applications will be posted at **midwestgenerationllc.com** no later than **April 18, 2022**. Contact: **midwestgeneration@nrg.com.**



R000023

MWG
Midwest Generation,LLC

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DOCUMENT 3

From:	EPA.CCR.Part845.Coordinator
To:	Shaw, Melinda; Liska, Mark
Cc:	LeCrone, Darin; Dunaway, Lynn
Subject:	FW: Public Meeting Notification - Powerton Generating Station (W1798010008) Bypass Basin and Former Ash Basin
Date:	Tuesday, April 19, 2022 2:09:07 PM
Attachments:	Powerton Station CCR Public Notice (poster).pdf Powerton Station CCR Public Notice (mailer).pdf

FYI

Tabitha K. Bernhardt
CCR Coordinator
Illinois Environmental Protection Agency
Bureau of Water
Division Water Pollution Control
Groundwater Section
1021 N. Grand Avenue
Springfield, IL 62702
tabitha.k.bernhardt@illinois.gov
D: 217-558-0347

Build a better tomorrow.

Please consider the environment before printing this e-mail

From: Shealey, Sharene
Sent: Thursday, April 14, 2022 5:44 PM
To: EPA.CCR.Part845.Coordinator
Cc: Bernhardt, Tabitha K. (EPA) ; Buckley, Jill
Subject: [External] Public Meeting Notification - Powerton Generating Station (W1798010008) Bypass Basin and Former Ash Basin

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DOCUMENT 4

Form CCR 1	Illinois Environmental Protection Agency CCR Surface Impoundment Permit Application Form CCR 1 – General Provisions

Bureau of Water ID Number:

CCR Permit Number:

Facility Name:

For IEPA Use Only

SECTION 1: FACILITY, OPERATOR, AND OWNER INFORMATION (35 Ill. Adm. Code 845.210(b))

Facility, Operator, and Owner Information

1.1	Facility Name		
	Powerton Generating Station		
1.2	Illinois EPA CCR Permit Number (if applicable)		
1.3	Facility Contact Information		
	Name (first and last) Joseph Kotas	Title Environmental Specialist	Phone Number 309-477-5216
	Email address Joseph.Kotas@nrg.com		
1.4	Facility Mailing Address		
	Street or P.O. box 13082 East Manito Road		
	City or town Pekin	State IL	Zip Code 61554
1.5	Facility Location		
	Street, route number, or other specific identifier 13082 East Manito Road		
	County name Tazewell	County code (if known)	
	City or town Pekin	State IL	Zip Code 61554
1.6	Name of Owner/Operator		
	Midwest Generation, LLC		

Facility, Operator, and Owner Info

1.7 Owner/Operator Contact Information

Name (first and last)	Title	Phone Number
Todd Mundorf	Plant Manager	309-477-5212

Email address: Todd.Mundorf@nrg.com

1.8 Owner/Operator Mailing Address

Street or P.O. box: 804 Carnegie Center

City or town	State	Zip Code
Princeton	NJ	08540

SECTION 2: LEGAL DESCRIPTION (35 Ill. Adm. Code 845.210(c))

Legal Description

2.1 Legal Description of the facility boundary

SEC 9 T24N R5W LYING W OF RR IN W 1/2 & W 50 X 2220.46 OF ADJ RR (EXC 2.05 AC TRACT) N W 1/4 300.7 AC

SECTION 3: PUBLICLY ACCESSIBLE INTERNET SITE REQUIREMENTS (35 Ill. Adm. Code 845.810)

Internet Site

3.1 Web Address(es) to publicly accessible internet site(s) (CCR website)

https://midwestgenerationllc.com/illinois-ccr-rule-compliance-data-and-information/

3.2 Is/are the website(s) titled “Illinois CCR Rule Compliance Data and Information”

☑	Yes	☐	No

SECTION 4: IMPOUNDMENT IDENTIFICATION

Impoundment Identification

4.1 List all the impoundment identification numbers for your facility and check the corresponding box to indicate that you have attached a written description for each impoundment.

W1798010008-04	☑	Attached written description
	☐	Attached written description
	☐	Attached written description
	☐	Attached written description
	☐	Attached written description
	☐	Attached written description

			☐	Attached written description
			☐	Attached written description
			☐	Attached written description
			☐	Attached written description

SECTION 5: CHECKLIST AND CERTIFICATION STATEMENT

Checklist and Certification Statement

5.1 In Column 1 below, mark the sections of Form 1 that you have completed and are submitting with your application. For each section, specify in Column 2 any attachments that you are enclosing.

Column 1		Column 2	
Section 1: Facility, Operator, and Owner Information	☑	w/attachments	☑
Section 2: Legal Description	☑	w/attachments	☐
Section 3: Publicly Accessible Internet Site Requirement	☑	w/attachments	☐
Section 4: Impoundment Identification	☑	w/attachments	☑

5.2 **Certification Statement**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name (print or type first and last name) of Owner/Operator	Official Title
Todd Mundorf	Plant Manager
Signature	Date Signed
Todd Mundorf	7/15/2022

Form CCR 2CN	Illinois Environmental Protection Agency CCR Surface Impoundment Permit Application Form CCR 2CN – New Construction

Bureau of Water ID Number:

CCR Permit Number:

Facility Name:

For IEPA Use Only

SECTION 1: DESIGN AND CONSTRUCTION PLANS (35 Ill. Adm. Code 845.220)

Design and Construction Plans (Construction History)

1.1	CCR surface impoundment name.
	Bypass Basin
1.2	Identification number of the CCR surface impoundment (if one has been assigned by the Agency).
	W1798010008-04
1.3	Describe the boundaries of the CCR surface impoundment. (35 Ill. Adm. Code 845.210 (c)).
	SEC 8 T24N R5W E 1/2 OF NE 1/4 (EXC RIVER) & E 1/2 OF SE 1/4 (EXC RIVER & EXC TRACT) 111.65 AC
1.4	State the purpose for which the CCR surface impoundment is being used.
	The Bypass Basin is not currently in service and was historically used as a settling pond for bottom ash remaining in decant water from the facility's dewatering bins and for other process water related to power generation at the site when the facility's Ash Surge Basin was out of service for regular maintenance. After it has been retrofitted, the Bypass Basin will be used for the same purpose.
1.5	How long has the CCR surface impoundment been in operation?
	42 Years (since 1980)
1.6	List the types of CCR that have been placed in the CCR surface impoundment.
	Bottom Ash
1.7	List the name of the watershed within which the CCR surface impoundment is located.
	Pekin Lake-Illinois River Watershed

Design and Construction Plans (Continued)

1.8	What is the size in acres of the watershed within which the CCR surface impoundment is located?	
	28,834 acres	
1.9	Check the corresponding boxes to indicate that you have attached the following:	
	☑	A description of the physical and engineering properties of the foundation and abutment materials on which the CCR surface impoundment is constructed.
	☑	A statement of the type, size, range, and physical and engineering properties of the materials used in constructing each zone or stage of the CCR surface impoundment.
	☑	A statement of the method of site preparation and construction of each zone of the CCR surface impoundment.
	☑	A statement of the approximate dates of construction of each successive stage of construction of the CCR surface impoundment.
	☑	Drawings satisfying the requirements of 35 Ill. Adm. Code 845.220(a)(1)(F).
	☑	A description of the type, purpose, and location of existing instrumentation.
	☑	Area Capacity Curves for the CCR Impoundment.
	☑	A description of each spillway and diversion design features and capacities and provide the calculations used in their determination.
	☑	The construction specifications and provisions for surveillance, maintenance, and repair of the CCR surface impoundment.
1.10.1	Is there any record or knowledge of structural instability of the CCR surface impoundment?	
	☐ Yes	☑ No
1.10.2	If you answered yes to Item 1.10.1, provide detailed explanation of the structural instability.	

SECTION 2: NARRATIVE DESCRIPTION OF THE FACILITY (35 Ill. Adm. Code 845.220)

Narrative Description

2.1	List the types of CCR expected in the CCR surface impoundments.	
	Bottom Ash	
2.2	Have you attached a chemical analysis of each type of expected CCR?	
	☑ Yes	

Narrative Description (Cont.)	2.3	Estimate of the maximum capacity of the surface impoundment in gallons or cubic yards.			
		The Bypass Basin's maximum capacity is approximately 6,700 cubic yards.			
	2.4	The rate at which CCR and non-CCR waste streams currently enter the CCR impoundment in gallons per day and dry tons.			
		18.8 million	GPD		dTn
	2.5	Estimate length of time the CCR surface impoundment will receive CCR and non-CCR waste streams.			
		Approximately 5 Years (Until December 31, 2028)			
	2.6	Have you attached an on-site transportation plan that includes all existing and planned roads in the facility that will be used during the operation of the CCR surface impoundment?			
		☑	Yes	☐	No

SECTION 3: MAPS (35 Ill. Adm. Code 845.220)

Maps	3.1	Check the corresponding boxes to indicate that you have attached the following maps:	
		☑	A site location map on the most recent United Sates Geological Survey (USGS) quadrangle of the area from the 7 ½ minute series (topographic) or on another map whose scale clearly shows the information required in 35 Ill. Adm. Code 845.220(a)(3).
		☑	Site plans maps satisfying the requirements of 35 Ill. Adm. Code 845.220(a)(4).

SECTION 4: ATTACHMENTS

Attachments	4.1	Check the corresponding boxes to indicate that you have attached the following:	
		☑	A narrative description of the proposed construction of, or modification to, a CCR surface impoundment and any projected changes in the volume or nature of the CCR or non-CCR waste streams.
		☑	Plans and specifications fully describing the design, nature, function, and interrelationship of each individual component of the facility.
		☑	The signature and seal of a qualified professional engineer.
		☑	Certification that the owner or operator of the CCR surface impoundment completed the public notification and public meetings required under 35 Ill. Adm. Code 845.240.
		☑	A summary of the issues raised by the public during the public notification and public meetings.
		☑	A summary of any revisions, determinations, or other considerations made in response to those issues raised by the public during the public notification and public meetings.
		☑	A list of interested persons in attendance who would like to be added to the Agency's listserv for the facility.
		☑	Certification that all contractors, subcontractors, and installers utilized to construct, install, modify, or close a CCR surface impoundment are participants in a training program that is approved by and registered with the U.S. Department of Labor's Employment and Training Administration and that includes instruction in erosion control and environmental remediation.

			Certification that all contractors, subcontractors, and installers utilized to construct, install, modify, or close a CCR surface impoundment are participants in a training program that is approved by and registered with the U.S. Department of Labor's Employment and Training Administration and that includes instruction in the operation of heavy equipment and excavation.
SECTION 5: GROUNDWATER MONITORING PROGRAM			
Groundwater	5.1		Indicate that you have attached the following components of a new groundwater monitoring program or any modifications to an existing groundwater monitoring program by checking the corresponding boxes:
		☑	A hydrogeologic site investigation meeting the requirements of 35 Ill. Adm. Code 845.620, if applicable.
		☑	Design and construction plans of a groundwater monitoring system meeting the requirements of 35 Ill. Adm. Code 845.630.
		☑	A proposed groundwater sampling and analysis program that includes selection of the statistical procedures to be used for evaluating groundwater monitoring data as required by 35 Ill. Adm. Code 845.640 and 35 Ill. Adm. Code 845.650.
SECTION 6: PLANS AND SPECIFICATIONS			
Plans and Specifications	6.1		Indicate that you have attached plans and specifications that demonstrate the proposed CCR surface impoundment will meet the location standards in the following sections by checking the corresponding boxes:
		☑	35 Ill. Adm. Code 845.300 (Placement Above the Uppermost Aquifer)
		☑	35 Ill. Adm. Code 845.310 (Wetlands)
		☑	35 Ill. Adm. Code 845.320 (Fault areas)
		☑	35 Ill. Adm. Code 845.330 (Seismic impact zones)
		☑	35 Ill. Adm. Code 845.340 (Unstable areas and floodplains)
	6.2		Indicate that you have attached plans and specifications that demonstrate the proposed CCR surface impoundment will meet the following design criteria by checking the corresponding boxes:
		☑	The CCR surface impoundment will have a liner meeting the liner requirements of 35 Ill. Adm. Code 845.400(b) or (c).
		☑	The CCR surface impoundment will have a leachate collection system meeting the requirements of 35 Ill. Adm. Code 845.420.
		☑	The CCR surface impoundment, if not incised, will be constructed with slope protection, as required by 35 Ill. Adm. Code 845.430.
	6.3		Indicate that you have attached the following plans by checking the corresponding boxes:
		☑	CCR fugitive dust control plan, as specified in 35 Ill. Adm. Code 845.500(b).
		☑	Preliminary written closure plan, as specified in 35 Ill. Adm. Code 845.720(a).
		☑	Initial written post-closure care plan, as specified in 35 Ill. Adm. Code 845.780(d), if applicable.

MWG
Midwest Generation, LLC

Powerton Generating Station
Bypass Basin
(IEPA ID No. W1798010008-04)

Application for Retrofit Construction Permit

Revision 0

July 15, 2022

Issue Purpose: Permit

Project No.: 12661-130

55 East Monroe Street
Chicago, IL 60603-5780 USA
312-269-2000
www.sargentlundy.com

Sargent & Lundy

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INTRODUCTION

Midwest Generation, LLC (MWG) currently operates the Powerton Generating Station ("Powerton" or the "Station"), a coal-fired steam electric generating station located in Pekin, Illinois. The Station's address is 13082 East Manito Rd, Pekin, IL 61554. The Station consists of four coal-fired boilers and two electric generating units, Units 5 and 6, with an approximate nameplate capacity of 1,785 megawatts (MW). As part of electric power generating operations, bottom ash, a coal combustion residual (CCR) from the Station's boilers, is sluiced to a set of two dewatering bins (one dedicated pair per unit) which mechanically promote sedimentation of the suspended bottom ash particles in the sluice water. Decant water from each pair of dewatering bins, which still contains some bottom ash particles, then overflows into a concrete trench that directs the effluent into a CCR surface impoundment for additional sedimentation.

Currently, decant water from the Station's dewatering bins is sent to the Station's Ash Surge Basin. Historically, whenever the Station had to clean the Ash Surge Basin as part of regular maintenance, decant water from the concrete trench would be diverted to the Bypass Basin instead. However, the Bypass Basin was taken out of service in October 2020 and has not been used for managing CCR or non-CCR waste streams since. It will not be placed back into service until it has been retrofitted with a new composite liner system and a new leachate collection and removal system in accordance with federal and state environmental regulations for CCR surface impoundments.

Pursuant to § 845.220 of Title 35 of the Illinois Administrative Code (35 Ill. Adm. Code), MWG is submitting this application to the Illinois Environmental Protection Agency (Illinois EPA) for a construction permit to retrofit Powerton's Bypass Basin with a new composite liner system and a new leachate collection and removal system so that it may be placed back into service to manage CCR effluent from the Station's dewatering bins and other non-CCR waste streams from electric power generating operations. The purpose of this report and all attachments hereto is to demonstrate that the design, construction, and operation of the retrofitted Bypass Basin will comply with the Illinois Pollution Control Board's "Standards for the Disposal of Coal Combustion Residuals in CCR Surface Impoundments," which are codified in Part 845 to the aforementioned 35 Ill. Adm. Code. Accordingly, this report and all attachments hereto provide the documents and information required for a construction permit application to retrofit an existing CCR surface impoundment as specified by 35 Ill. Adm. Code 845.220(a)–(b).

1.0 HISTORY OF CONSTRUCTION (845.220(A)(1))

The history of construction for the Bypass Basin as specified by 35 Ill. Adm. Code 845.220(a)(1) is presented in Sections 1.1 through 1.13.

1.1 CCR SURFACE IMPOUNDMENT IDENTIFYING INFORMATION

The Bypass Basin is operated by Midwest Generation, LLC, whose address is 804 Carnegie Center, Princeton, NJ, 08540. The Bypass Basin's Illinois EPA identification number is W1798010008-04.

1.2 PURPOSE OF THE CCR SURFACE IMPOUNDMENT

The Bypass Basin was historically used as a settling pond for bottom ash remaining in decant water from Powerton's dewatering bins and for other process water related to power generation at the site when the Station's Ash Surge Basin was out of service for regular maintenance. After it has been retrofitted with a new composite liner system and a new leachate collection and removal system, the Bypass Basin will be used for this same purpose.

1.3 CCR SURFACE IMPOUNDMENT SERVICE HISTORY

The Bypass Basin was originally constructed circa 1980 and operated until it was taken out of service for routine cleaning in early October 2020, after which MWG elected to take it out of service until it is retrofitted with a new composite liner system and a new leachate collection and removal system.

1.4 TYPES OF CCR IN THE SURFACE IMPOUNDMENT

Bottom ash was historically placed in the Bypass Basin until it was taken out of service in early October 2020. The chemical constituents that make up the Station's bottom ash are discussed in detail in Section 2.1.

1.5 NAME & SIZE OF SURROUNDING WATERSHED

The Bypass Basin is located within the Pekin Lake-Illinois River watershed (U.S. Geological Survey 12-Digit Hydrologic Unit Code 071300030304), which is approximately 28,834 acres (USGS, 2021). This watershed is located within the larger Lower Illinois watershed.

It should be noted that the surface water runoff for the Bypass Basin is limited to the area within the embankment crests because they are constructed with elevated embankments in relation to the surrounding ground surface.

1.6 DESCRIPTION OF CCR SURFACE IMPOUNDMENT FOUNDATION MATERIALS

1.6.1 PHYSICAL PROPERTIES OF FOUNDATION MATERIALS

The following descriptions of the physical properties of the Bypass Basin's foundation materials are taken from the history of construction prepared by Geosyntec Consultants (Geosyntec) for the basin in 2016 (Geosyntec, 2016a).

The physical properties of the foundation materials in the vicinity of the Bypass Basin generally consist of interlaying sandy and clayey units. Soil borings performed in 2005 as part of a site investigation by KPRG and Associates, Inc. (KPRG) identified layers of sand with silt and gravel, silty sand with traces of clay from the ground surface to a depth of about 20 feet. Approximately 100 to 125 feet of alluvial sands and gravels with some minor clay underlies the Station based on publicly available geologic information. Silt and clay layers were observed beneath the fill material used to construct the basin's embankments based on logs from monitoring wells installed in the basin's embankments as well as borings and cone penetration test (CPT) soundings performed in the vicinity of the basin. This information was obtained from site investigation work performed by Patrick Engineering in 2011 and Geosyntec in 2016. The logs and CPT soundings show that the silt and clay layers range from 16 to 20 feet thick, and these layers are underlain by approximately 34 to 43 feet of medium dense sand and gravel that is poorly graded. Geosyntec performed a soil boring and a CPT sounding north of the Bypass Basin that identified a layer of very hard lean clay below the above-mentioned poorly graded sand and gravel. Finally, no abutments are present.

1.6.2 ENGINEERING PROPERTIES OF FOUNDATION MATERIALS

The following descriptions of the engineering properties of the Bypass Basin's foundation materials are taken from the initial structural stability and safety factor assessments prepared by Geosyntec for the basin in 2016 (Geosyntec, 2016b).

The foundation materials for the Bypass Basin were determined to be clay or sand as indicated in Section 1.6.1; the engineering properties for these materials are presented in Table 1.6-1. The properties were determined from site investigations, published correlations, and laboratory testing of samples collected during the site investigations referenced in Section 1.6.1.

Table 1.6-1 – Engineering Properties of Foundation Materials

Material	Unit Weight (pcf)	Drained Friction Angle (degrees)	Effective Cohesion (psf)	Undrained Shear Strength (psf)
Clay	115	32	25	600
Sand	125	32	0	--

The very hard lean clay mentioned in Section 1.6.1 that underlies the poorly graded sand and gravel did not have engineering properties determined for it. This was because of its depth below ground surface in relation to the basins and its negligible contribution to the slope stability analysis (Geosyntec, 2016b).

1.7 DESCRIPTION OF CONSTRUCTION MATERIALS, METHODS, AND DATES

The following descriptions of the historical construction materials, methods, and dates for the Bypass Basin are based on the construction plans prepared by (1) NUS Corporation in 1980 for the basin's original construction and by (2) Natural Resource Technology (NRT) in 2010 for re-lining the basin. Both sets of construction plans are provided in Attachments 1-1 and Attachment 1-2, respectively. It should be noted that as-built drawings for the original construction of the Bypass Basin were not available detailing the actual methods and materials used to construct the basin circa 1980.

1.7.1 PHYSICAL & ENGINEERING PROPERTIES OF CONSTRUCTION MATERIALS

Based on the original construction plans for the Bypass Basin prepared by NUS Corporation in 1980, the basin's embankments were constructed using compacted fill. Engineering properties for the compacted fill were estimated by Geosyntec as shown in Table 1.7-1 for use in the Bypass Basin's initial safety factor assessment (Geosyntec, 2016b). These estimated engineering properties were based on site investigations, published data, and laboratory testing of the Bypass Basin's embankment materials.

Table 1.7-1 – Engineering Properties of Embankment Materials

Material	Unit Weight (pcf)	Drained Friction Angle (degrees)	Effective Cohesion (psf)
Embankment Fill	125	35	25

1.7.2 CONSTRUCTION METHODS

Based on the 1980 original construction plans, the fill material for the Bypass Basin's southern and eastern embankments were placed in loose lifts not to exceed 9 inches and compacted to 95 percent relative compaction when compacted to a maximum dry density obtained from a Modified Proctor test. The basin's northern and western embankments were already present when it was constructed because these embankments are shared with the Ash Surge Basin (north) and the East Yard Runoff Basin[1] (west), which were both constructed before the Bypass Basin. The design width for the top of the embankment ranged from 12 to 18 feet and a maximum slope height is approximately 24 feet on the west side of the basin where the embankment is shared by the East Yard Runoff Basin. The interior faces of the Bypass Basin's embankments were designed at slopes of 3-horizontal to 1-vertial (3H:1V), while the exterior faces were designed at slopes of 2.5H:1V or shallower.

[1] The East Yard Runoff Basin is a non-CCR surface impoundment.

Originally, the Bypass Basin was lined with a Hypalon® liner along the basin floor and interior slopes; a 12-in.-thick Poz-O-Pac liner was also installed along the basin floor when it was constructed. In 2010, the original Hypalon® and Poz-O-Pac liners were removed and replaced with a 60-mil HDPE geomembrane liner.

1.7.3 CONSTRUCTION DATES

Exact dates for construction of the Bypass Basin's embankments, original liner system, and appurtenant structures are unknown; however, construction drawings were approved for construction in June 1980. As previously stated, the Bypass Basin's original Hypalon® and Poz-O-Pac liners were removed and replaced with a 60-mil HDPE geomembrane liner in 2010.

1.8 DETAILED DIMENSIONAL DRAWINGS

The original construction plans for the Bypass Basin prepared by NUS Corporation in 1980 are provided in Attachment 1-1. Meanwhile, the as-built drawings for replacing the Bypass Basin's liner prepared by NRT in 2011 are provided in Attachment 1-2.

1.9 INSTRUMENTATION

When the Bypass Basin was in service, a water level monitoring system with an ultrasonic level detector in the pump house sump north of the Ash Surge Basin was used to control the pumps that maintained the operational water level in the Bypass Basin. However, this instrumentation did not determine the water level in the Bypass Basin. A staff gauge has been installed in the basin to determine the water level visually.

1.10 AREA-CAPACITY CURVE

An area-capacity curve for the retrofitted Bypass Basin is provided in Attachment 1-4.

1.11 SPILLWAY AND DIVERSION DESIGN FEATURE CAPACITIES AND CALCULATIONS

There is a vertical 5-foot-diameter, corrugated metal pipe (CMP) riser located in the northeast corner of the Bypass Basin that was originally designed to act as an emergency spillway for the basin. The vertical riser connects to a 30-inch diameter concrete pipe that extends northwards within the embankment between the Bypass Basin and the Ash Surge Basin that discharges onto a concrete apron on the southern slope of the Ash Surge Basin. Although no calculations for the original design of this emergency spillway structure are available, the Bypass Basin has historically operated properly without any issues.

1.12 SURVEILLANCE, MAINTENANCE, & REPAIR CONSTRUCTION SPECIFICATIONS

Technical specifications for the Bypass Basin liner replacement project performed in 2010 are provided in Attachment 1-3.

1.13 RECORD OF STRUCTURAL INSTABILITY

There is no record or knowledge of structural instability associated with the Bypass Basin.

2.0 NARRATIVE DESCRIPTION OF THE FACILITY (845.220(A)(2))

2.1 CCR TYPES & CHEMICAL ANALYSES

Bottom ash has historically been managed in the Bypass Basin and will continue to be managed in the basin after it has been retrofitted with a new composite liner system and a new leachate collection and removal system. A sample of the CCR present in the Ash Surge Basin, which is representative of the CCR that has been and will be managed in the Bypass Basin, was sampled and analyzed for the parameters listed in 35 Ill. Adm. Code 845.600(a) except for total dissolved solids. The results of those analyses are presented in Table 2.1-1, and the total laboratory data package is provided in Attachment 2-1.

Table 2.1-1 – Chemical Constituents of CCR to be Managed in Powerton Bypass Basin

Parameter	CCR Sample (06-23-2021)	Parameter	CCR Sample (06-23-2021)
Antimony	< 8.6	Cobalt	< 11
Arsenic	2.2	Fluoride	4.7
Barium	1,800	Lead	5.5
Beryllium	0.90	Lithium	12
Boron	46	Mercury	0.094
Cadmium	< 0.17	Molybdenum	1.0
Calcium	39,000	Selenium	< 0.86
Chloride	88	Sulfate	230
Chromium	16	Thallium	1.2

Notes:
1. Reproduced from Table 2-1 in KPRG, 2021a.
2. All results are in milligrams per kilogram (mg/kg), except for percent solids, which is percent (%).
3. Symbols:
    a. F1 – MS and/or MSD recovery exceed control limits.
    b. V – Serial Dilution exceeds the control limits.

2.2 MAXIMUM CAPACITY

The Bypass Basin's maximum capacity is approximately 6,700 cubic yards.

2.3 WASTE STREAMS

Powerton has not sent CCR or non-CCR waste streams to the Bypass Basin since early October 2020. However, the CCR and non-CCR waste streams currently being managed in the Ash Surge Basin will be managed in the Bypass Basin after the latter has been retrofitted. These waste streams and their corresponding average flow rates are listed in Table 2.3-1 and are shown on the Station's process flow diagram provided in Attachment 2-2. These waste streams are all treated for suspended solids removal prior to being discharged to the Illinois River in accordance with the Station's NPDES Permit No. IL0002232.

Table 2.3-1 – Future Inflows into Powerton Bypass Basin

Waste Stream	Description	Average Flow, MGD (Type)
Unit 5 & 6 Dewatering Bin Effluent	Effluent from the Unit 5 and 6 dewatering bins containing suspended bottom ash particles.	10.9 (Typical)
Unit 5 and 6 Slag Tank Overflow	Overflow water from the boiler slag tanks. Include wastewater from: • Dust extractors in the coal tripper room, and • Washdown of the tail end and tripper rooms.	6.2 (Typical)
East Yard Runoff Basin Overflow	Overflow water from the Station's East Yard Runoff Basin. In addition to runoff from the eastern portion of the Station's property, includes water from: • Roof and yard drains in the areas of former Units 1, 2, 3, and 4; • Boiler room sumps, roof drains, and building drains; • Scrubber and limestone building area drains; • Condensate storage tank overflow; • Washdown of the trona mill; and • Trona mill roof drains.	1.3 (Intermittent)
Makeup Treatment Plant Effluent	Wastewater generated by the Station for treating makeup water prior to use in plant processes. Includes: • Demineralizer sand filter backwash, • Demineralizer regenerant, • Reverse osmosis (RO) reject wastewater, and • RO cleaning wastewater.	0.4 (Typical)
Metal Cleaning Waste Treatment System Effluent	Effluent from the Station's Metal Cleaning Waste Treatment System, which treats gas-side boiler cleaning waste overflow from the Metal Cleaning Basin.	0.04 (Intermittent)

Source: Sargent & Lundy (2021).

2.4 OPERATING LIFE

The Bypass Basin is currently anticipated to receive the CCR and non-CCR waste streams listed in Table 2.3-1 until December 31, 2028.

2.5 ON-SITE TRANSPORTATION PLAN

The Powerton Generating Station is a secure facility. The property boundary is fenced in with two gates. The main gate has a guard house with full time security. This will be the typical vehicle access to the Bypass Basin using the main plant road. Visitors will be required to sign in and out with the guard personnel. The second gate will be used for large vehicles to access the Bypass Basin. This gate is a slide gate with a key card just east of the main gate.

Upon approval of this construction permit application, the Bypass Basin will be retrofitted with a new composite liner system and a new leachate collection system. During the retrofit construction activities, access to the facility will still be controlled via the two aforementioned gates. As needed, road intersections are traffic-controlled with stop signs. The speed limit on the property is 5 miles per hour.

The Bypass Basin will be accessed using the existing roads on the property. These roads are shown in Figure 2 in Attachment 2-3. The main road that leads from the main gate ultimately leads to the northwest corner of the Bypass Basin at the eastern end of the facility's property. Meanwhile, the plant road utilized by large vehicles ultimately leads to the southeast corner of the Bypass Basin. Gravel roads along the basin's northern and eastern embankments will allow vehicles to reach the basin's access ramp in the northeast corner of the basin. These roads will be used by construction personnel to bring materials and equipment required to retrofit the Bypass Basin. Larger construction equipment may utilize an existing road loop northeast of the basin to turn around. Such equipment will also have either backup alarms or spotters as they are backing up near the Bypass Basin.

Transportation access to the Bypass Basin will not be required during normal day-to-day operations after the Bypass Basin has been retrofitted and placed back into service. Station personnel will use the access roads shown in Figure 2 (Attachment 2-3) during weekly inspections of the basin to ensure no issue arise. On a quarterly basis, groundwater sampling will be performed at the monitoring wells surrounding the Bypass Basin, during which time these roads will be used to access the wells.

3.0 SITE LOCATION MAP (845.220(A)(3))

A site location map on the most recent U.S. Geological Survey (USGS) quadrangle of the area from the 7 ½ minute topographic series is provided in Attachment 3. This map includes details regarding the facility and adjacent properties boundaries extending 1000 meters, surface waters, the prevailing wind direction, and the limits of all 100-year floodplains. Alongside this, all natural areas designated as a Dedicated Illinois Nature Preserve under the Natural Areas Preservation Act, all historic and archaeological sites designated by the National Historic Preservation Act and the Illinois Historic Sites Advisory Council Act, and all areas identified as critical habitat under the Endangered Species Protection Act of 1973 and the Illinois Endangered Species Protection Act are also shown on this map.

4.0 SITE PLAN MAP (845.220(A)(4))

Site plan maps providing the information required by 845.220(a)(4) are included in various attachments. Figures 4-1 and 4-2 in Attachment 4 show the entire Powerton Generating Station property (Figure 4-1) and a plan view showing Units 5 and 6, the locations of all existing CCR surface impoundments, and facility roads (Figure 4-2). Transportation routes from the Station's main gates to the CCR surface impoundments are shown on the aforementioned transportation plan in Figure 2. The boundaries of the Station's CCR surface impoundments and the locations of their existing groundwater monitoring well locations are shown on Figure 9-1 in Attachment 9. Finally, cross sections near / through the Station's CCR surface impoundments are shown on Figures 9-2 through 9-7 in Attachment 9.

5.0 DESCRIPTION OF PROPOSED RETROFIT (845.220(A)(5))

The proposed construction plans and specifications for retrofitting the Bypass Basin are provided in Attachment 5-1. MWG intends for the retrofit work to be performed by a General Work (GW) Contractor and its subcontractors, while an independent, third-party Construction Quality Assurance (CQA) Contractor will be responsible for assuring the Bypass Basin is retrofitted in accordance with the proposed construction plans and specifications. The technical specifications for the CQA work are provided in Attachment 5-2.

In accordance with the proposed construction plans and specifications, MWG plans to retrofit the Bypass Basin with a new composite liner system and a new leachate collection and removal system by executing the following sequential steps:

1. Obtaining a construction permit from the Illinois EPA for retrofitting the Bypass Basin;
2. Removing the gravel warning and sand cushion layers over the existing geomembrane liner from the basin and transporting the soil materials to a permitted disposal facility;
3. Decontaminating the basin's existing geomembrane liner for re-use as a supplemental liner in the retrofitted basin, including submittal of visual inspection documentation and analytical testing results to demonstrate the existing liner is no longer contaminated with CCR constituents in accordance with 35 Ill. Adm. Code 845.770(a)(4);
4. Decontaminating the basin's appurtenant structures (*e.g.*, inlet and outlet structures, piping);
5. Placing structural fill within the basin floor to establish the slopes for the new leachate collection and removal system and to support the new composite liner system;
6. Installing a composite liner system consisting of a 60-mil HDPE geomembrane over a geosynthetic clay liner (GCL); and
7. Installing a leachate collection and removal system consisting of a drainage geocomposite, leachate collection pipe, and submersible sump pump;
8. Installing a sand filter layer over the leachate collection and removal system; and
9. Installing a protective warning layer over the sand filter layer.

5.1 CCR REMOVAL & DECONTAMINATION

In early October 2020, Powerton Station took the Bypass Basin out of service for routine cleaning and began drawing down the surface water in the basin to dewater the basin and the CCR material stored therein. The Station then began removing the ash stored above the existing granular protective layers covering the basin's existing geomembrane liner in accordance with the Station's historical cleaning and maintenance practices for the Bypass Basin whereby ash is periodically removed from the basin to recover storage capacity. As of late October 2021, no CCR remains in the Bypass Basin.

Upon approval of the retrofit construction permit application, the retrofit activities will begin with removal of the granular protective layers covering the Bypass Basin's existing geomembrane liner: a 6-in.-thick gravel warning layer and a 12-in.-thick sand cushion layer. These soil materials will be carefully excavated, loaded onto trucks, and transported off-site for disposal at a permitted disposal facility. Because these soil materials are likely to contain CCR, they will be handled and hauled off-site in accordance with 35 Ill. Adm. Code 845.740(c), which includes specifications for proper manifests for each transported truckload, a transportation plan, on-site fugitive dust controls, signage and public notices, and managing stormwater to prevent contamination of surface water and groundwater.

After the existing granular protective layers in the Bypass Basin have been removed, the basin's existing HDPE geomembrane liner will be decontaminated so that it can be re-used as a supplemental liner under the new composite liner system being installed. The basin's inlet and outlet structures, associated piping, etc. will also be decontaminated. At a minimum, decontamination procedures will include pressure washing of the geomembrane liner and pond appurtenances in a systematic manner to remove all CCR and residuals of CCR. Following decontamination, the existing geomembrane liner will be visually inspected, and an electrical leak location survey will be conducted to ensure the liner is competent. Analytical tests will also be conducted in accordance Note 4.C.III on Drawing POW-BBR-CSK-004 (see Attachment 5-1) to demonstrate that the liner is no longer contaminated with CCR constituents.

5.2 STRUCTURAL FILL

After the existing granular protective layers have been removed and the Bypass Basin's existing HDPE geomembrane liner and appurtenances have been decontaminated, structural fill will be placed, compacted, and graded along the relatively flat basin floor to establish a minimum slope of three percent towards the location of the new leachate collection pipe being installed near the center of the basin. All earthwork activities associated with placing, compacting, and grading structural fill along the basin floor will be done in a manner to prevent tearing, ripping, or otherwise damaging the Bypass Basin's existing HDPE geomembrane liner.

5.3 COMPOSITE LINER SYSTEM

After the structural fill has been placed over the basin's existing HDPE geomembrane liner, the Bypass Basin's new composite liner system will be installed. The proposed new composite liner system for the Bypass Basin consists of a 60-mil HDPE geomembrane over a geosynthetic clay liner (GCL). The liquid flow rate through the GCL component will be less than the liquid flow rate through two feet of compacted soil with a hydraulic conductivity of 1×10^{-7} cm/sec in accordance with 35 Ill. Adm. Code 845.400(c)(2).

The GCL panels will be delivered to the project site by the GCL manufacturer in rolls. The GCL panels will be deployed directly over the recently installed structural fill material parallel to the slope towards the leachate

collection trench (*i.e.*, perpendicular to the slope elevation contours shown on the construction plans). Adjacent panels will be overlapped by a minimum of six inches along longitudinal seams and by a minimum of 24 inches along end seams. Seaming will be performed by pouring dry granular bentonite along the overlap zone in accordance with the GCL manufacturer's recommendations. Temporary anchoring, such as sand bags, will be placed along the edges of the exposed GCL panels to prevent uplift of the panels by wind during installation of the GCL.

As panels of GCL are deployed, placed, and seamed, panels of the upper HDPE geomembrane liner will be placed over the installed GCL panels. Similar to the GCL panels, the HDPE geomembrane liner panels will be delivered to the project site by the geomembrane manufacturer in rolls. The panels will be deployed directly over and in the same orientation as the installed GCL panels (i.e., parallel to the slope towards the leachate collection trench). Adjacent panels will be overlapped by a minimum of three to four inches prior to being seamed via double wedge fusion welding or extrusion fillet welding, depending on the geomembrane manufacturer's recommendations.

Both composite liner system components will be secured in an anchor trench along the crests of the Bypass Basin's embankments. The anchor trench will approximately two feet deep and will be backfilled to anchor the geosynthetic components of the Bypass Basin's new composite liner system and leachate collection and removal system in place (i.e., GCL, HDPE geomembrane liner, and drainage geocomposite). The backfill soil will be properly compacted to prevent the geosynthetic components from pulling out of the anchor trench.

As the composite liner system is being installed, field CQA inspections and tests will be performed in accordance with the retrofit construction plans and specifications provided in Attachments 5-1 and 5-2.

5.4 LEACHATE COLLECTION & REMOVAL SYSTEM

As areas of the Bypass Basin are lined with the new composite liner system, the new leachate collection and removal system (LCRS) components will be installed. The two primary components of the proposed LCRS are (1) a drainage geocomposite and (2) a perforated leachate collection pipe. The drainage geocomposite will consist of an HDPE geonet core with a non-woven geotextile layer heat-laminated to each side of the geonet core. The transmissivity of the drainage geocomposite will be at least 6×10^{-4} m^2/sec pursuant to 35 Ill. Adm. Code 845.420(a)(B). Meanwhile, the perforated leachate collection pipe will be installed in the leachate collection trench along the middle of the basin and will convey collected leachate to a sump pump at the southern end of the Bypass Basin to ultimately be pumped out of the basin into the basin's outlet structure.

Similar to the GCL and HDPE geomembrane liner, the drainage geocomposite panels will be delivered to the project site by the corresponding manufacturer in rolls. The panels will be deployed directly over the new composite liner system. Adjacent panels will be overlapped by a minimum of four inches and will be joined using self-locking straps on 1-foot centers along end seams, 5-foot centers along longitudinal seams on the

basin slopes, and 10-foot centers along longitudinal seams on the basin floor. The drainage geocomposite will also be secured with the GCL and HDPE geomembrane liner in the anchor trench along the crests of the Bypass Basin's embankments.

As previously stated, the 6-inch diameter perforated leachate collection pipe will be installed in a leachate collection trench along the center of the basin floor above the new composite liner system. To preclude the pipe's perforations from clogging, the pipe will be installed in and supported by a bedding layer of free-draining, coarse aggregate material. At the southern end of the basin, a non-perforated riser pipe will be installed to house a wheeled, submersible pump that will ultimately be used to dewater the Bypass Basin during periodic cleanings, at the time of closure, and as needed during the post-closure care period.

As the leachate collection and removal system is being installed, field CQA inspections and tests will be performed in accordance with the retrofit construction plans and specifications provided in Attachment 5-1 and 5-2.

5.5 SAND FILTER & PROTECTIVE WARNING LAYERS

After the new LCRS components are installed in the Bypass Basin, a sand filter layer will be installed above the new LCRS to prevent CCR and non-CCR sediments from clogging the LCRS. This filter layer will consist of sand imported from an offsite borrow source conforming to Gradations FA 1 or FA 2 pursuant to the Illinois Department of Transportation's (IDOT) Standard Specifications for Road and Bridge Construction. The material will be carefully placed and graded within the basin area to preclude damage to the new LCRS and composite liner system components. Finally, the sand filter layer will have a hydraulic conductivity of at least 1×10^{-5} cm/sec pursuant to 35 Ill. Adm. Code 845.420(a)(2).

In addition, pursuant 35 Ill. Adm. Code 845.420(a)(8), a protective warning layer will be installed over the sand filter layer to provide a means of deflecting the force of CCR pumped into the retrofitted Bypass Basin. Along the floor of the retrofitted Bypass Basin, this uppermost layer will be comprised of coarse aggregate materials conforming to IDOT Gradation CA 6 to provide a working surface for operators removing CCR from the basin; it will also serve as a means of warning these operators that they have reached the basin floor and to stop excavating. Along the basin's side slopes, the protective warning layer will consist of riprap on a gravel bedding layer to protect the sand filter layer from erosion. Like the sand filter layer, all protective warning layer materials will be carefully placed and graded within the Bypass Basin to preclude damage to the basin's new LCRS and composite liner system.

6.0 FACILITY COMPONENT PLANS & SPECIFICATIONS (845.220(A)(6))

The Powerton Generating Station is a coal-fired steam electric generating station that burns coal to generate electricity. The facility's boundaries are shown on Figure 4-1 in Attachment 4. The Station consists of four coal-fired boilers and two electric generating units (Units 5 and 6) as shown on Figure 4-2 in Attachment 4. Fly ash and bottom ash are both generated in the boilers as byproducts of burning coal. The fly ash is captured by electrostatic precipitators, is then pneumatically conveyed to on-site storage silos, and is finally deposited into trucks and hauled off-site. Meanwhile, bottom ash from the bottom of the boilers falls directly into slag tanks where it is quenched with water and subsequently sluiced to a set of two dewatering bins (one dedicated pair per electric generating unit). The dewatering bins mechanically promote sedimentation of the suspended bottom ash particles in the sluice water.

The Station's bottom ash-handling components are shown on Figure 4-2. Per the figure, bottom ash sluice piping from Unit 5 emanates from the north end of the boiler building and heads east above ground for approximately 900 feet where the piping terminates at the two dewatering bins for Unit 5. Meanwhile, bottom ash sluice piping from Unit 6 emanates from the south end of the boiler building and heads east above ground for approximately 1,100 feet, where the piping terminates at the two dewatering bins for Unit 6. Each dewatering bin has a decant pipe where treated overflow water drains into a concrete trench that heads northward towards the Bypass Basin and Ash Surge Basin. The dewatering bin overflow, which still contains some suspended CCR particles, then flows into the basin that is in service at the time for additional sedimentation. Flow into each basin is controlled by a dedicated controlled gate per basin.

Only one basin operates at any given time, with the larger Ash Surge Basin functioning as the Station's primary basin for precipitating CCR particles still suspended in the overflow water from the dewatering bins. Effluent from the dewatering bins enters the Ash Surge Basin through a distribution trough at the southern-most end of the basin. Upon entering the pond, the ash particles still suspended in the ash transport water settle to the pond floor as the wastewater migrates towards the basin outlet structure at the opposite end (i.e., northern-most end of the basin). Treated water is then discharged through a reinforced concrete pipe into a sump underneath the pump station located north of the Ash Surge Basin. Water is then pumped to the Service Water Basin[2] located northwest of the Ash Surge Basin and is then either recycled to the Station's cooling pond or discharged to the Illinois River through NPDES-permitted Outfall 001. This process is illustrated on drawing POW-CSK-PFD-001 in Attachment 2-2 which is a process flow diagram (PFD) that shows how Powerton currently manages the wastestreams produced by its coal-fired steam electric generating process.

[2] The Service Water Basin is a non-CCR surface impoundment.

Historically, when the Ash Surge Basin was being cleaned to recover the ash particles stored therein, overflow from the dewatering bins would be diverted to the smaller Bypass Basin. Like the Ash Surge Basin, the Bypass Basin is used to promote settling of the ash particles that remain in suspension in the dewatering bin effluent. When operating, treated water from the Bypass Basin flows over a weir wall at the basin's southeastern corner into a reinforced concrete pipe that then conveys the water to the aforementioned pump station sump.

Currently, decant water from the Station's dewatering bins is sent to the Ash Surge Basin. The Bypass Basin was taken out of service in early October 2020 and has not been used for managing CCR or non-CCR waste streams since. It will not be placed back into service until it has been retrofitted with a new composite liner system and a new leachate collection and removal system as detailed in this construction permit application.

7.0 RETROFIT CONSTRUCTION STANDARDS (845.220(B)(1)–(3))

This section demonstrates the retrofitted Bypass Basin will meet the location, liner, leachate collection and removal system, slope protection, and CCR fugitive dust control standards promulgated by 35 Ill. Adm. Code Part 845.

7.1 LOCATION STANDARDS

7.1.1 PLACEMENT ABOVE THE UPPERMOST AQUIFER

As demonstrated in MWG's initial operating permit application for the Bypass Basin that was submitted to the Illinois EPA in October 2021 (KPRG, 2021a), the bottom of the Bypass Basin's existing liner is separated from the upper limit of the uppermost aquifer by at least five feet. This conclusion is based on the corresponding demonstration Geosyntec performed for the Bypass Basin in October 2018 (Geosyntec, 2018), which is included in Attachment 7-1.

Per Drawing POW-BBR-CSK-006 in Attachment 5-1, the base of the Bypass Basin's new composite liner system will be at El. 457.50 feet above mean sea level (amsl), approximately 6 inches above the base of the basin's existing liner (i.e., El. 457 feet amsl). Therefore, the demonstration provided in the Bypass Basin's initial operating permit application remains valid and, thus, the location of the retrofitted Bypass Basin complies with 35 Ill. Adm. Code 845.300(a).

7.1.2 WETLANDS

As demonstrated in MWG's initial operating permit application for the Bypass Basin that was submitted to the Illinois EPA in October 2021 (KPRG, 2021a), the Bypass Basin is not located in mapped wetlands. This conclusion is based on the corresponding demonstration Geosyntec performed for the Bypass Basin in October 2018 (Geosyntec, 2018b), which is included in Attachment 7-1.

Per the proposed construction plans provided in Attachment 5-1, the new composite liner system and new LCRS are being installed within the existing limits of the Bypass Basin, and no lateral expansions are planned for the basin's existing embankments. Therefore, the demonstration provided in the Bypass Basin's initial operating permit application remains valid and, thus, the location of the retrofitted Bypass Basin complies with 35 Ill. Adm. Code 845.310(a).

7.1.3 FAULT AREAS

As demonstrated in MWG's initial operating permit application for the Bypass Basin that was submitted to the Illinois EPA in October 2021 (KPRG, 2021a), the Bypass Basin is not located within 60 meters (200 feet) of the outermost damage zone of a fault that has had displacement in Holocene time. This conclusion is based on the corresponding demonstration Geosyntec performed for the Bypass Basin in October 2018 (Geosyntec, 2018c), which is included in Attachment 7-1.

Per the proposed construction plans provided in Attachment 5-1, the new composite liner system and new LCRS are being installed within the existing limits of the Bypass Basin, and no lateral expansions are planned for the basin's existing embankments. Therefore, the demonstration provided in the Bypass Basin's initial operating permit application remains valid and, thus, the location of the retrofitted Bypass Basin complies with 35 Ill. Adm. Code 845.320(a).

7.1.4 SEISMIC IMPACT ZONES

As demonstrated in MWG's initial operating permit application for the Bypass Basin that was submitted to the Illinois EPA in October 2021 (KPRG, 2021a), the Bypass Basin is not located within a seismic impact zone as defined by 35 Ill. Adm. Code 845.120. This conclusion is based on the corresponding demonstration Geosyntec performed for the Bypass Basin in October 2018 (Geosyntec, 2018d), which is included in Attachment 7-1.

Per the proposed construction plans provided in Attachment 5-1, the new composite liner system and new LCRS are being installed within the existing limits of the Bypass Basin, and no lateral expansions are planned for the basin's existing embankments. Therefore, the demonstration provided in the Bypass Basin's initial operating permit application remains valid and, thus, the location of the retrofitted Bypass Basin complies with 35 Ill. Adm. Code 845.330(a).

7.1.5 UNSTABLE AREAS

As demonstrated in MWG's initial operating permit application for the Bypass Basin that was submitted to the Illinois EPA in October 2021 (KPRG, 2021a), the Bypass Basin is not located in an unstable area. This conclusion is based on the corresponding demonstration Geosyntec performed for the Bypass Basin in October 2018 (Geosyntec, 2018e), which is included in Attachment 7-1.

Per the proposed construction plans provided in Attachment 5-1, the new composite liner system and new LCRS are being installed within the existing limits of the Bypass Basin, and no lateral expansions are planned for the basin's existing embankments. Therefore, the demonstration provided in the Bypass Basin's initial operating permit application remains valid and, thus, the location of the retrofitted Bypass Basin complies with 35 Ill. Adm. Code 845.340(a).

7.1.6 FLOODPLAINS

As demonstrated in MWG's initial operating permit application for the Bypass Basin that was submitted to the Illinois EPA in October 2021 (KPRG, 2021a), the Bypass Basin is not located in a floodplain according to the National Flood Hazard Layer FIRMette Map No. 17179C0175E prepared by the Federal Emergency Management Agency (FEMA, 2017). This map is included in Attachment 7-2.

Per the proposed construction plans provided in Attachment 5-1, the new composite liner system and new LCRS are being installed within the existing limits of the Bypass Basin, and no lateral expansions are planned for the basin's existing embankments. Therefore, the demonstration provided in the Bypass Basin's initial operating permit application remains valid and, thus, the location of the retrofitted Bypass Basin complies with 35 Ill. Adm. Code 845.340(c).

7.2 LINER DESIGN CRITERIA

As discussed in Section 5.3, the Bypass Basin will be retrofitted with a composite liner system consisting of a 60-mil HDPE geomembrane liner over a geosynthetic clay liner. As demonstrated in the Alternative Composite Liner Design Certification provided in Attachment 7-3, the design of this new composite liner system meets the requirements for an alternative composite liner system pursuant to 35 Ill. Adm. Code 845.400(c).

7.3 LEACHATE COLLECTION SYSTEM DESIGN CRITERIA

As discussed in Section 5.4, the Bypass Basin will be retrofitted with a new leachate collection and removal system (LCRS) consisting of a drainage geocomposite and a leachate collection pipe that will be used to ultimately pump collected leachate out of the basin. As demonstrated in the Leachate Collection System Design Certification provided in Attachment 7-4, the design of this new LCRS complies with 35 Ill. Adm. Code 845.420.

7.4 SLOPE PROTECTION DESIGN CRITERIA

7.4.1 INTERIOR SLOPES

Per Detail 008-02, "Typical Slope Transition Detail," on Drawing POW-BBR-CSK-008 in Attachment 5-1, a 6-inch-thick layer of riprap (IDOT Gradation No. RR 2) will be placed along the interior slopes of the Bypass Basin's embankments. This riprap layer will be supported by an underlying, 6-inch-thick bedding layer of coarse aggregate material (IDOT Gradation No. CA 16). This form of slope protection represents an engineered cover; will extend along the entire slope; and will provide protection against surface erosion, wave action, and adverse effects of rapid drawdown. Therefore, the retrofit construction of the Bypass Basin's interior slopes complies with 35 Ill. Adm. Code 845.430.

7.4.2 EXTERIOR SLOPES

As documented in MWG's initial operating permit application for the Bypass Basin that was submitted to the Illinois EPA in October 2021 (KPRG, 2021a), slope protection for the basin's exterior slopes consists of either the HDPE geomembrane liner of an adjacent surface impoundment or vegetative cover. The northern exterior slope is an interior slope for the Ash Surge Basin, which is lined with an HDPE geomembrane liner. Meanwhile, the eastern, southern, and western exterior slopes have grassy vegetation. The form of protection provided for each slope extends along the entire face of the given slope and provides protection against surface erosion, wave action, and adverse effects of rapid drawdown. Therefore, the existing construction of the Bypass Basin's exterior slopes comply with 35 Ill. Adm. Code 845.430.

Per the design drawings provided in Attachment 5-1, no lateral expansions are planned for the basin's existing embankments. Therefore, the downstream slopes of the Bypass Basin will remain unchanged, including the existing slope protection measures. Thus, the protection measures for the retrofitted Bypass Basin's exterior slopes will comply with 35 Ill. Adm. Code 845.430.

7.5 CCR FUGITIVE DUST CONTROL

The Station will continue to control CCR fugitive dust at the retrofitted Bypass Basin in accordance with its "CCR Compliance Fugitive Dust Control Plan" (KPRG, 2021b), which also covers the Station's Ash Surge Basin, Former Ash Basin, and Metal Cleaning Basin. This plan is included in Attachment 7-5.

8.0 RETROFIT, CLOSURE, & POST-CLOSURE CARE PLANS (845.770(C)(2) & 845.220(B)(4)–(5))

8.1 WRITTEN RETROFIT PLAN

MWG's written retrofit plan describing the steps necessary to retrofit the Bypass Basin has been prepared in accordance with 35 Ill. Adm. Code 845.770(c) and is included in Attachment 8-1.

8.2 PRELIMINARY WRITTEN CLOSURE PLAN

MWG currently intends to close the retrofitted Bypass Basin by removing CCR and CCR-mixed materials remaining in the basin at the time of closure and decontaminating affected areas in accordance with 35 Ill. Adm. Code 845.740(a). The preliminary written closure plan describing the steps necessary to close the retrofitted Bypass Basin in this manner has been prepared in accordance with 35 Ill. Adm. Code 845.720(a) and is included in Attachment 8-2.

8.3 POST-CLOSURE CARE PLAN

Because MWG intends to close the retrofitted Bypass Basin by removal of CCR in accordance with 35 Ill. Adm. Code 845.740(a), the post-closure care requirements promulgated by 35 Ill. Adm. Code 845.780 are not applicable to the retrofitted Bypass Basin. However, pursuant to 35 Ill. Adm. Code 845.740(b), MWG will continue groundwater monitoring under 35 Ill. Adm. Code Part 845 Subpart F for a minimum of three years after the basin has been closed.

9.0 GROUNDWATER MONITORING PROGRAM (845.220(A)(7))

To monitor the groundwater at the retrofitted Bypass Basin site, MWG plans to continue using the existing combined groundwater monitoring well network that was established for the Bypass Basin and the Ash Surge Basin. The details of this groundwater monitoring program are provided in Section 9.0 of MWG's initial operating permit application for the Bypass Basin that was submitted to the Illinois EPA in October 2021 (KPRG, 2021a). In accordance with 35 Ill. Adm. Code 845.220(a)(7), the details of this groundwater monitoring program are reproduced in this section. Where used in this section, "subject CCR surface impoundments" refers to the Station's Bypass Basin, Ash Surge Basin, and Former Ash Basin.

9.1 HYDROGEOLOGIC SITE CHARACTERIZATION

The following subsections provide information on the geology and hydrogeology of the site as required under 35 Ill. Adm, Code 845.620(b). Referenced tables and figures are provided in Attachment 9-0.

9.1.1 GEOLOGY

The physiography of Tazewell County is made up of end moraines, plains (including flood plains), river terraces and valleys, alluvial fans and loess. The Illinois and Mackinaw River Valleys are the prominent landforms. Several small lakes are located near the western border of the county, which is bound by the Illinois River. Tazewell County is in the Till Plaines Section of the Central Lowland Province. Near surface soils in the vicinity of the subject impoundment have been grouped as Orthents, loamy and Urban Land. Urban Land units are primarily covered by pavement, railroad tracks, and buildings, which typically impede infiltration and are subject to surface runoff. The Orthents, loamy soils are fine to moderately coarse textured soils found in areas that have been modified by filling and leveling. Available water capacity is generally high, while permeability is typically high at the surface level and decreases with depth. Organic matter and plant nutrient content is low in the Orthents, loamy soils (USDA, 1996).

Regionally, the stratigraphy in the area consists of approximately 100 to 125 feet of unconsolidated deposits consisting mainly of alluvial sands and gravels with some interspersed clays/silty clays. The unconsolidated deposits are underlain by alternating layers of limestone, shale, and coal of the Carbondale Formation. To evaluate local stratigraphy, water and test well logs were obtained for wells in the general vicinity of the Powerton Generation Station. The stratigraphy data from these boring logs and the well locations are provided in Attachment 9-1. In addition, well logs from 21 monitoring wells that were installed in the vicinity of the subject CCR surface impoundments were evaluated (MW-1 through MW-21; see Figure 9-1) with those borings ranging in depth from 30 feet to 41 feet. This information is also included in Attachment 9-1. Boring logs for these monitoring wells are included in Attachment 9-2. Based on an evaluation of this data, the

following general site-specific stratigraphy is defined and geologic cross-sections are provided as Figures 9-2 through 9-7 based on the 21 on-site monitoring well boring logs:

- Fill (16’ to 24.5’ thick) – Consisting of tan, brown and black fine to medium sand/silty sand with some gravel and clay seams. Several locations also included black cinders and brick fragments.
- Clay/silty clay/silts (0’ to approximately 18’ thick) – Consisting of olive, brown and gray clays, silts and silty clays with some more organic rich layers. May locally contain fine silty sand and/or fine sand. This unit is not mappable across the site (i.e., discontinuous).
- Sand and gravel (thickness undetermined; borings terminate within unit) – Consisting of light brown, brown and/or gray medium to coarse sands and gravels.

Although no specific borings were extended into the sedimentary bedrock beneath this facility, water well logs obtained for water wells in the vicinity of the Powerton Generating Station indicate shale bedrock is encountered from approximately 35 to 140 feet below ground surface (bgs), depending on the location of the specific well. The boring logs indicate limestone was encountered from approximately 99 to 103 bgs just northeast of the Powerton Generating Station and in close proximity to the Illinois River. There are no underground mines beneath the subject CCR surface impoundment.

9.1.2 HYDROGEOLOGY

Based on information from the Soil Survey of Tazewell County, the average annual precipitation is approximately 36 inches with about 62% of that total falling between April and September of any given year. The average seasonal snowfall is approximately just over 26 inches. More site-specific precipitation data from a water station located in Peoria, Illinois, is provided in Table 9-1 (from KPRG, 2021a). The nearest natural surface water body is the Lost Creek which bends around the eastern edge of the Former Ash Basin and property boundary. Lost Creek is an ephemeral stream that only flows during and after precipitation events. The Illinois River is located to the north of the subject CCR surface impoundments. Powerton Lake is located to the west-northwest.

Groundwater beneath the Powerton Generating Station occurs under water table conditions. Saturated conditions are generally encountered between 18 to 32 feet bgs, depending on the well location. The combined CCR monitoring well network for the Bypass Basin and Ash Surge Basin consists of monitoring wells MW-01 (upgradient), MW-08, MW-09 (upgradient), MW-11, MW-12, MW-15, MW-17, MW-18 and MW-19 (upgradient). CCR monitoring wells MW-08, MW-12, MW-15 and MW-17 are screened within the shallow, localized, saturated clay/silt unit. The remaining monitoring wells have deeper screens, within the more extensive sand and gravel unit. Table 9-2 (from KPRG, 2021a) provides groundwater elevation measurements obtained for the on-site monitoring wells in the vicinity of the subject CCR surface impoundment which includes data for the monitoring wells associated specifically with the Bypass Basin and Ash Surge Basin (upgradient wells MW-01, MW-09 and MW-19 and downgradient wells MW-08, MW-11,

MW-12, MW-15, MW-17 and MW-18). Hydrographs of water levels recorded at these monitoring wells are provided in Figure 9-8. A review of the hydrographs shows some temporal fluctuations with the highest water levels generally occurring within the first or second quarters of the year.

Groundwater flow maps for the four quarters from 3rd quarter 2020 through the 2nd quarter 2021 are provided as Figures 9-10 through 9-17. The maps include groundwater elevation data from all wells in the area, including the specific CCR monitoring wells associated with the Bypass Basin and Ash Surge Basin. The water levels from wells screened in the clay/silt unit and the water levels from monitoring wells screened within the sand unit were evaluated separately and used to generate groundwater flow maps for each unit. The water elevation data within the clay/silt unit indicates localized groundwater flow in a westerly direction. Groundwater flow within the more extensive sand unit shows some divergence with general flow in a northerly direction with flow components to the northwest and northeast towards the Illinois River. It is noted that MW-20 and MW-21 were installed in March 2021 and are therefore not shown on groundwater flow maps from prior to that time.

The horizontal hydraulic gradient is steeper within the silt/clay unit than within the deeper sandy gravel unit. Table 9-4 (from KPRG, 2021a) provides a summary of the flow direction, gradients and an estimated rate of groundwater flow for each sampling event. The flow rate was calculated using the following equation:

$$V_s = \frac{K\,dh}{n_e\,dl}$$

Where: V_s is seepage velocity (distance/time)
K is hydraulic conductivity (distance/time)
dh/dl is hydraulic gradient (unitless)
n_e is effective porosity (unitless)

Hydraulic conductivity (K) values were initially estimated for monitoring wells MW-2, -5, -8, -9, and -10 from slug tests. The geometric mean of the test data for these wells was approximately 350 feet per day (ft/d; 4.05×10^{-3} ft/sec) for each well (Patrick Engineering 2011). The slug test data were reviewed as part of a groundwater modeling study, and the data were re-analyzed using corrected input values for the well casing and borehole dimensions and effective porosity of the sand filter pack material. The revised geometric mean of the test data for these wells decreased to approximately 120 ft/d (1.39×10^{-3} ft/sec) for each well. The hydraulic conductivity estimate for MW-8 should be used with caution as this monitoring well was screened through site fill and native silty clay. The aquifer properties derived from this well have likely been impacted by the more porous non-native fill material in the upper portion of the well screen and are likely not indicative of the silty clay aquifer. As such, this data was grouped with the more porous sand/gravel materials.

The hydraulic conductivity of 1.39×10^{-3} ft/sec was used for the sandy unit in Table 9-4 (from KPRG, 2021a) as discussed above. The average hydraulic conductivities of 6.38×10^{-7} ft/sec (silt/clay unit) in Table 9-4 (from KPRG, 2021a) is consistent with estimates from literature (Freeze and Cherry, 1979) and is the center of the range of conductivity values used in the modeling work (1.16×10^{-7} to 1.16×10^{-6} ft/sec). The estimated effective porosities of the silt/clay materials (0.40) and of the sandy materials (0.35) were obtained from literature (Applied Hydrogeology, Fetter, 1980).

At this time, based on the geology discussion in Section 9.1.1 and the site-specific hydrogeology discussion above, the groundwater beneath the subject CCR surface impoundments is considered as Class I Potable Resource Groundwater in accordance with 35 Ill. Adm. Code 620.210. It is noted, however, that a Groundwater Management Zone (GMZ) and an Environmental Land Use Control ("ELUC") have been established where the subject CCR surface impoundments are located as part of a Compliance Commitment Agreement (CCA) between MWG and the Illinois EPA. The ELUC states that the groundwater shall not be used as potable water. The extent of the established and approved GMZ and ELUC are provided on Figure 9-19. The GMZ and ELUC occupy the same extent of the Powerton property.

A survey of all potable water sources within a 2,500-foot radius of the Powerton Generating Station was completed by Natural Resources Technology (NRT) in 2009. The following databases and sources of information were utilized by NRT in order to determine community water source and water well locations and construction in the vicinity of the ash pond wastewater treatment systems:

- Illinois State Geological Survey (ISGS) Water Well Database Query;
- Illinois State Water Survey (ISWS) Private Well Database and water well construction report request; and
- Illinois Division of Public Water Supply web-based Geographic System (GIS) files.

As part preparing the initial operating permit application for the Bypass Bain pursuant to 35 Ill. Adm. Code 845.230(d), KPRG evaluated the NRT information and reviewed the new Illinois State Geological Survey database and interactive map references as "ILWATER". The survey results are provided on Figure 9-19. Twelve wells were identified within a 2,500-foot radius of the Station's subject CCR surface impoundments. The two wells off-site to the east are upgradient of the subject CCR surface impoundments. There were eight wells identified on the Station's property on the ILWATER interactive map all of which were older construction wells installed by previous ownership. Discussions with facility personnel indicate that all eight of these wells were taken out of service/abandoned. The two wells at the far western boundary of the 2,500-foot radius (identified as wells 9 and 10 from the NRT evaluation) are part of the six water wells currently on Station property that are in use (the remaining four wells are located further west, outside the 2,500-foot search radius). These two wells are screened within the sand/gravel aquifer but are not directly downgradient of the subject CCR surface impoundments and are separated from those units by the Station's Intake

Channel and Discharge Channel. They are regularly sampled and analyzed for potable water constituents. The sampling results consistently have been in compliance with potable water regulations.

A search of the Illinois Department of Natural Resources dedicated nature preserve database (https://www2.illinois.gov/dnr/INPC/Pages/NaturePreserveDirectory.aspx) was performed to determine whether there may be a nearby dedicated nature preserve. There were no identified dedicated nature preserves in the immediate vicinity of the subject CCR surface impoundments.

Based on the geology of the site presented in Section 9.1.1 and the above hydrogeology discussions, the primary contaminant migration pathway for a potential release from the subject CCR surface impoundments would be downward migration to groundwater within the unconsolidated silty clay or sand/gravel aquifer. Due to the proximity to the Illinois River and/or Old Intake Canal, which are hydrogeologic flow boundaries, minimal to no downward vertical flow mixing would be anticipated. There are no other utility or man-made preferential pathway corridors that would act to potentially intercept the flow to move any contamination in a direction other than under natural groundwater flow conditions. There are no potable water wells between the subject CCR surface impoundments and anticipated flow discharge boundaries. Also, as previously discussed, there are no potable surface water intakes on the Illinois River either along or within at least several miles downstream of the subject site.

There is quarterly groundwater quality data associated with the Bypass Basin dating back to December 2010. However, the parameter list was slightly different from that specified in 35 Ill. Adm. Code 845.600 and included analysis of dissolved inorganic parameters rather than total inorganic parameters. That historical water quality data is provided in Attachment 9-3.

In addition to 35 Ill. Adm. Code Part 845, the Bypass Basin is also subject to the federal regulations for CCR groundwater monitoring networks under 40 CFR Part 257 Subpart D, “Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments”, also referred to herein as the (Federal CCR Rule). As required under the Federal CCR Rule, eight rounds of background sampling were completed for the monitoring wells within the monitoring network for the subject CCR surface impoundments. This included the full list of Appendix III (detection monitoring) and IV (assessment monitoring) parameters. Since the effective date of 35 Ill. Adm. Code Part 845, quarterly groundwater monitoring for the full list of parameters specified in 35 Ill. Adm. Code 845.600, which includes all parameters in the Federal CCR Rule Appendix III/IV, has continued. This data is provided in Table 9-5 (from KPRG, 2021a) for the combined Bypass Basin and Ash Surge Basin groundwater monitoring well network. In addition, it is noted that Illinois EPA added turbidity measurements to the list with a required eight rounds of background of that parameter for each well in the monitoring network for the subject CCR surface impoundment. This data is provided in Tables 9-7 (from KPRG, 2021a) for the Bypass Basin and Ash Surge Basin.

9.2 GROUNDWATER MONITORING SYSTEM DESIGN & CONSTRUCTION PLANS

A comprehensive monitoring well network that includes other basins in the vicinity of the Bypass Basin and Ash Surge Basin was established in 2010 and expanded pursuant to the CCA. The well spacing was developed as part of a previous hydrogeologic assessment. The well depths were determined based on depth to groundwater and the base elevations of the basins being monitored and were approved by Illinois EPA. Two separate groundwater monitoring networks have been established, including the combined network for the Bypass Basin and the Ash Surge Basin:

- Upgradient Wells: MW-01, MW-09, MW-19
- Downgradient Wells: MW-08, MW-11, MW-12, MW-15, MW-17, and MW-18

Groundwater data from the upgradient wells will be evaluated to provide a statistically representative upgradient water quality for the Bypass Basin and Ash Surge Basin prior to that water passing beneath the regulated units. The proposed monitoring well networks will be utilized for determining whether potential leakage from the regulated units may be causing or contributing to groundwater impacts in the vicinity of the units.

The monitoring wells MW-01 through MW-15 were installed in 2010 by Patrick Engineering, Inc. The remaining wells were installed by KPRG and Associates, Inc. at varying times since the initial 2010 well installations. Wells were drilled using 4.25-inch hollow stem augers. The wells were completed with standard 2-inch inner-diameter PVC casing with 10-feet of 0.010 slot PVC screen. Filter sand pack around each screen was extended to approximately 2-feet above the top of the well screen. The remainder of the annulus was backfilled with bentonite. Surface completions include stick-up (above grade two to three feet) locking protector casings set in concrete aprons. The wells are further protected by traffic bollards, as necessary. Boring logs and well construction summaries for these wells are provided in Attachment 9-2. Ground surface and top-of-casing elevations were surveyed by an Illinois licensed surveyor and are included in the previously referenced groundwater elevation table.

Each of the monitoring wells within the sampling network is outfitted with a dedicated sampling system. Specifically, each well has a QED Environmental Systems (QED) Well Wizard Model P1101M dedicated sampling pump with Model No. 37789 intake screens (0.010-inch slot). The screens are set within approximately one-foot of the base of the monitoring well.

In accordance with requirements under 35 Ill. Adm. Code 845.630(g), Attachment 9-4 includes an Illinois licensed Professional Engineer certification of the above-defined monitoring system.

9.3 GROUNDWATER SAMPLING & ANALYSIS PROGRAM

9.3.1 SAMPLE FREQUENCY

The Bypass Basin and Ash Surge Basin are regulated under the Federal CCR Rule. As such all of the above defined monitoring wells (upgradient and down-gradient) have been sampled on a quarterly basis starting the 4th quarter of 2015 for eight consecutive quarters for both Appendix III and Appendix IV parameters specified in the Federal CCR Rule which is the same parameter listing as provided under the 35 Ill. Adm. Code 845.600(a) plus calcium. This dataset will facilitate the development of proper statistical evaluation procedures for the site and use in development of applicable GWPSs for each constituent pursuant to 35 Ill. Adm. Code 845.600(b). Additional monitoring data collected since the initial eight rounds of background sampling will also be evaluated to determine whether an expanded dataset can be used in developing an appropriate and representative background for compliance with 35 Ill. Adm. Code Part 845. The Illinois EPA added turbidity as an additional parameter that will require development of a statistical background. Since this parameter was not included within the Federal CCR Rule, eight rounds of turbidity measurements were obtained within the 180-day period since the effective date of 35 Ill. Adm. Code Part 845. However, this restricted period of background data collection does not facilitate evaluation of potential seasonal variations during the development of statistical background for this parameter.

Currently, all wells within this CCR monitoring network are being sampled on a quarterly basis for all parameters specified in 35 Ill. Adm. Code 845.600(a) plus calcium and turbidity. Between quarterly monitoring events, groundwater level measurements from all designated CCR monitoring wells will be also obtained and recorded on a monthly basis. During the initial rounds of monthly groundwater level measurements after the enactment of 35 Ill. Adm. Code Part 845, surface impoundment measurements were not collected because the instrumentation for these measurements was not yet in-place and available for recording the data.

Quarterly groundwater monitoring will continue during the remaining active life of the Bypass Basin and the post-closure care period or, if closure is by removal, then in accordance with monitoring frequency requirements under 35 Ill. Adm Code 845.740(b). It is noted that if after 5 years of quarterly monitoring it can be demonstrated that the facility meets the requirements specified in 35 Ill. Adm. Code 845.650(b)(4), the owner can petition Illinois EPA to shift the monitoring frequency to semi-annual.

9.3.2 SAMPLING PREPARATION & CALIBRATIONS

Prior to any sampling event, the Station's designated Environmental Specialist shall be notified in advance of sampling crew arrival so that any arrangements can be made, including security clearance and training.

Prior to sampling activities, and at intervals recommended by the manufacturer, all non-dedicated equipment shall be cleaned and calibrated. Specifically, the field parameter water quality meter to be used for pH,

specific conductance, turbidity and temperature will be calibrated using standard reference solutions. In addition, an operational check of the electronic water level probe will also be performed by placing the probe into a bucket of water and ensuring that the audio signal is triggered when the sensor meets the water interface. The associated tape measure of the probe will also be checked for wear.

The monitoring network consists of all dedicated sampling equipment (QED Well Wizard P1101M). The controller used to operate individual bladder pumps will be checked and maintained prior to arrival at the site based on manufacturer specifications.

All lab ware shall be obtained directly from an Illinois certified laboratory. Upon arrival to the site, the monitoring wells will be assessed for structural integrity. Each well cover (either stick-up or flush mount) will be inspected for proper labels, locks, and any damage and be cleared of any flora or fauna that may be on the well or in the vicinity that would affect the sample or the sampling operation. In addition to any other notable observations, all of the above shall be entered on the sampling sheets. Once the well is uncovered and unlocked, and the well casing inspected, the well head shall be inspected for damage and cleanliness.

9.3.3 GROUNDWATER SAMPLE COLLECTION

Prior to initiating sampling, a round of groundwater levels will be collected from each monitoring well using an electronic water level probe. The timeframe over which these water levels are collected should be minimized and should not exceed 8 hours. The depth to water will be measured to the nearest one-hundredth of a foot from the top of casing using an electronic water level meter. The water level probe should be properly decontaminated between each reading using procedures specified in Section 9.3.4.

All of the monitoring wells at this Station are equipped with dedicated, down-hole, bladder pumps. At the top of casing for each well is a manifold with air and water quick connects and a port for a water level meter probe to fit so that an undisturbed water level can be obtained. Immediately prior to sampling, the depth to water will be measured again to the nearest one-hundredth of a foot from the top of casing using an electronic water level indicator and recorded onto the sampling sheets. Once recorded, an air compressor and flow controller will be attached to the air side quick connect and disposable tubing attached to the discharge connection. The discharge tubing will be run to a flow-through cell of the water quality meter. A discharge line from the flow-through cell will be placed into a vessel to allow for the measurement of the volume of groundwater removed. The water quality meter will be attached within the flow-through cell that allows for real time readings of pH, specific conductivity and temperature. It is noted that a calibration check of the water quality meter should be performed at the start and end of each day of sampling and recorded in the field notes. If the meter calibration-check shows drift outside of manufacturer specifications, the meter should be recalibrated in the field using standard solutions per manufacturer requirements.

The air controller will be set to the necessary pressure and to the slowest pumping interval, approximately 50 second refill and 10 second pump (flow rates at this setting tend to be less than 100 milliliters/minute), and the compressor will be started. The intent of the low flow pumping will be to minimize drawdown in the well with an ideal goal of keeping the drawdown to 0.30 feet or less. Once the water has filled the flow-through cell, a reading of the parameters will be recorded. Readings will continue to be recorded until such time as all parameters are deemed stable for three consecutive measurements at which point a sample will be collected from the tubing prior to the flow-through cell. An unfiltered groundwater sample shall be collected directly from the water tubing after it is disconnected from the flow-through cell. The laboratory provided bottles shall be properly filled. Once the sample is collected, the bottles shall be properly labeled and placed on ice as necessary.

If the well would pump dry prior to stabilized field parameter readings, the well will be allowed to recover for up to 24-hours at which point water sample collection will be initiated.

In the event that a dedicated bladder pump fails to work, the following procedures should be implemented:

- Pull the dedicated tubing and pump from the well and ensure that the tubing does not come in contact with the ground.
- Visually inspect the intake of the pump for clogging from sedimentation. If clogging is noted, clean the intake with distilled water. If there is no clogging, dismantle the pump casing and inspect the bladder for any holes, cracks or tears.
- If the bladder is determined to be compromised (i.e., wear has resulted in cracking or tearing), remove the bladder and replace it with a new bladder. Properly clean all parts of the pump using procedures described in Section 9.3.4, reassemble the pump and slowly lower it back down hole. Continue sampling as described above.
- If the entire pump is determined to have failed, a new pump will need to be ordered for replacement and a modified sampling procedure will be implemented as described below.

In the case of bladder pump failure, at a specific well during a sampling event, the alternate sampling method will be the use of a portable peristaltic pump (the pump itself does not go downhole) assuming depth to water is less than 23 feet bgs. Clean disposable polyethylene tubing will be attached to the pump and the tubing will be slowly lowered down hole along with the water level probe. The pump will be operated at the lowest rate possible to achieve the same goals as for sampling described above (generally below 300 milliliters/minute which is within the range of standard low flow protocols). Water will be collected in a clean glass jar for field parameter readings. Once stable field parameters are recorded, the sample will be collected directly onto laboratory prepared containers for analysis. Upon completion of sample collection, the water level meter and tubing should be removed from the well. The polyethylene tubing should be disconnected from the pump and discarded. The water level meter should be properly decontaminated as specified in Section 9.3.4. If depth to water is such that a peristaltic pump cannot be used, a submersible

pump will need to be used. The submersible pump must be properly cleaned as specified in Section 9.3.4 prior to placement down the well. All subsequent procedures will be the same as above. The alternate sampling pump use will be recorded on the field data sheet for that well and noted in any subsequent reporting summary.

9.3.4 EQUIPMENT DECONTAMINATION

Any equipment that is used down-hole at more than one sampling location must be thoroughly decontaminated between uses. Based on procedures described above, only the water level meter is anticipated to be in this category; however, if a submersible pump needs to be used during a particular sampling event due to dedicated pump failure (see Section 9.3.3), these procedures will also apply. The water level meter probe and any measuring tape, or any other non-dedicated equipment that may need to be placed down the well that extended below the water surface will need to be cleaned with an Alconox solution, or equivalent, wash followed by a double rinse with distilled water. Any pump tubing that is not dedicated should be discarded and only clean tubing should be used down-hole.

9.3.5 SAMPLE PRESERVATION, CHAIN-OF-CUSTODY, & SHIPMENT

Since measurement of total recoverable metals is required by 35 Ill. Adm. Code Part 845, the samples will not be filtered prior to collection. This will facilitate the analysis to capture both the particulate fraction and dissolved fraction of metals in natural groundwater. Groundwater samples will be collected directly into Illinois certified laboratory provided containers. Those containers will be prepared by the laboratory to contain any necessary chemical preservation. The samples shall be stored at temperatures required by the lab following sample collection. Table 9-9 (from KPRG, 2021a) includes a summary of sample bottle requirements, preservatives and holding times.

All groundwater samples collected shall be transferred to the laboratory under proper COC procedures. The laboratory provided COC, completed with all pertinent information, shall be maintained from sample collection through receipt by the laboratory. The information shall include, but is not limited to, the following:

- Project name and number,
- State samples collected in,
- Sample name and type,
- Time and date collected,
- Analysis requested, and
- Printed name and signatures of person(s) sampling.

The COC shall be completed and properly relinquished by the field sampler(s) with all samples clearly printed or typed.

All samples will be either delivered directly to the laboratory or be shipped using Federal Express or a similar overnight service. It should be noted that Total Dissolved Solids (TDS) analysis has a 7-day holding time. TDS samples should be shipped to the laboratory within 72 hours after collection. All other holding times for the specified parameters are long enough to facilitate one shipment after the full round of sampling is complete.

9.3.6 ANALYTICAL METHODS

A list of the analytical methods to be used by the laboratory for each specified parameter is included in Table 9-9 (from KPRG, 2021a). Individual detection limits for the parameters may change slightly from sample to sample depending on potential matrix interferences with a sample (e.g., amount of suspended solids/sediment) and/or the concentration of the constituent in the sample. However, the base detection limits will be set below the applicable Illinois Class I Drinking Water Standards as defined in 35 Ill. Adm. Code 845.600(a)(1) for that compound which are also provided in Table 9-9 (from KPRG, 2021a).

9.3.7 QUALITY ASSURANCE & QUALITY CONTROL

9.3.7.1 LABORATORY

Only an Illinois certified analytical laboratory will be used for sample analysis. The laboratory will be conducting their work under their specific approved Quality Assurance and Quality Control (QA/QC) program. A copy of their program can be available upon request. A standard Level II data documentation package will be included in all subsequent reporting, however, the lab will be requested to also provide a Level IV data documentation package (i.e., U.S. EPA Contract Laboratory Protocol equivalent) in the event more detailed data validation/evaluation is deemed necessary.

9.3.7.2 FIELD

The QA/QC program for fieldwork will include the collection of blind duplicates and the use of a laboratory supplied trip blank. The blind duplicate will be collected from a random well during every sampling event in which more than three (3) samples are collected. The duplicate will be blind in the manner that there will be no way for the laboratory to determine from which well or point the sample was collected.

Upon receipt of the analytical data, a determination will be made if the duplicate is consistent with the sample collected from the well/point. A generally acceptable range for groundwater samples is +/- 30 percent. If outside the acceptable range, a resample may be determined to be necessary and reanalyzed. The trip blank analytical data will be reviewed for any values other than non-detect. If there are any questions regarding the duplicate, trip blank, or other reported analytical QA/QC runs, the laboratory will be contacted to determine the effect on data quality, if any, and usability. If necessary, a specific well may need to be re-sampled.

9.3.8 STATISTICAL METHODS

A proposed statistical evaluation plan meeting the requirements specified in 35 Ill. Adm. Code 845.640(f) is provided in Attachment 9-5 along with a certification of the plan by an Illinois licensed Professional Engineer.

10.0 PROFESSIONAL ENGINEER CERTIFICATION (845.220(A)(8))

I hereby certify that:

- This retrofit construction permit application meets the requirements of 35 Ill. Adm. Code 845.220(a) and 845.220(b),
- This retrofit construction permit application was prepared by me or under my direct supervision, and
- I am a registered professional engineer under the laws of the State of Illinois.

Certified By: Thomas J. Dehlin Date: July 15, 2022

Seal:



Th. Dehlin
07/15/2022
Exp. 11/30/2023

11.0 OWNER CERTIFICATION (845.220(A)(9))

A certification stating that the owner or operator of the CCR surface impoundment has completed the public notification and public meetings that are required under 35 Ill. Adm. Code 845.240 is included in Attachment 11-1. Meanwhile, the following information is included in Attachment 11-2:

- A summary of the issues and questions raised by the public during the meetings;
- A summary of revisions, determinations, and other considerations made in response to those issues and questions; and
- A list of interested persons who attended the public meetings and would like to be added to the Illinois EPA's listserv for the facility.

12.0 REFERENCES

FEMA. (2017.) “Flood Insurance Rate Map, Tazewell County, Illinois and Incorporated Areas.” Map No. 17179C0175E. Panel No. 175. Effective February 17.

Geosyntec. (2016a.) “History of Construction, Ash Surge Basin and Bypass Basin, Powerton Station.” October.

Geosyntec. (2016b). “Structural Stability and Factor of Safety Assessment, Ash Surge Basin and Bypass Basin, Powerton Station.” October.

Geosyntec. (2018a). “Placement Above the Upper Aquifer Location Restrictions, Ash Surge Basin and Bypass Basin, Powerton Station.” October.

Geosyntec. (2018b). “Wetlands Location Restrictions, Ash Surge and Bypass Basins, Powerton Station.” October.

Geosyntec. (2018c). “Fault Areas Location Restrictions, Ash Surge and Bypass Basins, Powerton Station.” October.

Geosyntec. (2018d). “Seismic Impact Zones Location Restrictions, Ash Surge and Bypass Basins, Powerton Station.” October.

Geosyntec. (2018e). “Unstable Areas Location Restrictions, Ash Surge and Bypass Basins, Powerton Station.” October.

KPRG. (2021.) “Application for Initial Operating Permit, Powerton Generating Station, Midwest Generation, LLC, Pekin, Illinois.” October 29.

Patrick Engineering. (2011.) “Hydrogeologic Assessment Report, Powerton Generating Station, Pekin, Illinois.” Patrick Project No. 21053.070. February.

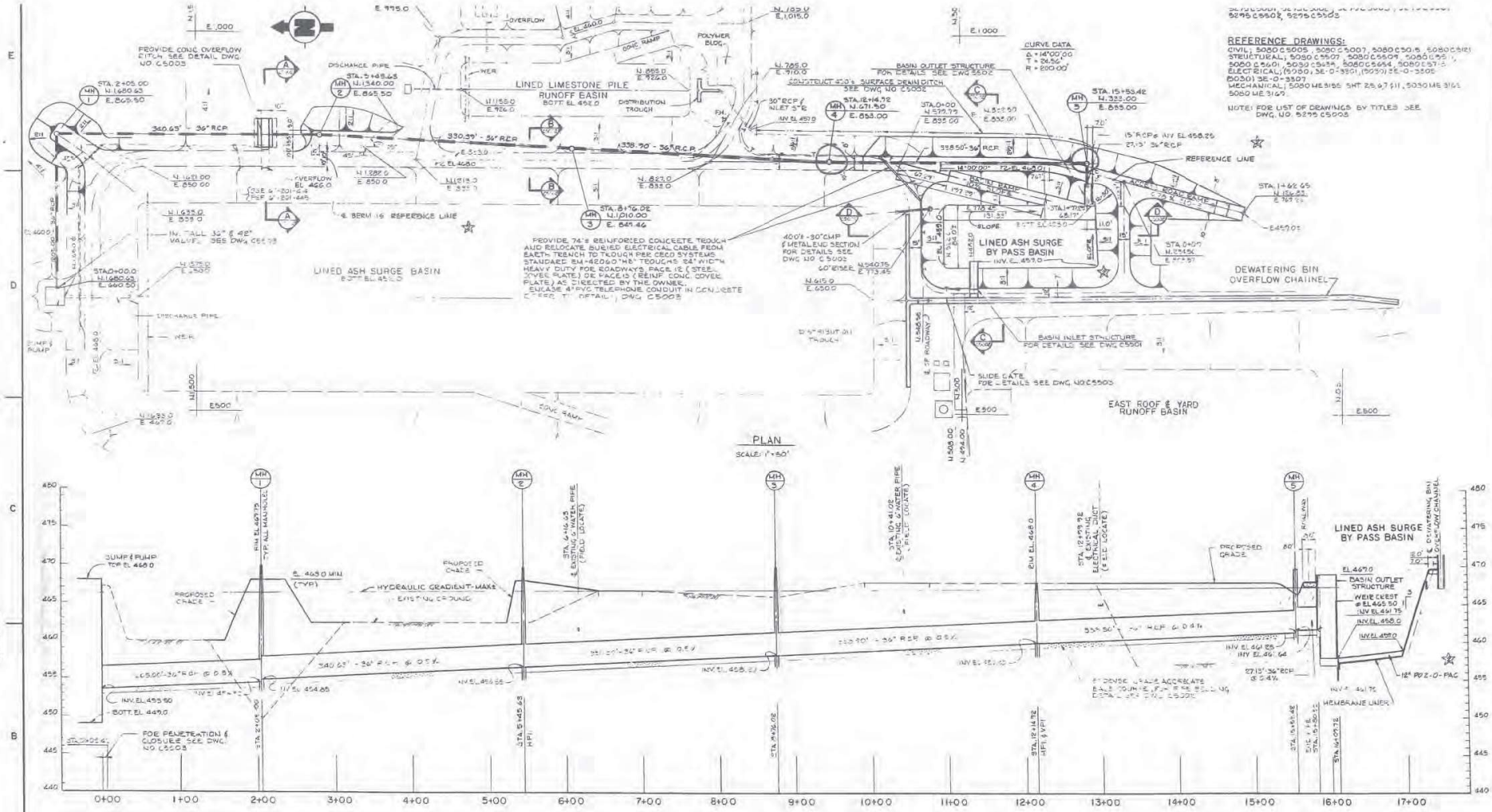
Sargent & Lundy. (2020.) “Powerton Generating Station, Demonstration for a Site-Specific Alternative Deadline to Initiate Closure.” Report SL-015574. November 30.

USDA. (1996.) “Soil Survey of Tazewell County, Illinois.” August.

USGS. (2021.) “Science in Your Watershed: Locate your Stream Site by 12-digit HUC.” https://water.usgs.gov/wsc/a_api/wbd/subwatershed07/071300030304.html. Accessed June 23, 2022.

ATTACHMENT 1-1
1980 ORIGINAL CONSTRUCTION DRAWINGS

R000080



REFERENCE DRAWINGS:
CIVIL; 5080 C5005, 5080 C5007, 5080 C5015, 5080 C5121
STRUCTURAL; 5080 C5507, 5080 C5509, 5080 C5511, 5080 C5601, 5080 C5635, 5080 C5654, 5080 C5715
ELECTRICAL; (5080) 3E-0-3301, (5080) 3E-0-3305, (5080) 3E-0-3307
MECHANICAL; 5080 ME3155, SHT 25, 67 & 11, 5080 ME 3165, 5080 ME 3169.

NOTE: FOR LIST OF DRAWINGS BY TITLES SEE DWG. NO. 5295 C5003

2 (a) REMOVED 9" SELECT FILL AND 9" GRAVEL BLANKET (TOTAL 1'-6" FROM BOTTOM BY-PASS BASIN. REPLACED WITH 12" PO2-O-PAC
(b) ADDED ELEV, SLOPE AND REFERENCE LINE NOTATIONS TO PLAN.

SPECIFICATION:

3 MANHOLES
MANHOLES SHALL BE THE SIZE AND AT THE LOCATIONS AND GRADES SHOWN ON THE CONTRACT DRAWINGS MATERIAL FOR THE WALL SHALL BE EITHER CAST IN PLACE REINFORCED CONCRETE OR PRECAST REINFORCED CONCRETE SECTIONS. PRECAST MANHOLES SHALL BE MANUFACTURED TO THE REQUIREMENTS OF ANSI/ASTM C478-78 A STANDARD SPECIFICATION FOR PRECAST REINFORCED CONCRETE MANHOLE SECTIONS. JOINTS ARE TO BE SEALED WITH CHEMICAL CAT. MANHOLES SHALL BE CONSTRUCTED FOR 15 FOOT HYDROSTATIC HEAD. THE COMPLETED CHANNEL THROUGH THE MANHOLE SHALL BE U-SHAPED TO AHEIGHT THREE FOURTHS THE DIAMETER. CAST FRAME (SPULE) AND COVER (1 LB) SHALL BE GRAY IRON ILLINOIS DOT STANDARD 5213-4 TYPE 1 (NEENAH CAT NO. R-1015, REF R-1712) OR EQUAL CONTRACTOR TO SUBMIT VENT OR DRAWINGS FOR APPROVAL.

4 MANHOLE LINER SPECIFICATION SEE DWG NO C5002

MANHOLE SCHEDULE

MH NO	BY PASS STATION	EL TOP CONE	EL SEWER PIPE INV. IN	EL SEWER PIPE INV OUT	MH DEPTH (MIN.)	NOTES
–	0+00	–	455.90	–	–	EXIST PUMP SUMP
1	2+05	469.0	454.85	454.55	14.45'	HFI 4 + 90°
2	5+45.63	469.0	456.57	456.53	12.47'	HFI 4 + 02° 27'
3	8+76.02	469.0	458.22	458.18	10.82'	STRAIGHT RUN
4	12+14.92	467.25	459.92	459.88	7.37'	HFI 4 + 12° 27' USE SCALE RINGS @ RD
5	15+55.42	469.0	461.64	461.25	7.75'	HFI 4 + 90°
–	15+80.55	–	–	461.75	–	OUTLET STRUCTURE

NOTE: MAX HYDRAULIC GRADIENT EL 467.25±

Robert D. Arrowsmith 4/8/80

DRAWING STATUS

APPROVED FOR CONSTRUCTION

6/26/80

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES
POWERTON

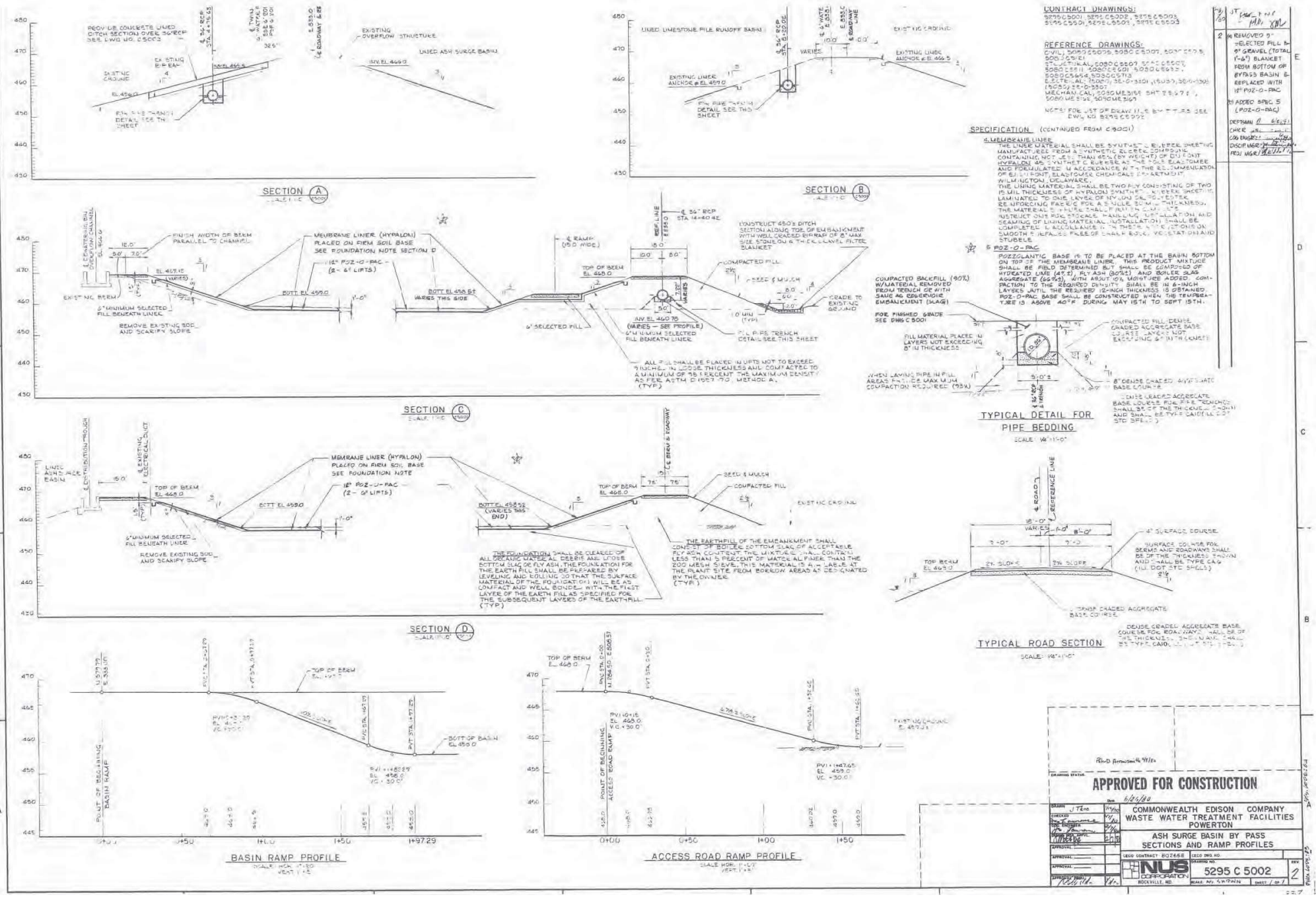
ASH SURGE BASIN BY PASS
PLAN AND PROFILE

CECO CONTRACT: 802668
CVCO DWG. NO.

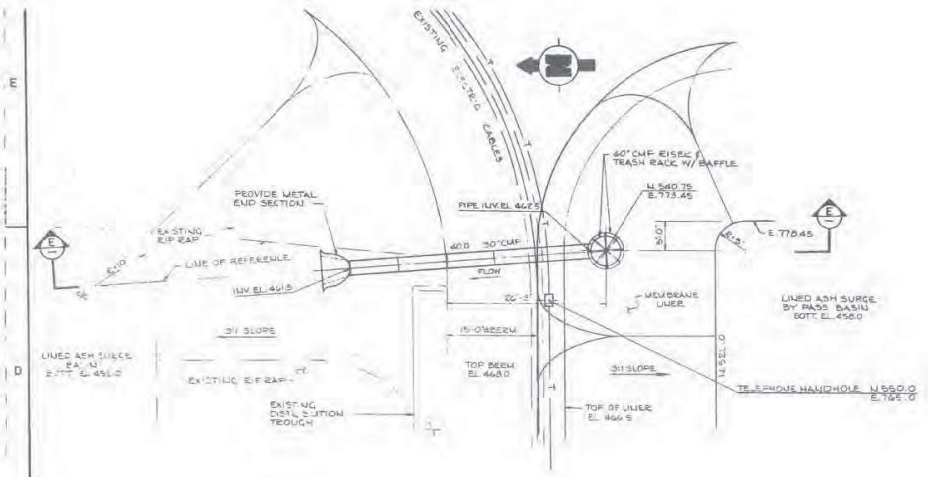
NUS CORPORATION
ROCKVILLE, MD.

DRAWING NO. 5295 C 5001
REV. 2
SCALE AS SHOWN
SHEET 1 OF 1

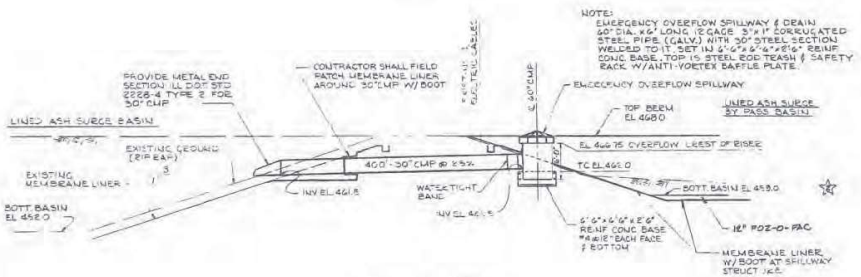
R000081


SECTION A
SECTION B
SECTION C
SECTION D
TYPICAL DETAIL FOR PIPE BEDDING
TYPICAL ROAD SECTION
BASIN RAMP PROFILE
ACCESS ROAD RAMP PROFILE
CONTRACT DRAWINGS:
REFERENCE DRAWINGS:
SPECIFICATION (CONTINUED FROM C5001)
APPROVED FOR CONSTRUCTION
COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES
POWERTON
ASH SURGE BASIN BY PASS
SECTIONS AND RAMP PROFILES
NUS CORPORATION
5295 C 5002

R000082



PLAN



SECTION E

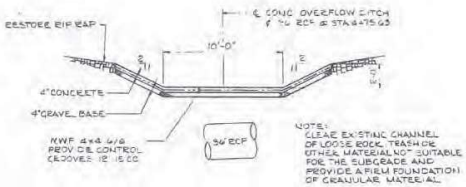
EMERGENCY OVERFLOW SPILLWAY

SCALE: 1/8"=1'-0"

CONTRACT DRAWINGS		
DRAWING NO.	REV.	DRAWING TITLES
5295 C 5001	1	PLAN & PROFILE
5295 C 5002	1	DETAILS & SECTIONS
5295 C 5003	1	MISCELLANEOUS DETAILS
5295 C 5501	1	INLET STRUCTURE
5295 C 5502	1	OUTLET STRUCTURE
5295 C 5503	1	MISCELLANEOUS GATES
REFERENCE DRAWINGS		
5080 C 5005	2	DETAIL PLAN - EAST ROOF & YARD RUNOFF BASIN
5080 C 5007	2	DETAIL PLAN ASH SURGE BASIN
5080 C 5015	2	MISCELLANEOUS SECTIONS AND DETAILS, SHTS 1 & 2
5080 C 5181	1	BASIN END SECTION
5080 C 5507	1	RAMPS & ASH SURGE BASIN OVERFLOW STRUCTURE
5080 C 5509	1	ASH SURGE BASIN & LIMESTONE BASIN DISTRIBUTION TROUGH SECTIONS & DETAILS
5080 C 5511	2	DEWATERING BIN OVERFLOW CHANNEL SECTIONS & DETAILS
5080 C 5601	2	STANDARD DETAILS
5080 C 5658	2	ASH SURGE BASIN SUMP - CLARIFIER OVERFLOW SUMP
5080 C 5654	1	PIPE SUPPORTS FRAMING PLAN & SECTIONS (DWG NO 74-79 151)
5080 C 5718	1	ASH SURGE BASIN SUMP FLAT PLATE SECTIONS & DETAILS
(5080) 3E-0-3501	2	ELECTRICAL AREA LAYOUT EAST RUNOFF BASIN - NORTH
(5080) 3E-0-3505	3	ELECTRICAL AREA LAYOUT LIMESTONE PILE RUNOFF BASIN
(5080) 3E-0-3507	2	ELECTRICAL AREA LAYOUT ASH SURGE BASIN AREA
5080 ME 3155 SHT 4	4	PIPING ARRANGEMENT YARD AREA
SHT 5	3	
SHT 6	3	
SHT 7	3	
SHT 11	3	
5080 ME 3162 SHT 1	3	PIPING ARRANGEMENT YARD DETAIL EAST ROOF & YARD RUNOFF BASIN
5080 ME 3169 SHT 1	1	PIPING ARRANGEMENT YARD DETAIL LIMESTONE PILE RUNOFF BASIN AND ASH SURGE BASIN SUMPS

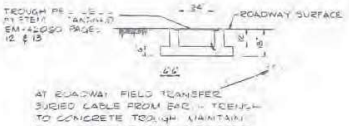
NOTE:
FOR ELECTRICAL CABLE TROUGH SEE CECO SYSTEMS STANDARD EM-42060 "HB" TROUGHS 54" WIDTH HEAVY DUTY FOR ROADWAYS PAGE 12 (STEEL COVER PLATE) OR PAGE 13 (REINFORCED CONCRETE 1 1/2" SLAB).

2	6/80	REMOVED COMBINED SELECT AND GRAVEL BLANKET FROM BOTTOM OF BASIN AND ADDED 18" PDT-O-PAC, SEE E
1	3/80	CHANGED BOTTOM EL 458.0 TO 459.0



TYPICAL DETAIL
CONCRETE OVERFLOW DITCH

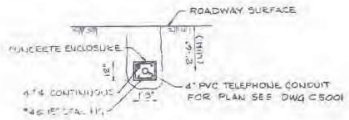
SCALE: 1/8"=1'-0"



AT ROADWAY FIELD TRANSFER SIZED CABLE FROM EXISTING TRENCH TO CONCRETE TROUGH MAINTAIN DESIGNATED GROUPING OF POWER AND OPERATING CABLES FOR PLAN SEE DWG C 5001

DETAIL
ELECTRICAL CABLE TROUGH

SCALE: 3/4"=1'-0"



DETAIL
CONCRETE ENCLOSURE FOR
TELEPHONE CONDUIT

SCALE: 3/8"=1'-0"

APPROVED FOR CONSTRUCTION

6/24/80

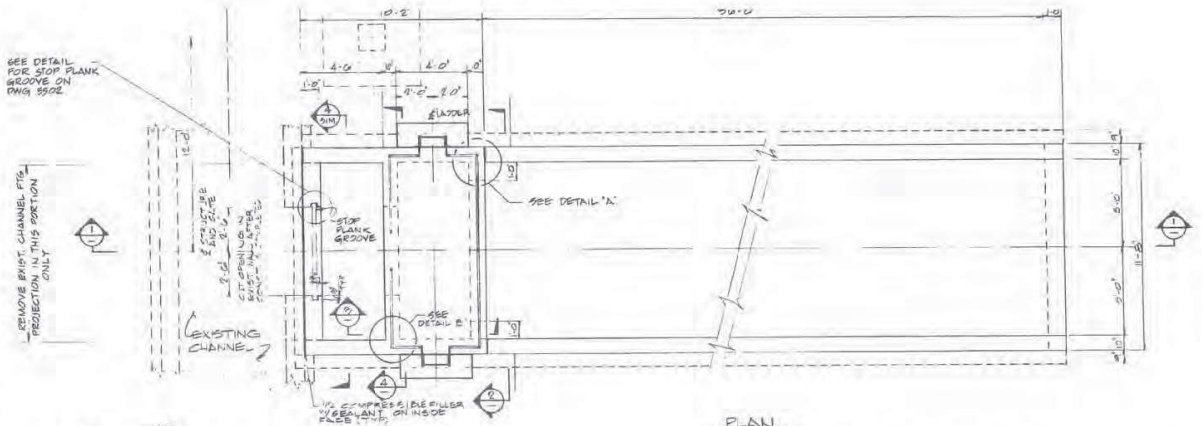
DESIGN	J.H.M.	3/80
DRAWN		
CHECKED		
QUALITY ASSURANCE		
ENGINEERING APPROVAL		6/24/80
APPROVAL		
APPROVAL		
APPROVAL		
APPROVAL PROJECT MGR.		7/1/80

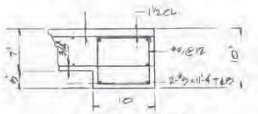
COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES
POWERTON

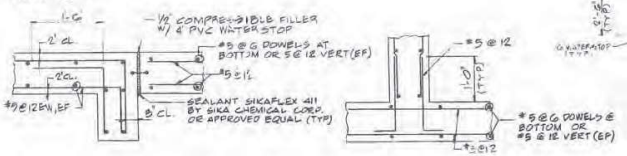
ASH SURGE BASIN BY PASS
MISCELLANEOUS DETAILS

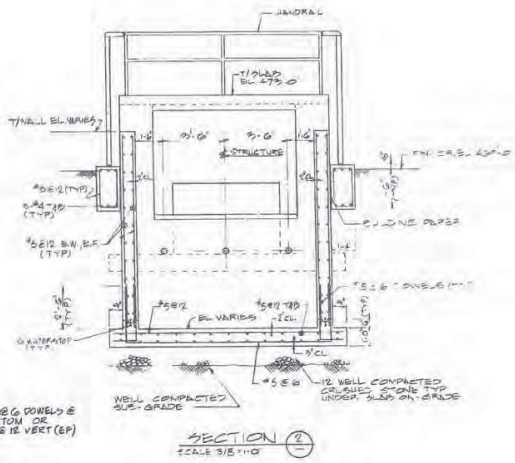
CECO CONTRACT: 802668	CECO DWG. NO.
NUS CORPORATION ROCKVILLE, MD.	5295 C 5003
SCALE: AS SHOWN	SHEET 1 OF 1

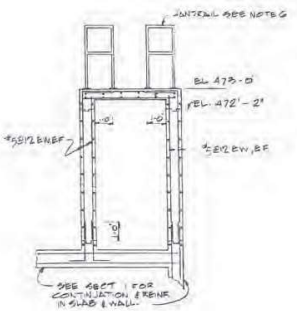
R000083

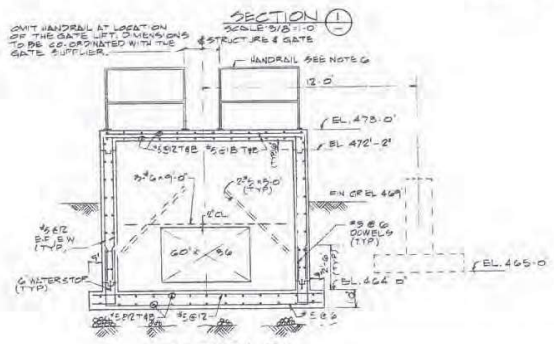












NOTES:

1. CONCRETE: f'c = 3000 PSI AT 28 DAYS
2. REINFORCING = ASTM A 615, GRADE 60
3. CONTRACTOR SHALL FURNISH AND INSTALL F&B STEEL GATE AND ACCESSORIES AS MANUFACTURED BY ARMCO STEEL CORP. CONFORMING TO THE FOLLOWING SPECS. OR APPROVED EQUAL.
   a. GATE MODEL 10-00
      QUANTITY REQUIRED = 1
      OPENING SIZE = 60" x 30"
      FRAME TYPE = FLAT BACK, STD. BOTTOM
      MATERIAL COMBINATION = #2
      STEM DIA. = 1 1/2"ø
   b. ACCESSORIES
      TYPE OF LIFT = CPE 2
      LIFT SUPPORT = WALL BRACKET TO MATCH CPE 2
      STEM SUPPORT = ADJUSTABLE STEM GUIDES AT SPACING RECOMMENDED BY MANUFACTURER.
4. CONTRACTOR SHALL COORDINATE WITH THE GATE SUPPLIER FOR THE NUMBER, SIZE AND LOCATION OF ANCHOR BOLTS REQUIRED TO ATTACH THE GATE, WALL BRACKET AND STEM GUIDES TO THE SUPPORTING WALL.
5. WORK THIS DWG. WITH CIVIL DWGS. 5295 C 5001 AND 5002.
6. FOR HANDRAIL & LADDER DETAILS SEE REF DWG. 5080 C 5601
7. FOR STOP PLANKS SEE DWG 5295 C 5502 NOTE 4

CONTRACT DRAWINGS:
5295 C 5001, 5002, 5003, 5501, 5502, 5503.

REFERENCE DRAWINGS:
CIVIL: 5080 C 5005, 5007, 5015, 5121
STRUCTURAL: 5080 C 5507, 5509, 5511, 5601, 5638, 5654, 5713
ELECTRICAL: (5080) 3E-0-3301, 3305, 3307
MECHANICAL: 5080 MB 3155 SHT 2, 5, 6, 7 & 11, 3162, 3169

NOTE: FOR LIST OF DRAWINGS BY TITLES SEE DWG NO. 5295 C 5003

Robert D. Ferguson 4/6/80

APPROVED FOR CONSTRUCTION

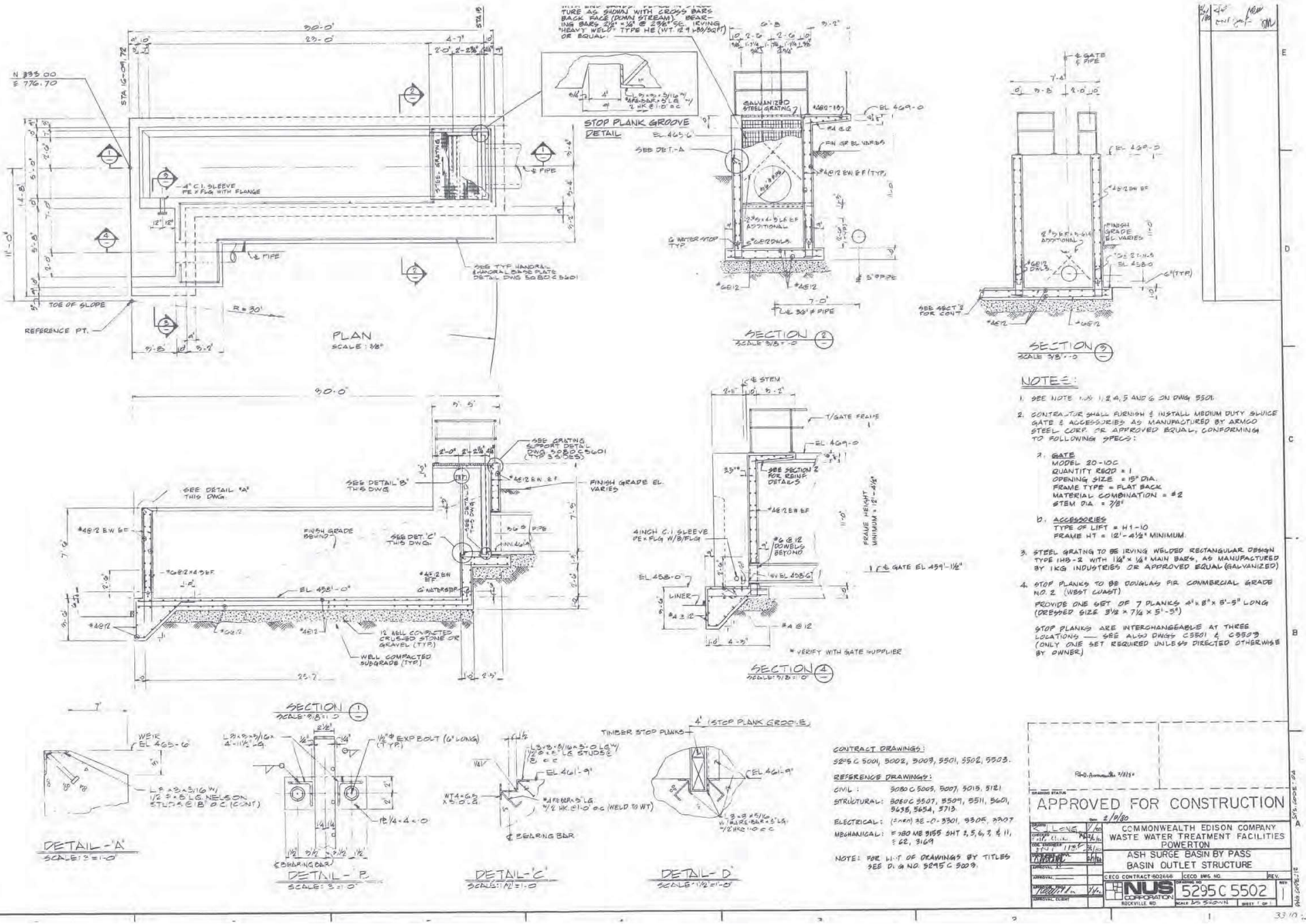
DRAWN	KENNETH LONG	3/19/80
CHECKED	T.N.	3/19/80
CIVIL ENGINEER		3/19/80
STRUCTURAL ENGINEER		3/19/80
APPROVAL		
APPROVAL		
APPROVED FOR CONSTRUCTION		3/19/80
APPROVAL CLIENT		

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES
POWERTON
ASH SURGE BASIN BY PASS
BASIN INLET STRUCTURE

NUS CORPORATION, ROCKVILLE, MD.
DRAWING NO. 5295 C 5501
REV. 1
SCALE: AS SHOWN
SHEET 1 OF 1

3311

R000084



NOTES:

1. SEE NOTE NOS 1, 2, 4, 5 AND 6 ON DWG 5501.
2. CONTRACTOR SHALL FURNISH & INSTALL MEDIUM DUTY SLUICE GATE & ACCESSORIES AS MANUFACTURED BY ARMCO STEEL CORP. OR APPROVED EQUAL, CONFORMING TO FOLLOWING SPECS:
   a. GATE
      MODEL 20-10C
      QUANTITY REQD = 1
      OPENING SIZE = 15" DIA.
      FRAME TYPE = FLAT BACK
      MATERIAL COMBINATION = #2
      STEM DIA. = 7/8"
   b. ACCESSORIES
      TYPE OF LIFT = H1-10
      FRAME HT = 12'-4 1/2" MINIMUM.
3. STEEL GRATING TO BE IRVING WELDED RECTANGULAR DESIGN TYPE IHB-2 WITH 1 1/2" x 1/4" MAIN BARS, AS MANUFACTURED BY IKG INDUSTRIES OR APPROVED EQUAL (GALVANIZED)
4. STOP PLANKS TO BE DOUGLAS FIR COMMERCIAL GRADE NO. 2 (WEST COAST)
   PROVIDE ONE SET OF 7 PLANKS 4" x 8" x 5'-5" LONG (DRESSED SIZE 3 1/2" x 7 1/4" x 5'-5")
   STOP PLANKS ARE INTERCHANGEABLE AT THREE LOCATIONS — SEE ALSO DWGS C5501 & C5503 (ONLY ONE SET REQUIRED UNLESS DIRECTED OTHERWISE BY OWNER)

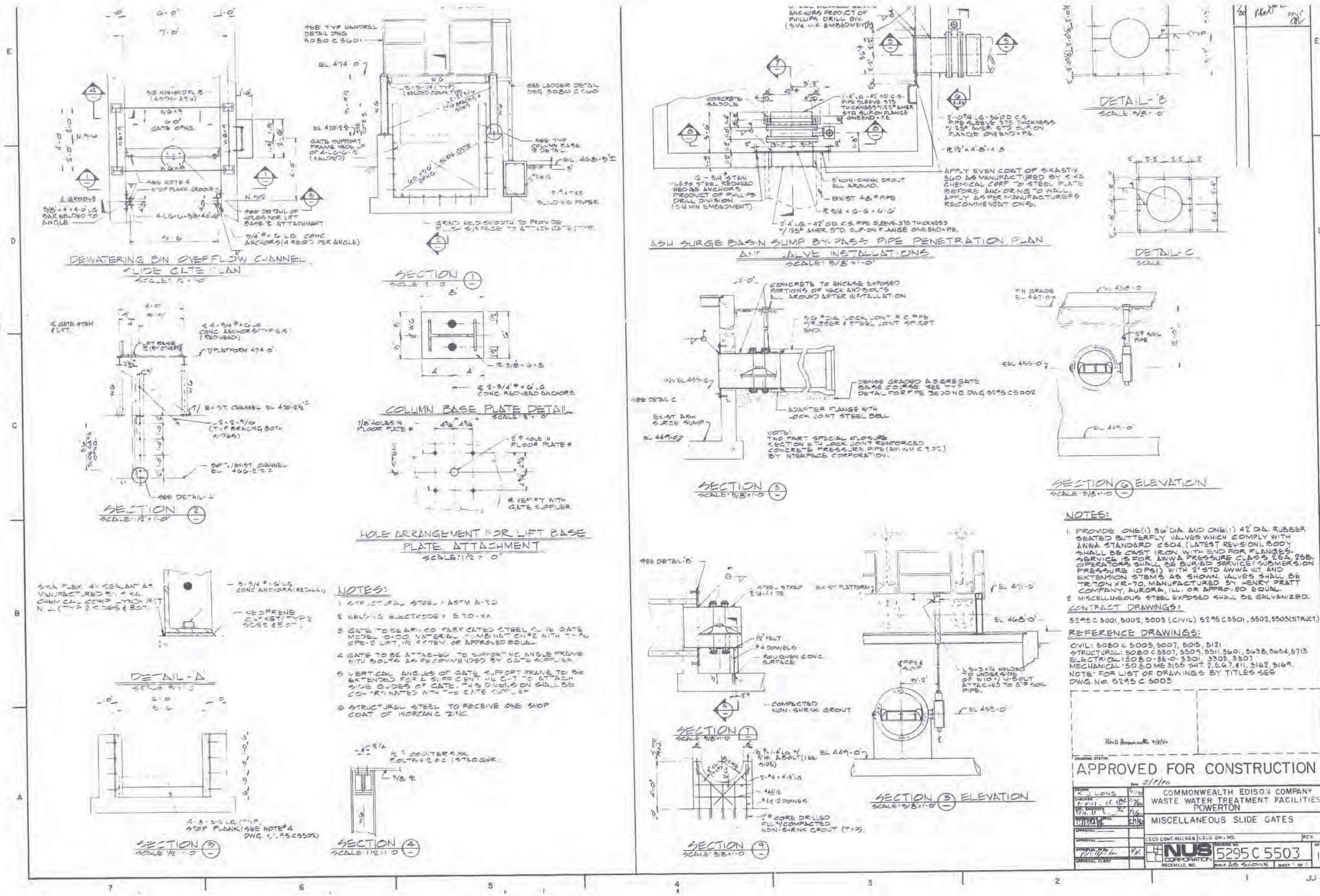
CONTRACT DRAWINGS:
5295 C 5001, 5002, 5003, 5501, 5502, 5503.

REFERENCE DRAWINGS:
CIVIL: 5080 C 5005, 5007, 5015, 5121
STRUCTURAL: 5080 C 5507, 5509, 5511, 5601, 5635, 5654, 5713
ELECTRICAL: (SIMILAR) 3E-0-3301, 3305, 3307
MECHANICAL: E 780 ME 3155 SHT 2, 5, 6, 7, & 11, E 62, 3169

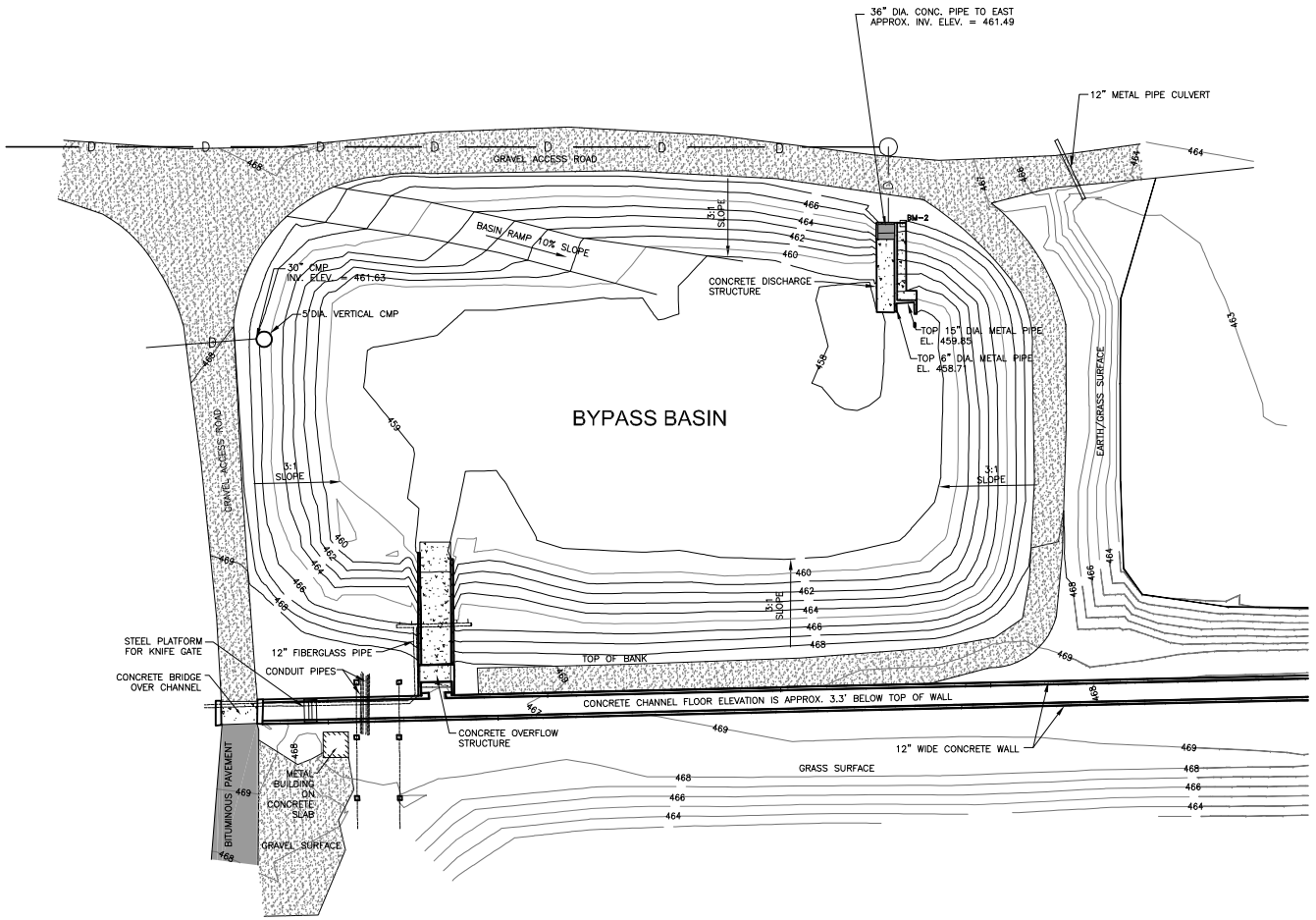
NOTE: FOR LIST OF DRAWINGS BY TITLES SEE DWG NO. 5295 C 5003.

APPROVED FOR CONSTRUCTION
Date 2/9/80

COMMONWEALTH EDISON COMPANY	
WASTE WATER TREATMENT FACILITIES	
POWERTON	
ASH SURGE BASIN BY PASS	
BASIN OUTLET STRUCTURE	
CECO CONTRACT 80-26468	CECO DWG. NO. 5295 C 5502
NUS CORPORATION ROCKVILLE, MD.	SCALE AS SHOWN SHEET 1 OF 1


DEWATERING BIN OVERFLOW CHANNEL SLIDE GATE PLAN
SCALE: 1/2" = 1'-0"
SECTION 1
SCALE: 1/2" = 1'-0"
COLUMN BASE PLATE DETAIL
SCALE: 3" = 1'-0"
HOLE ARRANGEMENT FOR LIFT BASE PLATE ATTACHMENT
SCALE: 1/2" = 1'-0"
SECTION 2
SCALE: 1/2" = 1'-0"
DETAIL-A
SCALE: 3" = 1'-0"
SECTION 3
SCALE: 1/2" = 1'-0"
SECTION 4
SCALE: 1/2" = 1'-0"
ASH SURGE BASIN SUMP BY-PASS PIPE PENETRATION PLAN AND VALVE INSTALLATIONS
SCALE: 3/8" = 1'-0"
DETAIL-B
SCALE: 3/8" = 1'-0"
DETAIL-C
SCALE:
SECTION 5
SCALE: 3/8" = 1'-0"
SECTION 6 ELEVATION
SCALE: 3/8" = 1'-0"
SECTION 7
SCALE: 3/8" = 1'-0"
SECTION 8
SCALE: 3/8" = 1'-0"
SECTION 9
SCALE: 3/8" = 1'-0"
SECTION 3 ELEVATION
SCALE: 3/8" = 1'-0"
NOTES:
1. STRUCTURAL STEEL = ASTM A-36
2. WELDING ELECTRODE = E70-XX
3. GATE TO BE ARMCO FABRICATED STEEL SLIDE GATE MODEL 10-00, MATERIAL COMBINATION #2 WITH TYPE CPE-2 LIFT, 1/2" STEM, OR APPROVED EQUAL.
4. GATE TO BE ATTACHED TO SUPPORTING ANGLE FRAME WITH BOLTS AS RECOMMENDED BY GATE SUPPLIER
5. VERTICAL ANGLES OF GATE SUPPORT FRAME TO BE EXTENDED FOR A SUFFICIENT HEIGHT TO ATTACH SIDE GUIDES OF GATE. THIS DIMENSION SHALL BE CO-ORDINATED WITH THE GATE SUPPLIER
6. STRUCTURAL STEEL TO RECEIVE ONE SHOP COAT OF INORGANIC ZINC
NOTES:
1. PROVIDE ONE(1) 36" DIA. AND ONE(1) 42" DIA. RUBBER SEATED BUTTERFLY VALVES WHICH COMPLY WITH AWWA STANDARD C504, (LATEST REVISION). BODY SHALL BE CAST IRON WITH END FOR FLANGES. SERVICE IS FOR AWWA PRESSURE CLASS 25A, 25B. OPERATORS SHALL BE BURIED SERVICE (SUBMERSION PRESSURE 10 PSI) WITH 2" STD AWWA NUT AND EXTENSION STEMS AS SHOWN. VALVES SHALL BE TRITON XR-70, MANUFACTURED BY HENRY PRATT COMPANY, AURORA, ILL. OR APPROVED EQUAL.
2. MISCELLANEOUS STEEL EXPOSED SHALL BE GALVANIZED.
CONTRACT DRAWINGS:
5295 C 5001, 5002, 5003 (CIVIL) 5295 C 5501, 5502, 5503 (STRUCT.)
REFERENCE DRAWINGS:
CIVIL: 5080 C 5005, 5007, 5015, 5121
STRUCTURAL: 5080 C 5507, 5509, 5511, 5601, 5638, 5654, 5713
ELECTRICAL: 5080-3E-0-3301, 3305, 3307
MECHANICAL: 5080 ME 3155 SHT. 2, 5, 6, 7, 411, 3162, 3169.
NOTE: FOR LIST OF DRAWINGS BY TITLES SEE DWG. NO. 5295 C 5003
APPROVED FOR CONSTRUCTION
COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES
POWERTON
MISCELLANEOUS SLIDE GATES
NUS CORPORATION
ROCKVILLE, MD.
5295 C 5503
SCALE AS SHOWN
339

ATTACHMENT 1-2
2010 LINER REPLACEMENT DRAWINGS



LEGEND

- D — UNDERGROUND DISCHARGE PIPE
- ABOVEGROUND INTAKE PIPE
- 460 — GROUND SURFACE CONTOUR
- BM-2 — BENCHMARK 2

HORIZONTAL DATUM:
ILLINOIS STATE PLANE COORDINATE SYSTEM, WEST ZONE, NAD83.

VERTICAL DATUM:
LOCAL PLANT DATUM

BENCHMARK 2:
NORTHEAST CORNER OF CONCRETE DISCHARGE STRUCTURE. CHISELED "+" IN CONCRETE ELEVATION 468.75 FT.

SOURCE NOTES:
THIS DRAWING WAS DEVELOPED FROM A SURVEY MAURER STUTZ, INC. DATED SEPTEMBER 7, 2010, DRAWING NO. 23210023.
LOCATION OF BASIN AND ACCESS RAMP TAKEN FROM MIDWEST GENERATION DRAWING NO. 5295 C5001-2, DATED 6-26-1980.

N

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SCALE IN FEET

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2.	RECORD DOCUMENTATION	06/08/11	HMS
1.	ISSUED FOR BID	10/06/10	HMS
0.	ISSUED FOR PERMIT	06/30/10	HMS
REVISION:		DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1965.5/5.4
DRAWN BY: KNW 06/30/10
CHECKED BY: RJG 06/30/10
APPROVED BY: HMS 06/130/10

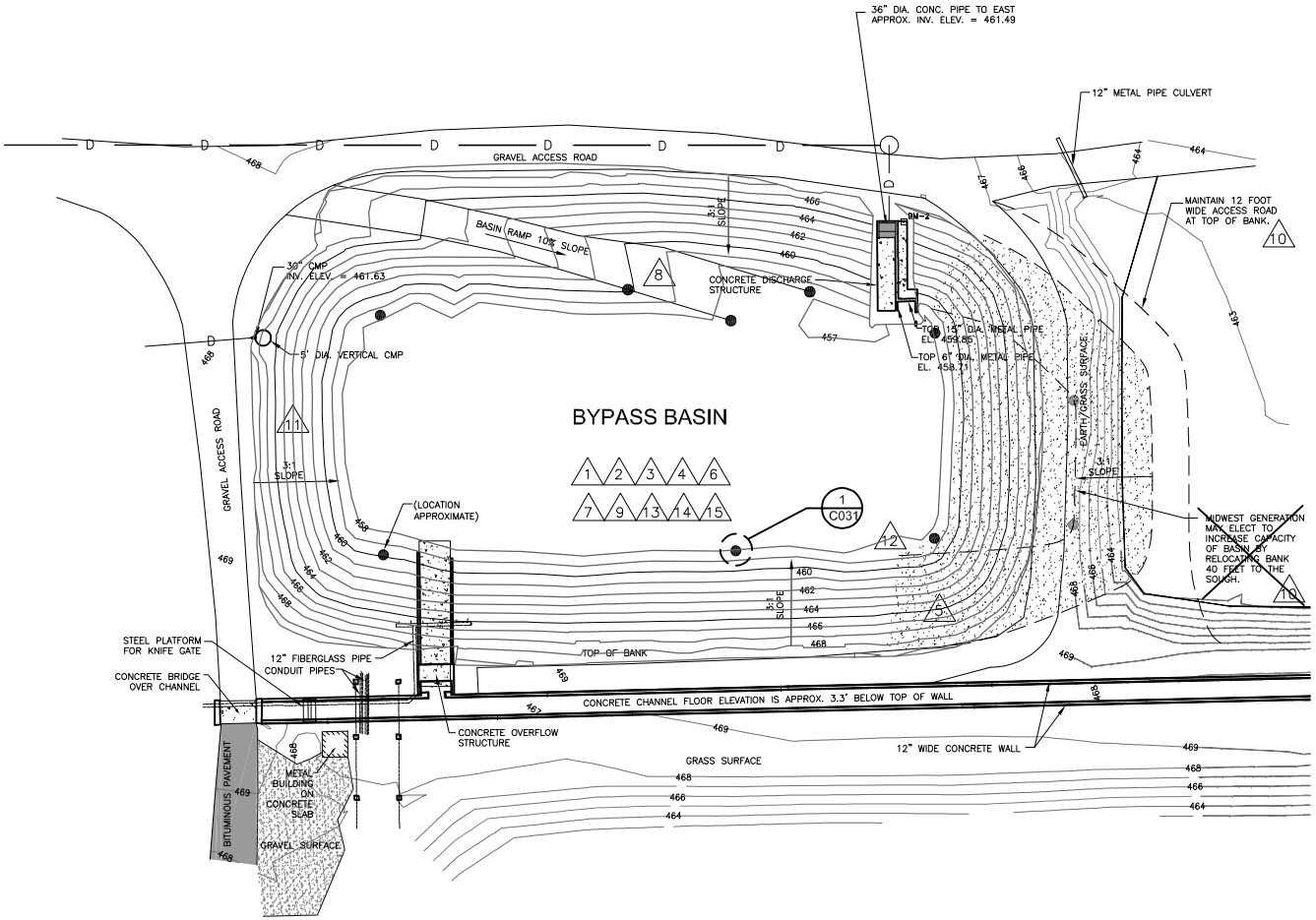
PRE-CONSTRUCTION CONDITIONS

BYPASS BASIN LINER REPLACEMENT
MIDWEST GENERATION
POWERTON POWER STATION
PEKIN, ILLINOIS

DRAWING NO: D1965C010-02
REFERENCE: .

SHEET NO. C010

R0000068



LEGEND

- UNDERGROUND DISCHARGE PIPE
- ABOVEGROUND INTAKE PIPE
- PREPARED SUBGRADE SURFACE CONTOUR
- 12 OZ. NON-WOVEN GEOTEXTILE
- MARKER POST LOCATION
- ADDITIONAL MARKER POST LOCATION IF BANK IS RELOCATED.
- BANK/AREA FOR POSSIBLE RELOCATION
- BENCHMARK 2

CONTRACTOR NOTES:

1. CONTRACTOR SHALL FIELD VERIFY LOCATION OF UNDERGROUND PIPES WITH ASSISTANCE OF OWNER'S UTILITY LOCATOR.
2. CONTRACTOR SHALL FIELD VERIFY LOCATION OF CONCRETE STRUCTURES AND ABOVE GROUND PIPING.
3. CONTRACTOR SHALL STORE ALL GEOSYNTHETICS AND SUBGRADE MATERIALS IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
4. CONTRACTOR SHALL STORE AND STAGE EQUIPMENT AT LOCATION APPROVED BY OWNER.
5. CLEAR AND GRUB ALL BRUSH ALONG TOP OF SLOPE OF BASIN.
6. PROTECT ALL CONCRETE AND UTILITY STRUCTURES THROUGHOUT PROJECT DURATION.
7. CONTRACTOR SHALL REMOVE ALL VEGETATION, ROCKS, AND OTHER DEBRIS FROM EXISTING LINER AND DISPOSE OF IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
8. CONTRACTOR SHALL CLEAN OFF THE RAMP SURFACE TO THE EXTENT PRACTICAL TO REMOVE ROCKS THAT MAY POSE A HAZARD TO GEOMEMBRANE, AS APPROVED BY GEOMEMBRANE INSTALLER, ENGINEER AND/OR OWNER.
9. CONTRACTOR SHALL REMOVE 12-INCH LAYER OF POZ-O-PAC AND 6-INCHES OF POZ-O-PAC SUBGRADE FROM THE BASE OF BASIN.
~~10. CONTRACTOR SHALL RELOCATE SOUTHERN BANK 40 FEET TO THE SOUTH, AS DIRECTED BY OWNER. SEGREGATE GRAVEL ACCESS ROAD MATERIAL TO BE REUSED AS BASE SOURCE MATERIAL. MATERIAL REMOVED FROM THE EXISTING BANK MAY BE USED TO RECONSTRUCT NEW SOUTHERN BANK IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.~~
11. CONTRACTOR SHALL REMOVE "SOFT" SUBGRADE MATERIAL BENEATH EXISTING HYPALON LINER, AS DIRECTED BY OWNER AND/OR ENGINEER. BACK FILL AREAS WITH FILL IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS. CUT HYPALON AS NEEDED TO REPAIR THE "SOFT" SUBGRADE AREAS.
12. CONTRACTOR SHALL INSTALL MARKER POSTS ALONG THE TOE OF SLOPE AS SHOWN AND IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS AND DETAIL 1 ON SHEET C031.
13. CONTRACTOR SHALL PLACE 16 OZ. NONWOVEN GEOTEXTILE AT BASE OF BASIN AND WHERE HYPALON LINER DOES NOT EXIST OR WAS REMOVED OF THE PREPARED SUBGRADE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
14. SUBGRADE SHALL BE APPROVED BY OWNER AND/OR ENGINEER PRIOR TO INSTALLATION OF GEOMEMBRANE.
15. CONTRACTOR SHALL PROVIDE MEANS TO PROTECT SUBGRADE FROM EROSION, STORM WATER, AND HEAVY EQUIPMENT TRAFFIC. DAMAGE TO SUBGRADE SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

HORIZONTAL DATUM:
ILLINOIS STATE PLANE COORDINATE SYSTEM, WEST ZONE, NAD83.

VERTICAL DATUM:
LOCAL PLANT DATUM

BENCHMARK 2:
NORTHEAST CORNER OF CONCRETE DISCHARGE STRUCTURE. CHISELED "+" IN CONCRETE ELEVATION 468.75 FT.

SOURCE NOTES:
THIS DRAWING WAS DEVELOPED FROM A SURVEY MAURER STUTZ, INC. DATED SEPTEMBER 7, 2010, DRAWING NO. 23210023.
LOCATION OF BASIN AND ACCESS RAMP TAKEN FROM MIDWEST GENERATION DRAWING NO. 5295 C5001-2, DATED 6-26-1980.
BASIN SUBGRADE AND SITE IMPROVEMENTS FROM A SURVEY PROVIDED BY MILLENNIA PROFESSIONAL SERVICES, MARCH 2011.

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	REVISION:	DATE:	APP'D BY:
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2.	RECORD DOCUMENTATION	06/08/11	HMS
1.	ISSUED FOR BID	10/06/10	HMS
0.	ISSUED FOR PERMIT	06/30/10	HMS

NATURAL RESOURCE TECHNOLOGY

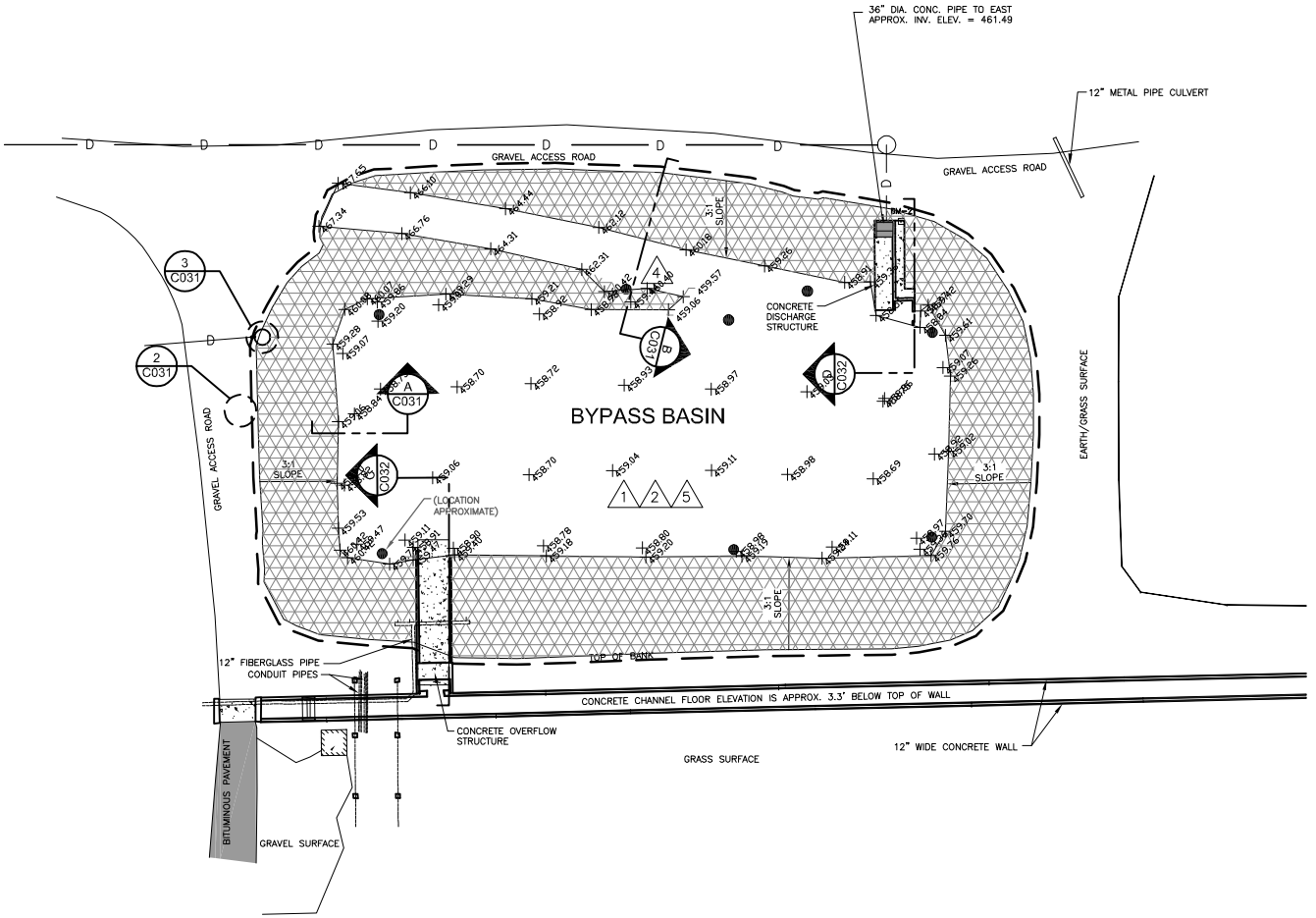
PROJECT NO.	1965/5.4
DRAWN BY:	KNW 06/30/10
CHECKED BY:	RJG 06/30/10
APPROVED BY:	HMS 06/30/10

LINER SUBGRADE PREPARATION

BYPASS BASIN LINER REPLACEMENT
MIDWEST GENERATION
POWERTON POWER STATION
PEKIN, ILLINOIS

DRAWING NO: D1965C020-02
REFERENCE: .

SHEET NO. C020



LEGEND

- D — UNDERGROUND DISCHARGE PIPE
- ABOVEGROUND INTAKE PIPE
- ANCHOR TRENCH
- × 459.11 — TOP OF WARNING LAYER (ELEVATION, FT.)
- MARKER POST LOCATION
- BM-2 — BENCHMARK 2
- HDPE GEOMEMBRANE

HORIZONTAL DATUM:
ILLINOIS STATE PLANE COORDINATE SYSTEM, WEST ZONE, NAD83.

VERTICAL DATUM:
LOCAL PLANT DATUM

BENCHMARK 2:
NORTHEAST CORNER OF CONCRETE DISCHARGE STRUCTURE. CHISELED "+" IN CONCRETE ELEVATION 468.75 FT.

CONTRACTOR NOTES: △

1. CONTRACTOR SHALL INSTALL 60 MIL HDPE, WHITE, TEXTURED GEOMEMBRANE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION PRIOR TO PLACEMENT OF THE WARNING LAYER. CONTRACTOR SHALL PROVIDE AND FOLLOW AN APPROVED GEOMEMBRANE LAYOUT PLAN.
2. GEOMEMBRANE SHALL BE ANCHORED INTO 2.5 FEET DEEP TRENCHES ALONG TOP OF BASIN BANK, AS SHOWN ON SHEET C031. CONTRACTOR SHALL ADVISE OWNER AND/OR ENGINEER IF PROPOSED LOCATION FOR ANCHOR TRENCH IS NOT POSSIBLE.
3. CONTRACTOR SHALL PLACE 12-OZ. NON-WOVEN GEOTEXTILE, CUSHION MATERIAL AND WARNING LAYER MATERIAL OVER THE GEOMEMBRANE AT BASE AND 4 FEET ON SIDE SLOPES FOLLOWING ENGINEER APPROVAL AND PASSING QUALITY CONTROL RESULTS IN ACCORDANCE WITH TECHNICAL SPECIFICATIONS (SEE SHEET C031).
4. CONTRACTOR SHALL PLACE 2 LAYERS OF 12-OZ. NONWOVEN GEOTEXTILE, CUSHION AND WARNING LAYER MATERIALS OVER THE GEOMEMBRANE ON THE RAMP, AS SHOWN ON SHEET C031.
5. RESTORE AREAS DISTURBED BY EQUIPMENT AND MATERIAL LAYDOWN.
6. CONTRACTOR SHALL PROVIDE SURVEY DOCUMENTATION OF THE ITEMS LISTED IN THE TECHNICAL SPECIFICATIONS.
7. CONTRACTOR SHALL PERFORM A LEAK LOCATION SURVEY IN ACCORDANCE WITH TECHNICAL SPECIFICATIONS.

SOURCE NOTES:
THIS DRAWING WAS DEVELOPED FROM A SURVEY MAURER STUTZ, INC. DATED SEPTEMBER 7, 2010, DRAWING NO. 23210023.
LOCATION OF BASIN AND ACCESS RAMP TAKEN FROM MIDWEST GENERATION DRAWING NO. 5295 C5001-2, DATED 6-26-1980.
BASIN SUBGRADE AND SITE IMPROVEMENTS FROM A SURVEY PROVIDED BY MILLENNIA PROFESSIONAL SERVICE, MARCH 2011.

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SCALE IN FEET

	REVISION:	DATE:	APP'D BY:
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2.	RECORD DOCUMENTATION	06/08/11	HMS
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NATURAL RESOURCE TECHNOLOGY

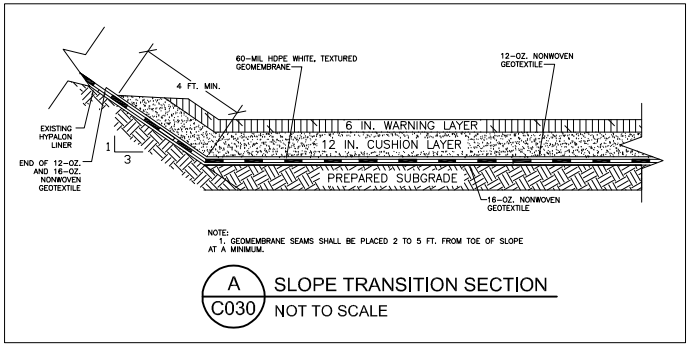
PROJECT NO. 1965.5/5.4
DRAWN BY: KNW 06/30/10
CHECKED BY: RJG 06/30/10
APPROVED BY: HMS 06/30/10

WARNING LAYER PLAN

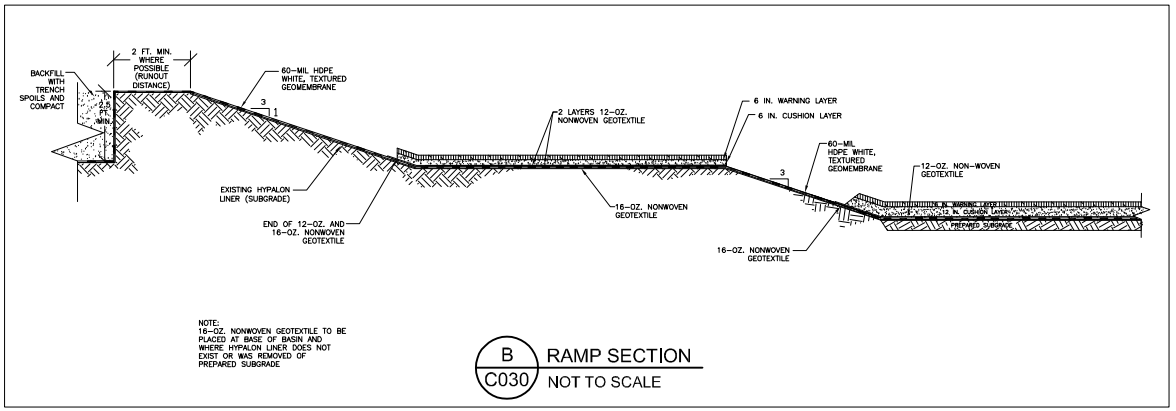
BYPASS BASIN LINER REPLACEMENT
MIDWEST GENERATION
POWERTON POWER STATION
PEKIN, ILLINOIS

DRAWING NO: D1965C030-02
REFERENCE: .

SHEET NO. C030



A / C030 SLOPE TRANSITION SECTION
NOT TO SCALE



B / C030 RAMP SECTION
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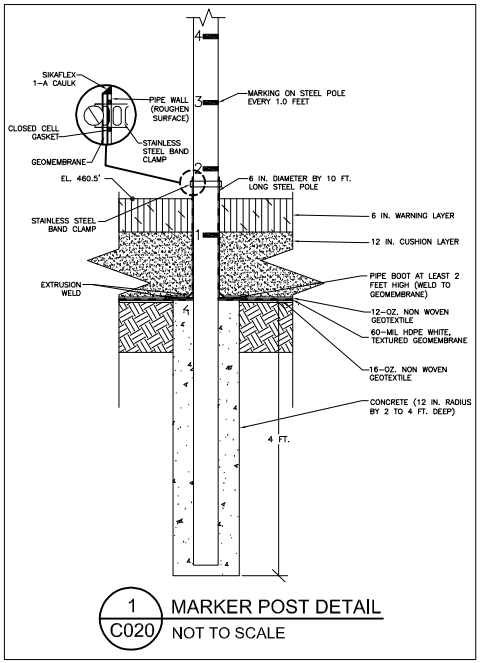
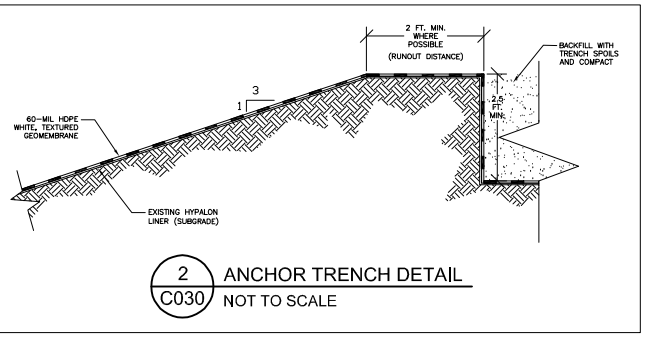
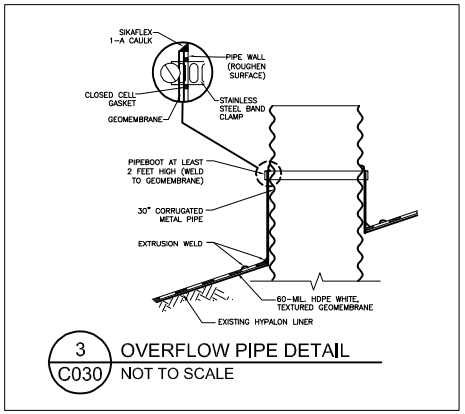


1 / C020 MARKER POST DETAIL
NOT TO SCALE



2 / C030 ANCHOR TRENCH DETAIL
NOT TO SCALE



3 / C030 OVERFLOW PIPE DETAIL
NOT TO SCALE

NOT FOR CONSTRUCTION

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2.	RECORD DOCUMENTATION	06/16/11	HMS
1.	ISSUED FOR BID	10/06/10	HMS
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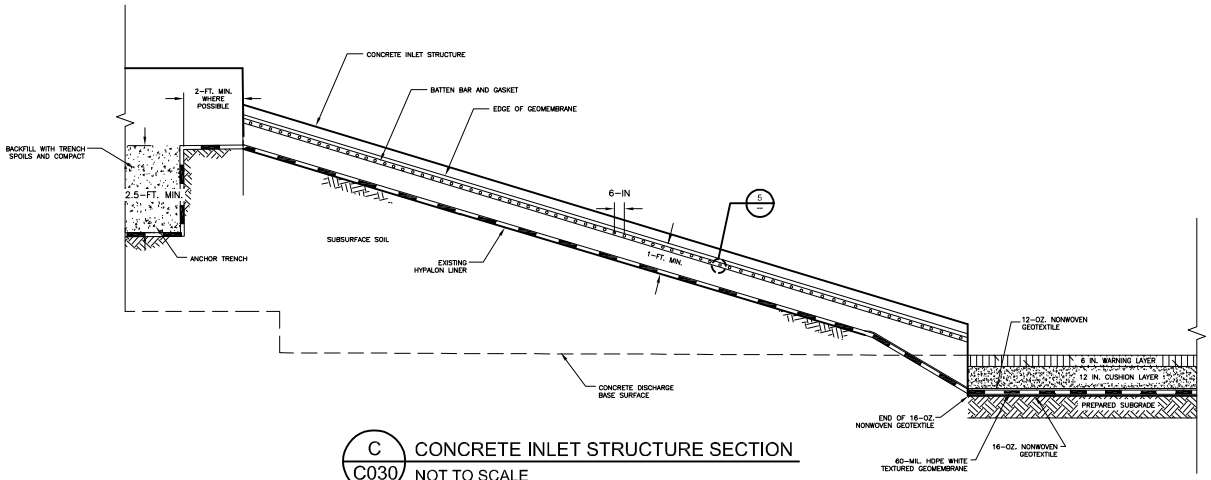
REVISION:		DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

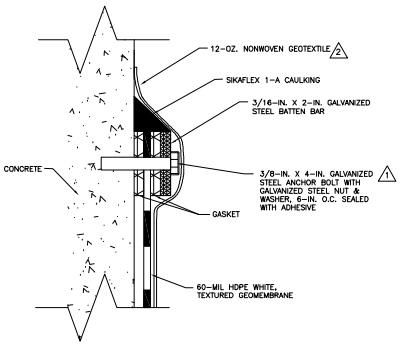
PROJECT NO.	1965/5.4
DRAWN BY:	KNW 06/30/10
CHECKED BY:	RJG 06/30/10
APPROVED BY:	HMS 06/30/10
DRAWING NO:	D1965C031-02
REFERENCE:	
SHEET NO.	C031

DETAILS AND SECTIONS

BYPASS BASIN LINER REPLACEMENT
MIDWEST GENERATION
POWERTON POWER STATION
PEKIN, ILLINOIS

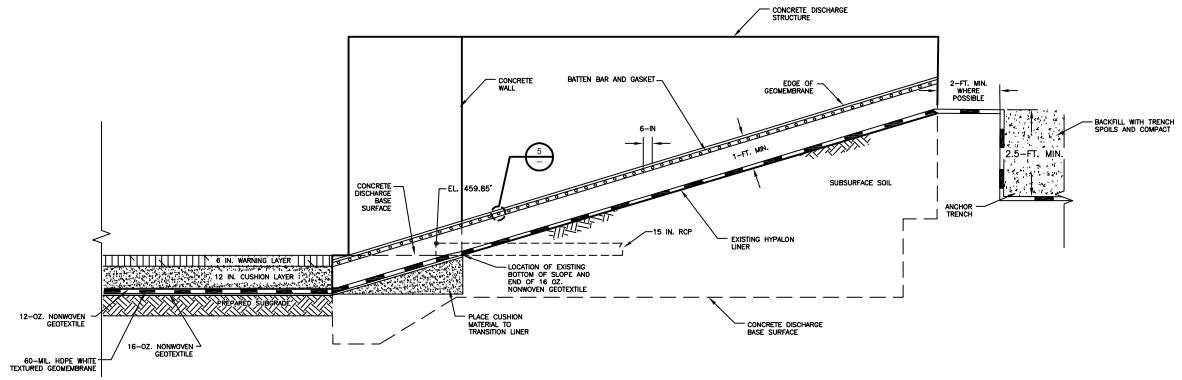


C / C030 CONCRETE INLET STRUCTURE SECTION
NOT TO SCALE



NOTE: △
1. ANCHOR BOLTS 6 IN. ON CENTER.
2. 12-OZ. NONWOVEN GEOTEXTILE TO BE USED TO PROTECT GEOMEMBRANE BELOW CUSHION/WARNING LAYERS.

5 / -- BATTEN BAR ATTACHMENT
NOT TO SCALE



D / - CONCRETE DISCHARGE STRUCTURE SECTION
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NOT FOR CONSTRUCTION

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2.	RECORD DOCUMENTATION	06/16/11	HMS
1.	ISSUED FOR BID	10/06/10	HMS
0.	ISSUED FOR PERMIT	06/30/10	HMS
REVISION:		DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1965/5.4	DETAILS AND SECTIONS
DRAWN BY: KNW 06/30/10	BYPASS BASIN LINER REPLACEMENT MIDWEST GENERATION POWERTON POWER STATION PEKIN, ILLINOIS
CHECKED BY: RJG 06/30/10	
APPROVED BY: HMS 06/30/10	DRAWING NO: D1965C032-02
	REFERENCE:
	SHEET NO. C032

ATTACHMENT 1-3
2010 LINER REPLACEMENT SPECIFICATIONS

SECTION 02600
HIGH DENSITY POLYETHYLENE (HDPE) GEOMEMBRANE

PART 1 - GENERAL

1.01 WORK INCLUDES

A. Furnish all labor, materials, tools, supervision, transportation, and installation equipment necessary for installation of 60-mil High Density Polyethylene (HDPE) geomembrane, as specified herein, and as shown on Contract Drawings.

1.02 REFERENCE STANDARDS

A. ASTM D6392 –Test Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods.

B. ASTM D7007 Standard Practice for Locating Leaks in Geomembranes Covered with Water or Earthen Materials.

C. GRI Test Method, GM 13 - Test Methods, Test Properties and Testing Frequency for High Density Polyethylene (HDPE) Smooth and Textured Geomembranes

D. GRI Test Method, GM 14 – Selecting Variable Intervals for Taking Geomembrane Destructive Seam Samples Using the Method of Attributes.

E. GRI Test Method, GM 19 – Seam Strength and Related Properties of Thermally Bonded Polyolefin Geomembranes.

1.03 DEFINITIONS

A. Geomembrane Installer: hired by Contractor or Owner responsible for field handling, transporting, storing, deploying, seaming and testing of the geomembrane seams.

B. Geomembrane Manufacturer: hired by Geomembrane Installer, Contractor, or Owner to provide HDPE geomembrane.

C. Leak Location Contractor: hired by Contractor or Owner and responsible for locating potential holes in the installed geomembrane using electrical methods.

D. Geosynthetic Quality Assurance Consultant: Consultant, independent from the Manufacturer, and Installer, responsible for field oversight of geosynthetics installation, and related testing, usually under the direction of the Owner.

D. Geosynthetic Quality Assurance Laboratory (Testing Laboratory): Laboratory, independent from the Manufacturer and Installer, responsible for conducting laboratory tests on samples of geosynthetics obtained at the site or during manufacturing, usually under the direction of the Owner.

D. Lot: A quantity of resin (usually the capacity of one rail car) used in the manufacture of geomembranes. Finished roll will be identified by a roll number traceable to the resin lot used.

E. Resin Supplier: selected by Geomembrane Manufacturer to provide resin used in manufacturing geomembrane.

F. Panel: Unit area of a geomembrane that will be seamed in the field that is larger than $100ft^2$.

G. Patch: Unit area of a geomembrane that will be seamed in the field that is less than $100ft^2$.

H. Subgrade Surface: Soil Layer surface which immediately underlies the geosynthetic material(s).

1.04 QUALITY ASSURANCE

A. Qualifications:

1. Geomembrane Manufacturer shall have a minimum of 5 years of continuous experience manufacturing HDPE geomembrane totaling 1,000,000 square feet.

2. Geomembrane Installer:

a. 5 years of continuous experience in installation of HDPE geomembrane.

b. Experience totaling a minimum of 5,000,000 square feet of installed HDPE geomembrane on some combination of at least 10 completed facilities.

c. Personnel performing seaming operations qualified by experience or by successfully passing seaming tests. Master seamer shall have experience seaming a minimum of 3,000,000 square feet of geomembrane using same type of seaming apparatus to be used on this project.

3. Leak Location Contractor:

d. 3 years of continuous experience in performing leak location surveys using electrical methods.

e. Experience totaling a minimum of 2,000,000 square feet of geomembrane leak location surveys on some combination of at least 5 completed facilities.

f. Personnel performing survey qualified by experience with at least 2 years of geomembrane testing experience using the leak location survey electrical method.

B. Quality Assurance Program:

1. Geomembrane Manufacturer/Installer shall conform with requirements of these Technical Specifications.

2. The Owner or Contractor will engage and pay for the services of a Geosynthetic Quality Assurance Consultant and Laboratory to monitor geomembrane installation.

1.05 SUBMITTALS

A. Prior to project start, submit the following to Geosynthetic Quality Assurance Consultant in accordance with Section 01300, Submittals:

1. Raw Materials:

a. Name of Resin Supplier, location of supplier's production plant(s), resin brand name and product number.

b. Source and nature of plasticizers, fillers, carbon black and any other additives along with their percent addition to geomembrane material.

c. Test results documenting conformance with the "index properties" of GRI Test Method, GM 13.

2. Geomembrane Manufacturer's Certification:

a. Written certification that Geomembrane Manufacturer's Quality Control Plan was fully implemented during production of geomembrane material supplied for this project. (Submittal shall be made within 5 working days of delivery to site).

3. Geomembrane Installer's Seaming Personnel

a. Training completed by personnel.

b. Seaming experience for each personnel.

4. Geomembrane Manufacturer Production Information:

a. Corporate background information indicating compliance with qualification requirements.

b. Quality control plan for manufacturing.

c. Copy of quality control certificates demonstrating compliance with the quality control plan for manufacturing and the test property requirements of GRI Test method, GM 13 (i.e. mill certificates).

5. Geomembrane Installer's Information:

a. Corporate background information indicating compliance with qualification requirements.

b. List of completed facilities, totaling 5,000,000 square feet minimum for which Geomembrane Installer has completed installation of a HDPE geomembrane. Include name and purpose of facility, location, date of installation, and quantity installed.

c. Resumes of personnel performing field seaming operation, along with pertinent experience information. Include documentation regarding which seamers are qualified to use thermal fusion welding apparatus.

d. Installation quality control plan.

6. Installation panel layout diagram identifying placement of geomembrane panels, seams, and any variance or additional details which deviate from Contract Drawings or Technical Specifications. Layout shall be drawn to scale and shall be adequate for use as a construction plan. Layout shall include dimensions and pertinent seam and anchorage details.

7. Installation Sequence and Schedule shall be included as part of Construction Progress Schedule.

8. Description of seaming apparatus to be used.

B. With bid, submit the following to Owner and/or Engineer in accordance with Section 01300, Submittals

1. Leak Location Contractor's Work Plan:

a. Corporate background information indicating compliance with qualification requirements.

b. List of completed facilities, totaling 2,000,000 square feet minimum of geomembrane leak location surveys on some combination of at least 5 completed facilities. Include name and purpose of facility, location, date of survey, survey method, and quantity surveyed.

c. Resumes of personnel performing leak location survey, along with pertinent experience information.

d. Leak Location Contractor quality control plan including description of the proposed survey methods and procedures, and field calibration procedures.

e. Leak Location Contractor's required site preparations to be completed to perform the proposed leak location survey, and estimated duration to complete the survey.

f. An example of a final report (per ASTM D 7007) provided by the Leak Location Contractor following the completion of the survey.

C. During installation, submit the following to the Geosynthetic Quality Assurance Consultant:

1. Daily records/logs prepared by Geomembrane Installer documenting work performed, personnel involved, general working conditions, and any problems encountered or anticipated on project. Submit on a weekly basis.

2. Copy of subgrade acceptance signed by Geomembrane Installer for areas to be covered with geomembrane each day.

D. Within 10 days of geomembrane installation completion, submit the following to Geosynthetic Quality Assurance Consultant:

1. Geomembrane installation certification that Work was performed under Geomembrane Installer's approved quality control plan and in substantial compliance with Technical Specifications and Contract Drawings.

2. As-built panel diagram identifying placement of geomembrane panels, seams, repairs, and destructive seam sample locations.

3. Copy of warranty for material (including factory seams) and installation covering both for a period of 2 years from the date of substantial completion.

E. The Geosynthetic Quality Assurance Consultant will review and inspect HDPE geomembrane installation upon completion of all Work specified in this Section. Deficiencies noted shall be corrected at no additional cost to the Owner.

F. The Geosynthetic Quality Assurance Consultant will provide written final acceptance of the geomembrane installation after completion of material placement above geomembrane. Written conditional geomembrane installation acceptance can be provided to the Contractor prior to completion of material placement above geomembrane when the following conditions are satisfied, if necessary, and requested by the Contractor:

1. The entire geomembrane installation is completed or any pre-determined subsection if the project is phased.

2. All installation quality assurance/control documentation has been completed and submitted to the Geosynthetic Quality Assurance Consultant or Owner.

3. Verification of the adequacy of all field seams, repairs and associated testing is complete.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Transportation:

1. Geomembrane rolls shall be transported, unloaded and handled at the job site in accordance with manufacturer recommendations. Damaged material may be rejected by the Geosynthetic Quality Assurance Consultant.

B. On-site Storage:

1. Geomembrane rolls which have been delivered to job site shall be unloaded and stored in original, unopened packaging in a secure location, determined by Owner and/or Geosynthetic Quality Assurance Consultant.

2. Store geomembrane rolls to ensure adequate protection against exposure to the following:

a. Equipment;

b. Strong oxidizing chemicals, acids, or bases;

c. Flames, including welding sparks;

d. Temperatures in excess of 160 deg. F;

e. Dust;

f. Ultraviolet radiation (i.e. sunlight); and

g. Inclement weather.

3. Whenever possible, provide a 6-inch minimum air space between rolls.

4. Containers/rolls shall not be stacked.

C. On-Site Handling:

1. Handle rolls per Geomembrane Manufacturer's recommendations and as necessary to prevent damage.

PART 2 - PRODUCTS

2.01 MATERIALS

A. High Density Polyethylene (HDPE) White Textured Geomembrane.

1. HDPE geomembrane shall be white, textured, 60-mil product approved by the Engineer and/or Geosynthetic Quality Assurance Consultant.

2. The Contractor shall submit, with the bid, written certification from the proposed Geomembrane Manufacturer that geomembrane products proposed in the bid satisfy the following requirements:

a. The proposed HDPE compound shall be comprised entirely of virgin materials. Compliance with this specification shall be documented in accordance with Geomembrane Manufacturer's quality control program and submitted to the Geosynthetic Quality Assurance Consultant with the written conformance certification.

b. The proposed Geomembrane Manufacturer shall certify that any plasticizers, fillers and additives incorporated into the manufacturing process for the proposed HDPE geomembrane have demonstrated acceptable performance on past projects.

c. The proposed geomembrane shall meet the requirements of Geosynthetic Research Institute's test method GM 13.

d. The nominal thickness of proposed geomembrane shall be 60 mil., or as approved by the Engineer and/or Geosynthetic Quality Assurance Consultant.

3. Geomembrane sheets shall be visually consistent in appearance and shall contain no holes, blisters, undisbursed raw materials or other signs of contamination by foreign material. Geomembrane must have no striations, roughness or bubbles on the surface.

B. Seaming Apparatus

1. Thermal fusion welding machines used for joining geomembrane surfaces may be either extrusion or hot wedge. These machines shall include sufficient temperature and rate-of-travel monitoring devices to allow continuous monitoring of operating conditions.

2. One spare, operable thermal fusion seaming device shall be maintained on site at all times.

C. Field Test Equipment

1. Field Tensiometer: the field tensiometer shall be calibrated within three months prior to project start date over the range of field test values.

2. Air Channel Test Equipment: air channel test equipment shall consist of hoses, fittings, valves and pressure gauge(s) needed to deliver and monitor the pressure of compressed air through an approved pressure feed device.

3. Air Compressor: the air compressor utilized for field testing shall be capable of producing and maintaining an operating pressure of at least 50 psi.

4. Vacuum Box: the vacuum box shall consist of a vacuum gage, valve, and a gasket around the edge of the open bottom needed to apply vacuum to a surface.

2.02. CONFORMANCE TESTING REQUIREMENTS

A. Geomembrane shipped to site shall undergo conformance testing. Manufacturer's roll certificates may be used for conformance evaluation at the option of the Geosynthetic Assurance Consultant. Nonconforming material shall either be retested at the direction of the Geosynthetic Quality Assurance Consultant or removed from site and replaced at Contractor's expense.

B. Conformance Test Methods

1. Samples will be located and collected by the Geosynthetic Quality Assurance Consultant at a rate of one sample per 100,000 square feet of geomembrane delivered to site.

2. One sample will be obtained from each geomembrane production batch delivered to the site.

3 Samples shall be cut by Geomembrane Installer and be at least 45 square feet in size.

4. Samples shall be tested in accordance with Table 1 (Smooth) or Table 2 (Textured) specified in GRI Test Method GM13.

5. Geomembrane thickness shall be measured a minimum of three times per panel during deployment to verify conformance with GRI Test Method GM13.

C. Role of Testing Laboratories

1. The Geosynthetic Quality Assurance Consultant will be responsible for acquiring samples of the geomembrane for conformance testing. The Owner or Geosynthetic Quality Assurance Consultant will retain an independent, third party laboratory to perform conformance testing on samples of geomembrane.

2. Retesting of geomembrane panels by the Geomembrane Installer because of failure to meet any of the conformance specifications can only be authorized by the Geosynthetic Quality Assurance Consultant. Non-conforming panels may be retested in accordance with Subsection 2.02(B) and 2.02(D) under authorization of the Geosynthetic Quality Assurance Consultant only.

3. The Geomembrane Manufacturer and/or Geomembrane Installer may perform independent tests in accordance with methods and procedures specified in Subsection 2.02(B). Results shall not be substituted for quality assurance testing described herein.

D. Procedures for Determining Conformance Test Failures

1. If conformance test results fail to meet specifications, the roll and/or batch may be retested using specimens from either the original roll sample or from another sample collected by the Geosynthetic Quality Assurance Consultant. Two additional tests (retests) shall be performed for each failed test procedure. Each retest shall consist of multiple specimen tests if multiple specimens are specified in the test procedure. If the results of both retests meet specifications, the roll and batch will be considered to have passed conformance testing.

2. Failure of any retest shall be cause for rejection of the entire roll or batch depending on the type of failing test. The Geosynthetic Quality Assurance Consultant reserves the right to collect samples from other rolls of a particular batch for further conformance testing. The Geosynthetic Quality Assurance Consultant may choose to accept only a portion of the batch on the basis of the results of conformance testing of samples collected from other rolls.

3. If retesting does not result in conformance with the specifications as defined in preceding paragraph, or if there are any other nonconformities with the material specifications, the Contractor shall remove the rolls from use in the project. The Contractor shall also be responsible for removal of rejected geomembrane from the site and replacement with acceptable geomembrane at no additional cost to the Owner.

PART 3 - EXECUTION

3.01 PRE-CONSTRUCTION MEETING

A. A Pre-Construction Meeting shall be held at the site to discuss and plan the details of geomembrane installation. This meeting shall be attended by the Geomembrane Installer, Owner, Engineer and the Contractor.

B. The following topics relating to geomembrane installation shall be addressed:

1. Responsibilities of each party.

2. Lines of authority and communication.

3. Methods for documenting, reporting and distributing documents and reports.

4. Procedures for packaging and storing archive samples.

5. Review of the schedule for all installation and quality assurance testing, including third-party testing turnaround times.

6. Review of panel layout, access and numbering systems for panels and seams including details for marking on the HDPE geomembrane.

7. Procedures and responsibilities for preparation and submittal of as-built drawings.

8. Temperature and weather limitations, installation procedures for adverse weather conditions and defining acceptable subgrade or ambient moisture and temperature conditions for working during liner installation.

9. Subgrade conditions, dewatering responsibilities and subgrade maintenance plan.

10. Deployment techniques including allowable subgrade for geomembrane.

11. Procedures for covering of the geomembrane to prevent damage.

12. Plan for minimizing wrinkles in the geomembrane.

13. Measurement and payment schedules.

14. Site health and safety procedures/protocols.

3.02 SUBGRADE PREPARATION

A. Contractor shall prepare a subgrade surface in accordance with Section 02300, Earthwork.

B. The Contractor shall not excavate more than the amount of anchor trench required for one day of geosynthetics deployment, unless otherwise specified by the Geosynthetic Quality Assurance Consultant. Rounded corners shall be provided in the trenches where the geosynthetics enter the trench to allow them to be uniformly supported by the subgrade and to avoid sharp bends. The geosynthetics shall not be supported by loose soils in anchor trenches.

C. The Geomembrane Installer shall visually inspect the subgrade immediately prior to geomembrane deployment. Inspection shall verify that there are no potentially harmful foreign objects present, such as sharp rocks and other deleterious debris. Any foreign objects encountered shall be removed by Geomembrane Installer or Contractor. All subgrade damaged by construction equipment and deemed unsuitable for geomembrane deployment shall be repaired prior to geomembrane deployment. All repairs shall be approved by the Geosynthetic Quality Assurance Consultant and Geomembrane Installer. The responsibility for preparation, repairs, and maintenance of the subgrade shall be defined in the preconstruction meeting. The Geomembrane Installer shall provide the Geosynthetic Quality Assurance Consultant with written acceptance of subgrade surface over which geomembrane is deployed (Part 1 .05C) for each day of deployment.

3.03 GEOMEMBRANE DEPLOYMENT

A. Geomembrane shall not be deployed until all applicable certifications/quality control certificates listed in Subsection 1.05 of this section and conformance testing listed in Subsection 2.02 of this section are submitted and approved by the Geosynthetic Quality Assurance Consultant. Any geomembrane deployed prior to approval by the Geosynthetic Quality Assurance Consultant shall be at the sole risk of the Geomembrane Installer and/or Contractor. If material installed prior to approval by the Geosynthetic Quality Assurance Consultant does not meet the requirements of this specification, it shall be removed from the site at no additional cost to the Owner.

B. Geomembrane will be deployed according to submitted panel layout drawing as approved by the Geosynthetic Quality Assurance Consultant. The Geosynthetic Quality Assurance Consultant is to be notified of and approve any revisions or modifications to the approved panel layout drawing prior to deploying geomembrane in the area of review.

C. Adequate temporary anchoring (sand bags, tires, etc.) that will not damage the geomembrane shall be placed on a deployed panel to prevent uplift by wind.

D. Geomembrane shall not be deployed if:

1. Ambient temperatures are below 41 degrees F (5 degrees C) or above 104 degrees F (40 degrees C) measured six inches above geomembrane surface unless approved by the Geosynthetic Quality Assurance Consultant.

2. Precipitation is expected or in the presence of excessive moisture or ponded water on the subgrade surface.

3. Winds are excessive as determined by Geomembrane Installer in agreement with the Geosynthetic Quality Assurance Consultant.

4. The Geosynthetic Quality Assurance Consultant will have the authority to suspend work during such conditions.

E. The Geomembrane Installer shall be responsible for conformance with the following requirements:

1. Equipment utilized for installation/quality assurance testing does not damage geomembrane. Such equipment shall have rubber tires and a ground pressure not exceeding 5 psi or total weight exceeding 750 lbs. Only equipment necessary for installation and quality assurance testing is allowed on the deployed geomembrane.

2. Personnel working on geomembrane do not damage geomembrane (activities such as smoking or wearing damaging clothing shall not be allowed).

3. Method of deployment does not damage geomembrane.

4. Method of deployment minimizes wrinkles.

5. Temporary loading or anchoring does not damage geomembrane.

6. Direct contact with geomembrane is minimized.

F. No vehicles shall be allowed on deployed geomembrane under any circumstances.

3.04 FIELD SEAMS

A. Seam Layout

1. In general, seams shall be oriented parallel to the line of the maximum slope. In corners and at other odd-shaped geometric intersections, number of seams should be minimized. If at all possible, seams shall not be located at low points in the subgrade unless geometry requires seaming to be done at these locations.

2. A seam numbering system compatible with the panel numbering system shall be agreed upon at the Pre-Construction Meeting.

C. Field Test Methods

1. Ten 1-inch-wide samples described above under Part 3.06(B)(3) shall be field tested for peel (5 samples) and shear (5 samples) in accordance with GRI GM 19.

2. One seam sample shall be field tested for peel and shear at the end of each continuous field seam 100 feet or greater in length.

3. Testing shall be performed in accordance with ASTM D6392 using a field tensiometer or equivalent device to qualitatively and quantitatively determine mode of failure.

4. Seam shall be considered passing if failure in both peel and shear meet criteria listed in GRI GM 19.

5. The procedures specified in Subsection 3.06(D) shall be implemented when sample passes field tensiometer test.

D. Laboratory Test Methods

1. Laboratory testing of seam samples shall be conducted by the Geosynthetic Quality Assurance Laboratory under contract with the Geosynthetic Quality Assurance Consultant or Owner. Five specimens shall be tested in shear and five in peel.

2. Laboratory testing shall be conducted in accordance with GRI GM 19.

3. For both seam shear and peel tension tests, an indication will be given for each specimen tested which defines locus of failure.

4. For shear tests, the following values, along with the mean and standard deviation where appropriate, will be reported for each specimen tested:

   a. Maximum tension in pounds per square inch.

   b. Elongation at break (up to a tested maximum of 100 percent).

   c. Locus of failure using ASTM D6392 designations.

5. For peel tests, the following values, along with the mean and standard deviation where appropriate, will be reported for each specimen tested:

   a. Maximum tension in pounds per square inch.

   b. Seam separation (expressed as percent of original seam area).

c. Locus of failure.

6. Retesting of seams due to nonconformance with specifications may be performed at the discretion of the Geosynthetic Quality Assurance Consultant.

E. Destructive Seam Test Failure

1. Shear and peel test results derived from testing described in Parts 3.06(C) and 3.06(D) shall comply with GRI GM 19 for seam to be considered acceptable.

2. The Geomembrane Installer has two options in determining the repair boundary whenever a seam has failed destructive testing:

   a. The seam can be reconstructed between the two previously tested and passed destructive sample locations; or,

   b. The Geomembrane Installer can trace the welding path to an intermediate location at least ten feet from point of failed test in each direction and obtain destructive test samples collected from these locations. If destructive tests on these samples are acceptable, then the seam shall be reconstructed between the intermediate locations. If either sample fails, the process may be repeated until an acceptable seam test has been performed on both sides of the original failed sample. If a passing sample is not realized on one (or both) side of the original failed sample, then seam repair must extend to the end(s) of the seam. Retesting of seams according to this procedure shall utilize the sampling methodology described in Part 3.06(B). The Owner reserves the right to terminate this process, at the discretion of the Geosynthetic Quality Assurance Consultant, after the second retesting. An additional sample taken from the reconstructed zone must pass destructive seam testing if destructive sample failure(s) causes reconstruction.

3. The Geosynthetic Quality Assurance Consultant shall be responsible for documenting all actions taken in repairing seams. The Geomembrane Installer will be responsible for keeping the Geosynthetic Quality Assurance Consultant informed of seaming progress.

4. Additional fees for destructive seam test failures shall be assessed to the Contractor and deducted from payment. This fee shall be assessed only if the failing sample is a laboratory sample.

3.07 ELECTRONIC LEAK LOCATION SURVEY

A. The Owner shall have the option to conduct an electronic leak location survey. Leak location survey shall be performed by the Leak Location Contractor under the observation of the Geosynthetic Quality Assurance Consultant.

B. Leak Location Contractor shall identify actions required by Contractor to prepare the site for the leak location survey.

C. Contractor shall ensure that the layers above and below the geomembrane contains sufficient moisture to conduct a leak location survey. Typically, a moisture content of earth materials of 1% to 2% by weight is sufficient to conduct the survey. If the moisture content of layers above and/or below the geomembrane is not sufficient per the requirements of the Leak Location Contractor, Contractor shall add moisture to the layers, as required.

D. Contractor shall provide electrical isolation of the metal marker posts, batten bars, and concrete structures, as requested by Leak Location Contractor.

E. Leak Location Contractor shall inspect the site prior to commencing the survey to ensure all site preparations are completed and the site conditions are appropriate for conducting the leak location survey.

F. Any discrepancy in the required site preparation detailed in the Leak Location Contractor's Work Plan or site conditions shall be reported to the Contractor for corrective or appropriate action.

G. After the final layer is placed above the geomembrane, conduct a leak location survey on the final layer material using the procedures for surveys with earth materials covering the Geomembrane as described in ASTM D 7007.

H. A leak detection sensitivity test using an artificial leak shall be conducted on the geomembrane for each set of equipment used before the equipment is used on for the leak location survey, as described in ASTM D 7007 to determine the detection distance for the survey.

I. The leak location survey shall be taken on survey lines or on a grid spaced no farther apart than twice the leak detection distance as determined in the leak detection sensitivity test.

J. The Leak Location Contractor shall inform the Owner and/or Engineer and mark the locations of all identified or indicated leaks with a flag or spray paint. The Geomembrane Installer shall repair the defect/hole as detailed in Part 3.08 of this Section.

3.08 DEFECTS AND REPAIRS

A. The geomembrane shall be examined by the Geomembrane Installer and the Engineer for defects, holes, blisters, undispersed raw materials, and any signs of contamination by foreign matter. The geomembrane surface shall be swept and/or washed by the Geomembrane Installer if the amount of dust or mud inhibits examination. The

Contractor shall provide a water truck, an operator, clean water and hoses as reasonably necessary to assist the Geomembrane Installer in this activity.

B. Portions of geomembrane exhibiting flaws, or failing a non-destructive or destructive (if conducted) test, shall be repaired or replaced by the Geomembrane Installer. Repair procedures available include:

1. Patching - used to repair large holes, tears, undispersed raw materials, contamination by foreign matter, holes resulting from destructive sampling (if conducted), and locations where seam overlap is insufficient;

2. Capping - used to repair large lengths of failed seams; and

3. Additional Procedures - used upon recommendation of the Geomembrane Installer if agreed to by the Engineer.

C. Patches or caps.

1. Extend patch or cap 6 inches (minimum) beyond the edge of the defect.

2. Round corners of patch and/or cap (suggest 3-inch radius).

3. Repair procedures, equipment, materials, and techniques will be approved by the Geosynthetic Quality Assurance Consultant prior to repair.

4. Geomembrane below large caps shall be appropriately cut to avoid water or gas collection between two sheets.

D. The Geomembrane Installer shall mark on the geomembrane (using a non-puncturing writing utensil), repair date, time, and personnel involved.

E. Each repair shall be non-destructively tested in accordance with Part 3.05. Large caps may require destructive test sampling in accordance with Part 3.06 at the discretion of the Geosynthetic Quality Assurance Consultant.

F. Repairs which fail testing shall be redone and retested until a passing result is obtained. The Geomembrane Installer will perform non-destructive testing on repairs and will document retesting of repairs.

G. The Geosynthetic Quality Assurance Consultant will document repairs, repair testing, and retesting results.

H. The Geomembrane Installer shall cut and seam wrinkles which may adversely affect long-term integrity of the geomembrane, hinder subsequent construction of overlying layers, or impede drainage off of the geomembrane after it is covered by soil. Seaming shall be done in accordance with procedures described in Parts 3.04(B) and 3.04(C), and it shall be subject to test provisions of Parts 3.05 (non-destructive testing) and 3.06 (destructive testing – if conducted).

3.09 PROTRUSIONS AND CONNECTIONS TO GEOMEMBRANE

A. If required, the Geomembrane Installer shall install geomembrane around utility poles, guy wires, and other structures according to the Contract Drawings and the following requirements:

1. Use minimum 1-ft long geomembrane pipe boots and steel clamps to seal the geomembrane around pole or structure.

2. Use standard welding procedures to seam the geomembrane boot to the geomembrane.

3. Seaming performed on and around penetrations, and other appurtenances shall be non-destructively tested using the vacuum testing method.

3.10 SURVEY DOCUMENTATION

A. The Geomembrane Installer shall survey the completed geomembrane prior to covering and provide the Geosynthetic Quality Assurance Consultant with 24-hour notification of survey. The Contractor shall document the location of all seams (panel corners acceptable), destructive test samples (if conducted) and repairs. The Contractor shall provide survey data to the Geosynthetic Quality Assurance Consultant within two working day of survey completion.

3.11 DAILY FIELD INSTALLATION REPORTS

A. At the beginning of each day, the Geomembrane Installer shall provide the Geosynthetic Quality Assurance Consultant with a report for all work completed the previous day.

B. The Daily Field Installation Report shall include the following:

1. The total amount and location of geomembrane placed.

2. The total length and location of seams completed, technician name and welding unit numbers.

3. A drawing or sketch depicting the geomembrane installed the previous day including the panel number, seam number and locations of non-destructive and destructive testing (if conducted).

4. Results of pre-qualification test seams, if available.

5. Results of non-destructive testing.

C. Destructive test results (if conducted) shall be reported within 48 hours or prior to covering the geomembrane, whichever is practical.

3.12 MATERIAL ABOVE GEOMEMBRANE

A. The Geosynthetic Quality Assurance Consultant and Geomembrane Installer shall verify the area of geomembrane completion prior to placement of material over the geomembrane.

B. Soils - Apply following general criteria for covering of the geomembrane:

1. Do not place soils on the geomembrane at an ambient temperature below 32 degrees F, (0 degrees C) nor above 104 degrees F (40 degrees C), unless otherwise specified.

2. Do not drive equipment used for placing soil directly on the geomembrane.

3. A minimum thickness of 1 foot of soil is specified between a low ground pressure dozer (maximum contact pressure of 5 lb/sq. inch) and the geomembrane.

4. A minimum thickness of 2 feet of soil is required between rubber-tired vehicles and the geomembrane.

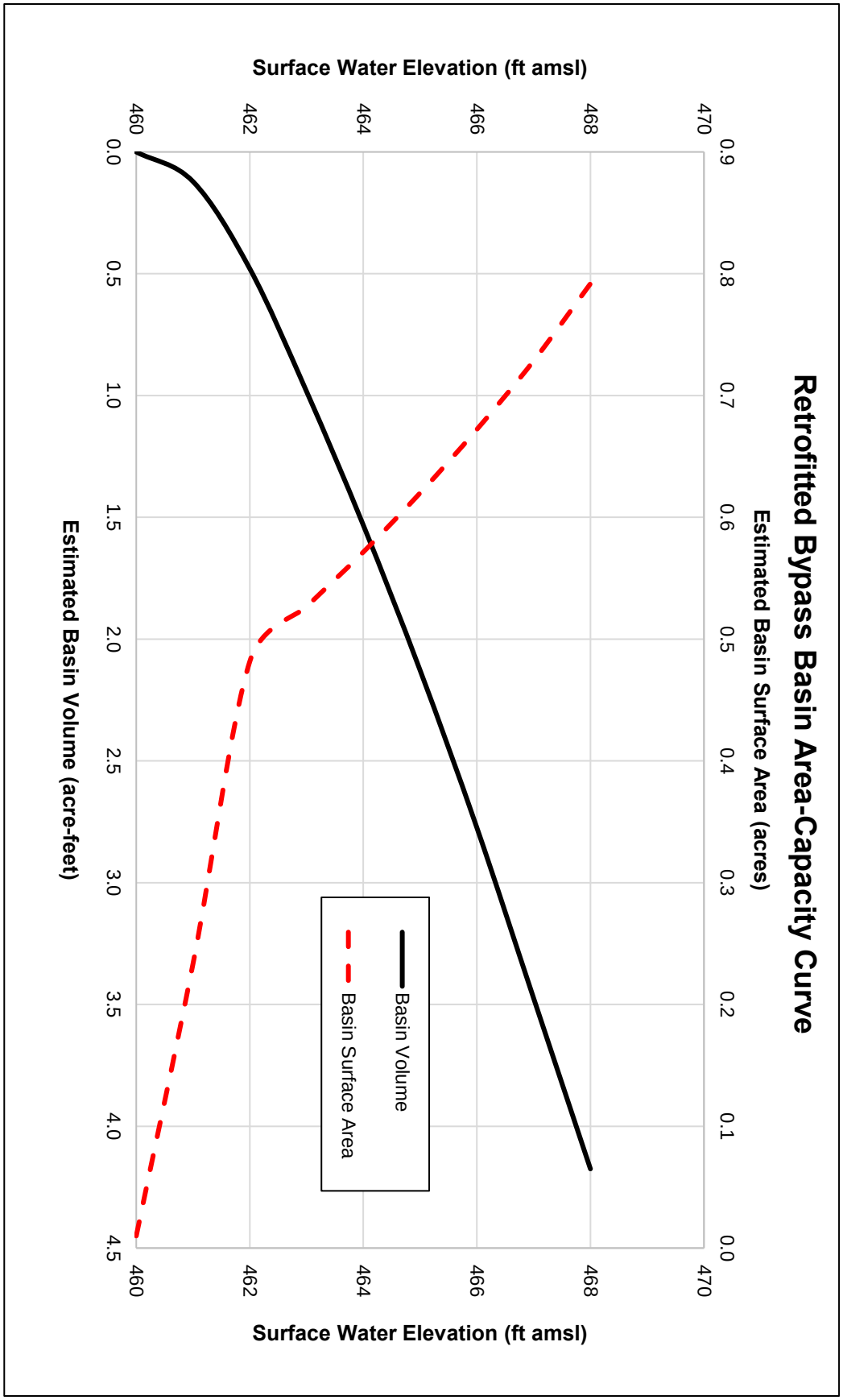
5. Do not compact soils placed directly on geomembrane.

6. Damage to the geomembrane resulting from placement of cover soils shall be repaired in accordance with Part 3.08 by the Geomembrane Installer at the Contractor's expense.

7. Do not push soil downslope. Soil shall be placed over the geomembrane starting from base of the slope, up to top of the slope.

END OF SECTION

ATTACHMENT 1-4
RETROFITTED BYPASS BASIN AREA-CAPACITY CURVE


Retrofitted Bypass Basin Area-Capacity Curve
Surface Water Elevation (ft amsl)
Estimated Basin Surface Area (acres)
Estimated Basin Volume (acre-feet)
Surface Water Elevation (ft amsl)
Basin Volume
Basin Surface Area
460
462
464
466
468
470
0.0
0.1
0.2
0.3
0.4
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0.8
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4.0
4.5

ATTACHMENT 2-1
CCR CHEMICAL CONSTITUENTS ANALYSIS

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Chicago
2417 Bond Street
University Park, IL 60484
Tel: (708)534-5200

Laboratory Job ID: 500-201436-1
Client Project/Site: Ash

For:
Midwest Generation EME LLC
13082 E Manito Road
Pekin, Illinois 61554

Attn: Joseph Kotas

Diana Mockler

Authorized for release by:
7/12/2021 3:51:25 PM

Diana Mockler, Project Manager I
(219)252-7570
Diana.Mockler@Eurofinset.com

LINKS

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The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Client: Midwest Generation EME LLC
Project/Site: Ash

Laboratory Job ID: 500-201436-1

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Case Narrative

Client: Midwest Generation EME LLC
Project/Site: Ash

Job ID: 500-201436-1

Job ID: 500-201436-1

Laboratory: Eurofins TestAmerica, Chicago

Narrative

Job Narrative
500-201436-1

Comments
No additional comments.

Receipt
The samples were received on 6/24/2021 3:35 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 4.6º C.

Metals
Method 6010B: The following samples were diluted due to the abundance of non-target analytes: ASH BASIN (500-201436-2) and METALS CB (500-201436-3). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: Midwest Generation EME LLC
Project/Site: Ash

Job ID: 500-201436-1

Method	Method Description	Protocol	Laboratory
6010B	Metals (ICP)	SW846	TAL CHI
7471A	Mercury (CVAA)	SW846	TAL CHI
9056A	Anions, Ion Chromatography	SW846	TAL CHI
Moisture	Percent Moisture	EPA	TAL CHI
SM 4500 Cl- E	Chloride, Total	SM	TAL CHI
SM 4500 F C	Fluoride	SM	TAL CHI
300_Prep	Anions, Ion Chromatography, 10% Wt/Vol	MCAWW	TAL CHI
3050B	Preparation, Metals	SW846	TAL CHI
7471A	Preparation, Mercury	SW846	TAL CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CHI = Eurofins TestAmerica, Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Sample Summary

Client: Midwest Generation EME LLC
Project/Site: Ash

Job ID: 500-201436-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
500-201436-1	FAB	Solid	06/23/21 13:30	06/24/21 15:35	
500-201436-2	ASH BASIN	Solid	06/23/21 14:23	06/24/21 15:35	
500-201436-3	METALS CB	Solid	06/23/21 15:00	06/24/21 15:35	

Client Sample Results

Client: Midwest Generation EME LLC
Project/Site: Ash

Job ID: 500-201436-1

Client Sample ID: FAB

Date Collected: 06/23/21 13:30
Date Received: 06/24/21 15:35

Lab Sample ID: 500-201436-1

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<2.0		2.0		mg/Kg		07/08/21 08:24	07/09/21 11:25	1
Arsenic	**1.8**		0.99		mg/Kg		07/08/21 08:24	07/09/21 11:25	1
Barium	**88**		0.99		mg/Kg		07/08/21 08:24	07/09/21 11:25	1
Beryllium	**1.9**		0.40		mg/Kg		07/08/21 08:24	07/09/21 11:25	1
Boron	**64**		4.9		mg/Kg		07/08/21 08:24	07/09/21 11:25	1
Cadmium	<0.20		0.20		mg/Kg		07/08/21 08:24	07/09/21 11:25	1
Calcium	**13000**		20		mg/Kg		07/08/21 08:24	07/09/21 11:25	1
Chromium	**34**		0.99		mg/Kg		07/08/21 08:24	07/09/21 11:25	1
Cobalt	**5.2**		2.5		mg/Kg		07/08/21 08:24	07/09/21 11:48	5
Lead	**4.1**		0.49		mg/Kg		07/08/21 08:24	07/09/21 11:25	1
Lithium	**10**		0.99		mg/Kg		07/08/21 08:24	07/09/21 11:25	1
Molybdenum	**2.4**		0.99		mg/Kg		07/08/21 08:24	07/09/21 11:25	1
Selenium	<0.99		0.99		mg/Kg		07/08/21 08:24	07/09/21 11:25	1
Thallium	<0.99		0.99		mg/Kg		07/08/21 08:24	07/09/21 11:25	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.032**		0.016		mg/Kg		07/06/21 14:50	07/07/21 07:00	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**52**		2.0		mg/Kg		07/12/21 11:07	07/12/21 12:47	1
Chloride	**27**		20		mg/Kg		07/05/21 13:55	07/05/21 16:18	1
Fluoride	**1.3**		1.0		mg/Kg		07/05/21 13:55	07/05/21 17:39	1

Client Sample Results

Client: Midwest Generation EME LLC
Project/Site: Ash

Job ID: 500-201436-1

Client Sample ID: ASH BASIN

Date Collected: 06/23/21 14:23
Date Received: 06/24/21 15:35

Lab Sample ID: 500-201436-2

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<8.6		8.6		mg/Kg		07/08/21 08:24	07/09/21 11:51	5
Arsenic	**2.2**		0.86		mg/Kg		07/08/21 08:24	07/09/21 11:28	1
Barium	**1800**		4.3		mg/Kg		07/08/21 08:24	07/09/21 11:51	5
Beryllium	**0.90**		0.34		mg/Kg		07/08/21 08:24	07/09/21 11:28	1
Boron	**46**		4.3		mg/Kg		07/08/21 08:24	07/09/21 11:28	1
Cadmium	<0.17		0.17		mg/Kg		07/08/21 08:24	07/09/21 11:28	1
Calcium	**39000**		17		mg/Kg		07/08/21 08:24	07/09/21 11:28	1
Chromium	**16**		0.86		mg/Kg		07/08/21 08:24	07/09/21 11:28	1
Cobalt	<11		11		mg/Kg		07/08/21 08:24	07/09/21 12:04	25
Lead	**5.5**		0.43		mg/Kg		07/08/21 08:24	07/09/21 11:28	1
Lithium	**12**		0.86		mg/Kg		07/08/21 08:24	07/09/21 11:28	1
Molybdenum	**1.0**		0.86		mg/Kg		07/08/21 08:24	07/09/21 11:28	1
Selenium	<0.86		0.86		mg/Kg		07/08/21 08:24	07/09/21 11:28	1
Thallium	**1.2**		0.86		mg/Kg		07/08/21 08:24	07/09/21 11:28	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.094**		0.015		mg/Kg		07/06/21 14:50	07/07/21 07:02	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**230**		9.7		mg/Kg		07/12/21 11:07	07/12/21 13:42	5
Chloride	**88**		20		mg/Kg		07/05/21 13:55	07/05/21 16:18	1
Fluoride	**4.7**		1.0		mg/Kg		07/05/21 13:55	07/05/21 17:42	1

Client Sample Results

Client: Midwest Generation EME LLC
Project/Site: Ash

Job ID: 500-201436-1

Client Sample ID: METALS CB

Date Collected: 06/23/21 15:00
Date Received: 06/24/21 15:35

Lab Sample ID: 500-201436-3

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.8		1.8		mg/Kg		07/08/21 08:24	07/09/21 11:32	1
Arsenic	**7.6**		0.89		mg/Kg		07/08/21 08:24	07/09/21 11:32	1
Barium	**1900**		8.9		mg/Kg		07/08/21 08:24	07/09/21 12:00	10
Beryllium	**1.5**		0.36		mg/Kg		07/08/21 08:24	07/09/21 11:32	1
Boron	**100**		4.5		mg/Kg		07/08/21 08:24	07/09/21 11:32	1
Cadmium	**4.3**		0.18		mg/Kg		07/08/21 08:24	07/09/21 11:32	1
Calcium	**120000**		180		mg/Kg		07/08/21 08:24	07/09/21 12:00	10
Chromium	**52**		0.89		mg/Kg		07/08/21 08:24	07/09/21 11:32	1
Cobalt	<22		22		mg/Kg		07/08/21 08:24	07/09/21 12:27	50
Lead	**66**		0.45		mg/Kg		07/08/21 08:24	07/09/21 11:32	1
Lithium	**16**		0.89		mg/Kg		07/08/21 08:24	07/09/21 11:32	1
Molybdenum	**5.3**		0.89		mg/Kg		07/08/21 08:24	07/09/21 11:32	1
Selenium	**7.1**		0.89		mg/Kg		07/08/21 08:24	07/09/21 11:32	1
Thallium	**4.0**		0.89		mg/Kg		07/08/21 08:24	07/09/21 11:32	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.26**		0.015		mg/Kg		07/06/21 14:50	07/07/21 07:04	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**21000**		2000		mg/Kg		07/12/21 11:07	07/12/21 14:09	1000
Chloride	**110**		20		mg/Kg		07/05/21 13:55	07/05/21 16:18	1
Fluoride	**22**		0.99		mg/Kg		07/05/21 13:55	07/05/21 17:49	1

Definitions/Glossary

Client: Midwest Generation EME LLC
Project/Site: Ash

Job ID: 500-201436-1

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

QC Association Summary

Client: Midwest Generation EME LLC
Project/Site: Ash

Job ID: 500-201436-1

Metals

Prep Batch: 607902

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-201436-1	FAB	Total/NA	Solid	7471A	
500-201436-2	ASH BASIN	Total/NA	Solid	7471A	
500-201436-3	METALS CB	Total/NA	Solid	7471A	
MB 500-607902/12-A	Method Blank	Total/NA	Solid	7471A	
LCS 500-607902/13-A	Lab Control Sample	Total/NA	Solid	7471A	

Analysis Batch: 608143

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-201436-1	FAB	Total/NA	Solid	7471A	607902
500-201436-2	ASH BASIN	Total/NA	Solid	7471A	607902
500-201436-3	METALS CB	Total/NA	Solid	7471A	607902
MB 500-607902/12-A	Method Blank	Total/NA	Solid	7471A	607902
LCS 500-607902/13-A	Lab Control Sample	Total/NA	Solid	7471A	607902

Prep Batch: 608328

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-201436-1	FAB	Total/NA	Solid	3050B	
500-201436-2	ASH BASIN	Total/NA	Solid	3050B	
500-201436-3	METALS CB	Total/NA	Solid	3050B	
MB 500-608328/1-A	Method Blank	Total/NA	Solid	3050B	
LCS 500-608328/2-A	Lab Control Sample	Total/NA	Solid	3050B	

Analysis Batch: 608625

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-201436-1	FAB	Total/NA	Solid	6010B	608328
500-201436-1	FAB	Total/NA	Solid	6010B	608328
500-201436-2	ASH BASIN	Total/NA	Solid	6010B	608328
500-201436-2	ASH BASIN	Total/NA	Solid	6010B	608328
500-201436-2	ASH BASIN	Total/NA	Solid	6010B	608328
500-201436-3	METALS CB	Total/NA	Solid	6010B	608328
500-201436-3	METALS CB	Total/NA	Solid	6010B	608328
500-201436-3	METALS CB	Total/NA	Solid	6010B	608328
MB 500-608328/1-A	Method Blank	Total/NA	Solid	6010B	608328
LCS 500-608328/2-A	Lab Control Sample	Total/NA	Solid	6010B	608328

General Chemistry

Analysis Batch: 606811

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-201436-1	FAB	Total/NA	Solid	Moisture	
500-201436-2	ASH BASIN	Total/NA	Solid	Moisture	
500-201436-3	METALS CB	Total/NA	Solid	Moisture	

Prep Batch: 607760

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-201436-1	FAB	Total/NA	Solid	300_Prep	
500-201436-2	ASH BASIN	Total/NA	Solid	300_Prep	
500-201436-3	METALS CB	Total/NA	Solid	300_Prep	
MB 500-607760/1-A	Method Blank	Total/NA	Solid	300_Prep	
LCS 500-607760/2-A	Lab Control Sample	Total/NA	Solid	300_Prep	
LCSD 500-607760/3-A	Lab Control Sample Dup	Total/NA	Solid	300_Prep	

QC Association Summary

Client: Midwest Generation EME LLC
Project/Site: Ash

Job ID: 500-201436-1

General Chemistry

Analysis Batch: 607876

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-201436-1	FAB	Total/NA	Solid	SM 4500 F C	607760
500-201436-2	ASH BASIN	Total/NA	Solid	SM 4500 F C	607760
500-201436-3	METALS CB	Total/NA	Solid	SM 4500 F C	607760
MB 500-607760/1-A	Method Blank	Total/NA	Solid	SM 4500 F C	607760
LCS 500-607760/2-A	Lab Control Sample	Total/NA	Solid	SM 4500 F C	607760
LCSD 500-607760/3-A	Lab Control Sample Dup	Total/NA	Solid	SM 4500 F C	607760

Analysis Batch: 607925

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-201436-1	FAB	Total/NA	Solid	SM 4500 Cl- E	607760
500-201436-2	ASH BASIN	Total/NA	Solid	SM 4500 Cl- E	607760
500-201436-3	METALS CB	Total/NA	Solid	SM 4500 Cl- E	607760
MB 500-607760/1-A	Method Blank	Total/NA	Solid	SM 4500 Cl- E	607760
LCS 500-607760/2-A	Lab Control Sample	Total/NA	Solid	SM 4500 Cl- E	607760
LCSD 500-607760/3-A	Lab Control Sample Dup	Total/NA	Solid	SM 4500 Cl- E	607760

Prep Batch: 608902

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-201436-1	FAB	Total/NA	Solid	300_Prep	
500-201436-2	ASH BASIN	Total/NA	Solid	300_Prep	
500-201436-3	METALS CB	Total/NA	Solid	300_Prep	
MB 500-608902/1-A	Method Blank	Total/NA	Solid	300_Prep	
LCS 500-608902/2-A	Lab Control Sample	Total/NA	Solid	300_Prep	

Analysis Batch: 608919

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-201436-1	FAB	Total/NA	Solid	9056A	608902
500-201436-2	ASH BASIN	Total/NA	Solid	9056A	608902
500-201436-3	METALS CB	Total/NA	Solid	9056A	608902
MB 500-608902/1-A	Method Blank	Total/NA	Solid	9056A	608902
LCS 500-608902/2-A	Lab Control Sample	Total/NA	Solid	9056A	608902

QC Sample Results

Client: Midwest Generation EME LLC
Project/Site: Ash

Job ID: 500-201436-1

Method: 6010B - Metals (ICP)

Lab Sample ID: MB 500-608328/1-A
Matrix: Solid
Analysis Batch: 608625

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 608328

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<2.0		2.0		mg/Kg		07/08/21 08:24	07/09/21 10:31	1
Arsenic	<1.0		1.0		mg/Kg		07/08/21 08:24	07/09/21 10:31	1
Barium	<1.0		1.0		mg/Kg		07/08/21 08:24	07/09/21 10:31	1
Beryllium	<0.40		0.40		mg/Kg		07/08/21 08:24	07/09/21 10:31	1
Boron	<5.0		5.0		mg/Kg		07/08/21 08:24	07/09/21 10:31	1
Cadmium	<0.20		0.20		mg/Kg		07/08/21 08:24	07/09/21 10:31	1
Calcium	<20		20		mg/Kg		07/08/21 08:24	07/09/21 10:31	1
Chromium	<1.0		1.0		mg/Kg		07/08/21 08:24	07/09/21 10:31	1
Cobalt	<0.50		0.50		mg/Kg		07/08/21 08:24	07/09/21 10:31	1
Lead	<0.50		0.50		mg/Kg		07/08/21 08:24	07/09/21 10:31	1
Lithium	<1.0		1.0		mg/Kg		07/08/21 08:24	07/09/21 10:31	1
Molybdenum	<1.0		1.0		mg/Kg		07/08/21 08:24	07/09/21 10:31	1
Selenium	<1.0		1.0		mg/Kg		07/08/21 08:24	07/09/21 10:31	1
Thallium	<1.0		1.0		mg/Kg		07/08/21 08:24	07/09/21 10:31	1

Lab Sample ID: LCS 500-608328/2-A
Matrix: Solid
Analysis Batch: 608625

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 608328

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	50.0	48.6		mg/Kg		97	80 - 120
Arsenic	10.0	9.39		mg/Kg		94	80 - 120
Barium	200	194		mg/Kg		97	80 - 120
Beryllium	5.00	4.65		mg/Kg		93	80 - 120
Boron	100	85.0		mg/Kg		85	80 - 120
Cadmium	5.00	4.62		mg/Kg		92	80 - 120
Calcium	1000	967		mg/Kg		97	80 - 120
Chromium	20.0	18.8		mg/Kg		94	80 - 120
Cobalt	50.0	47.4		mg/Kg		95	80 - 120
Lead	10.0	9.35		mg/Kg		94	80 - 120
Lithium	50.0	50.9		mg/Kg		102	80 - 120
Molybdenum	100	97.0		mg/Kg		97	80 - 120
Selenium	10.0	8.53		mg/Kg		85	80 - 120
Thallium	10.0	9.13		mg/Kg		91	80 - 120

Method: 7471A - Mercury (CVAA)

Lab Sample ID: MB 500-607902/12-A
Matrix: Solid
Analysis Batch: 608143

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 607902

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.017		0.017		mg/Kg		07/06/21 14:50	07/07/21 06:11	1

QC Sample Results

Client: Midwest Generation EME LLC
Project/Site: Ash

Job ID: 500-201436-1

Method: 7471A - Mercury (CVAA) (Continued)

Lab Sample ID: LCS 500-607902/13-A
Matrix: Solid
Analysis Batch: 608143

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 607902

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.167	0.174		mg/Kg		105	80 - 120

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 500-608902/1-A
Matrix: Solid
Analysis Batch: 608919

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 608902

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	<2.0		2.0		mg/Kg		07/12/21 11:07	07/12/21 12:20	1

Lab Sample ID: LCS 500-608902/2-A
Matrix: Solid
Analysis Batch: 608919

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 608902

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	50.0	53.7		mg/Kg		107	80 - 120

Method: SM 4500 Cl- E - Chloride, Total

Lab Sample ID: MB 500-607760/1-A
Matrix: Solid
Analysis Batch: 607925

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 607760

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<20		20		mg/Kg		07/05/21 13:55	07/05/21 16:17	1

Lab Sample ID: LCS 500-607760/2-A
Matrix: Solid
Analysis Batch: 607925

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 607760

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	200	205		mg/Kg		103	85 - 115

Lab Sample ID: LCSD 500-607760/3-A
Matrix: Solid
Analysis Batch: 607925

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 607760

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	200	206		mg/Kg		103	85 - 115	0	20

Method: SM 4500 F C - Fluoride

Lab Sample ID: MB 500-607760/1-A
Matrix: Solid
Analysis Batch: 607876

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 607760

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<1.0		1.0		mg/Kg		07/05/21 13:55	07/05/21 17:23	1

QC Sample Results

Client: Midwest Generation EME LLC
Project/Site: Ash

Job ID: 500-201436-1

Method: SM 4500 F C - Fluoride (Continued)

Lab Sample ID: LCS 500-607760/2-A
Matrix: Solid
Analysis Batch: 607876

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 607760

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	100	112		mg/Kg		112	80 - 120

Lab Sample ID: LCSD 500-607760/3-A
Matrix: Solid
Analysis Batch: 607876

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 607760

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	100	112		mg/Kg		112	80 - 120	1	20

Lab Chronicle

Client: Midwest Generation EME LLC
Project/Site: Ash

Job ID: 500-201436-1

Client Sample ID: FAB
Date Collected: 06/23/21 13:30
Date Received: 06/24/21 15:35

Lab Sample ID: 500-201436-1
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			608328	07/08/21 08:24	BDE	TAL CHI
Total/NA	Analysis	6010B		1	608625	07/09/21 11:25	JJB	TAL CHI
Total/NA	Prep	3050B			608328	07/08/21 08:24	BDE	TAL CHI
Total/NA	Analysis	6010B		5	608625	07/09/21 11:48	JJB	TAL CHI
Total/NA	Prep	7471A			607902	07/06/21 14:50	MJG	TAL CHI
Total/NA	Analysis	7471A		1	608143	07/07/21 07:00	MJG	TAL CHI
Total/NA	Prep	300_Prep			608902	07/12/21 11:07	PSP	TAL CHI
Total/NA	Analysis	9056A		1	608919	07/12/21 12:47	EAT	TAL CHI
Total/NA	Analysis	Moisture		1	606811	06/29/21 16:58	LWN	TAL CHI
Total/NA	Prep	300_Prep			607760	07/05/21 13:55	MS	TAL CHI
Total/NA	Analysis	SM 4500 Cl- E		1	607925	07/05/21 16:18	MS	TAL CHI
Total/NA	Prep	300_Prep			607760	07/05/21 13:55	MS	TAL CHI
Total/NA	Analysis	SM 4500 F C		1	607876	07/05/21 17:39	MS	TAL CHI

Client Sample ID: ASH BASIN
Date Collected: 06/23/21 14:23
Date Received: 06/24/21 15:35

Lab Sample ID: 500-201436-2
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			608328	07/08/21 08:24	BDE	TAL CHI
Total/NA	Analysis	6010B		1	608625	07/09/21 11:28	JJB	TAL CHI
Total/NA	Prep	3050B			608328	07/08/21 08:24	BDE	TAL CHI
Total/NA	Analysis	6010B		5	608625	07/09/21 11:51	JJB	TAL CHI
Total/NA	Prep	3050B			608328	07/08/21 08:24	BDE	TAL CHI
Total/NA	Analysis	6010B		25	608625	07/09/21 12:04	JJB	TAL CHI
Total/NA	Prep	7471A			607902	07/06/21 14:50	MJG	TAL CHI
Total/NA	Analysis	7471A		1	608143	07/07/21 07:02	MJG	TAL CHI
Total/NA	Prep	300_Prep			608902	07/12/21 11:07	PSP	TAL CHI
Total/NA	Analysis	9056A		5	608919	07/12/21 13:42	EAT	TAL CHI
Total/NA	Analysis	Moisture		1	606811	06/29/21 16:58	LWN	TAL CHI
Total/NA	Prep	300_Prep			607760	07/05/21 13:55	MS	TAL CHI
Total/NA	Analysis	SM 4500 Cl- E		1	607925	07/05/21 16:18	MS	TAL CHI
Total/NA	Prep	300_Prep			607760	07/05/21 13:55	MS	TAL CHI
Total/NA	Analysis	SM 4500 F C		1	607876	07/05/21 17:42	MS	TAL CHI

Client Sample ID: METALS CB
Date Collected: 06/23/21 15:00
Date Received: 06/24/21 15:35

Lab Sample ID: 500-201436-3
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			608328	07/08/21 08:24	BDE	TAL CHI
Total/NA	Analysis	6010B		1	608625	07/09/21 11:32	JJB	TAL CHI
Total/NA	Prep	3050B			608328	07/08/21 08:24	BDE	TAL CHI
Total/NA	Analysis	6010B		10	608625	07/09/21 12:00	JJB	TAL CHI

Lab Chronicle

Client: Midwest Generation EME LLC
Project/Site: Ash

Job ID: 500-201436-1

Client Sample ID: METALS CB

Date Collected: 06/23/21 15:00
Date Received: 06/24/21 15:35

Lab Sample ID: 500-201436-3

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			608328	07/08/21 08:24	BDE	TAL CHI
Total/NA	Analysis	6010B		50	608625	07/09/21 12:27	JJB	TAL CHI
Total/NA	Prep	7471A			607902	07/06/21 14:50	MJG	TAL CHI
Total/NA	Analysis	7471A		1	608143	07/07/21 07:04	MJG	TAL CHI
Total/NA	Prep	300_Prep			608902	07/12/21 11:07	PSP	TAL CHI
Total/NA	Analysis	9056A		1000	608919	07/12/21 14:09	EAT	TAL CHI
Total/NA	Analysis	Moisture		1	606811	06/29/21 16:58	LWN	TAL CHI
Total/NA	Prep	300_Prep			607760	07/05/21 13:55	MS	TAL CHI
Total/NA	Analysis	SM 4500 Cl- E		1	607925	07/05/21 16:18	MS	TAL CHI
Total/NA	Prep	300_Prep			607760	07/05/21 13:55	MS	TAL CHI
Total/NA	Analysis	SM 4500 F C		1	607876	07/05/21 17:49	MS	TAL CHI

Laboratory References:

TAL CHI = Eurofins TestAmerica, Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Accreditation/Certification Summary

Client: Midwest Generation EME LLC
Job ID: 500-201436-1
Project/Site: Ash

Laboratory: Eurofins TestAmerica, Chicago

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Illinois	NELAP	IL00035	04-29-22

R000130

Eurofins TestAmerica, Chicago
2417 Bond Street
University Park IL 60484
Phone 708-534-5200 Fax. 708-534-5211

Chain of Custody Record

eurofins Environment Testing America

Client Information	Sampler:	Lab PM: Mockler Diana J	Carrier Tracking No(s):	COC No: 500-92457-41195 1
Client Contact: Joseph Kotas	Phone:	E-Mail: Diana Mockler@Eurofinset.com	State of Origin:	Page: Page 1 of 1
Company: Midwest Generation EME LLC	PWSID:			Job #: 500-201436

Address: 13082 E Manito Road	Due Date Requested:
City: Pekin	TAT Requested (days):
State, Zip: IL, 61554	Compliance Project: Δ Yes Δ No
Phone: 815-372-4589(Tel)	PO #: 4502051132
Email: joseph kotas@nrg com	WO #: 36733393
Project Name: Powerton Station	Project #: 50000647
Site:	SSOW#:

Analysis Requested

500-201436 COC

Preservation Codes

A	HCL	M	Hexane
B	NaOH	N	None
C	Zn Acetate	O	AsNaO2
D	Nitric Acid	P	Na2O4S
E	NaHSO4	Q	Na2SO3
F	MeOH	R	Na2S2O3
G	Amchlor	S	H2SO4
H	Ascorbic Acid	T	TSP Dodecahydrate
I	Ice	U	Acetone
J	DI Water	V	MCAA
K	EDTA	W	pH 4-5
L	EDA	Z	other (specify)

Other

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, 904.0	Ra226Ra228_GFPC - Combined Rad 226/228	4500_F_C, 6010B, 7471A, 9056A, SM4500_Cl_E	Total Number of containers	Special Instructions/Note
			Preservation Code:				N	N	N		
1 FAB	6/23/21	13:30	G	Solid			X		X		
1 FAB2	6/23/21	13:30	C	Solid				X			
				Solid							
2 ASH BASIN	6/23/21	14:23	C	Sol				X			
1 ASH2	6/23/21	14:23	C	Sol			X		X		
3 Metals2	6/23/21	15:00	C	Sol				X			
1 Metals CB	6/23/21	15.00	C	Sol			X		X		

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by:	Date	Time	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time	Company
JN Kotas	6/23/21 4:30		Stephanie Hernandez	6/24/21 1535	EEA-CHI
Relinquished by:	Date/Time:	Company	Received by:	Date/Time	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time	Company

Custody Seals Intact. Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks.	4.9 → 4.6

ORIGIN ID PIAA (309) 477-5216
JOSEPH KOTAS
MIDWEST GENERATION
POWERTON GENERATING STATION
13082 E MANITO ROAD
PEKIN, IL 61554
UNITED STATES US

SHIP DATE 23JUN21
ACTWGT 30 00 LB
CAD 100275867/INET4340
DIMS 14x12x22 IN

BILL SENDER

TO ATTN: SAMPLE RECEIVING
EUROFINS TESTAMERICA, CHICAGO
2417 BOND ST

UNIVERSITY PARK IL 60484

(708) 534-5200 X 153
INV
PO
REF
DEPT

500-201436 Wayb

56DJ3/B38/1/FE4A

J211321033101uv

FedEx Express

THU - 24 JUN 4:30P
STANDARD OVERNIGHT

TRK# 0201 7740 8262 9809

60484
ORD
IL-US

UF JOTA

48qt.

fter printing this label

Use the 'Print' button on this page to print your label to your laser or inkjet printer
Fold the printed page along the horizontal line
Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned

/arning Use only the printed original label for shipping Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing harges along with the cancellation of your FedEx account number

se of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex com FedEx will not be responsible or any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher alue, pay an additional charge, document your actual loss and file a timely claim Limitations found in the current FedEx Service Guide apply Your right to recover om FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether irect, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value Recovery cannot exceed actual documented ss Maximum for items of extraordinary value is $1,000, e g jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide Written aims must be filed within strict time limits, see current FedEx Service Guide

Login Sample Receipt Checklist

Client: Midwest Generation EME LLC

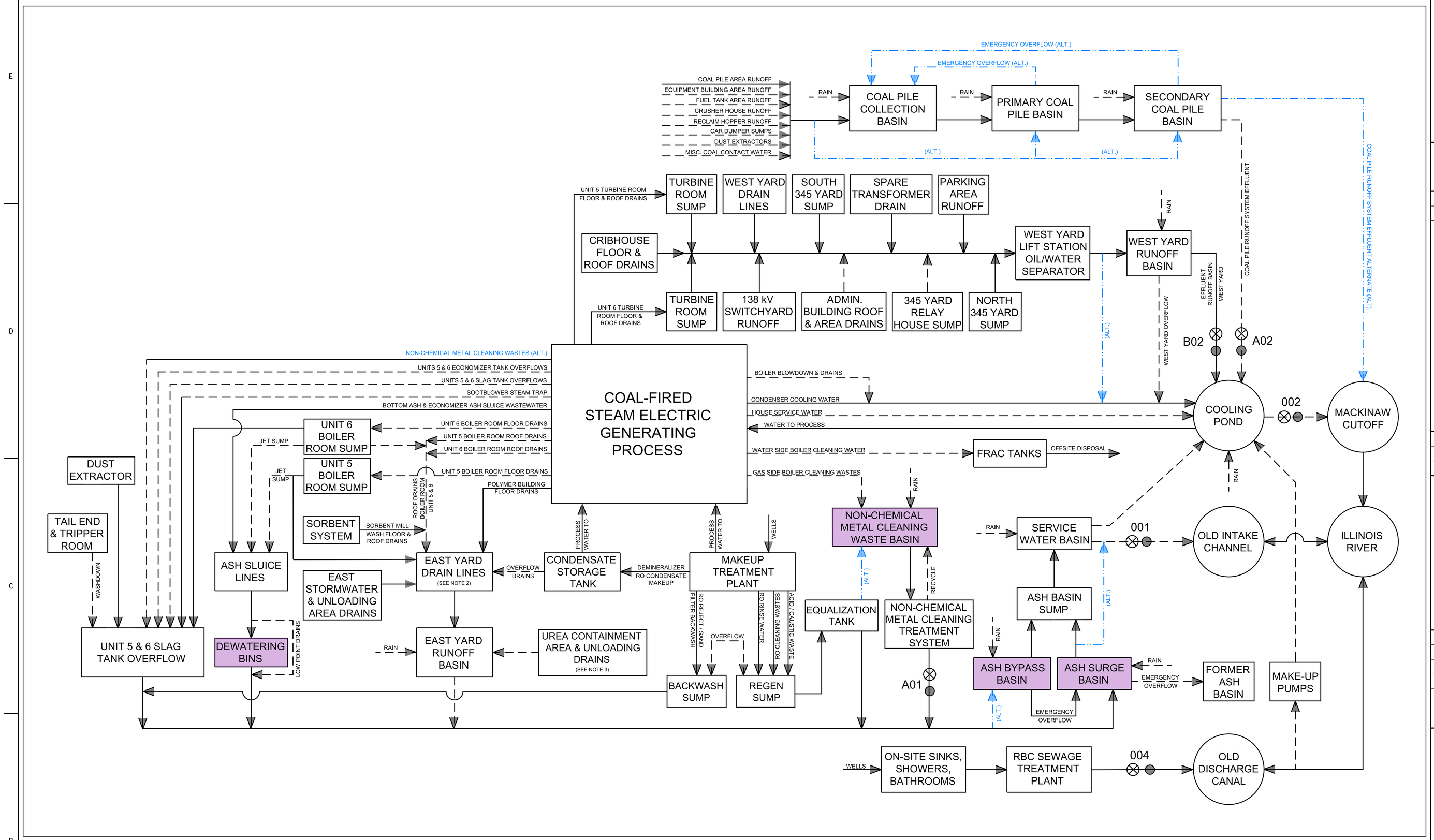
Job Number: 500-201436-1

Login Number: 201436
List Number: 1
Creator: Hernandez, Stephanie

List Source: Eurofins TestAmerica, Chicago

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	4.6
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

ATTACHMENT 2-2
POWERTON PROCESS FLOW DIAGRAM



LEGEND

- TYPICAL
- INTERMITTENT
- ALTERNATE
- OUTFALL NUMBER
- SAMPLING POINT
- CCR TREATMENT/STORAGE FACILITY

NOTES

1. THIS DRAWING WAS DEVELOPED USING MIDWEST GENERATION, LLC DRAWING "GENERAL FLOW DIAGRAM WITH NPDES OUTFALLS, NPDES PERMIT NO. IL0002232," PREPARED BY APTIM ENVIRONMENTAL & INFRASTRUCTURE, LLC (DATED NOVEMBER 2019) AND USED WITH PERMISSION FROM MIDWEST GENERATION, LLC. SARGENT & LUNDY HAS NOT INDEPENDENTLY VERIFIED THE INFORMATION SHOWN ON THIS DRAWING.
2. "EAST YARD DRAIN LINES" INCLUDES FAN BAY DRAINS, DRAINS ON EAST HALF OF PROPERTY.
3. VALVE IS LOCATED ON SUMP FROM UREA CONTAINMENT AREA & UNLOADING DRAINS TO THE EAST YARD RUNOFF BASIN.
4. OUTFALL 006, TREATED ASBESTOS CONTAMINATED STORMWATER, IS NOT INCLUDED IN THIS DIAGRAM AND IS BEING PROPOSED FOR REMOVAL DUE TO THERE NO LONGER BEING DEMOLITION DEBRIS.

HOLD INFORMATION

NO.	DESCRIPTION

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RELEASE INFORMATION

REV.	DATE	DESCRIPTION
0	11-25-2020	FOR USE

ISSUE PURPOSE: FOR USE

SPECIFICATION: ---

PROJECT NO.: 12661-097

CAD FILE NAME: POW-CSK-PFD-001.DGN

PREPARED BY: J. CHAVEZ

REVIEWED BY: T. DEHLIN

APPROVED BY: T. DEHLIN

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CHICAGO, ILLINOIS 60603-5780

MWG

PROJECT

MIDWEST GENERATION, LLC
POWERTON
GENERATING STATION
UNITS 5 & 6

DRAWING TITLE

EXISTING WATER BLOCK FLOW DIAGRAM

DRAWING NUMBER	REVISION
POW-CSK-PFD-001	0

SHEET 1 OF 1

PD11153/OM1864/S:\CivilDesign\2-Powerton - CCR\Drawings\POW-CSK-PFD-001.dgn
Form GDC-0401-01-08, ANSI (Imperial) MicroStation Border - Size E - 34 x 44
Revision 11A, Revision Date: 04-30-2010
11/24/2020 3:15:33 PM
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ATTACHMENT 2-3
ON-SITE TRANSPORTATION PLAN

FIGURE	REV.	TITLE
FIGURE 2	0	BYPASS BASIN SITE TRANSPORTATION MAP



NORTH

150' 0' 150' 300'

GRAPHIC SCALE

LEGEND

- TYPICAL VEHICLE ACCESS TO BYPASS BASIN
- LARGE VEHICLE ACCESS TO BYPASS BASIN
- BYPASS BASIN BOUNDARY

NOTES

REFERENCE DRAWINGS

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NOT FOR CONSTRUCTION

HOLD INFORMATION

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RELEASE INFORMATION

REV.	DATE	DESCRIPTION
0	07-15-2022	FOR PERMIT

ISSUE PURPOSE:	PERMIT
SPECIFICATION:	N/A
PROJECT NO.:	12661-130
CAD FILE NAME:	FIGURE 2.DGN
PREPARED BY:	J. CHAVEZ
REVIEWED BY:	T. DEHLIN
APPROVED BY:	--

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MWG
Midwest Generation, LLC

PROJECT

MIDWEST GENERATION, LLC
POWERTON
GENERATING STATION
BYPASS BASIN RETROFIT PROJECT

DRAWING TITLE

BYPASS BASIN
SITE TRANSPORTATION MAP

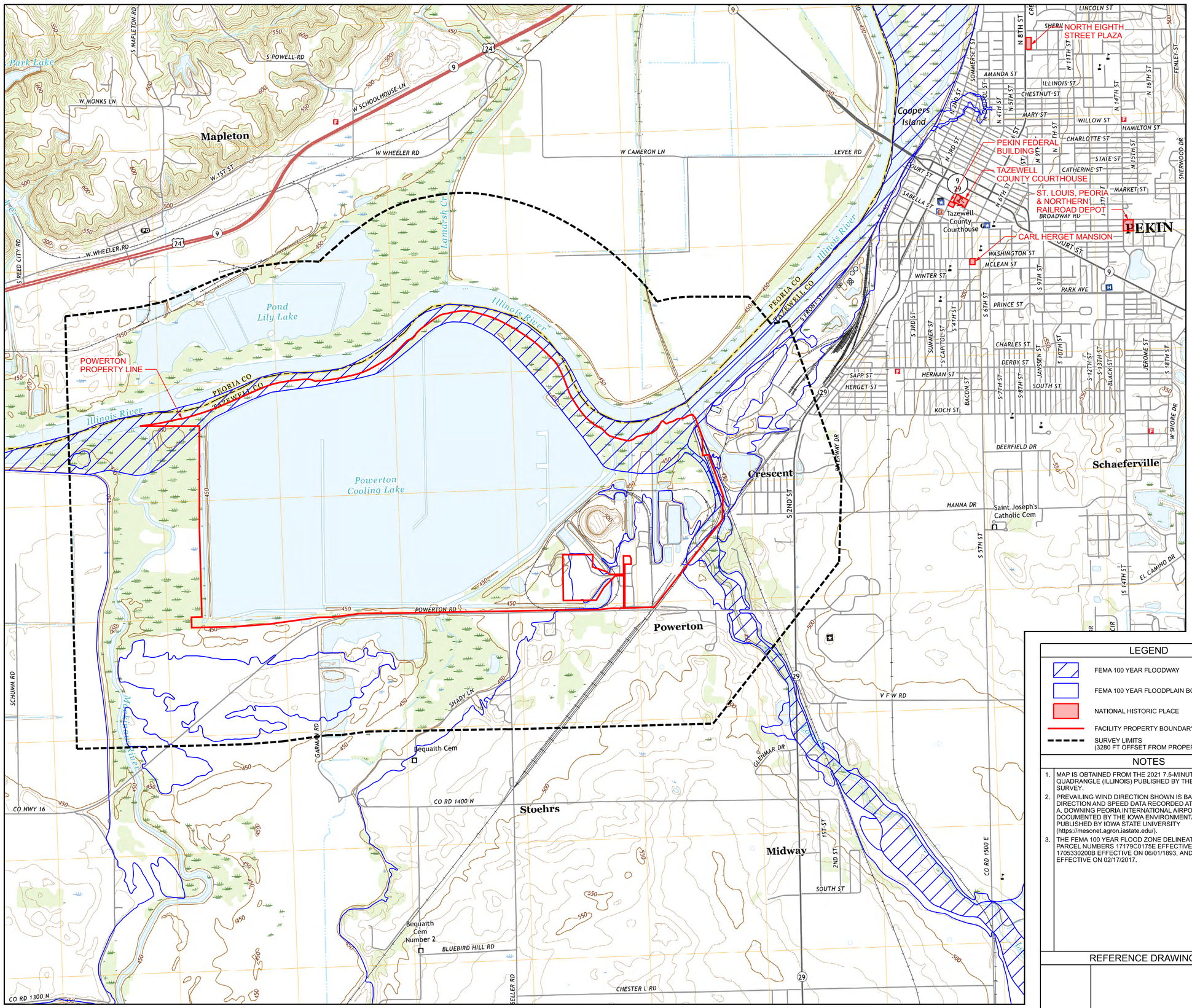
DRAWING NUMBER	REVISION
FIGURE 2	0

SHEET 1 OF 1

PL:12793\0M1864\E:\Shared\INFO CENTER\DISCIPLINE REF MATERIAL\CIVIL\DESIGN\2-Powerton - CCR\Drawings\FIGURE 2.dgn
Form GDG-0401-01-08, ANSI (Imperial) MicroStation Border - Size E - 34 x 44
Revision 11A, Revision Date: 04-30-2010
7/15/2022 8:43:24 AM
...\Drawings\FIGURE 2.dgn

ATTACHMENT 3
SITE LOCATION MAP

R000138



FOR PERMIT
NOT FOR CONSTRUCTION

PREVAILING WIND DIRECTION

NORTH

1000' 0' 1000' 2000'
GRAPHIC SCALE

LEGEND

- FEMA 100 YEAR FLOODWAY
- FEMA 100 YEAR FLOODPLAIN BOUNDARY
- NATIONAL HISTORIC PLACE
- FACILITY PROPERTY BOUNDARY LINE
- SURVEY LIMITS (3280 FT OFFSET FROM PROPERTY LINE)

NOTES

1. MAP IS OBTAINED FROM THE 2021 7.5-MINUTE PEKIN QUADRANGLE (ILLINOIS) PUBLISHED BY THE U.S. GEOLOGICAL SURVEY.
2. PREVAILING WIND DIRECTION SHOWN IS BASED ON WIND DIRECTION AND SPEED DATA RECORDED AT GENERAL WAYNE A. DOWNING PEORIA INTERNATIONAL AIRPORT AS DOCUMENTED BY THE IOWA ENVIRONMENTAL MESONET PUBLISHED BY IOWA STATE UNIVERSITY (https://mesonet.agron.iastate.edu/).
3. THE FEMA 100 YEAR FLOOD ZONE DELINEATION IS FROM FEMA PARCEL NUMBERS 17179C0175E EFFECTIVE 02/17/2017, 1705330200B EFFECTIVE ON 06/01/1893, AND 17179C0160E EFFECTIVE ON 02/17/2017.

REFERENCE DRAWINGS

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HOLD INFORMATION

NO.	DESCRIPTION

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RELEASE INFORMATION

REV.	DATE	DESCRIPTION
0	07-15-2022	FOR PERMIT

ISSUE PURPOSE:	PERMIT
SPECIFICATION:	P-1400
PROJECT NO.:	12661-130

CAD FILE NAME:	ATTACHMENT 3.DGN
PREPARED BY:	J. CHAVEZ
REVIEWED BY:	T. DEHLIN
APPROVED BY:	--

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CHICAGO, ILLINOIS 60603-5780

MWG
Midwest Generation, LLC

PROJECT

MIDWEST GENERATION, LLC
POWERTON
GENERATING STATION
BYPASS BASIN RETROFIT PROJECT

DRAWING TITLE

SITE LOCATION MAP

DRAWING NUMBER	REVISION
ATTACHMENT 3	0
SHEET 1 OF 1	

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Form GDG-0401-01-08, ANSI (Imperial) MicroStation Border - Size E - 34 x 44
Revision 11A, Revision Date: 04-30-2010

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ATTACHMENT 4
SITE PLAN MAPS

FIGURE	REV.	TITLE
FIGURE 4-1	0	SITE PLAN MAP
FIGURE 4-2	0	BOTTOM ASH-HANDLING EQUIPMENT AND CCR SURFACE IMPOUNDMENTS

R000140



NORTH

600' 0' 600' 1200'

GRAPHIC SCALE

LEGEND

FACILITY PROPERTY BOUNDARY LINE

NOTES

REFERENCE DRAWINGS

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HOLD INFORMATION

NO.	DESCRIPTION

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RELEASE INFORMATION

REV.	DATE	DESCRIPTION
0	07-15-2022	FOR PERMIT

ISSUE PURPOSE:	PERMIT
SPECIFICATION:	N/A
PROJECT NO.:	12661-130

CAD FILE NAME:	FIGURE 4-1.DGN
PREPARED BY:	J. CHAVEZ
REVIEWED BY:	T. DEHLIN
APPROVED BY:	--

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CHICAGO, ILLINOIS 60603-5780

MWG
Midwest Generation, LLC

PROJECT

MIDWEST GENERATION, LLC
POWERTON
GENERATING STATION
BYPASS BASIN RETROFIT PROJECT

DRAWING TITLE

SITE PLAN MAP

DRAWING NUMBER	REVISION
FIGURE 4-1	0
SHEET 1 OF 1	

7/15/2022 8:47:13 AM
...\Drawings\FIGURE 4-1.dgn

PL:\27930\M1864\E:\Shared\INFO CENTER\DISCIPLINE REF MATERIAL\CIVIL\DESIGN\2-Powerton - CCR\Drawings\FIGURE 4-1.dgn
Form GDG-0401-01-08, ANSI (Imperial) MicroStation Border - Size E - 34 x 44
Revision 11A, Revision Date: 04-30-2010

R000141



NORTH

150' 0' 150' 300'

GRAPHIC SCALE

FOR PERMIT
NOT FOR CONSTRUCTION

NOTES

1. AERIAL IMAGE IS FROM GOOGLE EARTH PRO V.7.3 AND IS DATED 09/14/2017.

REFERENCE DRAWINGS

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HOLD INFORMATION

NO.	DESCRIPTION

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RELEASE INFORMATION

REV.	DATE	DESCRIPTION
0	07-15-2022	FOR PERMIT

ISSUE PURPOSE: PERMIT

SPECIFICATION: ---

PROJECT NO.: 12661-097

CAD FILE NAME: FIGURE 4-2.DGN

PREPARED BY: J. CHAVEZ

REVIEWED BY: T. DEHLIN

APPROVED BY: --

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Sargent & Lundy LLC

SARGENT & LUNDY LLC
55 EAST MONROE STREET
CHICAGO, ILLINOIS 60603-5780

MWG
Midwest Generation, LLC

PROJECT

MIDWEST GENERATION, LLC
POWERTON
GENERATING STATION
BYPASS BASIN RETROFIT PROJECT

DRAWING TITLE

BOTTOM ASH-HANDLING EQUIPMENT AND CCR SURFACE IMPOUNDMENTS

DRAWING NUMBER	REVISION
FIGURE 4-2	0

SHEET 1 OF 1

PL:12793\0M1864\E:\Shared\INFO CENTER\DISCIPLINE REF MATERIAL\CIVIL\DESIGN\2-Powerton - CCR\Drawings\FIGURE 4-2.dgn
Form GDG-0401-01-08, ANSI (Imperial) MicroStation Border - Size E - 34 x 44
Revision 11A, Revision Date: 04-30-2010

7/15/2022 9:17:56 AM
...\Drawings\FIGURE 4-2.dgn

ATTACHMENT 5-1
CONSTRUCTION PLANS & SPECIFICATIONS

MWG

Midwest Generation, LLC

POWERTON GENERATING STATION

SPECIFICATION P-1400

BYPASS BASIN RETROFIT

S&L PROJECT NO.: 12661-130

REVISION 0C

ISSUE PURPOSE: PERMIT

ISSUE DATE: 07-15-2022

Sargent & Lundy

Midwest Generation, LLC
Powerton Generating Station
Project No. 12661-130
Issue Summary and Approval Page

Specification P-1400
Rev. 0C
Issue: Permit
Date: 07-15-2022

SECTION 000106

ISSUE SUMMARY AND APPROVAL PAGE

Rev.	Purpose of Issue	Date	Sections Affected
0A	Client Comment	03-28-2022	All
0B	Public Comment	04-15-2022	All
0C	Permit	07-15-2022	All

This is to confirm that this Specification has been prepared, reviewed, and approved in accordance with Sargent & Lundy's Standard Operating Procedure SOP-0407, Specifications and Bills of Materials, which is part of our Quality Management System.

Contributor Summary & Current Revision Signatures

Rev.	Prepared By	Reviewed By	Approved By
0A	T. Dehlin	D. Nielson	--
0B	T. Dehlin	D. Nielson	--
0C	Digitally signed by Thomas J. Dehlin Date: 2022.07.15 09:09:38 -05'00'	Digitally signed by David E. Nielson Date: 2022.07.15 10:46:45 -05'00'	Digitally signed by Thomas J. Dehlin Date: 2022.07.15 11:08:22 -05'00'
	T. Dehlin	D. Nielson	T. Dehlin

Midwest Generation, LLC
Powerton Generating Station
Project No. 12661-130
Certification Page

Specification P-1400
Rev. 0C
Issue: Permit
Date: 07-15-2022

SECTION 000107

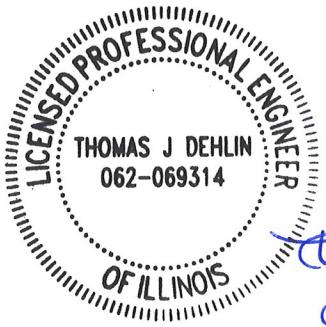
CERTIFICATION PAGE

Sargent & Lundy (S&L) is registered in the State of Illinois to practice engineering. S&L's Illinois Department of Financial and Professional Regulation registration number is 184-000106.

I certify that this Specification was prepared by me or under my direct supervision and that I am a registered professional engineer under the laws of the State of Illinois.

Certified By: Thomas J. Dehlin Date: July 15, 2022

Seal:



Th. Dehlin
07/15/2022
Exp. 11/30/2023



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END OF SECTION 000110

SECTION 011100

SUMMARY OF WORK

PART 1 - GENERAL

101. PROJECT INFORMATION

101.1 Owner: Midwest Generation, LLC (MWG)

101.2 Design Engineer: Sargent & Lundy (S&L)

101.3 Project Name: Bypass Basin Retrofit

101.4 Project Location: Powerton Generating Station
13082 E. Manito Rd.
Pekin, IL 61554

102. DESCRIPTION OF THE PROJECT AND GENERAL BACKGROUND

102.1 The purpose of this project is to retrofit the Bypass Basin at Midwest Generation, LLC's Powerton Generating Station in accordance with the Illinois Pollution Control Board's Coal Combustion Residuals (CCR) Rule, 35 Ill. Adm. Code Part 845, and with the U.S. Environmental Protection Agency's (EPA) CCR Rule, 40 CFR Part 257 Subpart D.

102.2 The Bypass Basin will be retrofitted by removing all CCR and CCR-mixed materials stored in the basin and decontaminating the basin's existing geomembrane liner and appurtenant structures, which will remain in place. Following removal of CCR and CCR-mixed material from the basin and decontamination of the basin facilities remaining in-place, a new composite liner system and new leachate collection and removal system (LCRS) will be installed within the Bypass Basin over the basin's existing decontaminated and leak-tested geomembrane liner.

103. SCOPE OF WORK

103.1 In general, this Specification covers the technical requirements for a General Work (GW) Contractor to retrofit the Bypass Basin at the Powerton Generating Station. The Work includes the following activities:

a. Surveying the project area to verify the accuracy of the existing topographic data shown on the Design Drawings.

b. Establishing benchmark monuments for survey control throughout the project.

c. Furnishing and installing temporary sediment and erosion control best management practices (BMPs) prior to and during all phases of earth disturbance work.

d. Retrofitting the Bypass Basin by:

d1. Removing all CCR, gravel warning layer, and sand cushion layer materials above the basin's existing geomembrane liner with offsite disposal of dry waste material in a permitted landfill approved by the Owner and disposal of liquid waste in the Ash Surge Basin.

d2. Decontaminating the basin's existing geomembrane liner and appurtenant structures for re-use in the retrofitted basin, including conducting and documenting visual inspections

and analytical testing to demonstrate the existing liner is no longer contaminated with CCR constituents.

d3. Ensuring all appropriate measures are taken to protect the Bypass Basin's existing HDPE geomembrane liner system from damage.

d4. Placing, compacting, and grading Structural Fill to establish the lines and grades for the basin's LCRS as specified on the Design Drawings.

d5. Installing a new composite liner system over the existing, decontaminated geomembrane liner and Structural Fill placed within the basin. The composite liner system consists of an HDPE geomembrane liner over a geosynthetic clay liner (GCL).

d6. Installing a new LCRS over the new composite liner system. The LCRS consists of drainage geocomposite – an HDPE geonet core with a non-woven geotextile layer heat-laminated to each side of the geonet – over a perforated HDPE collection pipe, a pipe bedding layer, and an HDPE riser pipe.

d7. Installing a Sand Filter Layer above the drainage geocomposite.

d8. Installing a Protective Warning Layer above the Sand Filter Layer on the basin floor.

d9. Installing riprap on a gravel bedding layer above the Sand Filter Layer along the basin's side slopes to protect the Sand Filter Layer from erosion.

e. Restoring and cleaning the project site.

f. GW Contractor shall allow access to all work areas by Owner, Design Engineer, CQA Contractor staff, and other parties as approved by Owner. GW Contractor shall not install, modify, repair or work on any elements of the project that are subject to the CQA testing and inspection services without notifying the CQA firm at least 2 work days in advance. Work on weekends or holidays shall be scheduled as soon as possible with the CQA Contractor. Failure to provide CQA Contractor adequate advanced notice to staff the site shall result in a hold on work until the CQA contractor staff arrive on site.

g. Developing fueling and maintenance facilities and practices to protect the project site from hydrocarbon spills or other environmental impacts that may impact the project site, adjacent property, or the Illinois River and connected waterways.

103.2 In addition, the Work shall include but not be limited to the following:

a. Engineering and construction services required to perform or install the Work.

b. Surveying to ensure the Work is located as indicated on the Design Drawings in accordance with the benchmark monuments established by the GW Contractor.

c. Furnishing all installation equipment and tools including any calibrated instruments required for monitoring and testing.

d. Maintaining the project site in a dry condition that includes dewatering of all areas that collect storm water or groundwater in the area controlled by the GW Contractor, redirecting any surface water as a result of rainfall or water generated by the installation Work. Any groundwater and/or surface water which requires removal from the area of work shall be disposed of in compliance with the Powerton Generating Station's National Pollutant Discharge Elimination System (NPDES) discharge permit in effect at the time of the Work. The methods and proposed place of discharge shall be approved by the Owner prior to disposing of the water.

e. Excess excavated material and other construction related debris shall be disposed of offsite in a permitted landfill approved by the Owner.

f. Maintaining a record of the installation (i.e., as-built drawings) in accordance with the technical requirements of this Specification.

g. Furnishing the services of qualified personnel at the project site to perform the Work.

h. Progress reporting as specified in the Commercial Terms and Conditions.

i. Daily site cleanup and disposal of waste and debris.

j. Participation in the Owner's on-site safety program, including the Owner's CCR Safety and Health Plan Training.

103.3 The Work shall conform to the requirements of this Specification and shall be performed and supervised by personnel who are experienced and knowledgeable in the crafts and trades required by the Scope of Work. The Work shall be performed exclusively by the GW Contractor's trained and competent personnel or, where permitted, that of its subcontractor(s); and shall comply with all applicable safety laws, regulations, programs, and practices to ensure the safety of all people located on the work site, including the Contractor's personnel (or that of its subcontractor(s)) performing the Work.

103.4 Performance of the Work shall include all the labor, supervision, administration, management, material procurement, tools, installation and testing equipment, miscellaneous material, and consumables to perform the Work specified herein.

103.5 Provide all installation equipment and all incidental items not shown or specified but reasonably implied for successful completion of the Work and in strict accordance with Design Drawings and this Specification, including inspection, testing and quality standards.

103.6 Provide installation quality assurance and quality control submittals where required.

103.7 Prepare red-lined as-built drawings for review upon completion of the Work to document any variances between the construction issue of the Design Drawings and the actual installation. Finalize as-built drawings after the Owner and the Design Engineer review.

103.8 All other work, as indicated on the Design Drawings, as specified herein or as required to properly complete the Work.

104. DIVISION OF RESPONSIBILITY & CONTRACTOR QUALIFICATIONS

104.1 Owner:

a. MWG is the Owner of the facility and has the authority to accept or reject materials and workmanship of the GW Contractor or reports and recommendations of the CQA Contractor.

b. The Owner will ultimately be responsible for the retrofit construction for the Bypass Basin and for assuring the Permitting Authority that the construction meets or exceeds the requirements specified in state regulations, permits, Project Specifications, and the Design Drawings.

104.2 Design Engineer:

a. S&L is the Design Engineer and is responsible for designing the retrofitted features for the Bypass Basin.

b. The Design Engineer will assure that the retrofit design meets the construction requirements of the Owner and meets or exceeds the requirements of the Permitting Authority.

c. The Design Engineer shall resolve unexpected conditions or unanticipated problems during construction, which may require changes to the permitted design. Changes to the permitted design shall require approval of the Owner and Design Engineer to ensure that the original design objectives are still maintained. All changes shall meet state regulatory requirements and the rules promulgated thereunder and may include Permitting Authority-approved variances to the rules.

104.3 Permitting Authority – Illinois EPA:

a. The Illinois EPA is the Permitting Authority and is responsible for reviewing the permit application for retrofitting the Bypass Basin to assure compliance with state regulations and for granting the construction permit for the project.

b. The Permitting Authority may review any design revisions during construction and any requests for variance submitted by the Owner. The Permitting Authority has the authority to review and approve all CQA documentation and reports and to confirm the Bypass Basin was retrofitted as specified in Project Specifications and the Design Drawings.

104.4 GW Contractor:

a. The GW Contractor is the firm with whom the Owner establishes a contract for the satisfactory performance of the Work.

b. The GW Contractor is responsible for the work, quality, and safety of their staff and all subcontractors and suppliers.

c. The GW Contractor may devise the Work into the following division of responsibilities between an Earthwork Contractor and a Geosynthetics Contractor.

104.5 Earthwork Contractor:

a. The Earthwork Contractor is the contractor responsible for earthwork and sitework, removal of existing CCR and protective layers above the Bypass Basin's existing geomembrane liner, placement of fill material to support the basin's new composite liner system and to establish the lines and grades of the basin's new LCRS, excavation and backfill of crest anchor trenches, placement of bedding material around the leachate collection pipe, installation of the leachate collection pipe, and installation of the granular materials above the basin's new LCRS.

b. The GW Contractor may self-perform or subcontract the Earthwork Contractor's scope of work.

104.6 Geosynthetics Contractor:

a. The Geosynthetics Contractor is the contractor responsible for the supply and installation of all geosynthetic materials for the project, including geosynthetic clay liner (GCL), high-density polyethylene (HDPE) geomembrane, drainage geocomposite, and non-woven geotextile.

b. The GW Contractor may self-perform or subcontract the Geosynthetics Contractor's scope of work.

c. Qualifications:

c1. The Geosynthetics Contractor shall be approved by the manufacturer(s) of the geosynthetics materials for installation of the geosynthetic materials supplied for the project.

c2. The Geosynthetics Contractor shall be approved by the Owner.

c3. The Geosynthetics Contractor shall have a minimum 5-year history of successfully performing similar work.

104.7 Construction Quality Assurance (CQA) Contractor:

a. The CQA Contractor is the firm with whom the Owner establishes a contract to perform all CQA work as specified on the Design Drawings and in Specification P-1401.

b. The CQA Contractor is independent of the GW Contractor and their subcontractors.

105. MATERIAL AND SERVICES FURNISHED BY OTHERS

105.1 The following work has been, or will be, performed and/or provided by Others:

a. Initial dewatering and removal of a significant quantity of CCR from the Bypass Basin. The GW Contractor shall be responsible for dewatering (if necessary) and removing all CCR and CCR-mixed materials remaining in the Bypass Basin after the GW Contractor mobilizes to the site. Estimated quantity of CCR and existing protective layers that are considered to be impacted by CCR to be removed from the basin will be provided by Owner during the bid period for the Work.

b. Construction Quality Assurance services as detailed in Specification P-1401 will be procured by the Owner.

106. DEFINITIONS

106.1 The term "Design Drawing" means the Design Engineer's drawings indicating the Work to be performed.

106.2 The term "Work" means the material and services furnished to retrofit the Bypass Basin as identified on the Design Drawings and as specified herein.

106.3 The term "Owner-approved equal" means an acceptable equivalent to a specified material that has been accepted by the Owner.

107. INTENT OF DOCUMENTS

107.1 The Contract Documents are complementary, and what is called for by any one shall be as binding as if called for by all. The intention of the documents is to include all labor, material, equipment, and transportation necessary for the proper execution of the Work.

107.2 Discrepancies between the Design Drawings and this Specification, or errors or omissions, ambiguities, or mis-description in either the Design Drawings or in this Specification, shall be referred to the Design Engineer for interpretation and adjustment prior to beginning the Work. Do not proceed without the Design Engineer’s written acceptance.

108. PERFORMANCE OF THE WORK

108.1 The GW Contractor shall provide materials and employ construction practices that are sustainable to the greatest extent possible, including disposal of waste.

108.2 The GW Contractor shall provide a representative that will input and provide daily force reports and daily production reports.

108.3 The performance of the Work, as specified herein and as indicated on the Design Drawings, shall comply with the current safety and health standards authorized by the U.S. Department of Labor's Occupational Safety and Health Administration, as well as state and local jurisdictional requirements.

108.4 The GW Contractor shall take all appropriate precautions to ensure the safety of all people working on site.

108.5 The GW Contractor shall maintain the necessary skilled and qualified labor force for the Work to ensure the on-time completion of the Work.

108.6 The GW Contractor's personnel shall be competent, capable, qualified, and able to perform the duties required to the satisfaction of the Owner. A supervisor vested with authority to make decisions binding on the GW Contractor shall be assigned to the task to resolve installation problems as they arise so as not to delay completion of the Work.

108.7 The GW Contractor shall be solely responsible for advising the Design Engineer in writing of any conflicts between this Specification and the Design Drawings and the GW Contractor's drawings, including performance and levels of quality. The Contractor agrees that its obligations, liabilities, and warranties shall not be diminished or extinguished due to its meeting the requirements of this Specification and the Design Drawings.

109. REGULATORY REQUIREMENTS

109.1 The GW Contractor shall at all times be solely responsible for complying with all applicable laws, ordinances, regulations, and codes, including those relating to safety of all persons, in connection with the Work. No obligation of the Owner or Design Engineer shall impose upon them any duty to review the GW Contractor's compliance with safety measures.

110. PROTECTION OF PROPERTY AND PERSONNEL SAFETY

110.1 The GW Contractor shall take adequate precautions to protect existing structures, fences, pavements, aboveground utilities and underground utilities and to avoid damage thereto. The GW Contractor shall, at its own expense, repair any damage caused by its operations.

110.2 The GW Contractor shall conduct safety training of all its personnel (including any subcontractors) in accordance with the Owner's safety requirements, including the Owner’s CCR Safety and Health Plan.

110.3 The GW Contractor shall take adequate precautions to protect the Illinois River, other waterways, and adjacent properties from environmental damage.

111. CLEAN-UP AND DISPOSAL OF DEBRIS

111.1 The Contractor shall be responsible for clean-up and disposal of all debris resulting from the installation work. All excess excavated material and other construction related debris shall be properly disposed of (i.e., in an environmentally responsible way) offsite in a permitted landfill approved by the Owner.

111.2 Clean up, disposal, and site restoration, if required, shall be in compliance with the applicable requirements of all access permits. If any additional permits are required for disposal of debris, these shall be the responsibility of the GW Contractor.

111.3 Work areas shall be kept clean and orderly at all times with as little disturbance as possible to existing conditions. Upon completion of work at each site, all tools, equipment, material, and debris shall be completely removed and the area left in a clean condition.

112. EXISTING SITE CONDITIONS

112.1 Prior to performing any Work in any part of the project site, the GW Contractor shall make a thorough field check for the purposes of verifying existing conditions that may affect the Work. The GW Contractor shall include a thorough investigation of the potential interferences and difficulties that it may encounter in the proper and complete execution of the Work, including the field location and identification of underground and overhead utilities within and adjacent to the limits of the Work. The GW Contractor shall advise the Owner immediately of the discovery of any conditions, including the existence of underground and overhead utilities that may affect the timely and safe execution of the Work.

112.2 The GW Contractor shall be responsible for location of underground utilities and obstructions prior to performance of the Work and shall promptly notify Owner of any potential interferences that may impact performance of the Work. Modifications to the design to resolve these interferences shall not be implemented until approved by the Owner.

112.3 The GW Contractor further acknowledges that it has satisfied itself as to the character, quality and quantity of surface and subsurface material and obstacles, including underground or embedded utilities, to be encountered insofar as this information is reasonably ascertainable from:

a. An inspection of the site (including field location and identification of underground utilities).

b. Reference drawings made available by the Owner.

c. Drawings and specifications that are a part of the Contract.

d. The character and extent of existing work within or adjacent thereto.

e. Any other work being performed thereon at the time of the submission of bids.

112.4 Should the GW Contractor fail to perform any of the obligations set forth above, the GW Contractor's later plea of ignorance of existing or foreseeable conditions which create difficulties or hindrances in the execution of the Work will not be considered as an excuse for any failure on the part of the GW Contractor to fulfill in every detail the requirements of the Contract nor will such a plea be acceptable as the basis of a claim for additional compensation or time to complete the work.

113. VERIFICATION OF DIMENSIONS ON DRAWINGS AND MEASUREMENTS AT SITE

113.1 The GW Contractor shall make a thorough field check for the purpose of verifying existing conditions that may affect the Work, such as existing topographic data shown on the Design Drawings, difficulties that might be encountered in the execution of the Work for any reason, and dimensions and other questions relating to interconnection of the Work with the existing ash basin construction.

113.2 The GW Contractor shall satisfy itself as to the accuracy of the dimensions of the existing ash basin construction as such dimensions relate to the dimensions given on any drawing issued by the Design Engineer. It shall be understood that neither the Design Engineer nor the Owner guarantee the exactness of such dimensions.

113.3 Should the GW Contractor discover any variation in the dimensions of existing conditions and the dimensions given on any drawings issued by the Design Engineer, the GW Contractor shall give immediate notice thereof to the Owner and the GW Contractor shall not proceed with the Work until such variation is resolved.

114. SOIL DATA

114.1 A structural stability and factor of safety assessment for the Bypass Basin was prepared in October 2016. Site specific soil data and geotechnical recommendations are provided and referenced therein. The geotechnical information in and referenced by this assessment indicates the general character of the subsurface conditions at the site. This information is made available for the GW Contractor's information and for interpretation of soil and water conditions that may be encountered at the site. The logs and test data that are provided are not to be taken as a complete description of the site soil and water information, but only display what was found in borings at the indicated locations. The Owner and the Design Engineer take no responsibility for the accuracy of this information.

114.2 The GW Contractor may obtain additional subsurface information, as it deems necessary, for installation purposes.

115. LINES AND GRADES

115.1 The GW Contractor shall furnish and install a minimum of two (2) benchmark monuments as approved by the Owner to lay out lines and grades on the site during the lifetime of the project. All GW Contractor-installed benchmark monuments shall be shown on the red-lined as-built drawings. The GW Contractor is fully responsible for the correctness of such lines and grades and for proper execution of work to such lines and grades.

115.2 The Owner reserves the right to verify correctness of lines and grades during progress of the Work. Such verification by the Owner will not relieve the GW Contractor of responsibility as herein specified.

116. CONTROL AND CHARGE OF CONTRACTOR’S WORK

116.1 The Design Engineer shall have no authority to stop the Work by the GW Contractor for any reason.

116.2 The GW Contractor shall be responsible for the safety of its employees and subcontractors and for maintaining the safety of the job site.

116.3 The GW Contractor shall be solely responsible for construction means, methods, techniques, sequences, and procedures used in the construction of the Work. The Owner, however, reserves the right to request, and the Contractor shall supply, detailed information regarding the Work such as procedures or work methods.

116.4 Only the Owner (or its authorized representative) has the authority to stop the Work (in accordance with the Commercial Terms and Conditions) if such Work is determined to be not in accordance with this Specification, the Design Drawings, or the Contract documents.

117. DESIGN DRAWINGS

117.1 The Design Drawings prepared by the Design Engineer indicate the physical dimensions of the Work to be installed as defined by the Scope of Work and form a part hereof. Refer to Attachment 1 of this Specification for the applicable Design Drawings for this project.

118. REFERENCE DOCUMENTS

118.1 The reference documents assembled by the Design Engineer are for information only. Refer to Attachments 3 through 4 of this Specification for applicable reference documents for this project.

END OF SECTION 011100

SECTION 319005

EARTHWORK

PART 1 - GENERAL

101. EXTENT

101.1 This section defines the material and work requirements associated with preparation for, and placement of, Structural Fill to be placed in the Bypass Basin and other tasks associated with the installation of a new composite liner system for the Bypass Basin. The Structural Fill will support the basin's new composite liner system and will establish the lines and grades for the basin's new leachate collection and removal system (LCRS). This work is further defined and depicted on the Design Drawings.

101.2 The work shall include, but not be limited to, the following items:

a. Clearing, and grubbing, and topsoil stripping.

b. Excavation of the granular protective layers covering the basin's existing liner.

c. Excavation of the existing access ramp surface materials above the basin's existing liner.

d. Cleaning and decontaminating the existing liner system.

e. Placement and compaction of Structural Fill.

f. Preparation of the Structural Fill surface to be lined with the Bypass Basin's new composite liner system.

g. Preparation of concrete surfaces that will come into contact with geosynthetic materials.

h. Excavation and backfill of crest anchor trenches for geosynthetic materials.

i. Placement of crushed stone to re-surface existing roads on the top of the Bypass Basin's dikes.

j. Offsite disposal of excess or unsuitable excavated earthen material and debris.

102. RELATED WORK SPECIFIED IN OTHER SECTIONS AND SPECIFICATIONS

102.1 The work specified in this section shall be coordinated with work specified in the following related sections and specifications:

a. GW Specification (P-1400):

a1. Section 319020 – High-Density Polyethylene Geomembrane Liner with Geocomposite.

a2. Section 319025 – Geosynthetic Clay Liner.

a3. Section 319050 – Leachate Collection and Removal System.

a3.1 Refer to Section 319050 for material and installation requirements for granular materials associated with the Bypass Basin's new LCRS.

b. CQA Specification (P-1401):

b1. Section 014362 – Quality Assurance for Fill, Liner, and Leachate Collection Materials.

103. REFERENCE DOCUMENTS

103.1 Standards, specifications, manuals, codes and other publications of nationally recognized organizations and associations are referenced herein. Methods, equipment, and materials specified herein shall comply with the specified and applicable portions of the referenced documents, in addition to federal, state, or local codes having jurisdiction.

103.2 References to these documents are to the latest issue of each document, unless otherwise indicated, together with the latest additions, addenda, amendments, supplements, etc., thereto, in effect as of the date of the Contract for the Work.

103.3 Abbreviations listed indicate the form used to identify the reference documents cited in this section.

103.4 ASTM – ASTM International:

a. C136 Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

b. D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3))

c. D2487 Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).

d. D2974 Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils

103.5 IDOT – Illinois Department of Transportation:

a. Standard Specifications for Road and Bridge Construction (Adopted January 1, 2022).

103.6 ITP – Illinois Test Procedure:

a. 27 Sieve Analysis of Fine and Coarse Aggregates

b. 96 Resistance by Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

c. 104 Soundness of Aggregate by Use of Sodium Sulfate

104. SUBMITTALS

104.1 The GW Contractor shall submit drawings and data as specified. The GW Contractor's drawings and data shall be submitted via electronic medium in a format compatible for importing into the Owner's information systems specified by the Owner.

104.2 Submittals with Bid Proposal:

a. Catalog data on all compaction equipment and proofrolling equipment the Earthwork Contractor plans to use on the project.

b. Earthwork Contractor's plan for placing Structural Fill material to meet the requirements specified herein while preventing damage to the Bypass Basin's existing geomembrane liner.

104.3 Submittals After Award:

a. Earthwork Equipment:

a1. Earthwork Contractor's demonstration that all earthwork equipment to be used to transport and place Structural Fill material will not exert a ground pressure greater than 8 psi.

b. Structural Fill Material:

b1. At least 30 days prior to scheduled delivery, the Earthwork Contractor shall submit certificates for the Structural Fill material signed by the supplier or a qualified geotechnical engineering consultant that certify the following items comply with or exceed specifications for the material:

Property		Standard(1)	Data Required
b1.1	Sieve Analysis	ASTM C136	Percent Passing Selected Sieves
b1.2	Classification of Material	ASTM D2487	Classification
b1.3	Organic Content	ASTM D2974	Percent of Organic Material
b1.4	Atterberg Limits(2)	ASTM D4318	Liquid Limit and Plasticity Index

Note:

(1) Test results shall be provided on two random samples taken from each borrow area. If processing of borrow area material is required to meet material specifications, the tests shall be performed on the process material.
(2) Atterberg limits are only required if cohesive/fine grained materials are to be used for Structural Fill.

c. Crushed Stone Surfacing for Roads:

c1. At least 30 days prior to scheduled delivery, the Earthwork Contractor shall submit certificates for the crushed stone material to be used to re-surface the existing roads on top of the basin dikes, which shall be signed by the supplier or a qualified geotechnical engineering consultant certifying the following items comply with or exceed specifications for the material:

Property		Standard(1)	Data Required
c1.1	Sieve Analysis	ITP 27	Percent Passing Selected Sieves
c1.2	Na_2SO_4 Soundness 5 Cycle	ITP 104	Percent Loss Max.
c1.3	Los Angeles Abrasion	ITP 96	Percent Loss Max.

Note:

(1) Test results shall be provided on two random samples taken from each borrow area. If processing of borrow area material is required to meet material specifications, the tests shall be performed on the process material.

105. QUALITY ASSURANCE

105.1 Material and construction procedures shall be subject to inspection and testing by the CQA Contractor hired by Owner. Such inspections and tests will not relieve the Earthwork Contractor of responsibility for providing and placing materials in compliance with specified requirements.

105.2 The Owner reserves the right, at any time before final acceptance, to reject material not complying with the specified requirements. The Earthwork Contractor shall correct all deficiencies which inspections, laboratory tests, or field tests have indicated are not in compliance with specified requirements. The Earthwork Contractor shall perform additional tests, at their expense, as may be necessary to reconfirm any noncompliance of the original work, and as may be necessary to show compliance of corrected work.

105.3 The Earthwork Contractor shall promptly correct errors or flaws in the work or material identified during construction and which prevent proper installation. The Earthwork Contractor shall make immediate substitution of the noncomplying material or shall make field changes to make the noncomplying material acceptable. The correction or substitution shall be performed at no cost to the Owner.

105.4 CQA activities shall be performed as described herein and in Specification P-1401.

PART 2 - PRODUCTS

201. MATERIAL FOR STRUCTURAL FILL

201.1 Definitions:

a. Structural Fill is fill placed within the Bypass Basin to support the basin's new composite liner system as identified on the Design Drawings.

201.2 Satisfactory Material:

a. Granular Material:

a1. Granular material for use as Structural Fill shall be rounded and not crushed, with less than two percent organic or other deleterious material, free of excess moisture, and a maximum particle size less than one inch.

a2. Acceptable granular materials are soils which are classified as coarse-grained soils in the Unified Soil Classification System, ASTM D2487. Classifications are GW, GP, GC, SW, SP, or SC, or combinations of these such as SP-SC.

a3. No material with a silt content of greater than 12 percent (i.e., SM or GM) shall be used for Structural Fill.

b. Cohesive Material:

b1. Cohesive material is suitable for use as Structural Fill if it contains not more than two percent organic or other deleterious material, has a maximum particle size of one inch, has a liquid limit of less than 45, and has a plasticity index of less than 25.

b2. Acceptable cohesive materials are soils which are classified as fine-grained soils in the Unified Soil Classification System, ASTM D2487. Classification is CL.

201.3 Unsatisfactory Material:

a. Material unsatisfactory use as Structural Fill is as follows:

a1. Soils classified as silt, silty, or organic soils in the Unified Soil Classification System, ASTM D2487. Classifications are SM, GM, ML, MH, PT, OL and OH.

a2. Clay soils classified as CH in the Unified Soil Classification System, ASTM D2487.

a3. Soils classified as CL-ML (plasticity index of 4 to 7) in the Unified Soil Classification System, ASTM D2487.

a4. Rock material without a soil matrix in which nesting of rocks could occur.

a5. Uncontrolled fill.

a6. Debris.

b. Material Sources:

b1. Structural Fill material shall be obtained from an offsite borrow source identified by the Earthwork Contractor and approved by the Owner.

202. RESTRICTIONS ON THE USE OF MATERIAL FOR ANY PURPOSE

202.1 Any material which is frozen is considered unsatisfactory for use as fill.

202.2 Fill and backfill soils placed by previous construction shall be considered unsatisfactory for use as fill unless they meet the requirements for satisfactory material. This specifically includes using any of the existing protective layers below the Bypass Basin's new composite liner system or on roads outside of the basin.

203. CRUSHED STONE SURFACING FOR ROADS

203.1 Material Requirements:

a. Crushed stone for re-surfacing existing roads on the top of the basin dikes shall be composed of gravel, crushed gravel, or crushed stone that is processed to meet the following requirements:

a1. The material shall conform to Gradation CA 6 in accordance with Paragraph 1004.01(c) of the IDOT Standard Specifications for Road and Bridge Construction.

a2. The material quality shall be Class D or better in accordance with Paragraph 1004.01(b) of the IDOT Standard Specifications for Road and Bridge Construction.

203.2 Material Sources:

a. Crushed stone surfacing material shall be obtained from an offsite borrow source identified by the Earthwork Contractor and approved by the Owner.

PART 3 - EXECUTION

301. DEMOLITION, CLEARING, GRUBBING AND STRIPPING

301.1 General:

a. The work required is shown on the Design Drawings. No work shall be performed outside of the designated area without prior written approval of the Owner.

b. All work incidental to excavation or fill work will not be specifically indicated on the Design Drawings but shall be performed as part of the work.

301.2 Demolition:

a. Concrete Infills:

a1. The Earthwork Contractor shall remove concrete infills from inlet, outlet, and emergency overflow structures as indicated on the Design Drawings.

a2. All concrete surfaces impacted by demolition work that will also come into contact with the Bypass Basin's new composite liner system shall be ground smooth in accordance with Article 305.

b. Demolition and removal of minor items which are incidental to the earthwork may be required. The Earthwork Contractor shall identify any such items during their pre-bid walkdown. The Earthwork Contractor shall demolish such items as required as part of the performance of the work.

c. All waste resulting from demolition work shall be disposed of by the Earthwork Contractor in an offsite disposal area.

301.3 Clearing, Grubbing, and Topsoil Stripping:

a. All vegetation within areas to be excavated or to receive fill shall be cleared and grubbed, stripped of topsoil and debris, and shall be inspected and approved by the Owner prior to beginning the earthwork operations.

b. Weeds, small roots, heavy grass, and other vegetation remaining after clearing and grubbing operations shall be removed with the topsoil.

c. Disposal:

c1. Stripped topsoil shall be placed in an onsite stockpile area as directed by Owner. Topsoil may be removed from the stockpile area at a later date and used to cover finished slopes and other designated areas.

c2. If any material remains in the topsoil stockpile area after construction is complete, the stockpile area side slopes shall be graded to a maximum slope of 20 percent (five horizontal to one vertical), the top of the pile shall be sloped to drain properly and provided with devices to control erosion, and the stockpile shall be seeded.

302. EXCAVATION

302.1 All material within the Bypass Basin and above the basin's existing liner shall be carefully removed. The limits and specifications for this excavation work are specified on the Design Drawings.

302.2 All material excavated from the Bypass Basin shall be disposed of in a permitted landfill approved by the Owner.

303. PLACEMENT OF STRUCTURAL FILL

303.1 Acceptable Placement Methods:

a. Acceptable placement methods for Structural Fill include:

a1. Using a conveyor truck to place material from outside of the basin.

a2. Using a crane to place material from outside of the basin.

a3. Transporting material into the basin to the point of dumping using trucks or scrapers, while complying with maximum ground pressure requirements.

a4. Alternate placement method(s) proposed by the Earthwork Contractor and approved by the Owner.

b. Requirements for Transportation of Structural Fill Materials into Basin:

b1. Under no circumstances shall any equipment (wheeled or tracked) traverse the Bypass Basin's existing geomembrane liner or new liner when less than 10 inches of earthen material are above the subject liner.

b2. Equipment transporting material into the basin shall use the permanent ramp along the basin's east dike. Following removal of the existing ramp surface layer, Structural Fill shall be installed above the existing geomembrane liner along the ramp surface as detailed on the Design Drawings and as specified herein before any equipment uses the ramp to access the basin floor.

b3. Only earthmoving equipment with low ground pressure shall be used to transport material inside of the basin. The Earthwork Contractor shall demonstrate that equipment entering the basin will not exert a ground pressure greater than 8 psi. The ground pressure is influenced by the tread pattern / tire contact area and is not the reading from a tire pressure gauge.

b4. Equipment operating within the basin shall avoid hard braking on ramps and avoid sharp turns or quick stops that could pinch or tear the existing geomembrane liner.

b5. Structural Fill shall be placed by the "dump and spread" method in which lightweight equipment with low ground pressure is used to spread the material.

b6. Material placement over the geomembrane liner during periods of warm weather can cause wrinkling and damage to the geosynthetic materials. Placement of the initial lift of Structural Fill shall be halted when the air temperature is greater than 85°F or less than 40°F.

b7. When Structural Fill is being placed, a worker shall safely walk alongside earthmoving equipment spreading the material to spot and remove rocks, stones, roots, and other debris that may be present in the Structural Fill that could cause damage to the liner.

303.2 Moisture Content of Structural Fill Material:

a. At the time of compaction, the moisture content of Structural Fill material shall be within ±3 percent of optimum moisture content as determined by ASTM D1557.

b. Fill material containing excessive moisture shall not be compacted unless the material has dried and the moisture content is within the specified limits.

c. Fill material that is too dry shall have moisture added and then be blended so that the moisture content is uniform prior to compaction.

d. For granular materials, non-compliance with moisture content shall not be the sole criteria for rejection of the work.

303.3 Lift Thickness:

a. Fill shall be placed in horizontal layers in thicknesses compatible with the material being placed, equipment being used and the compaction requirements.

b. Unless otherwise approved by the Owner the loose thickness shall not exceed the following:

b1. 12 inches maximum loose lift thickness for the lowest lift in contact with the Bypass Basin's existing geomembrane liner.

b2. 8 inches maximum loose lift thickness for compaction by self-propelled equipment.

b3. 4 inches maximum loose lift thickness for compaction by hand-operated equipment.

303.4 Placement Structural Fill:

a. Each layer of fill shall be evenly spread and moistened or aerated as required to achieve the required moisture content.

b. Each lift of Structural Fill in the Bypass Basin shall be uniformly placed to cover the entire length and width of the basin prior to compaction or placement of the next lift.

c. As allowed by the design of the LCRS, the top surface of each layer shall be approximately level but shall have sufficient crown or cross fall to provide adequate drainage of water at all times during the construction period. The crown or crossfall shall be at least 1 in 50 (2 percent) but no greater than 1 in 20 (5 percent).

d. Fill placed on slopes steeper than 20 percent (i.e., 5 horizontal to 1 vertical) shall be overfilled a minimum of 6 inches beyond the face of the slope, measured horizontally, and then cut back and trimmed to the required line and grade to expose a smooth surface uniformly compacted to the required density. Installing the fill slope to lines and grades shown on the Design Drawings and then compacting is not acceptable on the basin side slopes.

303.5 Compacting Structural Fill:

a. Equipment:

a1. Sheepsfoot, modified sheepsfoot, padfoot, or other non-smooth drums shall not be used to compact Structural Fill placed for this work.

a2. Each layer of fill shall be compacted by tamping, pneumatic-tired roller, or other mechanical means acceptable to the Owner that will produce the specified compaction.

a3. At locations where it would be impractical because of inaccessibility to use self-propelled compacting equipment, fill layers shall be compacted using hand directed compaction equipment.

a4. When soils are used that develop a densely packed surface as a result of spreading or compacting equipment, the surface of each layer of fill shall be sufficiently roughened after compaction to ensure bonding of the succeeding layer.

b. Inspection and Testing:

b1. All work is subject to inspection and testing by the CQA Contractor. The CQA Contractor shall have access to the work at all times. Testing shall be in accordance with the Contract. Refer to Specification P-1401 for inspection and testing requirements.

b2. Each layer of compacted fill shall be tested before proceeding with the next layer.

b3. It is the Earthwork Contractor’s responsibility to request inspection prior to proceeding with further work that would make parts of the work inaccessible for inspection.

b4. If the fill material fails to meet the required density, the material shall be removed and replaced or reworked, altering the construction method as necessary to obtain the required density and compaction. Sufficient time shall be allotted between lifts for the necessary testing of the soils.

c. Compaction Density:

c1. Structural Fill shall be compacted to a minimum of 95% of the maximum dry density as determined by ASTM D1557

303.6 Fine Grading:

a. Structural Fill shall be fine graded using equipment with low ground pressure.

303.7 Reporting Damage:

a. If damage occurs to the Bypass Basin's existing geomembrane liner while placing Structural Fill material, the Earthwork Contractor shall report the damage(s) to the Owner and Geosynthetics Contractor immediately so that repairs can be performed without delay.

b. Repairs to the existing geomembrane liner shall be made by the Geosynthetics Contractor as specified in Section 319020 at no additional cost to the Owner.

304. REQUIREMENTS FOR PREPARATION AND ACCEPTANCE OF STRUCTURAL FILL SURFACE SUPPORTING COMPOSITE LINER

304.1 Intersections Between Planes:

a. Intersections between planes shall be rounded as specified below to provide a firm bearing without abrupt change:

	Intersection of Slope	Radius of Rounding
a1.	Side slope and bottom plane	3 feet minimum
a2.	Side slope and top of dike or grade	6 inch minimum
a3.	Intersection of 2 bottom planes (planes sloped at 10% or less)	Straight line is acceptable

304.2 Responsibility:

a. The Earthwork Contractor shall be responsible for preparing the surface of the Structural Fill beneath the composite liner system prior to placement of the liner. The subgrade is subject to inspection and acceptance by the Owner and the Geosynthetics Contractor prior to installation of the lower component of the composite liner system.

304.3 Inspection:

a. The Earthwork Contractor, the Owner, the Geosynthetics Contractor, and the CQA Contractor shall inspect and document the following:

a1. Lines, grades, and slopes are in conformance with the Design Drawings.

a2. Surface has been graded and rolled such that it is free of irregularities, protrusions, loose soil, and abrupt changes in grade.

a3. The surface is free of debris, clods, stones, roots, and organic material.

a4. That no settlement or erosion has occurred.

a5. That there are no side slope failures.

a6. That there are no moisture seeps, puddling or ponding.

a7. That there are no soft spots.

304.4 Certification:

a. The Geosynthetics Contractor shall provide written certification that the surface is acceptable. The acceptance shall be recorded and copies of the certification given to both the Earthwork Contractor, the CQA Contractor, and the Owner.

b. Only as much surface as will be lined the following day shall be inspected, certified, and documented as acceptable.

305. PREPARATION OF CONCRETE SURFACES

305.1 All concrete surfaces that will come in contact with the Bypass Basin's new composite liner system shall be free of sharp edges or rough spots that can puncture or abrade the new liner materials. Where necessary, the concrete shall be ground smooth by the Earthwork Contractor.

306. CREST ANCHOR TRENCH EXCAVATION AND BACKFILLING

306.1 Excavation and Shaping:

a. The anchor trench for geosynthetic materials shall be excavated by the Earthwork Contractor at the top of the basin slope to the lines and widths shown on the Design Drawings prior to the Geosynthetics Contractor deploying the geosynthetic clay liner component of the Bypass Basin's new composite liner system.

b. A slightly rounded corner shall be provided in the trench where the geosynthetic materials adjoin the trench to avoid sharp bends in the geosynthetic materials. The radius of rounding is shown on the Design Drawings. No loose soil shall be allowed to underlie the geosynthetic materials in the anchor trench.

c. The anchor trench shall be adequately drained to prevent ponding or otherwise softening of the adjacent soils while the trench is open.

306.2 Backfilling:

a. The anchor trench shall be backfilled by the Earthwork Contractor after all geosynthetic materials are in place and seams are welded.

b. Backfilling of the anchor trench shall occur during the morning or during extended periods of overcast skies when the geosynthetic materials are at their most contracted states.

c. The first lift of fill above the geosynthetic materials in the anchor trench may be 12 inches in thickness.

d. If compacted using hand-operated equipment, backfill shall be placed in lifts not exceeding 4 inches loose thickness and shall be compacted to a minimum of 95% of the maximum dry density as determined by ASTM D1557.

e. If compacted using self-propelled equipment, backfill shall be placed in lifts not exceeding 8 inches loose thickness and shall be compacted to a minimum of 95% of the maximum dry density as determined by ASTM D1557.

307. GRADING TOLERANCES

307.1 The acceptable deviation from lines and grades indicated on the Design Drawings shall be as shown in Table 319005-1.

307.2 Slopes shall be finished in conformance with the lines and grades shown on the Design Drawings. When completed, the average plane of a slope shall conform to the slope indicated on the Design Drawings and no point on the completed slope shall vary from the designated plane by more than 6 inches measured at right angles to the slope.

308. CLEAN-UP

308.1 All waste, excess materials and debris shall be disposed of in an offsite disposal area approved by the Owner.

TABLE 319005-1
ACCEPTABLE DEVIATIONS FROM DESIGN LINES AND GRADES

Type of Installation (Excavation or Fill)	Maximum Acceptable Deviation from Line (feet)	Maximum Acceptable Deviation from Grade(1) (feet)
General Earthwork		
Top of Structural Fill	±0.3	+0.1 to -0.0
Roads		
Road Embankment	±0.2	+0.1 to -0.0
Leachate Collection & Removal System		
Leachate Collection Pipe Trench	±0.3	+0.1 to -0.0

Note:

(1) After initial settlement has taken place. Initial settlement is that settlement that will occur up to the time of determination and acceptance of final grade elevation as approved by the Owner.

END OF SECTION 319005

SECTION 319020

HIGH-DENSITY POLYETHYLENE GEOMEMBRANE LINER WITH GEOCOMPOSITE

PART 1 - GENERAL

101. EXTENT

101.1 This section defines the minimum material and installation requirements for the high-density polyethylene (HDPE) geomembrane liner to be used as the upper component of the retrofitted Bypass Basin's new composite liner system, and the minimum material and installation requirements for the drainage geocomposite to be used in the retrofitted Bypass Basin's new leachate collection and removal system (LCRS), all in accordance with the Design Drawings and as specified herein.

101.2 The Work shall include, but not be limited to, the following items:

a. Manufacture, shipping, handling, and storage of HDPE geomembrane and drainage geocomposite materials.

b. Preparation and inspection of surfaces to be lined.

c. Placement and seaming of geomembrane.

d. Placement and joining drainage geocomposite.

e. Crest anchorage of geomembrane and drainage geocomposite.

f. Attachment of the geomembrane to concrete structures and existing marker posts and an existing corrugated metal pipe (CMP) riser.

g. Non-destructive field testing of geomembrane seams.

h. Removal of samples of geomembrane seams and transportation to an independent third-party laboratory for destructive testing.

i. Repair of defective geomembrane seams.

j. Repair of defects in the geomembrane and at locations where samples were taken.

k. Visual inspection of the completed geomembrane liner.

101.3 Definitions and Qualifications:

a. The following definitions of terms shall apply throughout this section:

a1. CQA Geosynthetics Inspector: An inspector who works for the CQA Contractor and is responsible for inspection of the Geosynthetics Contractor's work.

a2. GM/GC Manufacturer: The manufacturer who is responsible for manufacture of geomembrane and drainage geocomposite materials and for transporting geomembrane and drainage geocomposite materials to the site.

b. Qualifications:

b1. The GM/GC Manufacturer shall be approved by the Owner. Owner's considerations when approving the GM/GC Manufacturer may include, but are not limited to, financial, safety, and prior performance aspects of the manufacturer, as well as ongoing litigation.

b2. The GM/GC Manufacturer shall have an internal QA/QC program to ensure and to verify the manufactured products consistently meet or exceed the requirements of this section.

b3. The GM/GC Manufacturer shall have at least 10 years manufacturing products similar to those required for this Work.

102. RELATED WORK SPECIFIED IN OTHER SECTIONS AND SPECIFICATIONS

102.1 The work specified in this section shall be coordinated with work specified in the following related sections and specifications:

a. GW Specification (P-1400):

a1. Section 319005 – Earthwork.

a2. Section 319025 – Geosynthetic Clay Liner.

b. CQA Specification (P-1401):

b1. Section 014362 – Quality Assurance for Fill, Liner, and Leachate Collection Materials.

103. REFERENCE DOCUMENTS

103.1 Standards, specifications, manuals, codes, and other publications of nationally recognized organizations and associations are referenced herein. Methods, equipment, and materials specified herein shall comply with the specified and applicable portions of the referenced documents, in addition to federal, state, or local codes having jurisdiction.

103.2 References to these documents are to the latest issue date of each document, unless otherwise indicated, together with the latest additions, addenda, amendments, supplements, etc., thereto, in effect as of the date of Contract for the Work.

103.3 Abbreviations listed indicate the form used to identify the reference documents cited in this section.

103.4 ASTM –- ASTM International:

a. A276 Specification for Stainless and Heat Resisting Steel Bars and Shapes.

b. B633 Specification for Electrodeposited Coatings of Zinc on Iron and Steel.

c. D792 Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement.

d. D1004 Test Method for Initial Tear Resistance of Plastic Film and Sheeting.

e. D1238 Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer.

f. D1505 Test Method for Density of Plastics by the Density-Gradient Technique.

g. D1603 Standard Test Method for Carbon Black Content in Olefin Plastics.

h. D4218 Standard Test Method for Determination of Carbon Black Content of Polyethylene Compounds by the Muffle-Furnace Technique.

i. D4355 Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc-Type Apparatus.

j. D4491 Standard Test Methods for Water Permeability of Geotextiles by Permittivity.

k. D4533 Standard Test Method for Trapezoid Tearing Strength of Geotextiles.

l. D4632 Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.

m. D4716 Test Method for Determining the (In-Plane) Flow Rate Per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head.

n. D4751 Standard Test Methods for Determining Apparent Opening Size of a Geotextile.

o. D4833 Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products.

p. D5199 Standard Test Method for Measuring the Nominal Thickness of Geosynthetics.

q. D5261 Test Method for Measuring Mass per Unit Area of Geotextiles.

r. D5397 Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test.

s. D5596 Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics.

t. D5641 Standard Practice for Geomembrane Seam Evaluation by Vacuum Chamber.

u. D5721 Standard Practice for Air-Oven Aging of Polyolefin Geomembranes.

v. D5820 Standard Practice for Pressurized Air Channel Evaluation of Dual Seamed Geomembranes.

w. D5885 Test Method for Oxidative Induction Time of Polyolefin Geosynthetics by High-Pressure Differential Scanning Colorimetry.

x. D5994 Test Method for Measuring Core Thickness of Textured Geotextile.

y. D6241 Standard Test Method for Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe.

z. D6364 Standard Test Method for Determining Short-Term Compression Behavior of Geosynthetics.

aa. D6392 Standard Test Method for Determining the Integrity of Non-Reinforced Geomembrane Seams Produced Using Thermo-fusion Methods.

bb. D7005 Standard Test Method for Determining the Bond Strength (Ply Adhesion) of Geocomposites.

cc. D7179 Standard Test Method for Determining Geonet Breaking Force

dd. D7466 Standard Test Method for Measuring Asperity Height of Textured Geomembranes

ee. D8117 Standard Test Method for Oxidative Induction Time of Polyolefin Geosynthetics by Differential Scanning Calorimetry.

103.5 Geosynthetic Research Institute (GRI):

a. GM6 Standard Practice for Pressurized Air Channel Test for Dual Seamed Geomembrane.

b. GM10 Specification for the Stress Crack Resistance of Geomembrane Sheet.

c. GM13 Standard Specification for Test Properties, Testing Frequency and Recommended Warranty for High Density Polyethylene (HDPE) Smooth and Textured Geomembranes.

d. GM14 Standard Guide for Selecting Variable Intervals for Taking Geomembrane Destructive Seam Samples Using the Method of Attributes.

e. GM19a Standard Specification for Seam Strength and Related Properties of Thermally Bonded Homogenous Polyolefin Geomembranes/Barriers.

103.6 Industrial Fabrics Association International (IFAI):

a. Field Sewing of Geotextiles by V. Diaz and B. Myles, 1989.

104. SUBMITTALS

104.1 The GW Contractor shall submit the following drawings and data as specified. The GW Contractor's drawings and data shall be submitted via electronic medium in a format compatible for importing into the Owner's information systems specified by the Owner.

104.2 Submittals with the Bid Proposal:

a. Geosynthetics Contractor:

a1. Geosynthetics Contractor's name, address, and telephone number.

a2. Geosynthetics Contractor's qualifications, including letter or certificate from the GM/GC Manufacturer documenting the manufacturer's approval of the Geosynthetics Contractor (or subcontracted Installer) to install the geomembrane and drainage geocomposite materials supplied for the project.

a3. Installer's qualifications if the Geosynthetics Contractor is proposing to subcontract the geomembrane and/or drainage geocomposite installation work.

b. HDPE Geomembrane and Drainage Geocomposite Materials:

b1. Certification of Compliance from the GM/GC Manufacturer , signed by its authorized representative, indicating that the materials meet the criteria specified herein and that those requirements are guaranteed by the manufacturer.

b2. One representative sample of each type of geosynthetic material.

b3. GM/GC Manufacturer's Quality Control and Quality Assurance Policies and Procedures for the geomembrane and drainage geocomposite materials being supplied for the project.

c. Warranty:

c1. Written warranties from the GM/GC Manufacturer and the Geosynthetics Contractor covering the quality of the material and workmanship as applicable.

c2. Warranty conditions proposed, including limits of liability, will be evaluated by the Owner in approving the GM/GC Manufacturer and the Geosynthetics Contractor.

104.3 Submittals After Award:

a. Geomembrane Resin:

a1. Certification signed by the GM/GC Manufacturer's authorized representative stating that the resin meets the criteria specified herein.

a2. Certification signed by the GM/GC Manufacturer's authorized representative stating the origin of the resin and that all resin is from the same supplier (including resin supplier's name, identification brand name, and number).

a3. Copies of GM/GC Manufacturer's and resin supplier's QA/QC certificates. Certificates shall include a summary report of test results conducted to verify the quality of the resin used in each batch used to manufacture geomembrane for this project. As a minimum, the report shall include tests on specific gravity, melt flow index and percent carbon black.

b. Geomembrane Sheeting:

b1. Prior to material shipment to the site, the GM/GC Manufacturer shall submit to the CQA Contractor representative samples of the geomembrane to be shipped to the site, along with chain of custody and certification that the samples submitted are from the geomembrane material to be delivered to the site. The number of samples shall be determined in accordance with the number of CQA conformance tests specified in Specification P-1401.

b2. Signed certification that the properties of the manufactured sheeting meet the criteria specified herein and are guaranteed by the GM/GC Manufacturer.

b3. Statement certifying that no post consumer resin (PCR) has been added to the formulation.

b4. Statement certifying that the manufactured sheeting is free of per- and polyfluoroalkyl substances (PFAS).

b5. Copies of all of the GM/GC Manufacturer's QA/QC certificates. The certificates shall include documents of test results.

c. Drainage Geocomposite:

c1. Copy of the raw material producers' certificates describing the origin and identification of the raw materials.

c2. Copy of the raw material producers' QC certificates.

c3. Statement certifying that the manufactured drainage geocomposite is free of per- and polyfluoroalkyl substances (PFAS).

c4. Copy of the GM/GC Manufacturer's QA/QC certificates on tests performed on the geonet core, geotextile cap and carrier, and double-sided laminated geocomposite as specified in Table 319020-2 and a summary of the results of the tests.

c5. Certification that the properties of the manufactured material meet the criteria specified herein and are guaranteed by the GM/GC Manufacturer.

d. Extrudate Resins or Rod for Seaming Geomembranes:

d1. Certification that all extrudate is the same resin type as the geomembrane and was obtained from the same resin supplier as the resin used to manufacture the geomembrane.

e. Installation Data:

e1. GM/GC Manufacturer's proposed geomembrane panel layout for each installation.

e2. GM/GC Manufacturer's recommended procedures for making and testing seams if different from those specified herein.

e3. GM/GC Manufacturer's recommended procedures for repairing damaged geomembrane sections and seams if different from those specified herein.

e4. GM/GC Manufacturer's details of geomembrane liner anchorage and attachment to structures if different from those specified herein and from the details shown on the Design Drawings.

104.4 Submittals After Construction is Complete:

a. Geosynthetics Contractor:

a1. As-built panel layout.

a2. Drawing showing locations of repairs and types of repairs made.

a3. Locations of destructive tests.

a4. Results of destructive tests.

a5. Results of non-destructive tests.

105. QUALITY ASSURANCE

105.1 Materials and construction procedures shall be subject to inspection and testing by the CQA Contractor employed by the Owner. Such inspections and tests will not relieve the Geosynthetics Contractor of the responsibility for providing materials and installation in compliance with specified requirements.

105.2 The Owner reserves the right, at any time before final acceptance, to reject materials or workmanship not complying with specified requirements. The Geosynthetics Contractor shall correct the deficiencies which the inspections and tests have indicated are not in compliance with specified requirements.

105.3 CQA activities shall be performed as described herein and in Specification P-1401.

PART 2 - PRODUCTS

201. HIGH-DENSITY POLYETHYLENE GEOMEMBRANE

201.1 Manufacturers of HDPE Geomembrane Products:

a. The products of the following manufacturers meeting the requirements herein are acceptable:

a1. AGRU America, 500 Garrison Road, Georgetown, SC 29440.

a2. Solmax, 19103 Gundle Road, Houston, TX 77073.

a3. Others as approved by the Owner.

201.2 General Requirements:

a. All HDPE geomembrane shall be white, textured, and meet the requirements of Table 319020-2.

b. The location of HDPE geomembrane to be used for each installation shall be as shown on the Design Drawings.

c. The top surface of the geomembrane shall be white.

d. The textured liner shall be manufactured using a co-extrusion process.

e. The textured coating shall be applied to both sides of the base sheet.

f. Textured HDPE geomembrane shall have uniform texturing appearance. It shall be free from agglomerated texturing material and such defects that would affect the specified properties of the HDPE geomembrane.

g. Each roll shall have 6-inch (minimum) wide smooth edges to provide suitable seaming surfaces. Textured HDPE geomembrane without smooth edges may be provided if approved by the Owner.

h. The HDPE geomembrane shall be manufactured from first quality, virgin resin. Blending of resins shall not be allowed. No recycled or reworked geomembrane may be used except edge trim generated during the manufacturing process (no more than 10%). No post-consumer resin (PCR) of any type shall be added to the formulation.

i. The resin used to produce the geomembrane shall be formulated to be resistant to chemical and ultraviolet degradation.

j. The geomembrane shall be free of plasticizers.

k. The geomembrane shall be free of leachable additives.

l. The geomembrane shall be free of per- and polyfluoroalkyl substances (PFAS).

m. During manufacture, each roll of geomembrane shall be continuously monitored across the width to assure uniformity of thickness. Thickness measurements shall meet the requirements of Table 319020-1.

n. The geomembrane shall be free of factory seams.

o. The geomembrane shall be free from dirt, oil, foreign matter, scratches, cracks, creases, bubbles, blisters, pits, tears, holes, pores, pinholes, voids, undispersed raw material, any sign of contamination or other defects that may affect serviceability, and shall be uniform in color, thickness, and surface texture.

p. The geomembrane shall be capable of being seamed in the field to yield seams that are as resistant to waste liquids as the sheeting.

q. The geomembrane shall be manufactured in the United States or Canada.

r. The minimum period of warranty for materials shall be 20 years with first year non-prorated. The minimum period of warranty for installation shall be 5 years with the first year non-prorated.

TABLE 319020-1
HIGH-DENSITY POLYETHYLENE TEXTURED GEOMEMBRANE REQUIREMENTS(1)

Property	ASTM Test Method	Polyethylene Base Compound	Geomembrane	Testing Frequency
Nominal Thickness (mil)	--	--	60	--
Resin Properties				
Density of Base Resin, g/cc (min.)	D1505 / D792	0.932		5,000 lbs. of Resin
Oxidative Induction Time (OIT) (min. ave.)				
a. Standard OIT (minutes)	D8117	100	--	5,000 lbs. of Resin
– or –				
b. High Pressure OIT (minutes)	D5885	400	--	5,000 lbs. of Resin
Oven Aging at 85°C	D5721	--	--	
a. Standard OIT (min. ave.), % retained after 90 days	D8117	55	--	One per Formulation
– or –				
b. High Pressure OIT (min. ave.), % retained after 90 days	D5885	80	--	One per Formulation
UV Resistance				
High Pressure OIT (min. ave.), % retained after 1600 hrs.	D5885	50	--	One per Formulation
Analytical Properties				
Formulated Density, g/cc (min.)	D1505 / D792	--	0.940	5,000 lbs. of Resin
Carbon Black Content, % (range)	D4218	2.0 – 3.0	--	5,000 lbs. of Resin
Carbon Black Dispersion for 10 Different Views	D5596	Note (2)	--	5,000 lbs. of Resin
Mechanical Properties				
Thickness, mils	D5994	--	--	One per Roll
Minimum Average			57	
Lowest Individual for 8 out of 10 Values			54	
Lowest Individual for 10 out of 10 Values			51	
Asperity Height, mils (min. ave.)	D7466	--	16	Every Second Roll(3)
Tensile Properties in Each Direction (min. ave.)	D6693 (Type IV Specimen at 2 ipm)			5,000 lbs. of Resin
Tensile Stress at Yield, ppi (min.)		--	126	
Elongation at Yield, % (min.)		--	12	
Tensile Stress at Break, ppi (min.)		--	90	
Elongation at Break, % (min. 2" gage length)		--	100	
Tear Resistance, lbs. (min. ave.)	D1004		42	5,000 lbs. of Resin
Puncture Resistance, lbs. (min. ave.)	D4833		90	5,000 lbs. of Resin
Bonded Seam Strength(4)	D6392	--	--	
Shear Strength, ppi		--	120	
Peel Adhesion (Hot Wedge), ppi		--	91	
Peel Adhesion (Extrusion Fillet), ppi		--	78	
Environmental Aging Effect on Properties				
Stress Crack Resistance, hours (min.)	D5397	--	500	Per GRI GM10

Notes:
(1) Requirements shown in this table meet the minimum requirements of GRI Standard GM13, Revision 16 (March 17, 2021) except for bonded seam strength.
(2) Carbon black dispersion (only near spherical agglomerates) for 10 different views: 9 in Categories 1 or 2 and 1 in Category 3.
(3) Alternate measurement side for double-sided textured sheet.
(4) Seam strength requirements shown in this table meet the minimum requirements of GRI Standard GM19a, Revision 10 (March 18, 2021).

201.3 Panel Layout:

a. Prior to manufacture of the geomembrane, a panel layout of the surface to be lined shall be made. Each panel to be used for the installation shall be given a numeric or alphanumeric identification number.

b. The panel identification number shall be related in writing to the manufacturing roll number that identifies the resin type, batch number, and date of manufacturer.

c. The panel layout shall be made considering the following requirements:

c1. Panel lengths shall include slope gain and anchorage.

c2. Perpendicular tie-ins shall be made a minimum of 5 feet beyond the toe of the slope.

c3. A minimum 6-inch overlap shall be allowed at double fusion welded seams.

c4. All field seams on slopes shall be oriented parallel to the slope (oriented along, not across the slope).

c5. The number of seams in corners or odd shaped geometric locations shall be minimized.

201.4 Packaging and Shipping:

a. The geomembrane shall be shipped to the project site in rolls. No material shall be folded.

b. Packaging and transportation shall be the responsibility of the GM/GC Manufacturer, who shall retain responsibility until the geomembrane is accepted at the site by the Geosynthetics Contractor.

c. A label shall be attached or adhered to each roll of the geomembrane identifying the following:

c1. Name of GM/GC Manufacturer.

c2. Product Identification, which can be traced back to the origin of the base material (resin supplier's name, resin production plant, resin brand name type, and production date of the resin).

c3. Date of manufacture of the geomembrane.

c4. Roll identification number.

c5. Geomembrane thickness and type.

c6. Roll dimensions (length and width).

c7. Manufacturing lot number.

c8. Panel number and weight.

c9. Order number.

202. <u>DRAINAGE GEOCOMPOSITE</u>

202.1 Manufacturers of Drainage Geocomposite Products:

a. The products of the following manufacturers meeting the requirements herein are acceptable:

a1. AGRU America, 500 Garrison Road, Georgetown, SC 29440.

a2. Solmax, 19103 Gundle Road, Houston, TX, 77073

a3. Others as approved by the Owner.

202.2 General Requirements:

a. The drainage geocomposite shall consist of a HDPE geonet core with a non-woven geotextile layer heat-laminated to each side of the geonet.

b. HDPE Geonet:

b1. The geonet shall be a profiled geonet manufactured by extruding two sets of polyethylene strands to form a three-dimensional structure in a diamond shape to provide planar water flow.

b2. The HDPE geonet formulation shall consist of a minimum of 97 percent of polyethylene resin, with the balance being carbon black and antioxidants for protection during extrusion and long-term service performance. No fillers, extenders, or other materials shall be mixed into the formulation.

b3. Regrind or reworked polymer which is previously processed HDPE geonet in chip form is acceptable if:

b3.1 It is the same formulation as the geonet being produced.

b3.2 No more than 25% rework material is used in the formulation.

b4. No PCR of any type shall be added to the formulation.

c. Non-Woven Geotextiles:

c1. The geotextiles shall be non-woven, spun bonded fabric manufactured from long chain polymeric filaments, yarns, staple fibers, or other structural components of polyester or polypropylene formed into a stable network (mesh).

c2. The nominal weight of each geotextile shall be 8 oz/sy.

d. The minimum period of warranty for materials shall be 20 years with first year non-prorated. The minimum period of warranty for installation shall be 5 years with the first year non-prorated.

202.3 Material Requirements:

a. The drainage geocomposite shall meet the requirements of Table 319020-2.

TABLE 319020-2
DRAINAGE GEOCOMPOSITE MATERIAL REQUIREMENTS

Property	Value	ASTM Test Method	Test Frequency
Geonet Core (Before Lamination)			
Thickness(1)	300 mil (min. ave.)	D5199	Per 50,000 lb.
Density of Formulated Material(2)	0.95 g/cm^3 (min. ave.)	D1505 / D792	Per 50,000 lb.
Carbon Black Content	1.5% to 3.0%	D1603 / D4218	Per 100,000 lb.
Tensile Strength	75 lb/in. (min. ave.)(3)	D7179	Per 50,000 lb.
Compressive Strength	120 psi (min. ave.)	D6364(4)	Per 100,000 lb.
Geotextile Cap and Carrier (Before Lamination)			
Mass per Unit Area	8 oz/sy (Min. ARV)	D5261	Varies(5)
Grab Strength	200 lb (Min. ARV)	D4632	
Grab Elongation	50% (Min. ARV)	D4632	
Tear Strength	80 lb (Min. ARV)	D4533	
Puncture Strength	430 lb (Min. ARV)	D6241	
Permittivity	0.2 sec^{-1} (Min. ARV)	D4491	
AOS	0.25 (Max. ARV)	D4751	
UV Stability	50% Retained (500 hr)	D4355	
Double-Sided Laminated Composite			
Flow Rate / Width Hydraulic Gradient Pressure Seating Dwell Time	0.42 gpm / ft (min. ave.) 0.03 1,200 psf 15 min.	D4716(6)	Per 200,000 lb.
Ply Adhesion	1.0 lb/in. (min. ave.)(7)	D7005	Per 100,000 lb.

Notes:

(1) The diameter of the presser foot shall be 2.22 in. and the pressure shall be 2.9 psi.

(2) The density of the base resin will be slightly lower than the density of the formulated material.

(3) This is the average peak value for five equally spaced machine direction tests across the roll width.

(4) Test shall be conducted using ASTM D6364 Section 6.3, the movable plate method.

(5) Because the specified geotextile properties are based on average roll values (ARV), the statistics needed to obtain such values will dictate the frequency of testing.

(6) Geocomposite shall be tested for ASTM D4716 flow rate per unit width between rigid end plates. Test values are for machine direction only.

(7) This is the average of five equally spaced machine direction tests across the roll width. Both sides of the geocomposite shall be tested for ply adhesion.

202.4 Packing and Shipping:

a. The drainage geocomposite shall be shipped to the project site in rolls. No material shall be folded.

b. Packaging and transportation shall be the responsibility of the GM/GC Manufacturer, who shall retain responsibility until the drainage geocomposite is accepted at the site by the Geosynthetics Contractor.

c. A label shall be attached or adhered to each roll of the drainage geocomposite identifying the following:

c1.1 Name of GM/GC Manufacturer.

c1.2 Product identification (brand name, product code).

c1.3 Date of manufacture of drainage geocomposite.

c1.4 Roll identification number.

c1.5 Drainage geocomposite thickness and type.

c1.6 Roll dimensions (length and width).

c1.7 Lot number.

c1.8 Panel number and weight.

c1.9 Order number.

203. MATERIALS FOR ATTACHMENT OF GEOMEMBRANE TO CONCRETE

203.1 Batten Strip:

a. Batten strip material shall be hot rolled, annealed, and pickled Type 316L stainless steel in accordance with ASTM A276.

b. Strips shall be 1/4 inch thick by 2 inches wide. Random lengths are acceptable.

203.2 Expansion Anchors:

a. Expansion anchors shall be stud type with a single piece three section wedge and zinc plated in accordance with ASTM B633. Wedges shall be manufactured from ANSI Type 304 stainless steel. Hilti Kwik Bolt 3 Expansion Anchors, or equal, are acceptable.

b. Wedge-type anchors shall have a minimum yield strength of 60,000 psi. Stud-type anchors shall have a minimum tensile strength of 65,000 psi.

c. Anchors shall be 3/8-inch diameter by 3 1/2-inches long.

d. Washers for anchors shall be Type 18-8 stainless steel flat washers for 3/8-inch diameter bolt size.

203.3 Neoprene Gasket:

a. Neoprene gaskets shall be ¼-inch thick by 2-inches wide, closed cell neoprene sponge sealing strips. Operating temperature range of neoprene shall be -40°F to +220°F.

b. Neoprene gaskets placed against concrete shall have a pressure sensitive adhesive on the side of the gasket placed against the concrete.

PART 3 - EXECUTION

301. ONSITE HANDLING AND STORAGE

301.1 Receipt/Unloading:

a. Unloading and storage of materials shall be responsibility of the GM/GC Manufacturer.

b. The unloading and other handling of materials shall be performed by the GM/GC Manufacturer to ensure that the material is handled with care and not damaged.

301.2 Storage:

a. The GW Contractor shall provide on-site storage space in a location near the area to be lined such that on-site transportation and handling are minimized. The GW Contractor shall be responsible for protecting stored material from theft and vandalism.

b. The rolls of geomembrane and drainage geocomposite shall be placed on a smooth surface free of rocks and standing water.

301.3 Inspection:

a. Upon delivery of the material to the project site, the Geosynthetics Contractor shall conduct a visual inspection of all rolls of geomembrane and drainage geocomposite for damage or defects. This inspection shall be done without unrolling any rolls unless damage to the inside of a roll is found or suspected.

b. Any damage or defects shall be noted and immediately reported to the Owner, the GM/GC Manufacturer and to the carrier that transported the material. Any roll or portion thereof, which, in the judgement of the Owner (or their authorized representative), is seriously damaged, shall be removed from the project site and replaced with complying material at no additional cost to the Owner.

302. PREPARATION OF SURFACES TO BE LINED

302.1 Preparation of Concrete Surfaces:

a. All concrete surfaces that will come in contact with a geomembrane shall be free of sharp edges or rough spots that can puncture or abrade the geomembrane. Where necessary, the concrete shall be ground smooth by the Earthwork Contractor.

b. Where specified on the Design Drawings, one or more layers of geomembrane scuff strips shall be placed between the concrete and the geomembrane liner to act as a protective layer for the geomembrane liner.

302.2 Geosynthetic Clay Liner:

a. See Section 319025 regarding installation, inspection, and acceptance of the geosynthetic clay liner (GCL) underlying the HDPE geomembrane liner.

303. INSTALLATION OF HDPE GEOMEMBRANE LINER

303.1 Weather:

a. Geomembrane shall not be placed when the air temperature is above 104ºF or below 41ºF unless it can be demonstrated to the approval of the Owner by trial welds that acceptable welds can be made at the prevailing temperature. Trial welds shall be as described in Paragraph 303.7c.

b. Geomembrane shall not be placed when there is any rainfall or snowfall, in the presence of excessive moisture due to fog or dew, in ponded water, on a frozen subgrade, or during high winds.

303.2 Panel Layout:

a. The panels shall be placed in accordance with the Manufacturer's panel layout drawing to ensure that they are placed in the proper direction for seaming.

b. If panels are installed in a location other than indicated on the panel layout drawing, the revised location shall be indicated on an "as-built" layout drawing. The "as-built" record drawing shall be submitted to the Owner at the completion of the project.

303.3 Panel Deployment:

a. Only the panels that can be anchored and seamed together in one shift shall be unrolled.

b. Unroll and layout panels in as close to the final position as possible. Pulling geomembrane panels should be minimized to reduce the chance of permanent tension.

c. The methods and equipment used to deploy the panels shall not damage the geomembrane or the supporting surface.

d. Wrinkles shall be minimized. However, enough slack shall be provided in both directions so that there will be no tension in the geomembrane at the lowest expected operating temperature.

303.4 Precautions to Prevent Wind Damage:

a. If possible, work shall be oriented in the direction of the prevailing wind.

b. Provide adequate temporary loading and/or anchoring of the geomembrane by the use of sandbags, tires or other means which will not damage the geomembrane, to prevent uplift of the geomembrane by wind.

303.5 Other Precautions to Prevent Damage:

a. Protection of the geomembrane from damage due to foot traffic on the slopes shall be provided.

b. Provisions of facilities for safe entrance and egress of employees from sloped depressions is required.

303.6 Replacement of Damaged Geomembrane:

a. Any area of a panel, which, in the judgement of the Owner and/or the CQA Contractor, becomes seriously damaged (torn, twisted, or crimped permanently) shall be replaced at no additional cost to the Owner.

303.7 Field Seaming:

a. Method of Seaming:

a1. The primary welding procedure for seams shall be double wedge fusion welding.

a2. Extrusion welding shall be used only for repairs, detail work, and for seaming where double wedge fusion welding is not possible.

a3. The rods used for extrusion welding shall be the same type of resin as the geomembrane, unless otherwise approved by the Owner.

a4. The use of solvents or adhesives is not permitted.

b. General Requirements for Seaming:

b1. On slopes steeper than 10 horizontal to 1 vertical, seams shall be oriented parallel to the line of maximum slope (oriented up and down, not across the slope) when possible. No seams oriented across the slope shall be used unless approved by the Owner.

b2. Seams parallel to the toe of the slope shall be located a minimum of 5 feet from the toe.

b3. Seams parallel to the crest of the slope shall be located a minimum of 2 feet from the crest.

b4. Seams at the bottom of a slope shall be overlapped so that the upslope sheet is positioned above the downslope sheet.

b5. Seaming shall extend to the outside edge of panels to be placed in the anchor trench. Seams at sheet corners of three or four sheets shall be completed with a patch having a minimum dimension of 24 inches, extrusion welded to the parent sheets.

b6. All cross seams between the two rows of seamed panels shall be welded during the coolest time of the day to allow for contraction of geomembrane.

c. Trial Welds Prior to Beginning Seaming:

c1. Trial welds are required for pre-qualification of personnel, equipment, and procedures for making seams on identical geomembrane material under the same climatic conditions as the actual field production seams will be made.

c2. Trial welds shall be made as follows:

c2.1 Prior to each seaming period.

c2.2 Every 4 to 5 hours (i.e., at the beginning of the work shift and after the lunch break).

c2.3 Whenever personnel or equipment are changed.

c2.4 When climatic conditions result in wide changes in geomembrane temperature.

c2.5 When requested by CQA Geosynthetics Inspector for any seaming crew or piece of welding equipment if problems are suspected.

c3. Once qualified by passing a trial weld, welding technicians shall not change parameters without performing another trial weld.

c4. Trial welds shall be made on both double wedge fusion welds and on extrusion welds.

c5. A test strip shall be prepared by joining two pieces of geomembrane, each piece shall be at least 6 inches wide. The length of double wedge fusion welded seams shall be a minimum of 10 feet long. The length of an extrusion welded seam shall be a minimum of 4 feet long. The CQA Geosynthetics Inspector shall witness the fabrication of each test strip.

c6. All test welds shall be tested by destructive testing. Testing can be done as soon as the seam cools.

c7. A minimum of three (3) one (1) inch wide sample strips shall be cut from each test strip, one from each end and one from the middle. The location of each sample shall be selected by the CQA Geosynthetics Inspector. The test strips shall be tested in peel at 2 inches per minute using a field tensiometer. The CQA Geosynthetics Inspector shall witness all tests.

c8. If any of the test specimens fail, a new test strip shall be fabricated and the tests repeated for the new strip. If additional specimens fail, the seaming apparatus and the seamer shall not be accepted and shall not be used for seaming until the deficiencies are corrected and successful trial welds have been achieved.

c9. The trial weld is considered acceptable if, when tested for peel adhesion using the field tensiometer, all three specimens meet the criteria specified in Table 319020-1 for both peel and shear under Bonded Seam Strength, or the three specimens exhibit Film Tear Bond (FTB) (yielding of the parent material before seam failure). In the case of a double wedge fusion welded seam, both welds must pass in order to be considered acceptable.

c10. If the specimens pass the tests, production seaming operations can begin.

c11. The GW Contractor shall document all data on each trial weld, including:

c11.1 Date.

c11.2 Time.

c11.3 Operator.

c11.4 Machine number.

c11.5 Ambient temperature.

c11.6 Operating temperature.

c11.7 Speed setting.

c11.8 Pass/Fail designation.

d. Preparation for Seaming:

d1. Prior to seaming, the surface of the geomembrane shall be wiped with a clean cloth to ensure that it is clean and free from moisture, grease, dust, dirt, and debris of any kind before seam welding is started.

d2. The panels shall be adjusted so that the seams are aligned to eliminate wrinkles and fish mouths. Where necessary, fish mouths and wrinkles shall be cut to achieve flat overlap.

e. Seaming:

e1. Seaming shall be performed in accordance with the Manufacturer's accepted procedure.

e2. Double Wedge Fusion Welds:

e2.1 The panels shall be overlapped a minimum of 4 inches prior to welding.

e2.2 Vehicle mounted automated hot wedge welding apparatus shall be used to make the seam.

e3. Extrusion Fillet Welding:

e3.1 Geomembrane overlap shall be a minimum of 3 inches for extrusion welding.

e3.2 Geomembrane panels shall be temporarily bonded using a hot air device prior to extrusion welding.

e3.3 The edge of the geomembrane to be fillet welded shall be pre-beveled before heat-tacking the seam in place.

e3.4 The seam overlap shall be ground (abraded) no more than one hour prior to welding.

e3.5 Grinding shall be performed in accordance with the Manufacturer's instructions in a manner that does not damage the geomembrane.

e3.6 Grinding shall not extend more than 1/4 inch past the area to be covered with extrudate during welding.

e3.7 All grind marks shall be covered with extrudate.

303.8 Non-Destructive Field Testing

a. General:

a1. All non-destructive field testing shall be performed and documented by the Geosynthetics Contractor.

a2. The CQA Geomembrane Inspector shall observe all non-destructive test procedures.

a3. One hundred (100) percent of the seam length shall be tested using non-destructive procedures to check the continuity of the field seams. Non-destructive testing is not meant to qualify seam strength.

a4. Air pressure testing shall be performed in accordance with ASTM D5820 and GRI GM6.

a5. Vacuum box testing shall be performed in accordance with ASTM D5641 and as specified herein.

a6. Continuity testing shall be performed as seaming progresses or as soon as a suitable length of seam is available, not at the completion of all field seaming.

b. Double Wedge Fusion Welded Seams:

b1. Double wedge fusion welded seams shall be tested using air pressure testing.

b2. The procedure for testing shall be as specified in GRI GM6 for the type and thickness of geomembrane in use.

b3. The following pressures are applicable to all HDPE geomembrane. After an initial 2-minute pressure stabilization period, the pressure shall be maintained between 27 and 30 psi for 60 mil HDPE geomembrane. The pressure shall be sustained for a minimum of 5 minutes. The loss of pressure shall not exceed a maximum of 3 psi in 5 minutes. If the

pressure does not stabilize in the first two minutes or the pressure loss exceeds the loss specified, the seam test shall be considered a failure.

b4. The leak or suspected leak shall be located and repaired.

b5. The repaired seam shall be re-tested as required until all leaks are identified, and repaired, and the seam passes a subsequent air pressure test.

b6. When the geometry of a double wedge fusion weld makes air testing impossible or impractical, vacuum testing may be used to test the seam.

c. Extrusion Welded Seams:

c1. Extrusion welded seams shall be tested using vacuum chamber testing in accordance with ASTM D5641.

c2. The completed seam shall exhibit no leakage when tested between 4 and 8 psi minimum vacuum for approximately 10 seconds.

c3. If leaks are discovered during vacuum box testing, they shall be located, marked, and repaired.

c4. The repaired area shall be re-tested and exhibit no leakage.

d. Inaccessible Seams:

d1. Where extrusion welded seam locations make use of vacuum box testing impractical, then the electric wire method of testing shall be used or the seam shall be cap stripped as approved by the Owner.

d2. If cap stripping is approved by the Owner, the seams shall be cap stripped as described in Paragraph 303.11d with strips of the same type and thickness of geomembrane being installed. The cap stripping shall be performed in the presence of the CQA Geosynthetics Inspector and the Owner's representative.

d3. The electric wire test method shall consist of placing a 24-gauge copper wire 1/8 inch beneath the top sheet overlap of the two sheets prior to welding with the extruder. The wire shall be embedded in the seam. After welding, a holiday spark detector, operating at 20,000 volts, shall be connected to one end of the wire, and slowly moved over the length of the seam. A seam defect between the probe and the embedded wire shall result in an audible alarm indicating where the defect is located.

e. Test Reports:

e1. Test reports for all air pressure tests shall contain all data specified in ASTM D5820 and GRI GM6.

e2. Test reports for vacuum box testing shall contain all of the data specified in ASTM D5641.

e3. Test report for other types of non-destructive tests shall contain the following data for each test as a minimum:

e3.1 Location.

e3.2 Type of test.

e3.3 Test parameters.

e3.4 Test data.

e3.5 Test number.

e3.6 Name of tester.

e3.7 Outcome of the test.

303.9 Destructive Testing

a. Testing:

a1. Destructive testing shall be performed by an independent third-party laboratory employed by the CQA Contractor on samples cut from production welds in the field by the Geosynthetics Contractor.

a2. Samples shall be taken by the Geosynthetics Contractor to the third-party laboratory and tested for shear strength and peel adhesion. For double wedge seam samples, both welds shall be tested for peel adhesion.

b. Location and Frequency:

b1. Test locations shall be determined after seaming. The location where the test samples shall be taken shall be marked by the CQA Geosynthetics Inspector. Locations may be prompted by the appearance of excessive heating, contaminations, offset welds, or a suspected defect. Destructive test samples shall be taken at a minimum average frequency of one per every 500 linear feet of seam length.

b2. The Method of Attributes described in GRI GM14 may be exercised to minimize the number of test samples taken if more than 100 destructive seam samples will be required based on the sampling strategy given in Paragraph 303.9.b1.

b3. Each sample location shall be numbered and marked with permanent identification and the location of the sample and these locations shall be indicated on a plan drawing prepared and maintained by the Geosynthetics Contractor. The following shall be recorded for each sample:

b3.1 Date and time.

b3.2 Ambient temperature.

b3.3 Seam number and location.

b3.4 Welding apparatus used.

b3.5 Name of Master Geomembrane Seamer.

b3.6 Reason for taking the sample.

b3.7 Size of sample.

b3.8 Test results.

b3.9 Name of tester.

b4. Samples shall be cut by the Geosynthetics Contractor. The CQA Geosynthetics Inspector shall witness test sample cutting.

b5. Test samples shall be cut every shift and taken by the Geosynthetics Contractor to the third-party laboratory the same day that the sample is prepared.

c. Sample Size:

c1. The minimum sample size shall be 12-inches wide with a seam 16-inches long centered length wise in the sample. As agreed to with Owner, a sample may be increased in size to accommodate the requirements of the testing laboratory.

d. Field Testing:

d1. A one-inch wide specimen shall be cut from each end of each sample for field testing.

d2. Each one-inch wide specimen shall be tested with a field tensiometer for peel adhesion.

d3. The CQA Geosynthetics Inspector shall witness each field test.

d4. A test is considered acceptable if a specimen meets the criteria specified in Table 319020-1 for both peel and shear under Bonded Seam Strength, or exhibits Film Tear Bond (FTB). For double wedge fusion welds, both welds must pass the test. If either sample fails the field test, it shall be assumed that the seam will not pass the specified laboratory testing and the sample shall be given a fail designation.

e. Laboratory Testing:

e1. Full size (12-inch minimum length) samples shall be taken to the independent third-party laboratory for testing.

e2. Samples shall be tested for shear strength and peel adhesion in accordance with ASTM D6392. Five specimens shall be tested for each test method. All samples shall meet minimum requirements for shear strength and peel adhesion given in Table 319020-1 under Bonded Seam Strength.

f. Test Results:

f1. Verbal test results shall be given to the Geosynthetics Contractor within 24 hours of receipt of the samples. Written results shall follow within one week.

f2. All test locations shall be marked with a pass/fail designation on the liner and on the drawings maintained by the Geosynthetics Contractor for submittal to the Owner after construction is complete.

g. Re-Testing if Failure Occurs:

g1. If a seam fails testing, one additional sample shall be taken 10 feet on each side of the location of the failed test. Additional samples shall continue to be taken at 10-foot intervals until tests show that seam strength is adequate and the zone in which the seam requires reconstruction is identified. Additional field and laboratory tests required to determine failed seams and any necessary patching and rework shall be performed at no additional cost to the Owner.

g2. All passing seams shall be bounded by two locations from which samples passing laboratory destructive tests have been taken.

g3. The entire seam length failing strength tests shall be reconstructed at no additional cost to the Owner.

g4. If the length of reconstructed seam exceeds 150 feet, a sample shall be taken of the reconstructed seam every 150 feet and shall pass destructive testing.

303.10 Inspection:

a. After seaming is complete, the Geosynthetics Contractor and the CQA Geosynthetics Inspector shall conduct a detailed walk-down to visually check all seams and non-seam areas of the HDPE geomembrane liner.

b. All defects, holes, blisters, tears, signs of damage during installation, areas of undispersed carbon and holes from destructive or non-destructive testing shall be marked and repaired.

303.11 Repair of Defects and Seams

a. Patching:

a1. Patching shall be used to repair large holes, tears, and destructive sample locations.

a2. All patches shall be round or oval, or shall have rounded corners.

a3. All patches shall be made of the base HDPE geomembrane material and shall extend a minimum of 3 inches beyond the edges of the defect.

a4. Patches shall be extrusion welded to the base sheet.

b. Grinding and Welding:

b1. Grinding and welding shall be used to repair sections of extruded fillet seams with small defects.

c. Spot Welding:

c1. Spot welding shall be used to repair small tears, pinholes, or other minor localized flaws.

d. Capping:

d1. Capping shall be used to repair lengths of extrusion welded seams with large defects and to repair double wedge fusion welded seams.

d2. Cap strips shall be made with strips of the same type and thickness of geomembrane being installed. Strips shall extend a minimum of 6 inches beyond the weld, and shall have rounded corners.

d3. Cap strips shall be extrusion welded to the base sheet.

e. Cut Out and Replacement:

e1. When approved by the Owner, a length of defective seam may be cut out and replaced with a strip of new material seamed into place.

f. Verification of Repairs:

f1. All repairs shall be non-destructive tested using one of the procedures described in Paragraph 303.8.

f2. Repairs passing non-destructive testing shall be deemed acceptable.

f3. Repairs of a seam in excess of 150 feet in length shall have one destructive seam test per 150 feet in length.

304. INSTALLATION OF DRAINAGE GECOMPOSITE

304.1 General Requirements:

a. In the presence of wind, all drainage geocomposite shall be weighted with sand bags or the equivalent. Weights shall be installed during deployment and shall remain in place until deployment of the cover material.

b. The drainage geocomposite shall not be welded to the geomembrane liner.

c. All necessary precautions shall be taken to prevent damage to underlying geomembrane during placement of the drainage geocomposite.

d. During placement of the drainage geocomposite, care shall be taken not to entrap dirt or excessive dust that could cause clogging of the drainage system, and/or stones that could damage the adjacent geomembrane. If dirt or excessive dust is entrapped in the drainage geocomposite, it shall be cleaned and all dirt removed prior to placement of the cover material. Care shall be taken in the handling of sand bags to prevent rupture or damage of the sand bag.

304.2 Placement of Drainage Geocomposite:

a. On slopes, the drainage geocomposite shall be secured in the anchor trench and then rolled down the slope in such a manner as to continuously keep the net in tension. If necessary, the net shall be positioned by hand after unrolling to minimize wrinkles.

b. The drainage geocomposite shall be placed on side slopes with no horizontal seams along the slope and so that the long dimension is parallel to the slope.

c. No horizontal seam shall be located within 5 feet of the toe of a slope.

d. The drainage geocomposite shall be positioned on both the slopes and the bottom so that the geonet core overlaps by a minimum of 4 inches.

e. Drainage geocomposite placed in the corners of the side slope shall be cut to eliminate excessive overlap of material.

e1. The drainage geocomposite shall only be cut using scissors or other cutting tools approved by the GM/GC Manufacturer that will not damage the underlying geomembrane.

e2. Care shall be taken not to leave tools in the drainage geocomposite.

304.3 Joining Geonet Cores:

a. The geonet cores between adjacent drainage geocomposite panels shall be joined using white or yellow self-locking straps. Metal fastening devices are not permitted and shall not be used.

b. Adjacent panels on slopes shall be joined on 5-foot centers.

c. Adjacent panels on the basin floor shall be joined on 10-foot centers.

d. End seams on the basin floor shall be joined on 12-inch centers.

e. Horizontal and end seams in anchor trenches shall be joined on 12-inch centers.

304.4 Joining Geotextile Caps:

a. Sewing on Basin Floor:

a1. On the basin floor and interior slopes flatter than 10H:1V (i.e., 10%), the geotextile caps between adjacent drainage geocomposite panels shall be continuously sewn or continuously heat bonded in accordance with the GM/GC Manufacturer's recommendations.

a2. Spot seaming is not allowed.

b. Sewing on Basin Slopes:

b1. On basin slopes greater than 10H:1V (i.e., 10%), the geotextile caps between adjacent drainage geocomposite panels shall be continuously sewn. All seams shall be vertical (i.e., parallel with the slope). No horizontal seams (i.e., across the slope) shall be permitted on basin slopes greater than 10H:1V (i.e., 10%).

b2. Spot seaming and heat bonding are not allowed.

c. Sewing Requirements:

c1. Sewing shall be done using polyester or heat-set UV stabilized polypropylene sewing thread with chemical and ultraviolet light resistance properties equal to or exceeding the values specified in Table 319020-2. The thread color shall contrast with the color of the geotextile cap to assist in inspection of the seam. Tex size or denier number of the thread shall be specified by the Geosynthetics Contractor.

c2. Seams shall be "prayer" or "flat" seams. Seams shall be formed by mating the edge of the geotextile caps and sewing the caps together with continuous stitches located a minimum of four inches from the mated edges.

c3. Sewing procedures shall conform to the latest procedures recommended by the GM/GC Manufacturer.

c4. Stitching:

c4.1 For drainage geocomposites placed on the interior slopes of the basin, stitching shall be two rows (SSa-2) of stitching using a 01 two-thread locking chain stitch as described in the IFAI with 6 to 10 stitches per inch. Thread strength shall be such field seam strength will be a minimum of 90 percent of the tensile strength of the geotextile cap.

c4.2 For drainage geocomposites used elsewhere in the basin, stitching shall be one row (SSa-1) of stitching using a Type 401 two-thread locking chain stitch as described in the IFAI with a minimum of 5 stitches per inch, or the seam shall be heat bonded. Thread strength shall be selected by the Geosynthetics Contractor.

c5. Seam Inspections:

c5.1 Visual examinations shall be conducted to ensure that 100 percent of the seams are sewn or heat bonded as required.

c5.2 Seam sampling and testing are not required.

304.5 Protection of HDPE Geomembrane:

a. The Geosynthetics Contractor shall be responsible for protection of the HDPE geomembrane liner during installation of the drainage geocomposite and shall be responsible for repair of any damage caused to the liner by installation of the drainage geocomposite.

304.6 Repair of Holes or Tears:

a. All holes or tears in the drainage geocomposite shall be repaired by placing a patch of drainage geocomposite over the hole or tear. The patch shall extend 2 feet beyond the edges of the hole or tear. If the hole or tear width across the role is more than 50% of the width of the roll, the damaged drainage geocomposite shall be removed and replaced.

b. A patch's geonet core shall be secured to the original geonet core by tying every 12 inches.

c. A patch's geotextile cap shall be sewn into place by hand or machine so as the patch will not accidentally shift out of position or be moved when it is covered. The thread shall be the same as specified for sewing seams.

305. CREST ANCHORAGE

305.1 The HDPE geomembrane liner and the drainage geocomposite shall be anchored in an anchor trench at the top of the slope.

305.2 Prior to the placement of the geosynthetic clay liner (GCL) underlying the HDPE geomembrane liner, the Earthwork Contractor shall excavate the crest anchor trench to the lines and widths shown on the Design Drawings and in accordance with the excavation, shaping, and backfilling requirements specified in Section 312201.

306. ATTACHMENT TO CONCRETE

306.1 Geomembrane shall be attached to concrete using batten strips in accordance with details on the Design Drawings.

307. ATTACHMENT TO PIPE PENETRATIONS

307.1 Geomembrane shall be attached to pipe penetrations through the lining in accordance with details on the Design Drawings.

307.2 Prefabricated or field fabricated HDPE sleeves (pipe boots) used for attaching the geomembrane to the pipe shall be supplied by the GM/GC Manufacturer.

END OF SECTION 319020

SECTION 319025

GEOSYNTHETIC CLAY LINER

PART 1 – GENERAL

101. EXTENT

101.1 This section defines the minimum material and installation requirements for the geosynthetic clay liner (GCL) to be used as the lower component of the retrofitted Bypass Basin's new composite liner system, all in accordance with the Design Drawings and as specified herein.

101.2 The work shall include, but not be limited to, the following items:

a. Manufacturing, shipping, handling, and storage of GCL.

b. Preparation and inspection of surfaces to be lined.

c. Placement and seaming of GCL.

d. Crest anchorage of GCL.

e. Sealing GCL around existing marker posts and an existing corrugated metal pipe (CMP) riser.

f. Sealing GCL at vertical walls of existing inlet and outlet structures and existing marker posts within the basin.

g. Visual inspection of the completed GCL.

h. Patching and repairs.

101.3 Definitions and Qualifications:

a. The following definitions of terms shall apply throughout this section:

a1. CQA Geosynthetics Inspector: An inspector who works for the CQA Contractor and is responsible for inspection of the Geosynthetics Contractor's work.

a2. GCL Manufacturer: The manufacturer who is responsible for manufacture of GCL materials and for transporting GCL materials to the site.

b. Qualifications:

b1. The GCL Manufacturer shall be approved by the Owner. Owner's considerations when approving the GCL Manufacturer may include, but are not limited to, financial, safety, and prior performance aspects of the manufacturer, as well as ongoing litigation.

b2. The GCL Manufacturer shall have an internal QA/QC program to ensure and to verify the manufactured products consistently meet or exceed the requirements of this section.

b3. The GCL Manufacturer shall have at least 10 years of experience manufacturing products similar to those required for this Work.

102. RELATED WORK SPECIFIED IN OTHER SECTIONS AND SPECIFICATIONS

102.1 The work specified in this section shall be coordinated with work specified in the following related sections and specifications:

a. GW Specification (P-1400):

a1. Section 319005 – Earthwork.

a2. Section 319020 – High-Density Polyethylene Geomembrane Liner with Geocomposite.

b. CQA Specification (P-1401):

b1. Section 014362 – Quality Assurance for Fill, Liner, and Leachate Collection Materials.

103. REFERENCE DOCUMENTS

103.1 Standards, specifications, manuals, codes, and other publications of nationally recognized organizations and associations are referenced herein. Methods, equipment, and materials specified herein shall comply with the specified and applicable portions of the referenced documents, in addition to federal, state, or local codes having jurisdiction.

103.2 References to these documents are to the latest issue date of each document, unless otherwise indicated, together with the latest additions, addenda, amendments, supplements, etc., thereto, in effect as of the date of Contract for the Work.

103.3 Abbreviations listed indicate the form used to identify the reference documents cited in this section.

103.4 ASTM – ASTM International:

a. D4643 Standard Test Method for Determination of Water (Moisture) Content of Soil by Microwave Oven Method.

b. D5261 Standard Test Method for Measuring Mass per Unit Area of Geotextiles.

c. D5887 Standard Test Method for Measurement of Index Flux through Saturated Geosynthetic Clay Liner Specimens using a Flexible Wall Permeameter.

d. D5889 Standard Practice for Quality Control of Geosynthetic Clay Liners.

e. D5890 Standard Test Method for Swell Index of Clay Mineral Component of Geosynthetic Clay Liners.

f. D5891 Standard Test Method for Fluid Loss of Clay Component of Geosynthetic Clay Liners.

g. D5993 Standard Test Method for Measuring Mass per Unit of Geosynthetic Clay Liners.

h. D6243 Standard Test Method for Determining the Internal and Interface Shear Resistance of Geosynthetic Clay Liner by Direct Shear Method.

i. D6496 Standard Test Method for Determining Average Bonding Peel Strength Between Top and Bottom Layers of Needle-Punched Geosynthetic Clay Liners

j. D6768 Standard Test Method for Tensile Strength of Geosynthetic Clay Liners

104. SUBMITTALS

104.1 The GW Contractor shall submit the following drawings and data as specified. The GW Contractor's drawings and data shall be submitted via electronic medium in a format compatible for importing into the Owner's information systems specified by the Owner.

104.2 Submittals with Bid Proposal:

a. Geosynthetics Contractor:

a1. Geosynthetics Contractor's name, address, and telephone number.

a2. Geosynthetics Contractor's qualifications, including letter or certificate from GCL Manufacturer documenting the manufacturer's approval of the Geosynthetics Contractor (or subcontracted Installer) to install the GCL materials supplied by the GCL Manufacturer.

a3. Installer's qualifications if the Geosynthetics Contractor is proposing to subcontract the GCL installation work.

b. GCL Material:

b1. Copies of the GCL Manufacturer's catalog data describing the GCL material proposed for use on this project.

b2. Copies of GCL Manufacturer's QA certificates on tests performed on the material and a summary of results after the tests.

b3. Certification of Compliance from the GCL Manufacturer, signed by its authorized representative, stating that the GCL material meets the specification requirements and that those requirements are guaranteed by the GCL Manufacturer.

b4. GCL Manufacturer's Quality Control and Quality Assurance Policies and Procedures.

c. Warranty:

c1. Written warranties from the GCL Manufacturer and the Geosynthetics Contractor covering the quality of the material and workmanship as applicable.

c2. Warranty conditions proposed, including limits of liability, will be evaluated by the Owner in approving the GCL Manufacturer and the Geosynthetics Contractor.

104.3 Submittals After Award:

a. Installation Data:

a1. GCL Manufacturer's proposed GCL panel layout for each installation.

a2. GCL Manufacturer's recommended procedures for making seams if different from those specified herein.

a3. GCL Manufacturer's recommended procedures for repairing damaged GCL sections and seams if different from those specified herein.

a4. GCL Manufacturer's details of GCL anchorage and attachment to structures and penetrations if different from those specified herein and from the details shown on the Design Drawings.

104.4 Submittals Upon Shipment:

a. Two representative samples of each GCL material to be used for the project.

b. GCL Manufacturer's QA/QC certificates with each shipment of GCL. The QA/QC certificates shall include:

b1. GCL lot and roll numbers with corresponding shipping information.

b2. GCL Manufacturer's test data for the geotextile materials used in GCL production including, at a minimum, mass per unit area data and tensile test data.

b3. Certificates of analyses for the bentonite clay used in GCL production including, at a minimum, test data for the properties shown in Table 319025-1.

b4. GCL Manufacturer's test data for the finished GCL product including, at a minimum, test data for the properties shown in Table 319025-2.

104.5 Submittals After Construction is Complete:

a. Plan drawing showing locations of repairs and types of repairs made.

105. QUALITY ASSURANCE

105.1 Materials and construction procedures shall be subject to inspection and testing by the CQA Contractor employed by the Owner. Such inspections and tests will not relieve the Geosynthetics Contractor of the responsibility for providing and installing materials in compliance with specified requirements.

105.2 The Owner reserves the right, at any time before final acceptance, to reject materials or workmanship not complying with specified requirements. The Geosynthetics Contractor shall correct the deficiencies which the inspections and tests have indicated are not in compliance with specified requirements.

105.3 CQA activities shall be performed as described herein and in Specification P-1401.

PART 2 - PRODUCTS

201. GEOSYNTHETIC CLAY LINER (GCL)

201.1 Approved GCL Products:

a. The products of the following manufacturers meeting the requirements herein are acceptable:

a1. CETCO BENTOMAT®.

a2. Solmax BentoLiner®.

a3. AGRU America GeoClay®.

b. Other GCL products meeting the requirements herein as approved by the Owner.

201.2 General Requirements:

a. The GCL shall be a needle punched GCL. The GCL shall be manufactured by placing a uniform layer of high-swell sodium bentonite encapsulated between two geotextiles and then needle punching through both layers of the geotextile and the bentonite to push

fibers from the non-woven geotextile cap through the bentonite layer and embed them in the geotextile carrier on the other side.

b. The upper and lower support materials shall protect the bentonite but shall be sufficiently porous to allow bentonite flow-through to create a positive bentonite-to-bentonite seal at the seams.

c. The support materials used in the manufacturing shall not interfere with the swelling, self-healing or low permeability characteristics of the GCL.

d. The GCL shall be fabricated such that bentonite will not be displaced when the liner is cut.

e. Six-inch and nine- or twelve-inch overlap marks shall be marked longitudinally on both edges of the geotextile cap by the GCL Manufacturer to assist in obtaining the proper overlap. The lines shall be printed in easily visible, non-toxic ink.

f. The minimum period of warranty for GCL materials shall be 5 years.

201.3 GCL Material Specifications:

a. Sodium Bentonite: The bentonite utilized in the manufacture of the GCL, as well as any accessory bentonite provided for seaming and detail work, shall be Wyoming-grade sodium bentonite with the properties listed in Table 319025-1.

TABLE 319025-1
PROPERTIES OF BASE BENTONITE IN GCL MATERIALS

Property(1)	ASTM Test Method	Value	Min. Testing Frequency(2)
Free Swell	D5890	24 mL / 2g min.	1/100,000 lb
Fluid Loss	D5891	18 mL max.	1/100,000 lb
Moisture Content	D4643	12% max.	1/100,000 lb

Notes:

(1) Properties of the base bentonite prior to incorporation into the finished GCL product.
(2) Minimum testing frequencies are per ASTM D5889. One test per 50 tonnes is also acceptable.

b. Geosynthetic Clay Liner: The finished GCL manufactured using both a non-woven cap and a non-woven carrier shall have the properties listed in Table 319025-2.

TABLE 319025-2
PROPERTIES OF FINISHED GCL MATERIALS WITH NON-WOVEN CAP & NON-WOVEN CARRIER

Property	ASTM Test Method	Value	Min Testing Frequency(1)
Geotextile Properties			
Non-Woven Cap	D5261	6.0 oz/yd^2 min.	1/20,000 SF
Non-Woven Carrier	D5261	6.0 oz/yd^2 min.	1/20,000 SF
Finished GCL Properties			
Bentonite Mass/Area	D5993	0.75 lb/ft^2 min. at 0% moisture content	1/20,000 SF
Moisture Content	D5993	35% max.	1/20,000 SF
Hydrated Internal Shear Strength	D6243	500 psf min.(2)	1/20,000 SF
Tensile Strength(3)	D6768	45 lb/in. min.	1/20,000 SF
Peel Strength	D6496	3.5 lb/in. min.	1/20,000 SF
Index Flux(4)	D5887	2x10^{-9} m^3/m^2/sec max.	1/20,000 SF
Hydraulic Conductivity(4)	D5887	1x10^{-9} cm/sec max.	1/20,000 SF

Notes:

(1) Minimum testing frequencies listed are in accordance with ASTM D5889.
(2) Typical peak value for specimen sheared under a 200 psf normal stress.
(3) Machine (warp) direction of primary backing.
(4) Index flux and hydraulic conductivity measured at 5 psi effective confining stress and 2 psi head.

b1.1 Acceptable Products:

b1.1.1 Solmax BentoLiner® NW

b1.1.2 CETCO BENTOMAT® DN

b1.1.3 AGRU America GeoClay® NN66

b1.1.4 Owner approved equal.

201.4 Packing and Shipping:

a. The finished GCL shall be completely wrapped and adequately secured with a durable polyethylene protective cover in order to provide protection from ultraviolet degradation of the Primary Backing Material (PBM) and excessive loss of moisture during shipping and storage.

b. The GCL shall be shipped to the project site in rolls.

c. A label shall be attached or adhered to each roll of the GCL identifying the following:

c1. Name of GCL Manufacturer.

c2. Product identification (brand name, product code).

c3. Date of manufacture.

c4. Roll identification number and weight.

c5. Panel number.

c6. GCL thickness.

c7. Roll dimensions (length, width).

c8. Manufacturing lot number.

c9. Order number.

d. The GCL shall be stenciled throughout each roll with the product name and name of the GCL Manufacturer, which can be cross-referenced to the roll number marked on the label and to the production and quality control data sheets.

202. BENTONITE SEALING COMPOUND (BSC) AND GRANULAR BENTONITE (GB)

202.1 The BSC and GB shall be supplied by the GCL Manufacturer and shall be comprised of the same bentonite used in the manufacturing of the GCL. The BSC shall be a mixture of non-aqueous liquid suspension agents which creates a paste-like texture. The GB shall be furnished in 50 lb bags.

202.2 The suspension agents used in the manufacture of the BSC shall be non-toxic, water-soluble and shall not restrict the bentonite's ability to swell and absorb water upon hydration.

PART 3 - EXECUTION

301. ONSITE HANDLING AND STORAGE

301.1 Unloading:

a. Handling and unloading shall be the responsibility of the Geosynthetics Contractor.

b. Upon arrival at the site, the rolls of the GCL shall be carefully unloaded by the Geosynthetics Contractor in accordance with the GCL Manufacturer's recommendations.

301.2 Storage:

a. The Owner shall provide on-site, outdoor storage space in a location near the area to be lined such that on-site transportation and handling are minimized. The Geosynthetics Contractor shall be responsible for protection of materials from damage, moisture, theft, and vandalism.

b. The rolls of GCL shall be stored horizontally in their original, unopened, wrapped cover in a clean, dry area. The material shall be stored off the ground on pallets or plywood in small stacks not to exceed five (5) rolls in height. The rolls shall be covered with a heavy, protective tarpaulin or plastic sheeting or enclosed within a storage facility. Care shall be used to keep the GCL clean and free from debris prior to installation.

c. Rolls shall be stacked in a manner recommended by the GCL Manufacturer that prevents them from sliding or rolling from the stacks.

d. Any rolls that come in contact with moisture while in storage shall be set aside by the Geosynthetics Contractor to await examination by the Owner. Damaged rolls shall also be set aside and inspected to determine suitability of the material for use.

301.3 Inspection:

a. Upon delivery of the material to the project site, the Geosynthetics Contractor shall conduct a visual inspection of the polyethylene sleeves of all rolls of GCL for damage or rips or tears. Sleeve damage shall be repaired immediately with tape or additional plastic sheeting.

b. Any damage shall be noted and immediately reported to the Owner, the GCL Manufacturer, and to the carrier that transported the material. Any roll or portion thereof, which, in the judgement of the Owner, is seriously damaged, shall be removed from the project site and replaced with complying material at no additional cost to the Owner.

302. PREPARATION OF SURFACE TO BE LINED

302.1 The Earthwork Contractor shall be responsible for the initial preparing and maintaining of the surfaces to be lined as specified in the Section 319005 prior to placement of the GCL.

302.2 The Geosynthetics Contractor shall provide written certification to both the Earthwork Contractor and the Owner that the surface on which the GCL is to be installed is acceptable. The surface then becomes the responsibility of the Geosynthetics Contractor.

302.3 The surface upon which the GCL is to be placed shall be free of standing water and maintained in a firm, clean and smooth condition during liner installation.

303. FIELD PLACEMENT OF THE GEOSYNTHETIC CLAY LINER

303.1 Weather:

a. GCL shall not be placed during a rainfall or snowfall, in ponded water, or during high winds.

303.2 Panel Layout:

a. Horizontal panel seams are not allowed on slopes, except as required at the intersection of two slopes (valley). All panel seams on slopes shall be parallel to the flow line down the slope.

b. The panels shall be placed in accordance with the GCL Manufacturer’s panel layout drawing to ensure that they are placed in the proper direction for overlapping.

c. If panels are installed in a location other than indicated on the panel layout drawing, the revised location shall be indicated on an “as-built” layout drawing prepared by the Geosynthetics Contractor. The as-built record drawing of the panel layout shall be submitted to the Owner at the completion of the project.

304. PANEL DEPLOYMENT

304.1 The rolls of GCL shall be brought to the area to be lined with a front-end loader and support pipes set up such that the GCL roll is fully supported across its length and freely suspended so that it can unroll freely. The core bar and spreader bar shall not flex or bend excessively when a full roll is lifted.

304.2 Any rutting of the subgrade (i.e., Structural Fill) shall be smoothed and leveled prior to covering that area with GCL.

304.3 Deploy only as much GCL as can be covered with the HDPE geomembrane liner by the end of the day or in a reasonably short time in the event of precipitation.

304.4 The anchor trench for the area to be lined shall be excavated before installation of the GCL begins.

304.5 The cap material (non-woven geotextile) shall face upwards, toward the installer. The GCL shall be placed over the prepared surface in such a manner as to assure minimum handling.

304.6 Installation shall begin at a high elevation and proceed to a low elevation.

304.7 Pulling GCL panels shall be minimized to reduce the chance of permanent tension.

304.8 Wrinkles shall be minimized. However, enough slack shall be provided in both directions so that there will be no tension in the GCL at the lowest expected operating temperature.

305. PRECAUTIONS TO PREVENT WIND DAMAGE

305.1 When possible, work shall be oriented in the direction of the prevailing wind.

305.2 Provide adequate temporary anchoring of the edges of the exposed sheets using sandbags, tires, or other means which will not damage the GCL to prevent uplift of the GCL by wind.

306. OTHER PRECAUTIONS TO PREVENT DAMAGE

306.1 Protection of the GCL from damage due to foot traffic on the slopes shall be provided.

306.2 Provisions of facilities for safe entrance and egress of employees from sloped depressions shall be provided.

307. FIELD SEAMING

307.1 General Requirements for Seaming:

a. Horizontal seams shall be located not less than five (5) feet from the toe of the slope.

b. On slopes, all runs shall be continuous with the long dimension of all panels oriented parallel to the slope.

c. Panels placed on the basin floor require no particular orientation.

d. Once the first run has been laid, adjoining runs shall be laid with a six (6) inch minimum overlap on the longitudinal seams and twenty-four (24) inch minimum overlap on end seams. If the GCL Manufacturer recommends larger overlap seams, then the GCL Manufacturer’s recommendations shall be followed.

e. The edges of GCL panels shall be adjusted to smooth out wrinkles, creases, or “fishmouths” in order to maximize contact with the underlying panel.

f. If the air temperature is higher than 85°F and the humidity is low, contraction may occur soon after placement when no confining stress has been placed over the GCL. To allow for the possibility of contraction under these conditions, the minimum seam overlap shall be increased to a minimum of twelve (12) inches on longitudinal seams and thirty-six (36) inches on end seams, or to 4% of the distance to the next parallel seams, whichever is greater.

307.2 Seaming:

a. Seaming shall be performed in accordance with the GCL Manufacturer's accepted procedure.

b. All seams shall be formed by executing a bentonite-enhanced overlap to ensure that a continuous seal is achieved.

c. The side of the overlying panel shall be pulled back to expose and examine the overlap areas. Seam overlap areas shall be clean and free from moisture, free from dust and debris of any kind before seaming is started. Any contamination shall be removed.

d. A fillet of dry granular bentonite shall be poured in a continuous manner along the overlap zone (between the edge of the panel and the six-inch line) at a rate of at least one-quarter pound per linear foot.

e. Seam overlap on the bottom shall be placed such that the direction of flow is from the top sheet to the bottom sheet to form a shingle effect and prevent flow into the seam.

308. SEALING AROUND AND AGAINST EXISTING STRUCTURES

308.1 The GCL shall be sealed to the existing structures within the Bypass Basin.

308.2 A wedge of GB shall be installed at the point of intersection of an existing structure and the basin floor or sideslope. This GB wedge shall be placed between the existing liner and the new GCL and shall be at least 1.0 lbs per foot.

308.3 At the intersection of the GCL and an existing structure, the GCL shall extend higher on the structure than the termination point for the existing geomembrane liner.

308.4 If the attachment hardware for the existing geomembrane liner are sharp or protrude to the extent that they could damage the GCL, a supplement HDPE geomembrane rub sheet shall be installed between the GCL and existing attachment hardware.

308.5 Vertical GCL shall be anchored to an existing structure at an elevation higher than the existing HDPE geomembrane liner and lower than the new HDPE geomembrane liner as shown on the Design Drawings. As an alternate, the Geosynthetics Contractor may propose a self-adhering GCL product that demonstrates similar properties to the base GCL in accordance with GCL Manufacturer's written recommendations.

309. INSPECTION

309.1 After seaming is complete, the Geosynthetics Contractor and the CQA Contractor shall conduct a detailed walkdown to visually check all seams and non-seam areas of the GCL.

309.2 All defects, holes, blisters, tears and signs of damage during installation shall be marked for repair.

310. PATCHING AND REPAIRS

310.1 Patching shall be used to repair small defects, blisters, holes, and tears.

310.2 All dirt and debris present in the patched area shall be removed.

310.3 All patches shall be round or oval or shall have rounded corners.

310.4 All patches shall be made of the base GCL and shall extend a minimum of twelve (12) inches beyond the edges of the defect. Accessory bentonite shall be placed around the perimeter of the affected area at a rate of one-half pound per lineal foot prior to placing the patch. Adhesive, such as wood glue, may be used if necessary to secure the patch.

311. CREST ANCHORAGE

311.1 The GCL shall be anchored in an anchor trench at the top of the slope.

311.2 Prior to the placement of the GCL, the Earthwork Contractor shall excavate the crest anchor trench to the lines and widths shown on the Design Drawings and in accordance with the excavation, shaping, and backfilling requirements specified in Section 319005.

312. PROTECTIVE COVER

312.1 The GCL shall be covered the same day with the HDPE geomembrane liner as shown on the Design Drawings in accordance with Section 319020. Precautions shall be taken to prevent damage to the GCL by restricting heavy equipment traffic.

312.2 To prevent premature contraction or hydration, only the amount of GCL that can be installed, inspected, repaired, and covered in the same day shall be installed.

312.3 Any leading edge or panels of GCL left unprotected shall be covered with a heavy, waterproofing tarp which is adequately secured and protected with sand bags or other ballast.

313. ACTIVATION OF GCL

313.1 Pre-hydration of the GCL is not required or allowed.

END OF SECTION 319025

SECTION 319050

LEACHATE COLLECTION AND REMOVAL SYSTEM

PART 1 - GENERAL

101. EXTENT

101.1 This section defines the minimum material and installation requirements for the components of the Bypass Basin's new leachate collection and removal system (LCRS) including high-density polyethylene (HDPE) leachate collection and sideslope riser pipes, Coarse Aggregate Bedding Material, Sand Filter Layer material, Protective Warning Layer material, Riprap Bedding Layer material, and riprap, all in accordance with the Design Drawings and as specified herein.

101.2 The components and dimensions of the LCRS are shown on the Design Drawings. The division of work shall include, but not be limited to, the following items:

a. The following items shall be furnished and installed by the Earthwork Contractor:

a1. Coarse Aggregate Bedding Material.

a2. Sand Filter Layer.

a3. Protective Warning Layer.

a4. Perforated leachate collection pipe.

a5. Solid sideslope riser pipe and cover.

b. The following items shall be furnished and installed by the Geosynthetics Contractor in accordance with Sections 319020 and 319025:

b1. HDPE geomembrane.

b2. HDPE scruff strips.

b3. Drainage geocomposite.

b4. Geotextiles.

b5. Geosynthetic clay liner (GCL).

c. The following items will be furnished and installed by Others:

c1. Wheeled submersible pump with flexible hose.

c2. Flowmeters.

c3. Control station for pumps and meters.

c4. Electrical and instrument conduit.

101.3 Definitions:

a. The following definitions of terms shall apply throughout this section:

a1. Pipe Manufacturer: The manufacturer who is responsible for manufacture of LCRS pipe materials and fittings and for transporting these materials to the site.

102. RELATED WORK SPECIFIED IN OTHER SECTIONS AND SPECIFICATIONS

102.1 The work specified in this section shall be coordinated with work specified in the following related sections and specifications:

a. GW Specification (P-1400):

a1. Section 319005 – Earthwork.

a2. Section 319020 – High-Density Polyethylene Geomembrane Liner with Geocomposite.

a3. Section 319025 – Geosynthetic Clay Liner.

b. CQA Specification (P-1401):

b1. Section 014362 – Quality Assurance for Fill, Liner, and Leachate Collection Materials.

103. REFERENCE DOCUMENTS

103.1 Standards, specifications, manuals, codes and other publications of nationally recognized organizations and associations are referenced herein. Methods, equipment, and materials specified herein shall comply with the specified and applicable portions of the referenced documents in addition to federal, state, or local codes having jurisdiction.

103.2 References to these documents are to the latest issue date of each document, unless otherwise indicated, together with the latest additions, addenda, amendments, supplements, etc., thereto, in effect as of the date of Contract for the Work.

103.3 Abbreviations listed indicate the form used to identify the reference documents cited in this section.

103.4 ASTM – ASTM International:

a. D2434 Standard Test Method for Permeability of Granular Soils (Constant Head)

b. D2487 Standard Practice for Classification of Soils for Engineering Purposes.

c. D2513 Standard Specification for Thermoplastic Gas Pressure Pipe, Tubing, and Fittings

d. D2657 Standard Practice for Heat Fusion Joining of Polyolefin Pipe and Fittings.

e. D3261 Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.

f. D6473 Standard Test Method for Specific Gravity and Absorption of Rock for Erosion Control

g. D6825 Standard Guide for Placement of Riprap Revetments

h. F714 Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Outside Diameter.

103.5 IDOT – Illinois Department of Transportation:

a. Standard Specifications for Road and Bridge Construction (Adopted January 1, 2022).

103.6 ITP – Illinois Test Procedure:

a. 27 Sieve Analysis of Fine and Coarse Aggregates

b. 96 Resistance by Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

c. 104 Soundness of Aggregate by Use of Sodium Sulfate

d. 203 Deleterious Particles in Coarse Aggregate

103.7 NSF – National Sanitation Foundation International:

a. NSF Listings: Plastics and Plumbing System Components.

104. SUBMITTALS

104.1 The GW Contractor shall submit drawings and data at least 30 days prior to use. The GW Contractor's drawings and data shall be submitted via electronic medium in a format compatible for importing into the Owner's information systems specified by the Owner.

104.2 Submittals with Bid Proposal:

a. HDPE Pipe:

a1. Pipe Manufacturer's name, address, and telephone number.

a2. Pipe Manufacturer's literature providing specifications of the pipes that will be supplied for the project.

a3. Pipe Manufacturer's signed certification that the pipes that will be supplied comply with the requirements of this Specification.

a4. Pipe Manufacturer's signed certification that no reclaimed polymer has been added to the resin.

104.3 Submittals After Award:

a. Coarse Aggregate Bedding Material:

a1. At least 30 days prior to scheduled delivery, the Earthwork Contractor shall submit certificates for the Coarse Aggregate Bedding Material signed by the supplier or a qualified geotechnical engineering consultant certifying that the following items comply with or exceed specifications for the material:

Property	Standard(1)	Data Required
a1.1 Sieve Analysis	ITP 27	Percent Passing Selected Sieves
a1.2 Na_2SO_4 Soundness 5 Cycle	ITP 104	Percent Loss Max.
a1.3 Los Angeles Abrasion	ITP 96	Percent Loss Max.
a1.4 Deleterious Materials	ITP 203	Shale, Percent Max. Clay Lumps, Percent Max. Soft & Unsound Fragments, Percent Max. Other Deleterious, Percent Max. Total Deleterious, Percent Max.

Note:

(1) Test results shall be provided on two random samples taken from each borrow area. If processing of borrow area material is required to meet material specifications, the tests shall be performed on the process material.

b. Sand Filter Layer Material:

b1. At least 30 days prior to scheduled delivery, the Earthwork Contractor shall submit certificates for the Sand Filter Layer material signed by the supplier or a qualified geotechnical engineering consultant certifying that the following items comply with or exceed specifications for the material:

Property	Standard(1)	Data Required
b1.1 Classification of Material	ASTM D2487	Classification
b1.2 Sieve Analysis	ITP 27	Percent Passing Selected Sieves
b1.3 Hydraulic Conductivity	ASTM D2434	Hydraulic Conductivity

Note:

(1) Test results shall be provided on two random samples taken from each borrow area. If processing of borrow area material is required to meet material specifications, the tests shall be performed on the process material.

c. Protective Warning Layer Material:

c1. At least 30 days prior to scheduled delivery, the Earthwork Contractor shall submit certificates for the Protective Warning Layer material signed by the supplier or a qualified geotechnical engineering consultant certifying that the following items comply with or exceed specifications for the material:

Property	Standard(1)	Data Required
c1.1 Sieve Analysis	ITP 27	Percent Passing Selected Sieves
c1.2 Na_2SO_4 Soundness 5 Cycle	ITP 104	Percent Loss Max.
c1.3 Los Angeles Abrasion	ITP 96	Percent Loss Max.

Note:

(1) Test results shall be provided on two random samples taken from each borrow area. If processing of borrow area material is required to meet material specifications, the tests shall be performed on the process material.

d. Riprap Bedding Layer Material:

d1. At least 30 days prior to scheduled delivery, the Earthwork Contractor shall submit certificates for the Riprap Bedding Layer material signed by the supplier or a qualified geotechnical engineering consultant certifying that the following items comply with or exceed specifications for the material:

Property	Standard(1)	Data Required
d1.1 Sieve Analysis	ITP 27	Percent Passing Selected Sieves
d1.2 Na_2SO_4 Soundness 5 Cycle	ITP 104	Percent Loss Max.
d1.3 Los Angeles Abrasion	ITP 96	Percent Loss Max.
d1.4 Deleterious Materials	ITP 203	Shale, Percent Max. Clay Lumps, Percent Max. Soft & Unsound Fragments, Percent Max. Other Deleterious, Percent Max. Total Deleterious, Percent Max.

Note:

(1) Test results shall be provided on two random samples taken from each borrow area. If processing of borrow area material is required to meet material specifications, the tests shall be performed on the process material.

e. Riprap:

e1. At least 30 days prior to scheduled delivery, the Earthwork Contractor shall submit certificates for the riprap material signed by the supplier or a qualified geotechnical engineering consultant certifying that the following items comply with or exceed specifications for the material:

Property	Standard(1)	Data Required
e1.1 Sieve Analysis	ITP 27	Percent Passing Selected Sieves
e1.2 Na_2SO_4 Soundness 5 Cycle	ITP 104	Percent Loss Max.

Note:

(1) Test results shall be provided on two random samples taken from each borrow area. If processing of borrow area material is required to meet material specifications, the tests shall be performed on the process material.

104.4 Submittals Upon Shipment:

a. HDPE Pipe:

a1. Copies of Pipe Manufacturer's QA/QC certificates on tests performed during fabrication.

104.5 Submittals After Construction is Complete:

a. HDPE Pipe:

a1. Logs indicating the location of each joint that did not pass visual examination and the work done to correct improper fusion weld.

105. QUALITY ASSURANCE

105.1 Materials and construction procedures shall be subject to inspection and testing by the CQA Contractor employed by the Owner. Such inspections and tests will not relieve the Earthwork Contractor of the responsibility of providing and placing materials in compliance with specified requirements.

105.2 The Owner reserves the right, at any time before final acceptance, to reject materials or workmanship not complying with specified requirements. The Earthwork Contractor shall correct the deficiencies which the inspections and tests have indicated are not in compliance with specified requirements.

105.3 CQA activities shall be performed as described herein and in Specification P-1401.

PART 2 - PRODUCTS

201. PIPE

201.1 Pipe Materials:

a. Leachate Collection Pipe and Sideslope Riser shall meet the general and material requirements presented in Table 319050-1.

201.2 Pipe Requirements:

a. Gravity leachate collection piping shall be single wall piping.

201.3 Fittings:

a. All fittings shall be prefabricated and manufactured by the same manufacturer as the pipe.

TABLE 319050-1
MATERIAL REQUIREMENTS FOR LEACHATE COLLECTION PIPE

General Requirements for Leachate Collection Pipes & Fittings	
Item	Leachate Collection Pipe
Service	Leachate Collection
Location	Leachate Collection Trench
Material	Perforated High-Density Polyethylene, Thermal Butt Fusion Welded Joints(1)
Listing	NSF Listed and Approved
Rating	Maximum Working Temperature: Ambient Maximum Working Pressure: Atmospheric

Material Requirements for Leachate Collection Pipes & Fittings			
Item	**ASTM Test Method**	**Size (in.)**	**Remarks**
Pipe(1)	ASTM F714, Pipe Grade PE4710 Resin	6	SDR 11
Joints	Not Applicable	All	Thermal Butt Fusion Welded
Fittings(2): 30°, 45°, 60°, and 90° Bends	ASTM D2513 and ASTM D3261	6	SDR 11 (reduced pressure) Injection molded butt fittings from same resins as pipe.
Fittings(2): Tees, Wyes, and Reducers	Not Applicable	6	SDR 11 (reduced pressure) Mitered fittings fabricated from angular cut sections of pipe.
Cleanout	Not Applicable	6	Lockable Cap

Approved Manufacturers of Leachate Collection Pipes and Fittings		
Manufacturer	**Trade Name**	**Size Range (in.)**
Chevron Phillips Chemical Company	Performance Pipe DriscoPlex® 4100	6
KWH Pipe	Sclairpipe	6
JM Eagle	HDPE Water Sewer C906	6
Others as Approved by the Owner	--	--

Notes:

(1) Solid or perforated pipe shall be provided as specified on the Design Drawings. Perforated pipe shall be perforated in accordance with the details shown on the Design Drawings.
(2) Fittings are reduced pressure rating fittings.

202. COARSE AGGREGATE BEDDING MATERIAL:

a. The bedding material for the leachate collection pipe shall be washed gravel or washed crushed coarse aggregate. Crushed slag or Portland cement concrete shall not be used.

b. The gradation for Coarse Aggregate Bedding Material shall conform to Gradation CA 7 in accordance with Paragraph 1004.01(c) of the IDOT Standard Specifications for Road and Bridge Construction.

c. The material quality for Coarse Aggregate Bedding Material shall be Class B or better in accordance with Paragraph 1004.01(b) of the IDOT Standard Specifications for Road and Bridge Construction.

203. SAND FILTER LAYER MATERIAL:

a. The “Sand Filter Layer” placed on top of the HDPE geonet and geotextile shall be composed of washed sand imported from an offsite borrow source, which shall be identified by the Earthwork Contractor and approved by the Owner, that is processed to meet the following requirements:

a1. The material shall be classified as SP, SM, or SP-SM in the Unified Soil Classification System, ASTM D2487.

a2. The material shall conform to Gradations FA 1 or FA 2 in accordance with Paragraph 1003.01(c) of the IDOT Standard Specifications for Road and Bridge Construction.

a3. The material shall have a permeability of greater than 1×10^{-5} cm/sec when tested in accordance with ASTM D2434.

a4. The material shall be free from all organic material and deleterious material.

a5. Fine aggregate produced by crushing slag or Portland cement concrete is not acceptable.

204. PROTECTIVE WARNING LAYER MATERIAL:

a. The “Protective Warning Layer” placed on top of the Sand Filter Layer along the basin floor shall be composed of gravel, crushed gravel, or crushed stone imported from an offsite borrow source, which shall be identified by the Earthwork Contractor and approved by the Owner, that is processed to meet the following requirements:

a1. The material shall conform to Gradation CA 6 in accordance with Paragraph 1004.01(c) of the IDOT Standard Specifications for Road and Bridge Construction.

a2. The material quality for Protective Warning Layer material shall be Class D or better in accordance with Paragraph 1004.01(b) of the IDOT Standard Specifications for Road and Bridge Construction.

205. RIPRAP BEDDING LAYER MATERIAL

a. The “Riprap Bedding Layer” placed on top of the Sand Filter Layer along the basin side slopes shall be composed of gravel, crushed gravel, or crushed stone imported from an offsite borrow source, which shall be identified by the Earthwork Contractor and approved by the Owner, that meets the following requirements:

a1. The material shall conform to Gradation CA 16 in accordance with Paragraph 1004.01(c) of the IDOT Standard Specifications for Road and Bridge Construction.

a2. The material quality for Riprap Bedding Layer material shall be Class B or better in accordance with Paragraph 1004.01(b) of the IDOT Standard Specifications for Road and Bridge Construction.

206. RIPRAP

a. Riprap placed along the basin side slopes shall consist of quarried or crushed stone imported from an offsite borrow source, which shall be identified by the Earthwork Contractor and approved by the Owner, that meets the following requirements:

a1. Riprap stones shall have 100% of all faces angular or crushed and shall be free from structural defects, laminations, seams, weak cleavage planes, and undesirable effects of weathering. Stone containing shale, unsound sandstone, or any other material which will readily disintegrate under handling and placing or under weathering shall not be used. All riprap material shall be clean and free from deleterious material and impurities, including but not limited to earth, clay, and refuse.

a2. Riprap material shall conform to Gradation RR 2 in accordance with Paragraph 1005.01(c) of the IDOT Standard Specifications for Road and Bridge Construction.

a3. Riprap material shall meet Quality A requirements in accordance with Paragraph 1005.01(b) of the IDOT Standard Specifications for Road and Bridge Construction, except that the bulk specific gravity of the riprap shall not be less than 2.55 per ASTM D6473 (approximate unit weight of 160 pounds per cubic foot).

a4. Riprap color shall be gray unless otherwise approved by the Owner.

PART 3 - EXECUTION

301. LEACHATE COLLECTION AND SIDESLOPE RISER PIPE INSTALLATION

301.1 The perforated leachate collection pipe and solid wall sideslope riser pipe shall be installed according to the elevations and locations indicated on the Design Drawings.

301.2 The maximum vertical variation from the correct profile and section shall not exceed ±0.1 ft. The slope of each pipeline shall not vary from the specified slopes by more than ±0.1%. The Earthwork Contractor shall regrade any area which does not meet the specified tolerances.

301.3 The perforated leachate collection pipe shall have two rows of 1/2-inch diameter perforations spaced 6 inches apart along the length of the pipe. The perforations shall face down in the collection and cleanout trenches.

301.4 All PE pipes shall be joined by the thermal butt-fusion process described in Article 302. The inside of the pipe shall be ground smooth so that it will not impede the sliding of the pumps.

301.5 The Earthwork Contractor shall provide hydraulic jet cleaning of all pipelines following installation. The jet cleaning shall verify that each pipe is intact and unobstructed. Defects in any pipeline identified by the cleaning process shall be repaired by the Earthwork Contractor.

302. WELDING AND TESTING OF HDPE PIPE JOINTS

302.1 Joints for HDPE Pipe:

a. HDPE pipe shall be joined together by the thermal butt fusion method in accordance with ASTM D2657 Procedure 2. Fittings shall be fabricated to provide a smooth inside surface. The hot plate butt fusion procedure shall be performed using apparatus recommended by the Pipe Manufacturer and which complies with ASTM D2657.

302.2 Bent Strap Test

a. Test Requirements:

a1. A bent strap test shall be made on each diameter of pipe prior to the start of joint welding procedures. A test joint shall be made and a specimen cut from the joint and destructively tested to confirm fusion joint integrity, operator procedure, and fusion machine settings, including temperature and pressure.

a2. Additional bent strap tests may be required by the Owner and/or CQA Contractor during the joint welding process if it is found that the joints of unacceptable quality are being made. These tests shall be used to adjust fusion machine settings and/or operator procedures as required. Test joints shall be prepared at no additional cost to the Owner.

b. Test Procedure:

b1. Using waste pieces of pipe, a joint specimen shall be prepared and then butt fusion welded and allowed to cool to ambient temperature.

b2. A test strap shall be cut from the specimen:

b2.1 The width of the strap shall be 1-1/2 times the pipe wall thickness, but not less than one inch.

b2.2 The length of the strap on each side of the fusion weld shall be 15 times the pipe wall thickness, but not less than six inches.

b3. The cut shall be bent so that the ends of the strap touch. If any separation, cracks or voids are observed, the fusion is unacceptable and indicates poor fusion quality.

b4. If failure occurs, fusion procedures and/or machine settings shall be changed, and a new trial fusion weld and new bent strap specimen shall be prepared and tested.

b5. The CQA Contractor shall witness all bent strap tests.

b6. Field fusion of pipe shall not proceed until a test joint has passed the bent strap test and visual inspection indicates that the fusion beads and “V” groove are the correct size.

303. VISUAL INSPECTION OF HDPE PIPE DURING INSTALLATION

303.1 General:

a. The Earthwork Contractor shall visually inspect all pipes during installation for:

a1. Verification that all perforated pipe has been placed with the perforations facing down.

a2. Surface damage.

a3. Weld quality.

303.2 Surface Damage:

a. Surface damage to a pipe that occurs during handling or installation shall be minimized. The maximum acceptable depth of damage is 10 percent of wall thickness of the pipe. If excessive damage occurs, the damaged portions of pipe shall be cut out and replaced. Deep, sharp notches may be filled with extudite and dressed smooth.

b. Butt fuse on misalignment shall not exceed 10 percent of the pipe wall thicknesses. Misaligned butt fusions shall be cut out and redone.

303.3 Butt-Fusion Joint Weld Quality:

a. All butt fusion welded joints shall be visually inspected to ensure joint quality. The size and shape of the fusion beads shall be used as an indicator of joint quality. Specifically:

a1. The double bead width shall be 2 to 2-1/2 times the height of the bead measured from the pipe surface.

a2. Both beads shall be uniform in size and shape around the joint.

a3. The depth of the “V” between the two beads shall not be more than half the bead height.

b. If the “V” groove is too deep a “cold” fusion may have occurred (uneven heating or insufficient heating time, or excessive pressure during heating or during joining). A non-uniform bead shape around the pipe indicates uneven heating.

c. A joint with cold fusion or a non-uniform bead is a poor quality joint that shall be removed (i.e., cut-out) and remade.

304. INSTALLATION OF GRANULAR AND RIPRAP MATERIALS

304.1 “Granular Materials” in this article include Coarse Aggregate Bedding Material, Sand Filter Layer material, Protective Warning Layer material, and Riprap Bedding Layer material.

304.2 Acceptable Placement Methods:

a. Acceptable placement methods for Granular Materials include:

a1. Using a conveyor truck to place material from outside of the basin.

a2. Using a crane to place material from outside of the basin.

a3. Transporting material into the basin to the point of dumping using trucks or scrapers.

a4. Alternate placement method(s) proposed by the Earthwork Contractor and approved by the Owner.

b. Requirements for Transportation of Granular and Riprap Materials into Basin:

b1. Under no circumstances shall there be direct equipment travel over any geosynthetic material (GCL, geomembrane, geotextile, geonet, etc.).

b2. Equipment transporting material into the basin shall use the permanent ramp along the basin’s east dike. Structural Fill shall be installed above the existing HDPE geomembrane liner along the ramp surface as detailed on the Design Drawings and as specified in Section 319005 before any equipment uses the ramp to access the basin floor.

b3. Only earthmoving equipment with low ground pressure shall be used to transport material inside of the basin. The Earthwork Contractor shall demonstrate that equipment entering the basin will not exert a ground pressure greater than 8 psi. The ground pressure is influenced by the tread pattern / tire contact area and is not the reading from a tire pressure gauge.

b4. Equipment operating within the basin shall avoid hard braking on ramps and avoid sharp turns or quick stops that could pinch or tear the geosynthetic materials.

b5. The Sand Filter Layer, Protective Warning Layer, and Riprap Bedding Layer Materials shall be placed by the “dump and spread” method in which appropriate lightweight equipment with low ground pressure are used to spread the material.

b6. No travel over piping shall be allowed without sufficient protection of the piping.

b7. Material placement over geosynthetic materials during periods of warm weather can cause wrinkling in the geosynthetic materials. The wrinkling effect can cause damage to the geosynthetic materials. Placement of Granular Materials shall be halted when the air temperature is greater than 85°F or less than 40°F.

b8. When Sand Filter Layer, Protective Warning Layer, or Riprap Bedding Layer materials are being placed, a worker shall walk alongside earthmoving equipment spreading the material to spot and remove all rocks, stones, roots, and other debris that may be remaining in the materials that could cause damage to a geosynthetic material.

b9. Placement of Granular Materials and riprap on the basin's side slopes shall begin at the toe of the slope and proceed up the slope.

304.3 Placement of Coarse Aggregate Bedding Material:

a. Coarse Aggregate Bedding Material shall be placed under and around the leachate collection and sideslope riser pipes to the thicknesses shown on the Design Drawings.

b. All piping shall be installed over an initial layer of Coarse Aggregate Bedding Material. After a pipe is installed, Coarse Aggregate Bedding Material shall be placed by hand beneath the haunches and above the pipe and compacted to ensure complete and uniform support of the pipe.

304.4 Placement of Sand Filter Layer Material:

a. Installation of the Sand Filter Layer shall not begin until Geosynthetics Contractor has finished installing the non-woven geotextile and HDPE geonet components of the LCRS, the CQA Contractor has finished inspecting those geosynthetic components of the LCRS, and the area has been released to the Earthwork Contractor in writing to proceed.

b. Sand Filter Layer material shall be placed in a single layer to the thickness shown on the Design Drawings without compaction or working of the material that could cause intrusion through the non-woven geotextile into the underlying HDPE geonet.

c. The Sand Filter Layer shall be fine graded using low ground pressure equipment.

304.5 Placement of Protective Warning Layer Material:

a. Protective Warning Layer materials shall be placed to the thickness shown on the Design Drawings.

b. Compaction:

b1. Protective Warning Layer materials shall be placed and maintained to a uniform thickness, free of ruts and irregularities.

b2. The Protective Warning Layer shall be compacted by a minimum of four passes in each direction (perpendicular to each other) by the equipment spreading the material. The upper surface shall then be compacted with a minimum of four passes each way by a vibratory drum roller with a minimum static weight of 13 tons.

b3. Acceptance of the fill shall be based on ruts less than 1 inch between the last successive passes. Compaction testing is not required.

c. The Protective Warning Layer shall be fine graded using low ground pressure equipment.

304.6 Placement of Riprap Bedding Layer Material:

a. Riprap Bedding Layer materials shall be placed to the full thickness shown on the Design Drawings in one operation using methods which will not cause segregation of particle sizes.

b. Riprap Bedding Layer materials shall not be dropped onto the underlying Sand Filter Layer from a height exceeding 3 feet.

c. Compaction of the Riprap Bedding Layer is not required; however, the surface shall be reasonably even and free from mounds or windrows.

d. The Riprap Bedding Layer shall be fine graded using low ground pressure equipment.

304.7 Placement of Riprap:

a. Riprap shall be placed in general accordance with the methods described in ASTM D6825 in designated areas to the lines, grades, and thickness specified on the Design Drawings. Riprap shall be placed to the full thickness in one operation.

b. Riprap placement operations – including handling, stockpiling, and transporting – shall be accomplished in such a manner as to produce a reasonably well graded mass of rock with minimum percentage of voids, free from objectionable pockets of small stone and clusters of large stones. The larger stones shall be well distributed and the entire mass of stones in their final positions shall be roughly graded to conform to the gradation specified.

c. Riprap shall be placed by dragline, clamshell, appropriately-sized excavators, or similar equipment, which shall be operated so as to place each load of material in approximately its final position without reworking and without excessive height drop (i.e., more than 12 inches).

d. Placing riprap in layers is not permitted.

e. Placing stones by dumping into chutes or other methods, which cause segregation of various stone sizes, is not permitted.

304.8 Grading Tolerances:

a. Horizontal and vertical tolerances for the Sand Filter Layer and Protective Warning Layer shall be as specified in Table 319050-2.

b. Thickness determination of riprap and Riprap Bedding Layer materials will be made at points selected by the CQA Contractor. When the average constructed thickness is less than the thickness specified on the Design Drawings, additional material shall be added to obtain the specified thickness at no additional cost to the Owner.

304.9 Reporting Damage:

a. If damage occurs (or is suspected to have occurred) to any portion of the LCRS, composite liner system, or existing HDPE geomembrane liner under the composite liner system while placing Granular Materials, the Earthwork Contractor shall report the damage(s) to the Owner immediately so that repairs can be performed without delay.

b. Repairs to a geosynthetic material shall be made as specified in the Section 319020. The Geosynthetics Contractor shall perform all geosynthetic repair work at no additional cost to the Owner.

c. Repairs to components of the LCRS shall be repaired as specified herein. The Earthwork Contractor shall perform all LCRS repair work at no additional cost to the Owner.

TABLE 319050-2
ACCEPTABLE DEVIATIONS FROM DESIGN LINES AND GRADES

Type of Installation (Excavation or Fill)	Maximum Acceptable Deviation from Line (feet)	Maximum Acceptable Deviation from Grade[1] (feet)
Granular Materials		
Top of Sand Filter Layer	±0.3	+0.1 to -0.0
Top of Protective Warning Layer		
Top of Riprap Bedding Layer		

END OF SECTION 319050

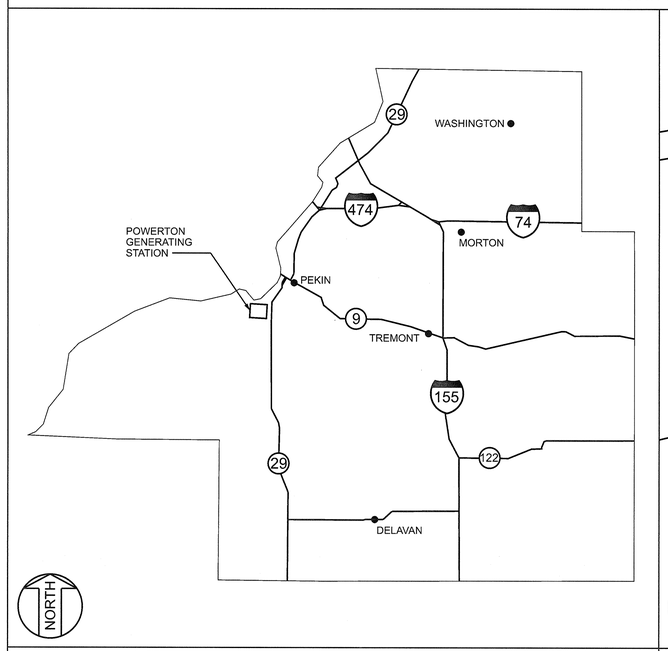
ATTACHMENT 1

DESIGN DRAWINGS

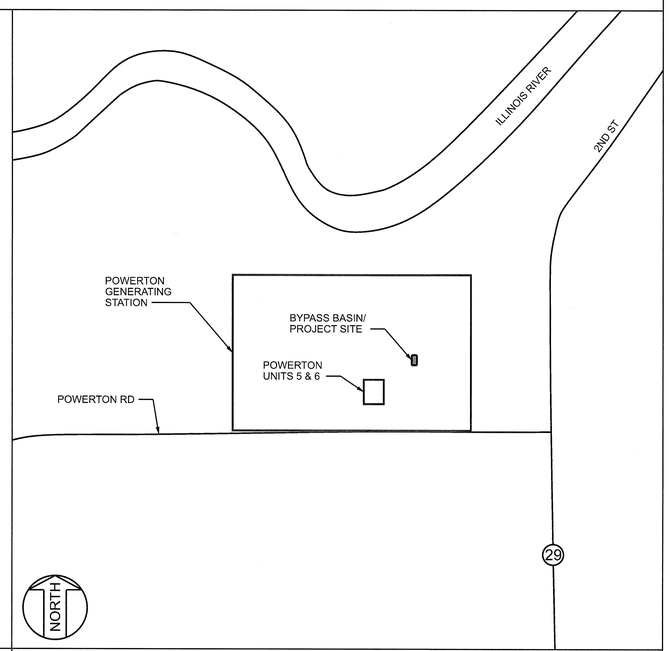
DRAWING NO.	REV.	TITLE
POW-BBR-CSK-001	C	BYPASS BASIN RETROFIT COVER SHEET
POW-BBR-CSK-002	C	BYPASS BASIN RETROFIT GENERAL NOTES
POW-BBR-CSK-003	C	BYPASS BASIN EXISTING CONDITIONS
POW-BBR-CSK-004	C	BYPASS BASIN EXCAVATION PLAN
POW-BBR-CSK-005	C	BYPASS BASIN EXCAVATION SECTIONS & DETAILS
POW-BBR-CSK-006	C	RETROFITTED BYPASS BASIN STRUCTURAL FILL GRADING PLAN
POW-BBR-CSK-007	C	RETROFITTED BYPASS BASIN COMPOSITE LINER & LEACHATE COLLECTION SYSTEM PLAN
POW-BBR-CSK-008	C	RETROFITTED BYPASS BASIN SECTIONS & DETAILS
POW-BBR-CSK-009	B	RETROFITTED BYPASS BASIN INLET & OUTLET STRUCTURE DETAILS SHEET 1
POW-BBR-CSK-010	B	RETROFITTED BYPASS BASIN INLET & OUTLET STRUCTURE DETAILS SHEET 2

MIDWEST GENERATION, LLC
POWERTON GENERATING STATION
BYPASS BASIN RETROFIT PROJECT

VICINITY MAP



TAZEWELL COUNTY MAP (N.T.S)



SITE LOCATION ENLARGED PLAN (N.T.S)

PREPARED FOR:
MIDWEST GENERATION, LLC
POWERTON GENERATING STATION
13082 E. MANITO RD.
PEKIN, IL 61554

PREPARED BY:
SARGENT & LUNDY
55 E. MONROE ST.
CHICAGO, IL 60603

POWERTON BYPASS BASIN RETROFIT PROJECT DRAWING LIST	
DWG NO.	DRAWING TITLE
POW-BBR-CSK-001	BYPASS BASIN RETROFIT COVER SHEET
POW-BBR-CSK-002	BYPASS BASIN RETROFIT GENERAL NOTES
POW-BBR-CSK-003	BYPASS BASIN EXISTING CONDITIONS
POW-BBR-CSK-004	BYPASS BASIN EXCAVATION PLAN
POW-BBR-CSK-005	BYPASS BASIN EXCAVATION SECTIONS & DETAILS
POW-BBR-CSK-006	RETROFITTED BYPASS BASIN STRUCTURAL FILL GRADING PLAN
POW-BBR-CSK-007	RETROFITTED BYPASS BASIN COMPOSITE LINER & LEACHATE COLLECTION SYSTEM PLAN
POW-BBR-CSK-008	RETROFITTED BYPASS BASIN SECTIONS & DETAILS
POW-BBR-CSK-009	RETROFITTED BYPASS BASIN INLET & OUTLET STRUCTURE DETAILS SHEET 1
POW-BBR-CSK-010	RETROFITTED BYPASS BASIN INLET & OUTLET STRUCTURE DETAILS SHEET 2

FOR PERMIT
NOT FOR CONSTRUCTION

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UNDERGROUND OR EMBEDDED UTILITIES MAY BE LOCATED WITHIN OR ADJACENT TO THE AREA IN WHICH EXCAVATION, DEMOLITION, FOUNDATION, OR MODIFICATION WORK IS TO BE PERFORMED.

REFERENCES RELATING TO THE UNDERGROUND OR EMBEDDED UTILITIES ARE PROVIDED TO ASSIST THE CONTRACTOR/INSTALLER IN THE FIELD LOCATING THOSE UTILITIES AND OTHER POSSIBLE UNDERGROUND OR EMBEDDED INTERFERENCES WITH THE WORK.

THE CONTRACTOR/INSTALLER SHALL EXERCISE DUE CAUTION DURING ALL EXCAVATION/FOUNDATION/DEMOLITION WORK.

HOLD INFORMATION

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B	04-15-2022	FOR PUBLIC COMMENT
C	07-15-2022	FOR PERMIT

ISSUE PURPOSE:	PERMIT
SPECIFICATION:	P-1400
PROJECT NO.:	12661-130

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF ILLINOIS.

THOMAS DEHLIN
07-15-2022

MY LICENSE RENEWAL DATE IS: 11-30-2023
PAGES OR SHEETS COVERED BY THIS SEAL:
THIS DOCUMENT ONLY.

LICENSED PROFESSIONAL ENGINEER
THOMAS J DEHLIN
062-069314
OF ILLINOIS

CAD FILE NAME:	POW-BBR-CSK-001.DGN
PREPARED BY:	J. CHAVEZ
REVIEWED BY:	T. DEHLIN
APPROVED BY:	T. DEHLIN

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MWG
Midwest Generation, LLC

PROJECT

MIDWEST GENERATION, LLC
POWERTON
GENERATING STATION
BYPASS BASIN RETROFIT PROJECT

DRAWING TITLE

BYPASS BASIN RETROFIT
COVER SHEET

DRAWING NUMBER	REVISION
POW-BBR-CSK-001	C
SHEET 1 OF 1	

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Form GDG-0401-01-08, ANSI (Imperial) MicroStation Border - Size E - 34 x 44
Revision 11A, Revision Date: 04-30-2010

GENERAL NOTES

1. ALL WORK SHALL BE PERFORMED ACCORDING TO THE REQUIREMENTS OF SPECIFICATION P-1400 UNLESS OTHERWISE NOTED ON THE DESIGN DRAWINGS.
2. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR AND HAVE CONTROL AND CHARGE OF CONSTRUCTION MEANS, METHODS, TECHNIQUES, WORK SEQUENCING, AND PROCEDURES IN CONNECTION WITH THE WORK. THE CONTRACTOR SHALL CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, COMPOSED OF THE DESIGN DRAWINGS AND SPECIFICATIONS.
3. ALL WORK DONE BY CONTRACTOR/INSTALLER PURSUANT TO THESE DRAWINGS SHALL: (A) CONFORM TO THE GOVERNING CONTRACT DOCUMENTS; (B) BE PERFORMED EXCLUSIVELY BY ITS TRAINED, COMPETENT PERSONNEL OR, WHERE PERMITTED, THAT OF ITS SUBCONTRACTOR(S); AND (C) COMPLY WITH ALL APPLICABLE SAFETY LAWS, REGULATIONS, PROGRAMS AND PRACTICES TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING THE CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUBCONTRACTOR(S)) PERFORMING THE WORK.
4. THE CONTRACTOR SHALL PERFORM INSTALLATION AND REMOVAL WORK IN A NEAT AND SKILLFUL MANNER, CAREFULLY TERMINATING WORK NEAR MATERIAL TO REMAIN IN PLACE. PRECAUTIONS SHALL BE TAKEN NOT TO DAMAGE OR DEFACE WORK, EXISTING FACILITIES, AND/OR MATERIAL TO REMAIN IN PLACE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY SUCH DAMAGE OR REPAIR THEREOF.
5. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF FEDERAL, STATE OR LOCAL CODES, STANDARDS AND SPECIFICATIONS.
6. COMPACTION:

   SEE SPECIFICATION P-1400 FOR COMPACTION AND EARTHWORK REQUIREMENTS UNLESS OTHERWISE NOTED.
7. SOIL EROSION AND SEDIMENTATION CONTROL:

   PROPER SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSTALLED TO MEET THE APPLICABLE REGULATORY CODES AND THE PERMIT REQUIREMENTS.
8. CONSTRUCTION QUALITY ASSURANCE:

   ANY WORK FOUND DEFECTIVE OR NOT IN COMPLIANCE WITH THE REQUIREMENTS OF THE PROJECT SPECIFICATIONS OR THE DESIGN DRAWINGS SHALL BE REPLACED/FIXED AT NO ADDITIONAL COST TO THE OWNER.
9. TOPOGRAPHIC MAP & COORDINATES:
   - A. THE TOPOGRAPHIC MAP OF THE PLANT SITE SHOWN ON THE DESIGN DRAWINGS WAS PREPARED IN 2008.
   - B. THE PLANT COORDINATE SYSTEM SHOWN ON THE DESIGN DRAWINGS IS BASED ON THE ILLINOIS STATE PLANE, WEST ZONE, NORTH AMERICAN DATUM OF 1983 (2011) (NAD 83/2011), U.S. SURVEY FEET.
10. HORIZONTAL AND VERTICAL CONTROL:
    - A. THE BASIS FOR HORIZONTAL CONTROL IS AS DESCRIBED IN NOTE 9.
    - B. THE BASIS FOR VERTICAL CONTROL IS THE LOCAL PLANT DATUM.
    - C. PRIOR TO BEGINNING ANY BASIN RETROFIT WORK, THE CONTRACTOR SHALL:
      - I. MAKE A TOPOGRAPHICAL ASSESSMENT TO VERIFY THE ACCURACY OF THE EXISTING SURVEY DATA SHOWN ON THE DESIGN DRAWINGS. CONTRACTOR SHALL NOTIFY THE OWNER OF THE RESULTS OF THIS ASSESSMENT IN WRITING, AND SHALL IDENTIFY ANY DIFFERENCES BETWEEN THE 2008 SURVEY AND THE CONTRACTOR'S SURVEY THAT MIGHT AFFECT THE WORK SHOWN ON THE DESIGN DRAWINGS.
      - II. FURNISH AND INSTALL A MINIMUM OF TWO BENCHMARK MONUMENTS TO PERFORM THE WORK. CONTRACTOR SHALL PROVIDE A BENCHMARK PLAN IDENTIFYING THE LOCATIONS AND TYPES OF BENCHMARKS TO BE INSTALLED FOR OWNER REVIEW AND APPROVAL. CONTRACTOR SHALL LAY OUT LINES AND GRADES FROM THESE CONTRACTOR-FURNISHED BENCHMARKS.
11. GEOTECHNICAL WORK:

    A STRUCTURAL STABILITY AND FACTOR OF SAFETY ASSESSMENT FOR THE ASH SURGE AND BYPASS BASINS WAS PREPARED BY GEOSYNTEC CONSULTANTS IN OCTOBER 2016. SITE SPECIFIC SOIL DATA AND GEOTECHNICAL RECOMMENDATIONS ARE PROVIDED AND REFERENCED THEREIN.
12. EXISTING CONDITIONS:
    - A. DIMENSIONS OF EXISTING WORK SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO THE START OF WORK IN ACCORDANCE WITH THE SPECIFICATION AS FIELD CONDITIONS MAY VARY FROM INFORMATION SHOWN ON THE DESIGN DRAWINGS. DIMENSIONS NOTED FOR REFERENCE (REF) INDICATE NOMINAL DIMENSIONS FOR THE EXISTING STRUCTURE, UTILITY, ETC. NEW WORK SHALL NOT BE LOCATED BASED ON THE REFERENCE DIMENSIONS.
    - B. PRIOR TO COMMENCING THE WORK, THE CONTRACTOR SHALL EXAMINE THE AREAS AND CONDITIONS UNDER WHICH THE RETROFIT WORK IS TO TAKE PLACE, AND NOTIFY THE OWNER IN WRITING OF CONDITIONS WHICH MAY IMPACT THE PROPER AND TIMELY COMPLETION OF THE WORK.
    - C. UNDERGROUND OR EMBEDDED UTILITIES MAY EXIST WITHIN THE AREA OF AND ADJACENT TO THE LIMITS OF THE WORK. THE LOCATION OR IDENTIFICATION OF SUCH UTILITIES HAS NOT BEEN VERIFIED BY THE OWNER OR BY S&L. CONTRACTOR/INSTALLER IS RESPONSIBLE FOR FIELD LOCATING AND IDENTIFYING UNDERGROUND OR EMBEDDED UTILITIES AND ANY OTHER UNDERGROUND OR EMBEDDED UTILITY DIMENSIONS.
    - D. REFERENCES USED HAVE BEEN IDENTIFIED ON EXCAVATION/FOUNDATION/DEMOLITION DRAWINGS AND HAVE BEEN PROVIDED TO ASSIST THE CONTRACTOR/INSTALLER IN THE FIELD LOCATING EXISTING UTILITIES AND OTHER POTENTIAL UNDERGROUND OR EMBEDDED INTERFERENCES. THESE REFERENCES ONLY SHOW THE APPROXIMATE LOCATION OF POTENTIAL UNDERGROUND OR EMBEDDED UTILITIES AND MAY NOT INDICATE OR REFLECT ALL EXISTING UNDERGROUND OR EMBEDDED UTILITIES OR THEIR ACTUAL LOCATIONS.
    - E. REFERENCES IDENTIFIED SHALL NOT SUBSTITUTE FOR THE CONTRACTOR'S/INSTALLER'S OBLIGATION TO FIELD LOCATE ANY UNDERGROUND OR EMBEDDED UTILITIES OR INTERFERENCES THAT MAY AFFECT THE WORK.
    - F. DUE CAUTION SHALL BE TAKEN DURING ANY EXCAVATION/FOUNDATION/DEMOLITION WORK WITHIN THE AREA OF, AND ADJACENT TO THE LIMITS OF THE WORK DUE TO POSSIBLE INTERFERENCES THAT MAY NOT BE REFLECTED ON THE REFERENCES IDENTIFIED.
    - G. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PRESERVATION AND RESTORATION OF THE EXISTING UTILITIES IF DAMAGED DURING CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER.

ABBREVIATIONS

ROAD AND GRADING

T/RD	TOP OF ROAD ELEVATION
EL OR ELEV	GRADE ELEVATION
INV	INVERT ELEVATION
HP	HIGH POINT
LP	LOW POINT
HPFS	HIGH POINT FINISH SURFACING
BC	BEGINNING OF CURVE (HORIZONTAL CURVE)
EC	END OF CURVE (HORIZONTAL CURVE)
PI	POINT OF INTERSECTION (HORIZONTAL CURVE)
PT	POINT OF TANGENT
PC	POINT OF CURVE
STA	STATION
VC	VERTICAL CURVE
BVC	BEGINNING OF VERTICAL CURVE
EVC	END OF VERTICAL CURVE
PIVC	POINT OF INTERSECTION OF VERT. CURVE
PRC	POINT OF REVERSE CURVE
PCC	POINT OF COMPOUND CURVE
R	RADIUS
T	TANGENT
L	LENGTH OF CURVE
D	DEGREE OF CURVE
I	INTERIOR/DEFLECTION ANGLE OF CURVE
UN	UNLESS NOTED
ROW	RIGHT OF WAY
OHL	OVERHEAD LINE
OC	ON CENTER
WL	WATER LEVEL
HWL	HIGH WATER LEVEL
YR	YEAR
DS	DOWNSTREAM
US	UPSTREAM
CL	CENTERLINE
AC	ACRE
N.T.S.	NOT TO SCALE
LWL	LOW WATER LEVEL

SYMBOLS

- CENTERLINE OF NATURAL DRAINAGE PATTERN
- VALLEY LINE OR "V" DITCH
- SWALE
- CENTERLINE OF TRAPEZOIDAL DRAINAGE
- TRAPEZOIDAL DRAINAGE DITCH WITH BOTTOM WIDTH GREATER THAN 2'. BOTTOM WIDTH AND SIDE SLOPE SHOWN ON PLAN OR DETAIL
- RIPRAP EROSION PROTECTION
- C-1 — PIPE CULVERT, CULVERT NUMBER SHOWN
- DOWN — TOP OF EMBANKMENT SLOPE OR DITCH SIDE SLOPE AND DIRECTION OF SLOPE
- 3:1 — HORIZONTAL TO VERTICAL SLOPE WHEN SLOPE IS CONSTANT
- SLOPE VARIES — SLOPE IS NOT CONSTANT
- 1% — DIRECTION OF ROAD OR AREA SLOPE. PERCENT OF SLOPE SHOWN WHERE APPLICABLE
- TOP OF DIKE
- R=50' — RADIUS OF CURVATURE
- 1 — SECTION NUMBER (FIRST NUMBER=DRAWING SECOND NUMBER=SECTION NUMBER)
- CHAIN LINK FENCE
- PLAN SECTION — WATER LINE
- G — G — BURIED GAS LINE
- E — E — BURIED ELECTRICAL CABLE
- INDEX CONTOUR
- INTERMEDIATE CONTOUR
- 405 — ELEVATION CONTOUR
- EXISTING DEPRESSION
- x 408.8 — SPOT ELEVATION
- x — VERTICAL CONTROL POINT
- HORIZONTAL CONTROL POINT
- EXISTING FIRE HYDRANT
- EXISTING UTILITY POLE
- EXISTING UTILITY POLE WITH GUY
- WOOD OR BRUSH OUTLINE
- GRATING
- SINGLE SIGN ON POST
- DOUBLE SIGN ON POST
- GUARD POST

SYMBOLS & ABBREVIATIONS

EROSION CONTROL SYMBOLS

S	SILT FENCE
IP	INLET PROTECTION
	ROCK CHECK

SEWERS AND UNDERGROUND PIPE

CB	CATCH BASIN
CO	CLEANOUT
MH	MANHOLE
RE	RIM ELEVATION
℄	CENTERLINE
S	SLOPE
BOP	BOTTOM OF PIPE
PVC	POLY VINYL CHLORIDE PIPE
HDPE	HIGH DENSITY POLYETHYLENE PIPE
RCP	REINFORCED CONCRETE PIPE
CMP	CORRUGATED METAL PIPE
CHDPE	CORRUGATED HIGH DENSITY POLYETHYLENE PIPE
CISP	CAST IRON SOIL PIPE
DIWP	DUCTILE IRON WATER PIPE
STL	CARBON STEEL PIPE
IP	IN PLACE
SWS	STORM WATER SEWER
OWS	OILY WATER SEWER
SAN	SANITARY SEWER
PWS	PROCESS WASTE SEWER
C.S.	CARBON STEEL

ROAD, PAVEMENT AND SURFACING SYMBOLS

	ASPHALT OR CONCRETE PAVED ROAD. OUTER LINES SHOW OVERALL WIDTH. INTERIOR LINES SHOW EDGES OF PAVEMENT.
	ROCK SURFACED ROAD
I	ISOLATION JOINT
IT	THICKENED EDGE ISOLATION JOINT
TE	THICKENED EDGE EXPANSION JOINT
T	PAVEMENT THICKENED EDGE
C	CONTRACTION JOINT
	CONCRETE PAVING
	CRUSHED ROCK SURFACING
	ASPHALT PAVEMENT
	6" THICK CRUSHED STONE GROUND COVER SURFACING
	4" THICK SEEDED TOPSOIL

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SPECIFICATION:	P-1400
PROJECT NO.:	12661-130

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THOMAS DEHLIN
07-15-2022

MY LICENSE RENEWAL DATE IS: 11-30-2023
PAGES OR SHEETS COVERED BY THIS SEAL:
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LICENSED PROFESSIONAL ENGINEER — THOMAS J DEHLIN — 062-069314 — OF ILLINOIS

CAD FILE NAME:	POW-BBR-CSK-002.DGN
PREPARED BY:	J. CHAVEZ
REVIEWED BY:	T. DEHLIN
APPROVED BY:	T. DEHLIN

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Sargent & Lundy LLC

SARGENT & LUNDY LLC
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CHICAGO, ILLINOIS 60603-5780

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PROJECT

MIDWEST GENERATION, LLC
POWERTON
GENERATING STATION
BYPASS BASIN RETROFIT PROJECT

DRAWING TITLE

BYPASS BASIN RETROFIT
GENERAL NOTES

DRAWING NUMBER	REVISION
POW-BBR-CSK-002	C
SHEET 1 OF 1	

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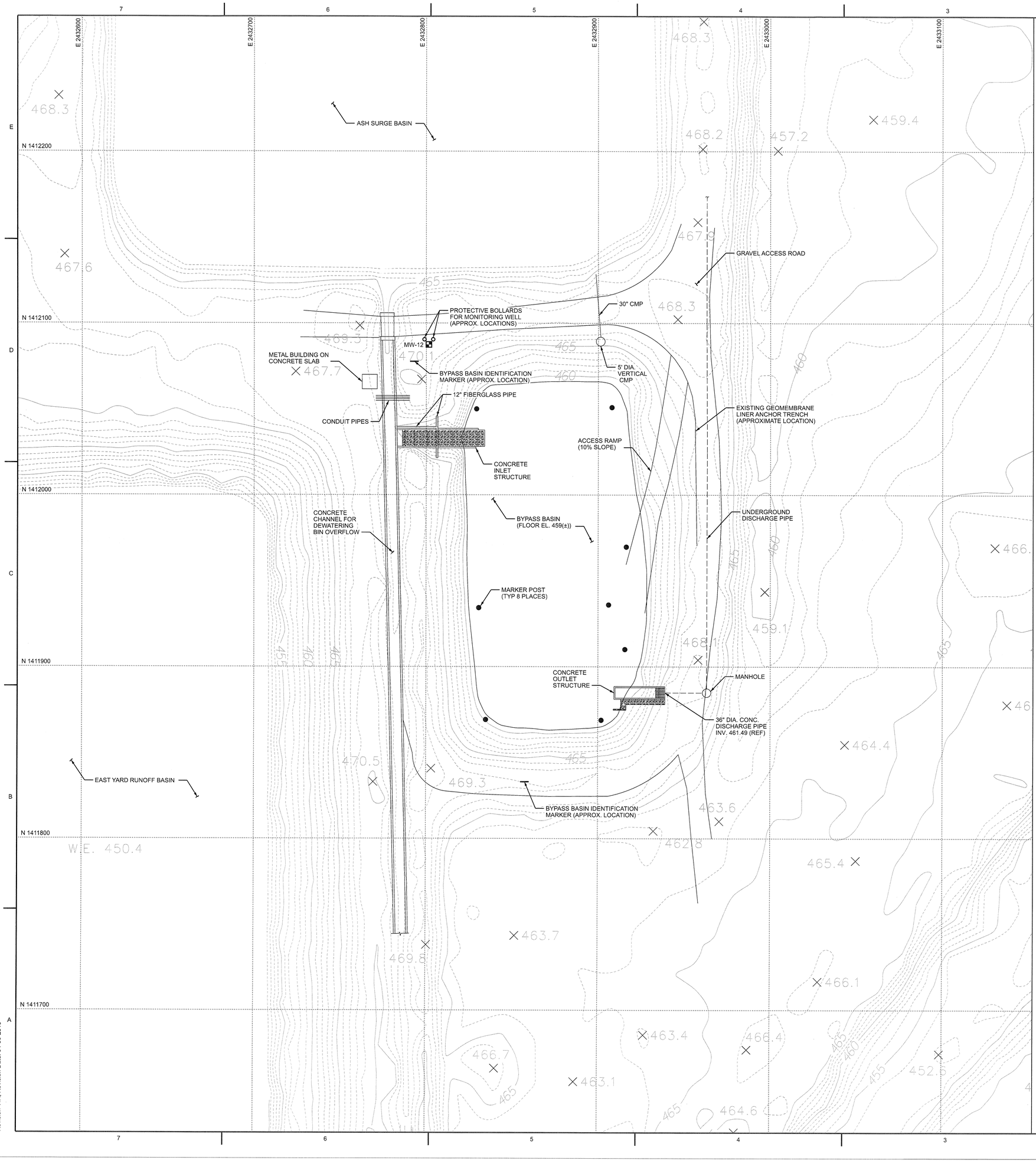

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NORTH

20' 0' 20' 40'
GRAPHIC SCALE

LEGEND

MW-12 MONITORING WELL

NOTES

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2. FOR GENERAL NOTES, ABBREVIATIONS, AND SYMBOLS, SEE DRAWING POW-BBR-CSK-002.
3. EXISTING CONDITIONS FOR THE BYPASS BASIN ARE BASED ON TOPOGRAPHIC DATA COLLECTED IN 2008. PRIOR TO BEGINNING ANY RETROFIT WORK, THE GW CONTRACTOR SHALL MAKE A TOPOGRAPHIC ASSESSMENT TO VERIFY THE ACCURACY OF THE EXISTING CONDITIONS SHOWN PER NOTE 10 ON DRAWING POW-BBR-CSK-002.

REFERENCE DRAWINGS

D1965C030-02	BYPASS BASIN LINER REPLACEMENT WARNING LAYER PLAN

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BYPASS BASIN RETROFIT PROJECT

DRAWING TITLE

BYPASS BASIN
EXISTING CONDITIONS

DRAWING NUMBER	REVISION
POW-BBR-CSK-003	C
SHEET 1 OF 1	

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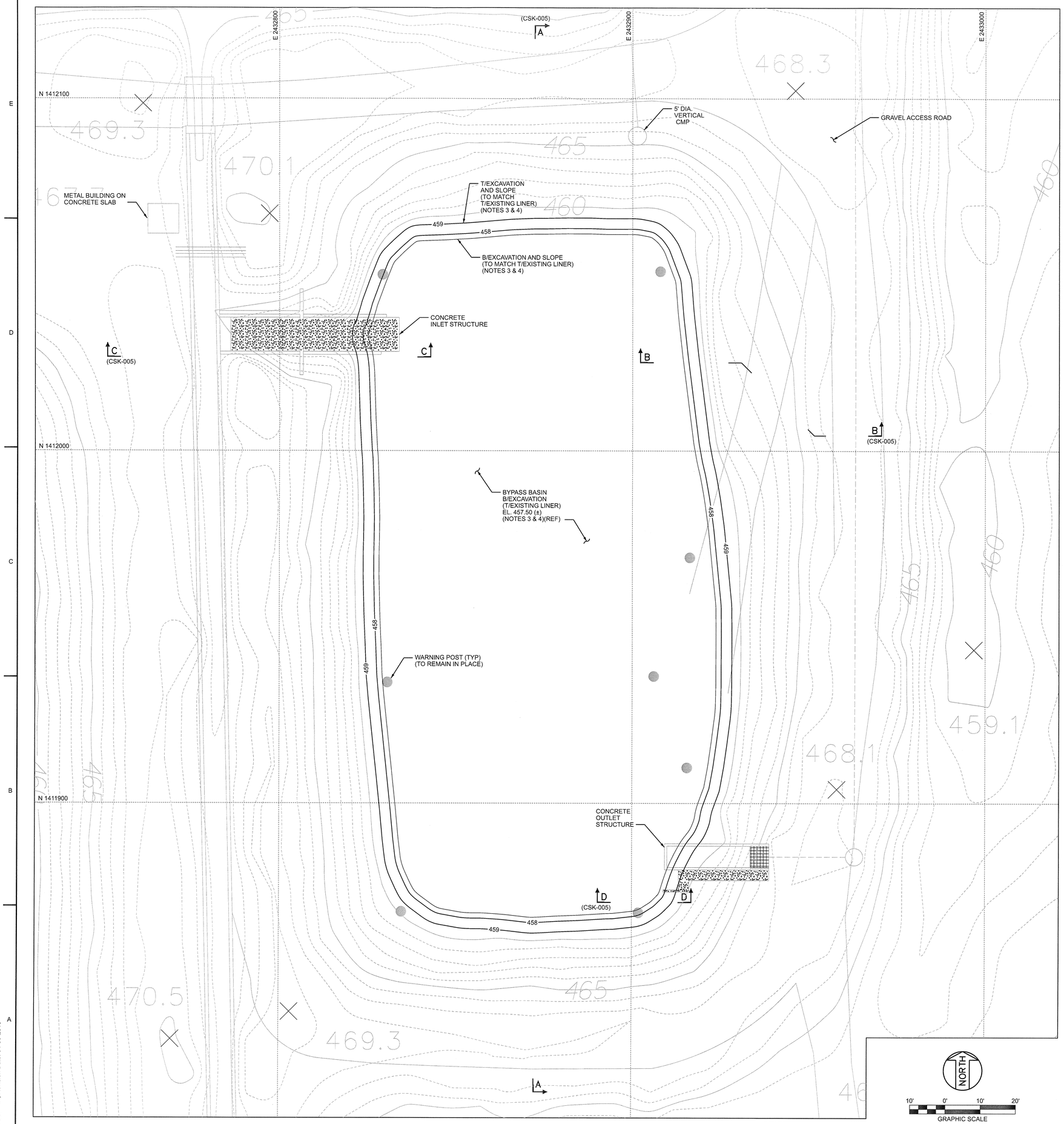

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2. FOR GENERAL NOTES, ABBREVIATIONS, AND SYMBOLS, SEE DRAWING POW-BBR-CSK-002.
3. MATERIAL REMOVAL / EXCAVATION:
   - A. ALL MATERIAL ABOVE THE EXISTING GEOMEMBRANE LINER SHALL BE REMOVED. BOTTOM-OF-EXCAVATION (I.E., TOP-OF-EXISTING LINER SURFACE) SHOWN ON THIS DRAWING IS APPROXIMATE.
   - B. DURING REMOVAL OF MATERIAL FROM THE BYPASS BASIN, GW CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO AVOID DAMAGING THE BASIN'S EXISTING GEOMEMBRANE LINER. GW CONTRACTOR SHALL PROVIDE ADEQUATE TEMPORARY BALLASTING AS NECESSARY TO PREVENT UPLIFT OF THE GEOMEMBRANE BY WIND BY THE USE OF SANDBAGS AND/OR OTHER MEANS WHICH WILL NOT DAMAGE THE GEOMEMBRANE. FOR ALL AREAS OF EXISTING LINER THAT ARE DAMAGED, THE GW CONTRACTOR SHALL:
     - I. TAKE APPROPRIATE MEASURES TO PREVENT ANY FLUID OR SOLID MATERIALS FROM ENTERING THE SUBGRADE BELOW THE LINER.
     - II. NOTIFY THE OWNER IMMEDIATELY.
     - III. INSPECT THE EXPOSED SOILS BELOW THE LINER TO DETERMINE WHETHER ANY FLUIDS, CCR CONSTITUENTS, OR CCR-MIXED SOILS HAVE BEEN RELEASED INTO THE BASIN SUBGRADE. IF SUCH MATERIAL HAS BEEN RELEASED INTO THE BASIN SUBGRADE, THE GW CONTRACTOR SHALL REMOVE THE IMPACTED SOILS UNTIL THE AFFECTED AREA HAS BEEN DECONTAMINATED. CONTAMINATED SOILS REMOVED FROM THE BASIN SUBGRADE SHALL BE REPLACED WITH STRUCTURAL FILL IN ACCORDANCE WITH PROJECT SPECIFICATIONS.
     - IV. REPAIR THE DAMAGED GEOMEMBRANE LINER AREA IN ACCORDANCE WITH PROJECT SPECIFICATIONS.
   - C. MATERIAL REMOVED FROM THE BYPASS BASIN AREA SHALL BE DISPOSED OF AS FOLLOWS:
     - I. ALL DRY WASTE SHALL BE DISPOSED OF IN AN OFF-SITE DISPOSAL FACILITY PERMITTED TO RECEIVE CCR WASTE. ALL OFF SITE TRANSPORTATION OF MATERIAL REMOVED FROM THE BYPASS BASIN SHALL BE PERFORMED IN ACCORDANCE WITH 35 ILL. ADM. CODE 845.740(C)(1).
     - II. ALL LIQUID WASTE SHALL BE DISPOSED OF IN THE ASH SURGE BASIN.
   - D. GW CONTRACTOR SHALL DEVELOP AND IMPLEMENT FUGITIVE DUST CONTROLS DURING MATERIAL REMOVAL FROM THE BYPASS BASIN AREA IN ACCORDANCE WITH 35 ILL. ADM. CODE 845.740(C)(2).
   - E. GW CONTRACTOR SHALL DEVELOP AND IMPLEMENT MEASURES TO PREVENT CONTAMINATION OF SURFACE WATER, GROUNDWATER, SOIL, AND SEDIMENTS DURING MATERIAL REMOVAL FROM THE BYPASS BASIN AREA IN ACCORDANCE WITH 35 ILL. ADM. CODE 845.740(C)(4).
   - F. AT THE END OF EACH MONTH DURING WHICH MATERIAL REMOVAL FROM THE BYPASS BASIN AREA, GW CONTRACTOR SHALL PREPARE A REPORT DOCUMENTING THE GW CONTRACTOR'S PROGRESS IN REMOVING CCR AND CCR-MIXED SOILS FROM THE AREA. THE MONTHLY REPORT SHALL BE PREPARED IN ACCORDANCE WITH THE RECORDKEEPING REQUIREMENTS STIPULATED IN 35 ILL. ADM. CODE 845.740(D).
4. LINER & CONCRETE DECONTAMINATION :
   - A. AFTER REMOVAL OF MATERIAL ABOVE THE EXISTING GEOMEMBRANE LINER AND REPAIR OF ANY DAMAGED AREAS, THE GW CONTRACTOR SHALL DECONTAMINATE THE LINER AND POND APPURTENANT STRUCTURES. AT A MINIMUM, THE EXPOSED GEOMEMBRANE SHALL BE PRESSURE WASHED IN A SYSTEMATIC MANNER TO REMOVE ALL CCR AND RESIDUALS OF CCR. WASH AND RINSE WATER SHALL BE COLLECTED AND DISPOSED OF IN THE ASH SURGE BASIN OR AS OTHERWISE DIRECTED BY THE OWNER.
   - B. AS AN AREA WITHIN THE BYPASS BASIN IS DECONTAMINATED, THE GW CONTRACTOR AND CQA CONTRACTOR (P-1401) SHALL VISUALLY INSPECT THE SUBJECT AREA WITH THE OWNER'S REPRESENTATIVE(S) TO ENSURE THE AREA IS NO LONGER CONTAMINATED WITH CCR CONSTITUENTS AND REMAINS COMPETENT FOR RE-USE (I.E., NO REPAIRS ARE REQUIRED).
   - C. UPON COMPLETION OF DECONTAMINATION ACTIVITIES FOR A GIVEN AREA OF EXISTING GEOMEMBRANE LINER BY THE GW CONTRACTOR, THE CQA CONTRACTOR (P-1401) SHALL:
     - I. PERFORM AN ELECTRICAL LEAK LOCATION SURVEY OVER THE DECONTAMINATED LINER AREA IN ACCORDANCE WITH ASTM D7953. IF THE SURVEY LOCATES A BREACH (HOLE, PUNCTURE, TEAR, DEFECT, ETC.) IN THE GEOMEMBRANE, THE CQA CONTRACTOR SHALL NOTIFY THE OWNER AND GW CONTRACTOR IMMEDIATELY, AND THE GW CONTRACTOR SHALL ADDRESS THE BREACH IN ACCORDANCE WITH NOTE 3.B.
     - II. CUT-OUT AND REMOVE A MINIMUM OF THREE SAMPLES OF THE DECONTAMINATED GEOMEMBRANE LINER. THE GW CONTRACTOR SHALL REPAIR THE GEOMEMBRANE LINER AT ALL SAMPLE LOCATIONS IN ACCORDANCE WITH PROJECT SPECIFICATIONS.
     - III. ALL SAMPLES SHALL BE ANALYZED BY A CERTIFIED LABORATORY IN ACCORDANCE WITH EPA SW-846 TEST METHOD 1311: TOXICITY CHARACTERISTIC LEACHING PROCEDURE. IF THE CONCENTRATIONS OF CCR CONSTITUENTS MEASURED BY THIS TEST METHOD MEET THE GROUNDWATER PROTECTION STANDARDS SPECIFIED IN THE OPERATING PERMIT ISSUED BY THE ILLINOIS EPA FOR THE BYPASS BASIN, THEN THE AREA OF EXISTING GEOMEMBRANE LINER REPRESENTATED BY THAT SAMPLE IS CONSIDERED TO BE DECONTAMINATED. OTHERWISE, THAT AREA OF EXISTING GEOMEMBRANE LINER IS NOT CONSIDERED TO BE DECONTAMINATED.
   - D. GW CONTRACTOR SHALL RECLEAN ANY AREAS THAT ANALYTICAL TESTING INDICATES ARE NOT DECONTAMINATED (I.E., ANALYTICAL TESTING OF A COLLECTED SAMPLE DETECTS AT LEAST ONE CCR CONSTITUENT EXCEEDS THE CONSTITUENT'S GROUNDWATER PROTECTION STANDARD LISTED IN IN THE OPERATING PERMIT ISSUED BY THE ILLINOIS EPA FOR THE BYPASS BASIN). AFTER RECLEANING A GIVEN AREA, THE CQA CONTRACTOR (P-1401) SHALL COLLECT AND TEST ONE ADDITIONAL SAMPLE FROM THE AREA PER NOTE 4.C.
   - E. LINER DECONTAMINATION IS CONSIDERED COMPLETE WHEN ALL COLLECTED LINER SAMPLES MEET THE DECONTAMINATION CRITERIA IN NOTE 4.C.III.

REFERENCE DRAWINGS

CSK-005	BYPASS BASIN EXCAVATION SECTIONS & DETAILS
D1965C010-02	BYPASS BASIN LINER REPLACEMENT PRE-CONSTRUCTION CONDITIONS

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUBCONTRACTOR(S)) PERFORMING THE WORK.

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THE CONTRACTOR/INSTALLER SHALL EXERCISE DUE CAUTION DURING ALL EXCAVATION/FOUNDATION/DEMOLITION WORK.

HOLD INFORMATION

NO.	DESCRIPTION

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RELEASE INFORMATION

REV.	DATE	DESCRIPTION
A	03-11-2022	FOR CLIENT COMMENT
B	04-15-2022	FOR PUBLIC COMMENT
C	07-15-2022	FOR PERMIT

ISSUE PURPOSE:	PERMIT
SPECIFICATION:	P-1400
PROJECT NO.:	12661-130

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF ILLINOIS.

LICENSED PROFESSIONAL ENGINEER — THOMAS J DEHLIN — 062-069314 — OF ILLINOIS

THOMAS DEHLIN
07-15-2022

MY LICENSE RENEWAL DATE IS: 11-30-2023
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CAD FILE NAME:	POW-BBR-CSK-004.DGN
PREPARED BY:	J. CHAVEZ
REVIEWED BY:	T. DEHLIN
APPROVED BY:	T. DEHLIN

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CHICAGO, ILLINOIS 60603-5780

MWG
Midwest Generation, LLC

PROJECT

MIDWEST GENERATION, LLC
POWERTON
GENERATING STATION
BYPASS BASIN RETROFIT PROJECT

DRAWING TITLE

RETROFITTED BYPASS BASIN
BYPASS BASIN EXCAVATION
PLAN

DRAWING NUMBER	REVISION
POW-BBR-CSK-004	C
SHEET 1 OF 1	

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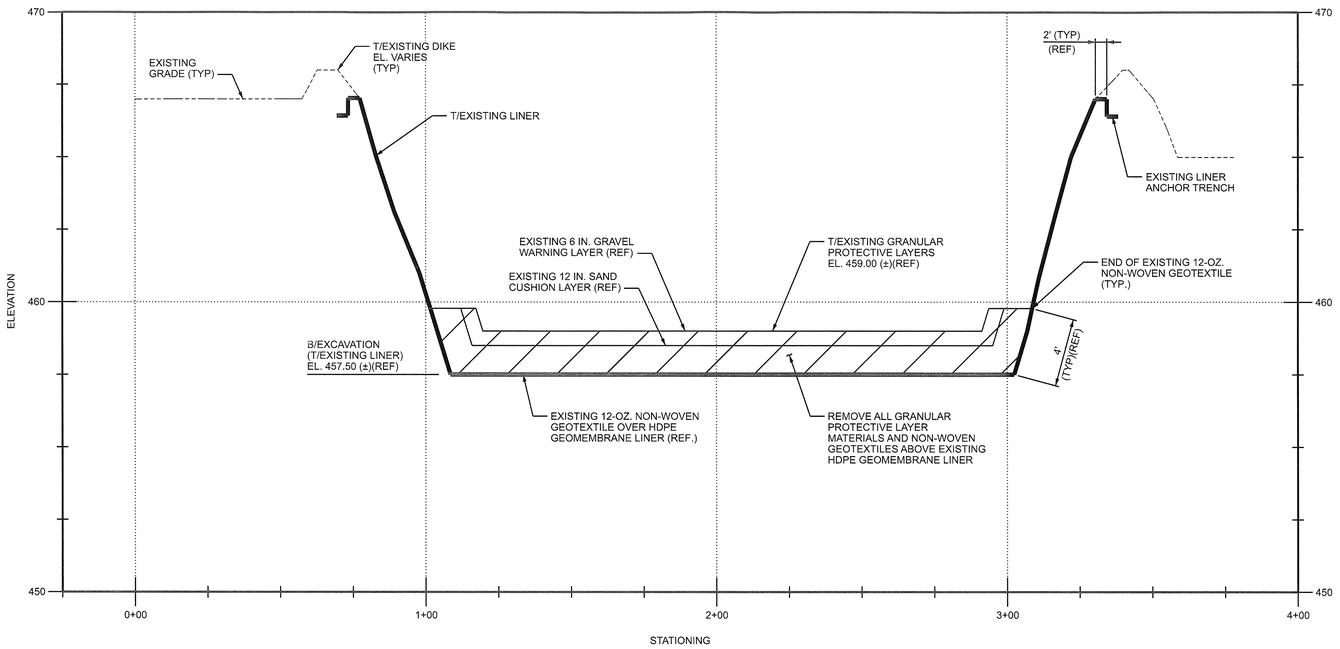
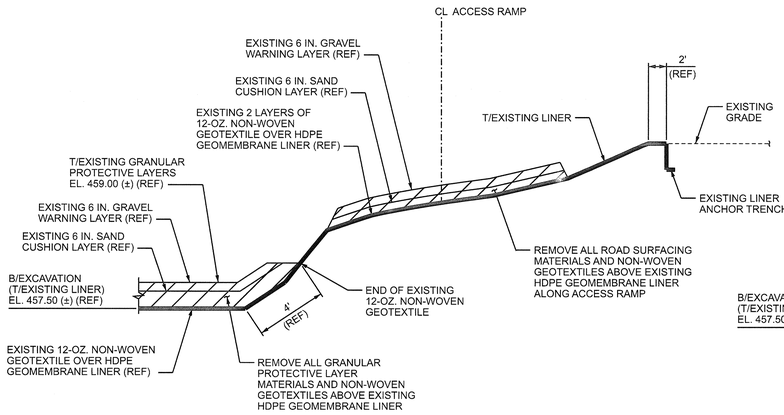


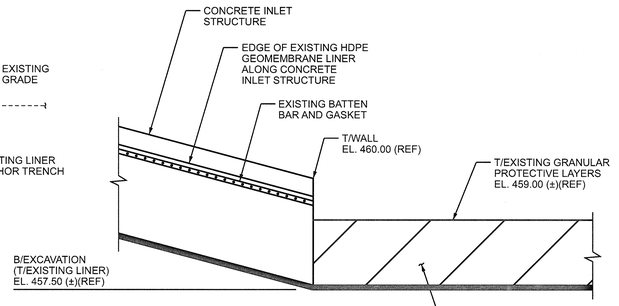
SECTION A

HORIZONTIAL SCALE 1"=20'
VERTICAL SCALE 1"=2'
(CSK-004)



SECTION B

SCALE: N.T.S.
(CSK-004)



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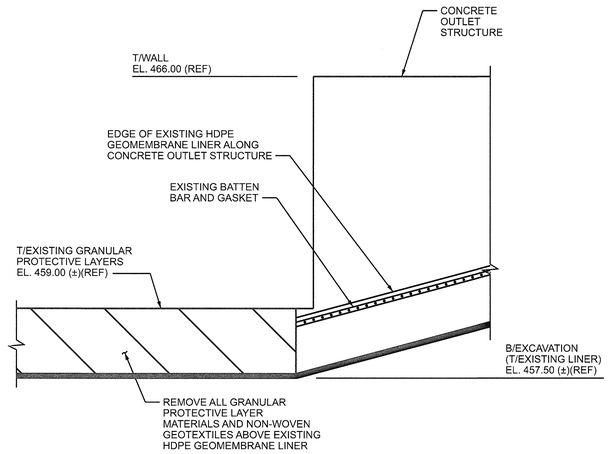
(CSK-004)



SECTION D

SCALE: N.T.S.
(CSK-004)

NOTES

1. ALL WORK SHOWN ON THIS DRAWING SHALL BE FURNISHED AND INSTALLED BY SPECIFICATION P-1400 UNLESS NOTED OTHERWISE.
2. FOR GENERAL NOTES, ABBREVIATIONS, AND SYMBOLS, SEE DRAWING POW-BBR-CSK-002.

REFERENCE DRAWINGS

CSK-004	BYPASS BASIN EXCAVATION PLAN
D1965C031-02	BYPASS BASIN LINER REPLACEMENT DETAILS AND SECTIONS

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FOR PERMIT
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SPECIFICATION:	P-1400
PROJECT NO.:	12661-130

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THOMAS DEHLIN
07-15-2022

LICENSED PROFESSIONAL ENGINEER — THOMAS J DEHLIN — 062-069314 — OF ILLINOIS

MY LICENSE RENEWAL DATE IS: 11-30-2023
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CAD FILE NAME:	POW-BBR-CSK-005.DGN
PREPARED BY:	J. CHAVEZ
REVIEWED BY:	T. DEHLIN
APPROVED BY:	T. DEHLIN

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CHICAGO, ILLINOIS 60603-5780

MWG
Midwest Generation, LLC

PROJECT

MIDWEST GENERATION, LLC
POWERTON
GENERATING STATION
BYPASS BASIN RETROFIT PROJECT

DRAWING TITLE

RETROFITTED BYPASS BASIN
BYPASS BASIN EXCAVATION
SECTIONS & DETAILS

DRAWING NUMBER	REVISION
POW-BBR-CSK-005	C

SHEET 1 OF 1

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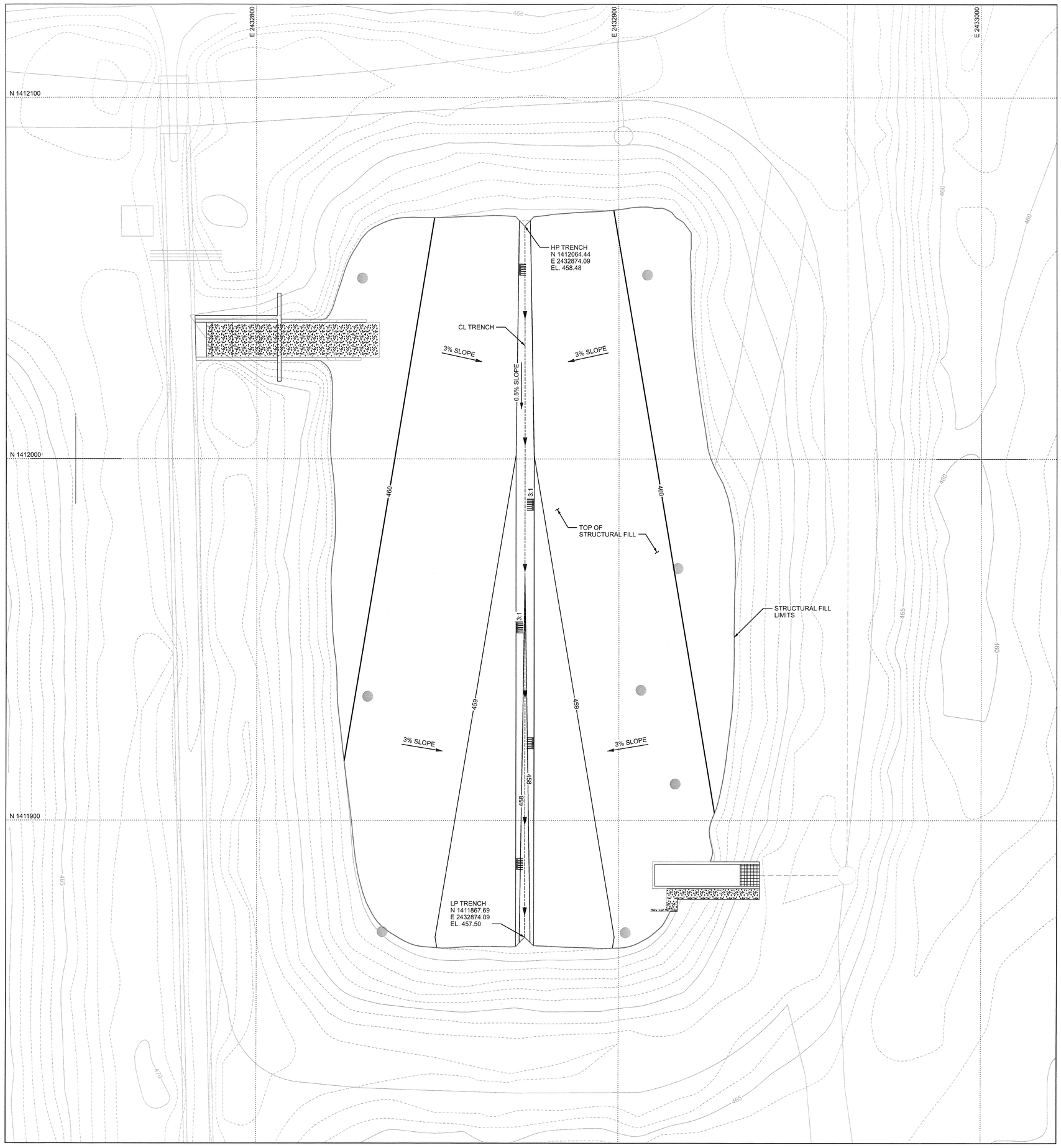
Revision 11A, Revision Date: 04-30-2010



FOR PERMIT
NOT FOR CONSTRUCTION

NORTH

10' 0' 10' 20'
GRAPHIC SCALE

LEGEND

465	MAJOR CONTOUR
464	MINOR CONTOUR

NOTES

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REFERENCE DRAWINGS

CSK-004	BYPASS BASIN EXCAVATION PLAN
CSK-008	BYPASS BASIN SECTIONS & DETAILS

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THOMAS DEHLIN
07-15-2022

LICENSED PROFESSIONAL ENGINEER
THOMAS J DEHLIN
062-069314
OF ILLINOIS

MY LICENSE RENEWAL DATE IS: 11-30-2023
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PREPARED BY:	J. CHAVEZ
REVIEWED BY:	T. DEHLIN
APPROVED BY:	T. DEHLIN

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MWG
Midwest Generation, LLC

PROJECT

MIDWEST GENERATION, LLC
POWERTON
GENERATING STATION
BYPASS BASIN RETROFIT PROJECT

DRAWING TITLE

RETROFITTED BYPASS BASIN STRUCTURAL FILL GRADING PLAN

DRAWING NUMBER	REVISION
POW-BBR-CSK-006	C
SHEET 1 OF 1	

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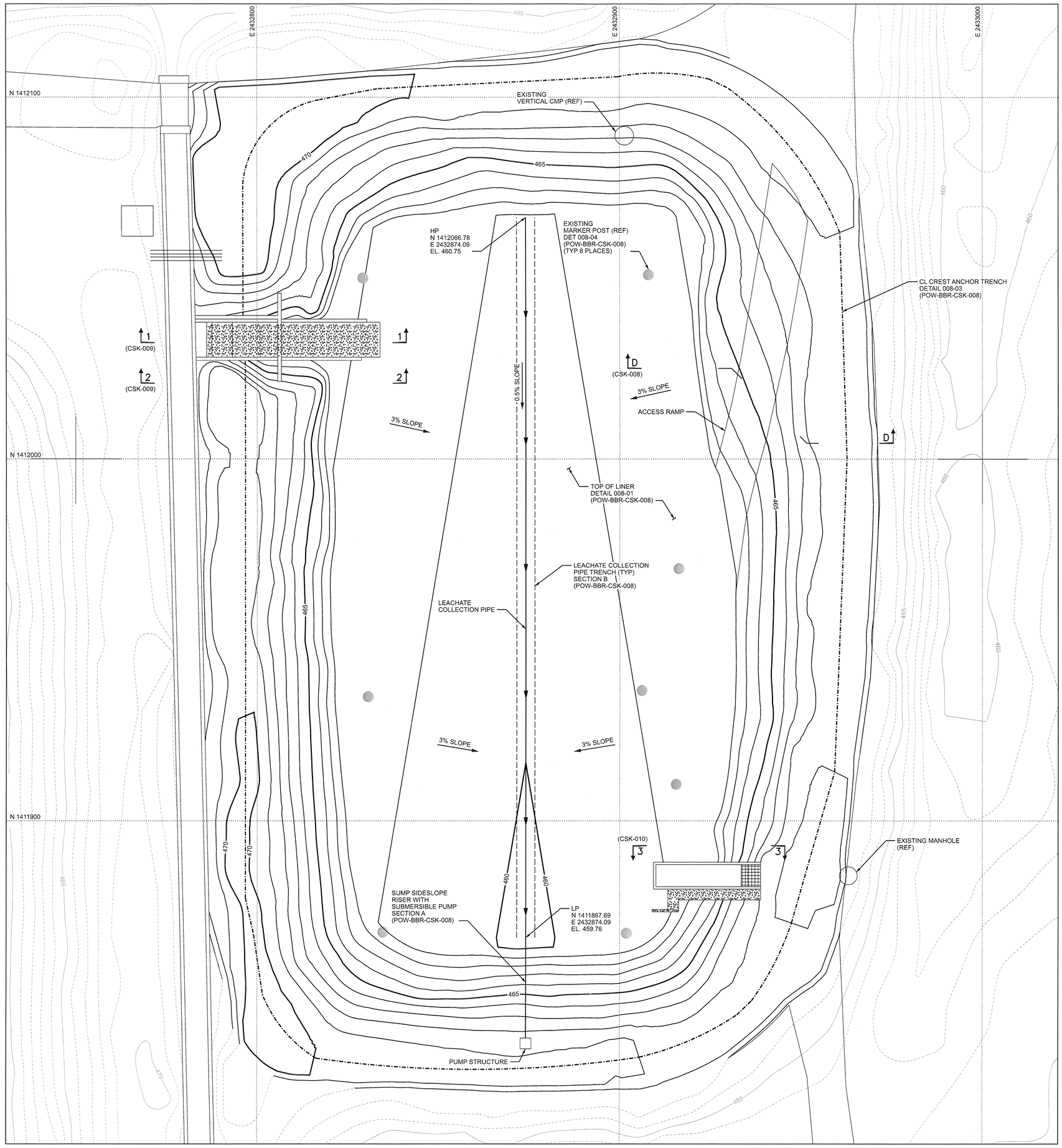

FOR PERMIT
NOT FOR CONSTRUCTION

NORTH

10' 0' 10' 20'
GRAPHIC SCALE

LEGEND

465	MAJOR CONTOUR
464	MINOR CONTOUR

NOTES

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2. FOR GENERAL NOTES, ABBREVIATIONS, AND SYMBOLS, SEE DRAWING POW-BBR-CSK-002.

REFERENCE DRAWINGS

CSK-004	BYPASS BASIN EXCAVATION PLAN
CSK-008	BYPASS BASIN SECTIONS & DETAILS

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THOMAS DEHLIN
07-15-2022

LICENSED PROFESSIONAL ENGINEER
THOMAS J DEHLIN
062-069314
OF ILLINOIS

MY LICENSE RENEWAL DATE IS: 11-30-2023
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CAD FILE NAME:	POW-BBR-CSK-007.DGN
PREPARED BY:	J. CHAVEZ
REVIEWED BY:	T. DEHLIN
APPROVED BY:	T. DEHLIN

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CHICAGO, ILLINOIS 60603-5780

MWG
Midwest Generation, LLC

PROJECT

MIDWEST GENERATION, LLC
POWERTON
GENERATING STATION
BYPASS BASIN RETROFIT PROJECT

DRAWING TITLE

RETROFITTED BYPASS BASIN
COMPOSITE LINER & LEACHATE
COLLECTION SYSTEM PLAN

DRAWING NUMBER	REVISION
POW-BBR-CSK-007	C
SHEET 1 OF 1	

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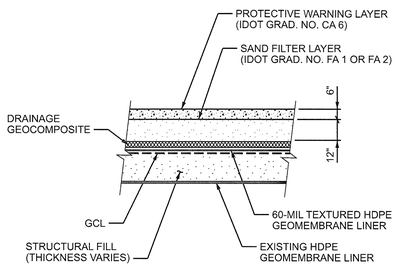
Revision 11A, Revision Date: 04-30-2010
7/12/2022 10:47:28 AM ...\Drawings\POW-BBR-CSK-007.dgn



TYPICAL LINER BASE DETAIL
DETAIL 008-01
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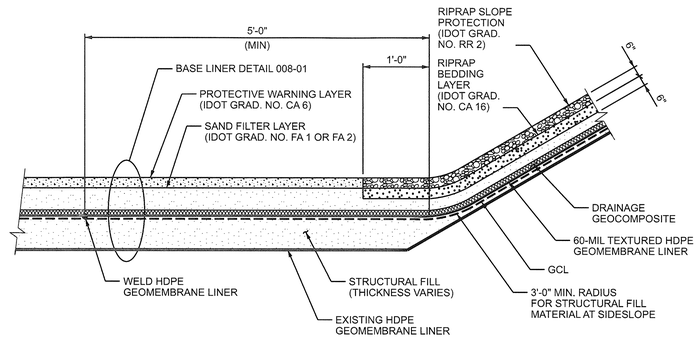

TYPICAL SLOPE TRANSITION DETAIL
DETAIL 008-02
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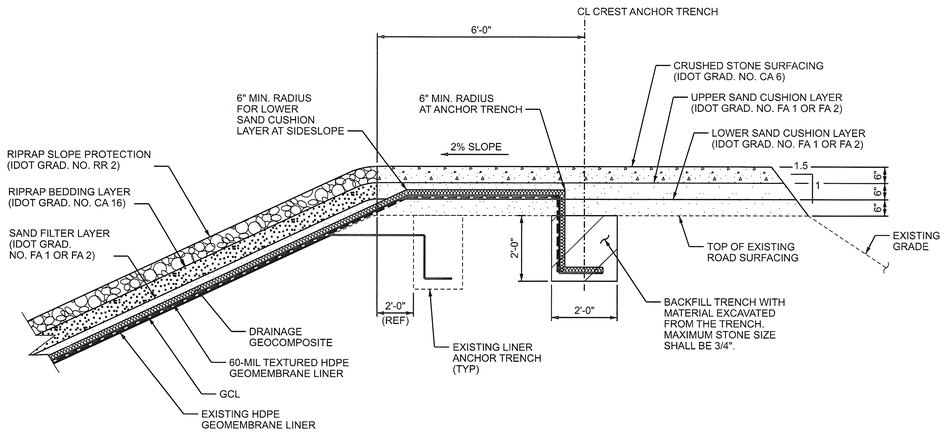

TYPICAL CREST ANCHOR TRENCH DETAIL
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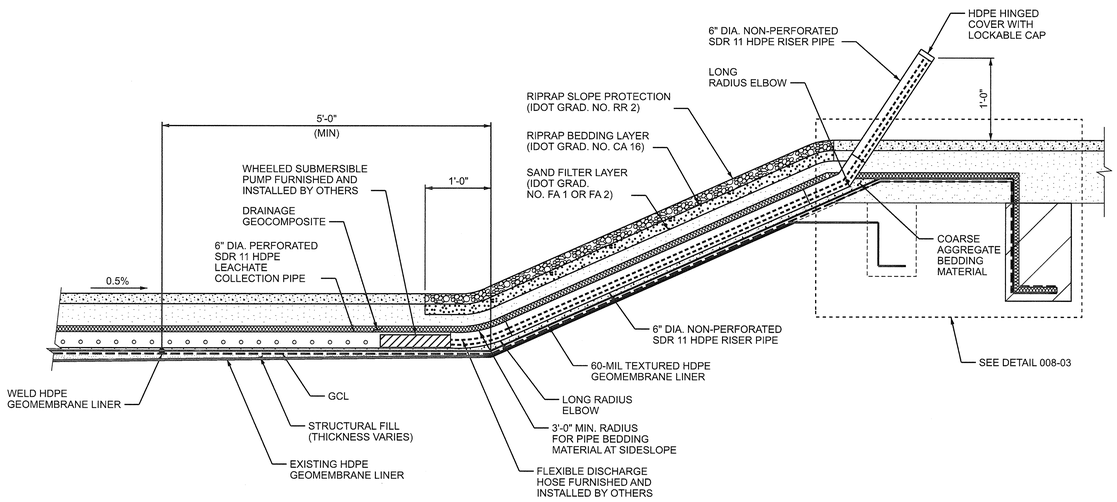
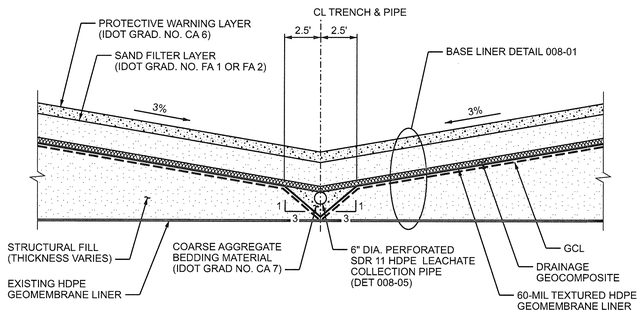
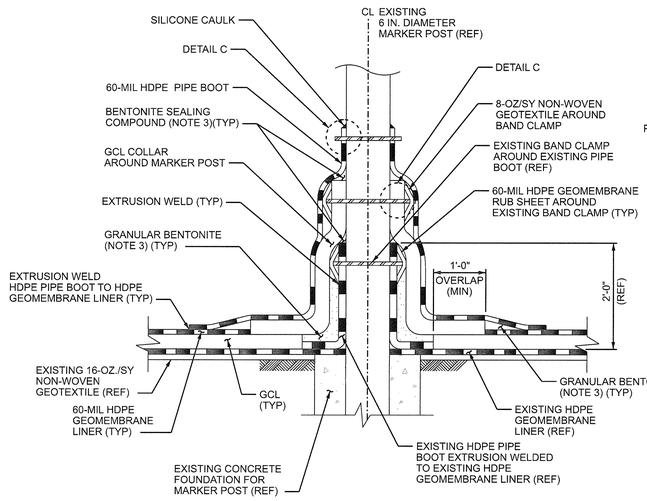


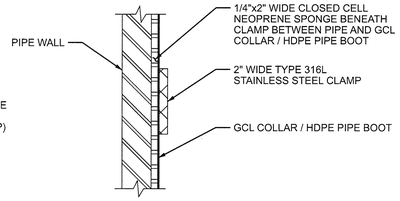
TYPICAL SECTION AT LEACHATE COLLECTION SUMP PUMP
SECTION A
N.T.S.



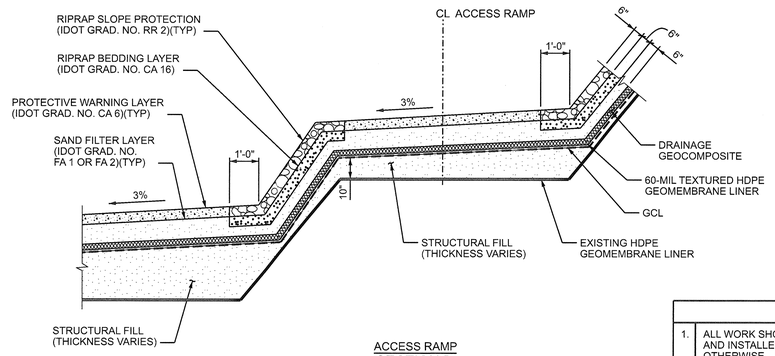
TYPICAL SECTION AT LEACHATE COLLECTION TRENCH
SECTION B
N.T.S.



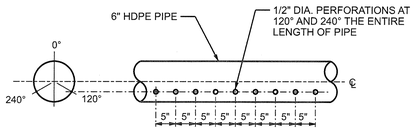
LINER CONNECTION AT EXISTING MARKER POST
DETAIL 008-04
N.T.S.
NOTE: PROTECTIVE WARNING LAYER, SAND FILTER LAYER, AND DRAINAGE GEOCOMPOSITE ARE NOT SHOWN FOR CLARITY



DETAIL C
N.T.S.



ACCESS RAMP
SECTION D
N.T.S.



6" DIAMETER PERFORATED
HDPE LEACHATE COLLECTION PIPE

TYPICAL PERFORATED PIPE DETAIL
DETAIL 008-05
N.T.S.

NOTES

1. ALL WORK SHOWN ON THIS DRAWING SHALL BE FURNISHED AND INSTALLED BY SPECIFICATION P-1400 UNLESS NOTED OTHERWISE.
2. FOR GENERAL NOTES, ABBREVIATIONS, AND SYMBOLS, SEE DRAWING POW-BBR-CSK-002.
3. GW CONTRACTOR SHALL APPLY GRANULAR BENTONITE AND BENTONITE SEALING COMPOUND IN BETWEEN EXISTING HDPE GEOMEMBRANE LINER AND GCL AS SPECIFIED AT A MINIMUM RATE OF 1 LB PER LINEAR FOOT.

REFERENCE DRAWINGS

D1965C031-02	BYPASS BASIN LINER REPLACEMENT DETAILS AND SECTIONS

UNDERGROUND OR EMBEDDED UTILITIES MAY BE LOCATED WITHIN OR ADJACENT TO THE AREA IN WHICH EXCAVATION, DEMOLITION, FOUNDATION, OR MODIFICATION WORK IS TO BE PERFORMED.

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THE CONTRACTOR/INSTALLER SHALL EXERCISE DUE CAUTION DURING ALL EXCAVATION/FOUNDATION/DEMOLITION WORK.

HOLD INFORMATION

NO.	DESCRIPTION

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RELEASE INFORMATION

REV.	DATE	DESCRIPTION
A	03-11-2022	FOR CLIENT COMMENT
B	04-15-2022	FOR PUBLIC COMMENT
C	07-15-2022	FOR PERMIT

ISSUE PURPOSE:	PERMIT
SPECIFICATION:	P-1400
PROJECT NO.:	12661-130

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF ILLINOIS.

THOMAS DEHLIN
07-15-2022

MY LICENSE RENEWAL DATE IS: 11-30-2023
PAGES OR SHEETS COVERED BY THIS SEAL:
THIS DOCUMENT ONLY.

LICENSED PROFESSIONAL ENGINEER
THOMAS J DEHLIN
062-069314
OF ILLINOIS

CAD FILE NAME:	POW-BBR-CSK-008.DGN
PREPARED BY:	J. CHAVEZ
REVIEWED BY:	T. DEHLIN
APPROVED BY:	T. DEHLIN

ANY MODIFICATION OR ADDITION TO THIS DRAWING BY AN ORGANIZATION OTHER THAN SARGENT & LUNDY, IS NOT THE RESPONSIBILITY OF SARGENT & LUNDY.

Sargent & Lundy LLC
SARGENT & LUNDY LLC
55 EAST MONROE STREET
CHICAGO, ILLINOIS 60603-5780

MWG
Midwest Generation, LLC

PROJECT

MIDWEST GENERATION, LLC
POWERTON
GENERATING STATION
BYPASS BASIN RETROFIT PROJECT

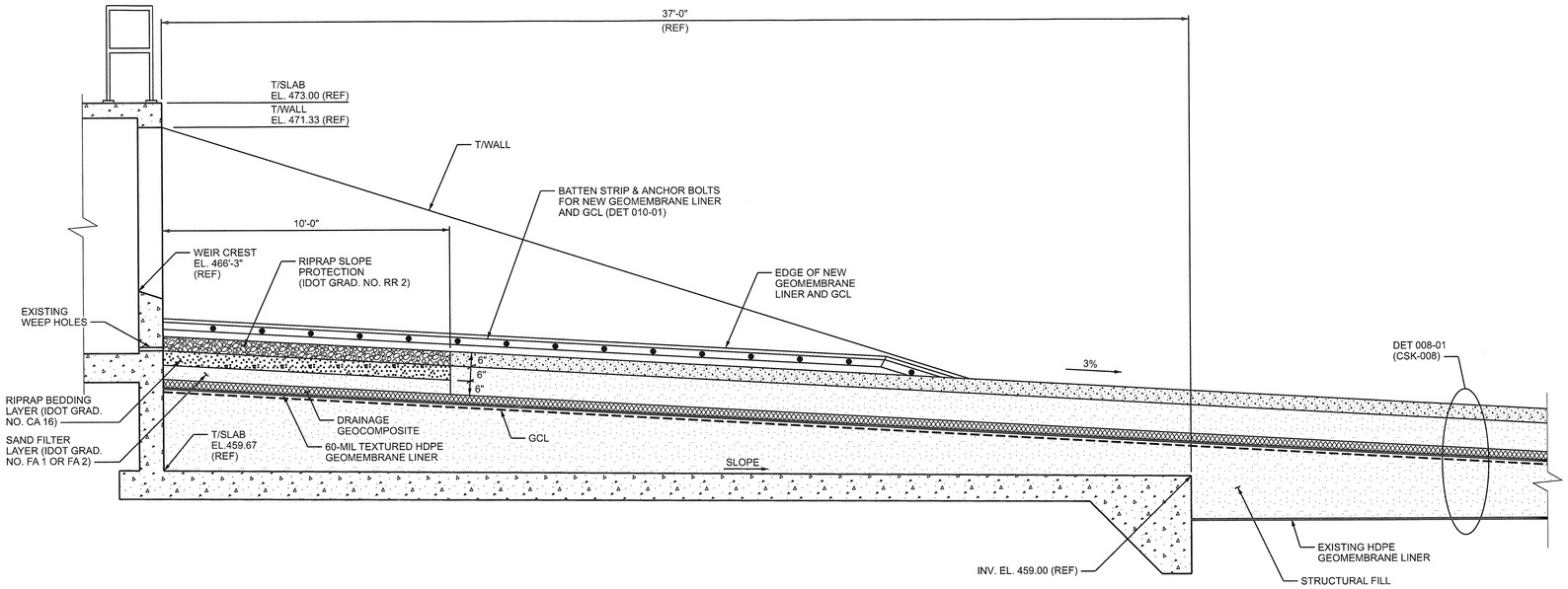
DRAWING TITLE

RETROFITTED BASIN RETROFIT
SECTIONS & DETAILS

DRAWING NUMBER	REVISION
POW-BBR-CSK-008	C
SHEET 1 OF 1	

$PINFO1$
Form GDG-0401-01-08, ANSI (Imperial) MicroStation Border - Size E - 34 x 44
Revision 11A, Revision Date: 04-30-2010

$DATE$ $TIME$ $FILEABBREV$



INTERIOR OF CONCRETE INLET STRUCTURE
SECTION 1
N.T.S.

EXTERIOR OF CONCRETE INLET STRUCTURE
SECTION 2
N.T.S.

NOTES

1. ALL WORK SHOWN ON THIS DRAWING SHALL BE FURNISHED AND INSTALLED BY SPECIFICATION P-1400 UNLESS NOTED OTHERWISE.
2. FOR GENERAL NOTES, ABBREVIATIONS, AND SYMBOLS, SEE DRAWING POW-BBR-CSK-002.

REFERENCE DRAWINGS

D1965C032-02	BYPASS BASIN LINER REPLACEMENT DETAILS AND SECTIONS
5295-C-5501	ASH SURGE BASIN BYPASS BASIN INLET STRUCTURE

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FOR PERMIT
NOT FOR CONSTRUCTION

HOLD INFORMATION

NO.	DESCRIPTION

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RELEASE INFORMATION

REV.	DATE	DESCRIPTION
A	04-15-2022	FOR PUBLIC COMMENT
B	07-15-2022	FOR PERMIT

ISSUE PURPOSE: PERMIT

SPECIFICATION: P-1400

PROJECT NO.: 12661-130

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THOMAS DEHLIN
07-15-2022

MY LICENSE RENEWAL DATE IS: 11-30-2023
PAGES OR SHEETS COVERED BY THIS SEAL:
THIS DOCUMENT ONLY.

LICENSED PROFESSIONAL ENGINEER
THOMAS J. DEHLIN
062-069314
OF ILLINOIS

CAD FILE NAME: POW-BBR-CSK-009.DGN

PREPARED BY: J. CHAVEZ

REVIEWED BY: T. DEHLIN

APPROVED BY: T. DEHLIN

ANY MODIFICATION OR ADDITION TO THIS DRAWING BY AN ORGANIZATION OTHER THAN SARGENT & LUNDY, IS NOT THE RESPONSIBILITY OF SARGENT & LUNDY.

Sargent & Lundy LLC
SARGENT & LUNDY LLC
55 EAST MONROE STREET
CHICAGO, ILLINOIS 60603-5780

MWG
Midwest Generation, LLC

PROJECT

MIDWEST GENERATION, LLC
POWERTON
GENERATING STATION
BYPASS BASIN RETROFIT PROJECT

DRAWING TITLE

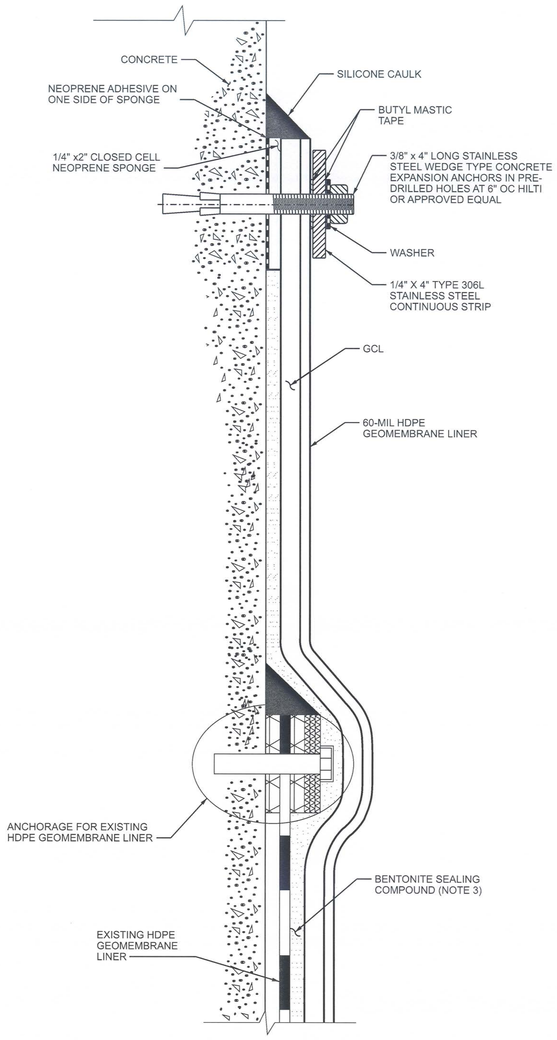
RETROFITTED BASIN RETROFIT
INLET & OUTLET STRUCTURE
DETAILS

DRAWING NUMBER	REVISION
POW-BBR-CSK-009	B

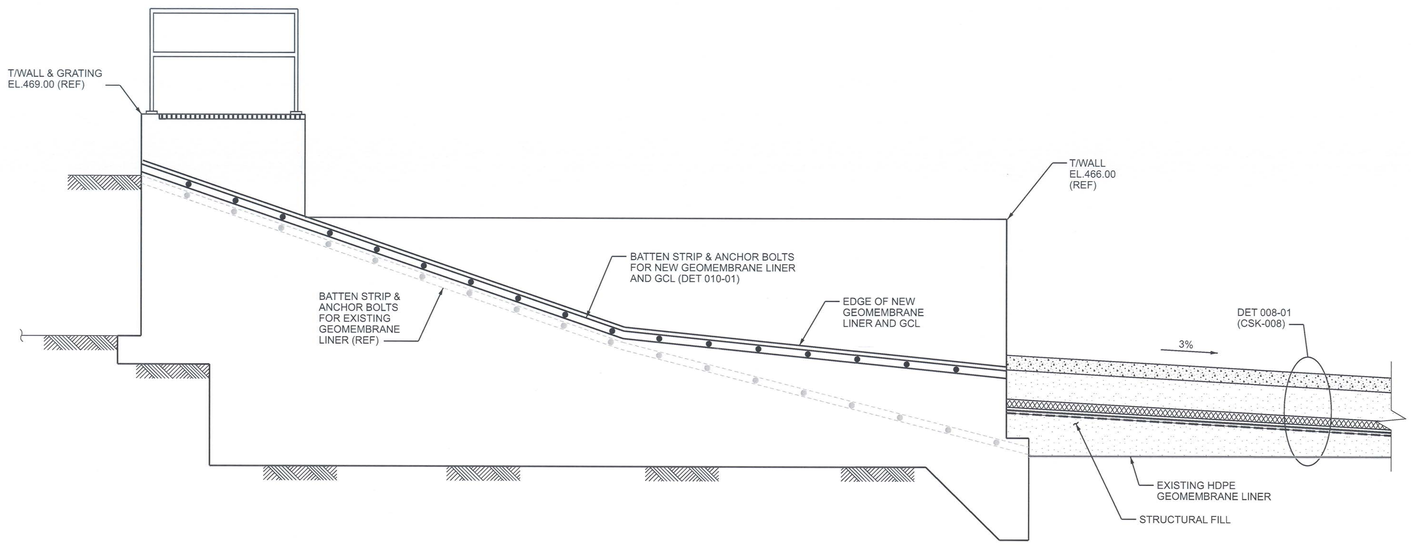
SHEET 1 OF 1

$PINFO1$
Form GDG-0401-01-08, ANSI (Imperial) MicroStation Border - Size E - 34 x 44
Revision 11A, Revision Date: 04-30-2010

$TIME$
$DATE$
$FILEABBREV$



GCL & GEOMEMBRANE LINER ANCHORING TO CONCRETE
DETAIL 010-01
N.T.S.



EXTERIOR OF CONCRETE OUTLET STRUCTURE
SECTION 3
N.T.S.

HOLD INFORMATION	
NO.	DESCRIPTION

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B	07-15-2022	FOR PERMIT

ISSUE PURPOSE:	PERMIT
SPECIFICATION:	P-1400
PROJECT NO.:	12661-130

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THOMAS DEHLIN
07-15-2022

LICENSED PROFESSIONAL ENGINEER
THOMAS J DEHLIN
062-069314
OF ILLINOIS

MY LICENSE RENEWAL DATE IS: 11-30-2023
PAGES OR SHEETS COVERED BY THIS SEAL:
THIS DOCUMENT ONLY.

CAD FILE NAME:	POW-BBR-CSK-010.DGN
PREPARED BY:	J. CHAVEZ
REVIEWED BY:	T. DEHLIN
APPROVED BY:	T. DEHLIN

ANY MODIFICATION OR ADDITION TO THIS DRAWING BY AN ORGANIZATION OTHER THAN SARGENT & LUNDY, IS NOT THE RESPONSIBILITY OF SARGENT & LUNDY.

Sargent & Lundy LLC

SARGENT & LUNDY LLC
55 EAST MONROE STREET
CHICAGO, ILLINOIS 60603-5780

MWG
Midwest Generation, LLC

PROJECT

MIDWEST GENERATION, LLC
POWERTON
GENERATING STATION
BYPASS BASIN RETROFIT PROJECT

DRAWING TITLE

RETROFITTED BASIN RETROFIT
INLET & OUTLET STRUCTURE
DETAILS

DRAWING NUMBER	REVISION
POW-BBR-CSK-010	B
SHEET 1 OF 1	

NOTES

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2. FOR GENERAL NOTES, ABBREVIATIONS, AND SYMBOLS, SEE DRAWING POW-BBR-CSK-002.
3. GW CONTRACTOR SHALL APPLY GRANULAR BENTONITE AND BENTONITE SEALING COMPOUND IN BETWEEN EXISTING HDPE GEOMEMBRANE LINER AND GCL AS SPECIFIED AT A MINIMUM RATE OF 1 LB PER LINEAR FOOT.

REFERENCE DRAWINGS

D1965C031-02	BYPASS BASIN LINER REPLACEMENT DETAILS AND SECTIONS
5295-C-5502	ASH SURGE BASIN BY-PASS BASIN OUTLET STRUCTURE

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FOR PERMIT
NOT FOR CONSTRUCTION

PL:\27930\M1864\E:\Shared\INFO CENTER\DISCIPLINE REF MATERIAL\CIVIL\DESIGN\2-Powerton - CCR\Drawings\POW-BBR-CSK-010.dgn
Form GDG-0401-01-08, ANSI (Imperial) MicroStation Border - Size E - 34 x 44
Revision 11A, Revision Date: 04-30-2010
7/12/2022 4:05:46 PM ...\Drawings\POW-BBR-CSK-010.dgn

ATTACHMENT 2

SPECIFICATION P-1401 – CONSTRUCTION QUALITY ASSURANCE FOR BYPASS BASIN RETROFIT

Note: See Attachment 5-2 for Specification P-1401

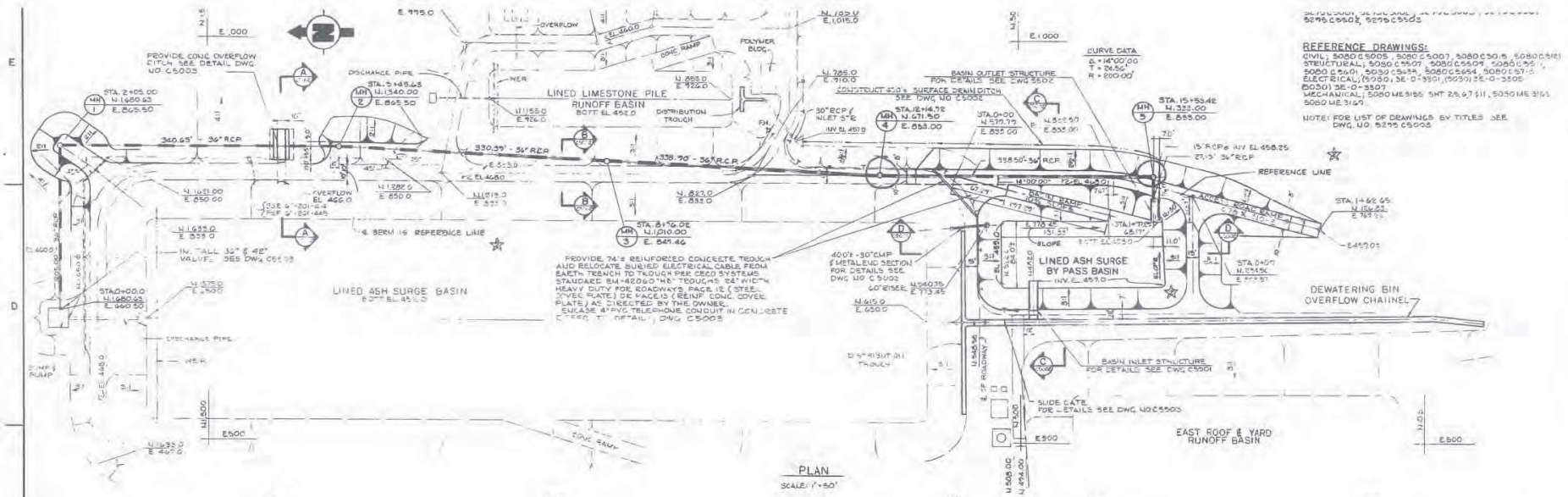
ATTACHMENT 3

REFERENCE DRAWINGS

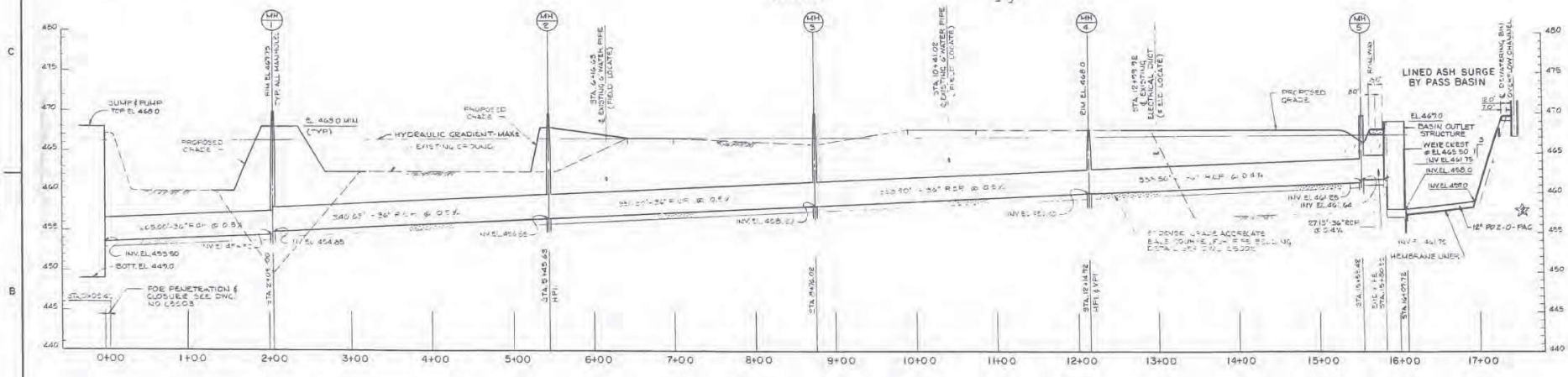
ATTACHMENT 3-1

1980 CONSTRUCTION DRAWINGS

DRAWING NO.	TITLE
5925-C-5001	ASH SURGE BASIN BY PASS PLAN AND PROFILE
5925-C-5002	ASH SURGE BASIN BY PASS SECTIONS AND RAMP PROFILES
5295-C-5003	ASH SURGE BASIN BY PASS MISCELLANEOUS DETAILS
5295-C-5501	ASH SURGE BASIN BY PASS BASIN INLET STRUCTURE
5925-C-5502	ASH SURGE BASIN BY PASS BASIN OUTLET STRUCTURE
5925-C-5503	MISCELLANEOUS SLIDE GATES



PLAN
SCALE: 1"=50'



PROFILE
SCALE: HOR 1"=50'
VERT 1"=5'

SPECIFICATION:

1 SYMBOLS
2 CONCRETE
3 MANHOLES
MANHOLES SHALL BE THE SIZE AND AT THE LOCATIONS AND GRADES SHOWN ON THE CONTRACT DRAWINGS. MATERIAL FOR THE WALL SHALL BE EITHER CAST IN PLACE REINFORCED CONCRETE OR PRECAST REINFORCED CONCRETE SECTIONS. PRECAST MANHOLES SHALL BE MANUFACTURED TO THE FOLLOWING ELEMENTS: (A) ANSI/ASTM C478-78 A STANDARD SPECIFICATION FOR PRECAST REINFORCED CONCRETE MANHOLE SECTIONS. JOINTS ARE TO BE SEALED WITH O-RING GASKET. MANHOLES SHALL BE CONSTRUCTED FOR 15 FOOT HYDROSTATIC HEAD. THE JOINTS SHALL REMAIN WATERTIGHT THROUGH THE MANHOLE SHALL BE U-SHAPED TO AID CAT THREE FOOT THE DIAMETER CAST FRAME (270 LBS) AND COVER (165 LBS) SHALL BE GRAY IRON ILLINOIS DOT STANDARD 611314 TYPE 1 (NEENAH CAT NO. R-1015, REF R-1712) THE EQUAL CONTRACTOR TO SUBMIT VENDOR DRAWINGS FOR APPROVAL.
4 UNDERGROUND PIPE RELOCATION SEE DWG NO C5003

MANHOLE SCHEDULE

MH NO	BY PASS STATION	EL TOP CONE	EL SEW PIPE INV. IN	EL SEW PIPE INV OUT	MH DEPTH (MIN.)	NOTES
-	0+70.0	-	455.50	-	-	EXIST PUMP SUMP
1	2+05	469.0	454.85	454.55	14.45'	MH 1 + 90°
2	5+45.63	469.0	456.57	456.53	12.47'	MH 2 + 02°83'
3	8+76.02	469.0	458.28	458.18	10.88'	STRAIGHT RUN
4	12+14.92	467.25	459.92	459.83	7.33'	MH 4 + 90°
5	15+53.42	469.0	461.64	461.55	7.75'	MH 5 + 90°
-	16+00.95	-	-	461.75	-	OUTLET STRUCTURE

NOTE: MAX HYDRAULIC GRADIENT EL 467.852

Robert D. Farnsworth 4/21/80

APPROVED FOR CONSTRUCTION

6/26/80

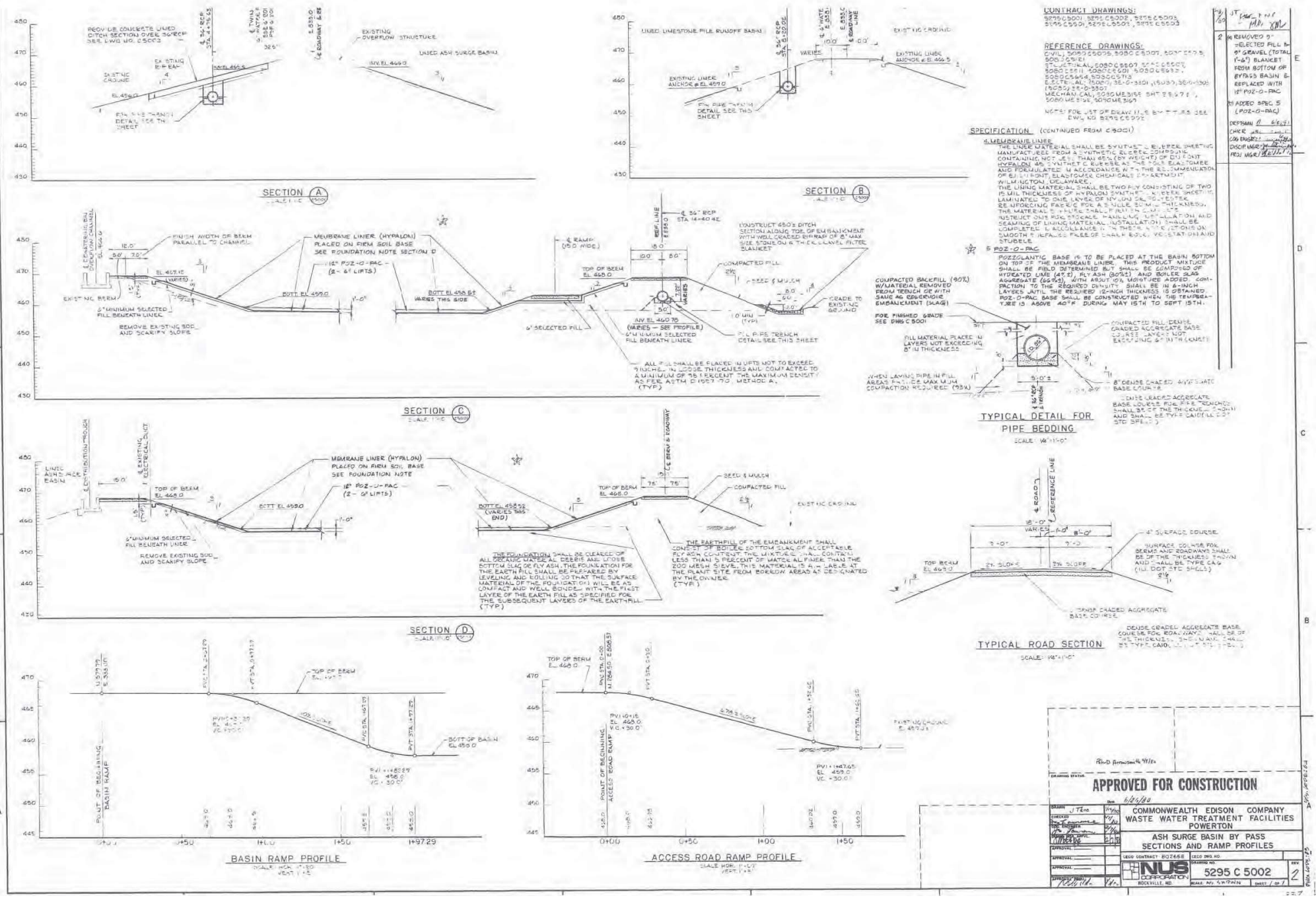
COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES
POWERTON
ASH SURGE BASIN BY PASS
PLAN AND PROFILE

CECO CONTRACT: 802668
CECO DWG. NO.
NUS CORPORATION ROCKVILLE, MD.
DRAWING NO. 5295 C 5001
REV. 2
SCALE: AS SHOWN
SHEET 1 OF 1

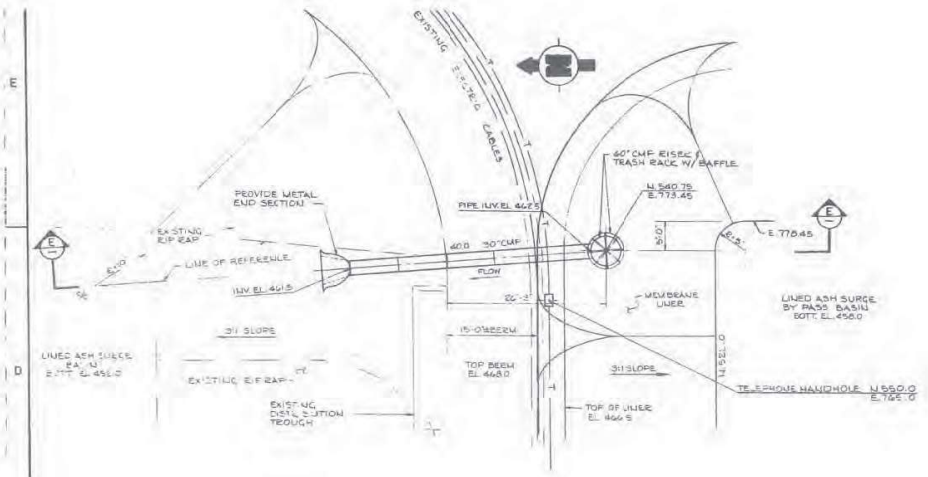
REV	DATE	BY
2	6/26/80	DM

(a) REMOVED 9" SELECT FILL AND 9" GRAVEL BLANKET (TOTAL 1'-6" FROM BOTTOM BY-PASS BASIN. REPLACED WITH 12" PDZ-O-PAC
(b) ADDED ELEV., SLOPE AND REFERENCE LINE NOTATIONS TO PLAN.

DRAFTSMAN
CHKR
LOG ENGR
DISCIP MGR
PROJ MGR


SECTION A
SECTION B
SECTION C
SECTION D
TYPICAL DETAIL FOR PIPE BEDDING
TYPICAL ROAD SECTION
BASIN RAMP PROFILE
ACCESS ROAD RAMP PROFILE
CONTRACT DRAWINGS:
REFERENCE DRAWINGS:
SPECIFICATION (CONTINUED FROM C 5001)
APPROVED FOR CONSTRUCTION
COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES
POWERTON
ASH SURGE BASIN BY PASS
SECTIONS AND RAMP PROFILES
NUS CORPORATION
5295 C 5002

R000233

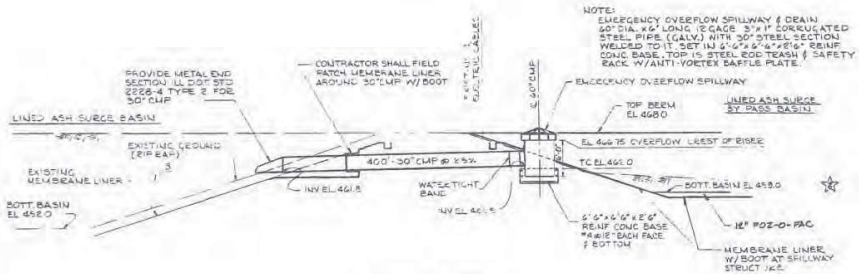


PLAN

CONTRACT DRAWINGS		
DRAWING NO.	REV.	DRAWING TITLES
5295 C 5001	1	PLAN & PROFILE
5295 C 5002	1	DETAILS & SECTIONS
5295 C 5003	1	MISCELLANEOUS DETAILS
5295 C 5501	1	INLET STRUCTURE
5295 C 5502	1	OUTLET STRUCTURE
5295 C 5503	1	MISCELLANEOUS GATES
REFERENCE DRAWINGS		
5080 C 5005	2	DETAIL PLAN - EAST ROOF & YARD RUNOFF BASIN
5080 C 5007	2	DETAIL PLAN ASH SURGE BASIN
5080 C 5015	2	MISCELLANEOUS SECTIONS AND DETAILS, SHTS 1 & 2
5080 C 5181	1	BASIN END SECTION
5080 C 5507	1	RAMPS & ASH SURGE BASIN OVERFLOW STRUCTURE
5080 C 5509	1	ASH SURGE BASIN & LIMESTONE BASIN DISTRIBUTION TROUGH SECTIONS & DETAILS
5080 C 5511	2	DEWATERING BIN OVERFLOW CHANNEL SECTIONS & DETAILS
5080 C 5601	2	STANDARD DETAILS
5080 C 5658	2	ASH SURGE BASIN SUMP - CLARIFIER OVERFLOW SUMP
5080 C 5654	1	PIPE SUPPORTS FRAMING PLAN & SECTIONS (DWG NO 74-79 151)
5080 C 5718	1	ASH SURGE BASIN SUMP FLAT FORM SECTIONS & DETAILS
(5080) 3E-0-3501	2	ELECTRICAL AREA LAYOUT EAST RUNOFF BASIN - NORTH
(5080) 3E-0-3505	3	ELECTRICAL AREA LAYOUT LIMESTONE PILE RUNOFF BASIN
(5080) 3E-0-3507	2	ELECTRICAL AREA LAYOUT ASH SURGE BASIN AREA
5080 ME 3155 SHT 4	4	PIPING ARRANGEMENT - YARD AREA
SHT 5	3	
SHT 6	3	
SHT 7	3	
SHT 11	3	
5080 ME 3162 SHT 1	3	PIPING ARRANGEMENT YARD DETAIL EAST ROOF & YARD RUNOFF BASIN
5080 ME 3163 SHT 1	1	PIPING ARRANGEMENT YARD DETAIL LIMESTONE PILE RUNOFF BASIN AND ASH SURGE BASIN SUMPS

NOTE:
FOR ELECTRICAL CABLE TROUGH SEE CECO SYSTEMS STANDARD EM-42060 "HB" TROUGHS 54" WIDTH HEAVY DUTY FOR ROADWAYS PAGE 12 (STEEL COVER PLATE) OR PAGE 13 (REINFORCED CONCRETE 4"/SLAB).

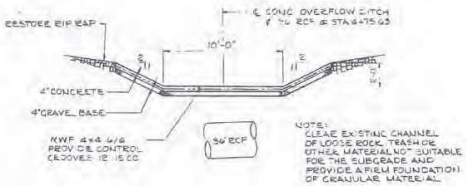
6/6/80	W. Mast	1319
2	(a) REMOVED COMBINED SELECT AND GRAVEL BLANKET FROM BOTTOM OF BASIN AND ADDED 18" POZ-O-PAC, SEE E (b) CHANGED BOTTOM EL 458.0 TO 459.0	



SECTION (E)

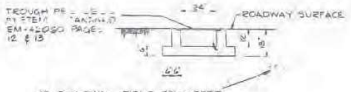
EMERGENCY OVERFLOW SPILLWAY

SCALE: 1/8"=1'-0"



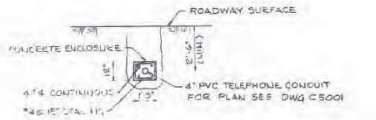
TYPICAL DETAIL
CONCRETE OVERFLOW DITCH

SCALE: 1/8"=1'-0"



DETAIL
ELECTRICAL CABLE TROUGH

SCALE: 3/4"=1'-0"



DETAIL
CONCRETE ENCLOSURE FOR
TELEPHONE CONDUIT

SCALE: 3/8"=1'-0"

Peter D. Arrendondo 4/21/80

APPROVED FOR CONSTRUCTION

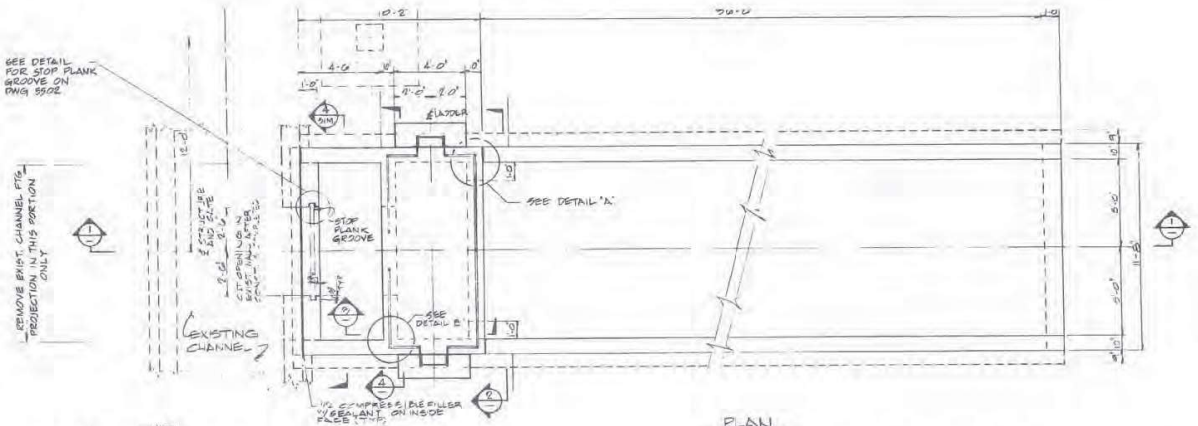
6/24/80

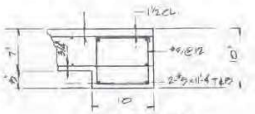
DESIGN	J.L.M.	6/80
DRAWN		
CHECKED		
QUALITY ASSURANCE		
CONSTRUCTION ENGINEER		6/24
PROJECT MGR.		6/24
APPROVAL		
APPROVAL		
APPROVAL		
APPROVAL PROJ. MGR.		7/1/80

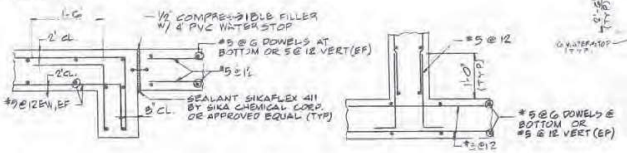
COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES
POWERTON

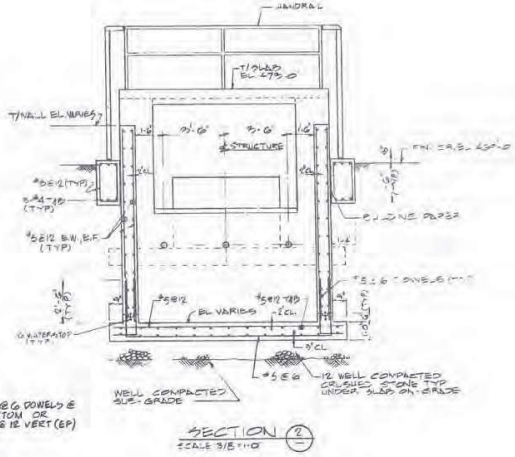
ASH SURGE BASIN BY PASS
MISCELLANEOUS DETAILS

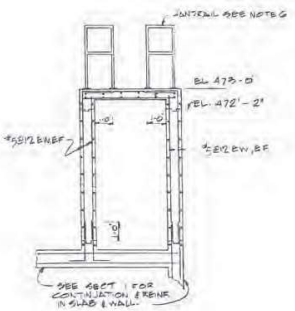
CECO CONTRACT: 802668	CECO DWG. NO.	REV.
NUS CORPORATION ROCKVILLE, MD.	5295 C 5003	2
	SCALE: AS SHOWN	SHEET 1 OF 1

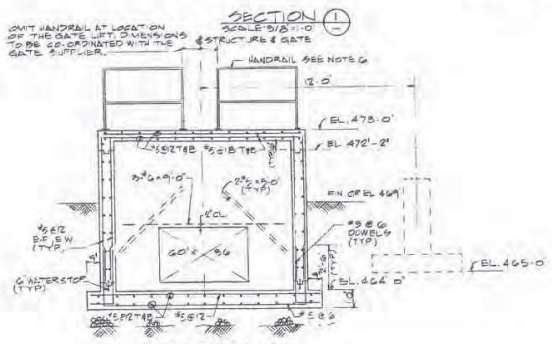












NOTES:

1. CONCRETE: f'c = 3000 PSI AT 28 DAYS
2. REINFORCING = ASTM A 615, GRADE 60
3. CONTRACTOR SHALL FURNISH AND INSTALL F&S STEEL GATE AND ACCESSORIES AS MANUFACTURED BY ARMCO STEEL CORP. CONFORMING TO THE FOLLOWING SPECS. OR APPROVED EQUAL.
   a. GATE MODEL 10-00
      QUANTITY REQUIRED = 1
      OPENING SIZE = 60" x 36"
      FRAME TYPE = FLAT BACK, STD. BOTTOM
      MATERIAL COMBINATION = #2
      STEM DIA. = 1 1/2" Ø
   b. ACCESSORIES
      TYPE OF LIFT = CPE 2
      LIFT SUPPORT = WALL BRACKET TO MATCH CPE 2
      STEM SUPPORT = ADJUSTABLE STEM GUIDES AT SPACING RECOMMENDED BY MANUFACTURER.
4. CONTRACTOR SHALL COORDINATE WITH THE GATE SUPPLIER FOR THE NUMBER, SIZE AND LOCATION OF ANCHOR BOLTS REQUIRED TO ATTACH THE GATE, WALL BRACKET AND STEM GUIDES TO THE SUPPORTING WALL.
5. WORK THIS DWG. WITH CIVIL DWGS. 5295 C 5001 AND 5002.
6. FOR HANDRAIL & LADDER DETAILS SEE REF. DWG. 5080 C 5601
7. FOR STOP PLANKS SEE DWG. 5295 C 5502 NOTE 4

CONTRACT DRAWINGS:
5295 C 5001, 5002, 5003, 5501, 5502, 5503.

REFERENCE DRAWINGS:
CIVIL: 5080 C 5005, 5007, 5015, 5121
STRUCTURAL: 5080 C 5507, 5509, 5511, 5601, 5638, 5654, 5713
ELECTRICAL: (5080) 3E-0-3301, 3305, 3307
MECHANICAL: 5080 M&3155 SHT 2, 5, 6, 7 & 11, 3162, 3169

NOTE: FOR LIST OF DRAWINGS BY TITLES SEE DWG NO. 5295 C 5003

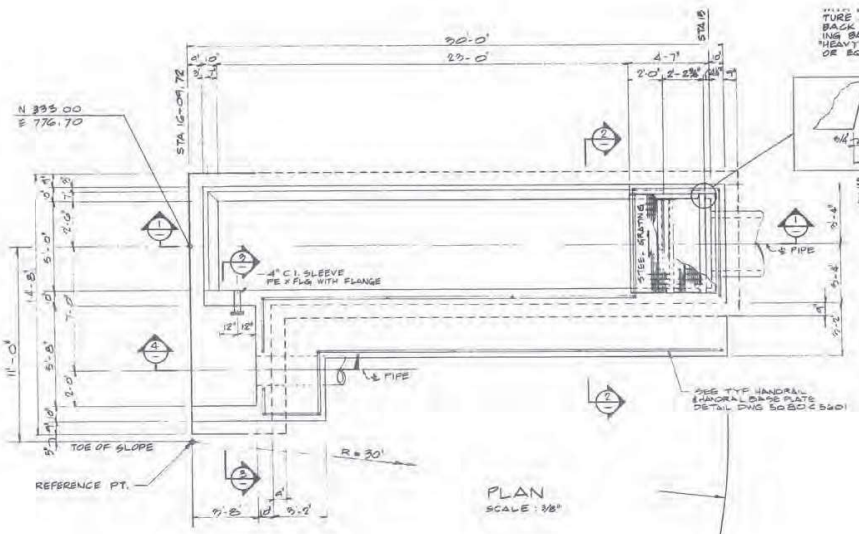
Rdw D, Ferguson 4/6/80

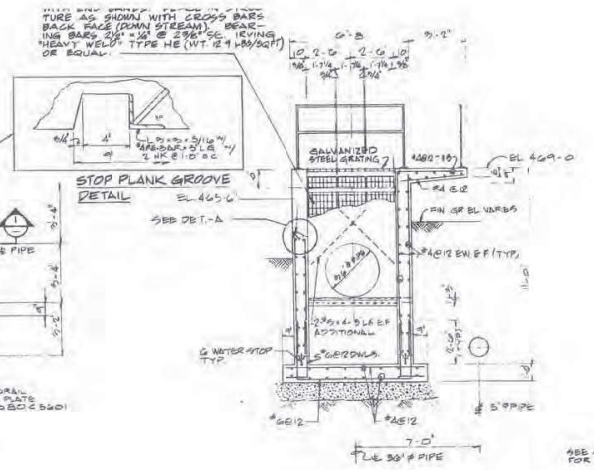
APPROVED FOR CONSTRUCTION

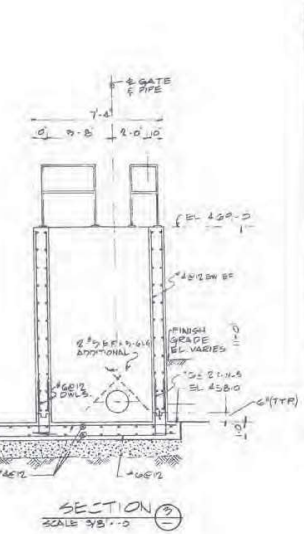
DESIGN	KENNETH LONG	3/1/80
CHECKED	T-N	3/1/80
CIVIL ENGINEER		3/6/80
APPROVAL		
APPROVAL		
APPROVAL		3/6/80
APPROVAL CLIENT		

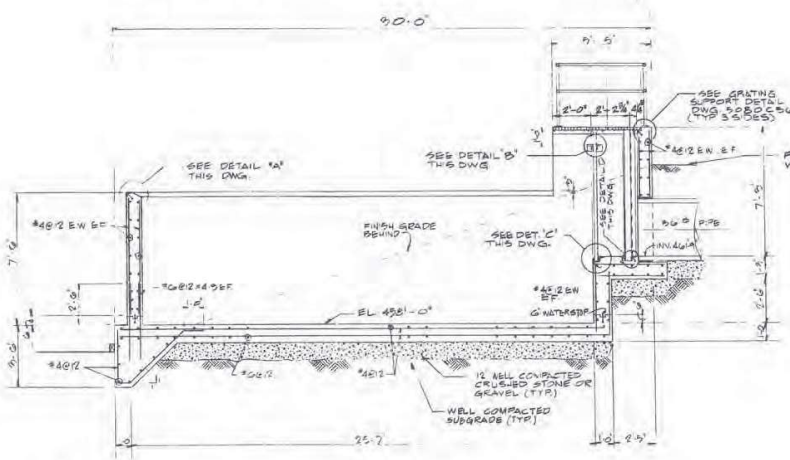
COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES
POWERTON
ASH SURGE BASIN BY PASS
BASIN INLET STRUCTURE

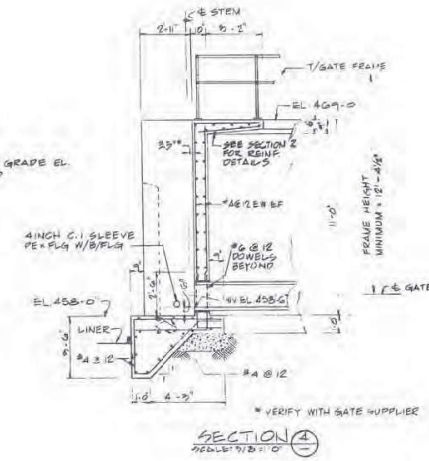
NUS CORPORATION, ROCKVILLE, MD.
DRAWING NO. 5295 C 5501
REV. 1
SCALE: AS SHOWN
SHEET 1 OF 1









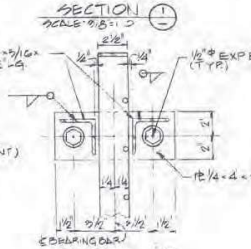


NOTES:

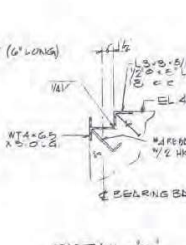
1. SEE NOTE NOS 1, 2, 4, 5 AND 6 ON DWG 5501.
2. CONTRACTOR SHALL FURNISH & INSTALL MEDIUM DUTY SLUICE GATE & ACCESSORIES AS MANUFACTURED BY ARMCO STEEL CORP. OR APPROVED EQUAL, CONFORMING TO FOLLOWING SPECS:
   a. GATE
      MODEL 20-10C
      QUANTITY REQD = 1
      OPENING SIZE = 15" DIA.
      FRAME TYPE = FLAT BACK
      MATERIAL COMBINATION = #2
      STEM DIA. = 7/8"
   b. ACCESSORIES
      TYPE OF LIFT = H1-10
      FRAME HT = 12'-4½" MINIMUM.
3. STEEL GRATING TO BE IRVING WELDED RECTANGULAR DESIGN TYPE IHB-2 WITH 1⅛" x ⅛" MAIN BARS, AS MANUFACTURED BY IKG INDUSTRIES OR APPROVED EQUAL (GALVANIZED)
4. STOP PLANKS TO BE DOUGLAS FIR COMMERCIAL GRADE NO. 2 (WEST COAST)
   PROVIDE ONE SET OF 7 PLANKS 4" x 8" x 5'-5" LONG (DRESSED SIZE 3½ x 7¼ x 5'-5")
   STOP PLANKS ARE INTERCHANGEABLE AT THREE LOCATIONS — SEE ALSO DWGS C5501 & C5503 (ONLY ONE SET REQUIRED UNLESS DIRECTED OTHERWISE BY OWNER)



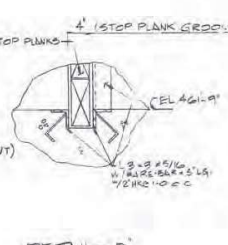
DETAIL - 'A'
SCALE: 3"=1'-0"



DETAIL - 'B'
SCALE: 3"=1'-0"



DETAIL - 'C'
SCALE: 1½"=1'-0"



DETAIL - 'D'
SCALE: 1½"=1'-0"

CONTRACT DRAWINGS:
5295 C 5001, 5002, 5003, 5501, 5502, 5503.

REFERENCE DRAWINGS:
CIVIL: 5080 C 5005, 5007, 5015, 5121
STRUCTURAL: 5080 C 3507, 3509, 3511, 5601, 5635, 5654, 3713
ELECTRICAL: (SHEET) 3E-0-3301, 3305, 3307
MECHANICAL: E 780 ME 3155 SHT 2, 5, 6, 7, & 11, E 62, 3169

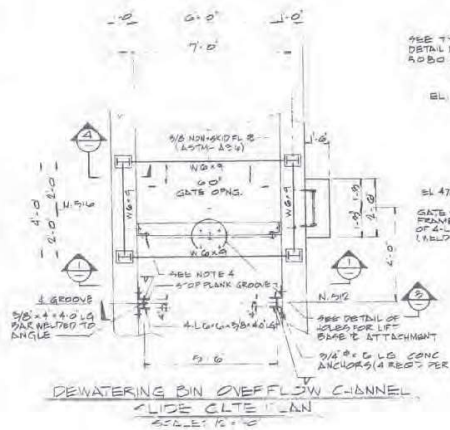
NOTE: FOR LIST OF DRAWINGS BY TITLES SEE DWG NO. 5295 C 5003.

APPROVED FOR CONSTRUCTION
Date 2/9/80

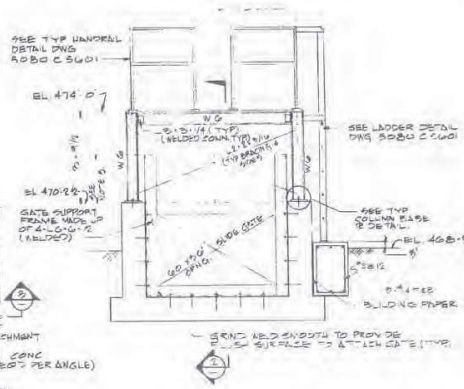
DRAWN	LENG	12/80	COMMONWEALTH EDISON COMPANY
CHECKED			WASTE WATER TREATMENT FACILITIES
QUALITY CONTROL			POWERTON
ENGINEERING			ASH SURGE BASIN BY PASS
APPROVAL			BASIN OUTLET STRUCTURE
APPROVAL			
APPROVAL CLIENT			CECO CONTRACT 80-26468 · CECO DWG NO. · REV.

NUS CORPORATION ROCKVILLE, MD. — DRAWING NO. 5295 C 5502 — SCALE AS SHOWN — SHEET 1 OF 1

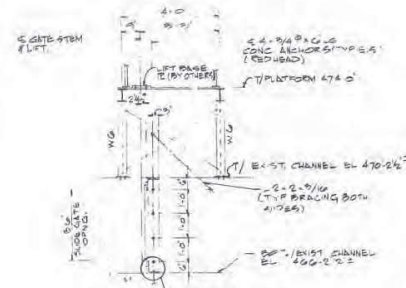
R000236



DEWATERING BIN OVERFLOW CHANNEL SLIDE GATE PLAN
SCALE: 1/2" = 1'-0"



SECTION (1)
SCALE: 1"=1'-0"



SECTION (2)
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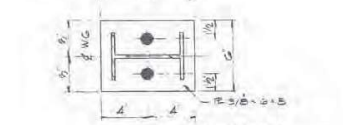
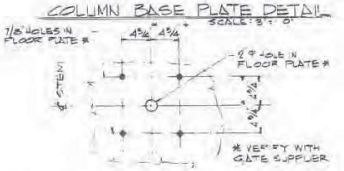


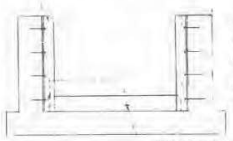
COLUMN BASE PLATE DETAIL
SCALE: 3"=1'-0"



HOLE ARRANGEMENT FOR LIFT BASE PLATE ATTACHMENT
SCALE: 1½"=1'-0"

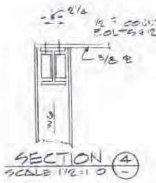


DETAIL-A
SCALE: 1"=1'-0"

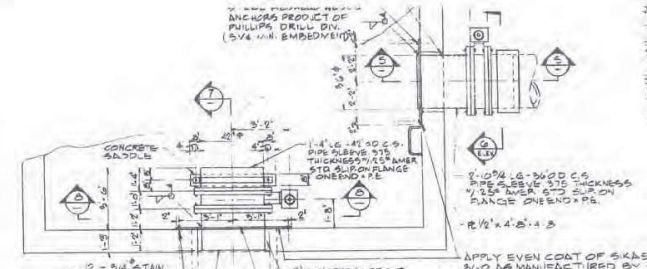


SECTION (11)
SCALE: 1½"=1'-0"

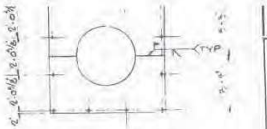
NOTES:
1. STRUCTURAL STEEL = ASTM A-36
2. WELDING ELECTRODE = E70-XX
3. GATE TO BE ARMCO FABRICATED STEEL SLIDE GATE MODEL 10-00, MATERIAL COMPLIANT WITH 2 PS CPS-2 LIFT, 1½" STEM OR APPROVED EQUAL.
4. GATE TO BE ATTACHED TO SUPPORT ANGLE FRAME WITH BOLTS AS RECOMMENDED BY GATE SUPPLIER.
5. VERTICAL ANGLES OF GATE SUPPORT FRAME TO BE EXTENDED FOR A SUFFICIENT LENGTH TO ATTACH SIDE GUIDES OF GATE. THIS DIMENSION SHALL BE CO-ORDINATED WITH THE GATE SUPPLIER
6. STRUCTURAL STEEL TO RECEIVE ONE SHOP COAT OF INORGANIC ZINC.



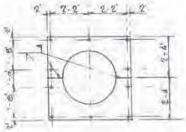
SECTION (4)
SCALE: 1½"=1'-0"



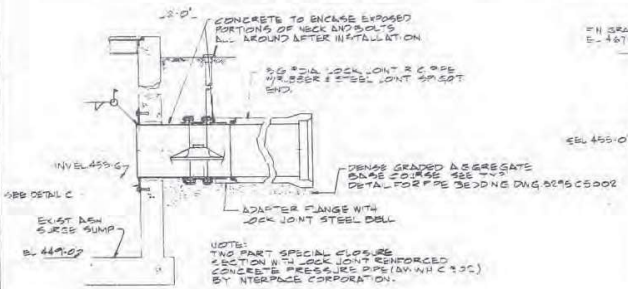
ASH SURGE BASIN SUMP BY-PASS PIPE PENETRATION PLAN AND VALVE INSTALLATIONS
SCALE: 3/8"=1'-0"



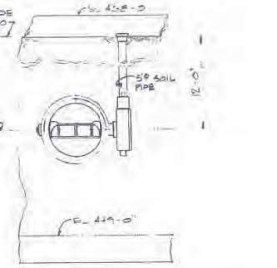
DETAIL-B
SCALE: 3/8"=1'-0"



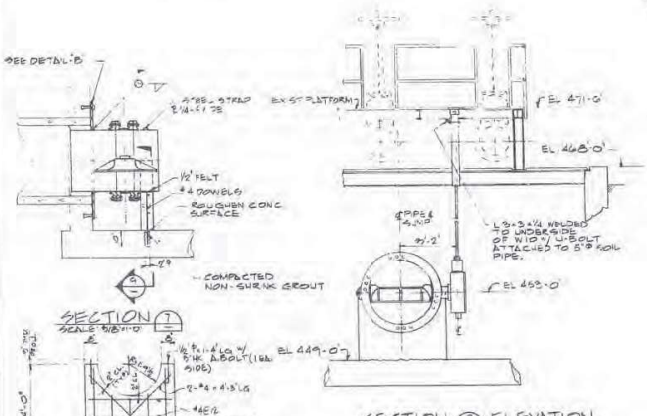
DETAIL-C
SCALE:



SECTION (5)
SCALE: 3/8"=1'-0"



SECTION (6) ELEVATION
SCALE: 3/8"=1'-0"



SECTION (7)
SCALE: 3/8"=1'-0"

SECTION (9) ELEVATION
SCALE: 3/8"=1'-0"

NOTES:
1. PROVIDE ONE(1) 36" DIA. AND ONE(1) 42" DIA. RUBBER SEATED BUTTERFLY VALVES WHICH COMPLY WITH AWWA STANDARD C504 (LATEST REVISION). BODY SHALL BE CAST IRON WITH END FLANGES; SERVICE IS FOR AWWA PRESSURE CLASS 250, 250; OPERATORS SHALL BE BURIED SERVICE / SUBMERSION PRESSURE (10 PSI) WITH 2" STD AWWA NUT AND EXTENSION STEMS AS SHOWN. VALVES SHALL BE TRITON XR-70, MANUFACTURED BY HENRY PRATT COMPANY, AURORA, ILL. OR APPROVED EQUAL.
2. MISCELLANEOUS STEEL EXPOSED SHALL BE GALVANIZED.

CONTRACT DRAWINGS:
5295 C 5001, 5002, 5003 (CIVIL) 5295 C 5501, 5502, 5503 (STRUCT.)

REFERENCE DRAWINGS:
CIVIL: 5080 C 5005, 5007, 5015, 5121
STRUCTURAL: 5080 C 5507, 5509, 5511, 5601, 5638, 5654, 5713
ELECTRICAL: 5080-35-0-3301, 3305, 3307
MECHANICAL: 5080 ME 3155 SHT. 2, 5, 6, 7, 11, 3162, 3169.
NOTE: FOR LIST OF DRAWINGS BY TITLES SEE DWG. NO. 5295 C 5005

R&D Approval 2/8/80

DRAWING STATUS
APPROVED FOR CONSTRUCTION
Date 2/19/80

DESIGN		
DRAWN	LONG	2/16
CHECKED		2/80
QC CHECKED		2/16/80
APPROVAL		
APPROVAL		
APPROVAL		
APPROVAL CLIENT		

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES
POWERTON
MISCELLANEOUS SLIDE GATES

CECO CONT. NO. 2668 | CECO DWG. NO. | REV.

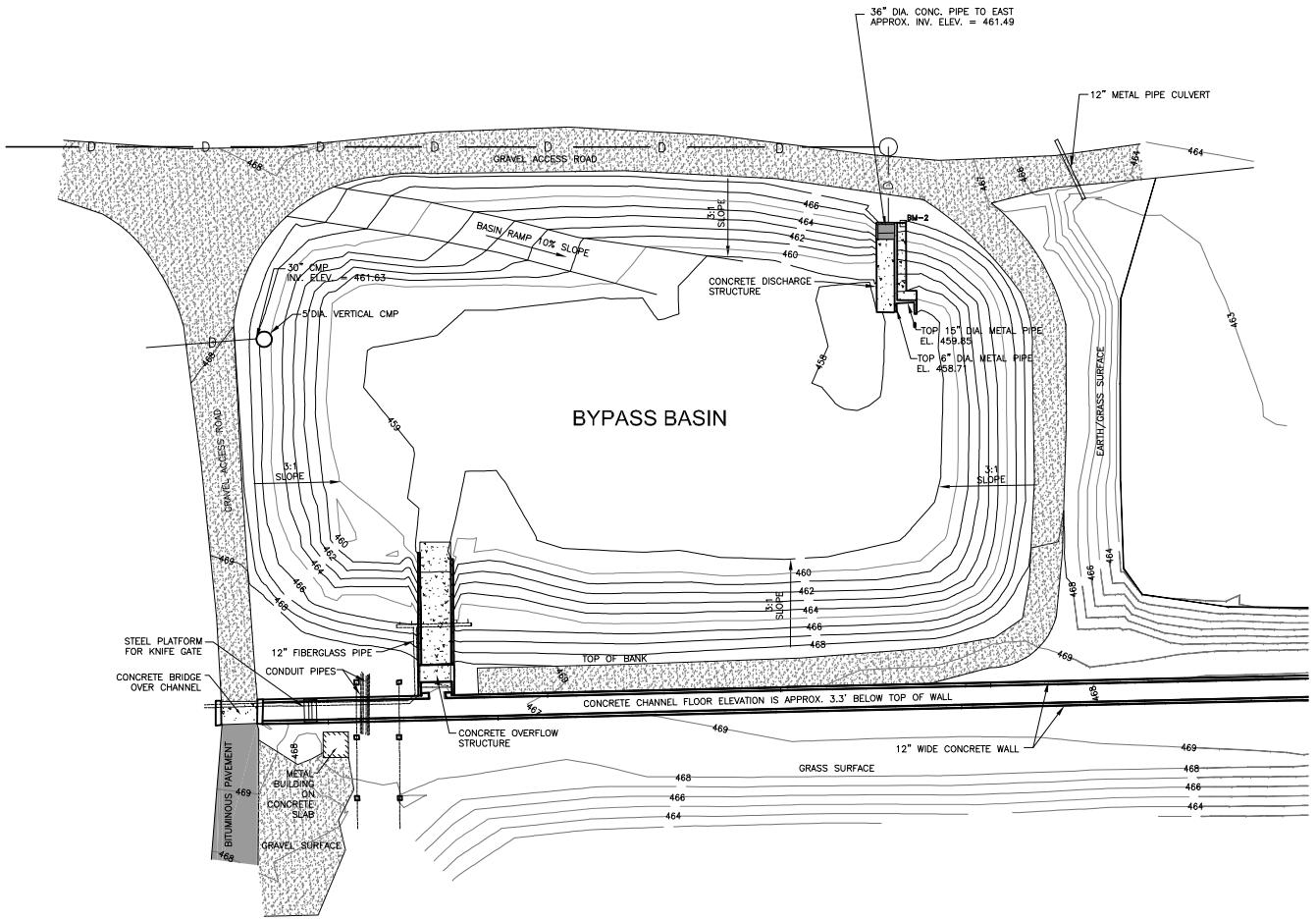
NUS CORPORATION, ROCKVILLE, MD. | DRAWING NO. 5295 C 5503 | REV. 1 | SCALE AS SHOWN | SHEET 1 OF 1

339

ATTACHMENT 3-2

2011 LINER REPLACEMENT DRAWINGS

DRAWING NO.	TITLE
D1965C010-02	PRE-CONSTRUCTION CONDITIONS
D1965C020-02	LINER SUBGRADE PREPARATION
D1965C030-02	WARNING LAYER PLAN
D1965C031-02	DETAILS AND SECTIONS
D1956C032-02	DETAILS AND SECTIONS



LEGEND

- D — UNDERGROUND DISCHARGE PIPE
- ABOVEGROUND INTAKE PIPE
- 460 — GROUND SURFACE CONTOUR
- BM-2 — BENCHMARK 2

HORIZONTAL DATUM:
ILLINOIS STATE PLANE COORDINATE SYSTEM, WEST ZONE, NAD83.

VERTICAL DATUM:
LOCAL PLANT DATUM

BENCHMARK 2:
NORTHEAST CORNER OF CONCRETE DISCHARGE STRUCTURE. CHISELED "+" IN CONCRETE ELEVATION 468.75 FT.

SOURCE NOTES:
THIS DRAWING WAS DEVELOPED FROM A SURVEY MAURER STUTZ, INC. DATED SEPTEMBER 7, 2010, DRAWING NO. 23210023.
LOCATION OF BASIN AND ACCESS RAMP TAKEN FROM MIDWEST GENERATION DRAWING NO. 5295 C5001-2, DATED 6-26-1980.

N

0 10 20 40
SCALE IN FEET

REVISION:		DATE:	APP'D BY:
6.			
5.			
4.			
3.			
2.	RECORD DOCUMENTATION	06/08/11	HMS
1.	ISSUED FOR BID	10/06/10	HMS
0.	ISSUED FOR PERMIT	06/30/10	HMS

NATURAL RESOURCE TECHNOLOGY

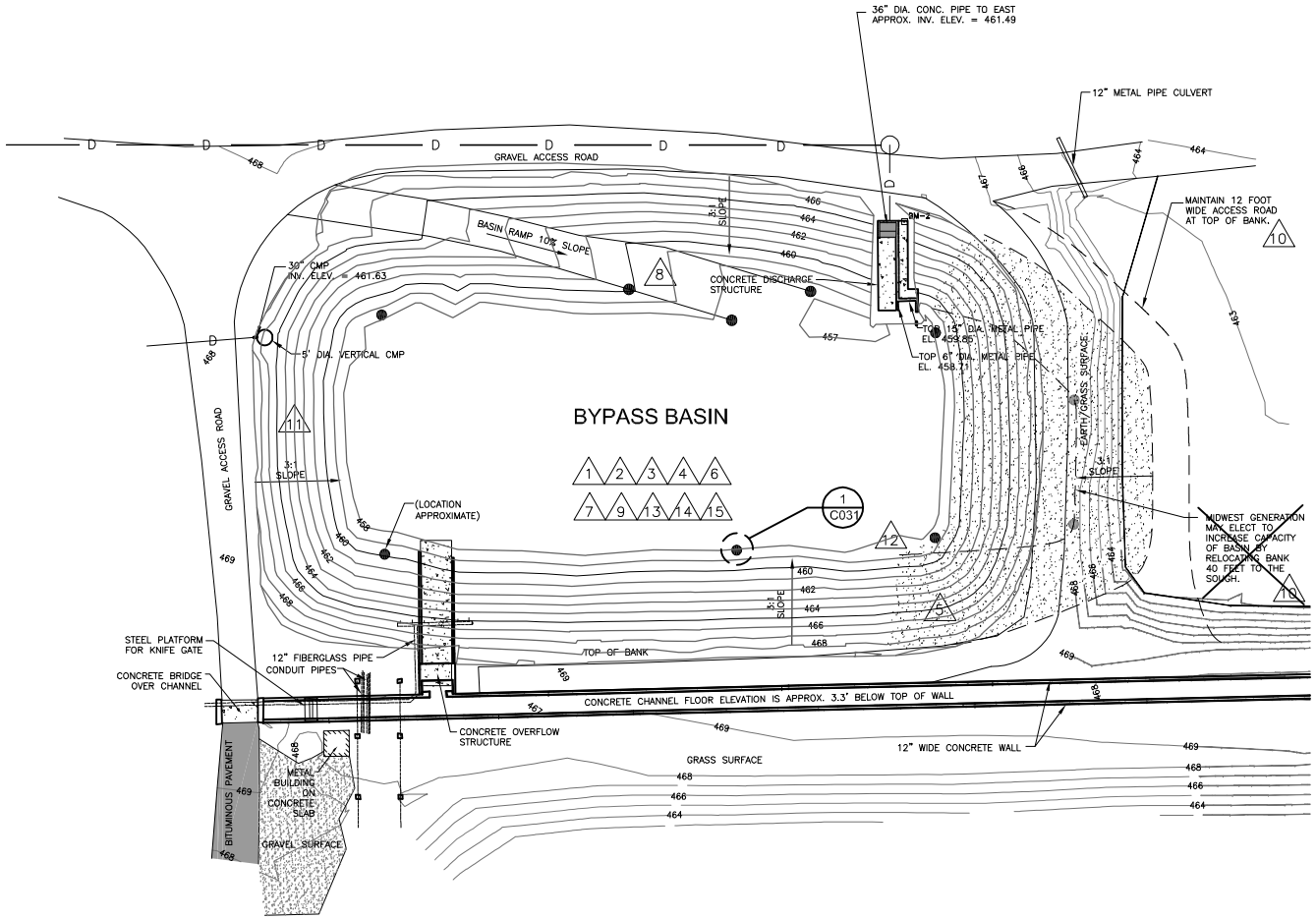
PROJECT NO. 1965.5/5.4
DRAWN BY: KNW 06/30/10
CHECKED BY: RJG 06/30/10
APPROVED BY: HMS 06/130/10

PRE-CONSTRUCTION CONDITIONS

BYPASS BASIN LINER REPLACEMENT
MIDWEST GENERATION
POWERTON POWER STATION
PEKIN, ILLINOIS

DRAWING NO: D1965C010-02
REFERENCE: .

SHEET NO. C010



LEGEND

- UNDERGROUND DISCHARGE PIPE
- ABOVEGROUND INTAKE PIPE
- PREPARED SUBGRADE SURFACE CONTOUR
- 12 OZ. NON-WOVEN GEOTEXTILE
- MARKER POST LOCATION
- ADDITIONAL MARKER POST LOCATION IF BANK IS RELOCATED.
- BANK/AREA FOR POSSIBLE RELOCATION
- BM-2 BENCHMARK 2

CONTRACTOR NOTES:

1. CONTRACTOR SHALL FIELD VERIFY LOCATION OF UNDERGROUND PIPES WITH ASSISTANCE OF OWNER'S UTILITY LOCATOR.
2. CONTRACTOR SHALL FIELD VERIFY LOCATION OF CONCRETE STRUCTURES AND ABOVE GROUND PIPING.
3. CONTRACTOR SHALL STORE ALL GEOSYNTHETICS AND SUBGRADE MATERIALS IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
4. CONTRACTOR SHALL STORE AND STAGE EQUIPMENT AT LOCATION APPROVED BY OWNER.
5. CLEAR AND GRUB ALL BRUSH ALONG TOP OF SLOPE OF BASIN.
6. PROTECT ALL CONCRETE AND UTILITY STRUCTURES THROUGHOUT PROJECT DURATION.
7. CONTRACTOR SHALL REMOVE ALL VEGETATION, ROCKS, AND OTHER DEBRIS FROM EXISTING LINER AND DISPOSE OF IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
8. CONTRACTOR SHALL CLEAN OFF THE RAMP SURFACE TO THE EXTENT PRACTICAL TO REMOVE ROCKS THAT MAY POSE A HAZARD TO GEOMEMBRANE, AS APPROVED BY GEOMEMBRANE INSTALLER, ENGINEER AND/OR OWNER.
9. CONTRACTOR SHALL REMOVE 12-INCH LAYER OF POZ-O-PAC AND 6-INCHES OF POZ-O-PAC SUBGRADE FROM THE BASE OF BASIN.
~~10. CONTRACTOR SHALL RELOCATE SOUTHERN BANK 40 FEET TO THE SOUTH, AS DIRECTED BY OWNER. SEGREGATE GRAVEL ACCESS ROAD MATERIAL TO BE REUSED AS BASE SOURCE MATERIAL. MATERIAL REMOVED FROM THE EXISTING BANK MAY BE USED TO RECONSTRUCT NEW SOUTHERN BANK IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.~~
11. CONTRACTOR SHALL REMOVE "SOFT" SUBGRADE MATERIAL BENEATH EXISTING HYPALON LINER, AS DIRECTED BY OWNER AND/OR ENGINEER. BACK FILL AREAS WITH FILL IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS. CUT HYPALON AS NEEDED TO REPAIR THE "SOFT" SUBGRADE AREAS.
12. CONTRACTOR SHALL INSTALL MARKER POSTS ALONG THE TOE OF SLOPE AS SHOWN AND IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS AND DETAIL 1 ON SHEET C031.
13. CONTRACTOR SHALL PLACE 16 OZ. NONWOVEN GEOTEXTILE AT BASE OF BASIN AND WHERE HYPALON LINER DOES NOT EXIST OR WAS REMOVED OF THE PREPARED SUBGRADE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
14. SUBGRADE SHALL BE APPROVED BY OWNER AND/OR ENGINEER PRIOR TO INSTALLATION OF GEOMEMBRANE.
15. CONTRACTOR SHALL PROVIDE MEANS TO PROTECT SUBGRADE FROM EROSION, STORM WATER, AND HEAVY EQUIPMENT TRAFFIC. DAMAGE TO SUBGRADE SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

HORIZONTAL DATUM:
ILLINOIS STATE PLANE COORDINATE SYSTEM, WEST ZONE, NAD83.

VERTICAL DATUM:
LOCAL PLANT DATUM

BENCHMARK 2:
NORTHEAST CORNER OF CONCRETE DISCHARGE STRUCTURE. CHISELED "+" IN CONCRETE ELEVATION 468.75 FT.

SOURCE NOTES:
THIS DRAWING WAS DEVELOPED FROM A SURVEY MAURER STUTZ, INC. DATED SEPTEMBER 7, 2010, DRAWING NO. 23210023.
LOCATION OF BASIN AND ACCESS RAMP TAKEN FROM MIDWEST GENERATION DRAWING NO. 5295 C5001-2, DATED 6-26-1980.
BASIN SUBGRADE AND SITE IMPROVEMENTS FROM A SURVEY PROVIDED BY MILLENNIA PROFESSIONAL SERVICES, MARCH 2011.

0 10 20 40
SCALE IN FEET

REVISION:		DATE:	APP'D BY:
6.			
5.			
4.			
3.			
2.	RECORD DOCUMENTATION	06/08/11	HMS
1.	ISSUED FOR BID	10/06/10	HMS
0.	ISSUED FOR PERMIT	06/30/10	HMS

NATURAL RESOURCE TECHNOLOGY

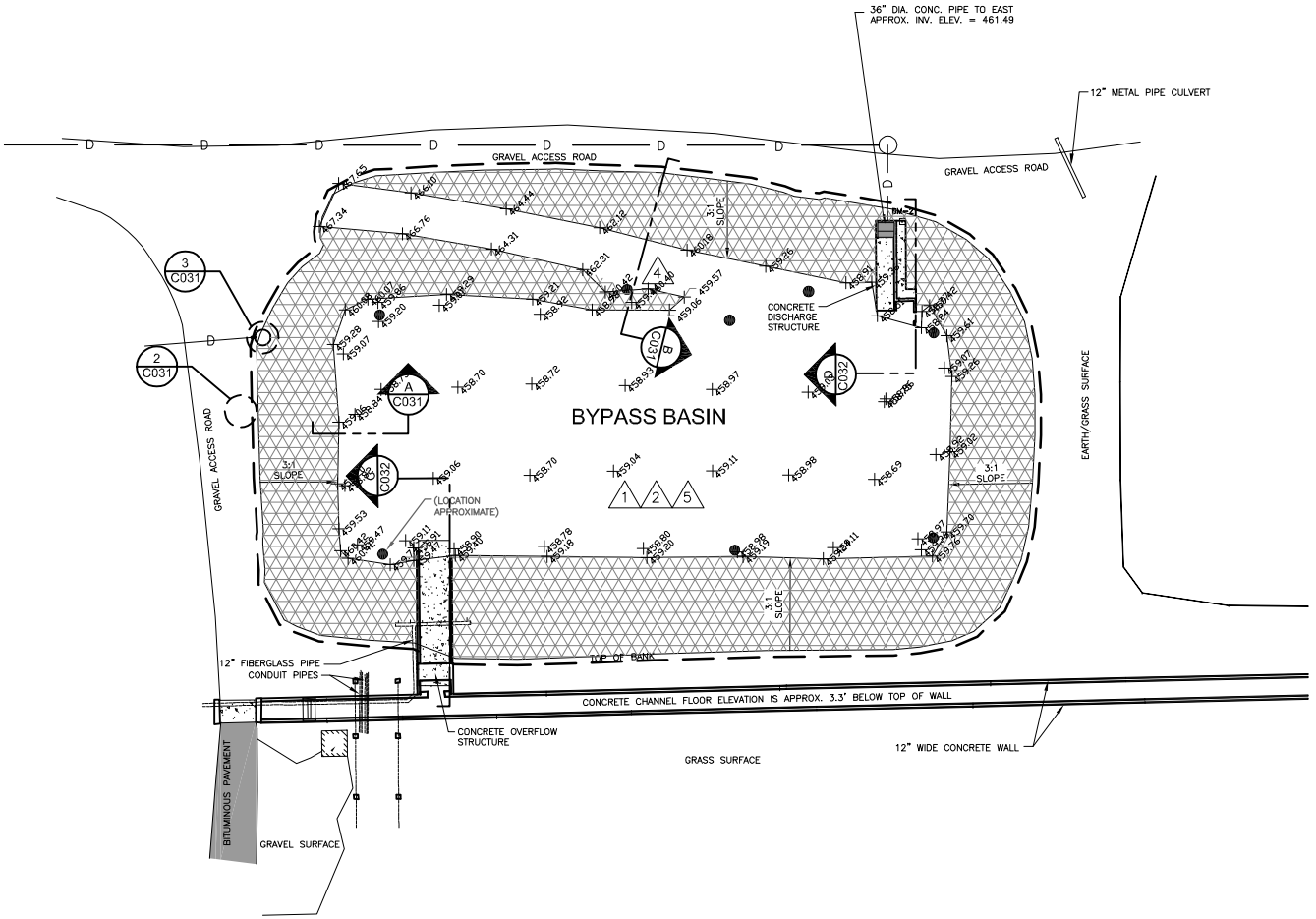
PROJECT NO.	1965/5.4
DRAWN BY:	KNW 06/30/10
CHECKED BY:	RJG 06/30/10
APPROVED BY:	HMS 06/30/10

LINER SUBGRADE PREPARATION

BYPASS BASIN LINER REPLACEMENT
MIDWEST GENERATION
POWERTON POWER STATION
PEKIN, ILLINOIS

DRAWING NO: D1965C020-02
REFERENCE: .

SHEET NO. C020



LEGEND

- D — UNDERGROUND DISCHARGE PIPE
- ABOVEGROUND INTAKE PIPE
- ANCHOR TRENCH
- × 459.11 — TOP OF WARNING LAYER (ELEVATION, FT.)
- MARKER POST LOCATION
- BM-2 — BENCHMARK 2
- HDPE GEOMEMBRANE

HORIZONTAL DATUM:
ILLINOIS STATE PLANE COORDINATE SYSTEM, WEST ZONE, NAD83.

VERTICAL DATUM:
LOCAL PLANT DATUM

BENCHMARK 2:
NORTHEAST CORNER OF CONCRETE DISCHARGE STRUCTURE. CHISELED "+" IN CONCRETE ELEVATION 468.75 FT.

CONTRACTOR NOTES: △

1. CONTRACTOR SHALL INSTALL 60 MIL HDPE, WHITE, TEXTURED GEOMEMBRANE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION PRIOR TO PLACEMENT OF THE WARNING LAYER. CONTRACTOR SHALL PROVIDE AND FOLLOW AN APPROVED GEOMEMBRANE LAYOUT PLAN.
2. GEOMEMBRANE SHALL BE ANCHORED INTO 2.5 FEET DEEP TRENCHES ALONG TOP OF BASIN BANK, AS SHOWN ON SHEET C031. CONTRACTOR SHALL ADVISE OWNER AND/OR ENGINEER IF PROPOSED LOCATION FOR ANCHOR TRENCH IS NOT POSSIBLE.
3. CONTRACTOR SHALL PLACE 12-OZ. NON-WOVEN GEOTEXTILE, CUSHION MATERIAL AND WARNING LAYER MATERIAL OVER THE GEOMEMBRANE AT BASE AND 4 FEET ON SIDE SLOPES FOLLOWING ENGINEER APPROVAL AND PASSING QUALITY CONTROL RESULTS IN ACCORDANCE WITH TECHNICAL SPECIFICATIONS (SEE SHEET C031).
4. CONTRACTOR SHALL PLACE 2 LAYERS OF 12-OZ. NONWOVEN GEOTEXTILE, CUSHION AND WARNING LAYER MATERIALS OVER THE GEOMEMBRANE ON THE RAMP, AS SHOWN ON SHEET C031.
5. RESTORE AREAS DISTURBED BY EQUIPMENT AND MATERIAL LAYDOWN.
6. CONTRACTOR SHALL PROVIDE SURVEY DOCUMENTATION OF THE ITEMS LISTED IN THE TECHNICAL SPECIFICATIONS.
7. CONTRACTOR SHALL PERFORM A LEAK LOCATION SURVEY IN ACCORDANCE WITH TECHNICAL SPECIFICATIONS.

SOURCE NOTES:
THIS DRAWING WAS DEVELOPED FROM A SURVEY MAURER STUTZ, INC. DATED SEPTEMBER 7, 2010, DRAWING NO. 23210023.
LOCATION OF BASIN AND ACCESS RAMP TAKEN FROM MIDWEST GENERATION DRAWING NO. 5295 C5001-2, DATED 6-26-1980.
BASIN SUBGRADE AND SITE IMPROVEMENTS FROM A SURVEY PROVIDED BY MILLENNIA PROFESSIONAL SERVICE, MARCH 2011.

N

0 10 20 40
SCALE IN FEET

	REVISION:	DATE:	APP'D BY:
6.			
5.			
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2.	RECORD DOCUMENTATION	06/08/11	HMS
1.	ISSUED FOR BID	10/06/10	HMS
0.	ISSUED FOR PERMIT	06/30/10	HMS

NATURAL RESOURCE TECHNOLOGY

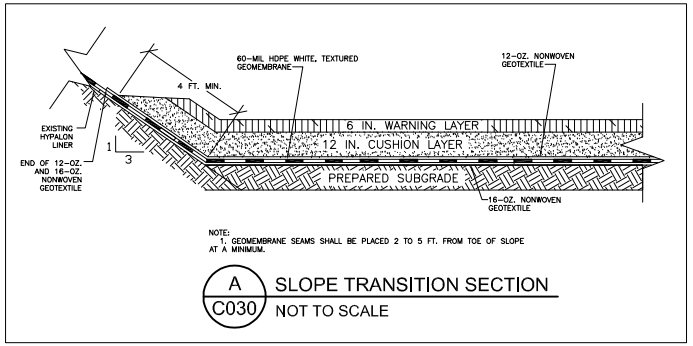
PROJECT NO. 1965.5/5.4
DRAWN BY: KNW 06/30/10
CHECKED BY: RJG 06/30/10
APPROVED BY: HMS 06/30/10

WARNING LAYER PLAN

BYPASS BASIN LINER REPLACEMENT
MIDWEST GENERATION
POWERTON POWER STATION
PEKIN, ILLINOIS

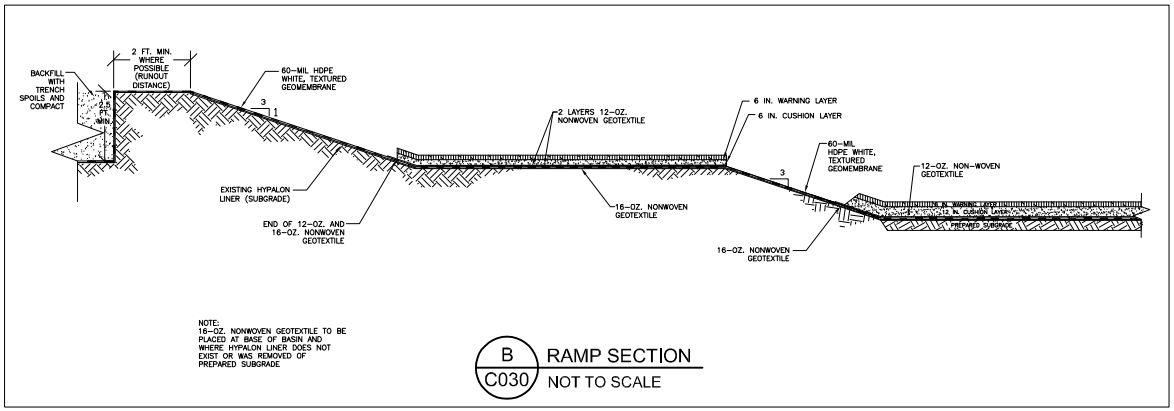
DRAWING NO: D1965C030-02
REFERENCE: .

SHEET NO. C030



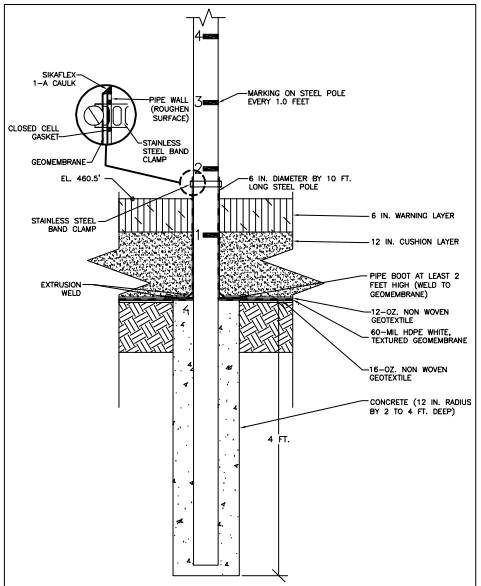
NOTE:
1. GEOMEMBRANE SEAMS SHALL BE PLACED 2 TO 5 FT. FROM TOE OF SLOPE AT A MINIMUM.

A / C030 SLOPE TRANSITION SECTION
NOT TO SCALE

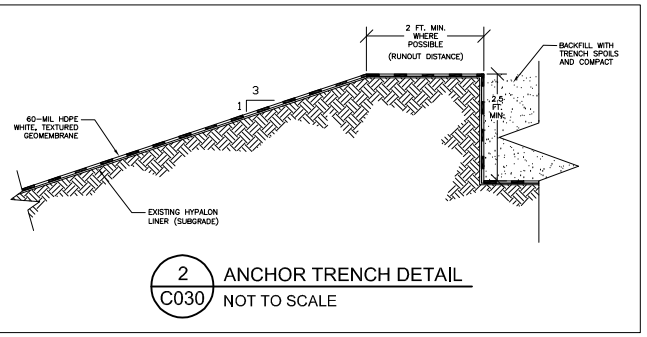


NOTE:
16-OZ. NONWOVEN GEOTEXTILE TO BE PLACED AT BASE OF BASIN AND WHERE HYPALON LINER DOES NOT EXIST OR WAS REMOVED OF PREPARED SUBGRADE

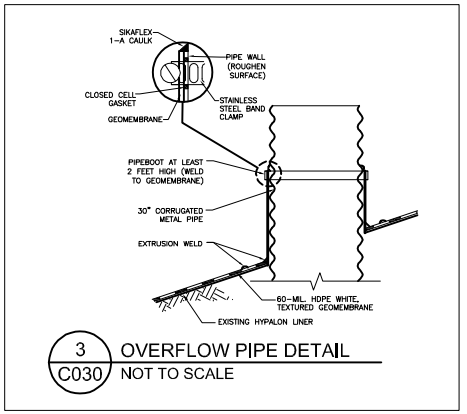
B / C030 RAMP SECTION
NOT TO SCALE



1 / C020 MARKER POST DETAIL
NOT TO SCALE



2 / C030 ANCHOR TRENCH DETAIL
NOT TO SCALE



3 / C030 OVERFLOW PIPE DETAIL
NOT TO SCALE

NOT FOR CONSTRUCTION

6.			
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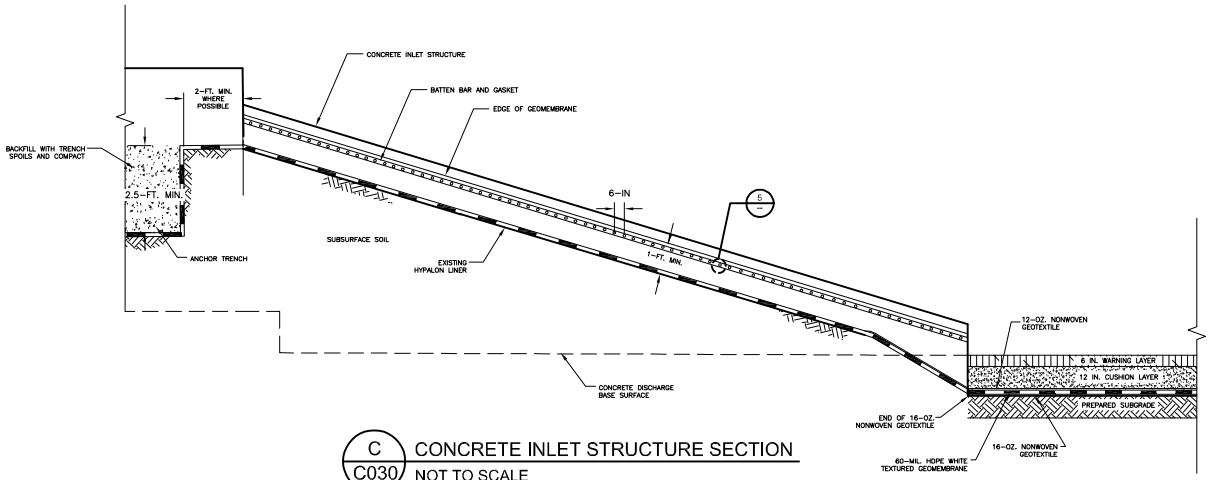
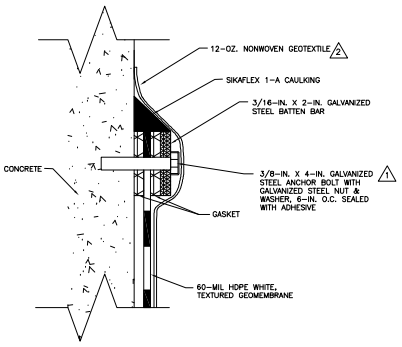
2.	RECORD DOCUMENTATION	06/16/11	HMS
1.	ISSUED FOR BID	10/06/10	HMS
0.	ISSUED FOR PERMIT	06/30/10	HMS
REVISION:		DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1965/5.4	DETAILS AND SECTIONS
DRAWN BY: KNW 06/30/10	BYPASS BASIN LINER REPLACEMENT MIDWEST GENERATION POWERTON POWER STATION PEKIN, ILLINOIS
CHECKED BY: RJG 06/30/10	
APPROVED BY: HMS 06/30/10	DRAWING NO: D1965C031-02
	REFERENCE:
	SHEET NO. C031

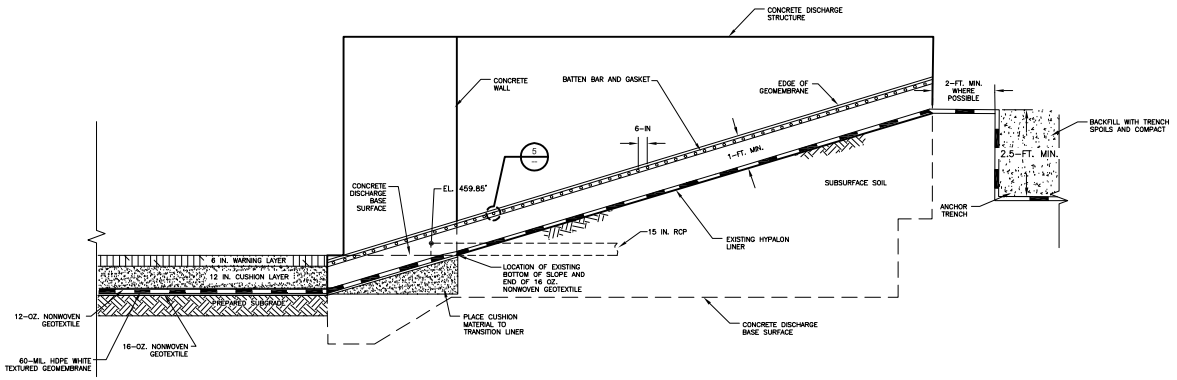


C / C030 CONCRETE INLET STRUCTURE SECTION
NOT TO SCALE



NOTE: △
1. ANCHOR BOLTS 6 IN. ON CENTER.
2. 12-OZ. NONWOVEN GEOTEXTILE TO BE USED TO PROTECT GEOMEMBRANE BELOW CUSHION/WARNING LAYERS.

5 / -- BATTEN BAR ATTACHMENT
NOT TO SCALE



D / - CONCRETE DISCHARGE STRUCTURE SECTION
NOT TO SCALE

NOT FOR CONSTRUCTION

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5.			
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3.			
2.	RECORD DOCUMENTATION	06/16/11	HMS
1.	ISSUED FOR BID	10/06/10	HMS
0.	ISSUED FOR PERMIT	06/30/10	HMS
REVISION:		DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1965/5.4	DETAILS AND SECTIONS
DRAWN BY: KNW 06/30/10	BYPASS BASIN LINER REPLACEMENT MIDWEST GENERATION POWERTON POWER STATION PEKIN, ILLINOIS
CHECKED BY: RJG 06/30/10	
APPROVED BY: HMS 06/30/10	DRAWING NO: D1965C032-02
	REFERENCE:
	SHEET NO. C032

ATTACHMENT 4

2016 STRUCTURAL STABILITY & FACTOR OF SAFETY ASSESSMENT

Geosyntec consultants

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San Diego, CA 92127
Phone: 858.674.6559
Fax: 858.674.6586
www.geosyntec.com

STRUCTURAL STABILITY AND FACTOR OF SAFETY ASSESSMENT
ASH SURGE BASIN AND BYPASS BASIN
POWERTON STATION
OCTOBER 2016

This report presents documentation of the initial periodic structural stability and initial safety factor assessments for the Ash Surge Basin and Bypass Basins (the Basins) at the Powerton Station (Site) in Pekin, Illinois (Figure 1). This report addresses the initial structural stability and safety factor assessment requirements of the Coal Combustion Residuals (CCR) regulations, Code of Federal Regulations Title 40, Part 257, Subpart D (referred to as the CCR Rule). These regulations were published in the Federal Register on 17 April 2015 and became effective on 19 October 2015. The Powerton Station is owned and operated by Midwest Generation, LLC (Midwest Generation). Based on the results provided in this report, the Ash Surge Basin and Bypass Basin meet the requirements of §257.73(d) and §257.73(e) of the CCR Rule.

The work presented in this report was performed under the direction of Ms. Jane Soule, P.E., of Geosyntec Consultants Inc. (Geosyntec) in accordance with §257.73(d) and §257.73(e). Mr. Robert White reviewed this report in accordance with Geosyntec's senior review policy.

1. Regulation Requirements - §257.73

Structural integrity criteria for existing CCR impoundments is described in §257.73 and includes structural stability and factor of safety assessments. The Ash Surge Basin and Bypass Basin meet the minimum size and capacity criteria under §257.73(b) and are subject to the structural stability and safety factor assessments required.

2. Site Conditions

The Ash Surge Basin is located east of the Main Wastewater Building, the cylindrical concrete clarifier and thickener structures, and the Metal Cleaning Basin, west of the inactive Limestone Basin, north of the Bypass Basin and East Roof and Yard Runoff (ERYR) Basin. The Ash Surge Basin is approximately 1,050 feet by 335 feet in plan dimensions (total plan area of approximately 8.1 acres). The surface impoundment is surrounded by a paved and a gravel perimeter access road around the western and eastern half of the impoundment, respectively.

The Bypass Basin is located east of the ERYR Basin and south of the southeast corner of the Ash Surge Basin. The Bypass Basin is approximately 160 feet by 255 feet in plan dimensions (total plan area of approximately 0.9 acres). A gravel perimeter access road is located along the northern and eastern boundaries of the Bypass Basin. A concrete-lined dewatering bin overflow

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channel is located along the crest of the berm between the Bypass Basin and the ERYR Basin. A temporary construction staging area is located south of the surface impoundment.

The Ash Surge Basin and the Bypass Basin are both lined with a 60-mil high density polyethylene (HDPE) geomembrane.

Based on available documentation and discussions with site personnel, the Basins, in their current configuration, were constructed in the late 1970s and early 1980s. A history of construction for the basins was prepared in accordance with §257.73(c) and describes the design of the basins and their construction (Geosyntec, 2016a).

3. Structural Stability Assessment

The following subsections address the components of §257.73(d)(1).

3.1 Foundations and Abutments – §257.73(d)(1)(i)

The Ash Surge Basin and the Bypass Basin consist of embankments on all sides. Because no formational materials provide lateral structural support for the embankments, the Basins do not include abutments. The remainder of this section addresses the foundation materials for the Basins.

Previous subsurface investigations performed at the Site indicate foundation materials underlying the embankments for the Ash Surge Basin and Bypass Basin generally consists of approximately 17 to 28 feet of fat and lean clay overlying approximately 35 to 40 feet of loose to very dense poorly graded sand and silty sand with some gravel associated with the Henry Formation (Geosyntec, 2016b).

Elastic settlement of the clay and sand layers underlying the embankments likely occurred very soon after construction in the late 1970s and early 1980s. Because of the age of the embankments (approximately 35 years old), the majority of consolidation and secondary compression settlement of the clay layer has likely already occurred. The initial annual inspection performed for the Basins in accordance with §257.83(b) did not identify any adverse effects on the Basins or their appurtenant structures resulting from settlement that may have occurred since construction (Geosyntec, 2016c). There are no proposed changes in operation which would increase loading conditions on the foundation materials; therefore, no significant settlement of the foundation materials underlying the embankments is anticipated to occur in the future. Further, the embankments of the Basins were not constructed with abutments or separate engineered zones that would be most susceptible to the adverse effects of differential settlement. Therefore, potential settlement of the foundation is not anticipated to impact the integrity of the impoundment embankments.

A factor of safety against the triggering of liquefaction was calculated for saturated foundation materials underlying the Ash Surge Basin and Bypass Basin embankments. The factor of safety was calculated based methods outlined in Idriss and Boulanger (2008) using information obtained from field explorations, including borings, Cone Penetration Test (CPT) soundings, laboratory data (Geosyntec, 2016b) and seismic data (Geosyntec, 2016g). Overall, the foundation materials underlying the Ash Surge Basin and Bypass Basin have a low susceptibility to liquefaction and liquefaction-induced strength loss (Geosyntec, 2016d).

3.2 Upstream Slope Protection – §257.73(d)(1)(ii)

The Ash Surge Basin and Bypass Basin are lined with a 60-mil HDPE geomembrane that protects the interior basin slopes from erosion, the effects of wave action, and mitigates potential effects of rapid drawdown.

3.3 Dike Compaction – §257.73(d)(1)(iii)

Documentation of as-built construction conditions for the Ash Surge Basin and Bypass Basin embankments was not available at the time of this report. Samples of embankment fill materials obtained during Geosyntec's geotechnical investigations at the Site indicate that the Ash Surge Basin embankments are compacted to relative densities on the order of 95 percent based on Standard Proctor testing (Geosyntec, 2016b). No quantitative evaluation of the degree of compaction of the embankments for the Bypass Basin was performed for the embankments in their current state. Slope stability analyses show that the embankments for the Ash Surge Basin and Bypass Basin are sufficient to withstand the range of loading conditions in the CCR units (Geosyntec, 2016e).

3.4 Downstream Slope Vegetation – §257.73(d)(1)(iv)

Downstream slopes of the Ash Surge Basin and Bypass Basin have erosion protection from either vegetation or geomembrane liners located on the interior slopes of adjacent basins.

3.5 Spillway – §257.73(d)(1)(v)

The Ash Surge Basin and the Bypass Basin both contain emergency spillway structures. A description of these structures and the design storm event identified for the Basins is included in the Inflow Design Flood Control System Plan (IDFCSP) prepared for the site in accordance with §257.82(c) (Geosyntec, 2016f). The IDFCSP identifies the design event for the Site as the 1,000 year flood. Because the Ash Surge Basin and Bypass Basin do not impound water from a natural stream and do not impound stormwater flows, except for direct precipitation that falls on the embankment crest or within the Basins, the IDFCSP identifies the design event as the 24-hour, 1,000-year precipitation event. When the operating freeboard for the Basins is taken

into account, the water levels in the Basins estimated after the design precipitation event are estimated to be lower than the invert elevations of the emergency spillways and no discharge from the Basins is anticipated (Geosyntec, 2016f). Therefore, the hydraulic capacity of the spillways was not calculated.

3.6 Structural Integrity of Hydraulic Structures – §257.73(d)(1)(vi)

Hydraulic structures passing through or beneath the embankments of the Bypass Basin and Ash Surge Basin consist of several pipes and conveyance structures associated with the inlet and outlet structures of the Basins. These structures and pipes were inspected periodically between 10 May 2016 and 24 May 2016 by a company specializing in video camera pipe inspections. The inspected structures and pipes related to the Basins included are presented on Figure 2. The video inspections did not identify significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, or debris that would negatively affect operation of the pipes was observed.

3.7 Downstream Slopes Adjacent to Water Bodies – §257.73(d)(1)(vii)

Ponds or water bodies near downstream slopes of the Ash Surge Basin and Bypass Basin are identified on Figure 3 and include:

- The Metal Cleaning Basin located west of the Ash Surge Basin. This basin is lined with an HDPE geomembrane.
- The ERYR Basin located west of the Bypass Basin and south of the Ash Surge Basin;
- The inactive Limestone Basin located east of the Ash Surge Basin; and
- The FAB located northeast of the Ash Surge Basin.

For stability analyses performed, a "low pool" condition where the modeled groundwater depth is lowered so there is little or no stabilizing force present on the downstream slope of the Ash Surge Basin or Bypass Basin embankments was evaluated for the water bodies presented above (Geosyntec, 2016e).

Stability during rapid drawdown was also evaluated for the embankments affected by the ERYR Basin and the FAB. Rapid drawdown was not evaluated for the embankments affected by the Metal Cleaning Basin because its HDPE geomembrane minimizes potential inundation of the slopes and mitigates effects of rapid drawdown. Similarly, embankments affected by the inactive Limestone Basin were not evaluated for rapid drawdown because the volume of water in this basin is anticipated to be minimal (inflow is limited to direct precipitation) and there is no outlet structure associated with this basin that could create a rapid drawdown condition for the adjacent Ash Surge Basin embankment.

Slope stability analyses show that the embankments are designed and constructed to maintain structural stability during "low pool" and rapid drawdown conditions (Geosyntec, 2016e).

3.8 Structural Stability Assessment Deficiencies - §257.73(d)(2)

No structural stability deficiencies associated with the Ash Surge Basin and Bypass Basin were identified in this initial structural stability assessment and no corrective measures are required.

3.9 Annual Inspection Requirement - §257.83(b)(4)(ii)

In accordance with §257.83(b)(4)(ii), submittal of this structural stability assessment precludes the requirement of an annual inspection under §257.83(b) for the Ash Surge Basin and Bypass Basin during the 2016 calendar year. One deficiency identified in the initial annual inspection (Geosyntec, 2016c) for the Bypass Basin was corrected as documented in the Notice of Remedy prepared in response to the initial annual inspection.

4. Safety Factor Assessment

This section describes the initial safety factor assessment for the Ash Surge Basin and Bypass Basin and the methodology used to perform the assessment in accordance with §257.73(e)(1). This assessment includes slope stability analyses of the critical embankment cross-section for each basin, shown in Figure 3.

4.1 Slope Stability Methodology

Limit equilibrium slope stability analyses were performed to evaluate the stability of the embankments for the Ash Surge Basin and Bypass Basin. The process involved performing two-dimensional analyses on the critical cross-section for each basin using Spencer's Method as coded in the computer program SLOPE/W (Version 8.15.4.11512, www.geoslope.com) which satisfies vertical and horizontal force equilibrium and moment equilibrium. For each cross section analyzed, the program searches for the sliding surface that produces the lowest factor of safety (FS). Factor of safety is defined as the ratio of the shear forces/moments resisting movement along a sliding surface to the forces/moments driving the instability.

Subsurface stratigraphy, groundwater conditions, and engineering parameters for the embankment and foundation materials were developed based on previous subsurface investigations performed at the Site (Geosyntec, 2016b and Geosyntec, 2016e).

4.2 Slope Stability Analyses

Four cases were analyzed to satisfy the safety factor assessment requirements in §257.73(e) (Geosyntec, 2016e).

4.2.1 Static, Long-Term Maximum Storage Pool Loading – §257.73(e)(1)(i)

Pursuant to §257.73(e)(1)(i) a static, long-term condition with the maximum operating pool loading on the embankments was evaluated. For the Ash Surge Basin and Bypass Basin, this condition included a pool elevation at 465 feet MSL[1] for the Ash Surge Basin and 465.5 feet MSL for the Bypass Basin, and a groundwater elevation of 451.8 feet MSL (Geosyntec, 2016e).

4.2.2 Static, Maximum Storage Pool Loading – §257.73(e)(1)(ii)

The conditions for §257.73(e)(1)(ii) are identical to §257.73(e)(1)(i) with the exception of the pool elevation, which is set at the lowest points of the embankment crest (Geosyntec, 2016e).

4.2.3 Seismic – §257.73(e)(1)(iii)

Pursuant to §257.73(e)(1)(iii), a seismic condition for Ash Surge Basin and Bypass Basin was also analyzed. Seismic stability was evaluated with a pseudostatic analysis that uses constant horizontal accelerations to represent the effects of earthquake shaking. The horizontal accelerations are represented in SLOPE/W by a horizontal seismic coefficient. The horizontal seismic coefficient used for analysis was based on a peak ground acceleration with a 2 percent probability of exceedance in 50 years (Geosyntec, 2016g).

4.2.4 Liquefaction – §257.73(e)(1)(iv)

The majority of the embankment soils for the Ash Surge Basin and Bypass Basin are not considered susceptible to liquefaction because saturation of the embankment soils is unlikely based on the presence of a geomembrane liner system. Based on the design phreatic surface discussed in Geosyntec (2016b), a limited portion of the bottom of the embankments may become saturated from groundwater. Liquefaction triggering analyses of these saturated embankment soils show that liquefaction and associated post-liquefaction shear strength loss is unlikely for the seismic design event (Geosyntec, 2016d). Because the likelihood of liquefaction and associated shear strength loss of the embankment soils is very low, post-liquefaction conditions are represented by the static factor of safety analyses.

4.3 Results

The results of the slope stability analysis for the critical cross sections of the Ash Surge Basin and Bypass Basin embankments are summarized in Table 1 below and presented in Figures 4 through 9 (Geosyntec 2016e).

[1] Mean Sea Level based on local plant vertical datum.

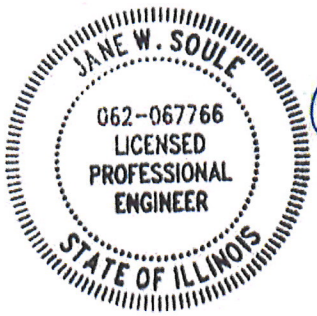
Table 1: Safety Factor Results

Section	Safety Factor			
	257.73(e)(1)(i)	257.73(e)(1)(ii)	257.73(e)(1)(iii)	257.73(e)(1)(iv)
1	≥1.50	≥1.40	≥1.00	≥1.20
2	≥1.50	≥1.40	≥1.00	≥1.20

These results meet the factor of safety requirements presented in §257.73(e)(1)(i) through §257.73(e)(1)(iv).

5. Limitations and Certification

This initial periodic structural stability and safety factor assessment meets the requirements of §257.73(d) and §257.73(e) of the Code of Federal Regulations Title 40, Part 257, Subpart D, and was prepared in accordance with current practices and the standard of care exercised by scientists and engineers performing similar tasks in the field of civil engineering. The contents of this report are based solely on the observations of the conditions observed by Geosyntec personnel and information provided to Geosyntec by Midwest Generation. Consistent with applicable professional standards of care, our opinions and recommendations were based in part on data furnished by others, which was consistent with other information that we developed in the course of our performance of the scope of services. The information contained in this report is intended for use solely by Midwest Generation and their subconsultants.



Jane W. Soule, P.E.
Illinois Professional Engineer No. 062-067766
Expiration Date: 11/30/2017

6. References

Das, 2007. "Principles of Foundation Engineering," Sixth edition. Thomson Canada Limited.

Geosyntec, 2016a. History of Construction Report, Ash Surge Basin and Bypass Basin, Powerton Station, October.

Geosyntec, 2016b. Ash Surge Basin and Bypass Basin – Soil Properties Calculation, Powerton Station, October.

Geosyntec, 2016c. Annual Inspection Report, Ash Surge Basin and Bypass Basin, Powerton Station, 18 January 2016.

Geosyntec, 2016d. Ash Surge Basin and Bypass Basin – Liquefaction Calculations, Powerton Station, October.

Geosyntec, 2016e. Ash Surge Basin and Bypass Basin – Slope Stability Calculations, Powerton Station, October.

Geosyntec, 2016f. Inflow Design Flood Control System Plan, Ash Surge Basin and Bypass Basin, Powerton Generating Station, October.

Geosyntec, 2016g. Ash Surge Basin and Bypass Basin – Seismic Coefficient Calculations, Powerton Station, October.

Idriss and Boulanger, 2008. "Soil Liquefaction During Earthquakes". Earthquake Engineering Research Institute, MNO-12.

Attachments

Figure 1 – Site Location
Figure 2 – Hydraulic Structure Locations
Figure 3 – Stability Sections
Figure 4 – Slope Stability Output, Section 1 - 257.73(e)(1)(i)
Figure 5 – Slope Stability Output, Section 1 - 257.73(e)(1)(ii)
Figure 6 – Slope Stability Output, Section 1 - 257.73(e)(1)(iii)
Figure 7 – Slope Stability Output, Section 2 - 257.73(e)(1)(i)
Figure 8 – Slope Stability Output, Section 2 - 257.73(e)(1)(ii)
Figure 9 – Slope Stability Output, Section 2 - 257.73(e)(1)(iii)

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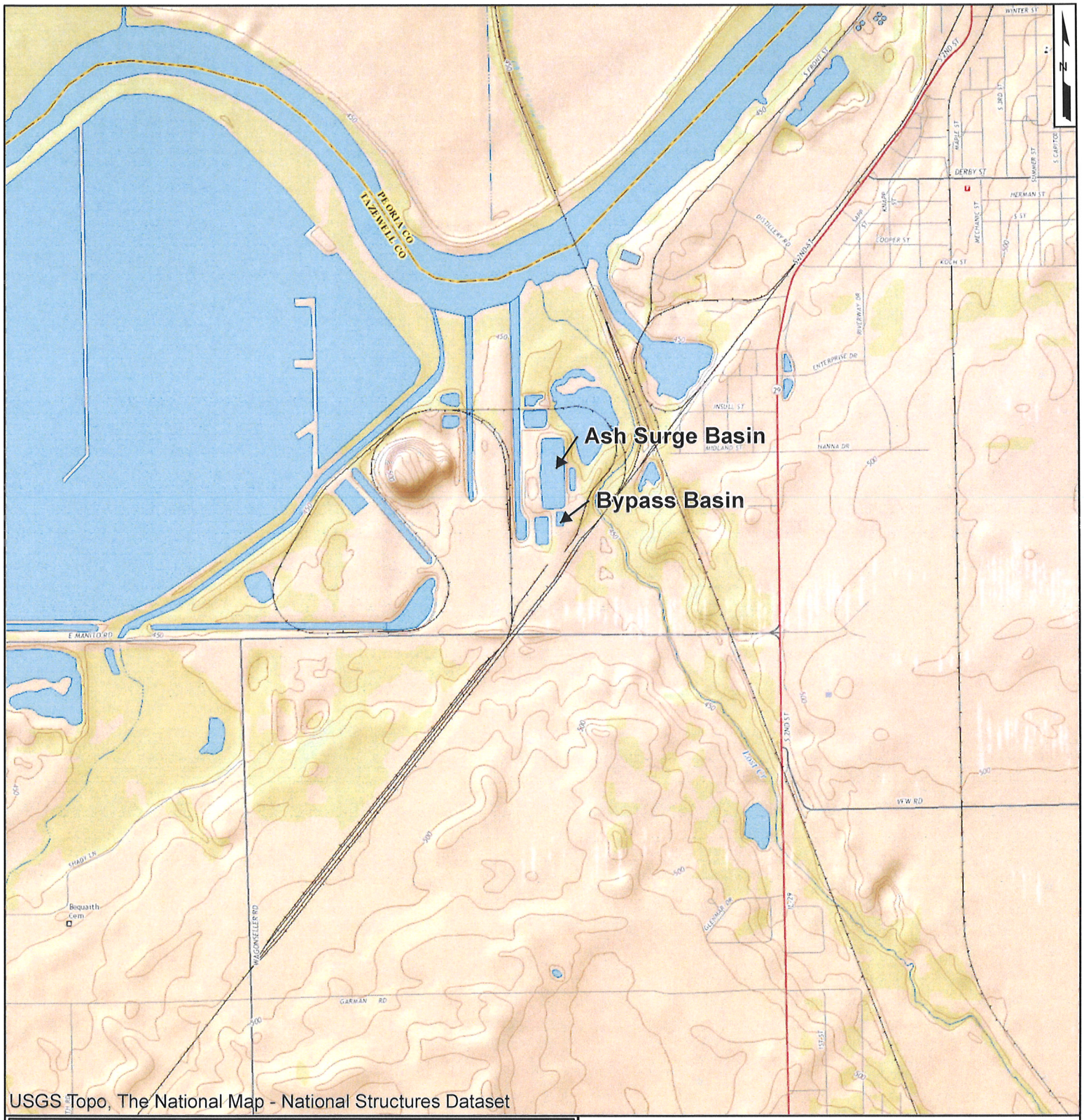

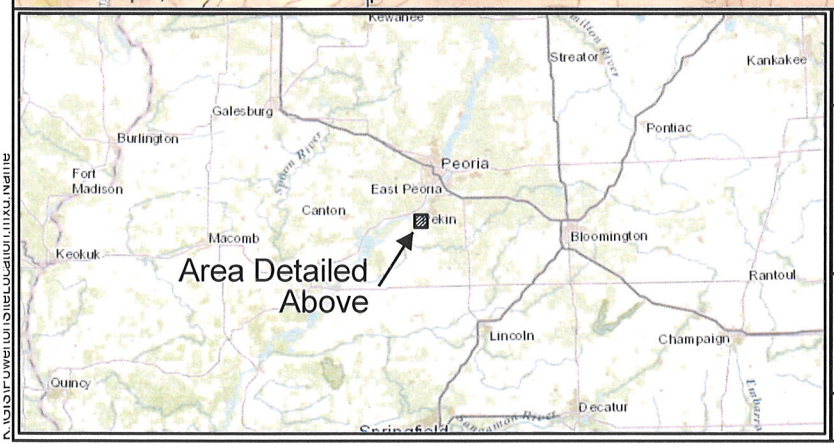

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Site Location

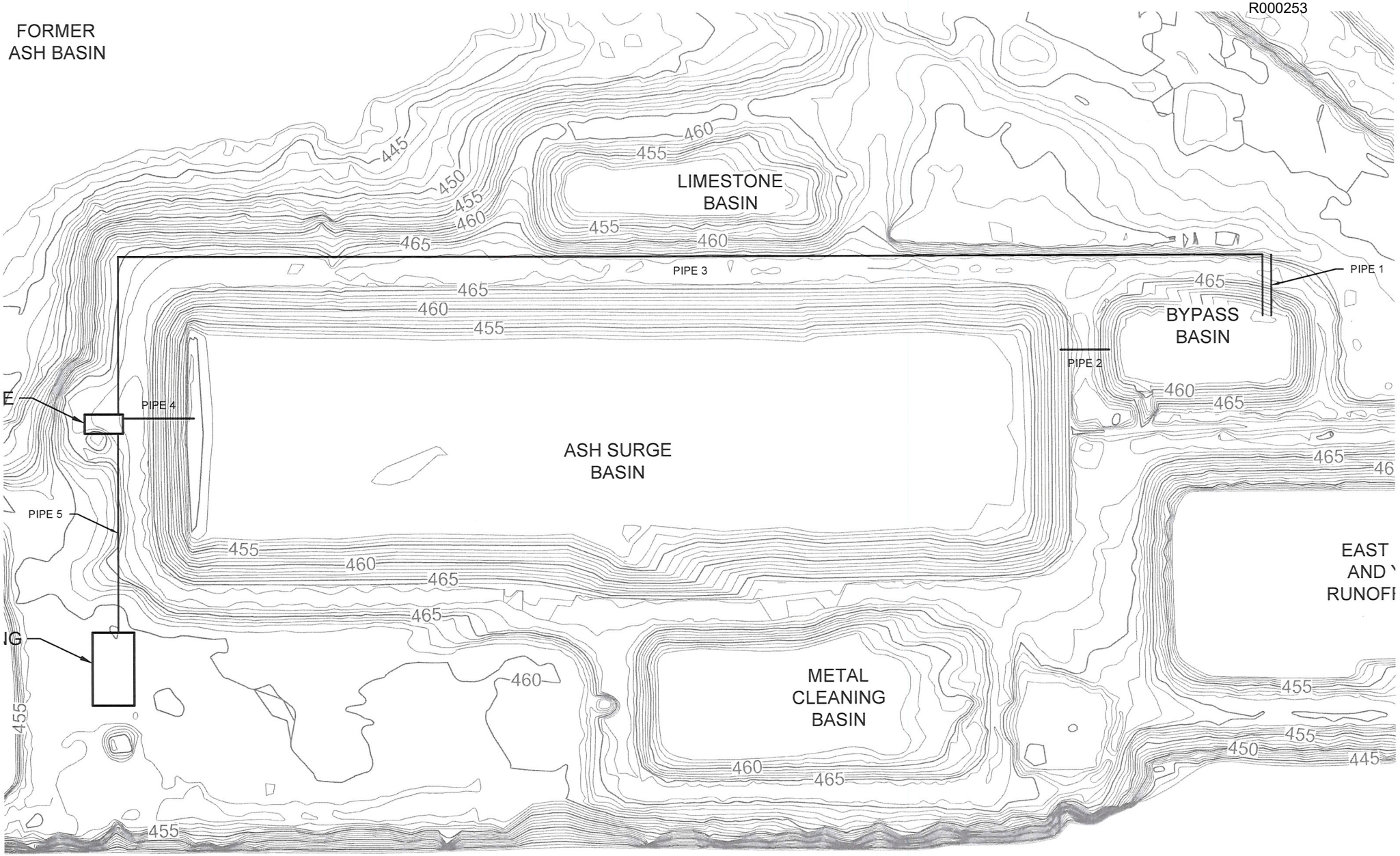
Ash Surge and Bypass Basins
Powerton Station
Pekin, Illinois

Geosyntec consultants

San Diego | October 2016

Figure 1

A:\GIS\Powerton\SiteLocation.mxd Name



LEGEND

460 — EXISTING GROUND MAJOR CONTOUR

EXISTING GROUND MINOR CONTOUR

PIPE LOCATION

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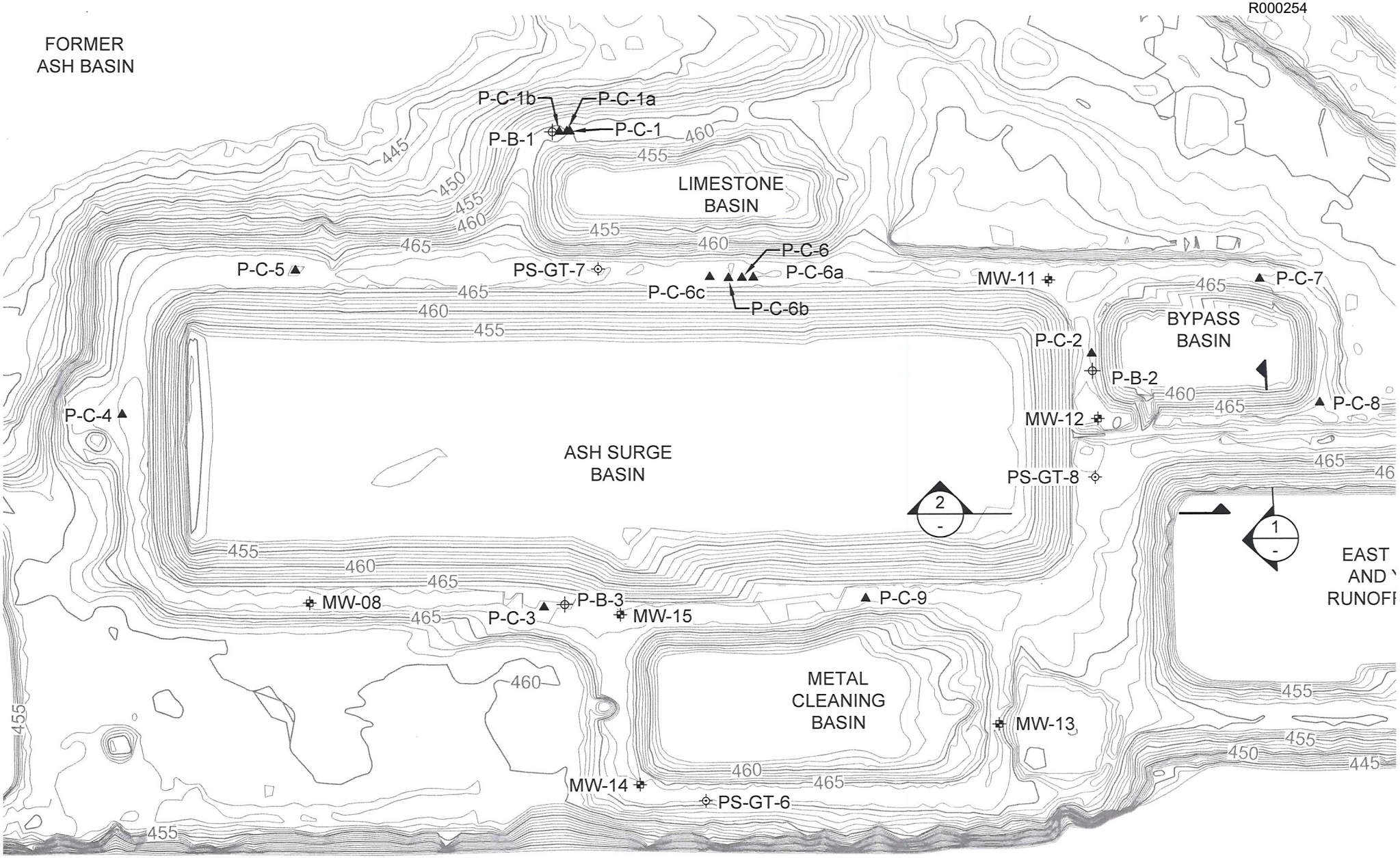
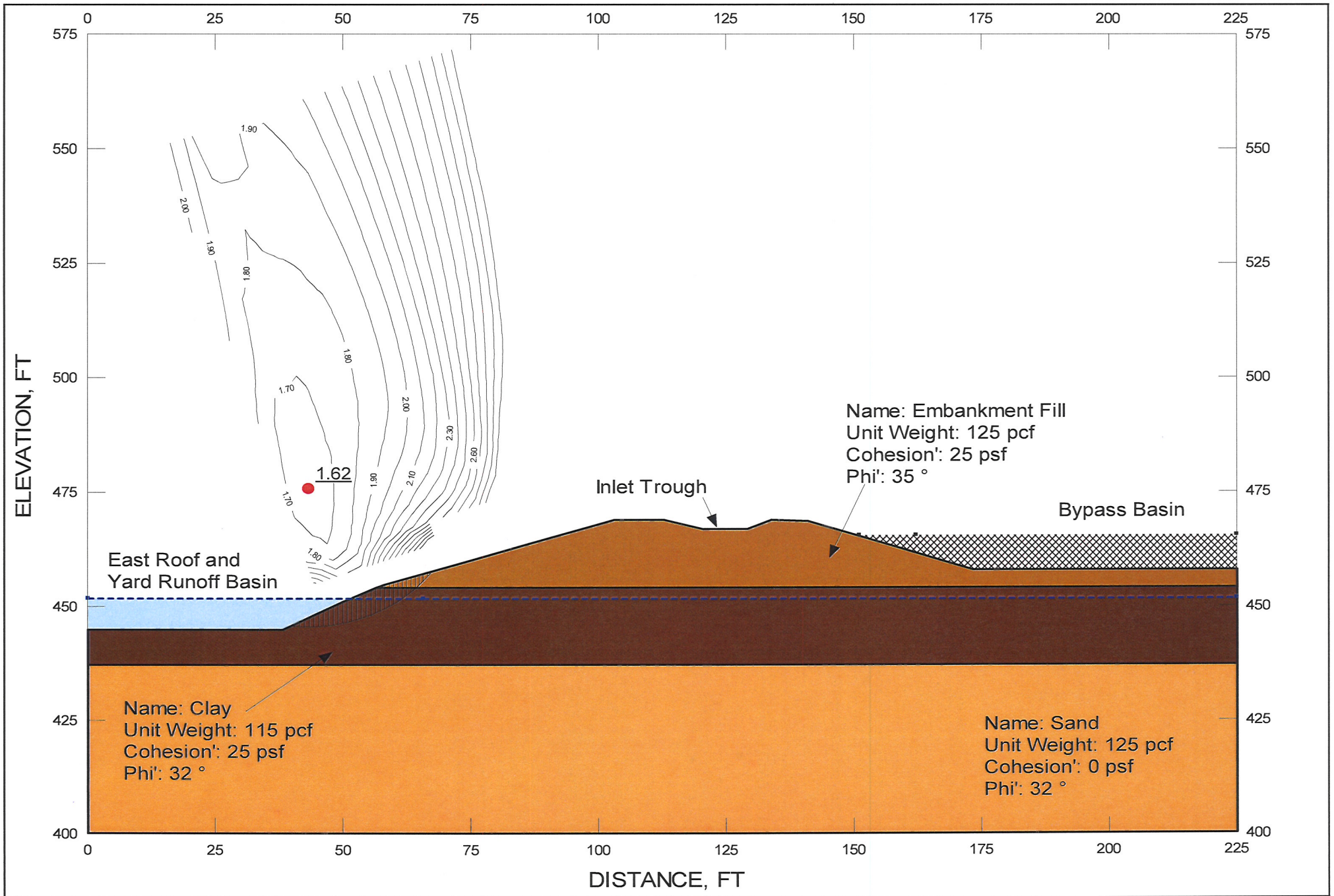
JRGE AND BYPASS BASINS IS BASED



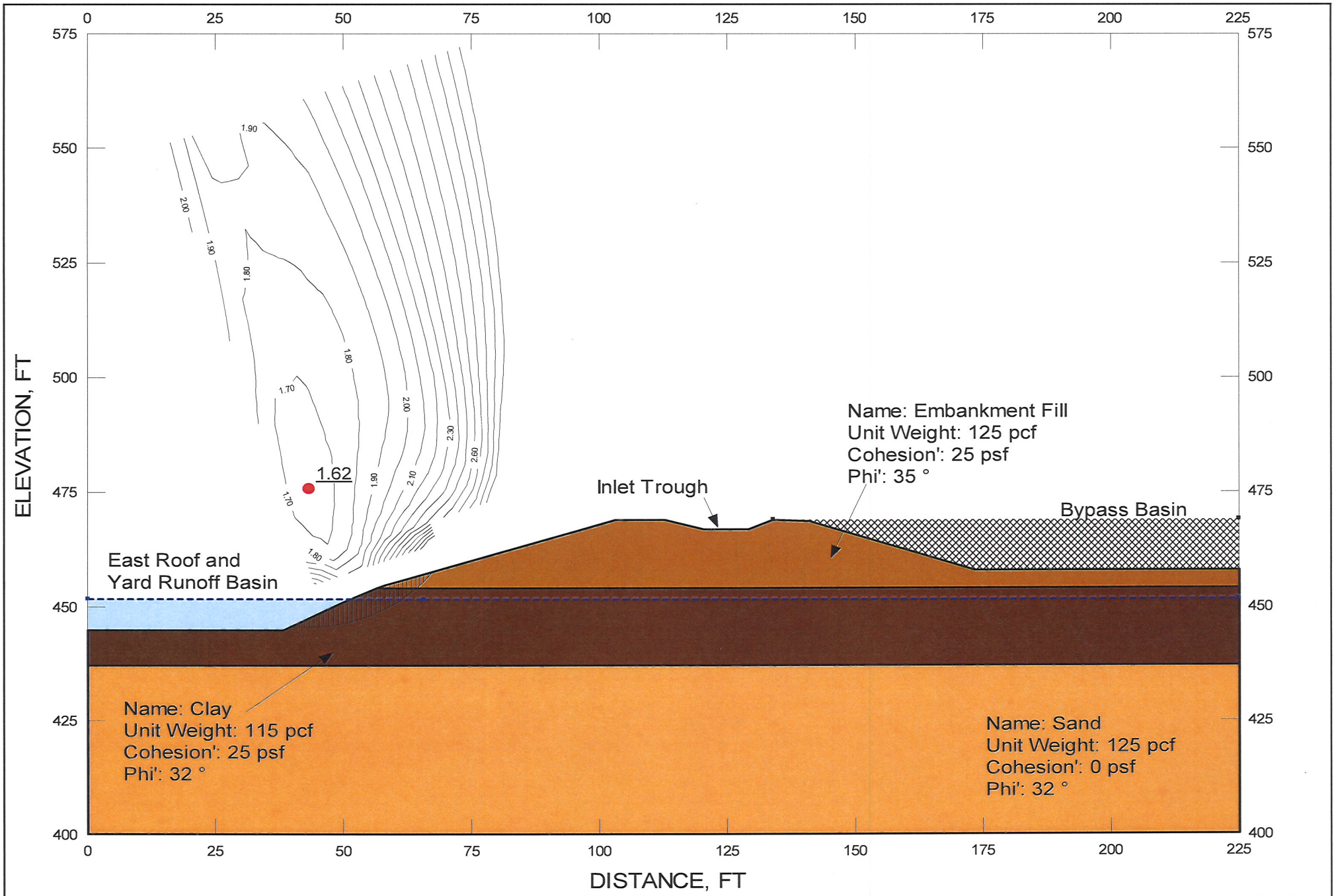
LEGEND

460	EXISTING GROUND MAJOR CONTOUR
	EXISTING GROUND MINOR CONTOUR
⌖	MW-03 MONITORING WELL (PATRICK, 2011)
⊠	P-B-1 BORING (GEOSYNTEC, 2016)
▲	P-C-1 CPT SOUNDING (GEOSYNTEC, 2016)
⊕	PS-GT-5 BORING (KRRG, 2005)

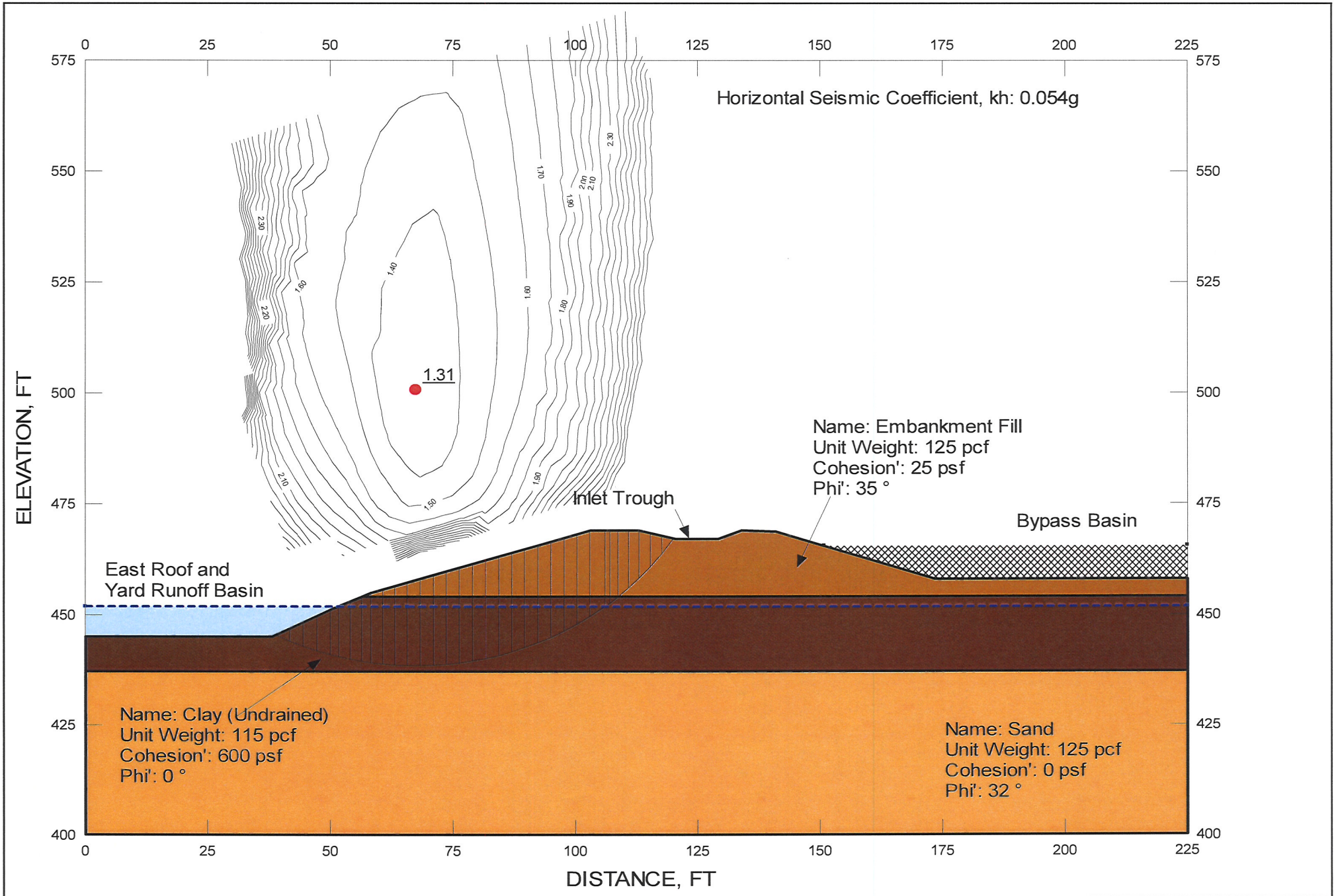
JRGE AND BYPASS BASINS IS BASED



Geosyntec consultants	Analysis: Section 1 - §257.73(e)(1)(i): Long Term, Maximum Storage Pool Loading		FIGURE 4
	Project: Powerton Ash Surge and Bypass Basins	Analysis By: Cory Russell	
	File Name: Powerton Section 1.gsz	Date: October 2016	



Geosyntec consultants	Analysis: Section 1 - §257.73(e)(1)(ii): Maximum Surcharge Pool Loading		FIGURE 5
	Project: Powerton Ash Surge and Bypass Basins	Analysis By: Cory Russell	
	File Name: Powerton Section 1.gsz	Date: October 2016	



Geosyntec consultants	Analysis: Section 1 - §257.73(e)(1)(iii): Long Term, Maximum Storage Pool Loading with Seismic (Undrained Conditions)		FIGURE 6
	Project: Powerton Ash Surge and Bypass Basins	Analysis By: Cory Russell	
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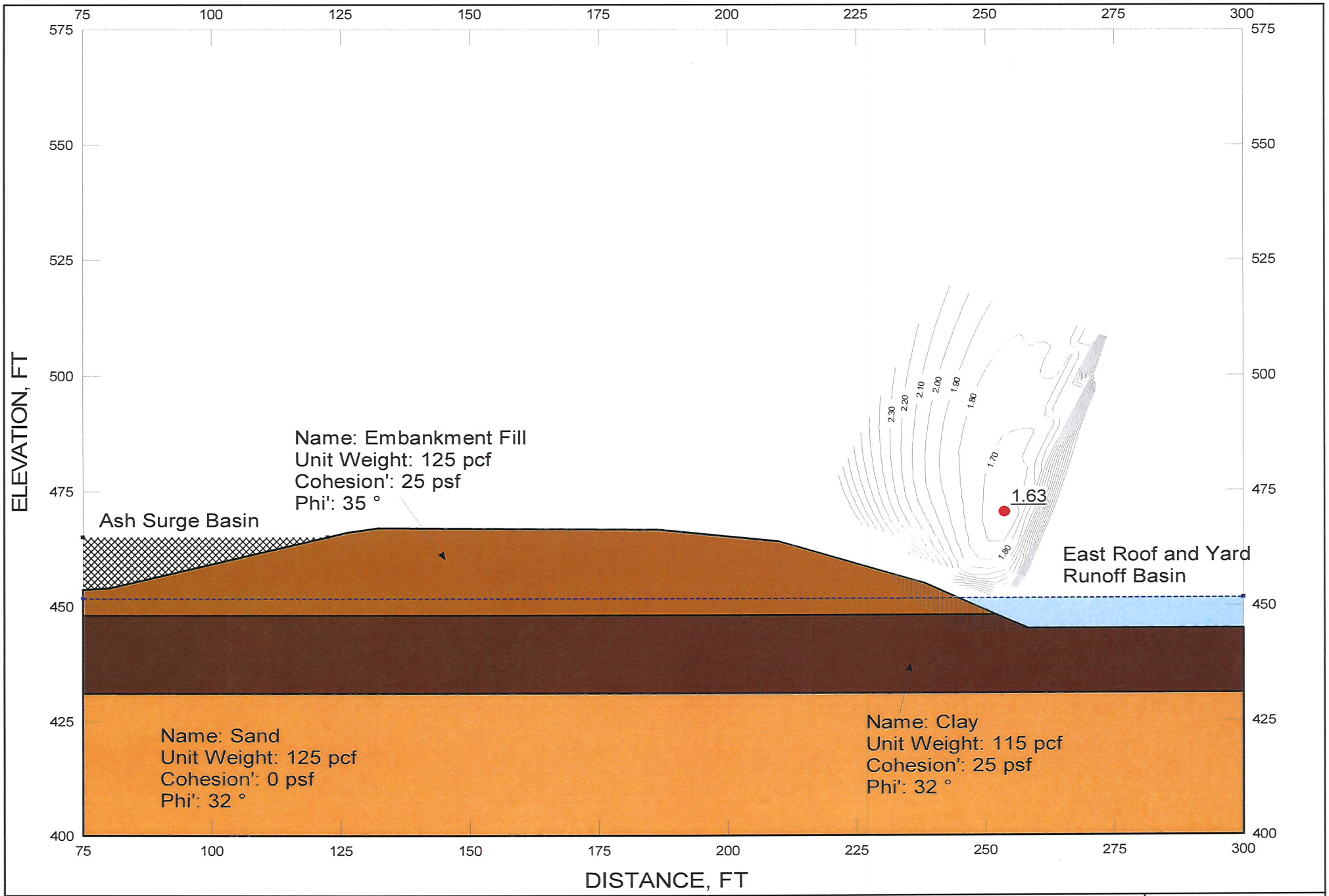
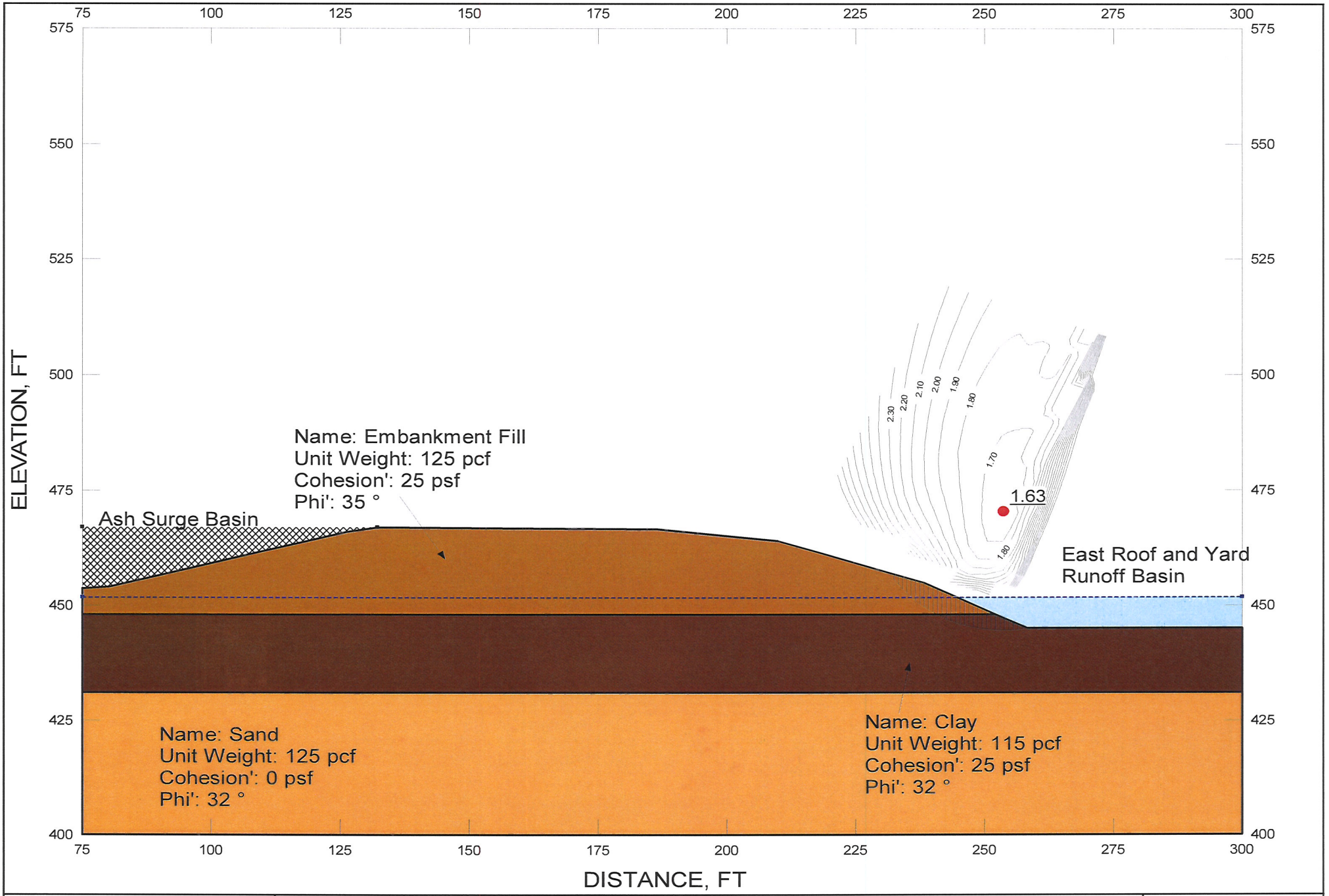
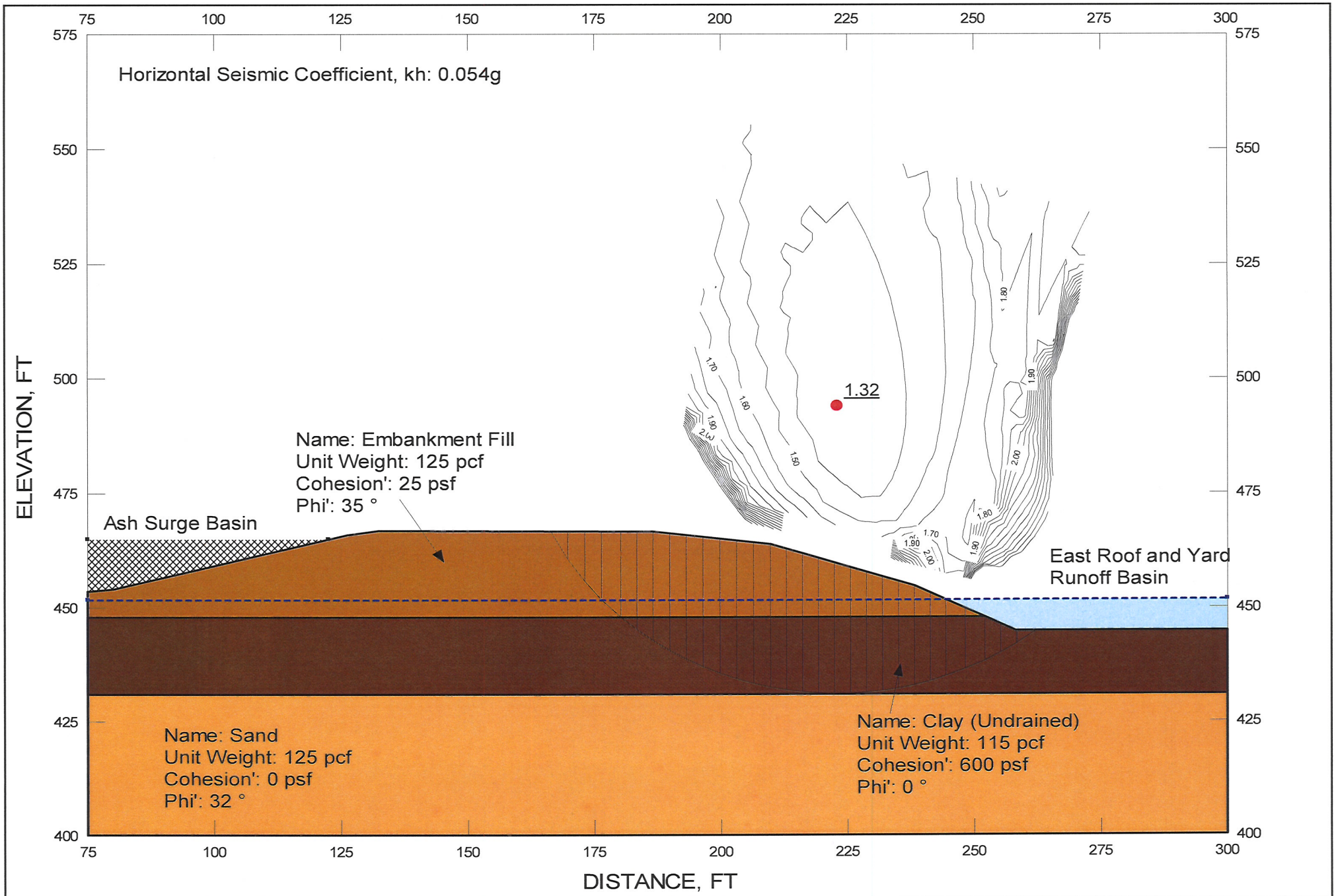


Geosyntec consultants	Analysis: Section 2 - §257.73(e)(1)(i): Long Term, Maximum Storage Pool Loading		FIGURE 7
	Project: Powerton Ash Surge and Bypass Basins	Analysis By: Cory Russell	
	File Name: Powerton Section 2.gsz	Date: October 2016	



Geosyntec consultants	Analysis: Section 2 - §257.73(e)(1)(ii): Maximum Surcharge Pool Loading		FIGURE 8
	Project: Powerton Ash Surge and Bypass Basins	Analysis By: Cory Russell	
	File Name: Powerton Section 2.gsz	Date: October 2016	



Geosyntec consultants	Analysis: Section 2 - §257.73(e)(1)(iii): Long Term, Maximum Storage Pool Loading with Seismic (Undrained Conditions)		FIGURE 9
	Project: Powerton Ash Surge and Bypass Basins	Analysis By: Cory Russell	
	File Name: Powerton Section 2.gsz	Date: October 2016	

ATTACHMENT 5-2
CQA SPECIFICATIONS

MWG

Midwest Generation, LLC

POWERTON GENERATING STATION

SPECIFICATION P-1401

CONSTRUCTION QUALITY ASSURANCE FOR BYPASS BASIN RETROFIT

S&L PROJECT NO.: 12661-130

REVISION 0C

ISSUE PURPOSE: PERMIT

ISSUE DATE: 07-15-2022

Sargent & Lundy

Midwest Generation, LLC
Powerton Generating Station
Project No. 12661-130
Issue Summary and Approval Page

Specification P-1401
Rev. 0C
Issue: Permit
Date: 07-15-2022

SECTION 000106

ISSUE SUMMARY AND APPROVAL PAGE

Rev.	Purpose of Issue	Date	Sections Affected
0A	Client Comment	03-28-2022	All
0B	Public Comment	04-15-2022	All
0C	Permit	07-15-2022	All

This is to confirm that this Specification has been prepared, reviewed, and approved in accordance with Sargent & Lundy's Standard Operating Procedure SOP-0407, Specifications and Bills of Materials, which is part of our Quality Management System.

Contributor Summary & Current Revision Signatures

Rev.	Prepared By	Reviewed By	Approved By
0A	T. Dehlin	D. Packard	--
0B	T. Dehlin	D. Packard	--
0C	Digitally signed by Thomas J. Dehlin Date: 2022.07.15 09:23:14 -05'00'	Digitally signed by Darrel Packard Date: 2022.07.15 09:28:31 -05'00'	Digitally signed by Thomas J. Dehlin Date: 2022.07.15 11:09:18 -05'00'
	T. Dehlin	D. Packard	T. Dehlin

Midwest Generation, LLC
Powerton Generating Station
Project No. 12661-130
Certification Page

Specification P-1401
Rev. 0C
Issue: Permit
Date: 07-15-2022

SECTION 000107

CERTIFICATION PAGE

Sargent & Lundy (S&L) is registered in the State of Illinois to practice engineering. S&L's Illinois Department of Financial and Professional Regulation registration number is 184-000106.

I certify that this Specification was prepared by me or under my direct supervision and that I am a registered professional engineer under the laws of the State of Illinois.

Certified By: Thomas J. Dehlin Date: July 15, 2022

Seal:



Th. Dehlin
07/15/2022
Exp. 11/30/2023



SECTION 000110

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ATTACHMENTS

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END OF SECTION 000110

SECTION 011100

SUMMARY OF WORK

PART 1 - GENERAL

101. PROJECT INFORMATION

101.1 Owner: Midwest Generation, LLC (MWG)

101.2 Design Engineer: Sargent & Lundy (S&L)

101.3 Project Name: Construction Quality Assurance for Bypass Basin Retrofit

101.4 Project Location: Powerton Generating Station
13082 E. Manito Rd.
Pekin, IL 61554

102. DESCRIPTION OF THE PROJECT AND GENERAL BACKGROUND

102.1 The purpose of this project is to retrofit the Bypass Basin at Midwest Generation, LLC's Powerton Generating Station in accordance with the Illinois Pollution Control Board's Coal Combustion Residuals (CCR) Rule, 35 Ill. Adm. Code Part 845, and with the U.S. Environmental Protection Agency's (EPA) CCR Rule, 40 CFR Part 257 Subpart D.

102.2 The Bypass Basin will be retrofitted by removing all CCR and CCR-mixed materials stored in the basin and decontaminating the basin's existing geomembrane liner and appurtenant structures, which will remain in place. Following removal of CCR and CCR-mixed material from the basin and decontamination of the basin facilities remaining in-place, a new composite liner system and a new leachate collection and removal system will be installed within the Bypass Basin over the basin's existing decontaminated and leak-tested geomembrane liner.

103. SCOPE OF WORK

103.1 In general, this Specification covers the field and laboratory activities for a Construction Quality Assurance (CQA) Contractor to provide assurance and documentation that the Bypass Basin at the Powerton Generating Station is retrofitted in accordance with the General Work (GW) Specification (P-1400), the Design Drawings, and permit requirements.

103.2 The CQA Work shall include but not be limited to the following:

a. Prepare a CQA Plan that provides a detailed description of the activities that will be performed by the CQA Contractor in accordance with the Design Drawings and this Specification.

b. Verify and document that all appropriate measures are taken by the GW Contractor to protect the Bypass Basin's existing geomembrane liner from damage during material removal and liner decontamination activities at the basin.

c. Verify and document decontamination of the Bypass Basin's existing geomembrane liner as specified in Section 014362 following material removal and liner decontamination activities performed by the GW Contractor.

d. Perform earthwork inspection and testing work specified in Section 014362 to:

d1. Verify compliance of materials with the GW Specification and Design Drawings.

d2. Perform specified field material and installation tests.

d3. Obtain samples and perform laboratory tests and/or contract to have laboratory tests performed and audit laboratory test results.

d4. Perform inspections during construction as specified.

e. Perform geosynthetics inspection and testing work specified in Section 014362 to:

e1. Verify compliance of materials with the GW Specification and Design Drawings.

e2. Perform field material and installation tests.

e3. Obtain samples and perform laboratory tests and/or contract to have laboratory tests performed and audit laboratory test results.

e4. Witness field testing and audit field test results as specified.

e5. Perform inspections during construction.

f. Identify non-conforming work.

g. Meetings, Documentation, and Reports:

g1. Participate in project meetings.

g2. Prepare CQA records and documents.

g3. Prepare CQA reports, including:

g3.1 Preparing an Index Report listing all CQA reports prepared throughout the project.

g3.2 Preparing and certifying Weekly Summary Reports until the end of the project.

g3.3 Preparing and certifying a Final Report at the end of the project.

103.3 The CQA Work shall conform to the requirements of this Specification and shall be performed and supervised by personnel who are experienced and knowledgeable in the crafts and trades required by the Scope of Work. The CQA Work shall be performed exclusively by the CQA Contractor's trained and competent personnel or, where permitted, that of its subcontractor(s); and shall comply with all applicable safety laws, regulations, programs, and practices to ensure the safety of those located on the work site and associated laboratories, including the CQA Contractor's personnel (or that of its subcontractor(s)) performing the CQA Work.

103.4 Performance of the CQA Work shall include all the labor, supervision, administration, management, tools, testing equipment, and consumables to execute the CQA Work identified herein.

103.5 Inspection and tests specified in this Specification shall be performed by personnel qualified to perform such inspections and tests.

104. RESPONSIBILITY AND AUTHORITY

104.1 The responsibilities and authority are described below for the organizations that will be involved in the design, permitting, and construction activities associated with the project.

a. Permitting Authority – Illinois EPA:

a1. The Illinois EPA is the Permitting Authority and is responsible for reviewing the permit application for retrofitting the Bypass Basin to assure compliance with state regulations and for granting the construction permit for the project.

a2. The Permitting Authority may review any design revisions during construction and any requests for variance submitted by the Owner. The Permitting Authority has the authority to review and approve all CQA documentation and reports and to confirm the Bypass Basin was retrofitted as specified in Project Specifications and the Design Drawings.

b. Owner:

b1. MWG is the Owner of the facility and has the authority to accept or reject materials and workmanship of the GW Contractor or reports and recommendations of the CQA Contractor.

b2. The Owner will ultimately be responsible for the retrofit construction for the Bypass Basin and for assuring the Permitting Authority that the construction meets or exceeds the requirements specified in state regulations, permits, Project Specifications, and the Design Drawings. The Owner will accomplish this by retaining a CQA Contractor for the project.

c. Design Engineer:

c1. S&L is the Design Engineer and is responsible for designing the retrofitted features for the Bypass Basin.

c2. The Design Engineer will assure that the retrofit design meets the construction requirements of the Owner and meets or exceeds the requirements of the Permitting Authority.

c3. The Design Engineer shall resolve unexpected conditions or unanticipated problems during construction, which may require changes to the permitted design. Changes to the permitted design shall require approval of the Owner and Design Engineer to ensure that the original design objectives are still maintained. All changes shall meet state regulatory requirements and the rules promulgated thereunder and may include Permitting Authority-approved variances to the rules.

d. GW Contractor:

d1. The GW Contractor shall be responsible for constructing the facility in accordance with the GW Specification (P-1400) and the Design Drawings and shall implement additional quality control and quality assurance procedures and techniques as necessary during construction.

d2. The GW Contractor will consist of an Earthwork Contractor performing the earthwork and a Geosynthetics Contractor installing the geosynthetic materials for the Bypass Basin’s new composite liner system and new leachate collection and removal system. The GW Contractor may self-perform or subcontract the duties of the Earthwork Contractor and/or Geosynthetics Contractor.

e. CQA Contractor:

e1. The CQA Contractor shall be the company employed by the Owner who is responsible for performing the CQA Work. The CQA Contractor shall be objective, competent, and independent from the GW Contractor whose work is being inspected. The CQA Contractor shall remain independent throughout the duration of the project.

e2. The CQA Contractor's team shall include the CQA Officer and two or more CQA Inspectors.

f. CQA Officer:

f1. The CQA Officer shall be a professional engineer licensed in the State of Illinois who shall be responsible for implementation of the CQA Work. The CQA Officer shall be responsible to the Owner.

f2. The CQA Officer shall be responsible for the performance of activities specified herein such as auditing, inspecting, sampling, testing, documenting, and for preparing and certifying the Final Report. In addition, the CQA Officer and/or its inspectors shall have the responsibility of daily coordination with CQA Inspectors, the GW Contractor and its subcontractors, and the Owner to discuss daily progress, review completed work, plan for upcoming work, perform visual inspections, review test results, and discuss and assist in resolving any current or potential construction problems.

f3. Except as provided by Paragraph 104.1f4, the CQA Officer shall be present to provide supervision and assume responsibility for performing all inspections of the following activities, when applicable:

f3.1 Compaction of subgrade materials.

f3.2 Installation of the new composite liner system.

f4. If the CQA Officer is unable to be present as required by Paragraph 104.1f3, the CQA Officer shall provide the following in writing:

f4.1 The reasons for the CQA Officer's absence.

f4.2 A designation of a person who must exercise professional judgment in carrying out the duties of the CQA Officer-in-Absentia.

f4.3 A signed statement that the CQA Officer assumes full responsibility for all inspections performed and reports prepared by the designated CQA Officer-in-Absentia during the absence of the CQA Officer.

g. CQA Inspectors:

g1. The CQA Inspectors shall be responsible for performing visual examinations and for performing or obtaining field and laboratory tests. The CQA Inspectors shall be under the direct supervision of the CQA Officer.

g2. The CQA Inspectors shall be responsible for reporting to the CQA Officer and the Owner's representative the results of any inspections or tests indicating materials or installed work are of unacceptable quality or do not meet specified design requirements.

g3. The work shall be divided so that two or more CQA Inspectors, each with specialized knowledge and training, will be involved in inspection work.

105. QUALIFICATIONS

105.1 CQA Officer:

a. The CQA Officer shall be a registered professional engineer in the State of Illinois with at least 10 years of experience in design/construction/permitting/licensing, at least 5 years of which is CQA experience as a certifying engineer on landfills or ponds with geomembrane liner systems.

b. The CQA Officer shall be qualified by education, technical knowledge, and experience to complete the technical certifications required by this Specification.

105.2 CQA Inspectors:

a. The CQA Inspectors shall have adequate formal academic training and sufficient practical and technical experience needed to execute and record auditing and inspection activities conducted at the site and perform all required laboratory and field testing. This includes a demonstrated knowledge of the various aspects of the type of work being conducted.

b. As required, different CQA Inspectors, each with specialized knowledge and experience, shall be employed for different portions of the work.

c. CQA Earthwork Inspectors:

c1. The lead CQA field inspector for earthwork (Lead CQA Earthwork Inspector) shall have at least 5 years of experience as an earthwork inspector.

c2. All CQA Earthwork Inspectors shall be knowledgeable in:

c2.1 Field practices relating to construction techniques used for the type of earthwork being performed.

c2.2 Construction and compaction equipment.

c2.3 All codes and regulations concerning material installation.

c2.4 Observation procedures for earthwork construction.

c2.5 Sampling and earthwork testing procedures.

c2.6 Testing equipment.

c2.7 Documentation procedures.

c2.8 Site safety.

d. CQA Geosynthetics Inspectors:

d1. The lead CQA field inspector for geosynthetics (Lead CQA Geosynthetics Inspector) shall have at least 5 years of CQA experience as a field inspector on projects with a geomembrane lining system including two years as a CQA inspector.

d2. All CQA Geosynthetics Inspectors shall be knowledgeable in:

d2.1 Field practice relating to techniques used for the installation of geosynthetic clay liners (GCLs), high-density polyethylene (HDPE) geomembranes, pipes, HDPE geonets, and non-woven geotextiles.

d2.2 Correct procedures for seaming GCL.

d2.3 HDPE geomembrane welding equipment and the correct operating procedures for seaming HDPE geomembranes, including but not limited to:

d2.3.1 Non-destructive seam testing procedures and failure criteria.

d2.3.2 Sampling for destructive testing of samples of seams and laboratory testing procedures.

d2.3.3 Laboratory testing equipment.

d2.4 Geotextile seaming equipment and the correct procedures for splicing geotextiles and joining HDPE geonets.

d2.5 All codes and regulations concerning material installation.

d2.6 Documentation procedures for field and laboratory tests.

d2.7 Site safety.

106. DEFINITIONS

106.1 The term "Design Drawing" means the Design Engineer's drawings indicating the Work to be performed.

106.2 The term "Work" means the services furnished to complete the CQA activities specified herein.

106.3 The term "Owner-approved equal" means an acceptable equivalent to a specified material or equipment that has been accepted by the Owner.

107. PROJECT MEETINGS

107.1 Project meetings will be held on a periodic basis during the lifetime of the project. The meetings will include:

a. A preconstruction meeting.

b. Progress meetings.

c. Additional meetings as required to discuss problems or work deficiencies.

107.2 Preconstruction Meeting:

a. The preconstruction meeting will be organized by the Owner. In addition to the Owner, the Design Engineer, the GW Contractor (including representatives of the Earthwork Contractor and Geosynthetics Contractor), the CQA Officer (or CQA Officer-in-Absentia), the Lead CQA Inspectors, and any other interested party designated by the Owner shall attend the preconstruction meeting.

b. The preconstruction meeting shall be used to discuss:

b1. Site specific safety requirements.

b2. Requirements of the Design Drawings, GW Specification, and CQA Specification.

b3. The CQA Contractor’s CQA Plan and the responsibilities of each party.

b4. The lines of authority and communication.

b5. Procedure for submittal of manufacturer QA/QC documents for audit.

b6. Procedures for examination of materials delivered to the site.

b7. Location of material storage area(s).

b8. Field and laboratory test requirements and sample sizes.

b9. Procedures for observance of field tests.

b10. Coordination between each contractor and the CQA Inspector to obtain timely field samples and tests.

b11. Procedure for handling construction deficiencies, repairs, and retesting.

b12. Work area security and safety protocol.

b13. Work days and work hours.

b14. Coordination with other contractors or trades.

b15. Site visits.

107.3 Weekly Progress Meetings:

a. Weekly progress meetings will be scheduled by the Owner. In addition to the Owner, the meetings shall be attended by the Design Engineer, the GW Contractor (including representatives of the Earthwork Contractor and the Geosynthetics Contractor), the CQA Officer (or CQA Officer-in-Absentia), and the Lead CQA Inspectors.

b. If needed, daily meetings shall be held each day to review the work schedule, work completed, results of tests, and to discuss potential construction problems.

c. The Owner or its designee will document each meeting and distribute copies of meeting minutes to all responsible parties.

107.4 Additional Meetings:

a. Additional meetings between one or more contractors, the Lead CQA Inspector(s), and the CQA Officer (or the CQA Officer-in-Absentia) shall be held immediately after a work deficiency is identified or a problem arises. These meetings shall be used to define and resolve the problem.

b. Any supervisor/superintendent can request such a meeting through their line of authority.

c. Possible solutions to the problem shall be discussed, and an acceptable solution shall be selected. This solution shall be implemented provided it does not conflict with or require a change to the Design Drawings, in which case the solution shall be submitted to the Design Engineer for review.

d. The Design Engineer shall resolve unexpected conditions or unanticipated problems during construction, which may require changes to the permitted design. Changes from the permitted design shall require approval by the Owner and Design Engineer to ensure that the original design objectives are maintained. All changes shall meet the requirements of the Permitting Authority and may include regulations approved by the Permitting Authority.

e. The CQA Contractor shall document each special meeting and distribute copies of minutes to all responsible parties.

108. PERFORMANCE AUDITS AND CQA DOCUMENTATION

108.1 As a minimum, the CQA Officer shall conduct the following reviews and performance audits:

a. Full review and audit of results of preconstruction testing or GW Contractor's material certificates used to qualify earthwork materials for construction use.

b. Full review and audit of manufacturer certificates that qualify geosynthetic materials and ballast infill materials for use in the final cover system (including geomembrane and synthetic turf).

c. Weekly audit of reports and test data sheets during and after construction of the earthwork until completion of work.

d. Weekly audit of reports and test data sheets during and after installation of geosynthetic materials and cover materials until completion of the work.

108.2 CQA documentation shall be well-documented and include at least the following:

a. Daily records, which shall include:

a1. Inspection data sheets.

a2. Data sheets listing the number and types of construction equipment used by the GW Contractor, including applicable construction equipment data.

a3. Problem identification reports and corrective action reports. Problem identification reports and corrective action reports shall include detailed descriptions of materials and/or workmanship that do not meet a specified design and shall be cross-referenced to specific inspection data sheets where the problem was identified and corrected.

b. Testing records, which shall include:

b1. Material shipping and manufacturer QA/QC data sheets.

b2. Data sheets describing field samples taken.

b3. Laboratory data sheets.

b4. Field test data sheets.

b5. Notes, charts, drawings, or sketches identifying the location and elevation of field tests, location of failures and repairs or retests, and where samples were obtained.

b6. Non-destructive test reports including location of failures, records of repairs, and results of retests.

c. Photographic records, which shall include:

c1. Digital photographs, each with a unique identifying number.

c2. Figure indicating the location from which each photograph was taken.

c3. Summary list giving the date and time of each photograph.

108.3 All records shall, at a minimum, bear the following:

a. Unique identifying sheet number.

b. The date.

c. Project name, project number, and location.

d. Descriptive remarks.

e. Data sheets for tests.

f. Written text descriptions for visual observations

g. Signature of the preparer of designated authority.

END OF SECTION 011100

SECTION 014362

QUALITY ASSURANCE FOR FILL, LINER, AND LEACHATE COLLECTION MATERIALS

PART 1 – GENERAL

101. EXTENT

101.1 The intent of this section is to define the requirements for Construction Quality Assurance (CQA) activities to ensure that the quality of materials and installation procedures used to retrofit the Bypass Basin are in accordance with the General Work (GW) Specification P-1400, Design Drawings, permit requirements, and as specified herein.

101.2 The Work specified within this Specification is the responsibility of the CQA Contractor and shall include, but not be limited to, the following items:

a. Attend project meetings and site visits as scheduled by the GW Contractor for coordination between the Owner, GW Contractor, subcontractors, and CQA Contractor.

b. Perform pre-construction material certification activities to ensure materials meet or exceed GW Specification requirements that include but are not limited to:

b1. Testing for suitability of material prior to use.

b2. Perform pre-construction audits of material certifications prior to material use.

c. Perform CQA activities during construction to ensure materials meet or exceed GW Specification requirements that include but are not limited to:

c1. Audits of material certifications.

c2. Perform field observations, inspections, and tests.

c3. Perform laboratory tests and reviews of test results.

c4. Material sampling.

d. Documentation of all observations, findings, and testing, and of conformance of work to the GW Specification to be submitted by the Owner to the Permitting Authority.

e. Preparation of an Index Report, an Acceptance Report, Weekly Summary Reports, and a Retrofit Completion Report

f. Submit a draft version of the Retrofit Completion Report to the Owner and Design Engineer for their review and comment. Upon resolution of all comments, submit a final version of the Retrofit Completion Report, sealed and certified by the CQA Officer, to the Owner and Design Engineer.

101.3 Definitions:

a. The following definitions of terms shall apply throughout this section:

a1. GCL Manufacturer: The manufacturer who is, pursuant to Specification P-1400, responsible for manufacture of GCL materials and for transporting GCL materials to the site.

a2. GM/GC Manufacturer: The manufacturer who is, pursuant to Specification P-1400, responsible for manufacture of geomembrane and drainage geocomposite materials and for transporting geomembrane and drainage geocomposite materials to the site.

a3. Pipe Manufacturer: The manufacturer who is, pursuant to Specification P-1400, responsible for manufacture of LCRS pipe materials and fittings and for transporting these materials to the site.

102. RELATED WORK SPECIFIED IN OTHER SECTIONS

102.1 CQA Specification P-1401:

a. Section 011100 – Summary of Work.

102.2 GW Specification P-1400:

a. Section 319005 – Earthwork.

b. Section 319020 – High-Density Polyethylene Geomembrane Liner with Geocomposite.

c. Section 319025 – Geosynthetic Clay Liner (GCL).

d. Section 319050 – Leachate Collection and Removal System.

103. REFERENCE DOCUMENTS

103.1 Standards, specifications, manuals, codes and other publications of nationally recognized organizations and associations are referenced herein.

103.2 References to these documents are to the latest issue date of each document, unless otherwise indicated, together with the latest additions, addenda, amendments, supplements, etc., thereto, in effect as of the date of Contract for the Work.

103.3 Abbreviations listed indicate the form used to identify the reference documents cited in this section.

103.4 ASTM – ASTM International:

a. D422 Standard Test Method for Particle-Size Analysis of Soils.

b. D792 Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement.

c. D1004 Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting.

d. D1505 Standard Test Method for Density of Plastics by the Density-Gradient Technique.

e. D1556 Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method.

f. D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).

g. D2167 Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.

h. D2216 Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.

i. D2434 Standard Test Method for Permeability of Granular Soils (Constant Head).

j.	D2487	Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
k.	D2488	Standard Practice for Description and Identification of Soils (Visual-Manual Procedures).
l.	D4218	Standard Test Method for Determination of Carbon Black Content in Polyethylene Compounds by the Muffle-Furnace Technique
m.	D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
n.	D4643	Standard Test Method for Determination of Water Content of Soil and Rock by Microwave Oven Heating.
o.	D4716	Standard Test Method for Determining the (In-plane) Flow Rate per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head.
p.	D4833	Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products
q.	D4959	Standard Test Method for Determination of Water Content of Soil By Direct Heating.
r.	D5084	Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter.
s.	D5261	Standard Test Method for Measuring Mass per Unit Area of Geotextiles.
t.	D5596	Standard Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics.
u.	D5887	Standard Test Method for Measurement of Index Flux Through Saturated Geosynthetic Clay Liner Specimens Using a Flexible Wall Permeameter.
v.	D5890	Standard Test Method for Swell Index of Clay Mineral Component of Geosynthetic Clay Liners.
w.	D5891	Standard Test Method for Fluid Loss of Clay Component of Geosynthetic Clay Liners.
x.	D5993	Standard Test Method for Measuring Mass per Unit Area of Geosynthetic Clay Liners.
y.	D5994	Standard Test Method for Measuring Core Thickness of Textured Geomembranes.
z.	D6243	Standard Test Method for Determining the Internal and Interface Shear Strength of Geosynthetic Clay Liner by the Direct Shear Method.
aa.	D6496	Standard Test Method for Determining Average Bonding Peel Strength Between Top and Bottom Layers of Needle-Punched Geosynthetic Clay Liners.
bb.	D6693	Standard Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes.
cc.	D6768	Standard Test Method for Tensile Strength of Geosynthetic Clay Liners.

dd. D6938 Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

ee. D7005 Standard Test Method for Determining the Bond Strength (Ply Adhesion) of Geocomposites.

103.5 ITP – Illinois Test Procedure:

a. 27 Sieve Analysis of Fine and Coarse Aggregates

104. SUBMITTALS

104.1 Submittals with Bid Proposal:

a. Documentation to substantiate that the CQA Contractor's and its laboratory's Accreditation Certifications are current.

b. Detailed resumes on all CQA laboratory and field personnel proposed for the Work, including:

b1. A complete description of their qualifications and previous experience in the same type of work.

b2. Documentation of certification to perform required testing.

104.2 Submittals During the Course of the Work:

a. Certifications and submittals as specified herein.

b. An Index Report, an Acceptance Report, Weekly Summary Reports, and a Retrofit Completion Report as described below shall be prepared.

b1. Index Report:

b1.1 An Index Report shall be prepared listing all records and reports.

b1.2 The Index Report shall be assembled in chronological framework for recording and identifying all reports.

b2. Weekly Summary Reports:

b2.1 At the end of each week of construction, until construction is complete, a Weekly Summary Report must be prepared by either the CQA Officer or under the supervision of the CQA Officer and submitted to the Owner and the Design Engineer. The CQA Officer must review and approve each Weekly Summary Report.

b2.2 The Weekly Summary Report shall contain descriptions of the weather, locations where construction occurred during the previous week, materials used, results of testing, inspection reports, and procedures used to perform inspections.

b3. Retrofit Completion Report:

b3.1 After the GW Contractor completes retrofit construction activities, the CQA Officer shall prepare a Retrofit Completion Report that demonstrates the Bypass Basin was retrofitted in conformance with Project Specifications, the Design Drawings, and permit requirements. At a minimum, this report shall include:

b3.1.1 All data sheets, testing records, manufacturer data sheets, and reports concerning items that were installed and tested.

b3.1.2 Photographs of the liner system and leachate collection system and any other photographs relied upon to document construction activities. All photographs shall include time, date, and location information.

b3.1.3 Any designations of CQA officers-in-absentia in accordance with Section 011100, Paragraph 104.1f4.

b3.1.4 Certification that the GW Contractor's work is in compliance with Project Specifications, the Design Drawings, and permit requirements.

b3.1.5 Certifications that:

b.3.1.5.1 Pipe bedding material contains no undesirable objects.

b.3.1.5.2 The anchor trench and backfill are constructed to prevent damage to a geosynthetic membrane.

b.3.1.5.3 All tears, rips, punctures, and other damage to geosynthetic materials are repaired.

b.3.1.5.4 All geomembrane seams are properly constructed and tested in accordance with the manufacturer's specifications.

b.3.1.5.5 Proper filter material consisting of uniform granular fill, to avoid clogging, is used in construction.

b.3.1.5.6 The filter material, as placed, possesses structural strength adequate to support the maximum loads imposed by the overlying materials and equipment used at the facility.

b3.2 The first draft version of the Retrofit Completion Report shall be submitted within 1 week after completion of CQA Work to the Owner and Design Engineer for their review and comment.

b3.3 Within 1 week of resolving all comments, the final version of the Retrofit Completion Report shall be sealed and certified by the CQA Officer and submitted to the Owner and Design Engineer.

105. CONSTRUCTION QUALITY ASSURANCE REQUIREMENTS

105.1 Organizations Involved:

a. The organizations involved in the design, permitting, and construction activities associated with the Work are defined in Section 011100.

b. The responsibilities and authorities of the organizations and personnel associated with the Work are described in Section 011100.

105.2 Qualifications:

a. The qualifications of the CQA Contractor personnel are described in Section 011100.

105.3 Project Meetings:

a. The requirements for project meetings and audits are described in Section 011100.

105.4 Performance Audits, CQA Documentation, and CQA Reports:

a. The requirements for performance audits and CQA documentation are described in Section 011100.

b. The requirements for CQA reports are described in Paragraph 104.2 of this section.

PART 2 – PRODUCTS

201. PRODUCTS

201.1 The requirements for the various products used for retrofitting the Bypass Basin are specified in their respective technical specification sections in the GW Specification.

201.2 All permanent materials to be used in the Work are supplied by the GW Contractor. The GW Contractor and CQA Contractor shall coordinate obtaining materials for testing by the CQA Contractor.

PART 3 – EXECUTION

301. GENERAL CQA TESTING AND INSPECTION REQUIREMENTS

301.1 Record daily weather conditions.

301.2 Field tests shall document the elevation and coordinate location for each test. The locations may be determined by survey, taping, or pacing off distances unless otherwise noted.

301.3 Material Source Testing: Material source testing activities include visual observations and laboratory and field testing at the material source to control material quality and material preparation prior to transport of the material to the project site.

302. CQA TESTING AND INSPECTION REQUIREMENTS FOR EXISTING LINER DECONTAMINATION ACTIVITITES

302.1 Testing During Construction:

a. CQA activities during removal of material from and decontamination of the Bypass Basin's existing geomembrane liner shall include visual observations and field testing to verify the liner has been decontaminated in accordance with the Design Drawings.

b. Visual Observations:

b1. Observe and record method(s) of material removal and decontamination.

b2. Verify and document that the GW Contractor is taking necessary precautions to avoid damaging the geomembrane liner. Identify any locations where damage to the existing geomembrane liner has occurred and record the method(s) used to repair such damage.

b3. Verify and document that the GW Contractor has developed and is implementing fugitive dust controls in accordance with 35 Ill. Adm. Code 845.740(c)(2), which must include:

b3.1 A water spray or other commercial dust suppressant to suppress dust in CCR handling areas and haul roads.

b3.2 Handling of CCR to minimize airborne particulates and offsite particulate movement during any weather event or condition.

b4. Verify and document that the GW Contractor has developed and is implementing measures to prevent contamination of surface water, groundwater, soil, and sediments in accordance with 35 Ill. Adm. Code 845.740(c)(4).

b4.1 If CCR and CCR-impacted material removed from the Bypass Basin is temporarily stored, verify and document the material is stored in a lined landfill, CCR surface impoundment, enclosed structure, or CCR storage pile.

b4.2 If CCR and/or CCR-impacted material are temporarily stored in a CCR storage pile, verify and document the pile is:

b4.2.1 Tarped or constructed with wind barriers to suppress dust and to limit stormwater contact with the pile.

b4.2.2 Is periodically wetted and/or has periodic application of dust suppressants.

b4.2.3 Has a storage pad or a geomembrane liner that:

b.4.2.3.1 Has a hydraulic conductivity no greater than 1×10^{-7} cm/sec.

b.4.2.3.2 Is properly sloped to allow appropriate drainage.

b4.2.4 Is tarped over the edge of the storage pad where possible.

b4.2.5 Is constructed with fixed and/or mobile berms, where appropriate, to reduce run-on and run-off of stormwater to and from the storage pile, and minimize stormwater-CCR contact.

b4.2.6 Is located within the groundwater monitoring system in-place for the Ash Surge Basin and/or Bypass Basin.

b5. Verify and document that all material removal and decontamination work is performed in a systematic manner to remove all ash and ash residuals from the liner surface.

b6. Verify and document that the GW Contractor is providing adequate temporary ballasting on exposed liner areas to prevent uplift of the geomembrane by wind by the use of sandbags and/or other means which will not damage the geomembrane.

b7. For areas of geomembrane that are damaged, verify and document that the GW Contractor addresses and repairs the damaged areas as specified on the Design Drawings.

b8. Verify and document that the GW Contractor repairs all locations of the geomembrane from which samples are obtained for verification of decontamination.

c. Laboratory and Field Tests:

c1. Perform an electrical leak location survey over decontaminated liner areas as specified on the Design Drawings.

c2. Collect samples of the existing geomembrane liner for verification of decontamination by laboratory testing as specified on the Design Drawings.

c3. Perform laboratory testing of existing geomembrane liner samples as specified on the Design Drawings.

d. Test Acceptance Criteria:

d1. Laboratory and field test acceptance criteria shall be as specified on the Design Drawings.

d2. If the results from any of the laboratory and field tests do meet the respective pass/fail thresholds, then the CQA Officer shall reject all existing geomembrane liner areas corresponding to the failed test(s) as decontaminated.

303. CQA TESTING AND INSPECTION REQUIREMENTS FOR STRUCTURAL FILL MATERIAL

303.1 Initial Material Certification:

a. Prior to shipment of any Structural Fill material, the CQA Contractor shall assemble, document the receipt of, and audit the material supplier's test results and certifications that the properties of the material meet GW Specification requirements.

303.2 Inspections and Testing During Construction:

a. CQA activities during placement of Structural Fill shall include visual observations and laboratory and field testing to ensure that Structural Fill is installed in accordance with GW Specification requirements. Field observations and tests shall be performed in accordance with the requirements specified in Table 014362-1 and the following paragraphs.

b. Visual Observation of the Material Source for Structural Fill Material During Construction:

b1. Inspect materials to ensure that they are uniform.

b2. Visually inspect the material in accordance with ASTM D2488.

b3. Inspect to ensure that only suitable material is transported to the site, observe segregation operations if unsuitable materials are present, and observe (if necessary) the removal of organic soils, roots, stumps, and stones.

b4. Observe changes in color or texture that can be indicative of a change in material type or moisture content.

b5. Observe moisture conditioning activities to ensure that any required substantial changes in moisture content are made at the source.

c. Visual Observation of Fill Placement:

c1. Record the placement method(s) the GW Contractor is utilizing for installing the Structural Fill.

c2. In instances where the GW Contractor is transporting material into the basin, the CQA Contractor shall:

c2.1 Verify no equipment (wheeled or tracked) is traversing the Bypass Basin area when less than 10 inches of earthen material are above the basin's existing geomembrane liner.

c2.2 Verify Structural Fill has been installed above the existing geomembrane liner along the basin's ramp as detailed on the Design Drawings before the GW Contractor's equipment uses the ramp to transport fill material into the basin.

c2.3 Document the receipt of and audit the GW Contractor's demonstration(s) that equipment entering the basin will not exert a ground pressure greater than 8 psi.

c2.4 Verify equipment operating within the basin does not hard brake on the ramp, make sharp turns, nor make quick stops that could pinch or tear the Bypass Basin's existing geomembrane liner.

c3. Record type and size of compaction equipment in use:

c3.1 For rubber-tired rollers, record the tire inflation pressure, spacing of tires, and empty and ballasted wheel loads.

c3.2 For hand tampers, record make, model number, size and compactive effort.

c3.3 Observe and record compactive effort, uniformity of compaction and scarification and connection between compacted lifts. Record number of passes of a roller by type, size, and weight of roller.

c3.4 For proofrolling, record the type, size, and weight of compaction equipment or other vehicles used for proofrolling.

c4. Observe removal of roots, rocks, rubbish, or out-of-specification soil from the borrow material.

c5. Observe and record changes in soil characteristics necessitating a change in construction procedures.

c6. Observe fill placement and procedures for proper lift thickness.

c7. Observe procedures to be followed to adjust the soil moisture content to obtain uniform moisture content.

c8. Observe and record final finishing procedures.

c9. Observe and record that final grade is consistent with the design grade specified on the Design Drawings.

d. Laboratory and Field Tests:

d1. Laboratory and field testing shall be performed in accordance with the requirements specified in Table 014362-1.

e. Test Acceptance Criteria:

e1. Acceptance criteria shall be as specified in GW Specification Section 319005.

304. <u>CQA TESTING AND INSPECTION REQUIREMENTS FOR GEOSYNTHETIC CLAY LINER COMPONENT OF COMPOSITE LINER SYSTEM</u>

304.1 Initial Material Certification:

a. Prior to shipment of any geosynthetic clay liner (GCL) materials, the CQA Contractor shall assemble, document the receipt of, and audit the GCL Manufacturer's submittals listed below for conformance with the GW Specification.

a1. Certificates describing the origin and identification of the raw materials.

a2. Copy of the GCL Manufacturer's QA/QC certificates on tests performed on the material and a summary of results of the tests.

a3. Certification and guarantee by the GCL Manufacturer that the properties of the manufactured material meet GW Specification requirements.

a4. Certification that the GCL was continuously inspected during the manufacturing process for, as a minimum, the following:

a4.1 Lack of uniformity.

a4.2 Damage.

a4.3 Imperfections.

a4.4 Holes.

a4.5 Tears.

a4.6 Thin spots.

a4.7 Foreign materials.

b. GCL Panel Layout:

b1. Document receipt of the GCL Manufacturer's proposed GCL panel layout.

304.2 Transportation, Handling, and Storage:

a. Documentation of Delivery:

a1. Document arrival of rolls of GCL.

a2. Document that each roll is marked with the following information:

a2.1 Name of GCL Manufacturer.

a2.2 Product identification (brand name, product code).

a2.3 Date of manufacture.

a2.4 Roll identification number and weight.

a2.5 Panel number.

a2.6 GCL thickness.

a2.7 Physical dimensions (length, width).

a2.8 Manufacturing lot number.

a2.9 Order number.

a3. Check the Quality Control certificates on each roll to verify that the rolls received onsite meet the GW Specification. Take the identifying labels from each roll or pallet and save them for future reference.

a4. Recommend rejection of rolls which do not have the required documentation and ensure that those rolls are removed from the site.

b. Inspection of Manufactured Rolls:

b1. Inspect all manufactured rolls upon delivery to the site.

b2. Ensure that packaging is secure and that no damage has occurred.

b3. If damage to packaging has occurred, inspect exposed roll surfaces, and note and identify any damage or repairable flaws. Note: This visual observation shall be conducted without unrolling rolls unless the extent of surface damage indicates that internal damage may be present.

b4. If damage to just the packaging has occurred, document repair of the packaging.

b5. If damage to the product has occurred, document that the damage or flaws are repaired or that the damaged material is wasted and removed from the site.

b6. Report all damage to the Owner.

c. Handling:

c1. Inspect the onsite handling equipment being used to move materials to ensure that it is adequate to minimize the risk of damage to materials.

c2. Inspect the handling of materials by installing personnel to ensure that care is used.

d. Storage:

d1. Inspect the storage facility.

d2. Inspect the ground surface to ensure that it is dry, relatively level, smooth and free of rocks, holes, and debris.

d3. Document unsafe or improper storage conditions, and report conditions to the Owner.

304.3 Preconstruction Testing:

a. Prior to material shipment to the site, the GCL Manufacturer shall submit to the CQA Contractor representative samples of the GCL materials to be shipped to the site, along with a chain of custody and a certification that the samples submitted are from the GCL materials to be delivered to the site. The CQA Geosynthetics Inspector shall perform conformance testing of the received GCL samples in accordance with Table 014362-3. The laboratory tests shall be performed at least at the corresponding minimum frequencies specified in Table 014362-3.

b. Test acceptance criteria shall be as specified in GW Specification Section 319025. If the results from any of the tests in Table 014362-3 do not meet the respective pass/fail thresholds, then the CQA Officer shall reject all GCL material for which the failed test(s) represent(s) for use in the project.

304.4 Inspections During Construction:

a. CQA activities during placement of the GCL component of the Bypass Basin's new composite liner system shall include visual observations and field testing to ensure that the GCL is installed in accordance with the GW Specification requirements. Field observations and tests shall be performed in accordance with the requirements specified in Table 014362-3 and the following paragraphs.

b. Weather Conditions for Placement:

b1. Observe and document the weather conditions (i.e., temperature, humidity, precipitation, and wind) to ensure that they are appropriate for GCL placement. The GW Specification describes acceptable weather conditions.

b2. If the weather becomes unacceptable for installation of GCL, recommend stopping the installation until conditions again become favorable, thus minimizing the potential for unacceptable installation.

c. GCL Placement:

c1. Supporting Surface:

c1.1 Prior to placement of the GCL, visually inspect the Structural Fill surface to ensure that it meets the requirements of the GW Specification. Confirm that it is compacted and is free from clods of soil, rocks larger than specified, roots, sudden or sharp changes in grade, and standing water. Field observations shall be performed in accordance with the requirements specified in Table 014362-4.

c1.2 Provide documentation of daily inspection of the Structural Fill surface for the area of GCL to be placed that day.

c2. Panel Deployment:

c2.1 As each panel is unrolled, visually inspect the GCL to ensure there are no flaws or damage. The CQA Inspector shall traverse the panels in such a way that the entire surface is inspected. Any defects shall be documented on a drawing and marked on the GCL for repair.

c3. Document that the location of the seams meet the general requirements for seaming contained in GW Specification Section 319025.

c4. At the time of placement, make measurements to confirm that required overlap of adjacent GCL panels has been achieved, that proper temporary anchorage is being used (e.g., sand bags or tires), and that the GCL is being placed in a relaxed (nonstressed) state.

c5. Document any liner damage from adverse weather conditions, equipment, inadequate temporary anchoring, or rough handling. Any damage shall be documented on a drawing and marked on the GCL for repair.

c6. Document improper GCL panel placement and, as a result, inadequate coverage with the available materials or an excess number of field seams.

c7. Document inadequate sheet overlap resulting in poor quality seams.

c8. Document unseamed or cut panels.

c9. Document repair of damage. Documentation shall include location, type, and method of repair.

305. <u>CQA TESTING AND INSPECTION REQUIREMENTS FOR GEOMEMBRANE COMPONENT OF COMPOSITE LINER SYSTEM</u>

305.1 Initial Material Certification and Inspection of Installation Plans:

a. Prior to shipment of any geomembrane materials, the CQA Contractor shall assemble, document the receipt of, and audit the GM/GC Manufacturer submittals listed below for conformance with the GW Specification.

a1. Geomembrane Resin:

a1.1 Certificate that the resin meets GW Specification requirements.

a1.2 Certificate of the origin of the resin and that all resin is from the same supplier (including resin supplier's name, identification brand name, and number).

a1.3 Copies of the GM/GC Manufacturer's and resin supplier's QA/QC certificates. Certificates shall include a summary report of test results conducted to verify the quality of the resin used in each batch to manufacture geomembrane for this project. As a minimum, the report shall include tests on specific gravity, melt flow index, and percent carbon black.

a2. Geomembrane Sheeting:

a2.1 Certification that the properties of the manufactured sheeting meet GW Specification requirements and are guaranteed by the GM/GC Manufacturer.

a2.2 Statement certifying that no reclaimed polymer has been added to the resin. Note: Polymer recycled during the manufacturing process may be permitted provided that it does not exceed 2% by weight.

a2.3 Statement certifying that the manufactured sheeting is free of per- and polyfluoroalkyl substances (PFAS).

a2.4 Copies of all of the GM/GC Manufacturer's QA/QC certificates for the geomembrane sheeting. The certificates shall include test results.

a3. Extrudate Resins or Rod for Seaming Geomembrane:

a3.1 Certification from the GM/GC Manufacturer that all extrudate is the same resin type as the geomembrane and was obtained from the same resin supplier as the resin used to manufacture the geomembrane.

b. Review of GW Contractor's Installation Plans

b1. Geomembrane Field Installation Quality Assurance Plan:

b1.1 Document receipt of the GW Contractor's QA plan for installing geomembrane.

b1.2 Review the plan for compliance with the GW Specification and document where the plan is not in compliance.

b2. Geomembrane Panel Layout:

b2.1 Document receipt of the GW Contractor's panel layout for geomembrane.

305.2 Transportation, Handling, and Storage:

a. Documentation of Delivery:

a1. Document arrival of rolls of geomembrane.

a2. Document that each roll is marked with the following information:

a2.1 Name of GM/GC Manufacturer.

a2.2 Product identification, which can be traced back to the origin of the base material (resin supplier's name, resin production plant, resin brand name type, and production date of the resin).

a2.3 Date of manufacture of the geomembrane.

a2.4 Roll identification number.

a2.5 Geomembrane thickness and type.

a2.6 Physical dimensions (length, width).

a2.7 Lot number.

a2.8 Panel number and weight.

a2.9 Order number.

a3. Check the Quality Control certificates on each roll to verify that the rolls received onsite meet the GW Specification. Take the identifying labels from each roll or pallet and save them for future reference.

a4. Recommend rejection of rolls which do not have the required documentation and ensure that those rolls are removed from the site.

b. Inspection of Manufactured Rolls:

b1. Inspect all manufactured rolls upon delivery to the site.

b2. Ensure that packaging is secure and that no damage has occurred.

b3. If damage to packaging has occurred, inspect exposed roll surfaces, and note and identify any damage or repairable flaws. Note: This visual observation shall be conducted without unrolling rolls unless the extent of surface damage indicates that internal damage may be present.

b4. If damage to just the packaging has occurred, document repair of the packaging.

b5. If damage to the product has occurred, document that the damage or flaws are repaired or that the damaged material is wasted and removed from the site.

b6. Report all damage to the Owner.

c. Handling:

c1. Inspect the onsite handling equipment being used to move materials to ensure that it is adequate to minimize the risk of damage to materials.

c2. Inspect the handling of materials by installing personnel to ensure that care is used.

d. Storage:

d1. Inspect the storage facility.

d2. Inspect the ground surface to ensure that it is dry, relatively level, smooth, and free of rocks, holes, and debris.

d3. Document unsafe or improper storage conditions, and report conditions to the Owner.

305.3 Preconstruction Testing:

a. Prior to material shipment to the site, the GM/GC Manufacturer shall submit to the CQA Contractor representative samples of the geomembrane materials to be shipped to the site, along with a chain of custody and a certification that the samples submitted are from the geomembrane materials to be delivered to the site. The CQA Geosynthetics Inspector shall perform conformance testing in accordance with Table 014362-6. The laboratory tests shall be performed at least at the corresponding minimum frequencies specified in Table 014362-6.

b. Test acceptance criteria shall be as specified in GW Specification Section 319020. If the results from any of the tests in Table 014362-6 do not meet the respective pass/fail thresholds, then the CQA Officer shall reject all geomembrane material from the resin batch corresponding to the failed test(s) for use in the project.

305.4 Inspections and Testing During Construction:

a. CQA activities during placement of the geomembrane component of the Bypass Basin's new composite liner system shall include visual observations and field testing to ensure that the geomembrane is installed in accordance with the GW Specification requirements. Field observations and tests shall be performed in accordance with the requirements specified in Table 014362-6 and the following paragraphs.

b. Weather Conditions for Placement:

b1. Observe and document the weather conditions (i.e., temperature, humidity, precipitation, and wind) to ensure that they are acceptable for geomembrane placement and seaming. The GW Specification describes acceptable weather conditions.

b2. If the weather becomes unacceptable for installation of the geomembrane liner, recommend stopping the installation until conditions again become favorable, thus minimizing the potential for unacceptable installation.

c. Geomembrane Placement:

c1. Prior to placement of the geomembrane liner, the GCL component of the composite liner system in the area to be lined shall have been installed, seamed, and inspected and all necessary repairs made in accordance with GW Specification Section 319025.

c2. Observe and document that the GW Contractor's geomembrane placement plan is being followed. Note where the plan is not being followed and document the GW Contractor's reasons for not following the plan. As each panel is placed, visually inspect the geomembrane for tears, punctures, and thin spots. The CQA Inspector shall traverse the panels in such a way that the entire surface is inspected. Any defects shall be documented on a drawing and marked on the geomembrane for repair.

c3. Document that the location of the seams meet the general requirements for seaming specified in GW Specification Section 319020.

c4. At the time of placement, make measurements to confirm that required overlap of adjacent geomembrane sheets has been achieved, that proper temporary anchorage is being used (e.g., sand bags or tires), and that the geomembrane is being placed in a relaxed (nonstressed) state.

c5. Document any liner damage from adverse weather conditions, equipment, inadequate temporary anchoring, or rough handling. Mark the location of damage on the geomembrane for repair and on a drawing.

c6. Document improper liner placement (if the GW Contractor's geomembrane placement plan is not followed) and, as a result, inadequate coverage with the available materials or an excess number of field seams.

c7. Document inadequate sheet overlap resulting in poor quality seams.

c8. Document nonwelded or cut panels.

c9. Document repair of damage. Documentation shall include location, type, and method of repair.

d. Geomembrane Seaming and Seam Repair:

d1. Trial Welds Prior to Beginning Seaming:

d1.1 Observe that trial welds are being made at the frequency specified in GW Specification Section 319020.

d1.2 Observe fabrication of test strips and note that test strips are fabricated correctly.

d1.3 Specify where samples are to be cut from the test strips and witness all destructive tests.

d1.4 Observe documentation of results of the destructive tests by the GW Contractor.

d1.5 Audit documentation of each trial weld received from the GW Contractor.

d2. Seaming and Seam Repair – Activities that shall be documented during field seaming operations include:

d2.1 Observe that the geomembrane is free from dirt, dust, and moisture.

d2.2 Observe that the seaming materials and seam welding equipment are as specified.

d2.3 Observe that a firm surface is available for seaming.

d2.4 Observe that geomembrane overlap and panel adjustment are correct prior to seaming.

d2.5 For extrusion welding, observe that the geomembrane is pre-beveled and the geomembrane is properly abraded and that the panels are temporarily bonded.

d2.6 Observe that grind marks are covered with extrudite.

d2.7 Observe weather conditions (e.g., temperature, humidity, wind) to ensure that they are acceptable for seaming.

d2.8 Measurements of temperatures, pressures, and speed of seaming to ensure that they are as specified. Gages and dials on seaming equipment shall be checked and readings recorded.

d2.9 Observe that the geomembrane is not damaged by equipment or personnel during the seaming process.

d2.10 Observe that no solvents or adhesives are used.

e. Anchorage at Existing Penetrations and Concrete Structures:

e1. Where shown on the Design Drawings, CQA Inspectors shall ensure that the seals around existing penetrations and the anchorage to existing concrete structures are of sufficient strength and are impermeable.

e2. Specific inspections that shall be made on all seals and anchors include:

e2.1 Observations and tests to ensure that the sealing systems (i.e., pipe boots) have been installed as specified (are leak free) and in the proper location(s).

e2.2 Observations to ensure that all objects that are placed adjacent to the geomembrane (i.e., batten bars) are smooth and free of objects or conditions that may damage the geomembrane.

e2.3 Observations to ensure that all seals and anchors are complete:

e2.3.1 Batten bars of the specified material, width, and thickness and prepunched at the specified spacing.

e2.3.2 Anchor bolts of the specified size and material.

e2.3.3 Anchor bolts spaced as specified.

e2.4 Observations to confirm that all geomembrane liner penetrations and connections are installed as specified. Liner penetrations shall be verified for appropriate clamp and caulking use, for appropriate material, for good seaming, and for good housekeeping practices. No sharp bends on concrete surfaces shall be allowed.

f. Geomembrane Production Seam Testing:

f1. Non-Destructive: Activities to be observed and documented include the following:

f1.1 Observe that 100 percent of the seam lengths are tested using non-destructive procedures.

f1.2 Observe that testing is performed as seaming progresses.

f1.3 Observe that the correct procedures are used for testing each type of seam.

f1.4 Observe all non-destructive test procedures.

f1.5 For air pressure testing, observe that the equipment, procedures, and air pressure meet specified requirements. Observe that all testing is properly documented.

f1.6 For vacuum box testing, observe that testing is being performed correctly.

f1.7 For inaccessible seams, observe that a procedure acceptable to the Owner is used to test the seams.

f1.8 Observe that all leaks are marked, recorded as to location, and repaired.

f1.9 Observe that repairs are made in accordance with approved techniques.

f1.10 Observe that all repairs are re-tested and that no leakage is present.

f1.11 Review leakage data for possible patterns. Make suggestions to the GW Contractor if data shows a consistent pattern of failure of a particular machine or crew.

f1.12 Audit documentation of testing prepared by the GW Contractor to make sure that the location of leaks is identified on the drawings.

f2. Destructive:

f2.1 Destructive seam testing shall be performed at the frequencies specified in GW Specification Section 319020.

f2.2 The CQA Inspector shall specify the location where each sample shall be taken and record data for each sample.

f2.3 The CQA Inspector shall designate any additional test locations that may be necessary. These locations may be based on the suspicion of contamination by dirt or moisture, change in seaming materials, increase in failed nondestructive tests, and other causes that could result in unacceptable seams.

f2.4 Laboratory testing shall be performed in accordance with GW Specification Section 319020. Predetermined pass/fail values are specified in that section.

f2.5 Audit and document the results of laboratory testing on seam samples. Note any sample that does not pass and identify the location on the geomembrane liner for repair in the field and on the drawings.

f3. Repair of Failed Seams:

f3.1 For field seams that fail, the seam can either be reconstructed between the failed and any previous passed seam location, or the installer can go on either side of the failed seam location (10-foot minimum), take another sample, and test it. If that sample passes, reconstruct the seam between the two locations. If it fails, the process shall be continued. In all cases, acceptable seams must be bounded by two passed test locations. The CQA Geosynthetics Inspector shall document the procedure used and results of tests.

f3.2 Document that repairs are made. Documentation shall include location, type, and method of repair.

306. CQA TESTING AND INSPECTION REQUIREMENTS FOR DRAINAGE GEOCOMPOSITE OF LEACHATE COLLECTION AND REMOVAL SYSTEM

306.1 Initial Material Certification:

a. Prior to shipment of any drainage geocomposite materials, the CQA Contractor shall assemble, document the receipt of, and audit the GM/GC Manufacturer submittals listed below for conformance with the GW Specification.

a1. Copies of the raw material producers' certificates describing the origin and identification of the raw materials.

a2. Copies of the raw material producers' QC certificates.

a3. Statement certifying that the manufactured drainage geocomposite is free of per- and polyfluoroalkyl substances (PFAS).

a4. Copies of the GM/GC Manufacturer's QC certificates on tests performed on the geonet core, geotextile cap and carrier, and double-sided laminated geocomposite as specified in Specification P-1400 Section 319020 and a summary of the results of the tests.

a5. Certification that the properties of the manufactured drainage geocomposite material meets GW Specification requirements and are guaranteed by the GM/GC Manufacturer.

306.2 Transportation, Handling, and Storage:

a. Documentation of Delivery:

a1. Document arrival of rolls of drainage geocomposite.

a2. Document that each roll is marked with the following information:

a2.1 Name of GM/GC Manufacturer.

a2.2 Product identification (brand name, product code).

a2.3 Date of manufacture of drainage geocomposite.

a2.4 Roll identification number.

a2.5 Drainage geocomposite thickness and type.

a2.6 Roll dimensions (length and width).

a2.7 Lot number.

a2.8 Panel number and weight.

a2.9 Order number.

a3. Check the Quality Control certificates on each roll to verify that the rolls received onsite meet the GW Specification. Take the identifying labels from each roll or pallet and save them for future reference.

a4. Recommend rejection of rolls which do not have the required documentation and ensure that those rolls are removed from the site.

b. Inspection of Manufactured Rolls:

b1. Inspect all manufactured rolls upon delivery to the site.

b2. Ensure that packaging is secure and that no damage has occurred.

b3. If damage to packaging has occurred, inspect exposed roll surfaces, and note and identify any damage or repairable flaws. Note: This visual observation shall be conducted without unrolling rolls unless the extent of surface damage indicates that internal damage may be present.

b4. If damage to just the packaging has occurred, document repair of the packaging.

b5. If damage to the product has occurred, document that the damage or flaws are repaired or that the damaged material is wasted and removed from the site.

b6. Report all damage to the Owner.

c. Handling:

c1. Inspect the onsite handling equipment being used to move materials to ensure that it is adequate to minimize the risk of damage to materials.

c2. Inspect the handling of materials by installing personnel to ensure that care is used.

d. Storage:

d1. Inspect the storage facility.

d2. Inspect the ground surface to ensure that it is dry, relatively level, smooth, and free of rocks, holes, and debris.

d3. Document unsafe or improper storage conditions, and report conditions to the Owner.

306.3 Preconstruction Testing:

a. Prior to material shipment to the site, the GM/GC Manufacturer shall submit to the CQA Contractor representative samples of the drainage geocomposite materials to be shipped to the site, along with a chain of custody and a certification that the samples submitted are from the drainage geocomposite materials to be delivered to the site. The CQA Geosynthetics Inspector shall perform conformance testing in accordance with Table 014362-7. The laboratory tests shall be performed at least at the corresponding minimum frequencies specified in Table 014362-7.

b. Test acceptance criteria shall be as specified in GW Specification Section 319020. If the results from any of the tests in Table 014362-7 do not meet the respective pass/fail thresholds, then the CQA Officer shall reject all drainage geocomposite materials for which the failed test(s) represent(s) for use in the project.

306.4 Inspections During Construction:

a. CQA activities during placement of the drainage geocomposite component of the Bypass Basin's new LCRS shall include visual observations and field testing to ensure that the drainage geocomposite is installed in accordance with the GW Specification requirements. Field observations and tests shall be performed in accordance with the requirements specified in Table 014362-7 and the following paragraphs.

b. Weather Conditions for Placement:

b1. Observe and document the weather conditions (i.e., temperature, precipitation, and wind) to ensure they are acceptable for placement. The GW Specification describes correct weather conditions.

b2. If the weather becomes unacceptable for installation of the drainage geocomposite, recommend stopping the installation until conditions again become favorable, thus minimizing the potential for unacceptable installation.

c. Drainage Geocomposite Placement:

c1. Prior to placement of the drainage geocomposite, the HDPE geomembrane component of the composite liner system in the area to be lined shall have been installed, seamed, and inspected and all necessary repairs made in accordance with GW Specification Section 319020.

c2. Inspect all materials as they are unrolled to ensure that there are no flaws or damage.

c3. Observe and document that drainage geocomposite coverage is as specified on the Design Drawings, that joining of the geonet cores is as specified in GW Specification Section 319020, and sewing of the geotextile caps is as specified in GW Specification Section 319020.

c4. Make measurements to ensure that the specified material overlap is achieved.

c5. Observe and document that all materials are free from wrinkles and folds.

c6. Observe and document that the material is not damaged during the installation process.

c7. Document any material damage from adverse weather conditions, equipment, inadequate temporary anchoring, or rough handling. Mark the location of damage on the drainage geocomposite for repair and on a drawing.

c8. Document repair of damage. Documentation shall include location, type, and method of repair.

307. CQA TESTING AND INSPECTION REQUIREMENTS FOR COARSE AGGREGATE BEDDING, SAND FILTER LAYER, PROTECTIVE WARNING LAYER, RIPRAP BEDDING LAYER, AND RIPRAP MATERIALS

307.1 Initial Material Certification:

a. Prior to shipment of any Coarse Aggregate Bedding, Sand Filter Layer, Protective Warning Layer, Riprap Bedding Layer, or riprap materials, the CQA Contractor shall assemble, document the receipt of, and audit the material suppliers' test results and certifications that the properties of the materials meet GW Specification requirements.

307.2 Inspections and Testing During Construction:

a. CQA activities during the placement of Coarse Aggregate Bedding, Sand Filter Layer, Protective Warning Layer, Riprap Bedding Layer, and riprap materials shall include visual observations and laboratory and field testing to ensure that the materials are installed in accordance with GW Specification requirements. Field observations and tests shall be performed in accordance with the requirements specified in Table 014362-2 and the following paragraphs.

b. Visual Observations of Material Placement:

b1. Upon delivery of the material to the site, inspect the material to ensure that it has not been contaminated during transportation and handling. Observe and document rejection of contaminated materials and replacement of suitable materials.

b2. Record the placement method(s) the GW Contractor is utilizing for installing the material.

b3. In instances where the GW Contractor is transporting material into the basin, then the CQA Contractor shall:

b3.1 Verify no equipment (wheeled or tracked) is traversing the Bypass Basin area when less than 10 inches of earthen material are above geosynthetic materials (i.e., drainage geocomposite, geomembrane liner, GCL).

b3.2 Verify the Protective Warning and Sand Filter Layers have been installed along the basin's ramp as detailed on the Design Drawings before the GW Contractor's equipment uses the ramp to transport fill material into the basin.

b3.3 Document the receipt of and audit the GW Contractor's demonstration(s) that equipment entering the basin will not exert a ground pressure greater than 8 psi.

b3.4 Verify equipment operating within the basin does not hard brake on the ramp, make sharp turns, nor make quick stops that could pinch or tear geosynthetic materials.

b4. Observe placement procedures to provide proper thickness.

b5. Observe placement procedures to prevent segregation and degradation of material.

b6. Observe placement procedures to:

b6.1 Ensure pipes and underlying geosynthetic materials are not damaged during the installation process (Note: Side slope cover installation must be observed at all times to assure appropriate placement technique and equipment are used and to detect any damage to geosynthetic materials).

b6.2 Ensure that placement of the Coarse Aggregate Bedding material did not damage or displace the leachate collection pipe.

c. With the use of the GW Contractor's surveyor, make thickness measurements not more than 50 feet on a grid pattern to ensure that the thickness and coverage of each material is in compliance with the Design Drawings.

d. Audit surveys of each completed layer to ensure that specified slopes and elevations specified on the Design Drawings are obtained.

e. Laboratory and Field Tests:

e1. Laboratory and field testing shall be performed in accordance with the requirements specified in Table 014362-2.

f. Test Acceptance Criteria:

f1. Acceptance criteria shall be as specified in GW Specification Section 319050.

308. CQA TESTING AND INSPECTION REQUIREMENTS FOR LEACHATE COLLECTION PIPING AND SIDESLOPE RISERS

308.1 Initial Material Certification:

a. Prior to shipment of any HDPE piping, the CQA Contractor shall assemble, document the receipt of, and audit the Pipe Manufacturer's submittals listed below for conformance with the GW Specification:

a1. Certification that the manufactured pipe meets the requirements of the GW Specification.

a2. Statement that no reclaimed polymer has been added to the resin.

a3. Copies of the Pipe Manufacturer's QA/QC certificates on tests performed during fabrication.

308.2 Transportation, Handling, and Storage:

a. Documentation of Delivery and Inspection of HDPE Pipe:

a1. Document the arrival of pipe.

a2. Check the Quality Control certificates and marking on each pipe to verify that the pipe received meets the GW Specification requirements.

a3. Document that each length of pipe is marked with the following information:

a3.1 Name of Pipe Manufacturer.

a3.2 Pipe type (ASTM designation).

a3.3 Pipe size (diameter).

a3.4 Standard Dimension Ratio (SDR).

a4. Document that all fittings are fabricated and manufactured by the same manufacturer.

a5. Measure and document the spacing and diameter of perforations for perforated pipe and that perforations are predrilled prior to shipment.

a6. Recommended rejection of pipe that does not have the required documentation; that is of the incorrect size, type, or strength; or that is incorrectly fabricated. Ensure that this pipe is removed from the site.

b. Handling:

b1. Inspect the onsite handling equipment being used to move materials to ensure that it is adequate to minimize the risk of damage to materials.

b2. Inspect the handling of materials by installing personnel to ensure that care is used.

c. Storage:

c1. Inspect the storage facility.

c2. Inspect the ground surface to ensure that it is dry, relatively level, smooth, and free of rocks, holes, and debris.

c3. Document unsafe or improper storage conditions, and report conditions to the Owner.

308.3 Preconstruction Testing:

a. Observe and document that the pipes are of the specified size and strength and are constructed of the specified material.

b. Observe and document that pipe perforations for perforated pipe are as specified.

c. Observe and document that the material is not damaged during the installation process and that underlying geosynthetic materials are not damaged.

308.4 Inspections and Testing During Construction:

a. Inspection activities that shall be performed during pipe placement and joining include:

a1. Location:

a1.1 Observations and measurements to ensure that the specified pipe sizes are placed at the specified locations.

a1.2 Observations to ensure that perforated pipe is placed correctly.

a1.3 Measurements to ensure that the horizontal and vertical position and slope are within tolerances required by the GW Specification.

a1.4 Document the as-built locations of all pipes.

a2. Pipe Joining:

a2.1 Observations to ensure that the pipe is joined by using the hot plate thermal butt fusion method as required by the GW Specification and that the equipment used for welding is as recommended by the Pipe Manufacturer.

a2.2 Observations to ensure that the joining method described in the GW Specification is followed.

a3. Joint Quality Control:

a3.1 Observations and documentation that the test joints required by the GW Specification are made.

a3.2 Observations and documentation that the quality of the test joints meet the GW Specification.

a4. Miscellaneous:

a4.1 Observations to ensure that cleanouts are installed as specified.

a4.2 Observations to ensure that the placement of the Coarse Aggregate Bedding material under, around, and over the pipe is as specified on the Design Drawings.

a4.3 Observations to ensure that the pipe network is not damaged during backfilling.

a5. Cleaning:

a5.1 Observe that all the pipes are cleaned by jet cleaning after installation is complete and document that all pipes are intact and not obstructed.

a5.2 Document the location of defective or clogged pipe.

a5.3 Document repair by the GW Contractor and re-cleaning.

a6. Testing:

a6.1 Observe and document that visual observations on pipe joints have been performed and the results of observations documented.

a6.2 Document the location of failed joints.

a6.3 Document the repair and retesting of failed joints by the GW Contractor and the results of testing.

309. CQA TESTING AND INSPECTION REQUIREMENTS FOR CREST ANCHOR TRENCH

309.1 Inspections and Testing During Construction:

a. CQA activities during excavation, formation, and backfilling of the crest anchor trench for the retrofitted Bypass Basin's geosynthetic materials shall include visual observations and field testing to ensure that the crest anchor trench is constructed in accordance with the GW Specification requirements. Field observations and tests shall be performed in accordance with the requirements specified in Table 014362-5 and the following paragraphs.

b. Measurements:

b1. Perform measurements of the crest anchor trench to ensure that the trench width, depth, and location is as specified on the Design Drawings.

c. Observations:

c1. Observe that the trench corners are rounded as specified.

c2. Observe that good housekeeping practices are followed in the trenching operation by not allowing soil to fall back into the trench or down the slope and not allowing water to pond in the trench.

c3. Observe that the trench is backfilled as soon as possible and compacted such that the geosynthetic materials are not damaged.

310. SAMPLING PATTERN

310.1 The CQA Officer shall establish a completely random sampling pattern for determining the choice of sampling points for field tests. Each block of work shall be subdivided into a sampling grid with at least 10 times as many grids as samples or tests to be taken or as directed by the Owner. The grid shall have a numeric identification system devised to distinguish each set of tests for a specific area from all other sets of tests. Each lift shall have a separate grid.

310.2 Sampling points shall be chosen by a random number generator or other acceptable method to obtain uniform coverage. Tests shall be numbered beginning with test number one (1) and no numbers shall be skipped. In areas where a test of any type fails to meet specification criteria and a retest is performed, the retest shall have the same test number as the original test except that an “R” shall follow the test designation.

311. VERIFICATION AND CALIBRATION

311.1 Verification of Selected Field Tests:

a. The following tests shall be verified at the following frequency:

Test Requiring Verification	Frequency of Verification Test
Nuclear In-Place Density and Nuclear In-Place Moisture Content, ASTM D6938	Note 1
“Quick” Moisture Content Test Using Microwave, (ASTM D4643) or Gas Stove, Frying Pan, or Infrared Oven, (ASTM D4959), etc.	One standard oven-dry moisture content (ASTM D2216) test per 20 quick tests.
Lift Thickness Measured Using a Shaft or Shovel	One lift thickness verified by measurement every two acre-lifts.

Notes:

1 – A standard block test as required by ASTM D6938 shall be performed at the start of each day on each Nuclear apparatus that will be used that day. At the start of earthwork construction, a series of five Nuclear tests and five sand cone or rubber balloon tests shall be performed in the borrow area, or area to be excavated, on a compacted test strip to calibrate the Nuclear apparatus. During construction, one of the last Nuclear readings performed at the end of each day shall be verified using a sand cone (ASTM D1556) or rubber balloon (ASTM D2167) density and moisture content test for each apparatus used

that day. The average wet density and moisture content for each apparatus shall be computed for every ten tests. If variations greater than those permitted by the ASTMs occur, corrections shall be applied to all future tests for the apparatus until the next set of 10 tests is performed.

311.2 Calibration:

a. Procedures for calibration of field and laboratory testing equipment shall be submitted by the CQA Contractor prior to the start of testing. These procedures shall meet ASTM requirements.

312. CORRECTIVE ACTION PROCEDURES

312.1 Failure of Material Quality Tests:

a. The GW Contractor and the Owner shall be notified immediately if gradation or Atterberg limits tests do not meet GW Specification acceptance criteria. Failure to meet acceptance criteria of one or more of these groups of tests may indicate problems with the quality of soil materials. The GW Contractor shall cease all construction activities until the source of the problem or “out-of-specification” materials is identified. Construction shall not begin again until materials and installation procedures meeting GW Specification acceptance criteria are identified for use.

312.2 Failure of Field Density or Moisture Content Tests:

a. If the results of field density or moisture content tests fail to meet GW Specification acceptance criteria, those tests shall be re-run after recompaction. Judgment shall be used to select re-test locations suspected of having lower than specified density or moisture content. If the results of the re-test meet GW Specification requirements, the compaction can be considered acceptable. If the results of the re-tests show out-of-specification densities or moisture contents, the CQA Officer shall immediately inform the Owner of the extent of the defective area. The defective area shall be removed and reconstructed or recompacted by the GW Contractor.

TABLE 014362-1

CQA FOR STRUCTURAL FILL MATERIAL

No.	Characteristic to be Monitored	Test		
		Monitoring / Testing Method	Test Method Reference	Minimum Test Frequency
1	In-Situ Moisture Content	Laboratory Moisture Content	ASTM D2216	One per 500 cubic yards, and for each moisture density curve sample.
2	Moisture Density Curve	Proctor	ASTM D1557	One per 500 cubic yards, and for all changes in material.
3	Soil Index Properties	Atterberg Limits	ASTM D4318	One per 500 cubic yards, and for each moisture density curve sample.
4	Soil Index Properties	Grain Size	ASTM D422	One per 500 cubic yards, and for each moisture density curve sample.
5	Soil Classification	Unified Soil Classification System	ASTM D2487	One per 500 cubic yards, and for each moisture density curve sample.
6	Field Density / Soil Compaction	Nuclear Density Gauge, Sand Cone or Rubber Balloon Method	ASTM D6938(1), ASTM D2167, or ASTM D1556	Four per lift. One per 500 cubic yards.
7	Field Moisture Content	Nuclear Density Gauge or Direct Heat Method	ASTM D6938(1) or ASTM D4959	At each field density test location.
8	Uncompacted and Compacted Thickness of Each Lift	Direct Measurement		Four per acre per lift.
9	Surface Lines and Grades	Surveying		One per 50-foot grid and at grade breaks (i.e., toe and top of slopes).

Notes:

(1) ASTM D6938 Procedure B (backscatter) shall be used to measure the as-compacted density of Structural Fill material.

TABLE 014362-2

CQA FOR COARSE AGGREGATE BEDDING, SAND FILTER LAYER, PROTECTIVE WARNING LAYER, RIPRAP BEDDING, AND RIPRAP MATERIALS

No.	Characteristic to be Monitored	Test		
		Monitoring / Testing Method	Test Method Reference	Minimum Test Frequency
Coarse Aggregate Bedding, Protective Warning Layer, Road Surfacing, Riprap Bedding, and Riprap Materials				
1	Soil Index Properties	Grain Size	ITP 27	One per 500 cubic yards.
2	Uncompacted and Compacted Thickness of Each Lift	Direct Measurement		Four per lift. One per 250 linear feet of road for material to be used as road surfacing.
3	Certification of Final Thickness and Grade	Surveying		One per 50-foot grid spacing.
Sand Filter Layer Material				
1	Hydraulic Conductivity	Hydraulic Conductivity	ASTM D2434	One per 500 cubic yards.
2	Soil Index Properties	Grain Size	ITP 27	One per 500 cubic yards.
3	Uncompacted and Compacted Thickness of Each Lift	Direct Measurement		Four per lift. One per 250 linear feet of road for material to be used as road subgrade.
4	Certification of Final Thickness and Grade	Surveying		One per 50-foot grid spacing.

TABLE 014362-3

CQA FOR GEOSYNTHETIC CLAY LINER

No.	Characteristic to be Monitored	Test	
		Test Method Reference	Minimum Test Frequency
1	Swell Potential	ASTM D5890	One test prior to material delivery for each type of material, and one test per material per 20,000 SF
2	Fluid Loss Properties	ASTM D5891	
3	Moisture Content	ASTM D4643	
4	Nonwoven Cap and Nonwoven Carrier Mass / Area	ASTM D5261	
5	Bentonite Mass / Area	ASTM D5993	
6	Hydraulic Conductivity	ASTM 5084	
7	Index Flux	ASTM D5887	
8	Tensile Strength	ASTM D6768	
9	Peel Strength	ASTM D6496	
10	Hydrated Internal Shear Strength	ASTM D6243	

TABLE 014362-4

CQA FOR AREAS TO RECEIVE GEOSYNTHETIC MATERIALS

No.	Characteristic to be Monitored	Test		
		Monitoring / Testing Method	Test Method Reference	Minimum Test Frequency
1	Certification of Surface Elevation Prior to Geomembrane	Surveying		One per 50-foot grid and at grade breaks (toe and top of slopes).
2	Subgrade Firm and Unyielding	Observe and Document Proofroll		Continuous on Structural Fill surface.
3	Subgrade Free of Deleterious Conditions	Observe and document exposed subgrade is free from • Irregularities • Protrusions • Loose soil or soft spots • Abrupt changes in grade • Debris • Clods • Stones • Roots • Organic material • Moisture seeps, puddling, or ponding • Frozen material		Continuous

TABLE 014362-5

CQA FOR ANCHOR TRENCHES

No.	Characteristic to be Monitored	Test		
		Monitoring / Testing Method	Test Method Reference	Minimum Test Frequency
1	Trench Geometry	Measurement		1 location per 100 ft of trench
2	Trench Condition	Observe and Document • Trench free of sloughed material • Trench free from ponded water • Absence of loose material below geosynthetics		Continuous
3	Trench Backfill	Observe and document prompt backfill of trenches		Continuous
4	Field Density / Soil Compaction	Nuclear Density Gauge, Sand Cone or Rubber Balloon Method	ASTM D6938, ASTM D2167, or ASTM D1556	One per 200 ft of trench per lift

TABLE 014362-6

CQA FOR HDPE GEOMEMBRANE

No.	Characteristic to be Monitored	Test		
		Monitoring / Testing Method	Test Method Reference	Minimum Test Frequency
1	Receipt of Delivery	Observe and document: • Name of GM/GC Manufacturer • Product identification • Date of manufacture of the geomembrane • Roll identification number • Geomembrane thickness and type • Physical dimensions (length, width) • Manufacturing lot number • Panel number and weight • Order number	Visual	Each Roll
2	Inspection of Rolls	Lack of uniformity	Visual	Each Roll
		Damage, Tears, Punctures	Visual	Each Roll
		Imperfections, Blisters, Excessive Folding	Visual	Each Roll
3	Geomembrane Properties	Thickness	ASTM D5994	5 per roll of geomembrane delivered at locations evenly distributed throughout roll
		Density	ASTM D1505 / D792	Per resin batch, but not less than once per 20,000 SF of geomembrane
		Tensile properties (strength and elongation at yield and at break)	ASTM D6693	Per resin batch, but not less than once per 20,000 SF of geomembrane
		Tear resistance	ASTM D1004	Per resin batch, but not less than once per 20,000 SF of geomembrane
		Puncture resistance	ASTM D4833	Per resin batch, but not less than once per 20,000 SF of geomembrane

No.	Characteristic to be Monitored	Test		
		Monitoring / Testing Method	Test Method Reference	Minimum Test Frequency
		Carbon black content	ASTM D4218	Per resin batch, but not less than once per 20,000 SF of geomembrane
		Carbon black dispersion	ASTM D5596	Per resin batch, but not less than once per 20,000 SF of geomembrane
4	Weather and Site Conditions at Time of HDPE Geomembrane Deployment and Seaming	Observe and document weather and site conditions		Continuous
5	Panel Deployment	Observe and document: • Relaxed deployment • Damage prevention • Wrinkles minimized • Temporary anchorage • Protected from damage • Proper overlap • Seam location	Visual	Continuous
6	Trial Welds	Observe and document Geosynthetics Contractor staff performing and testing trial welds		• Prior to each seaming period. • Every 4 hours of continuous seaming. • Whenever personnel or equipment are changed. • When climatic conditions result in wide changes in geomembrane temperature. • When requested by the CQA Geosynthetics Inspector(s) for any seaming crew or piece of welding equipment if problems are suspected.

No.	Characteristic to be Monitored	Test		
		Monitoring / Testing Method	Test Method Reference	Minimum Test Frequency
7	Preparation for Seaming	Observe and document: • HDPE geomembrane is clean • Minimum wrinkles and fish mouths • Fish mouths cut as necessary to lay flat • Film surface for seaming	Visual	Continuous
8	Seaming	Observe and document: • Materials • Equipment • Staff • Acceptable procedures • Weather • Pressure • Speed • Damage • Absence of solvents	Visual	Continuous
9	Non-Destructive Seam Tests	Observe and document: • Equipment • Methods • Pressures • Leaks marked • Repairs made • Repairs retested	Various as applicable to seam type	100 percent of seam lengths shall be tested.

No.	Characteristic to be Monitored	Test		
		Monitoring / Testing Method	Test Method Reference	Minimum Test Frequency
10	Destructive Seam Samples and Testing	Observe and document • Removal of all destructive test samples • Repair of sampled areas • Testing of repairs Label all samples Ship all samples to CQA Contractor's testing laboratory	Shear strength and peel adhesion	• One test per every 500 linear feet of seam length if the seam is welded with a fusion weld. • One test per every 400 linear feet of seam length if the seam is welded with an extrusion weld. • One test for each seaming machine

TABLE 014362-7

CQA FOR DRAINAGE GEOCOMPOSITE

No.	Characteristic to be Monitored	Test		
		Monitoring / Testing Method	Test Method Reference	Minimum Test Frequency
1	Receipt of Delivery	Observe and document: • Name of GM/GC Manufacturer • Product identification • Roll identification number • Product thickness or composition • Manufacturing batch code or lot code • Date of manufacture • Order number • Roll dimensions (i.e., length, width, and total weight)	Visual	Each Roll
2	Inspection of Rolls	Lack of uniformity	Visual	Each Roll
		Damage, Tears, Punctures	Visual	Each Roll
		Imperfections,	Visual	Each Roll
3	Drainage Geocomposite Properties	Flow rate per width	ASTM D4716	Once per 20,000 SF of drainage geocomposite
		Ply Adhesion	ASTM D7005	Once per 20,000 SF of drainage geocomposite
4	Weather and Site Conditions at Time of Deployment and Seaming	Observe and document weather and site conditions.		Continuous

No.	Characteristic to be Monitored	Test		
		Monitoring / Testing Method	Test Method Reference	Minimum Test Frequency
5	Panel Deployment	Observe and document: • No debris or rocks below geotextile or geonet • Anchorage • Cutting • Damage prevention • Proper overlap and seaming	Visual	Continuous
6	Seaming	Observe and document: • Seam orientation • Seaming method • Thread material • Stitching type • Stitch length • Sweep for broken needles	Visual	Continuous
7	Repair Areas	Identify areas to be patched Document patching method and location	Visual	Continuous

END OF SECTION 014362

ATTACHMENT 1

SPECIFICATION P-1400 – BYPASS BASIN RETROFIT

Note: See Attachment 5-1 for Specification P-1400

ATTACHMENT 7-1
LOCATION RESTRICTIONS COMPLIANCE DEMONSTRATION

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PLACEMENT ABOVE THE UPPERMOST AQUIFER LOCATION RESTRICTIONS
ASH SURGE BASIN AND BYPASS BASIN
POWERTON STATION
OCTOBER 2018

Pursuant to Code of Federal Regulations Title 40, Part 257, Subpart D (40 CFR), Section 257.60, Geosyntec Consultants (Geosyntec) prepared this report to document compliance with location restrictions related to placement above the uppermost aquifer for the existing Ash Surge Basin and Bypass Basin (the Basins) at the Powerton Station (Site) in Pekin, Illinois.

The work presented in this report was performed under the direction of Mr. Jesse Varsho, P.G., P.E., of Geosyntec. Ms. Jane Soule, P.E., reviewed this report in accordance with Geosyntec's senior review policy.

1. Placement Above the Uppermost Aquifer Restriction Determination

The bases of Ash Surge Basin and Bypass Basin are separated from the upper limit of the uppermost aquifer by a minimum distance of five (5) feet (1.52 meters). Therefore, the locations of the Basins are in compliance with the requirements outlined in §257.60.

2. Limitations and Certification

This report was prepared in accordance with current practices and the standard of care exercised by scientists and engineers performing similar tasks in the field of civil engineering. The contents of this report are based solely on the observations of the conditions observed by Geosyntec personnel and information provided to Geosyntec by Midwest Generation. Consistent with applicable professional standards of care, our opinions and recommendations were based in part on data furnished by others, which was consistent with other information that we developed in the course of our performance of the scope of services. The information contained in this report is intended for use solely by Midwest Generation and their subconsultants.



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WETLANDS LOCATION RESTRICTIONS
ASH SURGE AND BYPASS BASINS
POWERTON STATION
OCTOBER 2018

Pursuant to Code of Federal Regulations Title 40, Part 257, Subpart D (40 CFR), Section 257.61, Geosyntec Consultants (Geosyntec) prepared this report to document compliance with location restrictions related to wetlands for the existing Ash Surge Basin and Bypass Basin (the Basins) at the Powerton Station (Site) in Pekin, Illinois.

The work presented in this report was performed under the direction of Mr. Jesse Varsho, P.G., P.E., of Geosyntec in accordance with §257.61. Ms. Jane Soule, P.E., reviewed this report in accordance with Geosyntec's senior review policy.

1. Wetlands Location Restriction Determination

The Ash Surge Basin and the Bypass Basin are not located in mapped wetlands included in the National Wetlands Inventory – Version 2 presented by the U.S. Fish and Wildlife Service (USFW) [USFW, 2018]. Therefore, the locations of the Basins are in compliance with the requirements outlined in §257.61(a).

2. Limitations and Certification

This report was prepared in accordance with current practices and the standard of care exercised by scientists and engineers performing similar tasks in the field of civil engineering. The contents of this report are based solely on the observations of the conditions observed by Geosyntec personnel and information provided to Geosyntec by Midwest Generation. Consistent with applicable professional standards of care, our opinions and recommendations were based in part on data furnished by others, which was consistent with other information that we developed in the course of our performance of the scope of services. The information contained in this report is intended for use solely by Midwest Generation and their subconsultants.



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3. References

USFS, 2018. "National Wetlands Inventory, Version 2," https://www.fws.gov/wetlands/data/Mapper.html, updated 1 May 2018, accessed 28 August 2018.

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FAULT AREAS LOCATION RESTRICTIONS
ASH SURGE AND BYPASS BASINS
POWERTON STATION
OCTOBER 2018

Pursuant to Code of Federal Regulations Title 40, Part 257, Subpart D (40 CFR), Section 257.62, Geosyntec Consultants (Geosyntec) prepared this report to document compliance with location restrictions related to fault areas for the existing Ash Surge Basin and Bypass Basin (the Basins) at the Powerton Station (Site) in Pekin, Illinois.

The work presented in this report was performed under the direction of Mr. Jesse Varsho, P.G., P.E., of Geosyntec in accordance with §257.62. Ms. Jane Soule, P.E., reviewed this report in accordance with Geosyntec's senior review policy.

1. Fault Areas Location Restriction Determination

The Ash Surge Basin and the Bypass Basin are not located within 200 feet (60 meters) of a mapped Holocene-aged fault, as mapped by the United States Geological Survey (USGS) Quaternary Fault Database [USGS, 2018]. Therefore, the locations of the Basins are in compliance with the requirements outlined in §257.62(a).

2. Limitations and Certification

This report was prepared in accordance with current practices and the standard of care exercised by scientists and engineers performing similar tasks in the field of civil engineering. The contents of this report are based solely on the observations of the conditions observed by Geosyntec personnel and information provided to Geosyntec by Midwest Generation. Consistent with applicable professional standards of care, our opinions and recommendations were based in part on data furnished by others, which was consistent with other information that we developed in the course of our performance of the scope of services. The information contained in this report is intended for use solely by Midwest Generation and their subconsultants.



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Fault Areas Location Restrictions
Ash Surge and Bypass Basins, Powerton Station
October 2018

3. References

USGS, 2018. "Quaternary Fault and Fold Database," https://earthquake.usgs.gov/hazards/qfaults/, accessed 28 August 2018.

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SEISMIC IMPACT ZONES LOCATION RESTRICTIONS
ASH SURGE AND BYPASS BASINS
POWERTON STATION
OCTOBER 2018

Pursuant to Code of Federal Regulations Title 40, Part 257, Subpart D (40 CFR), Section 257.63, Geosyntec Consultants (Geosyntec) prepared this report to document compliance with location restrictions related to seismic impact areas for the existing Ash Surge Basin and Bypass Basin (the Basins) at the Powerton Station (Site) in Pekin, Illinois.

The work presented in this report was performed under the direction of Mr. Jesse Varsho, P.G., P.E., of Geosyntec in accordance with §257.63. Ms. Jane Soule, P.E., reviewed this report in accordance with Geosyntec's senior review policy.

1. Seismic Impact Zones Restriction Determination

The Ash Surge Basin and the Bypass Basin are not located within a seismic impact zone as defined in §257.53 and as mapped by the United States Geological Survey (USGS) [USGS, 2014]. Therefore, the locations of the Basins are in compliance with the requirements outlined in §257.63(a).

2. Limitations and Certification

This report was prepared in accordance with current practices and the standard of care exercised by scientists and engineers performing similar tasks in the field of civil engineering. The contents of this report are based solely on the observations of the conditions observed by Geosyntec personnel and information provided to Geosyntec by Midwest Generation. Consistent with applicable professional standards of care, our opinions and recommendations were based in part on data furnished by others, which was consistent with other information that we developed in the course of our performance of the scope of services. The information contained in this report is intended for use solely by Midwest Generation and their subconsultants.



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Seismic Impact Zones Location Restrictions
Ash Surge and Bypass Basins, Powerton Station
October 2018

3. References

USGS, 2014. "2014 U.S. Geological Survey National Seismic Hazard Maps, PGA 2% in 50 Years," https://earthquake.usgs.gov/hazards/hazmaps/conterminous/index.php#2014, accessed 28 August 2018.

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UNSTABLE AREAS LOCATION RESTRICTIONS
ASH SURGE AND BYPASS BASINS
POWERTON STATION
OCTOBER 2018

Pursuant to Code of Federal Regulations Title 40, Part 257, Subpart D (40 CFR), Section 257.64, Geosyntec Consultants (Geosyntec) prepared this report to document compliance with location restrictions related to unstable areas for the existing Ash Surge Basin and Bypass Basin (the Basins) at the Powerton Station (Site) in Pekin, Illinois.

The work presented in this report was performed under the direction of Mr. Jesse Varsho, P.G., P.E., of Geosyntec in accordance with §257.64. Ms. Jane Soule, P.E., reviewed this report in accordance with Geosyntec's senior review policy.

1. Unstable Areas Restriction Determination

The Ash Surge Basin and the Bypass Basin are not located in unstable areas [Geosyntec, 2016]. Therefore, the locations of the Basins are in compliance with the requirements outlined in §257.64(a).

2. Limitations and Certification

This report was prepared in accordance with current practices and the standard of care exercised by scientists and engineers performing similar tasks in the field of civil engineering. The contents of this report are based solely on the observations of the conditions observed by Geosyntec personnel and information provided to Geosyntec by Midwest Generation. Consistent with applicable professional standards of care, our opinions and recommendations were based in part on data furnished by others, which was consistent with other information that we developed in the course of our performance of the scope of services. The information contained in this report is intended for use solely by Midwest Generation and their subconsultants.



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License Expires: 11/30/19

3. References

Geosyntec, 2016. Structural Stability and Factor of Safety Assessment, Ash Surge Basin and Bypass Basin, Powerton Station, October.

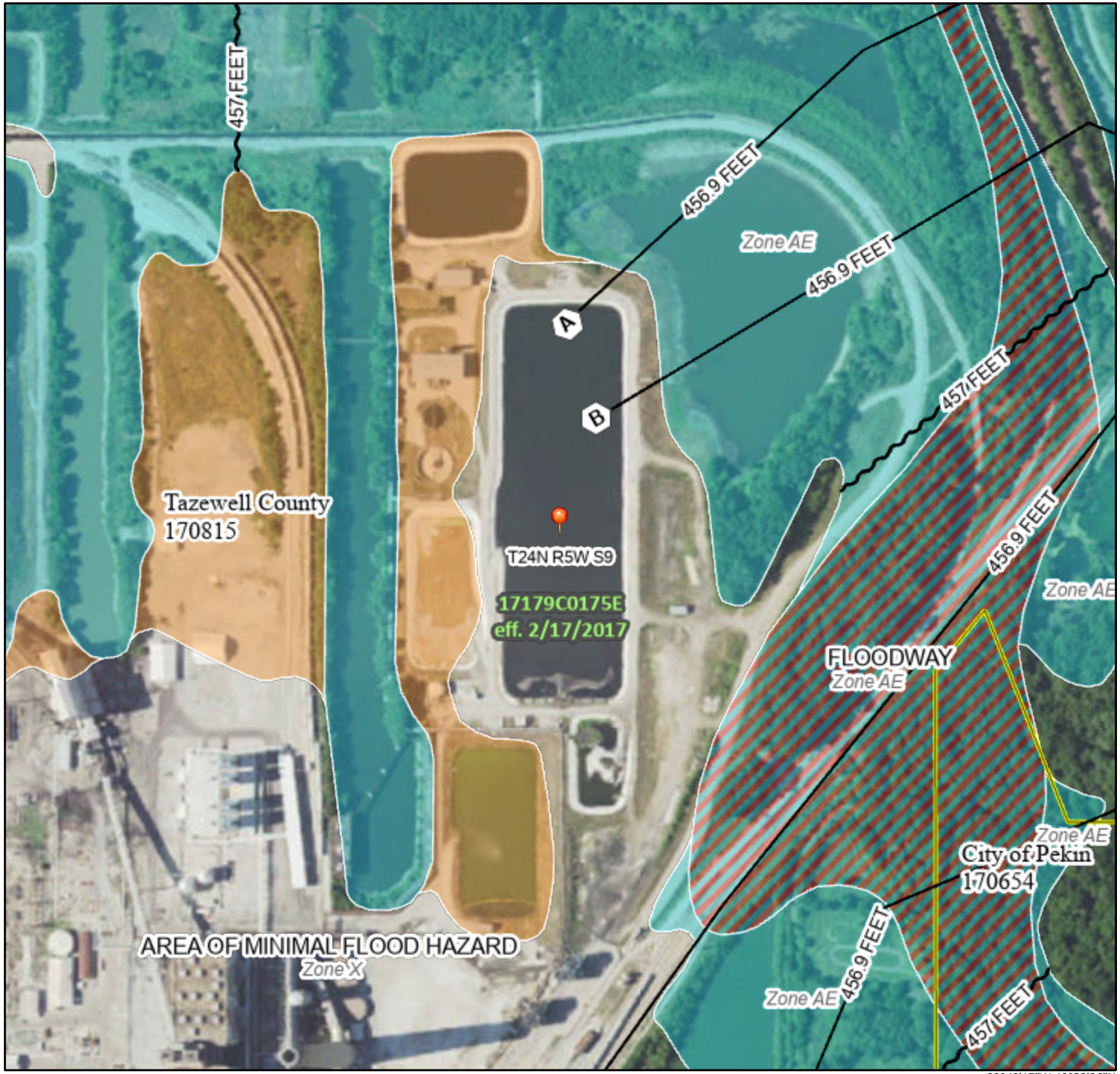
ATTACHMENT 7-2
FLOODPLAIN LOCATION DETERMINATION

R000324

National Flood Hazard Layer FIRMette

FEMA

89°40'55"W 40°32'53"N



89°40'17"W 40°32'26"N

Feet

0 250 500 1,000 1,500 2,000

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 9/23/2021 at 12:14 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

ATTACHMENT 7-3
LINER DESIGN CERTIFICATION

MWG

Midwest Generation, LLC

Powerton Generating Station

Alternative Composite Liner Design Certification for Retrofitted Bypass Basin

Revision 0

July 15, 2022

Issue Purpose: Use

Project No.: 12661-130

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Sargent & Lundy

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1.0 PURPOSE & SCOPE

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.410(c)
Federal CCR Rule Reference: 40 CFR 257.72(c)

1.1 PURPOSE

The Bypass Basin at Midwest Generation, LLC's (MWG) Powerton Generating Station ("Powerton" or the "Station") is an existing coal combustion residual (CCR) surface impoundment that is being retrofitted with a new composite liner system and a new leachate collection and removal system (LCRS). As a CCR surface impoundment, the Bypass Basin is regulated by the Illinois Pollution Control Board's "Standards for the Disposal of Coal Combustion Residuals in CCR Surface Impoundments," which is codified in Part 845 to Title 35 of the Illinois Administrative Code (35 Ill. Adm. Code 845, Ref. 1) and is referred to herein as the "Illinois CCR Rule." The Bypass Basin is also regulated by the U.S. Environmental Protection Agency's (EPA) "Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments," 40 CFR Part 257 Subpart D (Ref. 2), which is referred to herein as the "Federal CCR Rule."

Pursuant to 35 Ill. Adm. Code 845.410(c) and 40 CFR 257.72(c), this document demonstrates and provides certification that the design of the new composite liner system for the retrofitted Bypass Basin complies with the requirements of 35 Ill. Adm. Code 845.410 and 40 CFR 257.72 for an alternative composite liner.

1.2 SCOPE & APPLICABLE CCR REGULATIONS

Per the 2016 Water Infrastructure Improvements for the Nation (WIIN) Act, the retrofitted Bypass Basin will continue to be subject to both the Illinois and Federal CCR Rules until the U.S. EPA approves the Illinois EPA's CCR permit program. The Illinois EPA has yet to publish a timeline for submitting its proposed CCR permit program to the U.S. EPA for approval, and so this demonstration and certification has been prepared pursuant to both sets of regulations.

1.2.1 FEDERAL CCR RULE

The following excerpts from the Federal CCR Rule are applicable to the design of an alternative composite liner system for a retrofitted CCR surface impoundment:

- § 257.72(a): New CCR surface impoundments…must be designed, constructed, operated, and maintained with either a composite liner or an alternative composite liner that meets the requirements of § 257.70(b) or (c).
- § 257.70(c): If the owner or operator elects to install an alternative composite liner, all of the following requirements must be met:

- An alternative composite liner must consist of two components: the upper component consisting of, at a minimum, a 30-mil GM, and a lower component, that is not a geomembrane, with a liquid flow rate no greater than the liquid flow rate of two feet of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec. GM components consisting of high density polyethylene (HDPE) must be at least 60-mil thick. If the lower component of the alternative liner is compacted soil, the GM must be installed in direct and uniform contact with the compacted soil.
- The hydraulic conductivity for the two feet of compacted soil used in comparison [to the alternative composite liner's lower component] shall be no greater than 1×10^{-7} cm/sec. The hydraulic conductivity of any alternative to the two feet of compacted soil must be determined using recognized and generally accepted methods. The liquid flow rate comparison must be made using Equation 1 of [40 CFR 257.70(c)], which is derived from Darcy's Law for gravity flow through porous media.

1.2.2 ILLINOIS CCR RULE

The following excerpts from the Illinois CCR Rule are applicable to the design of an alternative composite liner system for a retrofitted CCR surface impoundment:

- § 845.410(a): New CCR surface impoundments…must be designed, constructed, operated, and maintained with either a composite liner or an alternative composite liner that meets the requirements of Section 845.400(b) or (c).
- § 845.400(c)(1): An alternative composite liner must consist of two components: the upper component consisting of, at a minimum, a 30-mil geomembrane liner, and a lower component, that is not a geomembrane, with a liquid flow rate no greater than the liquid flow rate of two feet of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec. The geomembrane liner components consisting of high-density polyethylene (HDPE) must be at least 60 mil. If the lower component of the alternative liner is compacted soil, the geomembrane liner must be installed in direct and uniform contact with the compacted soil.
- § 845.400(c)(2): The liquid flow rate through the lower component of the alternative composite liner must be no greater than the liquid flow rate through two feet of compacted soil with a hydraulic conductivity of 1×10^{-7} cm/sec. The hydraulic conductivity for the two feet of compacted soil used in the comparison must be no greater than 1×10^{-7} cm/sec. The hydraulic conductivity of any alternative to the two feet of compacted soil must be determined using recognized and generally accepted methods.
- § 845.400(c)(3): The liquid flow rate comparison must be made using the following equation, which is derived from Darcy's Law for gravity flow through porous media.

2.0 DEMONSTRATION

The alternative composite liner design for the retrofitted Bypass Basin at the Powerton Generating Station is compliant with the referenced regulations as demonstrated in the following sections.

2.1 UPPER COMPONENT

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.400(c)(1)
Federal CCR Rule Reference: 40 CFR 257.70(c)(1)

The upper component of the alternative composite liner design for the retrofitted Bypass Basin consists of a 60-mil HDPE geomembrane. This complies with 35 Ill. Adm. Code 845.400(c)(1) and 40 CFR 257.70(c)(1).

2.2 LOWER COMPONENT

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.400(c)(2) & 845.400(c)(3)
Federal CCR Rule Reference: 40 CFR 257.70(c)(2)

The lower component of the alternative composite liner design for the retrofitted Bypass Basin consists of a geosynthetic clay liner (GCL). To demonstrate the specified GCL complies with 35 Ill. Adm. Code 845.400(c)(2) and 845.400(c)(3) and 40 CFR 257.70(c)(2), the maximum liquid flow rate allowed by the project construction specifications is compared to the liquid flow rate through two feet of soil with a hydraulic conductivity of 1×10^{-7} cm/sec. Table 1 presents this flow rate comparison. As shown in the table, the maximum allowable hydraulic conductivity specified for the GCL is 1×10^{-9} cm/sec. The GCL's hydraulic conductivity will be determined by ASTM D5887, which is a recognized and generally accepted method for determining the hydraulic conductivity of a GCL.

Per Table 1, the design liquid flow rate through the GCL specified for the lower component of the alternative composite liner for the retrofitted Bypass Basin is less than the liquid flow rate through two feet of compacted soil with a hydraulic conductivity of 1×10^{-7} cm/sec. This complies with 35 Ill. Adm. Code 845.400(c)(2) and 845.400(c)(3) and 40 CFR 257.70(c)(2).

Table 1 – Liquid Flow Rate Comparison Between Compacted Soil Liner & GCL for Retrofitted Bypass Basin

Parameter	Symbol	Compacted Soil Liner	GCL
Crest Elevation	EL_{crest}	469.50 feet	
Minimum Retrofitted Bypass Basin Floor Elevation	EL_{floor}	459.76 feet	
Hydraulic Head on Liner (Omitting Geomembrane Thickness)	$h = EL_{crest} - EL_{floor}$	9.74 feet	
Thickness of Liner Lower Component	t	2 feet	7 mm = 0.023 feet
Hydraulic Gradient Through Liner	$i = h / t$	4.87	423
Maximum Hydraulic Conductivity of Liner	k	1.0×10^{-7} cm/sec	1.0×10^{-9} cm/sec
Liquid Flow Rate Through Liner (per Unit Area)	$q = k \times (i + 1)$	5.87×10^{-7} $cm^3/sec/cm^2$	4.24×10^{-7} $cm^3/sec/cm^2$

3.0 CERTIFICATION

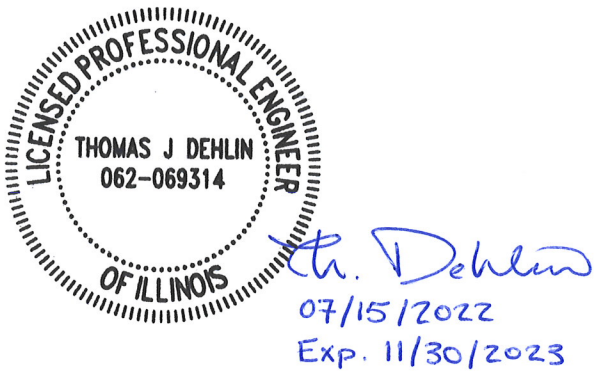
Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.410(c)
Federal CCR Rule Reference: 40 CFR 257.72(c)

I hereby certify that:

- Per the preceding demonstration and pursuant to 35 Ill. Adm. Code 845.400(c)(2) and 845.400(c)(3) and 40 CFR 257.70(c)(2), the design liquid flow rate through the lower component of the alternative composite liner for the retrofitted Bypass Basin is no greater than the liquid flow rate through two feet of compacted soil with a hydraulic conductivity of 1×10^{-7} cm/sec.
- The design of the alternative composite liner for the retrofitted Bypass Basin complies with the requirements of 35 Ill. Adm. Code 845.410 and 40 CFR 257.72.
- This pre-construction composite liner design certification was prepared by me or under my direct supervision, and
- I am a registered professional engineer under the laws of the State of Illinois.

Certified By: Thomas J. Dehlin Date: July 15, 2022

Seal:



4.0 REFERENCES

1. Illinois Pollution Control Board. "Standards for Disposal of Coal Combustion Residuals in CCR Surface Impoundments." 35 Ill. Adm. Code 845. Accessed April 15, 2022.
2. U.S. Environmental Protection Agency. "Standards for Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments." 40 CFR Part 257 Subpart D. https://www.ecfr.gov/current/title-40/chapter-I/subchapter-I/part-257/subpart-D. Accessed April 15, 2022.

ATTACHMENT 7-4
LEACHATE COLLECTION SYSTEM DESIGN CERTIFICATION

MWG
Midwest Generation, LLC

Powerton Generating Station

Leachate Collection System Design Certification for Retrofitted Bypass Basin

Revision 0

July 15, 2022

Issue Purpose: Permit

Project No.: 12661-130

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Sargent & Lundy

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1.0 PURPOSE & SCOPE

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.420(b)

1.1 PURPOSE

The Bypass Basin at Midwest Generation, LLC's (MWG) Powerton Generating Station ("Powerton" or the "Station") is an existing coal combustion residual (CCR) surface impoundment that is being retrofitted with a new composite liner system and a new leachate collection and removal system (LCRS). As a CCR surface impoundment, the Bypass Basin is regulated by the Illinois Pollution Control Board's "Standards for the Disposal of Coal Combustion Residuals in CCR Surface Impoundments," which is codified in Part 845 to Title 35 of the Illinois Administrative Code (35 Ill. Adm. Code 845, Ref. 1) and is referred to herein as the "Illinois CCR Rule."

Pursuant to 35 Ill. Adm. Code 845.420(b), this document demonstrates and provides certification that the design of the new leachate collection and removal system for the retrofitted Bypass Basin complies with the requirements of 35 Ill. Adm. Code 845.420.

1.2 APPLICABLE ILLINOIS CCR RULE REGULATIONS

The following excerpts from the Illinois CCR Rule are applicable to the design of an LCRS for a retrofitted CCR surface impoundment:

- § 845.420: A new CCR surface impoundment must be designed, constructed, operated and maintained with a leachate collection and removal system. The leachate collection and removal system must be designed, constructed, operated, and maintained to collect and remove leachate from the leachate collection system of the CCR surface impoundment during its active life and post-closure care period.
- § 845.420(a): The leachate collection and removal system must:
    1) Be placed above the liner required by Section 845.410;
    2) Have placed above it a filter layer that has a hydraulic conductivity of at least 1×10^{-5} cm/sec;
    3) Have a bottom slope of three percent or more towards the collections pipes;
    4) Be constructed of:
        A) Granular drainage materials with a hydraulic conductivity of 1×10^{-1} cm/sec or more and a thickness of 24 inches or more above the crown of the collection pipe; or
        B) Synthetic drainage materials with a transmissivity of 6×10^{-4} m^2/sec or more;
    5) Be constructed of materials that are chemically resistant to CCR and any non-CCR waste managed in the CCR surface impoundment and the leachate expected to be

generated, and of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying waste and any waste cover materials and equipment used at the CCR surface impoundment;

6) Be designed, constructed, and operated with collection pipes at the base of the granular material to prevent clogging with fines during the active life and post-closure care period:
7) Have collection pipes
    A) Designed such that leachate is collected at a sump and is pumped or flows out of the CCR surface impoundment;
    B) With slopes that allow flow from all points within the CCR surface impoundment to the sump or drain outlet; and
    C) Large enough to conduct periodic cleaning;
8) Have a protective layer or other means of deflecting the force of CCR pumped into the CCR surface impoundment;
9) Be designed and operated to minimize clogging during the active life and post-closure care period; and
10) At a minimum, the leachate collection and removal system must be operated to remove free liquids from the CCR surface impoundment at the time of closure and during post closure care.

2.0 DEMONSTRATION

The LCRS design for the retrofitted Bypass Basin at the Powerton Generating Station is compliant with the referenced regulations as demonstrated in the following sections.

2.1 LOCATION ABOVE NEW COMPOSITE LINER SYSTEM

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.420(a)(1)

The LCRS will be placed above the retrofitted Bypass Basin's new composite liner system – a 60-mil high-density polyethylene (HDPE) geomembrane over a geosynthetic clay liner (GCL) – as required by 35 Ill. Adm. Code 845.420(a)(1).

2.2 FILTER LAYER

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.420(a)(2)

A sand filter layer having a hydraulic conductivity of at least 1×10^{-5} cm/sec will be placed above the LCRS as required by 35 Ill. Adm. Code 845.420(a)(2).

2.3 BOTTOM SLOPE

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.420(a)(3)

Natural soil fill material will be placed along the floor of the Bypass Basin to establish three percent slopes down towards a leachate collection pipe located in the middle of the basin. The LCRS will also be installed along the inside faces of the Bypass Basin's existing dikes, which have interior sideslopes of approximately 3-horiztonal:1-vertical, or 33 percent. This complies with 35 Ill. Adm. Code 845.420(a)(3).

2.4 DRAINAGE MATERIAL

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.420(a)(4)

The LCRS will be constructed of a drainage geocomposite with a transmissivity of at least 6×10^{-4} m^2/sec. The drainage geocomposite will consist of an HDPE geonet core with a non-woven geotextile layer heat-laminated to each side of the geonet core. This complies with 35 Ill. Adm. Code 845.420(a)(4).

2.5 CHEMICAL RESISTANCE, STRENGTH, & THICKNESS

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.420(a)(5)

The HDPE components (collection pipe, drainage geocomposite) and natural soil components (protective warning layer, sand filter layer, and coarse aggregate bedding layer) of the LCRS are chemically resistant to the CCR and non-CCR waste that will be managed in the retrofitted Bypass Basin. The LCRS components have also been designed to have sufficient strength and thickness to prevent collapse under the pressures exerted by the overlying waste, a potential final cover system for the waste, and Station equipment used to perform routine maintenance at the CCR surface impoundment. This complies with 35 Ill. Adm. Code 845.420(a)(5).

2.6 CLOGGING PREVENTION FOR COLLECTION PIPE

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.420(a)(6)

The perforated leachate collection pipe will be surrounded by coarse aggregate bedding material. The perforations in the leachate collection pipe and the gradation of the coarse aggregate bedding material are designed to prevent fines from clogging the pipe during the active life and post-closure care period of the retrofitted Bypass Basin.

2.7 COLLECTION PIPE DESIGN

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.420(a)(7)

A 6-in.-diameter, perforated leachate collection pipe will be installed in a north-south spanning trench in the middle of the retrofitted Bypass Basin to collect leachate from the drainage geocomposite component of the LCRS. The leachate collection pipe will be sloped towards a sump with a submersible pump and riser pipe to convey leachate out of the basin. The slopes of the retrofitted Bypass Basin's LCRS will ensure flow from all points within the retrofitted Bypass Basin is directed to the leachate collection pipe and ultimately conveyed to the sump. Finally, the 6-in. diameter of the leachate collection pipe is large enough to conduct periodic cleaning. This complies with 35 Ill. Adm. Code 845.420(a)(7).

2.8 PROTECTIVE LAYER

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.420(a)(8)

Along the retrofitted Bypass Basin's floor, a protective warning layer consisting of 6 inches of densely graded aggregate will be installed over the sand filter layer to deflect the force of CCR flowing into the CCR surface impoundment. This layer will also provide a working surface for operators removing CCR from the basin during routine cleanings and will also serve as a means of warning these operators that they have reached the basin floor and to stop excavating. Along the basin's sideslopes, the protective warning layer will consist of riprap on a gravel bedding layer to protect the sand filter layer from erosion. This complies with 35 Ill. Adm. Code 845.420(a)(8).

2.9 CLOGGING PREVENTION FOR DRAINAGE GEOCOMPOSITE

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.420(a)(9)

The upper non-woven geotextile component of the drainage geocomposite will prevent CCR and non-CCR sediments from intruding into, clogging, and impeding the flow of leachate through the HDPE geonet core during the active life and post-closure care period of the retrofitted Bypass Basin. Moreover, the sand filter layer installed above the LCRS will also preclude CCR and non-CCR sediments from clogging the LCRS. This complies with 35 Ill. Adm. Code 845.420(a)(9).

2.10 OPERATION

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.420(a)(10)

At a minimum, the LCRS will be operated to remove free liquids from the retrofitted Bypass Basin when the basin is closed and during the basin's post-closure care period.

3.0 CERTIFICATION

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.420(b)

I hereby certify that:

- The design of the leachate collection system for the retrofitted Bypass Basin complies with the requirements of 35 Ill. Adm. Code 845.420.
- This pre-construction leachate collection system design certification was prepared by me or under my direct supervision, and
- I am a registered professional engineer under the laws of the State of Illinois.

Certified By: Thomas J. Dehlin Date: July 15, 2022

Seal:



Th. Dehlin
07/15/2022
Exp. 11/30/2023

4.0 REFERENCES

1. Illinois Pollution Control Board. "Standards for Disposal of Coal Combustion Residuals in CCR Surface Impoundments." 35 Ill. Adm. Code 845. Accessed June 17, 2022.

ATTACHMENT 7-5
CCR FUGITIVE DUST CONTROL PLAN

CCR COMPLIANCE
FUGITIVE DUST CONTROL PLAN

Midwest Generation, LLC
Powerton Generating Station
13082 East Manito Road
Pekin, Illinois

PREPARED BY: KPRG and Associates, Inc.
14665 W. Lisbon Road, Suite 1A
Brookfield, WI 53005

October 19, 2021

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1.0 INTRODUCTION

On April 15, 2021, the Illinois Environmental Protection Agency adopted a new Part 845 of its waste disposal regulations creating statewide standards for the disposal of coal combustion residuals (CCR) in surface impoundments, created by the generation of electricity by coal-fired power plants. Part 845 specifically requires that "the owner or operator of a CCR surface impoundment, or any lateral expansion of a CCR surface impoundment, must adopt measures that will effectively minimize CCR from becoming airborne at the facility, including CCR fugitive dust originating from CCR surface impoundments, roads, and other CCR management and material handling activities". As a result, each regulated facility must develop a CCR fugitive dust control plan that complies with 35 Ill. Adm. Code 845.500(b).

This site specific Fugitive Dust Control Plan (Plan) has been developed to comply with the requirements specified in Section 845.500. In general, the Plan identifies the potential CCR fugitive dust sources and describes the control measures that will be implemented to minimize CCR fugitive dust emissions. The Plan also includes a procedure for the periodic assessment of the Plan's effectiveness, documentation of any Plan amendments deemed necessary to assure continued compliance, a record of any citizen complaints received pertaining to CCR fugitive dust emissions, and an outline of the required reporting and recordkeeping requirements in 35 Ill. Adm. Code 845.500.

2.0 SITE INFORMATION

2.1 Owner/Operator and Address:

Midwest Generation, LLC
Powerton Generating Station
13082 East Manito Road
Pekin, Illinois

2.2 Owner Representative/Responsible Person Contact Information:

Mr. Dale Green
Plant Manager
309-346-2165

2.3 Location and Description of Facility Operations

The Midwest Generation Powerton Generating Station is located at 13082 East Manito Road, Pekin, Tazewell County, Illinois. The facility is a coal-fired electric power generating station occupying approximately 1,710 acres. Units 5 and 6 began operating in 1972 and 1975, respectively. Electrical power is transmitted from the site to the area grid through overhead transmission power lines. In conjunction with the station is a man-made perched cooling pond which occupies approximately 1,440 acres and provides cooling water to the facility.

The general vicinity is a primarily mixed industrial and agricultural area with limited commercial and residential developments.

3.0 POTENTIAL FUGITIVE DUST SOURCES

Potential fugitive dust sources associated with the bottom ash and slag and fly ash systems have been identified at the facility; however, some of these are regulated by the facility's operating permit and are adequately addressed within the required fugitive dust operating program. The potential CCR fugitive dust sources generally include exterior ash distribution systems, temporary ash storage locations, ash bulk loading/unloading operations and ash truck transportation routes. Fugitive dust could potentially be generated from these sources as a result of equipment malfunctions, wind erosion, housekeeping issues and/or the nature of the operation. Specifically, these identified sources were further evaluated to determine the probability of CCR fugitive dust being generated and to determine the level of emission controls that are warranted to mitigate fugitive dust emissions. The findings of the evaluation are individually discussed in the following sections.

3.1 Bottom Ash and Slag Distribution System

Collected bottom ash and slag in the boilers is transported as a liquid mixture through an enclosed piping system to the dewatering bins. Some of this piping is located inside a building; however, a portion is situated above ground and in the outside environment. Although not an anticipated occurrence, a breach in the exterior piping could result in the accidental release of bottom ash and slag and potential fugitive dust emissions if the material were to accumulate and dry out.

3.2 Dewatering Bins

The dewatering bins are designed to remove water from the bottom ash and slag. Bottom ash and slag that is relatively wet is drop loaded through the bins into open top trucks for removal off-site for beneficial reuse purposes. The water removed from the dewatering bins is pumped to the Ash Surge Basin and the Ash Bypass Basin where settling occurs prior to discharge of the water from the facility. As of right now, the Metals Cleaning Basin has no water. The loading operation has the potential for fugitive dust emissions if bottom ash and slag is not properly loaded and is allowed to accumulate and dry out on the ground surface beneath the dewatering bins.

3.3 Ash Surge Basin, Bypass Basin, and Metal Cleaning Basin

Extracted water from the dewatering bins is pumped through enclosed pipes to the Ash Surge Basin or the Ash Bypass Basin. Occasionally, CCR material is placed in the Metal Cleaning Basin. After settling occurs, water from the Ash Surge Basin, Ash Bypass Basin, and the Metal Cleaning Basin is ultimately discharged

through a final settling basin and then through a regulated NPDES outfall. These basins are normally filled with water; however, dredging occasionally may be required to remove the settled material from each basin. When this requirement occurs, the basins are dewatered and the dredged material is allowed to dry within each basin. When the material is suitable for transport, it is loaded into open top trucks, covered if necessary, and sent off site to a mine reclamation site. Potential fugitive dust emissions could occur if dry bottom ash and slag residual is exposed or loaded during excessive windy and dry weather conditions.

3.4 Former Ash Basin

This basin was formerly used for the routine disposal of bottom ash and slag; however, this procedure ceased in the 1970s. The bottom ash and slag is completely submerged within the basin. Water level fluctuations in the basin are attributable to precipitation and other weather-related conditions. In rare emergency operational situations, overflow from the Ash Surge Basin to the Former Ash Basin could occur by gravity through the spillway. This discharge is not expected to contain significant quantities of CCR and is allowed through the existing NPDES permit. It is noted that a new railroad spur was constructed through the middle of the Former Ash Basin.

3.5 Concrete Storage Pad

This partially below-grade concrete structure is used for the temporary storage of residual bottom ash and slag generated at the dewatering bins and as a result of other routine ash-related maintenance activities. The staged bottom ash and slag is allowed to partially dry within the structure until it is suitable for off-site removal. The material is placed in temporary storage, loaded into open top trucks, covered and sent off site to a mine reclamation site. Dry material that is exposed during excessively windy and dry weather conditions has the potential for becoming fugitive dust emissions.

3.6 Fly Ash Equipment

Collected fly ash in the precipitator hoppers is initially transported in a closed vacuum piping system to a cyclone and bag filter where it is mechanically separated from the air stream within an enclosed building. Fly ash is then sent within an enclosed building to the fly ash silos. At the silos, the fly ash is drop loaded into trucks through a telescopic pipe contained within a drop chute. The loading of fly ash occurs within a partially enclosed structure. After the trucks containing fly ash have been loaded and the truck's rear gate is water sprayed to remove dust, they proceed to a nearby platform to allow the truck driver to secure

the truck and to broom sweep or water spray any residual fly ash remaining on the truck. This entire process is covered by the fugitive dust operating program for the facility.

3.7 Ash Transport Roadways

Both gravel covered and asphalt paved roads within the facility are used by trucks hauling bottom ash, slag, and fly ash to the mine reclamation site as well as by other vehicles entering and exiting the facility. Fugitive CCR dust emissions could occur during transit if CCR material is not properly cleaned from the trucks or if there is a release of CCR material from the vehicle due to a malfunction or accident.

These potential fugitive dust sources are identified on the Site Diagram included in Appendix A.

4.0 DESCRIPTION OF CONTROL MEASURES

4.1 Purpose

The purpose of developing appropriate control measures is to minimize and reduce the emissions of CCR fugitive dust from the identified potential emission sources. The control measures and work practices implemented at the facility are described in the following sections.

4.2 Bottom Ash and Slag Distribution System

Bottom ash and slag is in a liquid mixture within a closed system until the point of discharge at the dewatering bins. A significant portion of the piping system is contained within a building, which eliminates dust emissions to the outside environment. An assessment of the exterior distribution system will be performed on a quarterly basis to verify the integrity of the system or when a breach in the system is detected. If a leak is noted, resulting in the release of bottom ash and slag, the affected area will be restored to original conditions and repair of the pipe will be performed as soon as feasible. The CCR will be sent off site to a mine reclamation site.

4.3 Dewatering Bins

The bottom ash and slag is drop loaded from the dewatering bins in a wet state and into trucks positioned beneath the bins. The bottom ash and slag has sufficient moisture to preclude this material from becoming airborne during loading. An assessment of the dewatering bin loading operation will be performed on a quarterly basis to verify if there has been an equipment malfunction resulting in an accumulation of released material. Should there be a malfunction in the dewatering equipment that results in a spill of the material, repair of any malfunctioning equipment and clean up and transfer of the material to the concrete storage pit will be performed as soon as feasible.

4.4 Ash Surge Basin, Ash Bypass Basin, and Metal Cleaning Basin

During normal operations, the Ash Surge Basin and Ash Bypass Basin are filled with water thereby suppressing any potential fugitive dust emissions. The Metal Cleaning Basin has recently been emptied and cleaned thereby suppressing any potential fugitive dust emissions. Infrequently, the basins will need to be dewatered and the sediment removed for proper off-site disposition. While the bottom ash and slag residue is drying, there is the potential for this material to

become airborne especially during excessively dry and windy conditions. Loading of this material under these adverse conditions also has the potential for generating fugitive dust. Dewatered basins will be assessed on a quarterly basis or more frequently during excessively dry and windy conditions. To minimize fugitive dust emissions from exposed dry bottom ash and slag, the height of the staged material will be minimized and the material piles will be either sprayed with water or covered. Loading activities also will be limited during such occasions.

4.5 Former Ash Basin

The Former Ash Basin was used for the disposal of bottom ash and slag in the past; however, this procedure is no longer occurring. The previously deposited material is completely submerged within the basin with the typical water level at approximately 10-15 feet below grade, thereby, making the bottom ash and slag not readily susceptible to wind erosion and generation of potential fugitive dust emissions.

4.6 Concrete Storage Pad

The concrete pad only periodically contains bottom ash and slag and other CCR-related materials generated from routine plant maintenance activities. Typically these materials are in a wet state but are allowed to partially dry to facilitate removal. When sufficiently dry, the material is promptly removed off site. The concrete pad will be assessed on a quarterly basis or more frequently during excessively dry and windy conditions. To minimize fugitive dust emissions from exposed dry bottom ash and slag and other CCR-related materials, the height of the staged material will be minimized and the material piles will be either sprayed with water or covered.

4.7 Fly Ash Equipment

Fly ash from the mechanical separators is sent to the silos within an enclosed structure. The fly ash is drop loaded into an opening within the tarp covering the truck trailer through a telescopic pipe contained within a drop chute. This loading mechanism minimizes the potential for fly ash to become airborne during the loading process. The loading of trucks also occurs within a partial enclosure. At the completion of loading but prior to leaving the enclosure, the rear of each truck trailer is sprayed with water. The truck is then broom swept or water sprayed at the truck stand to remove any accumulated fly ash. Accumulated CCR is promptly transferred to the concrete storage pad.

This process is covered by the facility's fugitive dust operating program. Under the program, the facility must maintain control measures, including enclosures, covers and dust collection devices. Additionally, the facility is required to conduct weekly inspections of the process to confirm compliance. A record of the inspections is maintained at the facility.

4.8 Ash Transport Roadways

Truck drivers are instructed on the proper procedure for cleaning trucks and a vehicle speed limit is enforced at the facility. Ash material that may not have been adequately removed from the trucks has the potential to become airborne and ultimately be deposited on haul roads. To minimize fugitive dust emissions, these roads will be assessed on a quarterly basis and any observed accumulated ash material will be promptly cleaned up and collected for off-site removal.

5.0 PLAN ASSESSMENTS/AMENDMENTS

To assure that the work practices being implemented adequately control the dust from the identified potential fugitive dust emission sources at the facility, routine assessments and record keeping are performed. These procedures include the following:

5.1 Fugitive CCR Dust Assessments

Pursuant to 845.500(b)(3), assessments of the potential fugitive dust emission sources identified within this Plan will be conducted to assess the effectiveness of this Plan. The assessment will include observation of ash removal from basins, temporary storage and transport activities at the facility to confirm the adequacy of the control measures. The assessments will be conducted on a quarterly basis by an individual designated by the contact identified in Section 2.2 of this Plan. Observations made during each assessment are recorded on a form similar to the one included in Appendix B, however, the station may create their own form.

If the results of the assessment determine that ash-related equipment has malfunctioned or the integrity of the equipment has been compromised, the necessary repairs or replacement will be performed as soon as feasible. If the assessment finds that this Plan does not effectively minimize the CCR from becoming airborne, this Plan will be amended to include additional control measures.

5.2 Plan Amendments

This Fugitive Dust Plan will be reviewed whenever there is a change in conditions that would substantially affect the written Plan currently in place. A record of the reviews and any modifications or amendments made to the Plan currently in place will be kept on a form similar to the one included in Appendix C, however, the station may create their own form. The amended Plan will be reviewed by a Registered Professional Engineer and, if deemed acceptable, will be recertified.

5.3 Citizen Complaints

Any written or verbal complaints received from a citizen involving alleged CCR fugitive dust emission events at the facility will be recorded by an individual designated by the contact identified in Section 2.2 of this Plan. The complaints will be recorded on a form similar to the one included in Appendix D, however, the station may create their own form. Upon receipt of the complaint, an investigation of the alleged source of the fugitive dust emissions will be

performed and the results of that investigation recorded on the form. If the fugitive dust emission event is confirmed, any necessary repairs or changes in operation required to mitigate the fugitive dust emissions will be implemented as soon as practicable. Quarterly reports will be submitted to the IEPA no later than 14 days from the end of the quarter of all complaints received during that quarter, including the information required by 845.500(b)(2)(A).

6.0 CCR FUGITIVE DUST PLAN REPORTING/RECORDKEEPING REQUIREMENTS

This section outlines the Plan reports that must be prepared, submitted, and records that must be maintained to meet the requirements specified in 35 Ill. Adm. Code Section 845.500. These requirements include the following:

- Place the Plan in the facility's operating record and publicly accessible internet site. If the Plan is amended, replace the initial Plan with the amended Plan. Only the most recent amended Plan will be maintained in the facility's operating record and internet site.

- Prepare an annual CCR Fugitive Dust Control Report and submit to the IEPA as part of the annual consolidated report required by 845.550. The annual report will include:
  - A description of the actions taken to control CCR fugitive dust,
  - A record of all citizen complaints, and
  - A summary of any corrective measures taken.
  - Placement of this report in the operating record and publicly accessible internet site.

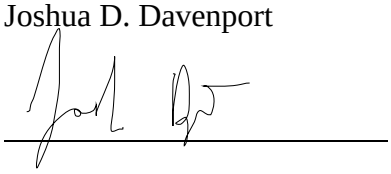
- Provide notification to the IEPA and, if applicable, the Tribal authority when the Plan and reports are placed in the facility's operating record and publicly accessible internet site.

- Submit quarterly reports to IEPA within 14 days from the end of the quarter of all complaints received in that quarter. The quarterly reports will include:
  - The date of the complaint,
  - The date of the incident,
  - The name and contact information of the complainant, and
  - All actions taken to assess and resolve the complaint.

7.0 PROFESSIONAL ENGINEER CERTIFICATION

The undersigned Registered Professional Engineer is familiar with the requirements of 845.500 and has visited and examined the facility or has supervised examination of the facility by appropriately qualified personnel. The undersigned Registered Professional Engineer attests that this CCR Fugitive Dust Control Plan has been prepared in accordance with good engineering practice, including consideration of applicable industry standards and meets the requirements of 845.500, and that this Plan is adequate for the facility. This certification was prepared as required by 845.500(b)(7).

Engineer: Joshua D. Davenport

Signature: 

Date: 10/19/21

Company: KPRG and Associates, Inc.

Registration State: Wisconsin

Registration Number: 062.061945

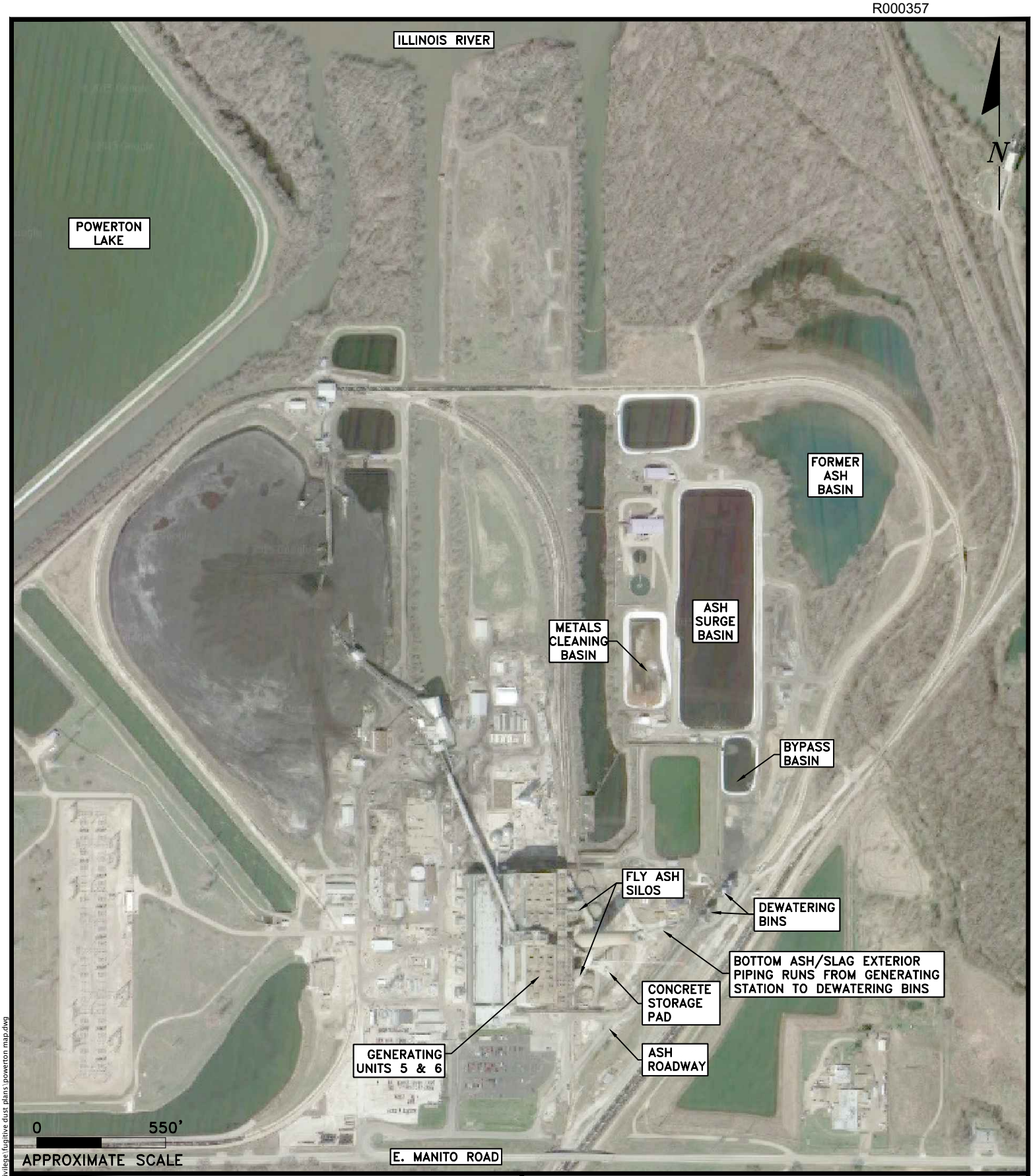
License Expiration Date: November 30, 2021

Professional Engineer Stamp:



APPENDIX A

SITE DIAGRAM
POTENTIAL FUGITIVE DUST SOURCES



ENVIRONMENTAL CONSULTATION & REMEDIATION

K P R G

KPRG and Associates, inc.

414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

14665 West Lisbon Road, Suite 2B Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478

SITE DIAGRAM/FUGITIVE DUST SOURCES

POWERTON GENERATING STATION
PEKIN, ILLINOIS

Scale: 1" = 550' | Date: October 15, 2021

KPRG Project No. 15315 | APPENDIX A

W:\projects\midwest generation\attorney-client privilege\fugitive dust plans\powerton map.dwg

APPENDIX B

EXAMPLE ASSESSMENT RECORD

APPENDIX B

POWERTON STATION

EXAMPLE ASSESSMENT RECORD

Date	Inspector	Unit Inspected (See Key Below)	Maintenance/Cleanup Required (yes/no)	Response Action Performed (completion date)	Inspector Signature

Unit Key:

1 - Exterior Bottom Ash/Slag Piping
2 - Dewatering Bins
3 - Concrete Storage Pad
4 - Ash Roadways
5 - Ash Surge Basin
6 - Bypass Basin

APPENDIX C

EXAMPLE PLAN REVIEW AND AMENDMENT RECORD

APPENDIX C

POWERTON STATION

EXAMPLE CCR PLAN REVIEW/AMENDMENT RECORD

Date of Review	Reason for Review	Section Amended	P.E. Certification (Name/Date)

APPENDIX D

EXAMPLE CITIZEN COMPLAINT LOG

APPENDIX D

POWERTON STATION

EXAMPLE CITIZEN COMPLAINT LOG

Date	Time	Citizen Information (Name, Address, Phone No., Email)	Summary of Complaint	Action Taken	Recorded By

ATTACHMENT 8-1
WRITTEN RETROFIT PLAN

MWG

Midwest Generation, LLC

Powerton Generating Station

Bypass Basin Retrofit Plan

Revision 0

April 15, 2022

Issue Purpose: Use

Project No.: 12661-130

55 East Monroe Street
Chicago, IL 60603-5780 USA
312-269-2000
www.sargentlundy.com

Sargent & Lundy

LEGAL NOTICE

This report was prepared by Sargent & Lundy, L.L.C. (S&L) expressly for the sole use of Midwest Generation, LLC (Client) in accordance with the contract agreement between S&L and Client. This report was prepared using the degree of skill and care ordinarily exercised by engineers practicing under similar circumstances. Client acknowledges: (1) S&L prepared this report subject to the particular scope limitations, budgetary and time constraints, and business objectives of Client; (2) information and data provided by others, including Client, may not have been independently verified by S&L; and (3) the information and data contained in this report are time-sensitive and changes in the data, applicable codes, standards, and acceptable engineering practices may invalidate the findings of this report. Any use or reliance upon this report by third parties shall be at their sole risk.

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1.0 PURPOSE & SCOPE

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.770(c)
Federal CCR Rule Reference: 40 CFR 257.102(k)(2)

1.1 PURPOSE

Midwest Generation, LLC (MWG) plans to retrofit the Bypass Basin at the Powerton Generating Station ("Powerton" or "Station") in Pekin, Illinois with a new composite liner system and a new leachate collection and removal system. The Bypass Basin is an existing coal combustion residual (CCR) surface impoundment that was historically used by the Station as a settling pond for bottom ash transport water discharged from the Station's dewatering bins (which initially treat the Station's CCR sluice water) and for other process waste streams related to electric power-generating operations when the Station's Ash Surge Basin was being cleaned. However, the Bypass Basin has not been in service since early October 2020 when the Station started cleaning out the basin in accordance with historical cleaning practices. The Bypass Basin is lined with a 60-mil high-density polyethylene (HDPE) geomembrane liner, has a surface area of approximately 0.83 acre, and has a storage capacity of approximately 9,000 cubic yards.

As a CCR surface impoundment, the Bypass Basin is regulated by both the Illinois Pollution Control Board's "Standards for the Disposal of Coal Combustion Residuals in CCR Surface Impoundments," which are codified in Title 35, Part 845 to the Illinois Administrative Code (35 Ill. Adm. Code 845), and the U.S. Environmental Protection Agency's (EPA) "Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments," which are codified in 40 CFR Part 257 Subpart D. These state and federal CCR regulations are referred to herein as the Illinois CCR Rule and the Federal CCR Rule, respectively. Pursuant to 35 Ill. Adm. Code 845.770(c) and 40 CFR 257.102(k)(2), this document provides MWG's written retrofit plan for the Bypass Basin.

1.2 SCOPE

Per the 2016 Water Infrastructure Improvements for the Nation (WIIN) Act, the Bypass Basin will continue to be subject to both the Illinois and Federal CCR Rules until the U.S. EPA approves the Illinois EPA's CCR permit program. The Illinois EPA has yet to publish a timeline for submitting its proposed CCR permit program to the U.S. EPA for approval, and so this written retrofit plan has been prepared pursuant to both sets of regulations.

2.0 RETROFIT PLAN NARRATIVE DESCRIPTION

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.770(c)(1)(A)
Federal CCR Rule Reference: 40 CFR 257.102(k)(2)(i)(A)

MWG plans to retrofit the Bypass Basin by executing the following sequential steps:

1. Obtaining a construction permit from the Illinois EPA for retrofitting the Bypass Basin;
2. Removing the gravel warning and sand cushion layers over the existing geomembrane liner from the basin and transporting the soil materials to a permitted disposal facility;
3. Decontaminating the basin's existing geomembrane liner for re-use as a supplemental liner in the retrofitted basin, including submittal of visual inspection documentation and analytical testing results to demonstrate the existing liner is no longer contaminated with CCR constituents in accordance with 35 Ill. Adm. Code 845.770(a)(4);
4. Decontaminating the basin's appurtenant structures (*e.g.*, inlet and outlet structures, piping);
5. Placing structural fill within the basin floor to establish the slopes for the new leachate collection and removal system and to support the new composite liner (see Section 2.1);
6. Installing an alternative composite liner system in accordance with 35 Ill. Adm. Code 845.410 and 40 CFR 257.72 (see Section 2.2);
7. Installing a leachate collection and removal system in accordance with 35 Ill. Adm. Code 845.420 (see Section 2.3);
8. Submitting to the Illinois EPA:
    a. A retrofit completion report (see Section 8.0), and
    b. A certification from a qualified professional engineer licensed in the State of Illinois that the Bypass Basin has been retrofitted in accordance with the activities outlined in this retrofit plan (or subsequent amendment of this retrofit plan), the requirements stipulated in 35 Ill. Adm. Code Part 845, and the requirements of 40 CFR 257.102(k).

2.1 STRUCTURAL FILL

Pursuant to 35 Ill. Adm. Code 845.420(a)(3), the retrofitted Bypass Basin will have a new leachate collection and removal system that slopes towards a collection pipe at a minimum slope of three percent. Because the existing basin floor is approximately flat, MWG plans to place, compact, and grade structural fill along the basin floor to establish the lines and grades for the new leachate collection and removal system. The structural fill will be placed over the Bypass Basin's existing HDPE geomembrane liner, which MWG plans to leave in-place as a supplemental liner under the basin's new composite liner. All earthwork activities associated with placing, compacting, and grading structural fill along the basin floor will be done in a manner to prevent tearing, ripping, or otherwise damaging the Bypass Basin's existing HDPE geomembrane liner.

2.2 COMPOSITE LINER

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.410(a) & 845.400(c)
Federal CCR Rule Reference: 40 CFR 257.72(a) & 257.70(c)

MWG plans to retrofit the Bypass Basin with an alternative composite liner system that meets the requirements of 35 Ill. Adm. Code 845.400(c) and 40 CFR 257.70(c). The composite liner will consist of a 60-mil HDPE geomembrane over a geosynthetic clay liner (GCL). Pursuant to 35 Ill. Adm. Code 845.400(c)(2) and 40 CFR 257.70(c)(1), the GCL component will have a hydraulic conductivity of no more than 1×10^{-9} cm/sec to ensure that the liquid flow rate through the GCL is less than the liquid flow rate through two feet of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec.

2.3 LEACHATE COLLECTION & REMOVAL SYSTEM

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.420(a)

In addition to installing a new composite liner in the basin, MWG plans to install a new leachate collection and removal system (LCRS) in the Bypass Basin pursuant to 35 Ill. Adm. Code 845.420. This LCRS will be placed over the new composite liner and will be constructed of drainage geocomposite with a transmissivity of at least 6×10^{-4} m^2/sec in accordance with 35 Ill. Adm. Code 845.420(a)(4). The drainage geocomposite will consist of an HDPE geonet core with a non-woven geotextile layer heat-laminated to each side of the geonet core, and will be sloped towards a perforated collection pipe installed in a trench along the middle of the basin. As discussed in Section 2.1, the structural fill placed along the basin floor will ensure the drainage geocomposite slopes towards the collection pipe at a slope of at least three percent pursuant to 35 Ill. Adm. Code 845.420(a)(3). This collection pipe will then convey leachate to a sump pump at the southern end of the retrofitted Bypass Basin to ultimately be pumped out of the basin. This drainage geocomposite and collection pipe system will ensure leachate flows from all points within the basin to the sump, will be constructed in such a way as to prevent clogging of the LCRS during the active life and post-closure care period of the basin, and will be large enough to conduct periodic cleaning. The upper non-woven geotextile component of the drainage geocomposite will also prevent CCR and non-CCR sediments from intruding into, clogging, and impeding the flow of leachate through the HDPE geonet core.

In addition to the upper non-woven geotextile component of the drainage geocomposite, a sand filter layer will be installed above the retrofitted Bypass Basin's LCRS to prevent CCR and non-CCR sediments from clogging the LCRS. This sand filter layer will have a hydraulic conductivity of at least 1×10^{-5} cm/sec pursuant to 35 Ill. Adm. Code 845.420(a)(2). Meanwhile, the upper non-woven geotextile component of the drainage geocomposite will preclude the intrusion of sand particles from the filter layer into the HDPE geonet core's apertures, which would otherwise impede the flow of leachate through the geonet.

Finally, in accordance with 35 Ill. Adm. Code 845.420(a)(8), a protective warning layer will be installed over the sand filter layer to provide a means of deflecting the force of CCR pumped into the retrofitted Bypass Basin. Along the floor of the retrofitted Bypass Basin, this uppermost layer will be comprised of coarse aggregate materials to provide a working surface for operators removing CCR from the basin; it will also serve as a means of warning these operators that they have reached the basin floor and to stop excavating. Along the basin's side slopes, the protective warning layer will consist of riprap on a gravel bedding layer to protect the sand filter layer from erosion.

3.0 CCR REMOVAL & DECONTAMINATION PROCEDURES

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.770(c)(1)(B)
Federal CCR Rule Reference: 40 CFR 257.102(k)(2)(i)(B)

In early October 2020, Powerton took the Bypass Basin out of service for routine cleaning and began drawing down the surface water in the basin to dewater the basin and the CCR material stored therein. The Station then began removing the ash stored above the granular protective layers covering the basin's existing geomembrane liner in accordance with the Station's historical cleaning and maintenance practices for the Bypass Basin whereby ash is periodically removed from the basin to recover storage capacity. As of late October 2021, no CCR remains in the Bypass Basin. With the CCR removed from the basin, the retrofit work described in Section 2.0 will be performed in accordance with this retrofit plan (or subsequent amendment of this retrofit plan) and the construction permit issued by the Illinois EPA.

After receiving a retrofit construction permit from the Illinois EPA, MWG will first remove the granular protective layers covering the Bypass Basin's existing geomembrane liner: a 6-in.-thick gravel warning layer and a 12-in.-thick sand cushion layer. These soil materials will be loaded onto trucks and transported to a permitted disposal facility. Because these soil materials are likely to contain CCR materials, the trucks transporting the material off-site will carry manifests pursuant to 35 Ill. Adm. Code 845.740(c)(1)(A) and as specified in 35 Ill. Adm. Code 809. In addition, a CCR transportation plan will be prepared in accordance with 35 Ill. Adm. Code 845.740(c)(1)(B) which will include:

- Identification of the transportation method selected;
- The frequency, time of day, and routes of CCR transportation;
- Any measures to minimize noise, traffic, and safety concerns caused by the transportation of the CCR;
- Measures to limit fugitive dust from any transportation of CCR;
- Installation and use of a vehicle washing station;
- A means of covering the CCR for any mode of CCR transportation;
- A requirement that the CCR is transported by a permitted special waste hauler under 35 Ill. Adm. Code 809.201.

On-site fugitive dust control measures will also be implemented as necessary to minimize airborne CCR particulates while CCR-impacted material is being handled. Pursuant to 35 Ill. Adm. Code 845.740(c)(2)(A), these dust control measures will include a water spray, commercial dust suppressant, or a combination of these.

Prior to the removal of the granular protective layers covering the Bypass Basin's existing geomembrane liner, signage will be posted at the Station's entrance warning of the hazards of CCR dust inhalation in accordance with 35 Ill. Adm. Code 845.740(c)(3)(A). Pursuant to 35 Ill. Adm. Code 845.740(c)(3)(B), a written notice will be issued to each of the local governments through which the CCR-impacted material will be transported. This written notice will include an explanation of the hazards of CCR dust inhalation, the aforementioned CCR transportation plan, and a tentative transportation schedule.

After the granular protective layers in the basin have been removed, MWG will begin decontaminating the Bypass Basin's existing geomembrane liner to be re-used as a supplemental liner under the new composite liner. The basin's inlet and outlet structures, associated piping, *etc.* will also be decontaminated. At a minimum, decontamination procedures will include pressure washing of the geomembrane liner and pond appurtenances in a systematic manner to remove all CCR and residuals of CCR. Following decontamination, the existing geomembrane liner will be visually inspected, and an electrical leak location survey will be conducted to ensure the liner is competent. Analytical tests will also be conducted in accordance with the construction permit issued by the Illinois EPA at the time of the retrofit work to demonstrate that the liner is no longer contaminated with CCR constituents. The results from the visual inspection and analytical tests will be submitted to the Illinois EPA for approval of re-using the existing geomembrane liner as a supplemental liner under the new composite liner in the retrofitted Bypass Basin.

4.0 ESTIMATED MAXIMUM INVENTORY OF CCR TO BE REMOVED

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.770(c)(1)(C)
Federal CCR Rule Reference: 40 CFR 257.102(k)(2)(i)(C)

As previously stated, no appreciable volume of CCR remains in the Bypass Basin since Powerton cleaned the basin in accordance with the Station's ash pond maintenance practices. However, it is likely that CCR materials are present within the granular protective layers covering the Bypass Basin's existing geomembrane liner. For the purposes of this retrofit plan, the maximum amount of CCR that will be removed during the retrofit of the Bypass Basin is conservatively based on the volume of the granular protective layers that will be removed from the basin prior to the installation of the basin's new composite liner and new LCRS: approximately 1,000 cubic yards.

5.0 ESTIMATED LARGEST AREA TO BE RETROFITTED

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.770(c)(1)(D)
Federal CCR Rule Reference: 40 CFR 257.102(k)(2)(i)(D)

The estimated largest area of the Bypass Basin to be retrofitted is anticipated to be the basin's full surface area: 0.83 acre.

6.0 RETROFIT SCHEDULE

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.770(c)(1)(E)
Federal CCR Rule Reference: 40 CFR 257.102(k)(2)(i)(E)

MWG expects to complete the retrofit work for the Bypass Basin in 2023. Table 1 lists the major milestones necessary for retrofitting the Bypass Basin and the expected duration for completing each milestone.

Table 1 – Planning Level Schedule for Retrofitting the Bypass Basin

Activity	Estimated Duration
Prepare Retrofit Construction Design Documents	Complete
Obtain Retrofit Construction Permit from Illinois EPA	13 Months
Hire Contractor to Complete Retrofit Activities in Accordance with Illinois EPA Permit	4 Months
Remove Protective Granular Layers Above Existing Liner	1 Week
Decontaminate Existing Liner and Basin Appurtenances (Including Laboratory Testing)	3 Weeks
Obtain Approval from Illinois EPA to Re-Use Existing Liner as Supplemental Liner	3 Months
Install Composite Liner System	1 Week
Install Leachate Collection and Removal System (Including Filter and Protective Layers)	1 Week
Submit Retrofit Completion Report and Certification to Illinois EPA	1 Week
Obtain Approval of Retrofit Completion Report and Certification from Illinois EPA	3 Months
Complete and Certify Retrofit of the Bypass Basin	--

7.0 AMENDMENTS TO CLOSURE PLAN

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.770(c)(3)
Federal CCR Rule Reference: 40 CFR 257.102(k)(2)(iii)

This retrofit plan will be amended in accordance with 35 Ill. Adm. Code 845.770(c)(3) and 40 CFR 257.102(k)(2)(iii) if a change in the operation of the Bypass Basin would substantially affect this retrofit plan or if an unanticipated event necessitates a revision to this retrofit plan. Any and all amendments to this retrofit plan will be certified by a qualified professional engineer licensed in the State of Illinois in accordance with 35 Ill. Adm. Code 845.770(c)(4) and 40 CFR 257.102(k)(2)(iv).

8.0 COMPLETION OF RETROFIT ACTIVITIES

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.770(g)
Federal CCR Rule Reference: 40 CFR 257.102(k)(4)

Upon completion of all retrofit activities required by 35 Ill. Adm. Code Part 845 and 40 CFR 257.102(k) and approved by the Illinois EPA in a construction permit, a retrofit completion report and certification will be submitted to the Illinois EPA. The retrofit completion report will include (1) the engineering and hydrogeology reports containing monitoring well completion reports, boring logs, all construction quality assurance (CQA) reports, certifications, designations of CQA officers-in-absentia required by 35 Ill. Adm. Code 845.290; (2) photographs with time, date, and location information of the liner system and leachate collection system; (3) other photographs relied upon for documentation of construction activities; (4) a written summary of the retrofit requirements and completed activities as stated in the construction permit and 35 Ill. Adm. Code 845; and (5) any other information relied upon by the qualified professional engineer for the certification. Pursuant to 35 Ill. Adm. Code 845.770(g)(2) and 40 CFR 257.102(k)(4), the certification will be prepared by an independent, qualified professional engineer licensed in the State of Illinois and will verify that the Bypass Basin has been retrofitted in accordance with this retrofit plan (or subsequent amendment of this retrofit plan), the requirements of 35 Ill. Adm. Code Part 845, and the requirements of 40 CFR 257.102(k). Finally, within 30 days of the Illinois EPA approving the retrofit completion report and certification, a notification of completion of retrofit activities will be prepared in accordance with 35 Ill. Adm. Code 845.770(h).

9.0 CERTIFICATION

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.770(c)(4)

Federal CCR Rule Reference: 40 CFR 257.102(k)(2)(iv)

I certify that:

- This written retrofit plan for the Bypass Basin was prepared by me or under my direct supervision.
- The work was conducted in accordance with the requirements of 35 Ill. Adm. Code 845.770 and with the requirements of 40 CFR 257.102(k).
- I am a registered professional engineer under the laws of the State of Illinois.

Certified By: Thomas J. Dehlin Date: April 15, 2022

Seal:



Digitally signed by Thomas J. Dehlin
Date: 2022.04.15 09:04:38 -05'00'

ATTACHMENT 8-2
PRELIMINARY WRITTEN CLOSURE PLAN

MWG

Midwest Generation, LLC
Powerton Generating Station

Preliminary Written Closure Plan for Bypass Basin

Revision 1

October 29, 2021

Issue Purpose: Use

Project No.: 12661-122

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Chicago, IL 60603-5780 USA
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Sargent & Lundy

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1.0 PURPOSE & SCOPE

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.720(a)
Federal CCR Rule Reference: 40 CFR 257.102(b)

1.1 PURPOSE

The Bypass Basin at Midwest Generation, LLC's (MWG) Powerton Generating Station ("Powerton" or the "Station") is an existing coal combustion residual (CCR) surface impoundment that is regulated by the Illinois Pollution Control Board's "Standards for the Disposal of Coal Combustion Residuals in CCR Surface Impoundments." These regulations are codified in Part 845 to Title 35 of the Illinois Administrative Code (35 Ill. Adm. Code 845, Ref. 1) and are also referred to herein as the "Illinois CCR Rule." The Bypass Basin is also regulated by the U.S. Environmental Protection Agency's (EPA) "Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments," 40 CFR Part 257 Subpart D (Ref. 2), also referred to herein as the "Federal CCR Rule."

Pursuant to 35 Ill. Adm. Code 845.720(a) and 40 CFR 257.102(b), this document provides the preliminary written closure plan for the Bypass Basin at Powerton. In accordance with both sets of regulations, this document describes the steps necessary to close the CCR unit at any point during its active life. MWG intends to first retrofit the Bypass Basin with a composite liner and a leachate collection and removal system (LCRS) in accordance with 35 Ill. Adm. Code 845.770(a) and 40 CFR 257.102(k) and then use the basin to manage CCR wastestreams and several non-CCR wastestreams from the Station. After Powerton ceases coal-fired power generating operations, the Station will initiate closure of the CCR surface impoundment. Therefore, this preliminary written closure plan describes the steps necessary to close the Bypass Basin after it has been retrofitted. In accordance with 40 CFR 257.102(k)(2)(ii)(A), MWG will prepare a corresponding retrofit plan for the Bypass Basin no later than 60 days prior to submitting a retrofit construction permit application to the Illinois EPA.

MWG intends to close the retrofitted Bypass Basin by removing CCR and CCR-mixed materials remaining in the basin at the time of closure and decontaminating affected areas pursuant to 35 Ill. Adm. Code 845.740(a) and 40 CFR 257.102(c). This plan describes the steps necessary to close the Bypass Basin in this manner.

1.2 SCOPE

Per the 2016 Water Infrastructure Improvements for the Nation (WIIN) Act, the retrofitted Bypass Basin will continue to be subject to both the Illinois and Federal CCR Rules until the U.S. EPA approves the Illinois EPA's CCR permit program. The Illinois EPA has yet to publish a timeline for submitting its proposed CCR permit program to the U.S. EPA for approval, and so this preliminary written closure plan has been prepared pursuant to both sets of regulations.

2.0 CLOSURE PLAN NARRATIVE DESCRIPTION

Illinois CCR Rule References: 35 Ill. Adm. Code 845.720(a)(1)(A) & 845.740(a)
Federal CCR Rule References: 40 CFR 257.102(b)(1)(i) & 257.102(c)

MWG plans to close the retrofitted Bypass Basin by removing CCR and CCR-mixed materials remaining in the basin at the time of closure and decontaminating affected areas pursuant to 35 Ill. Adm. Code 845.740(a) and 40 CFR 257.102(c). The Bypass Basin closure will be executed according to the following sequential steps:

1. Obtaining a construction permit from the Illinois EPA for closing the retrofitted basin;
2. Ceasing all CCR and non-CCR inflows to the basin;
3. Drawing down free surface water in the basin by draining water into the existing outlet structure in the southeast corner of the basin;
4. Once the water elevation is below the invert elevation of the basin's outlet structure, promoting additional drainage and dewatering by:
    a. Excavating sumps and trenches within the ash material,
    b. Using portable pumps as necessary to remove additional water by pumping water into the basin's outlet structure, and/or
    c. Utilizing earthmoving equipment to pile the ash within the basin to promote drainage;
5. Removing the CCR from the retrofitted basin, loading the material onto trucks, and transporting the material to a beneficial-use facility or a permitted disposal facility;
6. Removing the retrofitted basin's LCRS, filter layer installed over the LCRS, and any soil and geosynthetic materials installed over the filter layer and transporting the materials to a permitted disposal facility;
7. Removing the retrofitted basin's composite liner system;
8. Removing the original geomembrane liner (which MWG plans to use as a supplemental liner for the retrofitted basin pursuant to 35 Ill. Adm. Code 845.770(a)(4));
9. Inspecting the basin subgrade to verity it is not contaminated with CCR constituents;
10. Removing the retrofitted basin's appurtenant structures (*e.g.*, inlet troughs, outlet structures, piping);
11. Sampling the groundwater at the basin site to verify the groundwater monitoring concentrations do not exceed the groundwater protection standards established for constituents in accordance with the operating permit issued by the Illinois EPA for the basin; and
12. Certifying (via a qualified professional engineer licensed in the State of Illinois) that the CCR has been removed from the basin and the CCR surface impoundment has been decontaminated in accordance with the closure plan in effect at the time of closure and in accordance with the corresponding construction permit issued by the Illinois EPA.

3.0 CCR REMOVAL & DECONTAMINATION PROCEDURES

Illinois CCR Rule References: 35 Ill. Adm. Code 845.720(a)(1)(B) & 845.740(a)
Federal CCR Rule References: 40 CFR 257.102(b)(1)(ii) & 257.102(c)

The preliminary closure plan for the retrofitted Bypass Basin is to follow the sequential steps outlined in Section 2.0.

Upon receipt of the construction permit from the Illinois EPA for closing the retrofitted Bypass Basin and after permanent cessation of all flows into the impoundment, MWG will first draw down the free surface water remaining in the CCR surface impoundment and dewater the CCR stored therein. Initially, free water remaining in the retrofitted basin will be drawn down by allowing the water to drain to the outlet structure at the southeast corner of the basin. Once the water level falls below the outlet structure's invert elevation, additional drainage and dewatering may be facilitated by:

- Excavating sumps and trenches within the ash,
- Using portable pumps to pump water into the basin's outlet structure, and/or
- Utilizing earthmoving equipment to pile the CCR within the retrofitted basin to promote drainage.

Once the CCR within the impoundment is sufficiently dewatered to handle, construction equipment will then be used to load CCR materials onto trucks and transported to a beneficial-use facility or a permitted disposal facility. Trucks transporting the CCR materials off-site will carry manifests pursuant to 35 Ill. Adm. Code 845.740(c)(1)(A) and as specified in 35 Ill. Adm. Code 809. In addition, a CCR transportation plan will be prepared in accordance with 35 Ill. Adm. Code 845.740(c)(1)(B) which will include:

- Identification of the transportation method selected;
- The frequency, time of day, and routes of CCR transportation;
- Any measures to minimize noise, traffic, and safety concerns caused by the transportation of the CCR;
- Measures to limit fugitive dust from any transportation of CCR;
- Installation and use of a vehicle washing station;
- A means of covering the CCR for any mode of CCR transportation;
- A requirement that the CCR is transported by a permitted special waste hauler under 35 Ill. Adm. Code 809.201.

On-site fugitive dust control measures will also be implemented as necessary to minimize airborne CCR particulates while CCR materials are being handled. Pursuant to 35 Ill. Adm. Code 845.740(c)(2)(A), these dust control measures will include a water spray, commercial dust suppressant, or a combination of these.

Prior to the removal of CCR materials from the retrofitted Bypass Basin, signage will be posted at the Station's entrance warning of the hazards of CCR dust inhalation in accordance with 35 Ill. Adm. Code 845.740(c)(3)(A). Pursuant to 35 Ill. Adm. Code 845.740(c)(3)(B), a written notice will be issued to each of the local governments through which the CCR materials will be transported. This written notice will include an explanation of the hazards of CCR dust inhalation, the aforementioned CCR transportation plan, and a tentative transportation schedule.

The containment systems installed within the retrofitted Bypass Basin (*i.e.*, LCRS, composite liner, filter layer over the LCRS, *etc*.) will be removed from the impoundment. The original geomembrane liner and appurtenant structures (*i.e.*, inlet trough, outlet structure, piping, *etc*.) will also be removed. Materials removed from the impoundment site will be loaded onto trucks and transported to permitted disposal facilities in accordance with the aforementioned CCR transportation plan developed for the closure work. Finally, the basin subgrade will be visually inspected to verify the area is not contaminated with CCR constituents.

In accordance with 35 Ill. Adm. Code 845.740(e) and 40 CFR 257.102(c), CCR removal and decontamination will be complete when constituent concentrations throughout the retrofitted Bypass Basin and areas that may have been affected by releases from the basin have been removed and groundwater monitoring concentrations do not exceed the groundwater protection standards established under 35 Ill. Adm. Code 845.600. After CCR removal and decontamination of the retrofitted Bypass Basin has been completed, MWG will submit a report documenting the completion of CCR removal and decontamination of the unit, which will include a certification from a qualified professional engineer licensed in the State of Illinois that CCR removal and decontamination was completed in accordance with 35 Ill. Adm. Code 845.740.

In accordance with 35 Ill. Adm. Code 845.740(b), MWG will continue groundwater monitoring in accordance with Subpart F of the Illinois CCR Rule ("Groundwater Monitoring and Corrective Action") for three years after the completion of CCR removal and decontamination. After groundwater monitoring has been completed, MWG will submit a report documenting the completion of groundwater monitoring, which will include a certification from a qualified professional engineer licensed in the State of Illinois that groundwater monitoring was completed in accordance with 35 Ill. Adm. Code 845.740.

4.0 ESTIMATED MAXIMUM INVENTORY OF CCR

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.720(a)(1)(D)
Federal CCR Rule Reference: 40 CFR 257.102(b)(1)(iv)

Detailed records of the maximum inventory of CCR ever stored in the Bypass Basin are not available. For the purposes of this preliminary written closure plan, the maximum inventory of CCR ever on-site over the

active life of the Bypass Basin is conservatively based on the estimated maximum capacity of the basin prior to retrofit: 9,000 cubic yards.

5.0 CLOSURE SCHEDULE

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.720(a)(1)(F)
Federal CCR Rule Reference: 40 CFR 257.102(b)(1)(vi)

Closure activities for the retrofitted Bypass Basin are expected to be completed by 2030. Table 1 lists the major milestones necessary for closing the basin and the expected duration for completing each milestone.

Table 1 – Planning Level Schedule for Closing the Retrofitted Bypass Basin

Activity	Estimated Duration
Prepare Closure Construction Design Documents	6 Months
Obtain Closure Construction Permit from Illinois EPA	13 Months
Hire Contractor to Complete Closure Activities in Accordance with Illinois EPA Permit	4 Months
Cease All Flows into Retrofitted Bypass Basin	--
Draw Down Water & Dewater Impounded Ash	5 Months
Remove Impounded Ash	1 Month
Remove Basin Containment Systems and Appurtenant Structures	2 Months
Submit Completion of CCR Removal and Decontamination Report and Certification to Illinois EPA	2 Weeks
Obtain Approval of Completion of CCR Removal and Decontamination Report from Illinois EPA	3 Months
Complete and Certify Closure of the Retrofitted Bypass Basin	--

6.0 AMENDMENTS TO CLOSURE PLAN

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.720(a)(3)
Federal CCR Rule Reference: 40 CFR 257.102(b)(3)

This closure plan will be amended in accordance with 35 Ill. Adm. Code 845.720(a)(3) and 40 CFR 257.102(b)(3) if a change in the operation of the Bypass Basin would substantially affect this closure plan or if an unanticipated event necessitates a revision to this closure plan. Any and all amendments to this closure plan will be certified by a qualified professional engineer registered in the State of Illinois in accordance with 35 Ill. Adm. Code 845.720(a)(4) and 40 CFR 257.102(b)(4).

7.0 COMPLETION OF CLOSURE ACTIVITIES

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.760
Federal CCR Rule Reference: 40 CFR 257.102(f)

Upon completion of all CCR removal and decontamination activities required by 35 Ill. Adm. Code Part 845 and 40 CFR 257.102(c) and approved by the Illinois EPA in a construction permit, a closure report and a closure certification for the retrofitted Bypass Basin will be submitted to the Illinois EPA in accordance with 35 Ill. Adm. Code 845.760(e). The closure report will include (1) the engineering and hydrogeology reports containing any monitoring well completion reports, boring logs, all construction quality assurance (CQA) reports, certifications, designations of CQA officers-in-absentia required by 35 Ill. Adm. Code 845.290; (2) photographs with time, date, and location information relied upon for documentation of construction activities; (3) a written summary of the closure requirements and completed activities as stated in the closure plan in effect and 35 Ill. Adm. Code Part 845; and (4) any other information relied upon by the qualified professional engineer for the certification. Pursuant to 35 Ill. Adm. Code 845.760(e)(2) and 40 CFR 257.102(f)(3), the certification will be prepared by an independent, qualified professional engineer licensed in the State of Illinois and will verify that the retrofitted Bypass Basin has been closed in accordance with the closure plan in effect at the time of the closure work, the requirements of 35 Ill. Adm. Code Part 845, and the requirements of 40 CFR 257.102. Finally, within 30 days of the Illinois EPA approving the closure report and closure certification, a notification of completion of closure will be prepared in accordance with 35 Ill. Adm. Code 845.760(f).

8.0 CERTIFICATION

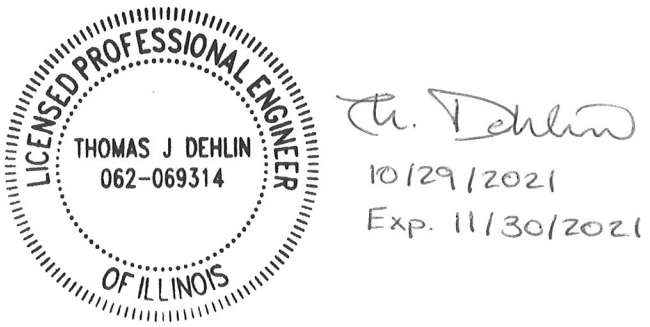
Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.720(a)(4)
Federal CCR Rule Reference: 40 CFR 257.102(b)(4)

I certify that:

- This preliminary written closure plan for the Bypass Basin was prepared by me or under my direct supervision.
- The work was conducted in accordance with the requirements of 35 Ill. Adm. Code Part 845 and with the requirements of 40 CFR 257.102.
- I am a registered professional engineer under the laws of the State of Illinois.

Certified By: Thomas J. Dehlin Date: October 29, 2021

Seal:

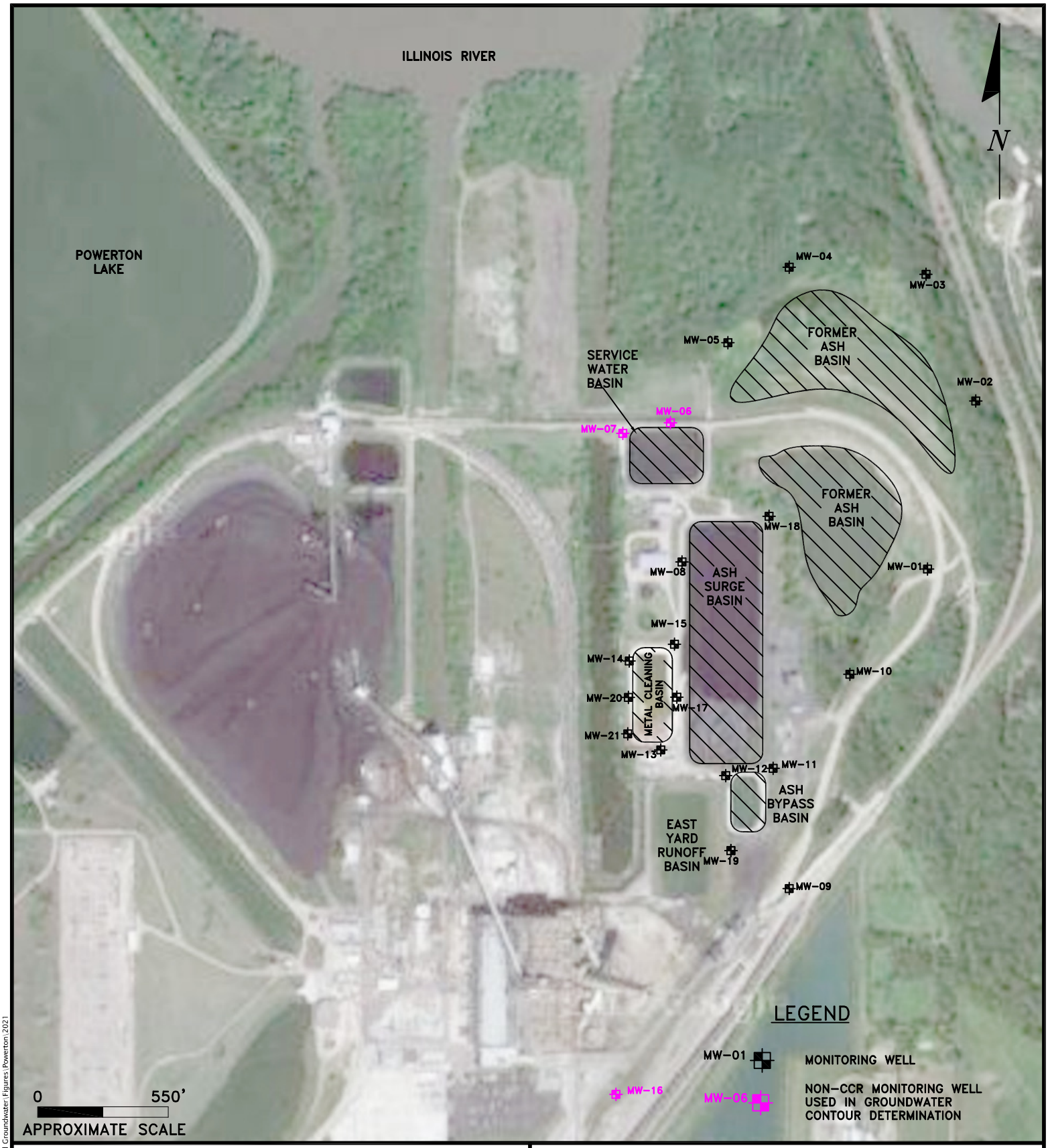


9.0 REFERENCES

1. Illinois Pollution Control Board. "Standards for Disposal of Coal Combustion Residuals in CCR Surface Impoundments." 35 Ill. Adm. Code 845. Accessed October 19, 2021.
2. U.S. Environmental Protection Agency. "Standards for Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments." 40 CFR Part 257 Subpart D. https://www.ecfr.gov/current/title-40/chapter-I/subchapter-I/part-257/subpart-D. Accessed October 19, 2021.

ATTACHMENT 9-0
GROUNDWATER MONITORING FIGURES & TABLES

FIGURE	TITLE
FIGURE 9-1	MONITORING WELL MAP
FIGURE 9-2	CROSS SECTION A–A’
FIGURE 9-3	CROSS SECTION A’–A”
FIGURE 9-4	CROSS SECTION B–B’
FIGURE 9-5	CROSS SECTION B’–B”
FIGURE 9-6	CROSS SECTION C–C’
FIGURE 9-7	CROSS SECTION D-D’
FIGURE 9-8	ASH BYPASS BASIN AND ASH SURGE BASIN HYDROGRAPH
FIGURE 9-9	*NOT USED*
FIGURE 9-10	GROUNDWATER CONTOUR MAP FOR GRAVELLY SAND UNIT 08/2020
FIGURE 9-11	GROUNDWATER CONTOUR MAP FOR SILT/CLAY UNIT 08/2020
FIGURE 9-12	GROUNDWATER CONTOUR MAP FOR GRAVELLY SAND UNIT 12/2020
FIGURE 9-13	GROUNDWATER CONTOUR MAP FOR SILT/CLAY UNIT 12/2020
FIGURE 9-14	GROUNDWATER CONTOUR MAP FOR GRAVELLY SAND UNIT 02/2021
FIGURE 9-15	GROUNDWATER CONTOUR MAP FOR SILT/CLAY UNIT 02/2021
FIGURE 9-16	GROUNDWATER CONTOUR MAP FOR GRAVELLY SAND UNIT 05/2021
FIGURE 9-17	GROUNDWATER CONTOUR MAP FOR SILT/CLAY UNIT 05/2021
FIGURE 9-18	GROUNDWATER MANAGEMENT ZONE FOR CCR SURFACE IMPOUNDMENTS
FIGURE 9-19	2500’ RADIUS POTABLE WELL MAP



W:\Projects\Midwest Generation\12313 Ash Pond Groundwater Figures\Powerton\2021

ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG and Associates, inc.

14665 West Lisbon Road, Suite 1A Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478

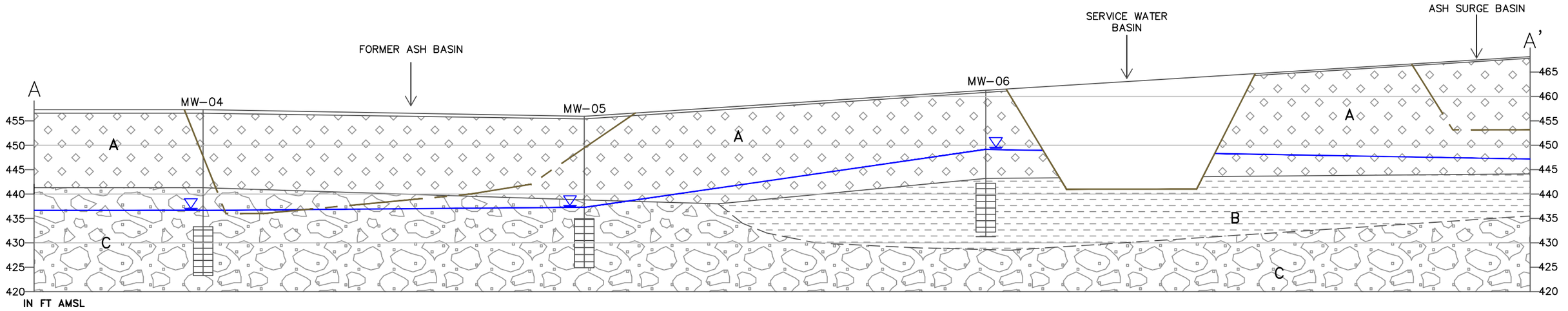
414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

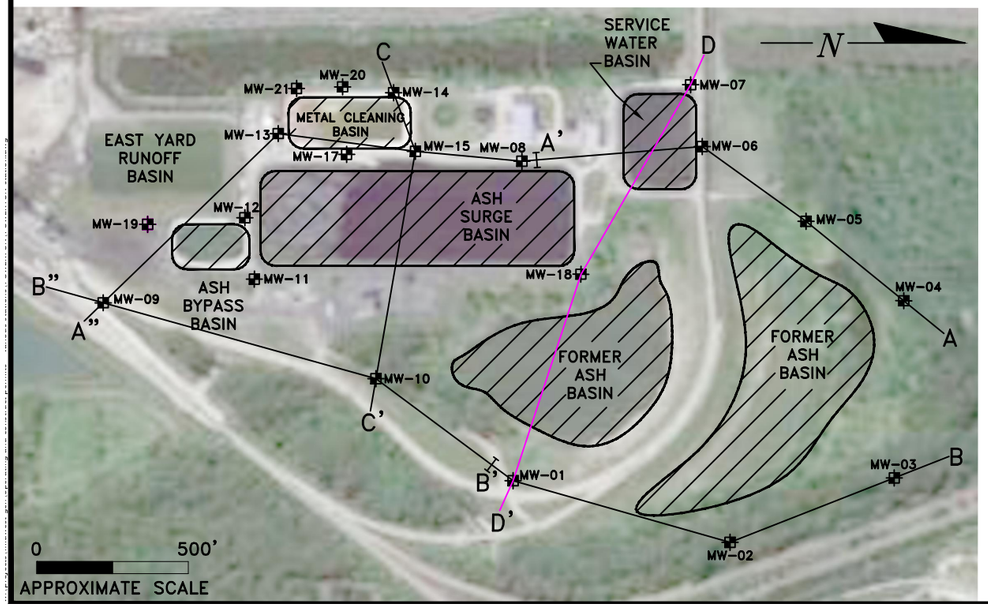
MONITORING WELL MAP

POWERTON STATION
PEKIN, ILLINOIS

Scale: 1" = 550' | Date: August 31, 2021

KPRG Project No. 19520.1 | FIGURE 9-1





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C — SAND AND GRAVEL: CONSISTING OF LIGHT BROWN, BROWN AND/OR GRAY MEDIUM TO COARSE SANDS AND GRAVELS.

WATER LEVEL (5/21)

PROJECTED POND OUTLINE

POND OUTLINE

20'
0
100'
APPROXIMATE SCALE

ENVIRONMENTAL CONSULTATION & REMEDIATION
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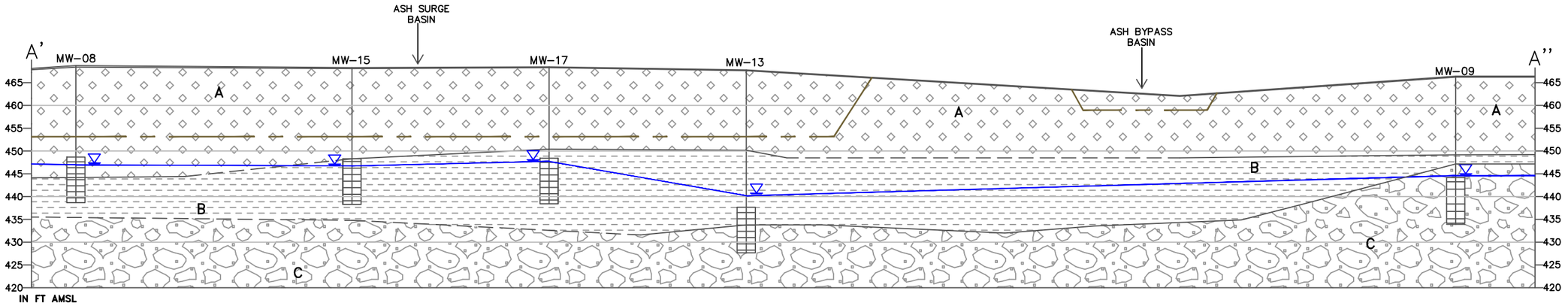
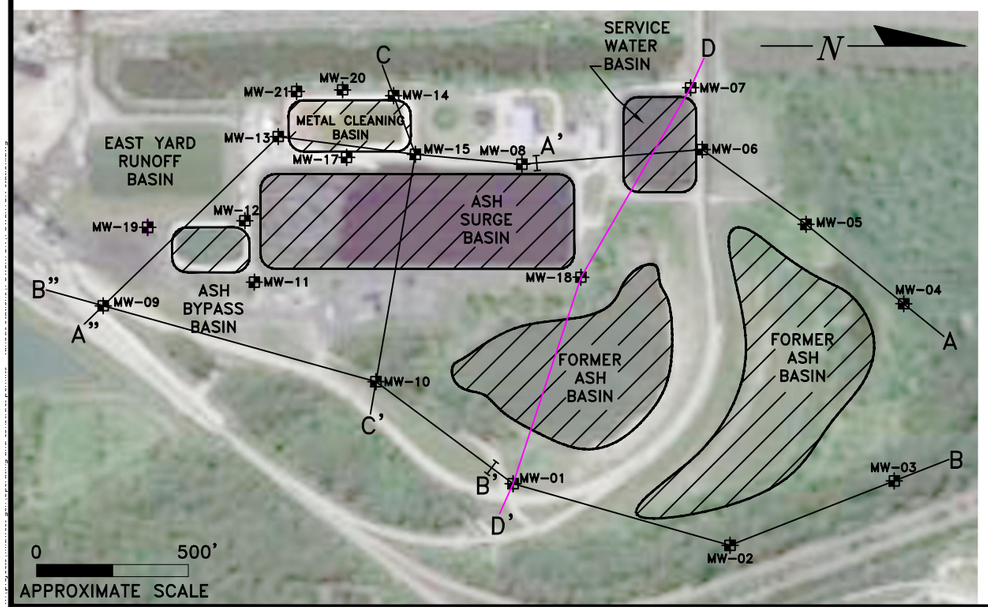
CROSS SECTION A–A'

POWERTON STATION
PEKIN, ILLINOIS

SEE SCALE | Date: October 4, 2021

KPRG Project No. 19520.1 | FIGURE 9–2





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WATER LEVEL (5/21)

PROJECTED POND OUTLINE

25'
0
125'
APPROXIMATE SCALE

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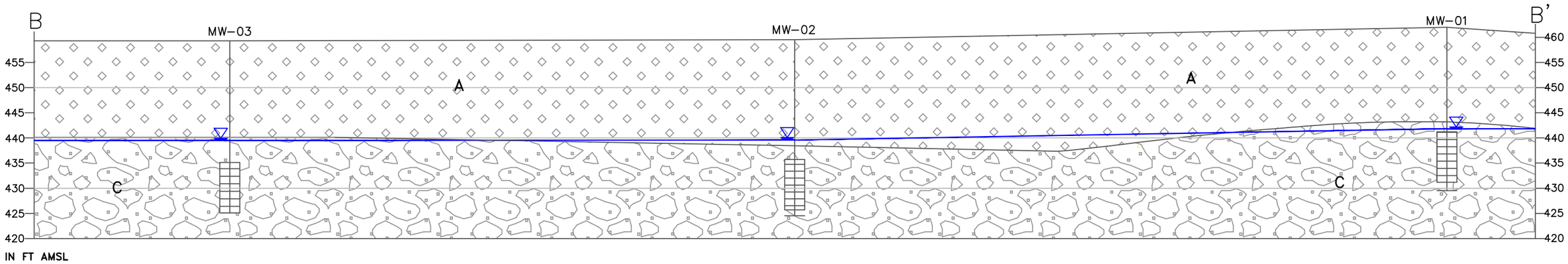
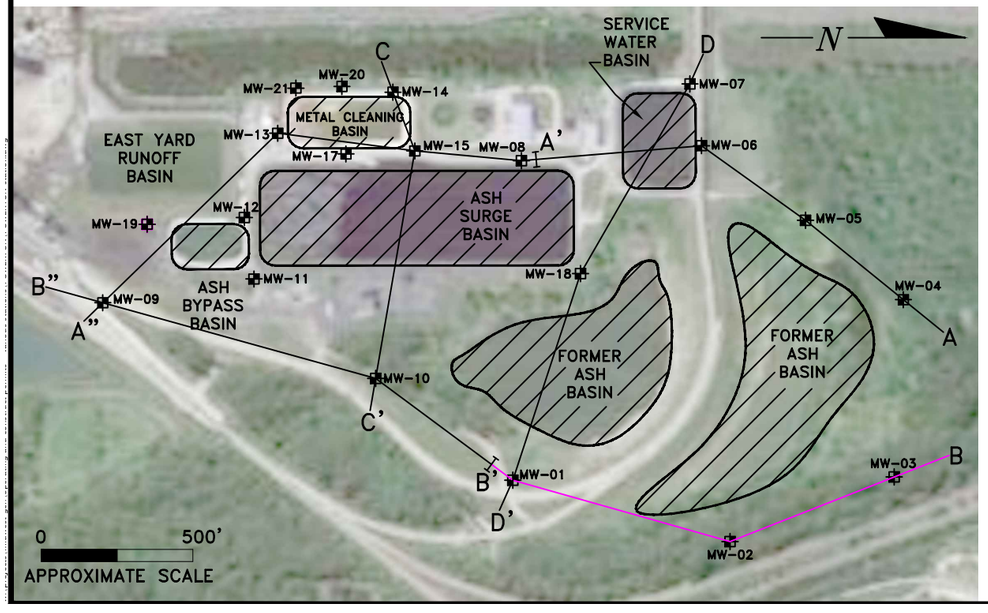
CROSS SECTION A'–A"

POWERTON STATION
PEKIN, ILLINOIS

SEE SCALE | Date: October 4, 2021

KPRG Project No. 19520.1 | FIGURE 9–3





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WATER LEVEL (5/21)

20'
0
100'
APPROXIMATE SCALE

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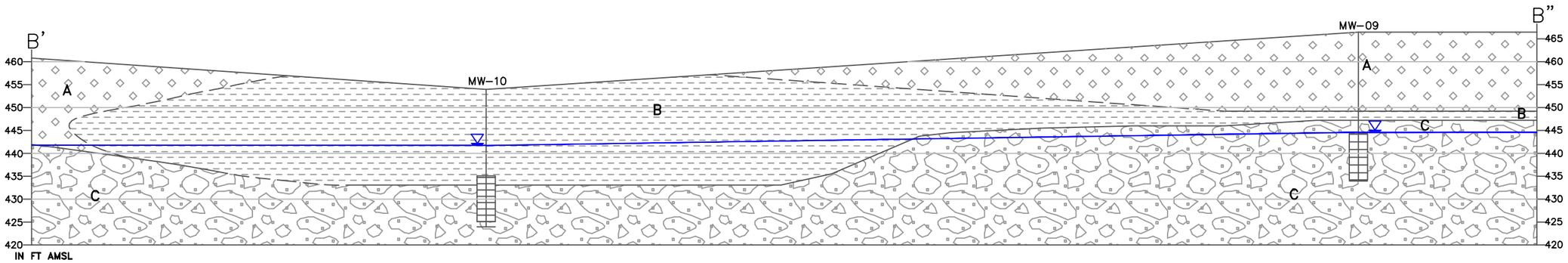
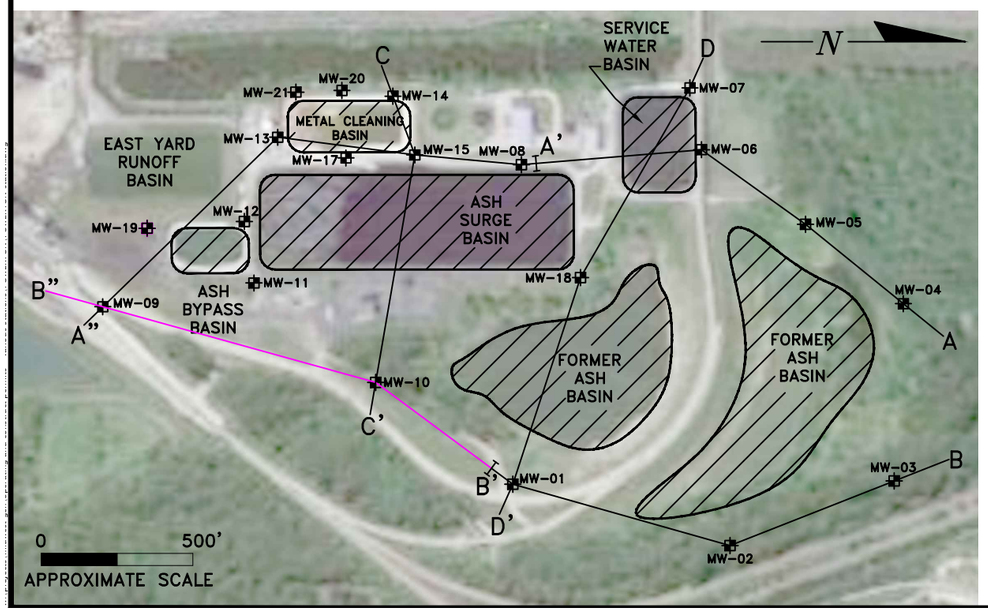
CROSS SECTION B–B'

POWERTON STATION
PEKIN, ILLINOIS

SEE SCALE | Date: August 17, 2021

KPRG Project No. 19520.1 | FIGURE 9–4





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WATER LEVEL (5/21)

25'
0
125'
APPROXIMATE SCALE

ENVIRONMENTAL CONSULTATION & REMEDIATION
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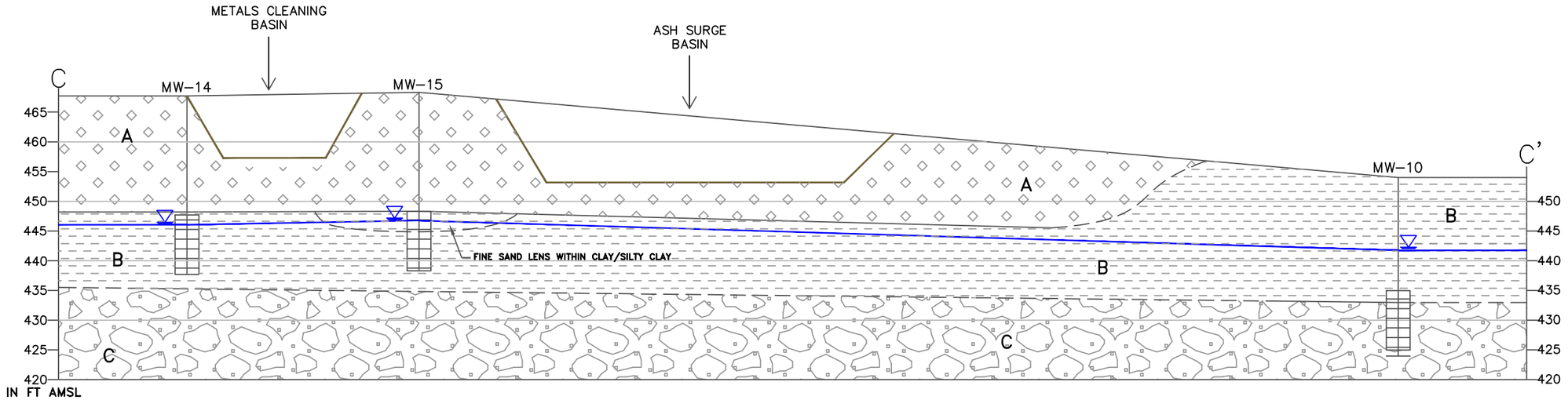
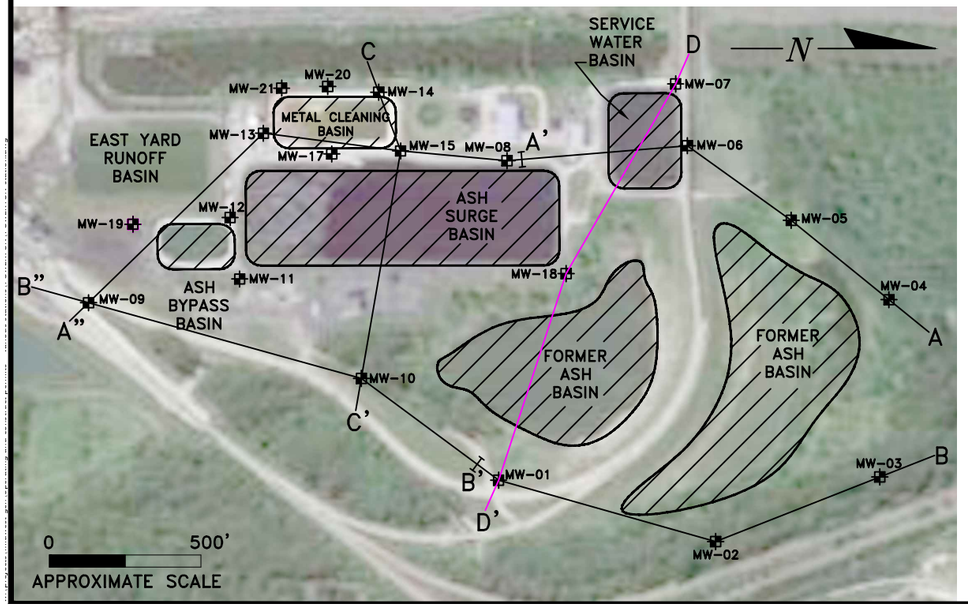
CROSS SECTION B'–B"

POWERTON STATION
PEKIN, ILLINOIS

SEE SCALE | Date: August 17, 2021

KPRG Project No. 19520.1 | FIGURE 9–5





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WATER LEVEL (5/21)

POND OUTLINE

20'
0
100'
APPROXIMATE SCALE

ENVIRONMENTAL CONSULTATION & REMEDIATION
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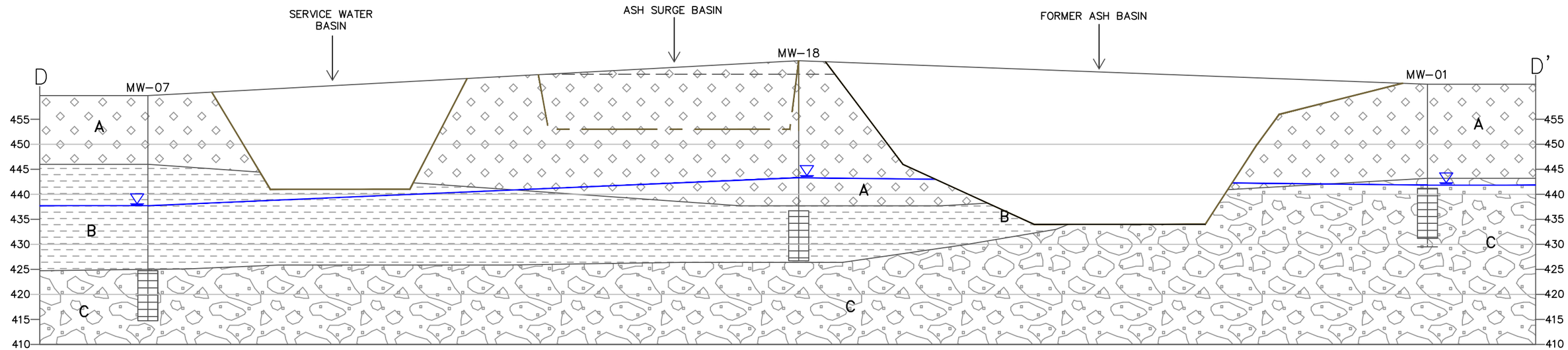
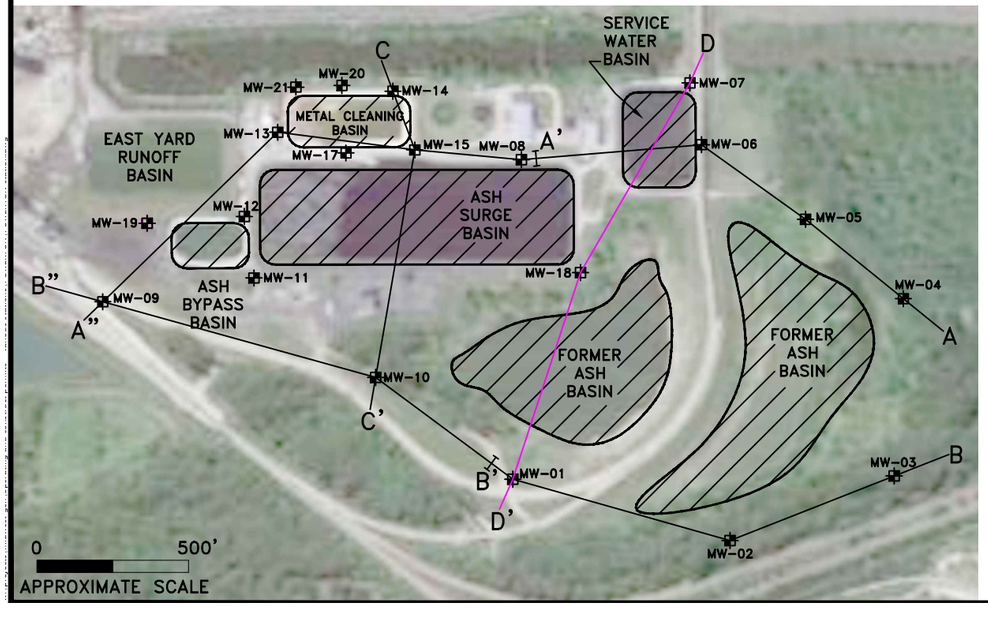
CROSS SECTION C–C'

POWERTON STATION
PEKIN, ILLINOIS

SEE SCALE | Date: October 4, 2021

KPRG Project No. 19520.1 | FIGURE 9–6





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WATER LEVEL (5/21)

PROJECTED POND OUTLINE

POND OUTLINE

20'
0
100'
APPROXIMATE SCALE

ENVIRONMENTAL CONSULTATION & REMEDIATION
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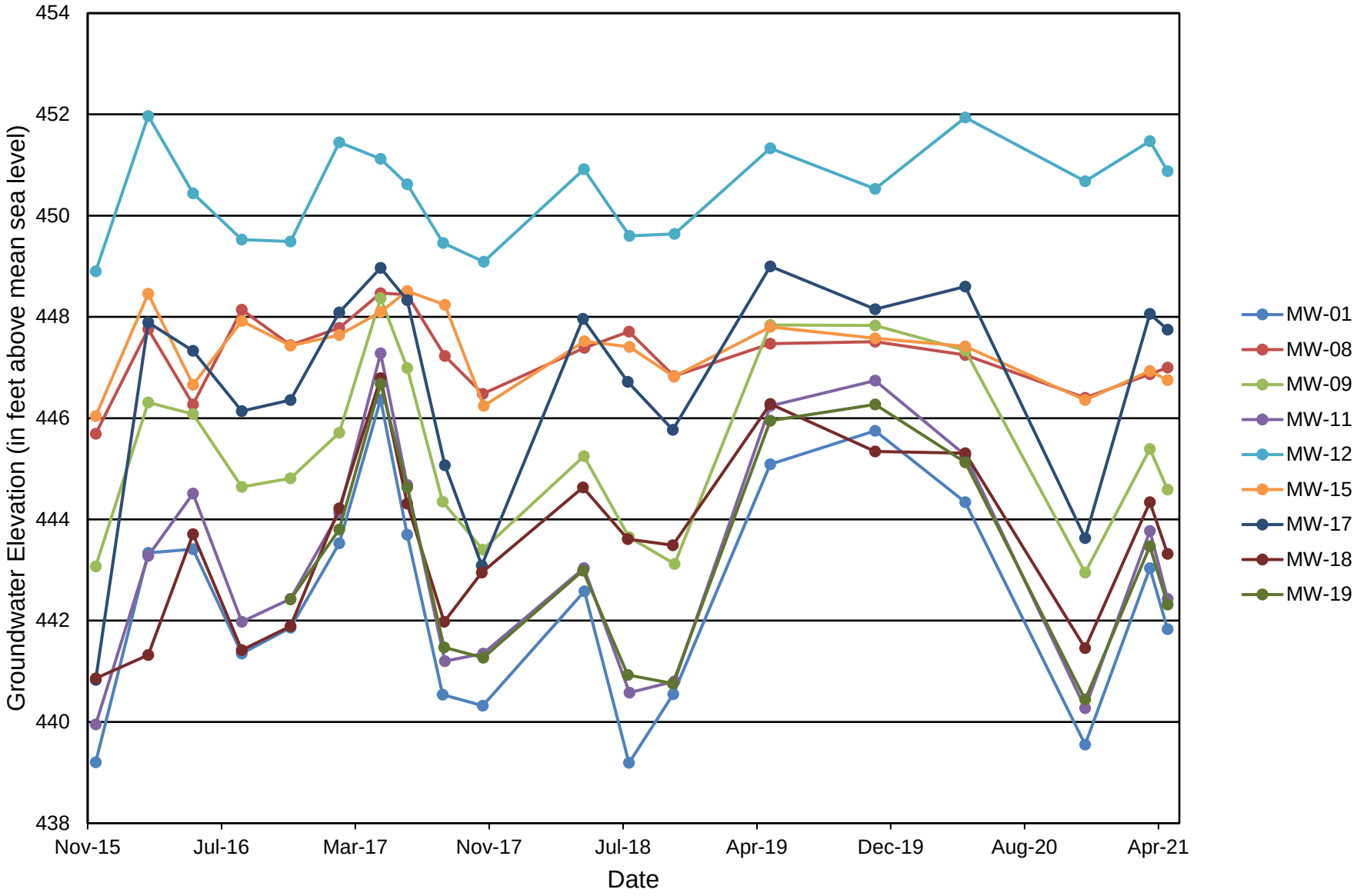
CROSS SECTION D–D'

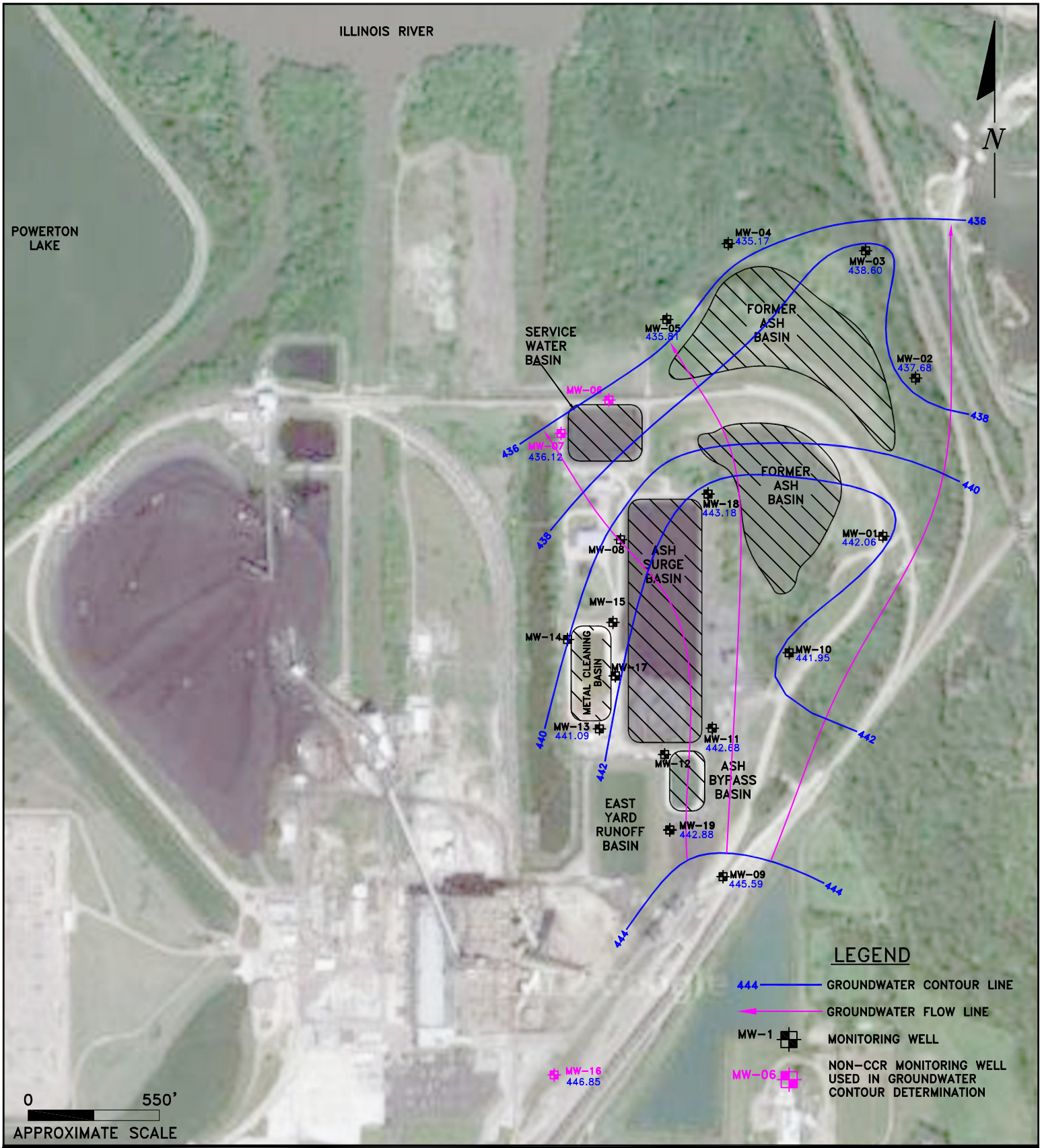
POWERTON STATION
PEKIN, ILLINOIS

SEE SCALE | Date: October 4, 2021

KPRG Project No. 19520.1 | FIGURE 9–7

Midwest Generation Powerton Station, Pekin, IL.
Figure 9-8. Ash Bypass Basin and Ash Surge Basin Hydrograph





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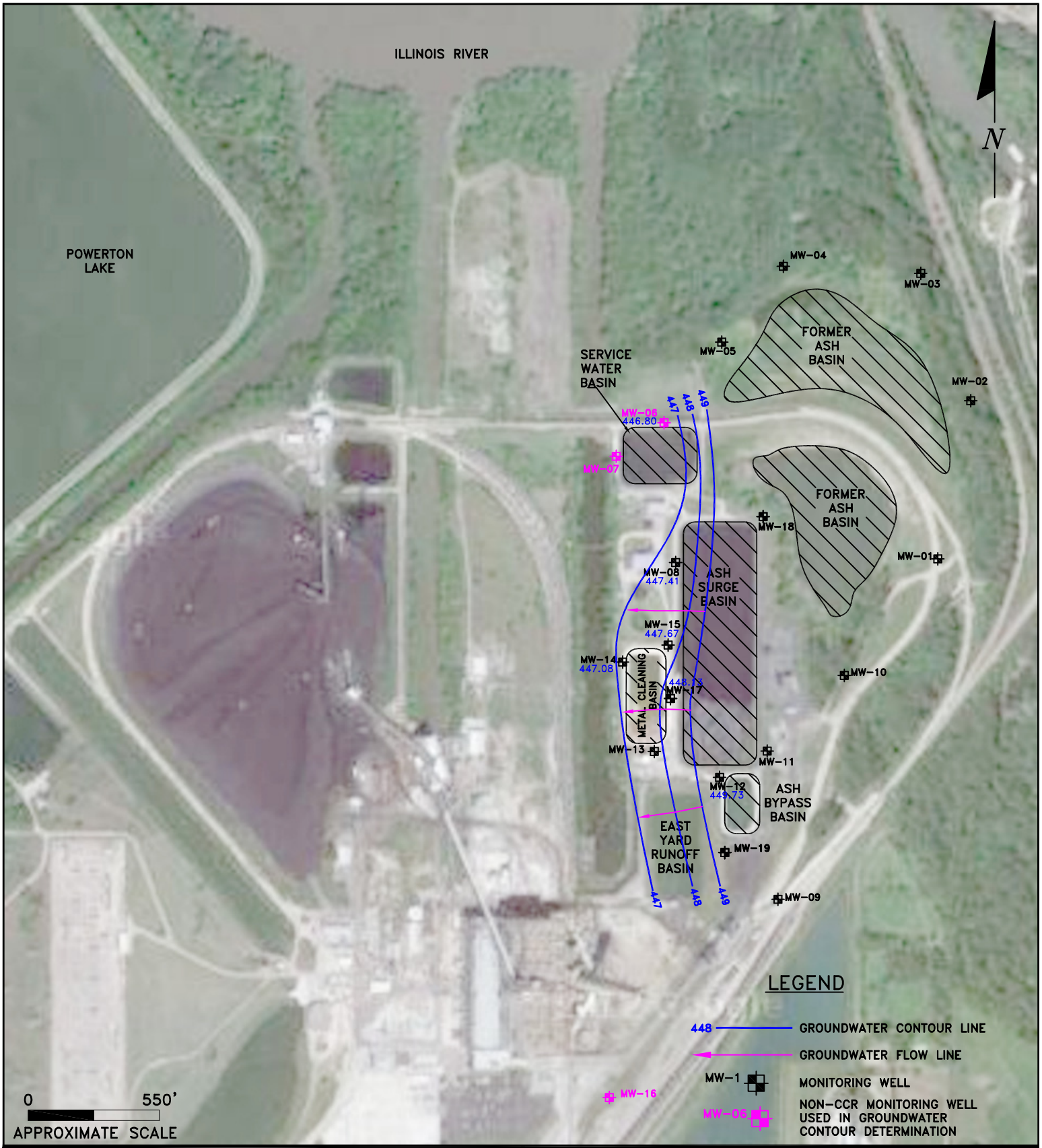
GROUNDWATER CONTOUR MAP FOR GRAVELLY SAND UNIT 08/2020

POWERTON STATION
PEKIN, ILLINOIS

Scale: 1" = 550' | Date: August 31, 2021

KPRG Project No. 19520.1 | FIGURE 9-10



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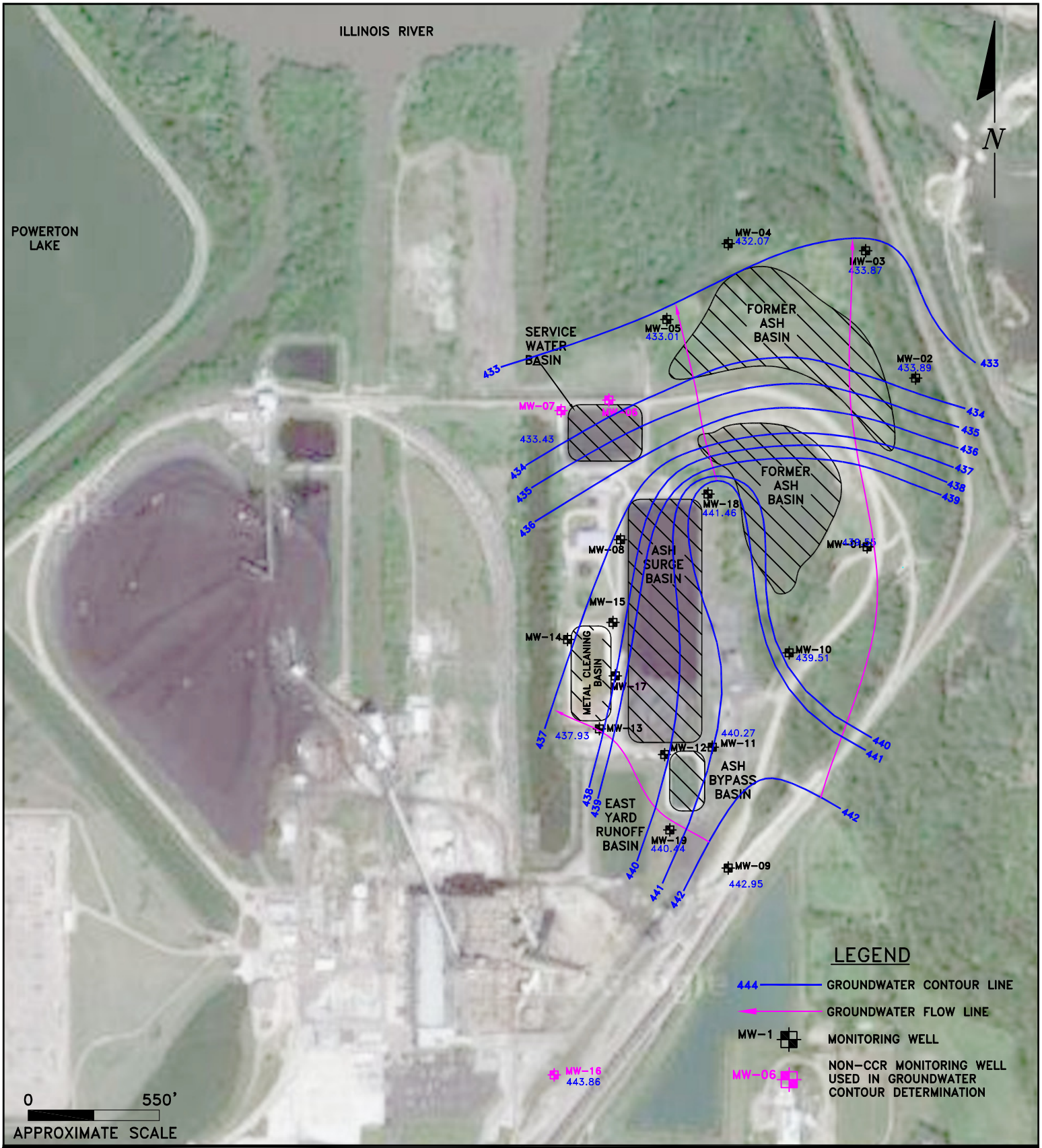
GROUNDWATER CONTOUR MAP FOR SILT/CLAY UNIT 08/2020

POWERTON STATION
PEKIN, ILLINOIS

Scale: 1" = 550' | Date: August 31, 2021

KPRG Project No. 19520.1 | FIGURE 9-11



ENVIRONMENTAL CONSULTATION & REMEDIATION

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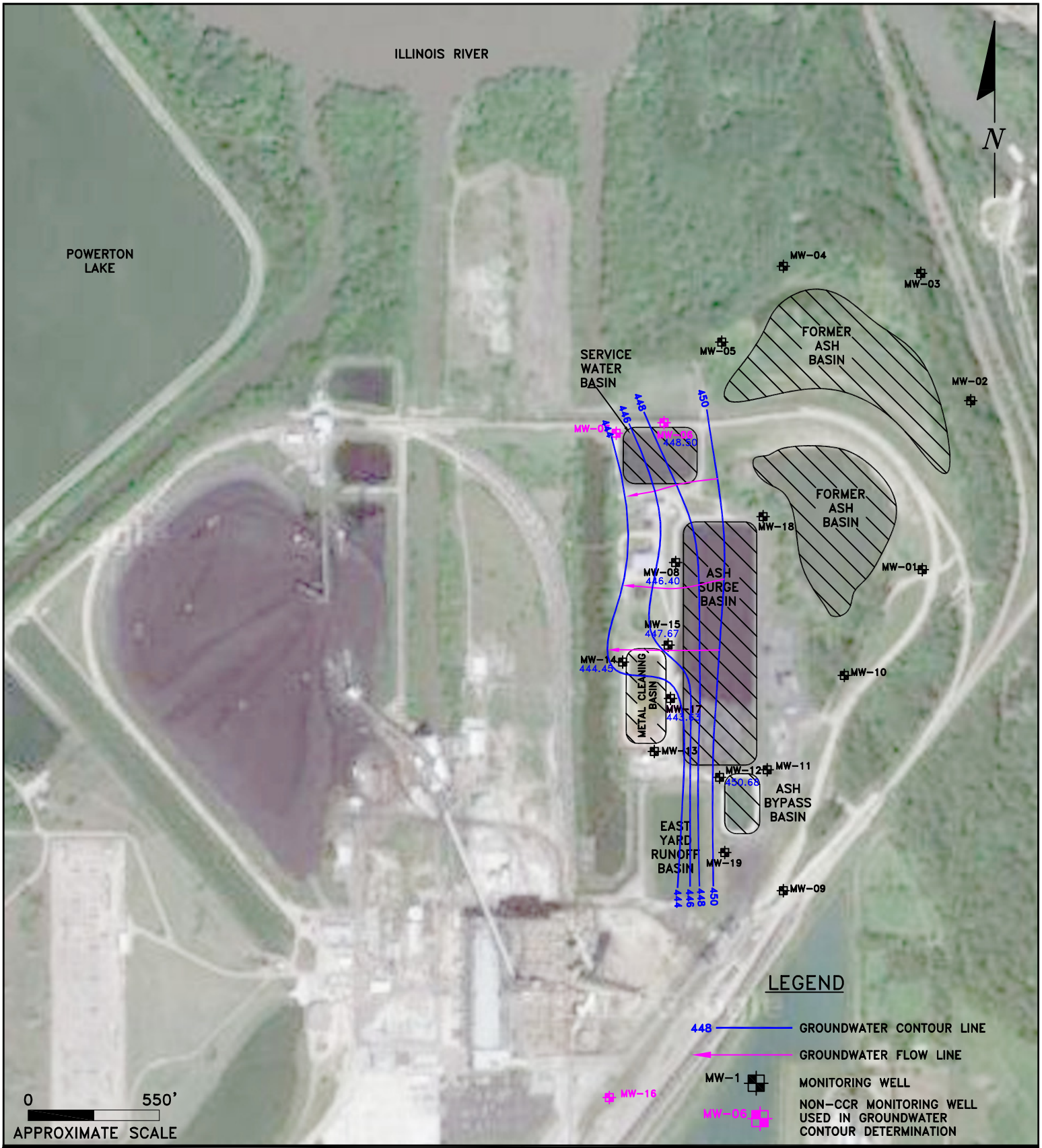
GROUNDWATER CONTOUR MAP FOR GRAVELLY SAND UNIT 12/2020

POWERTON STATION
PEKIN, ILLINOIS

Scale: 1" = 550' | Date: August 31, 2021

KPRG Project No. 19520.1 | FIGURE 9-12



ENVIRONMENTAL CONSULTATION & REMEDIATION

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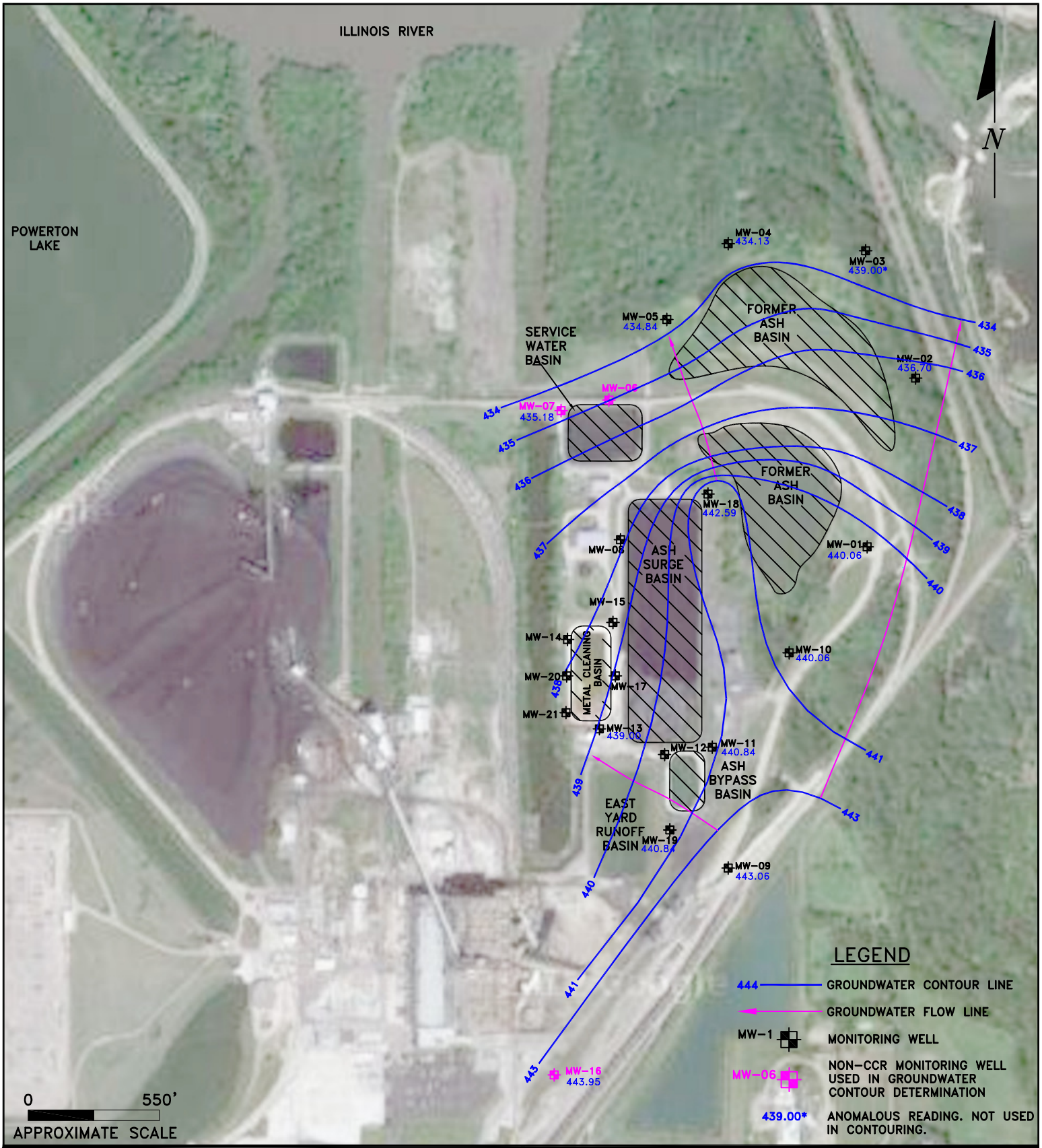
GROUNDWATER CONTOUR MAP FOR SILT/CLAY UNIT 12/2020

POWERTON STATION
PEKIN, ILLINOIS

Scale: 1" = 550' | Date: August 31, 2021

KPRG Project No. 19520.1 | FIGURE 9-13



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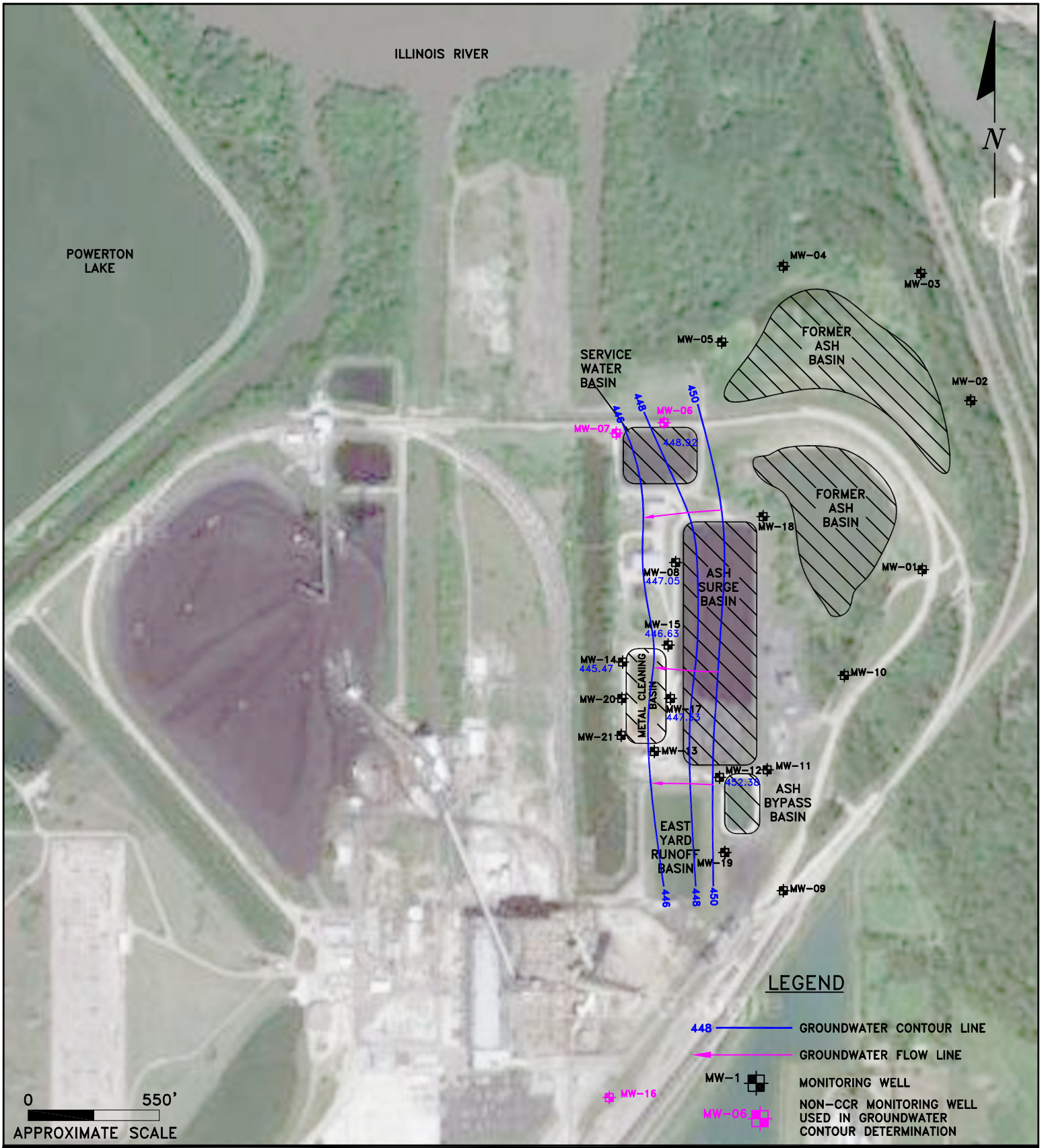
GROUNDWATER CONTOUR MAP FOR GRAVELLY SAND UNIT 02/2021

POWERTON STATION
PEKIN, ILLINOIS

Scale: 1" = 550' | Date: August 31, 2021

KPRG Project No. 19520.1 | FIGURE 9-14



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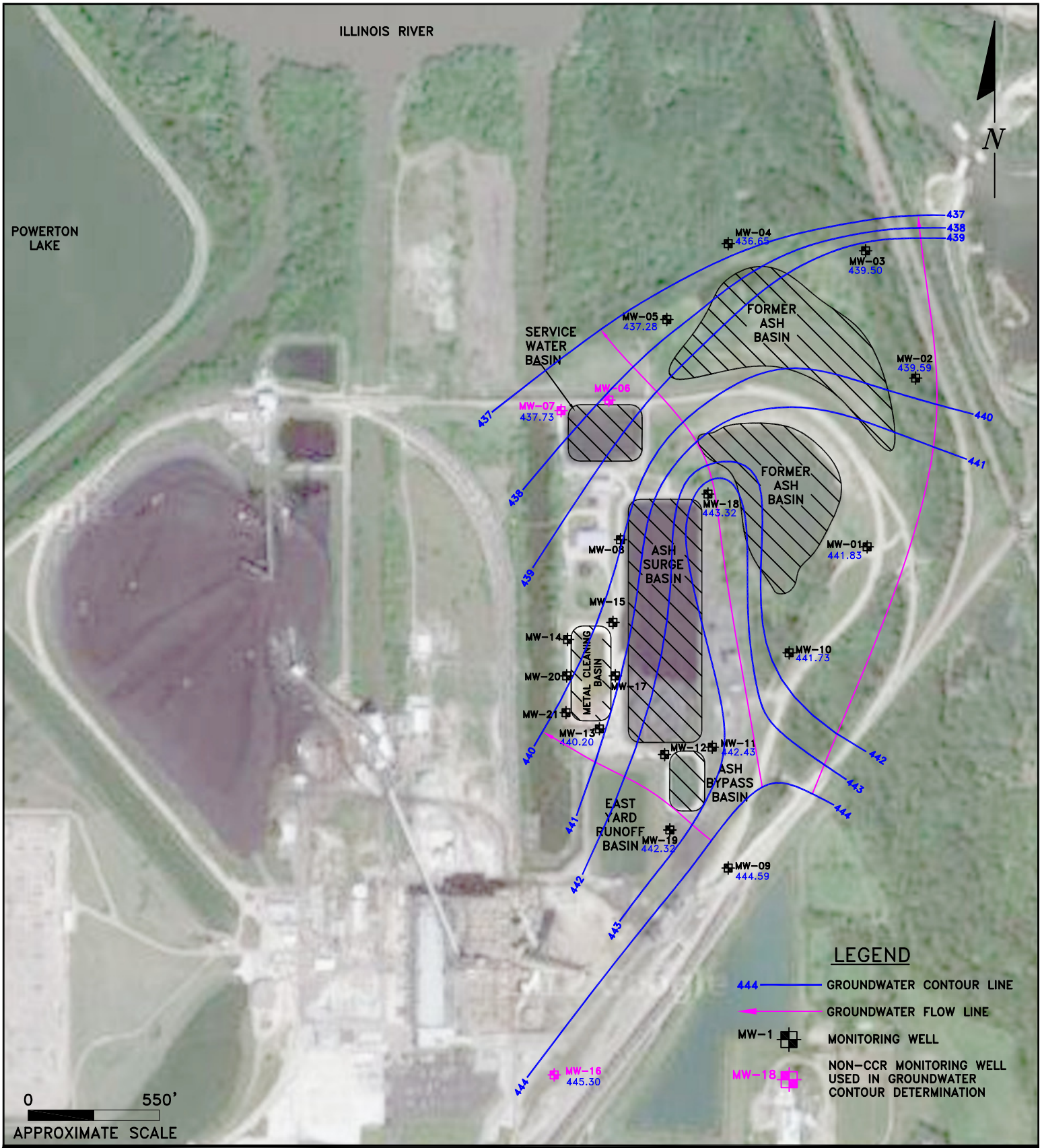
GROUNDWATER CONTOUR MAP FOR SILT/CLAY UNIT 02/2021

POWERTON STATION
PEKIN, ILLINOIS

Scale: 1" = 550' | Date: August 31, 2021

KPRG Project No. 19520.1 | FIGURE 9-15



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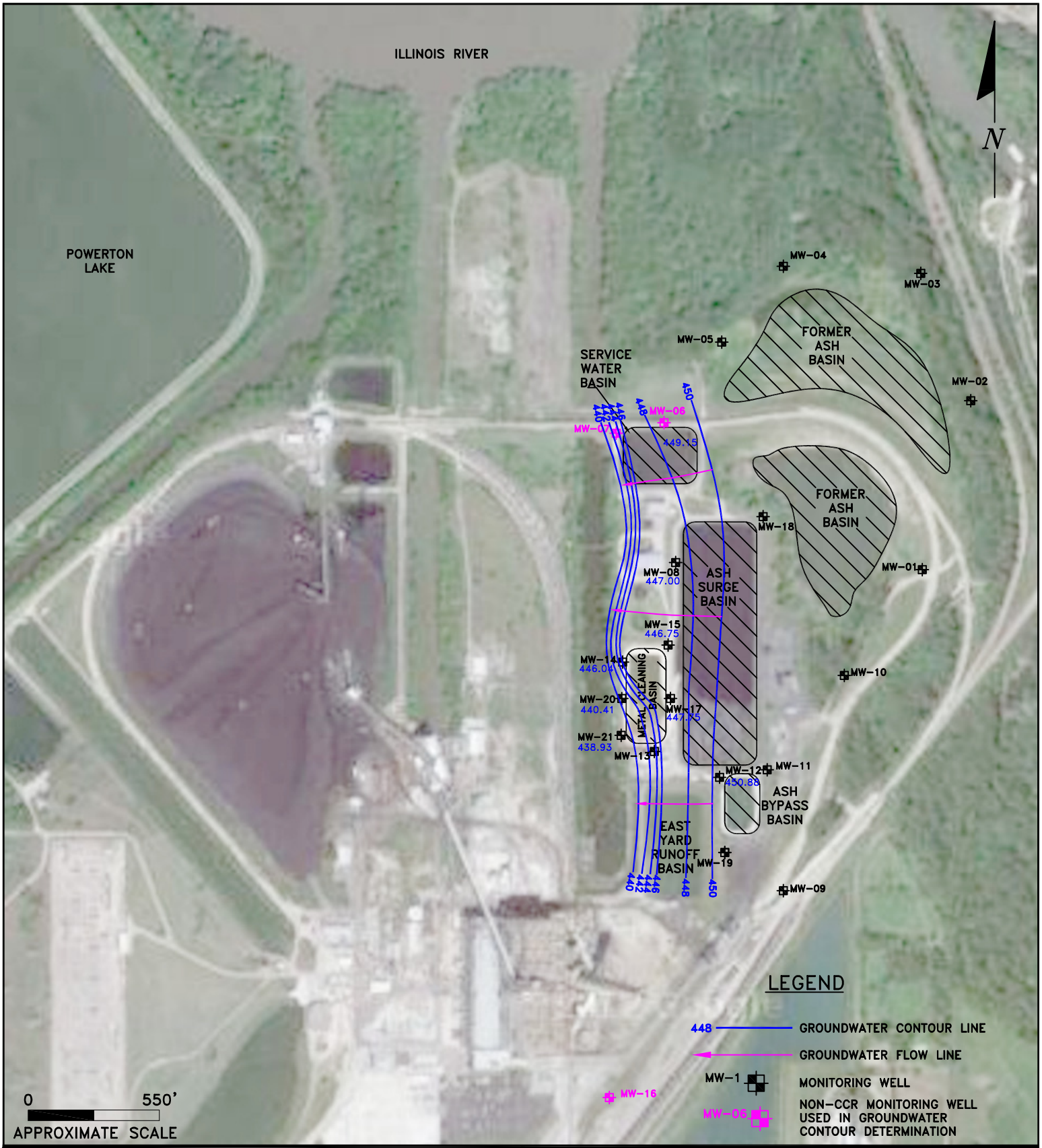
GROUNDWATER CONTOUR MAP FOR GRAVELLY SAND UNIT 05/2021

POWERTON STATION
PEKIN, ILLINOIS

Scale: 1" = 550' | Date: August 31, 2021

KPRG Project No. 19520.1 | FIGURE 9-16



ENVIRONMENTAL CONSULTATION & REMEDIATION

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GROUNDWATER CONTOUR MAP FOR SILT/CLAY UNIT 05/2021

POWERTON STATION
PEKIN, ILLINOIS

Scale: 1" = 550' | Date: August 31, 2021

KPRG Project No. 19520.1 | FIGURE 9-17



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GROUNDWATER MANAGEMENT ZONE FOR CCR SURFACE IMPOUNDMENTS

POWERTON STATION
PEKIN, ILLINOIS

Scale: 1" = 550' | Date: September 17, 2021

KPRG Project No. 19520.1 | Figure 9-18

W:\projects\midwest generation\ash pond issues\luc & gmz\powerton station gmz--former ash basin.dwg(proposed gmz)



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2500' RADIUS POTABLE WELL MAP

POWERTON STATION
PEKIN, ILLINOIS

Scale: 1" = 800' | Date: August 31, 2021

KPRG Project No. 19520.1 | FIGURE 9-19

W:\projects\midwest gen\operating and construct permits - various stations\POWERTON\POWERTON station.dwg

ATTACHMENT 9-0
GROUNDWATER MONITORING FIGURES & TABLES

TABLE	TITLE
TABLE 9-1	SUMMARY OF LOCAL PRECIPITATION DATA
TABLE 9-2	ASH BYPASS BASIN AND ASH SURGE BASIN GROUNDWATER ELEVATIONS
TABLE 9-3	*NOT USED*
TABLE 9-4	HYDRAULIC GRADIENT, DIRECTION AND SEEPAGE VELOCITY
TABLE 9-5	GROUNDWATER ANALYTICAL RESULTS
TABLE 9-6	*NOT USED*
TABLE 9-7	ASH BYPASS BASIN AND ASH SURGE BASIN TURBIDITY MEASUREMENT DATA
TABLE 9-8	*NOT USED*
TABLE 9-9	SUMMARY OF SAMPLE BOTTLES, PRESERVATION HOLDING TIME, AND ANALYTICAL METHODS

Table 9-1. Summary of Local Precipitation Data - Midwest Generation, LLC, Powerton Generating Station, Pekin, Illinois.

Powerton Station	
Month	**Average Monthly Precipitation* (inches)**
January	2.02
February	1.90
March	2.56
April	3.98
May	4.65
June	3.76
July	3.66
August	3.44
September	3.52
October	3.16
November	2.79
December	2.20

Notes:

* - Historical precipitation data was obtained from the National Oceanic and Atmospheric Administration. Precipitation data was averaged from thirteen stations located in and within close proximity to Pekin, Illinois. Dates of precipitation data range from 1991-2020.

Table 9-2. Ash Bypass Basin and Ash Surge Basin Groundwater Elevations - Midwest Generation, LLC, Powerton Station, Pekin, IL

Well ID	Date	Top of Casing Elevation (ft above MSL)	Depth to Groundwater (ft below TOC)	Groundwater Elevation (ft above MSL)
MW-01	11/16/2015	465.24	26.04	439.20
	2/22/2016	465.24	21.90	443.34
	5/16/2016	465.24	21.83	443.41
	8/15/2016	465.24	23.89	441.35
	11/14/2016	465.24	23.38	441.86
	2/13/2017	465.24	21.71	443.53
	5/1/2017	465.24	18.87	446.37
	6/20/2017	465.24	21.54	443.70
	8/25/2017	465.24	24.70	440.54
	11/8/2017	465.24	24.92	440.32
	5/17/2018	465.24	22.66	442.58
	8/8/2018	465.24	26.05	439.19
	10/30/2018	465.24	24.69	440.55
	4/29/2019	465.24	20.15	445.09
	11/11/2019	465.24	19.49	445.75
	4/27/2020	465.24	20.90	444.34
	12/7/2020	465.24	25.69	439.55
	4/7/2021	465.24	22.20	443.04
	5/10/2021	465.24	23.41	441.83
MW-08	11/16/2015	471.75	26.06	445.69
	2/22/2016	471.75	23.99	447.76
	5/16/2016	471.75	25.48	446.27
	8/15/2016	471.75	23.61	448.14
	11/14/2016	471.75	24.31	447.44
	2/13/2017	471.75	23.97	447.78
	5/1/2017	471.75	23.28	448.47
	6/20/2017	471.75	23.31	448.44
	8/29/2017	471.75	24.52	447.23
	11/8/2017	471.75	25.27	446.48
	5/17/2018	471.75	24.36	447.39
	8/8/2018	471.75	24.04	447.71
	10/31/2018	471.75	24.92	446.83
	4/29/2019	471.75	24.28	447.47
	11/11/2019	471.75	24.24	447.51
	4/27/2020	471.75	24.50	447.25
	12/7/2020	471.75	25.35	446.40
	4/7/2021	471.75	24.88	446.87
	5/10/2021	471.75	24.75	447.00
MW-09	11/16/2015	469.14	26.07	443.07
	2/22/2016	469.14	22.83	446.31
	5/16/2016	469.14	23.06	446.08
	8/15/2016	469.14	24.50	444.64
	11/14/2016	469.14	24.33	444.81
	2/13/2017	469.14	23.43	445.71
	5/1/2017	469.14	20.77	448.37
	6/20/2017	469.14	22.15	446.99
	8/25/2017	469.14	24.79	444.35
	11/8/2017	469.14	25.74	443.40
	5/16/2018	469.14	23.89	445.25
	8/8/2018	469.14	25.49	443.65
	11/1/2018	469.14	26.02	443.12
	4/29/2019	469.14	21.30	447.84
	11/11/2019	469.14	21.31	447.83
	4/27/2020	469.14	21.80	447.34
	12/7/2020	469.14	26.19	442.95
	4/7/2021	469.14	23.75	445.39
	5/10/2021	469.14	24.55	444.59

Table 9-2. Ash Bypass Basin and Ash Surge Basin Groundwater Elevations - Midwest Generation, LLC, Powerton Station, Pekin, IL

Well ID	Date	Top of Casing Elevation (ft above MSL)	Depth to Groundwater (ft below TOC)	Groundwater Elevation (ft above MSL)
MW-11	11/16/2015	471.62	31.67	439.95
	2/22/2016	471.62	28.34	443.28
	5/16/2016	471.62	27.11	444.51
	8/15/2016	471.62	29.64	441.98
	11/14/2016	471.62	29.19	442.43
	2/13/2017	471.62	27.49	444.13
	5/1/2017	471.62	24.34	447.28
	6/20/2017	471.62	26.94	444.68
	8/29/2017	471.62	30.42	441.20
	11/9/2017	471.62	30.27	441.35
	5/16/2018	471.62	28.58	443.04
	8/9/2018	471.62	31.04	440.58
	11/1/2018	471.62	30.82	440.80
	4/29/2019	471.62	25.38	446.24
	11/11/2019	471.62	24.88	446.74
	4/27/2020	471.62	26.35	445.27
	12/7/2020	471.62	31.35	440.27
	4/7/2021	471.62	27.85	443.77
	5/10/2021	471.62	29.19	442.43
MW-12	11/16/2015	473.38	24.48	448.90
	2/22/2016	473.38	21.41	451.97
	5/16/2016	473.38	22.94	450.44
	8/15/2016	473.38	23.85	449.53
	11/14/2016	473.38	23.89	449.49
	2/13/2017	473.38	21.93	451.45
	5/1/2017	473.38	22.26	451.12
	6/20/2017	473.38	22.76	450.62
	8/26/2017	473.38	23.92	449.46
	11/10/2017	473.38	24.29	449.09
	5/16/2018	473.38	22.46	450.92
	8/9/2018	473.38	23.78	449.60
	11/1/2018	473.38	23.74	449.64
	4/29/2019	473.38	22.05	451.33
	11/11/2019	473.38	22.85	450.53
	4/27/2020	473.38	21.44	451.94
	12/7/2020	473.38	22.70	450.68
	4/7/2021	473.38	21.91	451.47
	5/10/2021	473.38	22.50	450.88
MW-15	11/16/2015	471.37	25.33	446.04
	2/22/2016	471.37	22.91	448.46
	5/16/2016	471.37	24.71	446.66
	8/15/2016	471.37	23.45	447.92
	11/14/2016	471.37	23.94	447.43
	2/13/2017	471.37	23.73	447.64
	5/1/2017	471.37	23.27	448.10
	6/20/2017	471.37	22.86	448.51
	8/29/2017	471.37	23.13	448.24
	11/10/2017	471.37	25.13	446.24
	5/17/2018	471.37	23.85	447.52
	8/9/2018	471.37	23.96	447.41
	10/31/2018	471.37	24.55	446.82
	4/29/2019	471.37	23.57	447.80
	11/11/2019	471.37	23.79	447.58
	4/27/2020	471.37	23.95	447.42
	12/7/2020	471.37	25.01	446.36
	4/7/2021	471.37	24.44	446.93
	5/10/2021	471.37	24.62	446.75

Table 9-2. Ash Bypass Basin and Ash Surge Basin Groundwater Elevations - Midwest Generation, LLC, Powerton Station, Pekin, IL

Well ID	Date	Top of Casing Elevation (ft above MSL)	Depth to Groundwater (ft below TOC)	Groundwater Elevation (ft above MSL)
MW-17	11/16/2015	467.75	26.92	440.83
	2/22/2016	467.75	19.86	447.89
	5/16/2016	467.75	20.42	447.33
	8/15/2016	467.75	21.61	446.14
	11/14/2016	467.75	21.39	446.36
	2/13/2017	467.75	19.66	448.09
	5/1/2017	467.75	18.78	448.97
	6/20/2017	467.75	19.42	448.33
	8/29/2017	467.75	22.68	445.07
	11/6/2017	467.75	24.66	443.09
	5/14/2018	467.75	19.79	447.96
	8/6/2018	467.75	21.03	446.72
	10/29/2018	467.75	21.98	445.77
	4/29/2019	467.75	18.75	449.00
	11/11/2019	467.75	19.60	448.15
	4/27/2020	467.75	19.15	448.60
	12/7/2020	467.75	24.12	443.63
	4/7/2021	467.75	19.69	448.06
	5/10/2021	467.75	20.00	447.75
MW-18	11/16/2015	469.28	28.42	440.86
	2/22/2016	469.28	27.96	441.32
	5/16/2016	469.28	25.57	443.71
	8/15/2016	469.28	27.86	441.42
	11/14/2016	469.28	27.39	441.89
	2/13/2017	469.28	25.06	444.22
	5/1/2017	469.28	22.49	446.79
	6/20/2017	469.28	24.97	444.31
	8/28/2017	469.28	27.30	441.98
	11/6/2017	469.28	26.33	442.95
	5/14/2018	469.28	24.65	444.63
	8/6/2018	469.28	25.67	443.61
	10/29/2018	469.28	25.79	443.49
	4/29/2019	469.28	23.00	446.28
	11/11/2019	469.28	23.94	445.34
	4/27/2020	469.28	23.97	445.31
	12/7/2020	469.28	27.82	441.46
	4/7/2021	469.28	24.94	444.34
	5/10/2021	469.28	25.96	443.32
MW-19	11/14/2016	465.07	22.65	442.42
	2/13/2017	465.07	21.27	443.80
	5/1/2017	465.07	18.39	446.68
	6/20/2017	465.07	20.44	444.63
	8/28/2017	465.07	23.60	441.47
	11/9/2017	465.07	23.80	441.27
	5/14/2018	465.07	22.08	442.99
	8/6/2018	465.07	24.14	440.93
	10/29/2018	465.07	24.31	440.76
	4/29/2019	465.07	19.12	445.95
	11/11/2019	465.07	18.80	446.27
	4/27/2020	465.07	19.94	445.13
	12/7/2020	465.07	24.63	440.44
	4/7/2021	465.07	21.60	443.47
	5/10/2021	465.07	22.75	442.32

MSL - Mean Sea Level
TOC - Top of Casing

Table 9-4. Hydraulic Gradient, Direction and Seepage Velocity. Midwest Generation, LLC, Powerton Station, Pekin, IL.

DATE	Screened Unit	Groundwater Flow Direction	K_{avg} (ft/sec)*	Average Hydraulic Gradient (ft/ft)	Porosity (unitless)**	Estimated Seepage Velocity (ft/day)
11/16/2015	Silt/clay	Westerly	6.380E-07	0.0093	0.4	0.001
11/16/2015	Sandy	North-Northwest	1.390E-03	0.0026	0.35	0.87
2/22/2016	Silt/clay	Westerly	6.380E-07	0.0098	0.4	0.001
2/22/2016	Sandy	North-Northwest	1.390E-03	0.0030	0.35	1.03
5/16/2016	Silt/clay	Westerly	6.380E-07	0.0124	0.4	0.002
5/16/2016	Sandy	North-Northwest	1.390E-03	0.0021	0.35	0.72
8/15/2016	Silt/clay	Westerly	6.380E-07	0.0093	0.4	0.001
8/15/2016	Sandy	North-Northwest	1.390E-03	0.0014	0.35	0.48
11/14/2016	Silt/clay	Westerly	6.380E-07	0.0083	0.4	0.001
11/14/2016	Sandy	North-Northwest	1.390E-03	0.0014	0.35	0.48
2/13/2017	Silt/clay	Westerly	6.380E-07	0.0091	0.4	0.001
2/13/2017	Sandy	Northeasterly - Northwesterly	1.390E-03	0.0049	0.35	1.68
5/1/2017	Silt/clay	Westerly	6.380E-07	0.0100	0.4	0.001
5/1/2017	Sandy	Northeasterly - Northwesterly	1.390E-03	0.0021	0.35	0.72
6/20/2017	Silt/clay	Westerly	6.380E-07	0.0088	0.4	0.001
6/20/2017	Sandy	Northeasterly - Northwesterly	1.390E-03	0.0057	0.35	1.96
8/25/2017	Silt/clay	Westerly	6.380E-07	0.0214	0.4	0.003
8/25/2017	Sandy	North-Northwest	1.390E-03	0.0174	0.35	5.97
11/8/2017	Silt/clay	Westerly	6.380E-07	0.0267	0.4	0.004
11/8/2017	Sandy	North-Northwest	1.390E-03	0.0157	0.35	5.39
5/17/2018	Silt/clay	Westerly	6.380E-07	0.0070	0.4	0.0010
5/17/2018	Sandy	North-Northwest	1.390E-03	0.0042	0.35	1.44
8/7/2018	Silt/clay	Westerly	6.380E-07	0.0263	0.4	0.004
8/7/2018	Sandy	North-Northwest	1.390E-03	0.0037	0.35	1.27
4/29/2019	Silt/clay	Westerly	6.380E-07	0.0129	0.4	0.0018
4/29/2019	Sandy	North-Northwest	1.390E-03	0.0022	0.35	0.75
11/11/2019	Silt/clay	Westerly	6.380E-07	0.0114	0.4	0.0016
11/11/2019	Sandy	North-Northwest	1.390E-03	0.0008	0.35	0.27
4/27/2020	Silt/clay	Westerly	6.380E-07	0.0114	0.4	0.0016
4/27/2020	Sandy	Northeasterly - Northwesterly	1.390E-03	0.0023	0.35	0.79
12/7/2020	Silt/clay	Westerly	6.380E-07	0.0137	0.4	0.0019
12/7/2020	Sandy	Northeasterly - Northwesterly	1.390E-03	0.0037	0.35	1.27
5/10/2021	Silt/clay	Westerly	6.380E-07	0.0208	0.4	0.0029
5/10/2021	Sandy	North-Northwest	1.390E-03	0.0041	0.35	1.41

* K_{avg} - See text discussion in Section 9.1.2 for average hydraulic conductivity values used (feet/second).
** - Porosity estimates from Applied Hydrogeology, Fetter, 1980.

Table 9-5 Groundwater Analytical Results - Midwest Generation, LLC, Powerton Station, Pekin, IL Ash By-Pass Basin Ash Surge Basin

Well	Date	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Radium 226 + 228	Selenium	Thallium
MW-01 (S) up-gradient	11/16/2015	1.0	98	44	0.17	7.07	93	530	< 0.003	< 0.001	0.057	^< 0.001	< 0.0005	< 0.005	< 0.001	* < 0.0005	< 0.01	< 0.0002	< 0.0050	0.744	< 0.0025	* < 0.002
	2/25/2016	0.2	110	42	0.16	7.23	54	460	< 0.003	0.0025	0.053	< 0.001	< 0.0005	< 0.005	0.0014	0.0019	< 0.01	< 0.0002	< 0.005	< 0.722	0.0029	< 0.002
	5/20/2016	0.34	100	44	0.17	6.95	65	430	< 0.003	0.0081	0.062	< 0.001	< 0.0005	0.007	0.0053	0.011	< 0.01	< 0.0002	< 0.005	< 0.953	< 0.0025	< 0.002
	8/17/2016	0.27	78	39	0.25	7.16	50	530	< 0.003	0.0014	0.048	< 0.001	< 0.0005	< 0.005	< 0.001	0.0014	< 0.010	< 0.0002	0.0057	< 0.491	< 0.0025	< 0.002
	11/16/2016	0.18	97	39	0.21	7.22	32	500	< 0.003	0.0051	0.056	< 0.001	< 0.0005	< 0.005	0.0044	0.0082	< 0.01	< 0.0002	0.0059	< 0.618	< 0.0025	< 0.002
	2/14/2017	0.18	120	55	0.17	7.30	60	550	< 0.003	0.0041	0.056	< 0.001	< 0.0005	< 0.005	0.0045	0.0076	< 0.01	< 0.0002	0.0056	< 0.837	< 0.0025	< 0.002
	5/3/2017	0.19	86	66	0.16	7.41	45	460	< 0.003	0.0015	0.045	< 0.001	< 0.0005	< 0.005	0.0033	0.0067	< 0.01	< 0.0002	< 0.005	0.574	< 0.0025	< 0.002
	6/21/2017	0.18	85	58	0.18	7.60	47	540	< 0.003	< 0.001	0.04	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0061	< 0.418	< 0.0025	< 0.002
	8/25/2017	0.56	86	41	0.18	7.41	63	490	< 0.003	< 0.001	0.049	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0059	0.775	< 0.0025	< 0.002
	11/8/2017	0.57	130	38	0.12	6.69	61	640	< 0.003	< 0.001	0.083	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.343	< 0.0025	< 0.002
	5/17/2018	0.15	88	50	0.12	6.7	48	540	< 0.003	< 0.001	0.045	< 0.001	< 0.0005	< 0.005	< 0.001	0.00068	< 0.01	< 0.0002	< 0.005	< 0.396	< 0.0025	< 0.002
	8/8/2018	0.14	86	48	0.13	6.8	43	430	< 0.003	< 0.001	0.051	<^ 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.579	< 0.0025	< 0.002
	4/30/2019	0.07	78	54	0.17	7.2	27	450	< 0.003	0.0014	0.039	< 0.001	< 0.0005	< 0.005	< 0.001	0.0017	< 0.01	< 0.0002	< 0.005	< 0.656	< 0.0025	< 0.002
	11/13/2019	0.52	95	47	0.18	7.51	41	390	NA	0.029	0.091	NA	0.00085	NA	0.016	0.034	0.012	< 0.0002	0.0079	0.884	< 0.0025	< 0.002
	12/26/2019	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0021	0.0041	NA	NA	NA	NA	NA	NA
	4/28/2020	0.33	110	46	0.19	7.17	41	470	NA	< 0.001	0.051	NA	< 0.0005	NA	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.628	< 0.0025	< 0.002
	12/7/2020	0.6	100	54	0.25	7.22	55	490	NA	< 0.001	0.058	NA	< 0.0005	NA	< 0.001	0.00055	<^ 0.01	< 0.0002	0.0051	0.724	< 0.0025	< 0.002
	5/11/2021	0.23	84	53	0.2	7.52	38	450	< 0.003	< 0.001	0.043	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.01	< 0.523	< 0.0025	< 0.002
MW-09 (S) up-gradient	11/18/2015	2.0	63	H 31	H 0.19	7.15	H 110	H 440	< 0.003	< 0.001	0.027	^< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	H < 0.0002	0.043	< 0.655	< 0.0025	< 0.002
	2/25/2016	2.3	77	36	0.19	7.34	120	500	< 0.003	0.0042	0.036	< 0.001	< 0.0005	< 0.005	0.0011	< 0.0005	< 0.01	< 0.0002	0.053	< 0.361	< 0.0025	< 0.002
	5/19/2016	2.0	73	38	0.17	7.30	100	520	< 0.003	< 0.001	0.029	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.042	< 0.394	0.0032	< 0.002
	8/17/2016	2.7	74	39	0.15	7.32	120	750	< 0.003	< 0.001	0.031	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.036	< 0.498	< 0.0025	< 0.002
	11/17/2016	4.5	85	38	0.13	7.37	110	630	< 0.003	0.0038	0.039	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.036	0.646	0.0025	< 0.002
	2/15/2017	4.1	84	38	0.13	6.94	160	620	< 0.003	0.0032	0.043	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.035	< 0.377	0.0062	< 0.002
	5/3/2017	3.5	85	38	0.17	7.48	170	680	< 0.003	0.0012	0.034	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.034	< 0.445	0.011	< 0.002
	6/21/2017	3.3	82	38	0.14	7.63	180	760	< 0.003	< 0.001	0.037	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.033	< 0.380	0.0072	< 0.002
	8/25/2017	3.8	85	36	0.14	7.30	150	630	< 0.003	< 0.001	0.044	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.028	< 0.160	0.0043	< 0.002
	11/8/2017	4	89	37	0.13	6.92	190	650	< 0.003	0.0012	0.048	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.026	0.344	< 0.0025	< 0.002
	5/16/2018	4.1	89	36	0.15	7.83	180	550	< 0.003	< 0.001	0.038	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	0.00029	0.031	< 0.424	0.006	< 0.002
	8/8/2018	4.3	86	39	0.14	7.31	180	690	< 0.003	< 0.001	0.037	<^ 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.032	0.44	0.0078	< 0.002
	5/1/2019	4.6	79	37	0.17	7.11	170	640	< 0.003	< 0.001	0.038	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.031	< 0.66	0.0036	< 0.002
	11/14/2019	2.5	85	36	0.18	7.49	82	500	NA	0.0056	0.057	NA	< 0.0005	NA	0.0032	0.00076	< 0.010	< 0.0002	0.026	< 0.457	< 0.0025	< 0.002
	4/29/2020	2	71	34	0.2	7.19	140	510	NA	0.0012	0.031	NA	< 0.0005	NA	< 0.001	< 0.0005	< 0.010	< 0.0002	0.028	0.698	< 0.0025	< 0.002
	12/8/2020	2.6	65	34	0.22	7.29	63	400	NA	0.0013	0.042	NA	< 0.0005	NA	< 0.001	< 0.0005	< 0.010	< 0.0002	0.025	< 0.479	< 0.0025	< 0.002
	5/13/2021	2	74	33	0.2	7.33	120	410	< 0.003	< 0.001	0.035	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.025	< 0.612	< 0.0025	< 0.002
MW-19^ (S) up-gradient	11/18/2016	3.8	89	38	0.13	7.34	120	670	< 0.003	< 0.001	0.084	< 0.001	< 0.0005	< 0.005	0.001	0.00068	< 0.01	< 0.0002	0.035	< 0.476	0.0043	< 0.002
	2/15/2017	4.7	88	37	0.13	7.50	180	630	< 0.003	< 0.001	0.088	< 0.001	< 0.0005	< 0.005	< 0.001	0.00061	< 0.01	< 0.0002	0.046	< 0.482	0.0063	< 0.002
	5/5/2017	3.3	88	38	0.14	7.51	160	640	< 0.003	< 0.001	0.076	< 0.001	< 0.0005	< 0.005	0.0013	0.0012	< 0.01	< 0.0002	0.035	0.923	0.0068	< 0.002
	6/21/2017	2.3	110	35	0.12	7.30	170	690	< 0.003	< 0.001	0.089	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.024	< 0.334	0.0028	< 0.002
	8/28/2017	3.5	97	36	0.16	7.20	160	700	< 0.003	< 0.001	0.073	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.041	0.370	0.0035	< 0.002
	11/6/2017	4.5	86	35	0.17	7.26	190	640	< 0.003	< 0.001	0.071	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.042	0.360	< 0.0025	< 0.002
	5/14/2018	4.1	96	35	0.16	7.52	180	820	< 0.003	< 0.001	0.079	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.043	0.562	0.0044	< 0.002
	8/6/2018	3.8	100	37	0.13	7.57	170	720	< 0.003	< 0.001	0.078	<^ 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.032	0.835	0.0052	< 0.002
	5/2/2019	3.7	100	39	0.13	6.86	160	700	< 0.003	< 0.001	0.076	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.03	< 0.431	0.0035	< 0.002
	11/13/2019	2.5	130	53	0.15	7.51	140	740	NA	0.0014	0.100	NA	< 0.0005	NA	< 0.001	0.00056	< 0.01	< 0.0002	0.04	< 0.447	< 0.0025	< 0.002
	4/27/2020	2.3	100	43	0.17	6.87	110	570	NA	< 0.001	0.077	NA	< 0.0005	NA	< 0.001	< 0.0005	< 0.01	< 0.0002	0.04	0.630	< 0.0025	< 0.002
	12/7/2020	3.3	74	34	0.19	7.30	F1 76	420	NA	< 0.001	0.062	NA	< 0.0005	NA	< 0.001	< 0.0005	<^ 0.01	< 0.0002	0.05	< 0.509	< 0.0025	< 0.002
	5/10/2021	2.3	68	33	0.17	7.36	110	420	< 0.003	< 0.001	0.060	< 0.001	< 0.0005	< 0.0005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.05	< 0.524	< 0.0025	< 0.002
MW-08 (CL) down-gradient	11/18/2015	1.5	160	H 170	H 0.44	7.61	H 470	H 1300	< 0.003	0.0029	0.15	^< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.028	H < 0.0002	0.01	< 0.559	< 0.0025	< 0.002
	2/25/2016	1.7	160	200	0.30	7.00	280	1100	< 0.003	0.0018	0.11	< 0.001	0.00052	< 0.005	< 0.001	0.00072	0.015	< 0.0002	0.02	0.535	< 0.0025	< 0.002
	5/18/2016	1.7	160	140	0.34	7.67	300	1200	< 0.003	0.0029	0.16	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.036	< 0.0002	0.0069	0.417	< 0.0025	< 0.002
	8/17/2016	1.0	150	230	0.35	7.33	360	1400	< 0.003	0.0032	0.15	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.023	< 0.0002	0.013	< 0.519	< 0.0025	< 0.002
	11/15/2016	1.2	140	290	0.33	6.90	230	1300	< 0.003	0.0012	0.076	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.016	0.583	< 0.0025	< 0.002
	2/16/2017	1.5	150	460	0.28	7.00	230	1500	< 0.003	0.003	0.086	< 0.001	< 0.0005	< 0.005	< 0.001	0.00087	< 0.01	< 0.0002	0.026	< 0.375	< 0.0025	< 0.002
	5/2/2017	0.55	140	300	0.33	7.30	320	1300	< 0.003	0.0029	0.13	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.022	< 0.0002	0.0083	< 0.480	< 0.0025	< 0.002
	6/21/2017	1.2	160	490	0.30	7.27	350	1700	< 0.003	0.0045	0.14	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.031	< 0.439	< 0.0025	< 0.002
	8/29/2017	1.2	150	360	0.47	7.29	300	1500	< 0.003	0.0011	0.062	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.034	0.699	< 0.0025	< 0.002
	11/8/2017	0.68	130	260	0.45	7.27	270	1200	< 0.003	0.0027	0.10	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.019	< 0.0002	0.014	0.806	< 0.0025	< 0.002
	5/17/2018	1.2	130	200	0.37	6.79	170	1000	< 0.003	0.003	0.07	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.024	0.655	< 0.0025	< 0.002
	8/8/2018	1.1	140	270	0.32	6.93	190	1200	< 0.003	0.0055	0.07	<^ 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.019	< 0.410	< 0.0025	< 0.002
	5/1/2019	0.54	95	73	0.35	7.60	85	600	< 0.003	0.0018	0.07	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.021	< 0.0002	0.0069	0.892	< 0.0025	< 0.002
	11/13/2019	0.98	110	92	0.33	7.66	110	640	NA	0.0025	0.087	NA	< 0.0005	NA	< 0.001	0.00094	0.022	< 0.0002	0.013	< 0.498	< 0.0025	< 0.002
	4/28/2020	0.74	110	120	0.38	7.58	58	660	NA	0.0026	0.095	NA	< 0.0005	NA	< 0.001	< 0.0005	0.026	< 0.0002	0.011	< 0.450	< 0.0025	< 0.002
	12/14/2020	0.73	120	150	0.38	7.40	92	530	NA	0.0024	0.110	NA	< 0.0005	NA	< 0.001	0.00093	0.03	< 0.0002	0.012	1.310	< 0.0025	< 0.002
	5/11/2021	0.54	97	120	0.39	7.64	110	680	< 0.003	0.002	0.092	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.021	< 0.0002	0.011	< 0.695	< 0.0025	< 0.002

Notes: All units are in mg/l except pH is in standard units.
F1 - MS and/or MSD Recovery outside of limits.
H - Sample was prepped or analyzed beyond the specified holding time.
V- Serial dilution exceeds control limits.
* - LCS or LCSD is outside acceptance limits.
^ - Denotes instrument related QC exceeds the control limits
(R) - Resample Event
NA - Not Analyzed

R000411

Table 9-5 Groundwater Analytical Results - Midwest Generation, LLC, Powerton Station, Pekin, IL Ash By-Pass Basin Ash Surge Basin

Well	Date	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Radium 226 + 228	Selenium	Thallium
MW-11 (S) down-gradient	11/18/2015	1.7	110	H 54	H 0.55	7.06	H 160	H 670	< 0.003	0.017	0.18	^< 0.001	< 0.0005	< 0.005	0.002	< 0.0005	< 0.01	H< 0.0002	0.0120	0.788	< 0.0025	< 0.002
	2/26/2016	1.5	140	120	0.55	7.25	220	850	< 0.003	0.023	0.23	< 0.001	< 0.0005	< 0.005	0.0023	< 0.0005	< 0.01	< 0.0002	0.013	0.562	< 0.0025	< 0.002
	5/20/2016	1.6	140	120	0.56	7.10	210	920	< 0.003	0.027	0.26	< 0.001	< 0.0005	< 0.005	0.0024	0.00076	< 0.01	< 0.0002	0.014	0.524	< 0.0025	< 0.002
	8/17/2016	1.0	130	93	0.67	7.08	180	910	< 0.003	F1 0.29	1.4	< 0.001	< 0.0005	< 0.005	0.0034	0.001	< 0.010	< 0.0002	0.011	1.130	< 0.0025	< 0.002
	11/17/2016	1.2	140	130	0.44	7.21	240	1100	< 0.003	0.071	0.44	< 0.001	< 0.0005	< 0.005	0.0037	0.0013	< 0.01	< 0.0002	0.0088	0.734	< 0.0025	< 0.002
	2/16/2017	1.6	140	110	0.40	6.62	260	910	< 0.003	0.04	0.3	< 0.001	< 0.0005	< 0.005	0.003	0.00094	< 0.01	< 0.0002	0.013	0.341	< 0.0025	< 0.002
	5/3/2017	1.3	160	160	0.42	7.36	440	1300	< 0.003	0.039	0.26	< 0.001	< 0.0005	< 0.005	0.0035	0.00093	< 0.01	< 0.0002	0.015	0.662	< 0.0025	< 0.002
	6/22/2017	1.2	140	120	0.60	7.21	260	1000	< 0.003	0.07	0.36	< 0.001	< 0.0005	< 0.005	0.0025	< 0.0005	< 0.01	< 0.0002	0.014	< 0.418	< 0.0025	< 0.002
	8/29/2017	2.2	130	83	0.52	7.23	310	1100	< 0.003	0.017	0.21	< 0.001	< 0.0005	< 0.005	0.0026	< 0.0005	< 0.01	< 0.0002	0.016	< 0.313	< 0.0025	< 0.002
	11/9/2017	1.5	140	100	0.59	6.96	230	970	< 0.003	0.092	0.54	< 0.001	< 0.0005	< 0.005	0.0034	< 0.0005	< 0.01	< 0.0002	0.014	1.24	< 0.0025	< 0.002
	5/16/2018	2.0	140	88	0.61	7.89	270	1000	< 0.003	0.089	0.47	< 0.001	< 0.0005	< 0.005	0.0041	< 0.0005	< 0.01	< 0.0002	0.014	1.12	< 0.0025	< 0.002
	8/9/2018	1.4	160	120	0.65	7.24	220	1000	< 0.003	0.68	3.0	<^ 0.0010	0.0008	< 0.005	0.0053	0.0012	< 0.01	< 0.0002	0.013	1.48	< 0.0025	< 0.002
	5/1/2019	2.3	110	60	0.62	7.08	200	730	< 0.003	0.11	0.6	< 0.001	< 0.0005	< 0.005	0.0026	0.0011	< 0.01	< 0.0002	0.014	1.59	< 0.0025	< 0.002
	11/14/2019	1.8	120	83	0.55	7.43	150	890	NA	0.14	0.72	NA	< 0.0005	NA	0.0041	0.0021	< 0.01	< 0.0002	0.02	2.64	< 0.0025	< 0.002
	4/29/2020	1.2	100	110	0.62	7.08	320	950	NA	0.019	0.21	NA	< 0.0005	NA	0.0019	< 0.0005	< 0.01	< 0.0002	0.024	0.47	< 0.0025	< 0.002
	12/8/2020	0.7	86	94	0.67	7.26	200	650	NA	0.027	0.26	NA	< 0.0005	NA	0.0021	< 0.0005	< 0.01	< 0.0002	0.03	< 0.523	< 0.0025	< 0.002
	5/11/2021	1.0	99	130	0.72	7.26	230	820	< 0.003	0.024	0.25	< 0.001	< 0.0005	< 0.005	0.0019	< 0.0005	0.012	< 0.0002	0.032	1.59	< 0.0025	< 0.002
MW-12 (CL) down-gradient	11/19/2015	0.94	160	H 220	H 0.57	7.12	H 650	H 1400	< 0.003	0.10	0.180	^< 0.001	0.00068	< 0.005	< 0.001	0.00063	0.023	H< 0.0002	0.0280	< 0.685	< 0.0025	< 0.002
	2/26/2016	0.42	130	200	0.40	7.96	530	1200	< 0.003	0.077	0.130	< 0.001	0.0016	< 0.005	< 0.001	0.0014	0.014	< 0.0002	0.0150	1.11	< 0.0025	< 0.002
	5/20/2016	0.65	150	200	0.49	7.28	550	1400	< 0.003	0.065	0.16	F1 < 0.001	0.00077	< 0.005	< 0.001	0.0016	0.013	< 0.0002	0.028	0.576	< 0.0025	< 0.002
	8/18/2016	0.69	170	200	0.49	7.06	620	1600	< 0.003	0.33	0.88	0.0013	0.007	< 0.005	0.001	0.0011	0.015	< 0.0002	0.011	3.68	< 0.0025	< 0.002
	11/18/2016	0.83	140	180	0.46	7.34	340	1300	< 0.003	0.23	0.67	< 0.001	0.0028	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	< 0.01	1.86	< 0.0025	< 0.002
	2/16/2017	0.48	140	190	0.37	7.54	630	1300	< 0.003	0.29	0.26	< 0.001	0.0057	< 0.005	0.0013	0.0042	0.010	< 0.0002	0.015	1.15	< 0.0025	< 0.002
	5/3/2017	0.49	120	190	0.37	7.47	500	1200	< 0.003	0.10	0.17	< 0.001	0.0022	< 0.005	< 0.001	0.0038	0.011	< 0.0002	0.017	0.518	< 0.0025	< 0.002
	6/22/2017	0.50	130	190	0.48	7.36	580	1400	< 0.003	0.025	0.11	< 0.001	< 0.0005	< 0.005	< 0.001	0.00096	< 0.010	< 0.0002	0.028	0.376	< 0.0025	< 0.002
	8/29/2017	0.78	140	180	0.52	7.34	520	1400	< 0.003	0.02	0.095	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.014	< 0.0002	0.024	0.529	< 0.0025	< 0.002
	11/10/2017	0.94	130	170	0.48	7.38	370	1200	< 0.003	0.50	0.45	< 0.001	0.0015	< 0.005	< 0.001	0.00097	0.018	< 0.0002	0.023	1.67	< 0.0025	< 0.002
	5/16/2018	0.46	100	180	0.47	8.12	720	1500	< 0.003	0.09	0.1	< 0.001	0.00052	< 0.005	< 0.001	0.00067	0.012	< 0.0002	0.021	0.741	< 0.0025	< 0.002
	8/9/2018	0.61	120	190	0.44	7.42	480	1300	< 0.003	0.12	0.15	<^ 0.001	0.00084	< 0.005	< 0.001	0.00072	< 0.010	< 0.0002	0.026	0.735	< 0.0025	< 0.002
	5/1/2019	0.4	100	170	0.38	7.68	330	1000	< 0.003	0.04	0.13	< 0.001	0.00054	< 0.005	< 0.001	0.0012	0.014	< 0.0002	0.011	0.666	< 0.0025	< 0.002
	11/14/2019	0.74	120	160	0.45	7.61	280	1100	NA	0.026	0.072	NA	< 0.0005	NA	< 0.001	< 0.0005	0.014	< 0.0002	0.027	0.568	< 0.0025	< 0.002
	4/29/2020	0.34	71	150	0.34	7.96	360	980	NA	0.003	0.034	NA	< 0.0005	NA	< 0.001	< 0.0005	0.012	< 0.0002	0.015	0.578	< 0.0025	< 0.002
	12/8/2020	0.61	92	160	0.56	7.36	320	990	NA	0.025	0.069	NA	< 0.0005	NA	< 0.001	< 0.0005	0.012	< 0.0002	0.027	< 0.476	< 0.0025	< 0.002
	5/13/2021	0.4	89	140	0.23	7.39	350	990	< 0.003	0.0025	0.058	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.016	0.563	< 0.0025	< 0.002
MW-15 (CL) down-gradient	11/18/2015	1.5	270	H 210	H 0.53	6.55	H 1400	H 2400	< 0.003	0.03	0.096	^< 0.001	0.00061	< 0.005	< 0.001	< 0.0005	0.042	H< 0.0002	0.023	< 0.599	0.0065	< 0.002
	2/25/2016	2.0	240	110	0.61	6.84	640	1700	< 0.003	0.025	0.083	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.041	< 0.0002	0.035	0.870	0.045	< 0.002
	5/19/2016	2.7	320	240	0.53	6.83	1200	2800	< 0.003	0.04	0.097	< 0.001	0.00098	< 0.005	< 0.001	< 0.0005	0.044	< 0.0002	0.041	< 0.420	0.0067	< 0.002
	8/18/2016	1.5	200	F1 170	0.54	6.96	660	1900	< 0.003	0.13	0.11	< 0.001	0.0041	< 0.005	< 0.001	< 0.0005	0.028	< 0.0002	0.027	< 0.672	0.0061	< 0.002
	11/17/2016	1.3	120	180	0.47	6.91	560	1900	< 0.003	0.0033	0.031	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.016	< 0.0002	0.018	< 0.570	0.0078	< 0.002
	2/17/2017	1.9	200	190	0.43	7.24	670	1700	< 0.003	0.02	0.056	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.025	< 0.0002	0.027	< 0.392	0.0032	< 0.002
	5/4/2017	1.5	180	190	0.57	7.35	670	1700	< 0.003	0.011	0.049	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.023	< 0.0002	0.023	< 0.456	0.0034	< 0.002
	6/21/2017	1.6	180	200	0.56	7.30	530	1600	< 0.003	0.0093	0.054	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.027	< 0.0002	0.03	< 0.347	0.019	< 0.002
	8/29/2017	2.2	190	200	0.53	6.87	540	1800	< 0.003	0.0018	0.044	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.023	< 0.0002	0.032	0.377	0.0092	< 0.002
	11/10/2017	1.6	170	180	0.63	7.09	530	1500	< 0.003	0.0063	0.046	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.025	< 0.0002	0.02	< 0.313	0.016	< 0.002
	5/17/2018	2.3	200	160	0.5	6.75	680	1800	< 0.003	0.0081	0.05	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.029	< 0.0002	0.03	0.397	0.077	< 0.002
	8/9/2018	2.3	200	200	0.48	7.06	520	1700	< 0.003	0.0083	0.048	<^ 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.026	< 0.0002	0.033	0.566	0.06	< 0.002
	5/2/2019	1.5	180	200	0.52	6.89	420	1500	< 0.003	0.0045	0.052	< 0.001	< 0.0005	< 0.005	< 0.0010	< 0.0005	0.027	< 0.0002	0.023	< 0.424	< 0.0025	< 0.002
	11/14/2019	1.8	170	170	0.5	7.24	260	1300	NA	0.0044	0.053	NA	< 0.0005	NA	< 0.0010	< 0.0005	0.029	< 0.0002	0.025	< 0.475	< 0.0025	< 0.002
	4/29/2020	1.2	160	200	0.58	6.90	370	1300	NA	0.0036	0.06	NA	< 0.0005	NA	< 0.0010	< 0.0005	0.027	< 0.0002	0.023	0.578	< 0.0025	< 0.002
	12/8/2020	1.5	170	200	0.55	7.04	540	1400	NA	0.02	0.1	NA	0.00059	NA	0.0012	< 0.0005	0.035	< 0.0002	0.02	0.626	0.012	< 0.002
	5/12/2021	1.3	180	180	0.54	6.97	520	1500	< 0.003	0.0048	0.065	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.026	< 0.0002	0.014	< 0.648	0.0071	< 0.002
MW-17 (CL) down-gradient	11/19/2015	1.6	210	H 230	H 0.43	7.11	H 850	H 1800	< 0.003	0.0028	0.14	^< 0.001	< 0.0005	< 0.005	0.0012	0.0012	0.019	H< 0.0002	0.035	< 0.790	< 0.0025	< 0.002
	2/22/2016	1.8	290	280	0.55	7.19	960	2100	< 0.003	0.021	0.051	< 0.001	< 0.0005	< 0.005	0.0012	< 0.0005	0.038	< 0.0002	0.042	0.093	1.07	< 0.002
	5/18/2016	1.4	200	230	0.64	7.02	700	1800	< 0.003	0.32	0.12	< 0.001	0.0011	< 0.005	0.0015	< 0.0005	0.026	< 0.0002	0.12	8.27	< 0.0025	0.0028
	8/15/2016	1.1	220	220	0.60	7.08	860	2100	< 0.003	0.34	0.12	< 0.001	0.001	< 0.005	0.0016	< 0.0005	0.022	< 0.0002	0.1	0.606	< 0.0025	0.0031
	11/14/2016	1.5	200	210	0.56	7.26	560	2000	< 0.003	0.19	0.073	< 0.001	0.00051	< 0.005	0.0012	< 0.0005	0.022	< 0.0002	0.042	3.76	< 0.0025	0.0021
	2/13/2017	1.6	190	230	0.56	6.84	770	1600	< 0.003	0.35	0.16	< 0.001	0.00093	< 0.005	0.0014	0.00079	0.019	< 0.0002	0.088	2.08	< 0.0025	0.0025
	5/4/2017	1.2	170	210	0.61	7.29	720	1500	< 0.003	0.24	0.39	0.0013	0.0023	< 0.005	0.0023	0.00066	0.016	< 0.0002	0.036	1.91	< 0.0025	0.0065
	6/22/2017	0.95	150	230	0.72	7.38	580	1600	< 0.003	0.41	0.13	< 0.001	0.0007	< 0.005	0.0012	0.0011	0.022	< 0.0002	0.11	1.21	< 0.0025	0.0022
	8/29/2017	1.4	190	230	0.64	7.19	640	1900	< 0.003	0.24	0.092	< 0.001	< 0.0005	< 0.005	< 0.001	0.00058	0.021	< 0.0002	0.13	3.32	< 0.0025	0.0025
	11/6/2017	1.7	190	240	0.62	7.27	840	1800	< 0.003	0.17	0.38	< 0.001	0.0022	< 0.005	0.0015	< 0.0005	< 0.01	< 0.0002	0.019	2.54	< 0.0025	0.0075
	5/14/2018	1.6	170	220	0.6	7.79	800	1700	< 0.003	0.42	0.17	< 0.001	0.002	< 0.005	0.0029	0.0021	0.015	< 0.0002	0.13	2.03	< 0.0025	0.0068
	8/6/2018	1.3	170	230	0.6	7.12	620	1600	< 0.003	0.087	0.055	<^ 0.001	0.00094	< 0.005	0.0015	< 0.0005	0.019	< 0.0002	0.084	1.34	< 0.0025	0.0023
	4/29/2019	0.98	150	190	0.66	7.25	660	1500	< 0.003	0.042	0.04	< 0.001	0.00052	< 0.005	< 0.001	0.00069	0.015	< 0.0002	0.06	0.517	< 0.0025	< 0.002
	11/13/2019	1.9	230	600	0.55	7.16	730	2300	NA	0.088	0.1	NA	0.0015	NA	0.0011	0.00093	0.021	< 0.0002	0.058	0.643	< 0.0025	0.0029
	4/27/2020	1.2	150	170	0.79	7.27	520	1300	NA	0.026	0.036	NA	< 0.0005	NA	< 0.001	0.00081	0.021	< 0.0002	0.075	0.498	< 0.0025	< 0.002
	12/7/2020	1.3	140	160	0.8	7.22	430	1100	NA	0.08	0.05	NA	0.001	NA	< 0.001	0.0011	0.022	< 0.0002	0.056	< 0.438	< 0.0025	< 0.002
	5/12/2021	0.99	130	160	0.77	7.52	480	1200	< 0.003	0.0053	0.027	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.018	< 0.0002	0.049	< 0.478	< 0.0025	< 0.002
MW-18 (S) down-gradient	11/19/2015	0.80	140	H 220	H 0.66	7.62	H 310	H 1200	< 0.003	0.0014	0.14	^< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	H< 0.0002	0.0051	< 0.845	< 0.0025	< 0.002
	2/22/2016	0.76	150	220	0.68	7.06	310	1200	< 0.003	0.0012	0.15	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.022	< 0.0002	0.0055	1.88	< 0.0025	< 0.002
	5/18/2016	0.72	120	230	0.71	7.68	230	1200	< 0.003	< 0.001	0.13	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.014	< 0.0002	0.0052	< 0.493	< 0.0025	< 0.002
	8/15/2016	0.67	130	210	0.64	7.52	330	1300	< 0.003	< 0.001	0.14	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.012	< 0.0002	0.0059	0.836	< 0.0025	< 0.002
	11/18/2016	0.94	130	200	0.58	7.69	250	1300	< 0.003	< 0.001	0.14	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.013	< 0.0002	0.0053	0.488	< 0.0025	< 0.002
	2/15/2017	0.56	140	190	0.50	7.81	340	1200	< 0.003	< 0.001	0.14	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.014	< 0.0002	0.0058	< 0.347	< 0.0025	< 0.002
	5/5/2017	0.46	130	180	0.52	8.12	360	1100	< 0.003	0.0032	0.12	< 0.001	< 0.0005	< 0.005	< 0.001	0.00057	0.01	< 0.0002	< 0.005	0.612	< 0.0025	< 0.002
	6/21/2017	0.53	120	190	0.51	8.10	320	1200	< 0.003	< 0.001	0.12	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.014	< 0.0002	0.0051	0.629	< 0.0025	< 0.002
	8/28/2017	0.65	120	200	0.53	7.81	310	1200	< 0.003	< 0.001	0.12	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.012	< 0.0002	0.005	0.498	< 0.0025	< 0.002
	11/6/2017	0.67	120	190	0.57	7.74	400	1200	< 0.003	< 0.001	0.12	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.011	< 0.0002	0.0057	0.755	< 0.0025	< 0.002
	5/14/2018	0.57	130	180	0.59	8.27	440	1200	< 0.003	< 0.001	0.13	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.013	< 0.0002	0.0052	0.641	< 0.0025	< 0.002
	8/6/2018	0.58	120	230	0.57	7.88	270	1100	< 0.003	< 0.001	0.12	<^ 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.013	< 0.0002	0.0052	1.02	< 0.0025	< 0.002
	4/29/2019	0.54	120	180	0.61	7.77	170	1000	< 0.003	< 0.001	0.12	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.013	< 0.0002	< 0.005	< 0.445	< 0.0025	< 0.002
	11/13/2019	0.79	130	180	0.56	8.26	210	1100	NA	0.0013	0.12	NA	< 0.0005	NA	< 0.001	< 0.0005	0.014	< 0.0002	< 0.005	< 0.49	< 0.0025	< 0.002
	4/27/2020	0.60	120	170	0.69	7.90	180	1000	NA	< 0.001	0.12	NA	< 0.0005	NA	< 0.001	< 0.0005	0.016	< 0.0002	< 0.005	< 0.526	< 0.0025	< 0.002
	12/7/2020	0.75	110	F1 150	0.70	7.70	160	910	NA	0.0032	0.11	NA	< 0.0005	NA	< 0.001	< 0.0005	0.014	< 0.0002	0.061	< 0.497	< 0.0025	< 0.002
	5/10/2021	0.66	130	140	0.66	8.02	350	880	< 0.003	< 0.001	0.12	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.013	< 0.0002	0.005	< 0.544	< 0.0025	< 0.002

Notes: All units are in mg/l except pH is in standard units.
F1 - MS and/or MSD Recovery outside of limits.
H - Sample was prepped or analyzed beyond the specified holding time.
V- Serial dilution exceeds control limits.

* - LCS or LCSD is outside acceptance limits.
^ - Denotes instrument related QC exceeds the control limits
(R) - Resample Event
NA - Not Analyzed

R000412

Table 9-7 Ash Bypass Basin and Ash Surge Basin Turbidity Measurement Data - Midwest Generation, LLC, Powerton Station.

Well	Date	Turbidity (NTU)
MW-01	2/23/2021	78.20
	4/9/2021	6.96
	5/11/2021	3.24
	6/2/2021	3.80
	6/28/2021	4.30
	7/19/2021	4.88
	8/24/2021	3.34
	9/30/2021	3.04
MW-09	2/24/2021	16.90
	4/9/2021	5.73
	5/13/2021	0.49
	6/2/2021	2.37
	6/29/2021	4.53
	7/19/2021	6.12
	8/25/2021	16.65
	9/30/2021	3.20
MW-19	2/22/2021	0.56
	4/9/2021	4.25
	5/10/2021	1.80
	6/2/2021	5.77
	6/29/2021	8.79
	7/19/2021	7.30
	8/26/2021	30.91
	9/30/2021	2.92
MW-08	2/23/2021	47.30
	4/9/2021	23.05
	5/11/2021	8.93
	6/3/2021	11.11
	6/29/2021	5.48
	7/19/2021	6.86
	8/25/2021	6.80
	9/30/2021	5.01
MW-11	2/25/2021	35.10
	4/9/2021	41.53
	5/13/2021	14.70
	6/3/2021	14.92
	6/29/2021	40.48
	7/19/2021	25.73
	8/25/2021	55.39
	9/30/2021	4.06
MW-12	2/25/2021	26.50
	4/9/2021	66.11
	5/13/2021	5.17
	6/3/2021	106.47
	6/29/2021	21.40
	7/19/2021	22.70
	8/25/2021	12.62
	9/30/2021	18.66
MW-15	2/24/2021	64.90
	4/9/2021	16.80
	5/12/2021	16.45
	6/3/2021	7.85
	6/29/2021	6.58
	7/20/2021	5.82
	8/23/2021	4.28
	10/1/2021	13.13
MW-17	2/24/2021	42.00
	4/8/2021	17.10
	5/12/2021	10.90
	6/3/2021	38.15
	6/28/2021	29.15
	7/20/2021	16.38
	8/23/2021	26.51
	10/1/2021	21.26
MW-18	2/22/2021	3.40
	4/9/2021	4.62
	5/10/2021	2.28
	6/3/2021	2.38
	6/29/2021	3.96
	7/19/2021	5.19
	8/26/2021	7.96
	9/30/2021	37.94

Table 9-9. Summary of Sample Bottles, Preservation Holding Time, and Analytical Methods. Midwest Generation, LLC, Powerton Station, Pekin, IL.

PARAMETER	ANALYTICAL METHOD	CONTAINER	PRESERVATION	HOLD TIME	METHOD DETECTION LIMIT (MG/L)	Section 845.600(a) Standards
Boron	6020 A	250 mL plastic	HNO_3, < 6 °C	6 months	0.0245	2
Calcium	6020 A	250 mL plastic	HNO_3, < 6 °C	6 months	0.106	NS
Chloride	SM4500 Cl-E	1 L plastic	None, < 6 °C	28 days	1.22	200
Fluoride	SM4500 F-C	1 L plastic	None, < 6 °C	28 days	0.019	4
pH	SM4500 H^+ -B	1 L plastic	None, < 6 °C	immediate *	Field Parameter	6.5 - 9.0 (secondary standard)
Sulfate	SM4500 SO_4 -E	1 L plastic	None, < 6 °C	28 days	2	400
Total Dissolved Solids	SM2400 C	1 L plastic	None, < 6 °C	7 days	6.1	1200
Antimony	6020 A	250 mL plastic	HNO_3, < 6 °C	6 months	0.00101	0.006
Arsenic	6020 A	250 mL plastic	HNO_3, < 6 °C	6 months	0.000439	0.01
Barium	6020 A	250 mL plastic	HNO_3, < 6 °C	6 months	0.000841	2
Beryllium	6020 A	250 mL plastic	HNO_3, < 6 °C	6 months	0.000237	0.004
Cadmium	6020 A	250 mL plastic	HNO_3, < 6 °C	6 months	0.00019	0.005
Chromium	6020 A	250 mL plastic	HNO_3, < 6 °C	6 months	0.000608	0.1
Cobalt	6020 A	250 mL plastic	HNO_3, < 6 °C	6 months	0.000189	0.006
Lead	6020 A	250 mL plastic	HNO_3, < 6 °C	6 months	0.000141	0.0075
Lithium	6010 C	250 mL plastic	HNO_3, < 6 °C	6 months	0.00215	0.04
Mercury	7470 A	250 mL plastic	HNO_3, < 6 °C	28 days	0.0000611	0.002
Molybdenum	6020 A	250 mL plastic	HNO_3, < 6 °C	6 months	0.00162	0.1
Selenium	6020 A	250 mL plastic	HNO_3, < 6 °C	6 months	0.000834	0.05
Thallium	6020 A	250 mL plastic	HNO_3, < 6 °C	6 months	0.000591	0.002
Radium 226	903.0	1 L plastic	HNO_3	180 days	1 pCi/L	5 pCi/L **
Radium 228	904.0	2 L plastic	HNO_3	180 days	1 pCi/L	5 pCi/L **

Notes: It is noted that some parameters may be combined with others within the same container.
* - The result for pH is obtained in the field and is not submitted to the laboratory.
** - Combined Radium 226/228
mL - milliliters
L - liters
°C - degrees Celsius
HNO_3 - Nitric Acid
NS- No Standard

ATTACHMENT 9-1
LOCAL WELL STRATIGRAPHY INFORMATION

Attachment 9-1
Local Well Statrigraphy Information. Midwest Generation, LLC, Powerton Generating Station, Pekin, IL.

ID	Well_Count	Well_ID	From	To	Original Logged Description	Grouped As_ToUseToDefine_K_interval	Base of Model	Notes	Ignored
11	3	121790013000	70	70	shale at	shale	x		
30	5	121790012800	76	76	shale at	shale	x		
51	9	121790013200	59	61	shale	shale	x		
58	10	121790052800	49	49	blue shale at	shale	x		
68	12	121790048800	120	121	gray shale	shale	x		
97	14	121790012700	76	76	shale at	shale	x		
101	15	121790012600	36	36	shale at	shale	x		
103	16	121790012500	85	85	shale at	shale	x		
114	18	121792462600	99	103	dk gray shale & hd dk color limestone	shale	x		
128	22	121792453000	44	45	shale bedrock	shale	x		
133	23	121792323500	93	93	shale at	shale	x		
139	24	121792489200	63	63	shale below	shale	x		
178	31	121792478800	99	104	gray shale	shale	x		
194	35	121792481600	102	103	dark gray shale	shale	x		
214	39	121792534000	70	70	boulders or bedrock at	shale	x		
238	45	121792501800	73	73	shale at	shale	x		
258	49	121792492400	60	85	blue-green shale below 60'	shale	x		
334	65	121792379400	61	65.5	light gray, hard, shale	shale	x		
352	70	121792361700	39	40	shale gray	shale	x		
358	72	121792552000	141	141	shale below	shale	x		
421	87	121792438000	45.5	50.25	clayey shale, gray & rust brown-extremely dense	shale	x		
442	90	121792440300	60	70	clayey shale;medium dark gray	shale	x		
451	91	121792440000	35	48.1	clayey shale-gray weathered-very dense	shale	x		
500	99	121792515900	72	72	gray shale at	shale	x		
508	100	121792515800	93	100	soft and hard shale	shale	x		
525	104	121792519900	56	58	shale	shale	x		
536	106	121792312100	103	103	shale at	shale	x		
540	107	121792200900	47	47	shale at	shale	x		
558	111	121792311900	106	106	shale at	shale	x		
572	114	121792180200	104	104	rocks	shale	x	(Assumed to be bedrock)	
581	115	121792179800	78	79	shale	shale	x		
584	116	121792179700	48	67	rock	shale	x	(Assumed to be bedrock)	
599	121	121792180500	88	88	shale	shale	x		
616	123	121792090700	105	107	shale	shale	x		
629	125	121792088600	54	54	cap rock & gray shale at	shale	x		
641	130	121792238000	105	105	rocks at	shale	x	(Assumed to be bedrock)	
650	131	121792237900	95	100	firm gray shale	shale	x		
661	133	121792237700	81	85	firm gray shale	shale	x		
667	135	121792157500	42	42	shale	shale	x		
669	136	121792156800	105	108	black shale	shale	x		
681	138	121792219300	136	136	shale at	shale	x		
693	141	121792138000	80	108	rocks	shale	x	(Assumed to be bedrock)	x
701	142	121792237600	118	120	gray shale	shale	x		
715	146	121792285300	133	133	shale at	shale	x		
730	148	121792204800	96	100	dark gray shale	shale	x		
750	152	121790067100	100	100	hardpan at	shale	x	(Assumed to be bedrock)	

ATTACHMENT 9-2
MONITORING WELL BORING LOGS

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-1-Po** SHEET **1** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **461.7**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ - - - ○ - - - △ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
461.7	0.0		Brown coarse to fine sand, dry FILL				
				SS-1 1.0-2.5 14"R	3 4 4		qu=NT
				SS-2 3.5-5.0 12"R	3 3 5		Bentonite seal 3.0'-18.0'. Stickup protective cover installed. qu=NT
				SS-3 6.0-7.5 12"R	2 6 8		qu=NT
				SS-4 8.5-10.0 10"R	2 5 8		qu=NT
			Trace coarse gravel	SS-5 11.0-12.5 8"R	5 9 10		qu=NT
				SS-6 13.5-15.0 12"R	3 6 6		qu=NT
				SS-7 16.0-17.5 16"R	4 6 7		qu=NT
443.2	18.5		Brown coarse to medium sand, trace fine gravel, medium dense, saturated SW	SS-8 18.5-20.0 14"R	4 5 6		Sand pack 18.0'-30.0' qu=NT

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/4/10** ENDED **10/4/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **22.0**
▼
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-1-Po** SHEET **2** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **461.7**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL 10 20 30 40 LL 50 / Unconfined Compressive Strength (TSF) * 1 2 3 4 5	NOTES & TEST RESULTS
441.7	20.0						Set screen (slot 0.010") 20.5'-30.5'
				SS-9 21.0-22.5 15"R	4 5 5		qu=NT
439.7	22.0		▽				
				SS-10 23.5-25.0 18"R	4 4 4		qu=NT
				SS-11 26.0-27.5 18"R	4 4 6		qu=NT
433.7	28.0		Coarse to fine gravel, some coarse sand, medium dense, saturated GP	SS-12 28.5-30.0 18"R	4 5 6		qu=NT
				SS-13 31.0-32.5 18"R	4 6 7		qu=NT
429.2	32.5		End of Boring at 32.5'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/4/10** ENDED **10/4/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **22.0**
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-2-Po** SHEET **1** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **459.2**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL 10 20 30 40 LL 50 / Unconfined Compressive Strength (TSF) 1 2 3 4 5	NOTES & TEST RESULTS
459.2	0.0		Dark brown topsoil, silty clay, dry FILL				
457.7	1.5		Light brown coarse to fine sand, loose, dry FILL	SS-1 1.0-2.5 10"R	4 4 4		qu=NT
				SS-2 3.5-5.0 10"R	2 3 2		Bentonite seal 3.0'-20.0'. Stickup protective cover installed. qu=NT
				SS-3 6.0-7.5 12"R	3 3 4		qu=NT
			Dry	SS-4 8.5-10.0 14"R	4 5 4		qu=NT
				SS-5 11.0-12.5 15"R	2 2 3		qu=NT
			Some fine gravel	SS-6 13.5-15.0 15"R	3 6 5		qu=NT
				SS-7 16.0-17.5 18"R	2 5 6		qu=NT
			Dry	SS-8 18.5-20.0 18"R	3 3 4		qu=NT
439.2	20.0						

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/5/10** ENDED **10/5/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **24.0**
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-2-Po** SHEET **2** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **459.2**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL 10 20 30 40 LL 50 / Unconfined Compressive Strength (TSF) ✳ 1 2 3 4 5	NOTES & TEST RESULTS
439.2	20.0		Light brown fine to medium sand, well graded, medium dense, dry FILL				Sand pack 20.0'-33.5'
				SS-9 21.0-22.5 18"R	4 10 11		qu=NT
435.7	23.5						
435.2	24.0		▽ Gray coarse to fine gravel, coarse sand, trace fine sand and silt, poorly graded, medium dense GP	SS-10 23.5-25.0 18"R	5 13 13		qu=NT Set screen (slot 0.010") 23.5'-33.5'
				SS-11 26.0-27.5 18"R	4 6 8		qu=NT
				SS-12 28.5-30.0 18"R	7 10 10		qu=NT
				SS-13 31.0-32.5 18"R	7 8 7		qu=NT
				SS-14 33.5-35.0 18"R	6 9 10		qu=NT
424.2	35.0		End of Boring at 35.0'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/5/10** ENDED **10/5/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **24.0**
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-3-Po** SHEET **1** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **459.1**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ ○ △ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
459.1	0.0		Dark brown silty clay topsoil				
458.6	0.5		Light brown coarse to medium sand, trace fine gravel, trace fine sand, very loose to loose, dry FILL	SS-1 1.0-2.5 16"R	2 1 2		qu=NT
				SS-2 3.5-5.0 14"R	1 1 2		Bentonite seal 3.0'-20.0'. Stickup protective cover installed. qu=NT
				SS-3 6.0-7.5 16"R	2 2 3		qu=NT
			Some fine sand	SS-4 8.5-10.0 18"R	2 3 2		qu=NT
			Light brown medium to fine sand, loose, dry	SS-5 11.0-12.5 17"R	1 2 2		qu=NT
				SS-6 13.5-15.0 18"R	4 5 6		qu=NT
				SS-7 16.0-17.5 16"R	2 2 3		qu=NT
440.1	19.0		Brown coarse sand, trace fine gravel, well graded, very loose, wet	SS-8 18.5-20.0 16"R	3 4 3		qu=NT

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/5/10** ENDED **10/5/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **23.0**
▼
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-3-Po** SHEET **2** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **459.1**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL 10 20 30 40 LL 50 / Unconfined Compressive Strength (TSF) * 1 2 3 4 5	NOTES & TEST RESULTS
439.1	20.0		SW				Sand pack 20.0'-34.0'
				SS-9 21.0-22.5 18"R	1 1 1		qu=NT
436.1	23.0		▽ Saturated				
				SS-10 23.5-25.0 0"R	1 2 2		qu=NT Set screen (slot 0.010") 24.0'-34.0'
				SS-11 26.0-27.5 18"R	1 2 2		qu=NT
				SS-12 28.5-30.0 18"R	2 1 2		qu=NT
				SS-13 31.0-32.5 18"R	1 2 2		qu=NT
425.1	34.0		End of Boring at 34.0'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/5/10** ENDED **10/5/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **23.0**
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-4-Po** SHEET **1** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **457.3**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □---○---△ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
457.3	0.0		Brown silty clay, roots, topsoil FILL				
456.5	0.8		Light brown sand, medium to fine brown silty clay, fine gravel, dry FILL	SS-1 1.0-2.5 10"R	6 3 4		
				SS-2 3.5-5.0 8"R	3 4 4		Bentonite seal 3.0'-20.0'. Stickup protective cover installed.
				SS-3 6.0-7.5 18"R	4 6 9		qu=4.0**tsf
			Brown clayey silt	SS-4 8.5-10.0 18"R	4 5 5		qu=4.0**tsf
				SS-5 11.0-12.5 17"R	3 3 4		qu=3.5**tsf
				SS-6 13.5-15.0 17"R	2 2 3		qu=3.5**tsf
			Black clayey silt to silty clay				
441.3	16.0		Light brown coarse to fine sand, fine gravel, loose, dry SP	SS-7 16.0-17.5 18"R	2 2 3		
				SS-8 18.5-20.0 18"R	2 3 5		
437.3	20.0						

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/16/10** ENDED **10/16/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **24.0**
▼
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-4-Po** SHEET **2** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **457.3**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL–LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) (1 2 3 4 5)	NOTES & TEST RESULTS
437.3	20.0		Brown coarse to fine gravel, trace coarse to medium sand, loose to medium dense, poorly graded GP				Sand pack 20.0'-34.0'
				SS-9 21.0-22.5 12"R	4 6 6		qu=NT
433.3	24.0		▽ Saturated	SS-10 23.5-25.0 18"R	6 5 7		qu=NT Set screen (slot 0.010") 24.0'-34.0'
				SS-11 26.0-27.5 14"R	2 3 3		qu=NT
				SS-12 28.5-30.0 18"R	5 6 10		qu=NT
				SS-13 31.0-32.5 10"R	4 4 8		qu=NT
			Coarse to fine gravel, trace silt				
423.3	34.0		End of Boring at 34.0'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/16/10** ENDED **10/16/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **24.0**
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-5-Po** SHEET 1 OF 2
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **455.8**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL–LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
455.8	0.0		Dark brown silty clay, black coal cinders, topsoil				
			FILL	SS-1 1.0-2.5 12"R	2 2 3		qu=NT
			Dry				Bentonite seal 2.0'-19.0'. Stickup protective cover installed.
				SS-2 3.5-5.0 14"R	6 8 10		qu=NT
			Coarse gravel, red coal cinders				
			Gray silty clay with coarse sand and fine gravel, medium stiff, dry	SS-3 6.0-7.5 16"R	2 3 3		qu=1.25**tsf
				SS-4 8.5-10.0 18"R	1 2 2		qu=1.0**tsf
				SS-5 11.0-12.5 18"R	2 2 3		qu=0.5**tsf
			Trace black coal cinders Trace coarse sand, moist				
			Gray clayey silt	SS-6 13.5-15.0 18"R	WOH 2 2		
				SS-7 16.0-17.5 18"R	WOH 6 6		
438.8	17.0		Gray coarse to fine gravel, coarse to fine sand, poorly graded, medium dense, dry				
			GP	SS-8 18.5-20.0 18"R	4 8 7		Sand pack 19.0'-31.0'
435.8	20.0						

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/5/10** ENDED **10/6/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **20.5**
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-5-Po** SHEET **2** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **455.8**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL 10 20 30 40 LL 50 / Unconfined Compressive Strength (TSF) * 1 2 3 4 5	NOTES & TEST RESULTS
435.8 435.3	20.0 20.5		▽ Coarse to fine gravel, trace coarse to fine sand, poorly graded, medium dense, saturated GP				
				SS-9 21.0-22.5 0"R	4 6 6		qu=NT Set screen (slot 0.010") 21.0'-31.0'
				SS-10 23.5-25.0 10"R	4 6 6		qu=NT
			Loose	SS-11 26.0-27.5 10"R	3 4 4		qu=NT
				SS-12 28.5-30.0 10"R	4 5 6		qu=NT
424.8	31.0		End of Boring at 31.0'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/5/10** ENDED **10/6/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **20.5**
▽
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-6-Po** SHEET **1** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **461.2**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL 10 20 30 40 LL 50 / Unconfined Compressive Strength (TSF) * 1 2 3 4 5	NOTES & TEST RESULTS
461.2	0.0		Gravel, clay, coal cinders FILL				
				SS-1 1.0-2.5			
							Bentonite seal 3.0'-18.0'. Stickup protective cover installed.
				SS-2 3.5-5.0			
				SS-3 6.0-7.5			
				SS-4 8.5-10.0			
451.2	10.0		Dark gray clayey silt, organics, very soft, moist FILL				
				SS-5 11.0-12.5 17"R	WOH 1 1		qu=0.25**tsf
447.2	14.0		Black coal cinders, loose, wet FILL	SS-6 13.5-15.0 16"R	WOH 3 3		qu=0.25**tsf
				SS-7 16.0-17.5 14"R	2 3 3		
444.2	17.0	▽					
443.2	18.0		Olive gray and gray organic silt, trace clay, trace peat, low plasticity, wet OL				Sand pack 18.0'-28.0' qu=NT Set screen (slot 0.010") 19.0'-29.0'
				SS-8 18.5-20.0	2 2 1		

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/6/10** ENDED **10/6/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **17.0**
▽
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-6-Po** SHEET **2** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **461.2**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL 10 20 30 40 LL 50 / Unconfined Compressive Strength (TSF) ✳ 1 2 3 4 5	NOTES & TEST RESULTS
441.2	20.0						
				SS-9 21.0-22.5 16"R	WOH 1 2		qu=0.25**tsf
			Trace fine sand, dark gray mottled black organic silt, trace fine sand, wet				
				SS-10 23.5-25.0 18"R	1 2 3		qu=0.50**tsf
				SS-11 26.0-27.5 18"R	3 3 3		qu=0.75**tsf
433.7	27.5		Dark gray organic clay, trace fine sand, medium stiff, moist OL				
				SS-12 28.5-30.0 18"R	2 2 3		qu=1.25**tsf
431.2	30.0		End of Boring at 30.0'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/6/10** ENDED **10/6/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **17.0**
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-7-Po** SHEET **1** OF **3**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**
LOGGED BY **MPG**
GROUND ELEVATION **459.6**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL 10 20 30 40 LL 50 / Unconfined Compressive Strength (TSF) * 1 2 3 4 5	NOTES & TEST RESULTS
459.6	0.0		Sand, gravel, black cinders, dry FILL				
				SS-1 1.0-2.5			
				SS-2 3.5-5.0			Bentonite seal 3.0'-32.0'. Stickup protective cover installed.
				SS-3 6.0-7.5			
				SS-4 8.5-10.0			
449.6	10.0		Sand, gravel, clay, black coal cinders FILL				
				SS-5 11.0-12.5 6"R	5 3 3		
446.1	13.5		Dark gray organic clay, soft, moist OH	SS-6 13.5-15.0 10"R	2 2 2		qu=0.5**tsf
				SS-7 16.0-17.5 18"R	2 1 2		qu=0.5**tsf
			Moist				
			Trace fine sand, organic silt, moist				
				SS-8 18.5-20.0 18"R	WOH 2 2		qu=0.75**tsf
439.6	20.0						

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/4/10** ENDED **10/5/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **36.0**
▽
▽

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-7-Po** SHEET **2** OF **3**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **459.6**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL–LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) * (1 2 3 4 5)	NOTES & TEST RESULTS
439.6	20.0		Dark gray organic clay, mottled black, medium stiff, dry				
			OH	SS-9 21.0-22.5 18"R	3 2 4		qu=1.0**tsf
				SS-10 23.5-25.0 18"R	2 3 4		qu=1.25**tsf
433.6	26.0		Gray organic silt, trace shells, fibers, very soft, moist	SS-11 26.0-27.5 18"R	2 2 2		qu=0.25**tsf
			OL				
			Dry	SS-12 28.5-30.0 18"R	2 3 3		qu=1.75**tsf
428.6	31.0		Dark gray organic clay, trace fine gravel, moist	SS-13 31.0-32.5 18"R	2 4 3		qu=1.25**tsf
			OH				Sand pack 32.0'-45.0'
426.1	33.5		Gray clayey gravel, coarse sand, clay, silt, moist	SS-14 33.5-35.0 18"R	WOH 2 2		qu=NT
			GC				Set screen (slot 0.010") 35.0'-45.0'
423.6	36.0	▽	Medium dense, saturated	SS-15 36.0-37.5 18"R	2 7 6		qu=NT
				SS-16 38.5-40.0 10"R	2 4 7		
419.6	40.0						

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/4/10** ENDED **10/5/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **36.0**

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-8-Po** SHEET **1** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **468.7**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL 10 20 30 40 LL 60 / Unconfined Compressive Strength (TSF) ✳ 1 2 3 4 5	NOTES & TEST RESULTS
468.7	0.0		Fine gravel, sand, silt, clay, black cinders, dry FILL	SS-1 1.0-2.5			
				SS-2 3.5-5.0			Bentonite seal 3.0'-18.0'. Stickup protective cover installed.
				SS-3 6.0-7.5			
				SS-4 8.5-10.0			
458.7	10.0		Black cinders FILL	SS-5 11.0-12.5 14"R	15 28 15/3"		
				SS-6 13.5-15.0 18"R	11 15 12		
			Silty clay seam 15.5'-16.5'	SS-7 16.0-17.5 17"R	15 15 14		
				SS-8 18.5-20.0 18"R	7 11 11		Sand pack 18.0'-30.0'
449.2	19.5		▽				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **9/30/10** ENDED **9/30/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **21.0**
▽ **19.5**
▽

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-8-Po** SHEET **2** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **468.7**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL 10 20 30 40 LL 50 / Unconfined Compressive Strength (TSF) * 1 2 3 4 5	NOTES & TEST RESULTS
448.7	20.0		Black cinders FILL				Set screen (slot 0.010") 20.0'-30.0'
447.7	21.0		▽ Saturated	SS-9 21.0-22.5 18"R	5 5 3		
				SS-10 23.5-25.0 18"R	1 1 2		
444.2	24.5		Dark gray organic clay, soft, moist OH				qu=0.75**tsf
				SS-11 26.0-27.5 18"R	1 2 2		qu=1.0**tsf
441.2	27.5		Dark gray organic silt, medium stiff to soft, low plasticity, moist OL				
				SS-12 28.5-30.0 18"R	2 4 4		qu=1.25**tsf
438.7	30.0		End of Boring at 30.0'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **9/30/10** ENDED **9/30/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **21.0**
▽ **19.5**

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-9-Po** SHEET **1** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **466.2**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL–LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) * (1 2 3 4 5)	NOTES & TEST RESULTS
466.2	0.0		Black cinders, fine gravel, crushed rock, dry FILL				
				SS-1 1.0-2.5			
				SS-2 3.5-5.0			Bentonite seal 3.0'-20.0'. Stickup protective cover installed.
				SS-3 6.0-7.5			
				SS-4 8.5-10.0			
456.2	10.0		Black cinders, coarse to fine sand, brick, fine gravel, dry FILL				
				SS-5 11.0-12.5 14"R	6 12 15		qu=NT
				SS-6 13.5-15.0 18"R	5 6 7		qu=NT
				SS-7 16.0-17.5 18"R	6 9 10		qu=NT
449.2	17.0		Moist Brown clayey silt, trace fine sand, moist CL				
447.2	19.0		Light brown fine to medium sand, loose, well graded	SS-8 18.5-20.0 18"R	3 6 11		qu=NT

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **9/28/10** ENDED **9/28/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **23.5**
▽ **21.6**
▽

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-9-Po** SHEET **2** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **466.2**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL 10 20 30 40 LL 50 / Unconfined Compressive Strength (TSF) * 1 2 3 4 5	NOTES & TEST RESULTS
446.2	20.0		SW				Sand pack 20.0'-32.0'
444.6	21.6		▼	SS-9 21.0-22.5 18"R	3 3 4		Set screen (slot 0.010") 22.0'-32.0'
442.7	23.5		▽ Saturated	SS-10 23.5-25.0 18"R	1 3 6		
				SS-11 26.0-27.5 18"R	0 2 2		
			Medium dense	SS-12 28.5-30.0 18"R	2 6 13		
			Trace fine gravel	SS-13 31.0-32.5 18"R	2 5 10		
433.7	32.5		End of Boring at 32.5'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **9/28/10** ENDED **9/28/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **23.5**
▼ **21.6**

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-10-Po** SHEET **1** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **454.1**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ - - - ○ - - - △ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
454.1	0.0		Black and brown silty clay topsoil CL	SS-1 1.0-2.5			
				SS-2 3.5-5.0			Bentonite seal 3.0'-17.0'. Stickup protective cover installed.
				SS-3 6.0-7.5			
				SS-4 8.5-10.0			
444.1	10.0		Brown organic silt, some clay, trace peat, soft, moist OL	SS-5 11.0-12.5 16"R	1 2 2		qu=0.5**tsf
440.6	13.5		Black organic clay, medium plasticity, medium stiff, dry OL	SS-6 13.5-15.0 18"R	2 3 4		qu=1.5**tsf
438.1	16.0		Brown and gray silty clay, trace to little coarse to fine sand, medium stiff, dry CL	SS-7 16.0-17.5 18"R	4 4 4		qu=2.0**tsf Sand pack 17.0'-29.0'
				SS-8 18.5-20.0			Set screen (slot 0.010") 19.0'-29.0'

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/4/10** ENDED **10/4/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **21.0'**
▼
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-10-Po** SHEET **2** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **454.1**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL 10 20 30 40 LL 50 / Unconfined Compressive Strength (TSF) * 1 2 3 4 5	NOTES & TEST RESULTS
434.1	20.0						
433.1	21.0		Gray coarse to fine sand, trace fine gravel, silt, poorly graded, loose, saturated SP	SS-9 21.0-22.5 18"R	2 2 1		qu=NT
				SS-10 23.5-25.0 10"R	2 4 3		qu=NT
429.6	24.5		Brown and gray coarse to fine gravel, poorly graded, loose, saturated GP				
				SS-11 26.0-27.5 10"R	2 4 7		qu=NT
				SS-12 28.5-30.0 14"R	5 7 8		qu=NT
424.1	30.0		End of Boring at 30.0'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/4/10** ENDED **10/4/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **21.0'**

PATRICK ENGINEERING INC.

BORING NUMBER B-MW-11-Po SHEET 1 OF 2
CLIENT Midwest Generation
PROJECT & NO. 21053.070
LOCATION Powerton

LOGGED BY MPG
GROUND ELEVATION 468.1

ELEV.	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □---○---△ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
468.1	0.0		Cinders, gravel, sand, silt FILL				
				SS-1 1.0-2.5			
				SS-2 3.5-5.0			Bentonite seal 3.0'-28.0'. Stickup protective cover installed.
				SS-3 6.0-7.5			
				SS-4 8.5-10.0			
458.1	10.0		Black and brown clay, fine gravel, cinders, bricks, silt, coarse sand, dry FILL	SS-5 11.0-12.5 16"R	8 10 10		qu=NT
				SS-6 13.5-15.0 17"R	2 2 3		qu=2.5**tsf
452.1	16.0		Brown and gray silty clay, trace fine gravel, trace fine sand, stiff, dry CL	SS-7 16.0-17.5 18"R	1 3 4		qu=1.5**tsf
449.6	18.5		Gray clayey silt, organics, very soft, moist ML	SS-8 18.5-20.0 18"R	WOH 2 2		qu=0.5**tsf

DRILLING CONTRACTOR Groff Testing
DRILLING METHOD 4.25" I.D. HSA
DRILLING EQUIPMENT CME 550 ATV
DRILLING STARTED 9/28/10 ENDED 9/29/10

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ 32.5 while drilling
▼ 26.5 after 12 hours
▼ 26.5 after 48 hours

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-11-Po** SHEET **2** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **468.1**

ELEV.	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ ○ △ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) * (1 2 3 4 5)	NOTES & TEST RESULTS
448.1	20.0						
				SS-9 21.0-22.5 0"R	1 2 3		qu=NT
				SS-10 23.5-25.0 18"R	WOH WOH 1		qu=0.5**tsf
442.1	26.0						
441.6	26.5		▼ Dark gray silty clay, some organics, medium stiff, dry CL	SS-11 26.0-27.5 18"R	1 3 4		qu=1.5**tsf
				SS-12 28.5-30.0 18"R	3 4 6		Sand pack 28.0'-40.0' qu=2.5**tsf
				SS-13 31.0-32.5 18"R	3 4 6		Set screen (slot 0.010") 30.0'-40.0' qu=2.5**tsf
435.6	32.5		▽ Brown and gray coarse to fine gravel, coarse to fine sand, loose, saturated GP	SS-14 33.5-35.0 18"R	1 2 1		qu=NT
431.6	36.5		Light brown fine sand, well graded, very loose, saturated SW	SS-15 36.0-37.5 18"R	1 0 0		qu=NT
				SS-16 38.5-40.0 18"R	2 3 4		qu=NT
428.1	40.0		End of Boring at 40.0'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **9/28/10** ENDED **9/29/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **32.5** while drilling
▼ **26.5** after 12 hours
▼ **26.5** after 48 hours

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-12-Po** SHEET 1 OF 2
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **470.0**

ELEV.	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □---○---△ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) * (1 2 3 4 5)	NOTES & TEST RESULTS
470.0	0.0		Black cinders, fine gravel, silty clay, dry FILL				
				SS-1 1.0-2.5			
				SS-2 3.5-5.0			Bentonite seal 3.0'-18.0'. Stickup protective cover installed.
				SS-3 6.0-7.5			
				SS-4 8.5-10.0			
460.0	10.0		Black cinders FILL				
				SS-5 11.0-12.5 18"R	17 18 11		qu=NT
				SS-6 13.5-15.0 18"R	12 20 17		qu=NT
			Seam of l ight brown coarse sand	SS-7 16.0-17.5 18"R	6 7 6		qu=NT
451.5	18.5						Sand pack 18.0'-35.0'
450.5	19.5		▽ Gray silt, little to some coarse to fine sand, trace clay, very soft, saturated	SS-8 18.5-20.0 18"R	1 5 2		qu=NT Set screen (slot 0.010") 19.0'-29.0'

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **9/29/10** ENDED **9/29/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **20.5**
▼ **19.5**

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-12-Po** SHEET **2** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **470.0**

ELEV.	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL 10 20 30 40 LL 50 / Unconfined Compressive Strength (TSF) * 1 2 3 4 5	NOTES & TEST RESULTS
450.0	20.0		ML				
449.5	20.5		▽	SS-9 21.0-22.5 18"R	1 2 1		qu=0.25**tsf
			Trace peat	SS-10 23.5-25.0 18"R	WOH 2 1		qu=0.5**tsf
444.0	26.0		Gray mottled black clayey silt, with some organics, trace peat, very soft, medium stiff, moist OH	SS-11 26.0-27.5 18"R	WOH WOH 2		qu=0.5**tsf
				SS-12 28.5-30.0 18"R	1 3 4		qu=1.75**tsf
				SS-13 31.0-32.5 18"R	2 3 3		qu=2.0**tsf
437.5	32.5		Dark brown and gray silty clay, trace coarse sand, trace organics, stiff to very stiff, dry CL				
				SS-14 33.5-35.0 18"R	4 6 6		qu=2.5**tsf
435.0	35.0		End of Boring at 35.0'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **9/29/10** ENDED **9/29/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **20.5**
▼ **19.5**
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-13-Po** SHEET **1** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **467.7**

ELEV.	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ ○ △ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
467.7	0.0		Black cinders, sand, rock, dry FILL				
				SS-1 1.0-2.5			
				SS-2 2.5-4.0			Bentonite seal 3.0'-28.0'. Stickup protective cover installed.
				SS-3 6.0-7.5			
				SS-4 8.5-10.0			
457.7	10.0		Black cinders, medium sand FILL				
				SS-5 11.0-12.5 14"R	5 9 7		qu=NT
				SS-6 13.5-15.0 15"R	3 3 2		qu=NT
			Some organic silt, moist	SS-7 16.0-17.5 18"R	WOH 1 1		qu=NT
450.2	17.5		Gray/olive gray organic silt, very soft OL				
				SS-8 18.5-20.0 18"R	1 0 0		qu=0.0**tsf
447.7	20.0						

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **9/29/10** ENDED **9/29/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **31.5**
▽ **29.5**
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-13-Po** SHEET **2** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **467.7**

ELEV.	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL–LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) * (1 2 3 4 5)	NOTES & TEST RESULTS
447.7	20.0		Dark gray and black organic clay, very soft, moist OH				
				SS-9 21.0-22.5 18"R	WOH WOH 2		qu=0.25**tsf
445.2	22.5		Dark gray and black organic silt, very soft, moist OL				
				SS-10 23.5-25.0 18"R	WOH 1 1		qu=0.25**tsf
441.7	26.0		Dark gray and black organic clay, soft, dry OH	SS-11 26.0-27.5 18"R	WOH 1 2		qu=1.0**tsf
			Medium stiff				
				SS-12 28.5-30.0 18"R	0 2 3		Sand pack 28.0'-40.0' qu=1.5**tsf
438.2	29.5	▽					
437.2	30.5		Gray silty clay, some coarse to fine sand, trace fine gravel, wet CL				Set screen (slot 0.010") 30.0'-40.0'
436.2	31.5	▽		SS-13 31.0-32.5 18"R	2 4 5		qu=2.0**tsf
433.7	34.0		Stiff	SS-14 33.5-35.0 6"R	2 3 2		qu=2.0**tsf
			Brown coarse to fine gravel, trace coarse to medium sand, silt, medium dense, saturated GP				
				SS-15 36.0-37.5 8"R	4 6 6		qu=NT
				SS-16 38.5-40.0 8"R	5 8 8		qu=NT
427.7	40.0		End of Boring at 40.0'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **9/29/10** ENDED **9/29/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **31.5**
▽ **29.5**
▽

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-14-Po** SHEET **1** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **467.7**

ELEV.	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □---○---△ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
467.7	0.0		Cinders, gravel, sand, silt, dry FILL				
				SS-1 1.0-2.5			
				SS-2 3.5-5.0			Bentonite seal 3.0'-18.0'. Stickup protective cover installed.
				SS-3 6.0-7.5			
				SS-4 8.5-10.0			
457.7	10.0		Brown fine gravel, some silty clay and coarse sand, dry FILL				
				SS-5 11.0-12.5 18"R	4 4 4		
				SS-6 13.5-15.0 16"R	4 3 4		
				SS-7 16.0-17.5 16"R	2 3 3		
			Black cinders				
							Sand pack 18.0'-30.0'
				SS-8 18.5-20.0 18"R	3 3 1		
448.2	19.5	▽	Gray organic silt, some fine sand,				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **9/30/10** ENDED **9/30/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **19.5**
▼ **20.5**
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-14-Po** SHEET **2** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **467.7**

ELEV.	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL–LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) * (1 2 3 4 5)	NOTES & TEST RESULTS
447.7 447.2	20.0 20.5		▽ very loose, low plasticity, saturated OL				Set screen (slot 0.010") 20.0'-30.0'
				SS-9 21.0-22.5 18"R	1 0 0		qu=NT
				SS-10 23.5-25.0 18"R	1 1 2		qu=0.25**tsf
442.7	25.0		Gray and mottled black organic silt, trace fine sand, soft, low plasticity, moist OL				
				SS-11 26.0-27.5 18"R	0 0 1		qu=0.25**tsf
438.7	29.0		Gray and black organic clay, medium stiff, moist OH	SS-12 28.5-30.0 18"R	2 3 4		qu=1.25**tsf
437.7	30.0		End of Boring at 30.0'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **9/30/10** ENDED **9/30/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **19.5**
▽ **20.5**
▽

PATRICK ENGINEERING INC.

BORING NUMBER B-MW-15-Po SHEET 2 OF 2
CLIENT Midwest Generation
PROJECT & NO. 21053.070
LOCATION Powerton

LOGGED BY MPG
GROUND ELEVATION 468.3

ELEV.	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □---○---△ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
448.3	20.0		Gray fine sand, trace medium sand, loose, saturated SM				Set screen (slot 0.010") 20.0'-30.0'
				SS-9 21.0-22.5 18"R	1 1 1		qu=NT
444.8	23.5		Gray silt, mottled black, some organics, soft, moist to wet OL	SS-10 23.5-25.0 18"R	1 2 2		qu=0.75**tsf
				SS-11 26.0-27.5 18"R	1 2 2		qu=1.0**tsf
440.3	28.0		Gray silty clay, some organics, soft, medium stiff, dry CL	SS-12 28.5-30.0 18"R	1 3 2		qu=1.0**tsf
438.3	30.0		End of Boring at 30.0'				

DRILLING CONTRACTOR Groff Testing
DRILLING METHOD 4.25" I.D. HSA
DRILLING EQUIPMENT CME 550 ATV
DRILLING STARTED 9/30/10 ENDED 9/30/10

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ 20.0'
▼ 19.5
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-15-Po** SHEET **1** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **468.3**

ELEV.	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL 10 20 30 40 50 LL; Unconfined Compressive Strength (TSF) * 1 2 3 4 5	NOTES & TEST RESULTS
468.3	0.0		Black cinders, fine gravel, sand, silt, dry FILL	SS-1 1.0-2.5			
				SS-2 3.5-5.0			Bentonite seal 3.0'-17.0'. Stickup protective cover installed.
				SS-3 6.0-7.5			
				SS-4 8.5-10.0			
458.3	10.0		Black cinders, fine gravel, coarse sand, silt, dry FILL	SS-5 11.0-12.5 14"R	6 13 12		
				SS-6 13.5-15.0 0"R	50/1"		
				SS-7 16.0-17.5 14"R	7 7 5		Sand pack 17.0'-30.0'
				SS-8 18.5-20.0 18"R	2 1 1		
448.8	19.5		▽				
448.3	20.0						

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **9/30/10** ENDED **9/30/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **20.0'**
▽ **19.5**
▽

KPRG
ENVIRONMENTAL CONSULTATION & REMEDIATION
KPRG and Associates, Inc.

Midwest Generation, LLC
Powerton Station
Pekin, Illinois

KPRG Project No. 18311.21

GEOLOGIC LOG OF MW-16

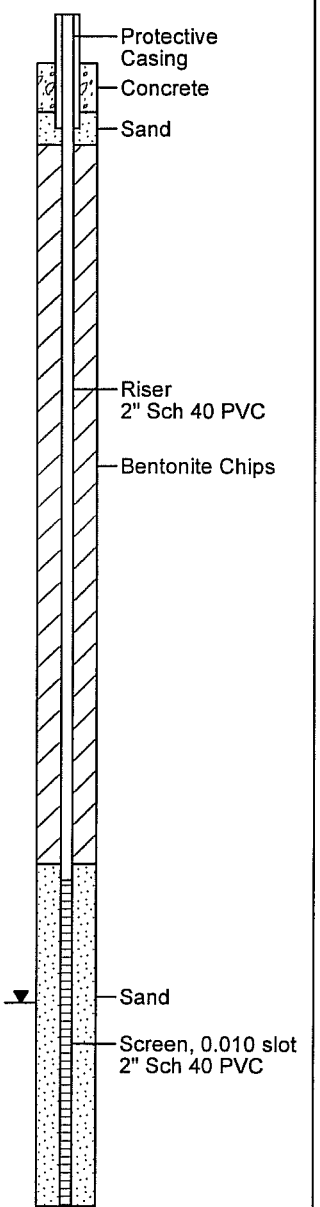
(Page 1 of 1)

Date Started	: 11/27/2012
Date Well Set	: 11/27/2012
Rock Coring Tools	: Not cored
Drilling Tools	: 4.25 ID HSA
Drill Rig	: Geoprobe
Driller Name/Co	: S. Keehma/Cabeno

Total Boring Depth	: 35 feet
Well Bottom Depth	: 35 feet
Surface Elev.	: 468.957 feet above MSL
TOC Elev.	: 471.564 feet above MSL
Groundwater Elev.	: 439.81
Riser Material	: 2" Sch 40 PVC
Screen Material	: 2" Sch 40 PVC, 0.010 slot
Coordinate N	: 40 32' 22.9" N
Coordinate E	: 89 40' 41.1" W
Logged By	: M. Wilson

Depth in Feet	Surf. Elev. 468.957	DESCRIPTION	PID	% Recovery
0	469			
		FILL: Black to brown silty clay with sand and gravel (Hydrovac from 0-10')		
2	467			
4	465			
6	463			
8	461	Approximate extent of fill		
10	459	Tan medium to fine grained SAND with some gravel	0	60
12	457			
14	455		0	
16	453		0	70
18	451		0	
20	449	- Gravel layer approximately 2" thick	0	100
22	447			
24	445	- Thin layer of fine grained sand	0	
26	443		0	100
28	441		0	
30	439	- Wet	0	60
32	437			
34	435		0	
36	433	End of boring at 35'		
38	431			
40				

Well Diagram: MW-16



12-13-2012 N:\Projects\18311 - Midwest Generation Ash Storage Issues\18311.2 - Powerton\Well Install\MW 16.bor

KPRG
ENVIRONMENTAL CONSULTATION & REMEDIATION
KPRG and Associates, Inc.

Midwest Generation, LLC
Powerton Station
Pekin, Illinois

Project No. 15315.7

GEOLOGIC LOG OF MW-17

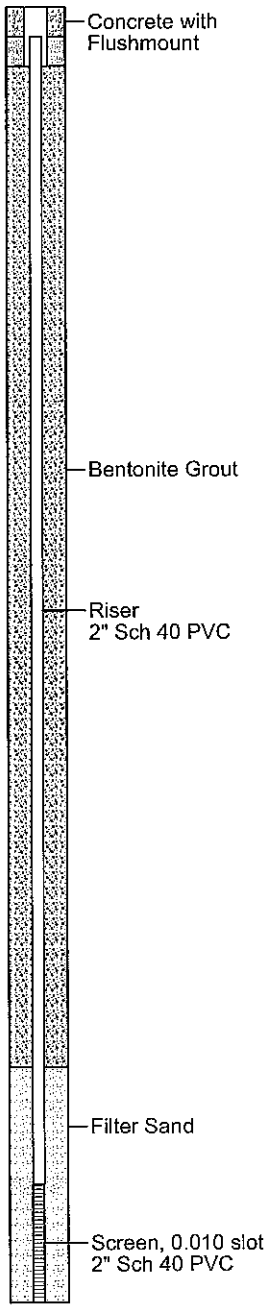
(Page 1 of 2)

Date Started	: 09/21/15
Date Well Set	: 09/21/15
Drilling Tools	: 8 1/4 HSA
Reaming Tools	: None
Drill Rig	: Geoprobe
Driller Name/Co	: Nick / Cabeno Env. Serv.

Total Boring Depth	: 30.0 feet
Well Bottom Depth	: 30.0 feet
Surface Elev.	: xxx feet above MSL
TOC Elev.	: xxx feet above MSL
Groundwater Elev.	: xxx feet above MSL
Riser Material	: 2" Sch 40 PVC
Screen Material	: 2" Sch 40 PVC, 0.010 slot
Coordinate N	:
Coordinate E	:
Logged By	: P. Allenstein

Depth in Feet	Surf. Elev. 575	DESCRIPTION	% RQD	% Recovery
0	575	Asphalt Roadway over sand, silt, gravel mix, brown, dry.		
1	574			
2	573	SILTY SAND, fine to coarse, black, slightly moist, occ silty layers.		
3	572			
4	571			
5	570			
6	569			
7	568			
8	567			
9	566			
10	565			
11	564			
12	563	- begin black with orange brown		
13	562			
14	561			
15	560			
16	559	- some gray silt laminates		
17	558			
18	557			
19	556	SILT, gray, laminated with SILTY SAND, moist		
20	555	- increase to very moist then wet		
21	554			
22		SILT, gray, laminated with light brown silt, trace organics, wet.		

Well Diagram:



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Midwest Generation, LLC
Powerton Station
Pekin, Illinois

Project No. 15315.7

GEOLOGIC LOG OF MW-17

(Page 2 of 2)

Date Started	: 09/21/15
Date Well Set	: 09/21/15
Drilling Tools	: 8 1/4 HSA
Reaming Tools	: None
Drill Rig	: Geoprobe
Driller Name/Co	: Nick / Cabeno Env. Serv.

Total Boring Depth	: 30.0 feet
Well Bottom Depth	: 30.0 feet
Surface Elev.	: xxx feet above MSL
TOC Elev.	: xxx feet above MSL
Groundwater Elev.	: xxx feet above MSL
Riser Material	: 2" Sch 40 PVC
Screen Material	: 2" Sch 40 PVC, 0.010 slot
Coordinate N	:
Coordinate E	:
Logged By	: P. Allenstein

Depth in Feet	Surf. Elev. 575	DESCRIPTION	% RQD	% Recovery	Well Diagram:
22	553				
23	552				
24	551				
25	550				Filter Sand
26	549	SILTY SAND, black and dark gray, fine to meduim, wet.			Screen, 0.010 slot 2" Sch 40 PVC
27	548	SILT and SAND, gray and black, wet.			
28	547				
29	546				
30	545				
31	544	End of Boring at 30 feet.			
32	543				
33	542				
34	541				
35	540				
36	539				
37	538				
38	537				
39	536				
40	535				
41	534				
42	533				
43	532				
44					

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Powerton Station
Pekin, Illinois

Project No. 15315.7

GEOLOGIC LOG OF MW-18

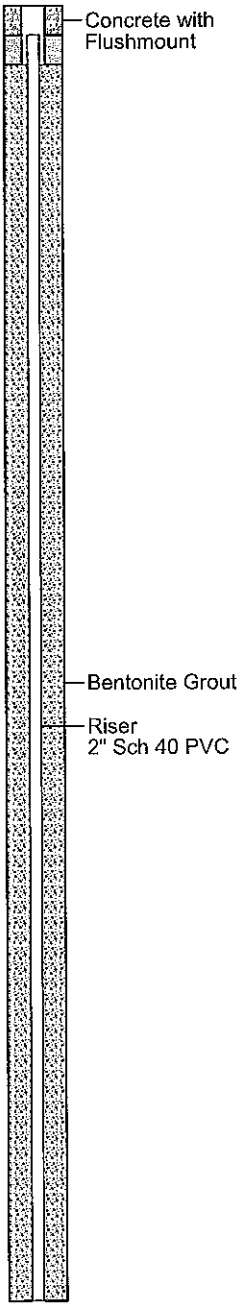
(Page 1 of 2)

Date Started	: 09/21/15
Date Well Set	: 09/21/15
Drilling Tools	: 8 1/4 HSA
Reaming Tools	: None
Drill Rig	: Geoprobe
Driller Name/Co	: Nick / Cabeno Env. Serv.

Total Boring Depth	: 30.0 feet
Well Bottom Depth	: 30.0 feet
Surface Elev.	: xxx feet above MSL
TOC Elev.	: xxx feet above MSL
Groundwater Elev.	: xxx feet above MSL
Riser Material	: 2" Sch 40 PVC
Screen Material	: 2" Sch 40 PVC, 0.010 slot
Coordinate N	:
Coordinate E	:
Logged By	: P. Allenstein

Depth in Feet	Surf. Elev. 575	DESCRIPTION	% RQD	% Recovery
0	575	SILTY CLAY, brown, trace gravel, slightly moist.		
1	574			
2	573			
3	572	SILTY SAND, fine to coarse, black, brown and dark gray, dry to slightly moist.		
4	571			
5	570			
6	569			
7	568	- clayey from 7-8, followed by occasional clayey layers		
8	567			
9	566			
10	565			
11	564			
12	563			
13	562			
14	561			
15	560			
16	559	- begin all black		
17	558			
18	557			
19	556	- very moist		
20	555			
21	554			
22				

Well Diagram:



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Project No. 15315.7

GEOLOGIC LOG OF MW-18

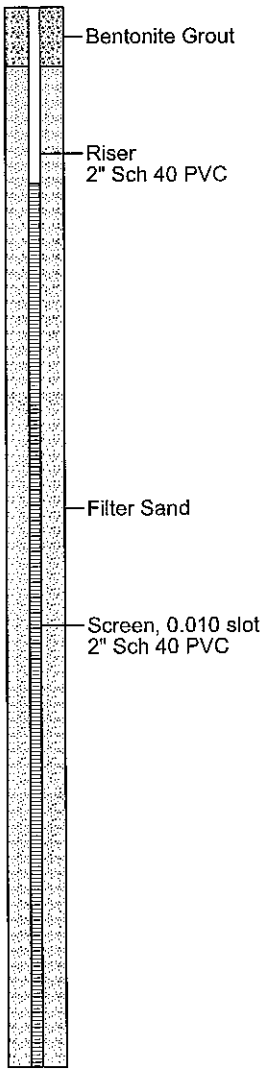
(Page 2 of 2)

Date Started	: 09/21/15
Date Well Set	: 09/21/15
Drilling Tools	: 8 1/4 HSA
Reaming Tools	: None
Drill Rig	: Geoprobe
Driller Name/Co	: Nick / Cabeno Env. Serv.

Total Boring Depth	: 30.0 feet
Well Bottom Depth	: 30.0 feet
Surface Elev.	: xxx feet above MSL
TOC Elev.	: xxx feet above MSL
Groundwater Elev.	: xxx feet above MSL
Riser Material	: 2" Sch 40 PVC
Screen Material	: 2" Sch 40 PVC, 0.010 slot
Coordinate N	:
Coordinate E	:
Logged By	: P. Allenstein

Depth in Feet	Surf. Elev. 575	DESCRIPTION	% RQD	% Recovery
22	553			
23	552			
24	551			
25	550			
26	549			
27	548			
28	547			
29	546			
30	545	CLAY, gray, some black, moist.		
31	544			
32	543	CLAY, dark gray, trace organics, moist.		
33	542			
34	541			
35	540			
36	539			
37	538	CLAY, greenish gray, trace organics, moist.		
38	537			
39	536			
40	535	SILTY SAND, tan, some gravel, very moist.		
41	534	End of Boring at 40 feet.		
42	533			
43	532			
44				

Well Diagram:



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GEOLOGIC LOG OF MW-19

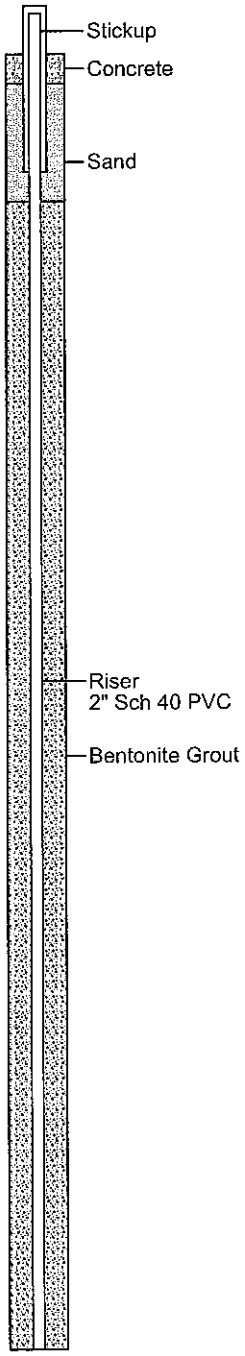
(Page 1 of 2)

Date Started	: 10/05/16
Date Well Set	: 10/05/16
Drilling Tools	: 8 1/4 HSA
Reaming Tools	: None
Drill Rig	: Geoprobe
Driller Name/Co	: Nick / Cabeno Env. Serv.

Total Boring Depth	: 41.0 feet
Well Bottom Depth	: 41.0 feet
Surface Elev.	: xxx feet above MSL
TOC Elev.	: xxx feet above MSL
Groundwater Elev.	: xxx feet above MSL
Riser Material	: 2" Sch 40 PVC
Screen Material	: 2" Sch 40 PVC, 0.010 slot
Coordinate N	:
Coordinate E	:
Logged By	: P. Allenstein

Depth in Feet	Surf. Elev. 575	DESCRIPTION	% RQD	% Recovery
0	575	SILTY SAND, black, fine to coarse, occasional clayey layers slightly moist.		
1	574			
2	573			
3	572			
4	571			
5	570	- very moist to wet		
6	569			
7	568	- slightly moist		
8	567			
9	566			
10	565			
11	564			
12	563			
13	562			
14	561	- 6" white and brown gravel		
15	560			
16	559			
17	558			
18	557	- moist		
19	556			
20	555			
21	554			
22				

Well Diagram:



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GEOLOGIC LOG OF MW-19

(Page 2 of 2)

Date Started	: 10/05/16
Date Well Set	: 10/05/16
Drilling Tools	: 8 1/4 HSA
Reaming Tools	: None
Drill Rig	: Geoprobe
Driller Name/Co	: Nick / Cabeno Env. Serv.

Total Boring Depth	: 41.0 feet
Well Bottom Depth	: 41.0 feet
Surface Elev.	: xxx feet above MSL
TOC Elev.	: xxx feet above MSL
Groundwater Elev.	: xxx feet above MSL
Riser Material	: 2" Sch 40 PVC
Screen Material	: 2" Sch 40 PVC, 0.010 slot
Coordinate N	:
Coordinate E	:
Logged By	: P. Allenstein

Depth in Feet	Surf. Elev. 575	DESCRIPTION	% RQD	% Recovery	Well Diagram:
22	553				
23	552				
24	551				
25	550				
26	549				Bentonite Grout
27	548				Riser 2" Sch 40 PVC
28	547				
29	546	SAND, fine to medium, gray, trace gravel, moist.			
30	545	SAND, fine to medium, brown, very moist.			
31	544				
32	543				
33	542				
34	541				Filter Sand
35	540				
36	539				Screen, 0.010 slot 2" Sch 40 PVC
37	538				
38	537				
39	536				
40	535				
41	534	End of Boring at 41 feet.			
42	533				
43	532				
44					

ATTACHMENT 9-3
HISTORICAL CCA GROUNDWATER DATA

Attachment "A-3 Historical CCA Groundwater Data - Midwest Generation LLC, Powerton Station, Pekin, IL

Sample: MW-01	Date	12/17/2010	2/25/2011	6/16/2011	9/19/2011	12/12/2011	3/19/2012	6/25/2012	9/18/2012	12/12/2012	2/27/2013	5/29/2013	7/29/2013	10/21/2013	3/5/2014	5/27/2014	8/28/2014	10/29/2014	2/25/2015	5/11/2015	8/18/2015	11/16/2015	2/25/2016	5/20/2016	8/17/2016	11/16/2016	2/14/2017	5/3/2017	8/25/2017	11/8/2017	1/4/2018	5/17/2018	8/8/2018	10/16/2018	2/25/2019	4/30/2019	8/27/2019	11/12/2019	2/24/2020	5/19/2020	8/19/2020	12/7/2020	2/23/2021	5/31/2021
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	1.0P	0.003	1.0D	0.003	1.0D	0.003	1.0D	0.003	1.0D	0.003	1.0D	0.003	1.0D	0.003	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032
Arsenic	0.010	1.0P	0.003	1.0D	0.003	1.0D	0.003	1.0D	0.003	1.0D	0.003	1.0D	0.003	1.0D	0.003	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032
Barium	2.0	1.0P	0.044	0.001	0.026	0.001	0.044	0.001	0.058	0.001	0.044	0.001	0.028	0.001	0.038	0.001	0.0376	0.001	0.0415	0.001	0.0376	0.001	0.0403	0.001	0.0401	0.001	0.0446	0.001	0.0478	0.001	0.0465	0.001	0.0465	0.001	0.0465	0.001	0.0465	0.001	0.0465	0.001	0.0465	0.001	0.0465	0.001	0.0465
Beryllium	0.004	1.0P	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010
Boron	2.0	1.0P	0.43	0.01	0.28	0.01	0.31	0.01	0.31	0.01	0.28	0.01	0.18	0.01	0.21	0.01	0.17	0.01	0.17	0.01	0.17	0.01	0.17	0.01	0.17	0.01	0.17	0.01	0.17	0.01	0.17	0.01	0.17	0.01	0.17	0.01	0.17	0.01	0.17	0.01	0.17	0.01	0.17	0.01	0.17
Cadmium	0.005	1.0P	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010
Chloride	200.0	1.0P	1.0	1.0	37	10	1.0	1.0	37	10	1.0	1.0	36	10	1.0	1.0	41	10	1.0	1.0	38	10	1.0	1.0	38	10	1.0	1.0	41	10	1.0	1.0	43	10	1.0	1.0	43	10	1.0	1.0	43	10	1.0	1.0	45	10	1.0
Chromium	0.1	1.0P	0.003	0.001	0.003	0.001	0.004	0.001	0.004	0.001	0.004	0.001	0.004	0.001	0.0040	0.001	0.0032	0.001	0.0041	0.0050	0.0032	0.001	0.0032	0.001	0.0032	0.001	0.0032	0.001	0.0032	0.001	0.0032	0.001	0.0032	0.001	0.0032	0.001	0.0032	0.001	0.0032	0.001	0.0032	0.001	0.0032	0.001	0.0032
Cobalt	1.0	1.0P	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010
Copper	0.65	1.0P	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.0197	0.001	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010
Cyanide	0.2	1.0P	0.0010	0.5D	0.0010	0.5D	0.0050	0.0057	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010
Fluoride	4.0	1.0P	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10
Iron	5.0	1.0P	0.10	0.5D	0.110	0.5D	0.110	0.5D	0.130	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10
Lead	0.0075	1.0P	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010
Manganese	0.15	1.0P	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010
Mercury	0.002	1.0P	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.00020	0.0002	0.00020	0.0002	0.00020	0.0002	0.00020	0.0002	0.00020	0.0002	0.00020	0.0002	0.00020	0.0002	0.00020	0.0002	0.00020	0.0002	0.00020	0.0002	0.00020	0.0002	0.00020	0.0002	0.00020	0.0002	0.00020	0.0002	0.00020
Nickel	0.1	1.0P	0.01	0.005	0.008	0.005	0.02	0.005	0.0089	0.005	0.007	0.0068	0.005	0.01	0.0100	0.005	0.009	0.0092	0.0078	0.005	0.0020	0.005	0.0020	0.005	0.0020	0.005	0.0020	0.005	0.0020	0.005	0.0020	0.005	0.0020	0.005	0.0020	0.005	0.0020	0.005	0.0020	0.005	0.0020	0.005	0.0020	0.005	0.0020
Nitrogen-Nitrate	10.0	1.0P	0.5	0.38	4.3	0.38	0.5	0.38	4.1	0.38	0.5	0.38	4.3	0.38	0.5	0.38	4.3	0.38	0.5	0.38	3.2	0.1	3.4	0.38	0.5	0.38	4.1	0.38	0.5	0.38	4.1	0.38	0.5	0.38	4.4	0.38	0.5	0.38	4.1	0.38	0.5	0.38	4.1	0.38	0.5
Nitrogen-Nitrite, NO2	1.0	1.0P	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5
Nitrogen-Nitrate-Nitrite	10.0	1.0P	0.5	0.38	4.3	0.38	0.5	0.38	4.1	0.38	0.5	0.38	4.3	0.38	0.5	0.38	4.3	0.38	0.5	0.38	3.2	0.1	3.4	0.38	0.5	0.38	4.1	0.38	0.5	0.38	4.1	0.38	0.5	0.38	4.4	0.38	0.5	0.38	4.1	0.38	0.5	0.38	4.1	0.38	0.5
Nitrogen-Nitrite	1.0	1.0P	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5
Perchlorate	0.0056	1.0P	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5	0.38	0.5
Selenium	0.05	1.0P	0.0034	0.001	0.0022	0.001	0.0048	0.001	0.0017	0.001	0.0031	0.001	0.0095	0.001	0.0020	0.001	0.0029	0.001	0.0049	0.0050	0.0025	0.001	0.0025	0.001	0.0025	0.001	0.0025	0.001	0.0025	0.001	0.0025	0.001	0.0025	0.001	0.0025	0.001	0.0025	0.001	0.0025	0.001	0.0025	0.001	0.0025	0.001	0.0025
Silver	0.05	1.0P	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010
Sulfate	400.0	1.0P	10	10	10	10	49	10	10	10	10	10	48	10	10	10	50	10	10	10	49	10	10	10	49	10	10	10	50	10	10	10	49	10	10	10	49	10	10	10	49	10	10	10	49
Thallium	0.002	1.0P	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010
Total Dissolved Solids	1,200	10P	440	10	348	10	440	10	376	10	440	10	376	10	440	10	376	10	440	10	376	10	440	10	376	10	440	10	376	10	440	10	376	10	440	10	376	10	440	10	376	10	440	10	376
Vanadium	0.049	1.0P	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010
Zinc	1.0	1.0P	0.003	0.5D	0.003	0.5D	0.003	0.5D	0.003	0.5D	0.003	0.5D	0.003	0.5D	0.003	0.5D	0.0030	0.5D	0.0030	0.5D	0.0030	0.5D	0.0030	0.5D	0.0030	0.5D	0.0030	0.5D	0.0030	0.5D	0.0030	0.5D	0.0030	0.5D	0.0030	0.5D	0.0030	0.5D	0.0030	0.5D	0.0030	0.5D	0.0030	0.5D	0.0030
Bromide	0.001	NP	NR	NP	NR	NP	NR	NP	NR	NP	NR	NP	NR	NP	NR	NP	NR	NP	NR	NP	NR	NP	NR	NP	NR	NP	NR	NP	NR	NP	NR	NP	NR	NP	NR	NP	NR	NP	NR	NP	NR	NP	NR	NP	NR
BETX	11.199	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
pH	6.5 to 8.5	NA	7.91	NA	7.78	NA	7.98	NA	7.85	NA	7.98	NA	7.85	NA	7.98	NA	7.85	NA	7.98	NA	7.85	NA	7.98	NA	7.85	NA	7.98	NA	7.85	NA	7.98	NA	7.85	NA	7.98	NA	7.85	NA	7.98	NA	7.85	NA	7.98	NA	7.85
Temperature	3.0	NA	18.47	NA	3.77	NA	8.73	NA	18.92	NA	3.77	NA	13.79	NA	11.74	NA	11.58	NA	11.58	NA	18.75	10A	11.68	3.0A	11.68	3.0A	18.75	10A	11.68	3.0A	11.68	3.0A	18.75	10A	11.68	3.0A	11.68	3.0A	18.75	10A	11.68	3.0A	11.68	3.0A	18.75	10A	11.68
Conductivity	50A	NA	1.41	NA	1.41	NA	1.41	NA	1.41	NA	1.41	NA	1.41	NA	1.41	NA	1.41	NA	1.41	NA	1.41	50A	1.41	50A	1.41	50A	1.41	50A	1.41	50A	1.41	50A	1.41	50A	1.41	50A	1.41	50A	1.41	50A	1.41	50A	1.41	50A	1.41
Dissolved Oxygen	3.0A	NA	0.68	NA	7.19	NA	4.01	NA	4.53	3.0A	5.21	3.0A	0.96	3.0A	0.38	3.0A	0.68	3.0A	0.38	3.0A	3.19	3.0A	3.03	3.0A	3.03	3.0A	3.19	3.0A	3.03	3.0A	3.03	3.0A	3.19	3.0A	3.03	3.0A	3.03	3.0A	3.19	3.0A	3.03	3.0A	3.03	3.0A	3.19
ORP	50A	NA	156	NA	140.1	NA	156	NA	109.8	NA	140.1	NA	156	NA	140.1	NA	156	NA	140.1	NA	156	NA	140.1	NA	156	NA	140.1	NA	156	NA	140.1	NA	156	NA	140.1	NA	156	NA	140.1	NA	156	NA	140.1	NA	156

Notes: Standards obtained from IAC Title 35, Chapter I, Part 620, Subpart D, Section 620.410 and Groundwater Quality Standards for Class I: Potable Resource Groundwater.
All reference to mg/L (ppm) unless otherwise noted

DL = Detection limit
NA = Not applicable
ND = Not Detected
NA = Not Measured

RP = Re-Reported
NP = Not Sampled
P = Propagated/estimated (partial) data
Field Duplicate Sample Number (Control)

F1 = Laboratory control sample (LCS) recovery outside of limits
F2 = MS/MSD RPD exceeds control limits
F3 = Initial Calibration Verification is outside acceptance limits, high biased
F4 = Continuing Calibration Verification is outside acceptance limits, high biased

F5 = MS and/or MSD Recovery outside of limits
F6 = Matrix Effect (% recovery exceeds limits)
F7 = LCS or LCSD is outside acceptance limits

Temperature
Conductivity
Dissolved Oxygen
Oxygen Reduction Potential (ORP)

°C
umhos/cm
mg/L
mV

Agrees Calculation
millimhos/centimeters
milligrams/liter
millivolts

Sample: MW-02	Date	12/17/2010	2/25/2011	6/16/2011	9/19/2011	12/12/2011	3/19/2012	6/25/2012	9/18/2012	12/12/2012	2/27/2013	5/29/2013	7/29/2013	10/21/2013	3/5/2014	5/27/2014	8/25/2014	10/27/2014	2/25/2015	5/13/2015	8/17/2015	11/17/2015	2/23/2016	5/17/2016	8/16/2016	11/15/2016	2/14/2017	5/1/2017	8/23/2017	11/7/2017	3/6/2018	5/15/2018	8/7/2018	10/16/2018	2/26/2019	4/30/2019	8/27/2019	11/12/2019	2/24/2020	5/19/2020	8/19/2020	12/9/2020	2/22/2021	5/31/2021
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	1.0P	0.003	1.0D	0.003	1.0D	0.003	1.0D	0.003	1.0D	0.003	1.0D	0.003	1.0D	0.003	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032
Arsenic	0.010	1.0P	0.003	1.0D	0.003	1.0D	0.003	1.0D	0.003	1.0D	0.003	1.0D	0.003	1.0D	0.003	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032	1.0D	0.0032
Barium	2.0	1.0P	0.043	0.001	0.031	0.001	0.049	0.001	0.059	0.001	0.049	0.001	0.034	0.001	0.039	0.001	0.0371	0.001	0.0415	0.001	0.0389	0.001	0.0446	0.001	0.0431	0.001	0.0418	0.001	0.0465	0.001	0.0483	0.001	0.0483	0.001	0.0465	0.001	0.0465	0.001	0.0465	0.001	0.0465	0.001	0.0465	0.001	0.0465
Beryllium	0.004	1.0P	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010
Boron	2.0	1.0P	0.75	0.01	0.18	0.01	0.41	0.01	0.41	0.01	0.41	0.01	0.46	0.02	0.41	0.01	0.49	0.01	0.52	0.01	0.47	0.01	0.50	0.01	0.49	0.01	0.50	0.01	0.52	0.01	0.54	0.01	0.54	0.01	0.54	0.01	0.54	0.01	0.54	0.01	0.54	0.01	0.54	0.01	0.54
Cadmium	0.005	1.0P	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010
Chloride	200.0	1.0P	1.0	1.0	37	10	1.0	1.0	37	10	1.0	1.0	36	10	1.0	1.0	41	10	1.0	1.0	38	10	1.0	1.0	38	10	1.0	1.0	41	10	1.0	1.0	43	10	1.0	1.0	43	10	1.0	1.0	43	10	1.0	1.0	45	10	1.0
Chromium	0.1	1.0P	0.003	0.001	0.003	0.001	0.004	0.001	0.004	0.001	0.004	0.001	0.004	0.001	0.0040	0.001	0.0032	0.001	0.0041	0.0050	0.0032	0.001	0.0032	0.001	0.0032	0.001	0.0032	0.001	0.0032	0.001	0.0032	0.001	0.0032	0.001	0.0032	0.001	0.0032	0.001	0.0032	0.001	0.0032	0.001	0.0032	0.001	0.0032
Cobalt	1.0	1.0P	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010
Copper	0.65	1.0P	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010
Cyanide	0.2	1.0P	0.0010	0.5D	0.0010	0.5D	0.0050	0.0057	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010
Fluoride	4.0	1.0P	0.22	0.5D	0.25	0.5D	0.25	0.5D	0.33	0.5D	0.33	0.5D	0.33	0.5D	0.33	0.5D	0.33	0.5D	0.33	0.5D	0.33	0.5D	0.33	0.5D	0.33	0.5D	0.33	0.5D	0.33	0.5D	0.33	0.5D	0.33	0.5D	0.33	0.5D	0.33	0.5D	0.33	0.5D	0.33	0.5D	0.33	0.5D	0.33
Iron	5.0	1.0P	0.10	0.5D	0.110	0.5D	0.110	0.5D	0.130	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10	0.5D	0.10
Lead	0.0075	1.0P	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010
Manganese	0.15	1.0P	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.001	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010	0.5D	0.0010
Mercury	0.002	1.0P	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.00020	0.0002	0.00020	0.0002	0.00020	0.0002	0.00020	0.0002	0.00020	0.0002	0.00020	0.0002	0.00020	0.0002	0.00020	0.0002	0.00020	0.0002	0.00020	0.0002	0.00020	0.0002	0.00020	0.0002	0.00020

Attachment "A-3 Historical CCA Groundwater Data - Midwest Generation LLC, Powerton Station, Pekin, IL

Sample: MW-04 | **Date** | 12/17/2010 | 3/25/2011 | 6/16/2011 | 9/19/2011 | 12/12/2011 | 3/19/2012 | 6/25/2012 | 9/18/2012 | 12/12/2012 | 2/27/2013 | 5/29/2013 | 7/31/2013 | 10/21/2013 | 3/5/2014 | 5/27/2014 | 8/21/2014 | 10/27/2014 | 2/25/2015 | 5/13/2015 | 8/17/2015 | 11/17/2015 | 2/23/2016 | 5/17/2016 | 8/16/2016 | 11/1/2016 | 2/14/2017 | 5/1/2017 | 8/28/2017 | 11/7/2017 | 3/6/2018 | 5/15/2018 | 8/7/2018 | 10/30/2018 | 2/26/2019 | 4/30/2019 | 8/26/2019 | 11/12/2019 | 2/24/2020 | 4/28/2020 | 8/10/2020 | 12/9/2020 | 2/22/2021 | 5/31/2021

| Parameter | Standards | DL | Result | DL | Result | DL | Result

Attachment "K-3 Historical CCA Groundwater Data - Midwest Quantum LLC, Powerton Station, Pekin, IL

Sample: MW-07	Date	12/6/2010		2/25/2011		6/16/2011		9/19/2011		12/12/2011		3/19/2012		6/25/2012		9/18/2012		12/12/2012		2/27/2013		5/31/2013	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Ammonia	0.008	1.0P	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.0018	ND
Arsenic	0.010	1.0P	0.028	0.001	0.005	0.001	0.12	0.001	0.18	0.001	0.23	0.001	0.23	0.001	0.11	0.001	0.17	0.0018	0.112	0.0018	0.22	0.0018	0.112
Barium	2.0	1.0P	0.35	0.001	0.32	0.001	0.357	0.001	0.37	0.001	0.37	0.001	0.41	0.001	0.44	0.0042	0.345	0.0042	0.41	0.0042	0.41	0.0042	0.412
Beryllium	0.004	1.0P	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.0018	ND
Boron	2.0	1.0P	0.21	0.01	0.44	0.012	0.43	0.01	0.5	0.01	0.51	0.01	0.51	0.01	0.48	0.012	0.46	0.012	0.47	0.012	0.52	0.0092	0.52
Cadmium	0.005	1.0P	ND	0.0005	0.001	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.00018	ND
Chloride	200.0	1.0P	178	5.0	208	25	145	25	120	10	21	10	17	5.0	140	25	128	25	158	50	168	10	150
Chromium	0.1	1.0P	0.0103	0.004	0.0075	0.004	0.0103	0.004	ND	0.004	ND	0.004	ND	0.004	0.0064	0.004	0.0051	0.0018	0.0128	0.004	0.0117	0.0018	ND
Cobalt	1.0	1.0P	0.0117	0.001	0.0054	0.001	0.0107	0.001	0.0095	0.001	0.011	0.001	0.0093	0.001	0.0095	0.0018	ND	0.0018	0.00878	0.0018	0.0113	0.0018	0.0054
Copper	0.65	1.0P	0.114	0.003	0.042	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.0042	ND	0.0042	ND	0.0042	ND	0.0018	ND
Cyanide	0.2	1.0P	0.0018	0.005	0.0018	0.005	0.0018	0.005	0.0018	0.005	ND	0.0018	0.005	0.0018	ND	0.0018	0.005	ND	0.0018	0.005	ND	0.0018	ND
Fluoride	4.0	1.0P	0.47	0.25	0.42	0.25	0.38	0.25	0.39	0.25	0.36	0.25	0.38	0.25	0.31	0.25	0.33	0.25	0.33	0.25	0.48	0.18	0.47
Iron	5.0	1.0P	0.01	0.01	7.5	0.05	0.18	0.05	0.05	0.05	0.28	0.05	0.08	0.05	0.06	0.05	0.08	0.05	0.08	0.05	0.15	0.036	0.15
Lead	0.0075	1.0P	0.0119	0.001	ND	0.001	0.0034	0.001	ND	0.001	ND	0.001	ND	0.001	0.0013	0.001	ND	0.001	ND	0.00092	ND	0.00018	ND
Manganese	0.15	1.0P	3.5	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.0018	0.0018
Mercury	0.002	1.0P	0.0002	0.0002	0.0005	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.00018	ND
Nickel	0.1	1.0P	0.043	0.01	0.023	0.005	0.038	0.005	0.032	0.005	0.035	0.005	0.032	0.005	0.032	0.005	0.032	0.005	0.032	0.005	0.034	0.0018	0.0128
Nitrogen(Nitrate)	10.0	1.0P	0.043	0.02	0.08	0.02	0.02	0.25	0.25	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.08	0.02	0.08	0.02	0.08	0.018	0.08
Nitrogen(Nitrite)	1.0	1.0P	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.018	ND
Nitrogen(Nitrate+Nitrite)	10.0	1.0P	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.018	ND
Perchlorate	0.0049	1.0P	ND	0.0049	ND	0.0049	ND	0.0049	ND	0.0049	ND	0.0049	ND	0.0049	ND	0.0049	ND	0.0049	ND	0.0049	ND	0.0049	ND
Selenium	0.05	1.0P	0.0043	0.001	0.0016	0.001	0.0076	0.001	0.0054	0.001	0.0061	0.001	0.0056	0.001	0.0061	0.001	0.0059	0.0018	0.0078	0.0018	0.0078	0.0018	0.0043
Silver	0.05	1.0P	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.00018	ND
Sulfate	500.0	1.0P	7.1	5.0	8.1	5.0	7.8	5.0	7.7	5.0	7.7	5.0	7.8	5.0	7.8	5.0	7.8	5.0	7.8	5.0	7.8	1.8	7.8
Thallium	0.002	1.0P	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.00018	ND
Total Dissolved Solids	1,500	1.0P	398	17	1180	17	1086	17	1048	17	1008	17	1008	17	1008	17	1008	17	1008	17	1008	18	1008
Vanadium	0.049	1.0P	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.0018	ND
Zinc	1.0	1.0P	0.074	0.008	0.008	0.008	0.086	0.008	0.084	0.008	0.084	0.008	0.011	0.008	0.084	0.008	0.083	0.008	0.083	0.008	0.083	0.0128	0.083
Benzene	0.005	1.0P	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
BETX	11.195	1.0P	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
pH	6.5-9.5	1%/L	7.04	1%/L	6.74	1%/L	6.78	1%/L	6.91	1%/L	6.78	1%/L	6.83	1%/L	6.72	1%/L	6.77	1%/L	6.95	1%/L	6.88	1%/L	6.95
Temperature	38A	1%/L	15.95	1%/L	15.15	1%/L	18.85	1%/L	18.28	1%/L	19.13	1%/L	18.28	1%/L	19.13	1%/L	18.56	1%/L	17.68	1%/L	17.81	1%/L	17.96
Conductivity	38A	1%/L	1.82	1%/L	1.97	1%/L	1.93	1%/L	1.98	1%/L	1.94	1%/L	1.98	1%/L	1.98	1%/L	1.98	1%/L	1.98	1%/L	1.98	1%/L	1.98
Dissolved Oxygen	38A	1%/L	0.41	1%/L	0.47	1%/L	0.44	1%/L	0.16	1%/L	0.11	1%/L	0.16	1%/L	0.11	1%/L	0.16	1%/L	0.11	1%/L	0.16	1%/L	0.11
ORP	38A	1%/L	92.6	1%/L	97.1	1%/L	115	1%/L	198	1%/L	93	1%/L	97.1	1%/L	115	1%/L	198	1%/L	93	1%/L	97.1	1%/L	115

Sample: MW-08	Date	12/15/2010		3/25/2011		6/16/2011		9/19/2011		12/12/2011		3/19/2012		6/25/2012		9/18/2012		12/12/2012		2/27/2013		5/30/2013	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Ammonia	0.008	1.0P	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Arsenic	0.010	1.0P	0.0265	0.001	0.0039	0.001	0.0144	0.001	0.0168	0.001	0.0091	0.001	0.0104	0.001	0.0061	0.0042	0.0047	0.0042	0.0041	0.0018	0.0018	0.0018	0.0018
Barium	2.0	1.0P	0.0107	0.001	0.0107	0.001	0.0118	0.001	0.0111	0.001	0.0116	0.001	0.0111	0.001	0.0116	0.0042	ND	0.0042	ND	0.0042	ND	0.0018	ND
Beryllium	0.004	1.0P	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.0018	ND
Boron	2.0	1.0P	0.12	0.01	0.14	0.012	0.17	0.01	0.17	0.01	0.17	0.01	0.17	0.01	0.16	0.012	0.16	0.012	0.16	0.012	0.17	0.0092	0.17
Cadmium	0.005	1.0P	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.00018	ND
Chloride	200.0	1.0P	108	5.0	218	50	140	50	106	10	170	10	260	10	218	10	230	10	240	10	270	10	250
Chromium	0.1	1.0P	0.0094	0.004	0.0059	0.004	0.0094	0.004	0.0099	0.004	0.0094	0.004	0.0094	0.004	0.0094	0.004	0.0094	0.004	0.0094	0.004	0.0094	0.0018	0.0094
Cobalt	1.0	1.0P	0.0012	0.001	0.0012	0.001	0.0012	0.001	0.0012	0.001	0.0012	0.001	0.0012	0.001	0.0012	0.0018	ND	0.0018	ND	0.0018	ND	0.0018	ND
Copper	0.65	1.0P	0.0042	0.003	0.0025	0.003	0.0103	0.003	0.0042	0.003	0.0027	0.003	0.0042	0.003	0.0042	0.0042	ND	0.0042	ND	0.0042	ND	0.0018	ND
Cyanide	0.2	1.0P	0.0055	0.005	0.0018	0.005	0.0058	0.005	0.0079	0.005	0.0079	0.005	0.0079	0.005	0.0079	0.005	0.0079	0.005	0.005	0.005	0.0079	0.005	0.0079
Fluoride	4.0	1.0P	0.27	0.25	0.27	0.25	0.27	0.25	0.27	0.25	0.27	0.25	0.27	0.25	0.27	0.25	0.27	0.25	0.27	0.25	0.27	0.18	0.27
Iron	5.0	1.0P	0.16	0.025	2.1	0.025	0.37	0.025	0.94	0.025	0.72	0.025	0.94	0.025	0.82	0.25	0.67	0.25	0.48	0.25	0.72	0.18	0.72
Lead	0.0075	1.0P	ND	0.001	0.0011	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Manganese	0.15	1.0P	0.27	0.01	0.17	0.01	0.17	0.01	0.17	0.01	0.17	0.01	0.17	0.01	0.17	0.01	0.17	0.01	0.17	0.01	0.17	0.0018	0.17
Mercury	0.002	1.0P	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.00018	ND
Nickel	0.1	1.0P	0.0128	0.01	0.0128	0.005	0.0128	0.005	0.0128	0.005	0.0128	0.005	0.0128	0.005	0.0128	0.005	0.0128	0.005	0.0128	0.005	0.0128	0.0018	0.0128
Nitrogen(Nitrate)	10.0	1.0P	0.93	0.02	0.41	0.02	0.18	1.0	0.87	0.02	0.87	0.02	0.87	0.02	0.82	0.02	0.85	0.02	0.85	0.02	0.85	0.018	0.85
Nitrogen(Nitrite)	1.0	1.0P	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.018	ND
Nitrogen(Nitrate+Nitrite)	10.0	1.0P	0.93	0.02	0.41	0.02	0.18	1.0	0.87	0.02	0.87	0.02	0.87	0.02	0.82	0.02	0.85	0.02	0.85	0.02	0.85	0.018	0.85
Perchlorate	0.0049	1.0P	ND	0.0049	ND	0.0049	ND	0.0049	ND	0.0049	ND	0.0049	ND	0.0049	ND	0.0049	ND	0.0049	ND	0.0049	ND	0.0049	ND
Selenium	0.05	1.0P	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.0018	ND
Silver	0.05	1.0P	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.00018	ND
Sulfate	500.0	1.0P	7.1	5.0	7.8	5.0	7.8	5.0	7.8	5.0	7.8	5.0	7.8	5.0	7.8	5.0	7.8	5.0	7.8	5.0	7.8	1.8	7.8
Thallium	0.002	1.0P	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.00018	ND
Total Dissolved Solids	1,500	1.0P	398	17	992	17	970	17	940	17	1008	17	1008	17	1008	17	1008	17	1008	17	1008	18	1008
Vanadium	0.049	1.0P	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.0018	ND
Zinc	1.0	1.0P	0.084	0.008	0.084	0.008	0.086	0.008	0.086	0.008	0.086	0.008	0.084	0.008	0.084	0.008	0.084	0.008	0.084	0.008	0.084	0.0128	0.084
Benzene	0.005	1.0P	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
BETX	11.195	1.0P	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
pH	6.5-9.5	1%/L	6.94	1%/L	6.74	1%/L	6.78	1%/L	6.91	1%/L	6.78	1%/L	6.83	1%/L	6.72	1%/L	6.77	1%/L	6.95	1%/L	6.88	1%/L	6.95
Temperature	38A	1%/L	15.95	1%/L	15.15	1%/L	18.85	1%/L	18.28	1%/L	19.13	1%/L	18.28	1%/L	19.13	1%/L	18.56	1%/L	17.68	1%/L	17.81	1%/L	17.96
Conductivity	38A	1%/L	1.82	1%/L	1.97	1%/L	1.93	1%/L	1.98	1%/L	1.94	1%/L	1.98	1%/L	1.98	1%/L	1.98	1%/L	1.98	1%/L	1.98	1%/L	1.98
Dissolved Oxygen	38A	1%/L	0.41	1%/L	0.47	1%/L	0.44	1%/L	0.16	1%/L	0.11	1%/L	0.16	1%/L	0.11	1%/L	0.16	1%/L	0.11	1%/L	0.16	1%/L	0.11
ORP	38A	1%/L	92.6	1%/L	97.1	1%/L	115	1%/L	198	1%/L	93	1%/L	97.1	1%/L	115	1%/L	198	1%/L	93	1%/L	97.1	1%/L	115

Notes: Standards defined from 2011 Title 35, Chapter I, Part 620, Subpart D, Section 620.440 - Groundwater Quality Standards for Class I: Potable Resource Groundwater
All values in mg/L (ppm) unless otherwise noted

DL = Detection limit
NR = Not Applicable
ND = Not Detected
1%/L = Not Reported

RD = Not Required
1P = Not Applicable
2P = Not Required
3P = Not Applicable
4P = Not Required
5P = Not Applicable
6P = Not Required
7P = Not Applicable
8P = Not Required
9P = Not Applicable
10P = Not Required

Attachment "A-3 Historical CCA Groundwater Data - Midwest Guarantee LLC, Pewaukee Station, Pekin, IL

| Sample: MW-09 | Date | 12/15/2010 | | | 3/25/2011 | | | 6/16/2011 | | | 9/19/2011 | | | 12/12/2011 | | | 3/19/2012 | | | 6/25/2012 | | | 9/18/2012 | | | 12/12/2012 | | | 2/27/2013 | | | 5/20/2013 | | | 7/30/2013 | | | 10/22/2013 | | | 3/4/2014 | | | 5/20/2014 | | | 8/28/2014 | | | 10/30/2014 | | | 2/25/2015 | | | 5/14/2015 | | | 8/18/2015 | | | 11/18/2015 | | | 2/24/2016 | | | 5/18/2016 | | | 8/19/2016 | | | 11/16/2016 | | | 2/15/2017 | | | 5/2/2017 | | | 8/24/2017 | | | 11/9/2017 | | | 3/7/2018 | | | 5/16/2018 | | | 8/8/2018 | | | 10/30/2018 | | | 2/26/2019 | | | 5/1/2019 | | | 8/27/2019 | | | 11/12/2019 | | | 2/25/2020 | | | 4/28/2020 | | | 8/17/2020 | | | 12/8/2020 | | | 2/23/2021 | | | 5/11/2021 | | |
|---|---|---

Attachment "A-3 Historical CCA Groundwater Data - Midwest Generation LLC, Powerton Station, Pekin, IL

Sample: MW-03 Date

| Parameter | Standards | 12/17/2010 | | 2/15/2011 | | 4/25/2011 | | 6/16/2011 | | 8/9/2011 | | 10/13/2011 | | 12/12/2011 | | 4/10/2012 | | 12/14/2012 | | 2/28/2013 | | 5/30/2013 | | 7/30/2013 | | 10/22/2013 | | 3/4/2014 | | 5/20/2014 | | 8/27/2014 | | 10/29/2014 | | 2/26/2015 | | 5/13/2015 | | 8/19/2015 | | 11/10/2015 | | 2/24/2016 | | 5/19/2016 | | 8/18/2016 | | 11/17/2016 | | 2/17/2017 | | 5/4/2017 | | 8/24/2017 | | 11/9/2017 | | 3/7/2018 | | 5/17/2018 | | 8/9/2018 | | 10/31/2018 | | 2/28/2019 | | 5/2/2019 | | 8/20/2019 | | 11/14/2019 | | 2/26/2020 | | 4/30/2020 | | 8/11/2020 | | 12/10/2020 | | 2/24/2021 | | 5/12/2021 | |
|---|---|---

Attachment W-3 Historical CCA Groundwater Data - Midwest Generation LLC, Powerton Station, Pekin, IL

| Sample: MW-40 | Date | 12/17/2010 | | 2/15/2011 | | 4/25/2011 | | 6/16/2011 | | 8/9/2011 | | 10/13/2011 | | 12/12/2011 | | 4/10/2012 | | 12/12/2012 | | 2/27/2013 | | 5/29/2013 | | 7/29/2013 | | 10/22/2013 | | 3/3/2014 | | 5/30/2014 | | 8/26/2014 | | 10/30/2014 | | 2/24/2015 | | 5/12/2015 | | 8/18/2015 | | 11/16/2015 | | 2/24/2016 | | 5/16/2016 | | 8/19/2016 | | 11/16/2016 | | 2/15/2017 | | 5/2/2017 | | 8/23/2017 | | 11/9/2017 | | 3/8/2018 | | 5/17/2018 | | 8/8/2018 | | 10/31/2018 | | 2/27/2019 | | 5/2/2019 | | 8/27/2019 | | 11/14/2019 | | 2/25/2020 | | 4/27/2020 | | 8/11/2020 | | 12/10/2020 | | 2/23/2021 | | 5/10/2021 | |
|---|---|---

ATTACHMENT 9-4
CERTIFICATION OF GROUNDWATER MONITORING WELL SYSTEM

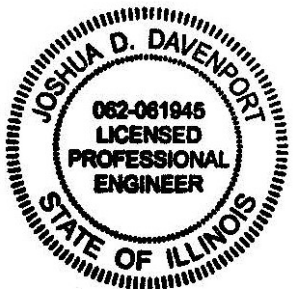
CERTIFICATION
35 Ill. Adm. Code 845.630

In accordance with Section 35 Ill. Adm. Code 845.630(g), I hereby certify based on review of the information contained within the Initial Operating Permit Application for Powerton Station dated October 29, 2021, the groundwater monitoring system has been designed and constructed to satisfy the requirements of 35 Ill. Adm. Code 845.630. For this site the minimum number of wells required is deemed sufficient based on the following: 1) The number of wells, placement and screened intervals are based on a hydrogeologic assessment performed for the site; 2) hydrogeologic considerations included aquifer characteristics affecting flow velocity and physical transport processes; 3) available historical groundwater flow data indicate consistent flow conditions over time; and 4) Illinois Environmental Protection Agency (IEPA) approved the overall hydrogeologic assessment as part of a larger study.

Certified by: _____

Date: 10/29/21

Joshua Davenport, P.E.
Professional Engineer Registration No.: 062-061945
KPRG and Associates, Inc.



ATTACHMENT 9-5
CCR COMPLIANCE STATISTICAL APPROACH

K P R G

ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG and Associates, Inc.

ILLINOIS STATE CCR RULE COMPLIANCE STATISTICAL APPROACH FOR GROUNDWATER DATA EVALUATION

Midwest Generation, LLC
Powerton Generating Station
13082 Manito Rd.
Pekin, Illinois

PREPARED BY: KPRG and Associates, Inc.
14665 West Lisbon Road, Suite 1A
Brookfield, WI 53005

August 23, 2021

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FIGURE

Figure 1 – Monitoring Well Location Map

TABLE

Table 1 – Section 845.600 Parameters

1.0 INTRODUCTION

On April 21, 2021, the Illinois Pollution Control Board (IPCB) and Illinois Environmental Protection Agency (Illinois EPA) enacted a final rule regulating coal combustion residuals (CCR) as part of Ill. Adm. Code Title 35, Part 845: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments (State CCR Rule). The State CCR Rule specifically requires that the owner or operator of a CCR unit must develop an Operating Permit that will specify a sampling and analysis program that includes procedures and techniques for sample collection, sample preservation and shipment, analytical procedures, chain of custody (COC) control, and quality assurance and quality control. As a result, each regulated facility must develop a program that meets the State CCR Rule. At the Powerton facility, the Ash Bypass Basin/Ash Surge Basin (ABB/ASB) the Former Ash Basin (FAB) and the Metals Cleaning Basin (MCB) require monitoring under the State CCR Rule. The monitoring well networks around these basins consist of the following wells:

- Combined ABB/ASB monitoring network - upgradient wells MW-01, MW-09 and MW-19 and downgradient wells MW-08, MW-11, MW-12, MW-15, MW-17 and MW-18.

- FAB monitoring network - upgradient wells MW-01 and MW-10 and downgradient wells MW-02 thru MW-05.

- MCB monitoring network – upgradient wells MW-15 and MW-17 and downgradient wells MW-14, MW-20 and MW-21.

The well locations are shown on Figure 1.

Section 845.640(f) of the State CCR Rule requires the development of the statistical approach that will be used for assessing the data and determining whether a statistically significant increase over background concentrations in groundwater has occurred at identified downgradient monitoring points. Potential statistical methods that can be applied to the data are listed in Section 845.640(f) and performance standards are provided in 845.640(g).

This narrative of the statistical approach that will be used for the Powerton facility's groundwater monitoring data is intended to fulfill certification requirements under Section 845.640(f)(2). The professional engineer's certification of this statistical approach is provided in Section 4.0 of this document.

2.0 STATISTICAL METHOD SELECTION and BACKGROUND DATA EVALUATION

Section 845.640(f)(1) identifies five statistical data evaluation methods that can be used for assessing site groundwater data. Relative to the subject site, the prediction interval procedure identified in 845.640(f)(1)(C) will be used. This approach is robust and conforms to varying data distributions and facilitates various non-detect frequencies. U.S. EPA identifies this method as preferred over establishment of tolerance intervals (Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities – Unified Guidance, March 2009 [Unified Guidance]).

Total recoverable metals groundwater data has been collected for this site at many of the monitoring well locations since 2015 as part of Federal CCR Rule requirements. Under the Federal CCR Rule, the initial eight rounds of quarterly data generated were used to develop a representative background concentration with which to develop applicable prediction limits for subsequent statistical downgradient monitoring well data comparisons. Since additional data has been generated since the initial eight rounds of groundwater monitoring under the Federal CCR Rule, the full, currently available data set through the second quarter 2021 will be evaluated for potential use in developing a representative background dataset. If appending this additional data to the original eight rounds of background sampling is determined to be not statistically appropriate, then the background calculations will be reverted to using the initial eight rounds of background data for subsequent calculations. The established, representative background concentration for the upgradient well locations will be used to develop prediction limits for the regulated unit for each constituent listed in Section 845.600(a) and (b) as provided in Table 1.

Statistical evaluations will be performed with the assistance of the Sanitas™ software package.

2.1 Outlier Testing

The background dataset will be first checked for potential outliers for each constituent. Potential causes of outliers can be, but are not limited to:

- Changes in sampling technique;
- Changes in analytical methods;
- Data transcription errors;
- Unnatural localized event such as a spill; or
- Natural but extreme variations in constituent concentration.

The Unified Guidance does not recommend removing an outlier from the data set unless it can be shown that the outlier is not caused by extreme natural variation. If the outlier can be traced to other than natural causes, the data set will be adjusted appropriately.

2.2 Spatial Variability

If more than one background well is being used for the monitored unit, an evaluation of spatial variability will be performed to determine whether the mean concentration of a constituent varies statistically between the background points. This is generally accomplished by performing an Analysis of Variance (ANOVA). If statistically significant spatial variation is determined to be

present, the background points will not be combined between the wells. If the spatial variability is determined to be natural, an intrawell data evaluation approach may be considered for both upgradient and downgradient wells.

2.3 Temporal Variability

Temporal variability in groundwater data from a specific monitoring point occurs when a consistent fluctuation of constituent concentrations occurs over time. The most common example is seasonal variation. If such a variation is noted in the data, the dataset should be corrected to account for the trend; however, any such corrections must be applied judiciously and would be completed in accordance with the Unified Guidance recommended procedures.

2.4 Trend Testing

As discussed above, it is intended to expand the initial background dataset collected under the Federal CCR Rule which consisted of eight rounds of quarterly sampling, with any additional data collected for a specific well since that time to facilitate a larger background data set upon which to develop subsequent interwell, and if necessary intrawell, prediction limits. The expanded background dataset for each upgradient well, for each constituent listed in Table 1, will undergo trend analysis to determine if there may be a potential statistically significant trend in the data. Linear regression will be the primary trend analysis tool, however, other methods such Sen's Slope Estimator may also be used. If a statistically significant trend is identified in the larger combined background dataset, the new data cannot be added to the initial background dataset, and only the original eight rounds of data can be used for that well in background development and associated subsequent calculations.

2.5 Test of Normality

The main underlying assumption in parametric data evaluations, such as establishing prediction limits, is that the underlying data distribution is normal. A quick approximation can be made by calculating the Coefficient of Variance (CV) which is the quotient of the standard deviation divided by the sample mean. In general, if this quotient is greater than 1, the underlying data distribution is probably not normal. The new Unified Guidance is more conservative and suggests that if this quotient is greater than 0.5, the dataset may not be normal and a more robust distribution evaluation should be performed. Therefore, for any CV value greater than 0.5 for a specific dataset, normality will be evaluated using the Shapiro-Wilk Test with an alpha (α) value of 0.05 (or 95%).

If the dataset does not pass this initial test, the data will undergo a log transformation and the test will be repeated for the natural log values of the dataset. If it is determined that this dataset is log-normal, statistical evaluations will be completed on those values and the result converted back to the standard value. If the underlying distribution is also determined not to be log-normal, the Unified Guidance provides for a number of other data transformations that can be performed to evaluate whether those underlying distributions may be normal at which point the entire dataset would be transformed for subsequent calculations.

If a normal underlying distribution can not be determined, non-parametric statistical evaluations will need to be considered which do not rely on a specific underlying distribution.

2.6 Non-Detects

It is not uncommon in environmental datasets to have parameters being detected at low concentrations during one sampling event and being not detected in other sampling events. Having a consistent approach to the handling of non-detect values is an important part of the statistical evaluation process. The handling of non-detect values will be accomplished as follows:

- 100 Percent Non-Detects – Assumed that the constituent is not present and no statistical evaluations will be performed. The upper prediction limit will be set at the Reporting Limit (RL) established by the analytical laboratory.

- 50 Percent or Greater Non-Detects – A non-parametric evaluation will be performed where the confidence interval will be constructed using the highest detected concentration as the upper prediction limit.

- 15 to 50 Percent Non-Detects – Aitchison's Adjustment will be used with subsequent parametric or non-parametric evaluations, as appropriate, based on underlying distributions.

- 0 to 15 Percent Non-Detects - The non-detect values will be replaced with RL/2 and the dataset will be evaluated for distribution normality with subsequent parametric or non-parametric evaluations, as appropriate, based on underlying distributions.

2.7 Prediction Limit Calculation for Normally Distributed Data

For datasets where the distribution or underlying transformed distribution is normal, a parametric statistical approach will be used for establishing the prediction limit at the required 95% statistical confidence. In accordance with Unified Guidance, the following equation will be used:

$$95\%\ Prediction\ Limit = \bar{x} + t_{1-0.05/m,n-1} s \sqrt{1+\frac{1}{n}}$$

Where:

$\bar{x}$ = the sample mean of the detected or adjusted results
S = sample standard deviation of the detected or adjusted results
$t_{1-0.05/m,n-1}$ = the students t-coefficient for degrees of freedom (n-1) and confidence level (1-0.05/m)
n = the number of samples
m = the number of future samples

The number of future sampling events (*m*) will be set at 2 which will account for one sampling event and a confirmation resampling. This will assist in limiting the potential number of false

positives. An acceptable site-wide false positive (SWFP) rate of 10% or less is acceptable under the Unified Guidance.

2.8 Prediction Limit Calculation for Non-Normally Distributed Data

If the dataset distribution or underlying distribution is determined not to be normal, a non-parametric approach will need to be used for the establishment of the prediction limit. The non-parametric evaluation will use the highest detected concentration as the upper prediction limit for the specific constituent.

3.0 GROUNDWATER MONITORING

The State CCR Rule does not distinguish between detection monitoring or assessment monitoring as was defined under the Federal CCR Rule. To meet the requirements set forth in Section 845.650(b), a minimum of eight rounds of groundwater data need to be collected for establishing background. As noted above, if more than eight rounds of data are available, then the larger dataset will be evaluated to determine whether the background dataset can be expanded to provide a more robust statistical assessment. At that point, statistical evaluation of the background dataset will be performed to establish the upper prediction limits for each Section 845.600(a) and (b) constituent. It is noted that in the case of pH, a lower prediction limit will also be established since this parameter has an established upper and lower value range for compliance.

Site specific Groundwater Protection Standards (GWPSs) will be developed in accordance with Section 845.600(a)(2) as follows:

- If the constituent has an established State standard listed in Section 845.600(a)(1) and the standard is greater than the calculated background upper prediction limit, then the standard will serve as the GWPS. If the background upper prediction limit is greater than the standard, the upper prediction limit will serve as the GWPS.

- If the constituent does not have an established standard (i.e., calcium and turbidity) then the calculated upper prediction limit will serve as the GWPS.

Once the proposed GWPSs are determined and approved by Illinois EPA, subsequent downgradient well concentrations will be compared against the upper prediction limit (and lower prediction limit in the case of pH), and the GWPSs. If an exceedance of the GWPS is identified during a quarterly sampling event, an immediate resampling of the specific well(s) will be completed for those specific parameters. If the exceedance is confirmed by the resampling, the Illinois EPA will be notified of the exceedance(s) and the notification will be placed in the facilities operating record in accordance with 845.800(d)(16). It is noted that there are some constituents that historically may have had no detections (i.e., 100% non-detects). In this case, in accordance with the Unified Guidance, if there is a detection of such a constituent, then the Double Quantification Rule will be applied. Under this rule, a confirmed exceedance is registered if any well-constituent pair in the 100% non-detect group exhibits quantified measurements (i.e., at or above the Reporting Limit in two consecutive sample and resample events.

If an exceedance of the GWPS is recorded and reported to Illinois EPA, an Alternate Source Demonstration (ASD) may be completed within 60-days of the confirmed exceedance in accordance with Section 845.650(e) and submitted to the Illinois EPA as well as placing the ASD on the facility's publically accessible CCR website. Illinois EPA will review and approve or disapprove the ASD.

If it is decided not to complete an ASD or if Illinois EPA does not concur with and approve the ASD, a characterization of the nature and extent of the potential release must be completed in

accordance with Section 845.650(d)(1) as well as meeting the requirements of Sections 845.660, 845.670 and 845.680.

4.0 CERTIFICATION

In accordance with Section 845.640(f)(2) of the State CCR Rule, I hereby certify based on a review of the information contained within this Illinois State CCR Rule Compliance Statistical Approach for Groundwater Data Evaluation dated August 23, 2021, the statistical procedures developed and selected for evaluation of groundwater data associated with the Midwest Generation Powerton Station CCR Units are adequate and appropriate for evaluating the groundwater data.

Certified by: _____

Date: 823/21

Joshua Davenport, P.E.

Professional Engineer Registration No. 062-061945

KPRG and Associates, Inc.



FIGURE



W:\projects\midwest generation\12313 groundwater\figures\powerton\ccr\powerton ccr 4q2018 gw map.dwg

ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG and Associates, inc.

414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

14665 West Lisbon Road, Suite 1A Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478

CCR MONITORING WELL SITE MAP

POWERTON STATION
PEKIN, ILLINOIS

Scale: 1" = 350' | Date: June 10, 2021

KPRG Project No. 12313.1 | FIGURE 1

TABLE

Table 1. Section 845.600 Groundwater Monitoring Parameter List

Parameter	Section 845.600 Standards
Antimony	0.006
Arsenic	0.01
Barium	2
Beryllium	0.004
Boron	2.0
Cadmium	0.005
Chloride	200
Chromium	0.1
Cobalt	0.006
Combined Radium 226 + 228 (pCi/L)	5.0
Fluoride	4.0
Lead	0.0075
Lithium	0.04
Mercury	0.002
Molybdenum	0.10
pH (standard units)	6.5-9.0
Selenium	0.05
Sulfate	400
Thallium	0.002
Total Dissolved Solids	1200
Calcium	NE
Turbidity	NE

All vaues in mg/l unless otherwise specified.
NE- Not Established

ATTACHMENT 11-1
OWNER CERTIFICATION

I, Todd Mundorf , as an authorized representative of Midwest Generation, certify that the public notification and public meeting requirements were completed in accordance with 35 Ill. Adm. Code 845.240.

Signature: 

Title: Plant Manager

ATTACHMENT 11-2
PUBLIC MEETING GENERAL SUMMARY

Midwest Generation, LLC
Powerton Generating Station
Bypass Basin Retrofit and Former Ash Basin Closure
Public Meeting General Summary

INTRODUCTION

In accordance with Title 35 of the Illinois Administrative Code ("35 IAC") Section 845.240, Midwest Generation, LLC (MWG) posted the public meeting notice for closure of the Powerton Generating Station's Former Ash Basin and the Retrofit Plan for the Bypass Basin on its publicly available website and provided a copy of such notice to the Illinois Environmental Protection Agency (Illinois EPA or Agency) to email to its listserv for this facility. The public meeting notice was also mailed to all residents within at least 1 mile of the facility on April 14, 2022, which totaled 986 residential mailing addresses. The notice was also posted in 31 public locations within 10 miles of the facility boundary.

The public meetings for Powerton Generating Station's Bypass Basin and Former Ash Basin (FAB) were held on May 18, 2022 from 6:00 p.m. to 8:00 p.m. and on May 19, 2022 from 10:00 a.m. to 12:00 p.m. The meetings were held in a hybrid format – in person and via Zoom or telephone. Seven members of the public attended the May 18th meeting in person; four attended via Zoom. Seven members of the public attended the May 19th meeting in person; eleven attended via Zoom. The remaining attendees were MWG affiliate employees and consultants. Attendees who wished to sign up for a copy of the meeting summary and/or be added to Illinois EPA's listserv for the facility were asked to sign up via a form provided at the in-person location or a link to a Google form that was provided within the chat function of the Zoom meeting and posted on MWG's website, midwestgenerationllc.com. Seventeen attendees requested a copy of the meeting summary, eleven of whom requested transmittal of their email address to the Agency to be added to the Agency's listserv for the facility. It was also announced that the link would be available on MWG's public website for two weeks. After an introduction and approximate 50-minute presentation on the proposed retrofit and closure construction plans, the public was given approximately 1 hour during each meeting to ask questions and provide comments.

This document serves as a summary of the issues and questions raised during the meeting.

MWG proposes to retrofit the Bypass Basin by removing and disposing of the remaining material in the basin, decontaminating the existing geomembrane liner so that it will act as another protective layer in the composite liner system, and installing a composite liner system and leachate collection system. MWG proposes to close the Former Ash Basin in-place by installing an alternate final cover system (ClosureTurf®).

SUMMARY OF ISSUES AND QUESTIONS RAISED DURING THE MEETING

General

Powerton Lake

In response to a specific question, there is one fish advisory specific to Powerton Lake, for the channel catfish. The advisory is for polychlorinated biphenyls (PCBs) and the Illinois Department of Public Health recommends that people consume no more than 1 meal per week of channel catfish that are between 15 and 19 inches in size, and no more than 1 meal per month of channel catfish that are 19 inches or longer. Note that the Illinois Department of Natural Resources (IDNR) leases Powerton Lake for fishing, waterfowl hunting, and other recreation uses; IDNR has leased Powerton Lake since 1984. In 2021, IDNR stocked the Powerton Lake with over 230,000 fish across three species: blue catfish, smallmouth bass, and hybrid striped bass. Information on IDNR's management of the fishery at Powerton Lake can be found on IDNR's website (https://www.ifishillinois.org/profiles/waterbody.php?waternum=00039).

Labor

Midwest Generation, LLC operates under a Power House Labor Agreement (PHLA) that gives preference to Union labor for construction and maintenance activities at all plants that MWG owns and/or operates in Illinois. MWG will continue to abide by PHLA.

Availability of Information

Questions were raised about availability of information regarding MWG's plans for retrofitting the Bypass Basin and closing the FAB. Generally, MWG posts all required reports and assessments to its publicly available website within 14 days of completion. This information can be found at midwestgenerationllc.com.

Former Ash Basin

FAB History

Questions were asked about whether ash has washed out of the FAB into the Illinois River, if MWG has studied whether potential contaminants have leached over time into the Illinois River, and whether MWG has studied the Illinois River.

> The ash that is currently in the FAB is stable and not moving. Powerton Station personnel inspect the FAB weekly and the FAB is inspected by a third-party Professional Engineer annually. The inspection reports are posted at midwestgenerationllc.com.

MWG has not studied whether potential contaminants have leached over time because MWG is unable to recreate the initial conditions that likely produced the ash that is in the FAB. Powerton Station began operation in the late 1920's with pulverized coal-fired (PC) boilers (Units 1 through 4) that burned Illinois coal. Units 1 through 4 were retired before MWG began operating Powerton Station, presumably in the 1970's, the same decade that placement of ash in the FAB ceased.

Ash from the FAB was sampled and analyzed as required by the IL CCR Rule. The results of that sampling can be found in the Initial Operating Permit application, available at midwestgenerationllc.com. MWG did not identify any constituent levels of concern in that sampling.

MWG does not study the Illinois River. Instead, we monitor our discharges to the Illinois River and report those to the Illinois EPA as required by the Station's NPDES permit.

Groundwater Monitoring

Groundwater monitoring at the FAB shows that groundwater from each of the four downgradient monitoring wells meet the Section 845.600(a) groundwater protection standards which are based on the Illinois Class I Potable Resource Groundwater standards.

Closure in Place Regulations and Financial Assurance

Several questions were asked about whether the regulations allow for closure in place of the FAB as it is unlined and not separated from the uppermost aquifer by at least five feet.

The regulations do not distinguish between closure methods for unlined or lined CCR surface impoundments, nor do the regulations distinguish between closure methods for CCR surface impoundments that fail any location restrictions. Instead, the regulations require impoundments that are unlined or fail one or more location restrictions to close. The closure alternatives analysis compared three methods of closure in place and one closure by removal. Various transportation methods were examined for closure by removal.

Under Illinois EPA oversight, MWG will be required to inspect and monitor any CCR surface impoundment that is closed in place for at least 30 years after the closure construction is complete. Post-closure care includes continued groundwater monitoring, impoundment inspections, as-needed repairs to the final cover system, and corrective actions as necessary. Once 30 years of monitoring have been completed, the owner or operator of a CCR surface impoundment must request Illinois EPA approval to terminate post-closure care. While MWG cannot predict future events, the Illinois EPA will continue to have oversight for CCR surface impoundments until the Agency agrees that its oversight is no longer necessary.

Owners and operators of CCR surface impoundments are required to financially assure the costs of closure and post-closure care through the end of the post-closure care period. Financial assurance would be used only in the case of owner insolvency; otherwise costs for closure, post-closure care, and any necessary remedial activities are paid by the surface impoundment owner and/or operator. The responsibility for a CCR surface impoundment would transfer to any future owner, similarly to how the FAB responsibility transferred to MWG when MWG became the operator of Powerton Station in 1999. Additionally, should any additional corrective actions be required in the future, 35 IAC Part 845 requires the owner to financially assure the costs of the additional corrective actions. In addition, the corrective action would be performed by the CCR surface impoundment owner to ensure that impacts to the environment, including groundwater, do not occur or are corrected under EPA oversight. Groundwater modeling may be used as part of evaluating the appropriate corrective action to demonstrate the selected corrective action's effectiveness in remedying the environmental impacts.

Closure in Place Design

Several questions were asked about the northern berm that is included in the closure in place design. The berm is designed to be three to four feet above grade to prevent flooding of the impoundment once the final cover system is placed. The berm will be constructed of fill material composed of natural soils, but the specific materials have not been chosen at this time. Material specifications will be included in construction bid requests. Construction bid requests will not occur until a final closure construction permit is issued by the Agency.

The FAB will be dewatered before placement of the final cover system. The final cover system will be the proprietary ClosureTurf cover system that consists of an impermeable geomembrane liner covered with synthetic turf and sand infill. The impermeable geomembrane liner is a specially designed plastic liner that minimizes precipitation from passing through it and moves precipitation off the liner, so it does not accumulate on top of the liner. The synthetic turf and sand infill protect the geomembrane liner from animal, weather, and UV damage. Third party testing has demonstrated the geomembrane liner has a permeability of $1x10^{-13}$ centimeters per second (cm/s) and a lifespan of at 100 years. Additional testing has demonstrated that the freeze-thaw cycle has no impact on the integrity and effectiveness of the geomembrane liner.

Questions were raised regarding potential future concerns, specifically seismic activity and rising water levels. On its website, the United States Geological Survey (USGS) lists earthquakes in Illinois since 1900. No earthquakes have been recorded in Tazewell County in the 122-year period recorded by the USGS. Closure in place requires continued monitoring of the surface impoundment and corrective action if necessary. As part of the Initial FAB Operating Permit application, the location of the FAB was determined to not be located in a seismic impact zone, not in a fault area, and not in an unstable area.

Onsite Landfill/Consolidate and Close

An onsite landfill was considered and ultimately ruled out because of the lengthy process of siting a new landfill and lack of available space vertically and horizontally. One commentor suggested MWG examine removing ash from the northern portion of the FAB, placing a liner in that area, and consolidating the ash in the northern portion. While MWG did not overtly examine this scenario in the closure alternatives analysis, it was considered and eliminated because installation of a liner and consolidating the ash in the northern portion could be considered construction of a CCR landfill, further delaying the closure of the FAB.

The rail line that separates the northern portion of the FAB from southern portion acts as a berm to prevent flooding of the southern portion from the Illinois River, so consolidation in the southern half could be the better option for protection of the environment. This alternative option is still being internally considered/evaluated, but consideration could not be finalized within the 14 days that this summary is required to be posted.

Closure Costs

The selected option for closure of the FAB is not the least expensive based on engineering analysis that is documented in the Closure Alternatives Analysis. Costs were not determinative in selecting closure in place.

Bypass Basin

Bypass Basin Underlying Surface

Questions were asked about whether the Bypass Basin currently has a Poz-o-Pac liner, had a Poz-o-Pac liner, and whether the Bypass Basin retrofit includes reusing the Poz-o-Pac liner if it exists.

> During the May 18 meeting, MWG mistakenly stated that the Bypass Basin never had a Poz-o-Pac liner and corrected that statement during the May 19 meeting when the question was asked again. The original construction documents show that a 12-inch-thick layer of Poz-o-Pac was installed over the Bypass Basin's original Hypalon® liner along the basin floor.
>
> Both the Poz-o-Pac and Hypalon® liners were removed from the Bypass Basin when the basin was relined in 2010 with a 60-mil HDPE geomembrane liner. Currently, the Bypass Basin does <u>not</u> have either of its original Poz-o-Pac or Hypalon® liners; only the relatively new 60-mil HDPE geomembrane liner is present.

It should be noted that Poz-o-Pac is a cementitious material and has been used as a supporting surface for things like roads, highways, and parking lots (in addition to similar pozzolan-stabilized base materials). According to the Federal Highway Administration, Poz-o-Pac was used at over 100 sites throughout Illinois between 1955 and 1985.

Questions were asked about the material that underlies the Bypass Basin's current HDPE geomembrane liner and whether this material will be tested during the retrofit process. The plan for retrofitting the Bypass Basin does not include testing of soils beneath the HDPE geomembrane liner unless tears in the liner are discovered which may indicate the potential release of contaminants into the Bypass Basin's subgrade. The competency of the Bypass Basin's existing HDPE geomembrane liner will be verified by conducting an electrical leak location survey, which involves placing a voltage across the entire liner and using a detection probe to determine whether any tears are present in the liner. Where a tear is present, the probe will identify an electrical current flowing through the tear. If a tear is discovered, the soils under the tear will be inspected to determine whether any contaminants have been released into the basin subgrade. Contaminated soils identified during this inspection will be removed and replaced with structural fill.

Retrofit Design

Questions were asked about the structural fill material that will be used to establish the slopes for the retrofitted Bypass Basin's leachate collection system. This fill material will be comprised of natural soils, not CCR; however, the specific soil materials have not been chosen at this time. Material specifications will be included in construction bid requests. Construction bid requests will not occur until a final retrofit construction permit is issued by the Illinois EPA.

SUMMARY OF REVISIONS, CHANGES, AND CONSIDERATIONS

Public engagement is an important part of the permitting process. Midwest Generation, LLC valued the opportunity to hear and consider the comments of community members and others who participated in the public meetings. At this time, Midwest Generation is proceeding with the proposal for retrofitting the Bypass Basin and closing the Former Ash Basin in-place as presented at the public meetings. Taking public comments into consideration, the current analysis continues to indicate that the proposed plan – which remains subject to regulatory review and approval – prioritizes the environment and community well-being.

Timestamp	Email Address	Name	What is your home city?	The Illinois Environmental Protection Agency is creating a listserv for the facility. Would you like us to transmit your email address to the Agency to be added to the listserv?
Virtual				
5/18/2022 16:37:26	kg@nijmanfranzetti.com	Kristen Gale	La Grange	Yes
5/18/2022 18:02:59	kcourtney@elpc.org	Kiana Courtney	Chicago	Yes
5/19/2022 10:04:22	fbugel@gmail.com	Faith E Bugel	Wilmette	Yes
5/19/2022 12:03:21	ryan.hidden+NRG@sierraclub.org	Ryan Hidden	Peoria	Yes
5/19/2022 12:18:59	ewatkins@forgen.com	Emily Watkins	Point Pleasant	Yes
5/19/2022 15:46:20	hannahlee.flath@sierraclub.org	Hannah Flath	Chicago	Yes
5/20/2022 9:22:13	logan@iuoe649.org	Luke Ogan	Bloomington	Yes
5/23/2022 12:52:40	tsshel1@ilstu.edu	Tim Shelley	Peoria	Yes
In-Person				
5/18/2022	rowe@bradley.edu	Robert Rowe	Peoria	No
5/18/2022	johnwosik@outlook.com	John Wosik	Dunlap	No
5/18/2022	jestpn@aol.com	Diane Jorgensen	East Peoria	No
5/18/2022	johchoices@hotmail.com	Joyce Harnett	Pekin	Yes
5/18/2022		Dave Grooms	Pleasant Baine?	No
5/18/2022	jobluem@yahoo.com	Joyce Bluemshine	Peoria	No
5/18/2022	jdickson@comcast.net	Jeff Dickson	Green Valley	No
5/19/2022		Lawrence Farlington	Pekin	No
5/19/2022		Joseph Kotas	Aurora	No
5/19/2022	petalnrose@gmail.com	Robin Nolting	Pekin	Yes
5/19/2022	jestpr@aol.com	Bob Jorgensen	East Peoria	Yes
5/19/2022	nclong405@yahoo.com	Nancy Long	Peoria	Yes
5/19/2022	moseynme@mtco.com	David Grebner	Peoria Heights	No

DOCUMENT 5

From: EPA.CCR.Part845.Coordinator
To: Liska, Mark; Dunaway, Lynn; Hunt, Lauren; Zimmer, Amy
Subject: FW: MWG Powerton Station - ASB/BB/FAB/MCB 3rd Quarter 2022 Groundwater Data
Date: Wednesday, October 26, 2022 3:29:50 PM
Attachments: image001.png
2022 Q3 Powerton ASB_BB GW Data Monitoring.pdf
2022 Q3 Powerton FAB GW Data Monitoring.pdf
2022 Q3 Powerton MCB GW Data Monitoring.pdf

We have received an electronic submittal for Powerton's CCR Groundwater Monitoring data for Q3. Attached is copy of the pdf. It has also been placed on the N drive.

From: Buckley, Jill <Jill.Buckley@nrg.com>
Sent: Wednesday, October 26, 2022 9:08 AM
To: EPA.CCR.Part845.Coordinator <EPA.CCR.Part845.Coordinator@Illinois.gov>
Subject: [External] MWG Powerton Station - ASB/BB/FAB/MCB 3rd Quarter 2022 Groundwater Data

Hello,

As requested, the 3rd quarter 2022 groundwater data packages for the Ash Surge Basin, Bypass Basin, Former Ash Basin, and Metal Cleaning Basin at Powerton Station (W1798010008) are attached. These have already been mailed to IEPA and will be posted on our public website. www.Midwestgenerationllc.com

Thanks,
Jill

NRG Energy

Jill Buckley
Environmental Manager
NRG Energy
724-448-9732
Jill.Buckley@nrg.com

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DATA SUMMARY POSTING

Station: Midwest Generation Powerton Generating Station

Regulated Unit(s): Ash By-pass Basin (IEPA ID No. W1798010008-04)
Ash Surge Basin (IEPA ID No. W1798010008-01)

In accordance with the new Ill. Adm. Code Title 35, Part 845: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments (State CCR Rule) groundwater monitoring was completed during the 3rd quarter 2022 which includes the entire list of parameters specified under Section 845.600(a)(1) and (b). Table 1 is a summary table of all available CCR monitoring data to date including any data generated previously as part of the Federal CCR Rule monitoring. In addition, Table 2 provides a summary of turbidity data which was collected as part of State CCR Rule requirements which is a data parameter that was not required under the Federal CCR Rule.

No background statistics or proposed Groundwater Protection Standards are included on these tables. The background statistics and Proposed Groundwater Protection Standards were submitted to Illinois Environmental Protection Agency (EPA) as part of the Application for Initial Operating Permit submitted October 31, 2021. Upon Illinois EPA approval of the Operating Permit and Proposed Groundwater Protection Standards, the approved comparison values will be included on the tables for subsequent data comparisons/evaluations.

Table 1. Groundwater Analytical Results - Midwest Generation, LLC, Powerton Station, Pekin, IL. Ash By-Pass Basin Ash Surge Basin.

Well	Date	Boron	Calcium	Chloride	Fluoride	pH	Sulfide	Total Dissolved	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Radium 226 + 228	Selenium	Thallium
MW-01 (S) up-gradient	11/16/2015	1.0	98	44	0.17	7.07	93	530	< 0.003	< 0.001	0.057	^ < 0.001	< 0.0005	< 0.005	< 0.001	* < 0.0005	< 0.01	< 0.0002	< 0.0050	0.744	< 0.0025	*< 0.002
	2/25/2016	0.2	110	42	0.16	7.23	54	460	< 0.003	0.0025	0.053	< 0.001	< 0.0005	< 0.005	0.0014	0.0019	< 0.01	< 0.0002	< 0.005	< 0.722	0.0029	< 0.002
	5/20/2016	0.34	100	44	0.17	6.95	65	430	< 0.003	0.0081	0.062	< 0.001	< 0.0005	0.007	0.0053	0.011	< 0.01	< 0.0002	< 0.005	< 0.953	< 0.0025	< 0.002
	8/17/2016	0.27	78	39	0.25	7.16	50	530	< 0.003	0.0014	0.048	< 0.001	< 0.0005	< 0.005	< 0.001	0.0014	< 0.010	< 0.0002	0.0057	< 0.491	< 0.0025	< 0.002
	11/16/2016	0.18	97	39	0.21	7.22	32	500	< 0.003	0.0051	0.056	< 0.001	< 0.0005	< 0.005	0.0044	0.0082	< 0.01	< 0.0002	0.0059	< 0.618	< 0.0025	< 0.002
	2/14/2017	0.18	120	55	0.17	7.30	60	550	< 0.003	0.0041	0.056	< 0.001	< 0.0005	< 0.005	0.0045	0.0076	< 0.01	< 0.0002	0.0056	< 0.837	< 0.0025	< 0.002
	5/3/2017	0.19	86	66	0.16	7.41	45	460	< 0.003	0.0015	0.045	< 0.001	< 0.0005	< 0.005	0.0033	0.0067	< 0.01	< 0.0002	< 0.005	0.574	< 0.0025	< 0.002
	6/21/2017	0.18	85	58	0.18	7.60	47	540	< 0.003	< 0.001	0.04	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0061	< 0.418	< 0.0025	< 0.002
	8/25/2017	0.56	86	41	0.18	7.41	63	490	< 0.003	< 0.001	0.049	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0059	0.775	< 0.0025	< 0.002
	11/8/2017	0.57	130	38	0.12	6.69	61	640	< 0.003	< 0.001	0.083	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.343	< 0.0025	< 0.002
	5/17/2018	0.15	88	50	0.12	6.7	48	540	< 0.003	< 0.001	0.045	< 0.001	< 0.0005	< 0.005	< 0.001	0.00068	< 0.01	< 0.0002	< 0.005	< 0.396	< 0.0025	< 0.002
	8/8/2018	0.14	86	48	0.13	6.8	43	430	< 0.003	< 0.001	0.051	<^ 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.579	< 0.0025	< 0.002
	4/30/2019	0.07	78	54	0.17	7.2	27	450	< 0.003	0.0014	0.039	< 0.001	< 0.0005	< 0.005	< 0.001	0.0017	< 0.01	< 0.0002	< 0.005	< 0.656	< 0.0025	< 0.002
	11/13/2019	0.52	95	47	0.18	7.51	41	390	NA	0.029	0.091	NA	0.00085	NA	0.016	0.034	0.012	< 0.0002	0.0079	0.884	< 0.0025	< 0.002
	12/26/2019	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0021	0.0041	NA	NA	NA	NA	NA	NA
	4/28/2020	0.33	110	46	0.19	7.17	41	470	NA	< 0.001	0.051	NA	< 0.0005	NA	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.628	< 0.0025	< 0.002
	12/7/2020	0.6	100	54	0.25	7.22	55	490	NA	< 0.001	0.058	NA	< 0.0005	NA	< 0.001	0.00055	<^ 0.01	< 0.0002	0.0051	0.724	< 0.0025	< 0.002
	5/11/2021	0.23	84	53	0.2	7.52	38	450	< 0.003	< 0.001	0.043	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.01	< 0.523	< 0.0025	< 0.002
	8/24/2021	0.26	98	40	0.18	7.19	56	450	< 0.003	< 0.001	0.06	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0069	1.08	< 0.0025	< 0.002
	11/30/2021	0.33	97	42	0.2	7.14	~ 28	410	< 0.003	< 0.001	0.06	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.005	< 0.0002	0.0072	1.1	0.0026	< 0.002
	2/9/2022	0.18	95	47	0.17	7.33	47	520	< 0.003	0.0013	0.051	< 0.001	< 0.0005	< 0.005	< 0.001	0.00089	0.0026	< 0.0002	0.0075	< 0.628	< 0.0025	< 0.002
	6/7/2022	0.23	82	51	0.15	7.62	27	440	< 0.003	< 0.001	0.041	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0057	0.386	< 0.0025	< 0.002
	8/10/2022	0.59	100	44	0.13	7.10	66	700	< 0.003	< 0.001	0.076	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.628	< 0.0025	< 0.002
MW-09 (S) up-gradient	11/18/2015	2.0	63 H	31 H	0.19	7.15 H	110 H	440	< 0.003	< 0.001	0.027	^ < 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	H < 0.0002	0.043	< 0.655	< 0.0025	< 0.002
	2/25/2016	2.3	77	36	0.19	7.34	120	500	< 0.003	0.0042	0.036	< 0.001	< 0.0005	< 0.005	0.0011	< 0.0005	< 0.01	< 0.0002	0.053	< 0.361	< 0.0025	< 0.002
	5/19/2016	2.0	73	38	0.17	7.30	100	520	< 0.003	< 0.001	0.029	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.042	< 0.394	< 0.0025	< 0.002
	8/17/2016	2.7	74	39	0.15	7.32	120	750	< 0.003	< 0.001	0.031	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.036	< 0.498	< 0.0025	< 0.002
	11/17/2016	4.5	85	38	0.13	7.37	110	630	< 0.003	0.0038	0.039	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.036	0.646	0.0025	< 0.002
	2/15/2017	4.1	84	38	0.13	6.94	160	620	< 0.003	0.0032	0.043	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.035	< 0.377	0.0062	< 0.002
	5/3/2017	3.5	85	38	0.17	7.48	170	680	< 0.003	0.0012	0.034	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.034	< 0.445	0.011	< 0.002
	6/21/2017	3.3	82	38	0.14	7.63	180	760	< 0.003	< 0.001	0.037	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.033	< 0.380	0.0072	< 0.002
	8/25/2017	3.8	85	36	0.14	7.30	150	630	< 0.003	< 0.001	0.044	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.028	< 0.160	0.0043	< 0.002
	11/8/2017	4	89	37	0.13	6.92	190	650	< 0.003	0.0012	0.048	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.026	0.344	< 0.0025	< 0.002
	5/16/2018	4.1	89	36	0.15	7.83	180	550	< 0.003	< 0.001	0.038	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	0.00029	0.031	< 0.424	0.006	< 0.002
	8/8/2018	4.3	86	39	0.14	7.31	180	690	< 0.003	< 0.001	0.037	<^ 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.032	0.44	0.0078	< 0.002
	5/1/2019	4.6	79	37	0.17	7.11	170	640	< 0.003	< 0.001	0.038	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.031	< 0.66	0.0036	< 0.002
	11/14/2019	2.5	85	36	0.18	7.49	82	500	NA	0.0056	0.057	NA	< 0.0005	NA	0.0032	0.00076	< 0.010	< 0.0002	0.026	< 0.457	< 0.0025	< 0.002
	4/29/2020	2	71	34	0.2	7.19	140	510	NA	0.0012	0.031	NA	< 0.0005	NA	< 0.001	< 0.0005	< 0.010	< 0.0002	0.028	0.698	< 0.0025	< 0.002
	12/8/2020	2.6	65	34	0.22	7.29	63	400	NA	0.0013	0.042	NA	< 0.0005	NA	< 0.001	< 0.0005	< 0.010	< 0.0002	0.025	< 0.479	< 0.0025	< 0.002
	5/13/2021	2	74	33	0.2	7.33	120	410	< 0.003	< 0.001	0.035	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.025	< 0.612	< 0.0025	< 0.002
	8/25/2021	2.2	80	32	0.17	7.11	130	420	< 0.003	< 0.001	0.035	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.022	< 0.579	< 0.0025	< 0.002
	12/1/2021	3.2	79	32	0.2	7.22	~ 100	570	< 0.003	< 0.001	0.036	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.002	< 0.0002	0.028	< 0.365	< 0.0025	< 0.002
	2/10/2022	3.5	79	33	0.23	7.12	120	510	< 0.003	0.0019	0.043	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.003	< 0.0002	0.03	< 0.393	< 0.0025	< 0.002
	6/8/2022	3.2	70	31	0.21	7.52	150	510	< 0.003	0.002	0.042	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.028	< 0.548	< 0.0025	< 0.002
	8/31/2022	3.2	79	30	0.18	7.18	140	530	< 0.003	< 0.001	0.036	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.024	< 0.458	< 0.0025	< 0.002
MW-19^ (S) up-gradient	11/18/2016	3.8	89	38	0.13	7.34	120	670	< 0.003	< 0.001	0.084	< 0.001	< 0.0005	< 0.005	0.001	0.00068	0.01	< 0.0002	0.035	< 0.476	0.0043	< 0.002
	2/15/2017	4.7	88	37	0.13	7.50	180	630	< 0.003	< 0.001	0.088	< 0.001	< 0.0005	< 0.005	< 0.001	0.00061	< 0.01	< 0.0002	0.046	< 0.482	0.0063	< 0.002
	5/5/2017	3.3	88	38	0.14	7.51	160	640	< 0.003	< 0.001	0.076	< 0.001	< 0.0005	< 0.005	0.0013	0.0012	< 0.01	< 0.0002	0.035	0.923	0.0068	< 0.002
	6/21/2017	2.3	110	35	0.21	7.30	170	690	< 0.003	< 0.001	0.089	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.024	< 0.334	0.0028	< 0.002
	8/28/2017	3.5	97	36	0.16	7.20	160	700	< 0.003	< 0.001	0.073	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.041	0.370	0.0035	< 0.002
	11/6/2017	4.5	86	35	0.17	7.26	190	640	< 0.003	< 0.001	0.071	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.042	0.360	< 0.0025	< 0.002
	5/14/2018	4.1	96	35	0.16	7.92	180	820	< 0.003	< 0.001	0.079	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.043	0.562	0.0044	< 0.002
	8/6/2018	3.8	100	37	0.13	7.57	170	720	< 0.003	< 0.001	0.078	<^ 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.032	0.835	0.0052	< 0.002
	5/2/2019	3.7	100	39	0.13	6.86	160	700	< 0.003	< 0.001	0.076	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.03	< 0.431	0.0035	< 0.002
	11/13/2019	2.5	130	53	0.15	7.51	140	740	NA	0.0014	0.100	NA	< 0.0005	NA	< 0.001	0.00056	< 0.01	< 0.0002	0.04	< 0.447	< 0.0025	< 0.002
	4/27/2020	2.3	100	43	0.17	6.87	110	570	NA	< 0.001	0.077	NA	< 0.0005	NA	< 0.001	< 0.0005	< 0.01	< 0.0002	0.04	0.630	< 0.0025	< 0.002
	12/7/2020	3.3	74	34	0.19	7.30 F1	76	420	NA	< 0.001	0.062	NA	< 0.0005	NA	< 0.001	< 0.0005	<^ 0.01	< 0.0002	0.05	< 0.509	< 0.0025	< 0.002
	5/10/2021	2.3	68	33	0.17	7.36	110	420	< 0.003	< 0.001	0.060	< 0.001	< 0.0005	< 0.0005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.05	< 0.524	< 0.0025	< 0.002
	8/26/2021	2.1	85	32	0.17	7.12	130	520	< 0.003	< 0.001	0.066	< 0.001	< 0.0005	< 0.0005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.028	< 0.543	< 0.0025	< 0.002
	12/1/2021	3.5	89	31	0.17	7.25	~ 120	620	< 0.003	< 0.001	0.07	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.0038	< 0.0002	0.05	1.18	< 0.0025	< 0.002
	2/7/2022	3.9	77	34	0.17	7.18	140	600	< 0.003	< 0.001	0.074	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.003	< 0.0002	0.043	0.881	< 0.0025	< 0.002
	6/6/2022	2.7	92	33	0.12	7.08	130	560	< 0.003	< 0.001	0.082	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.01	< 0.0002	0.03	< 0.419	< 0.0025	< 0.002
	8/30/2022	0.69	140	200	0.32	7.29	45	1100	< 0.003	0.0027	0.15	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.023	< 0.0002	0.0082	0.44	< 0.0025	< 0.002
MW-08 (CL) down-gradient	11/18/2015	1.5	160 H	170 H	0.44	7.61 H	470 H	1300	< 0.003	0.0029	0.15	^ < 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.028	H < 0.0002	0.01	< 0.559	< 0.0025	< 0.002
	2/25/2016	1.7	160	200	0.30	7.00	280	1100	< 0.003	0.0018	0.11	< 0.001	0.00052	< 0.005	< 0.001	< 0.0007	0.015	< 0.0002	0.02	0.535	< 0.0025	< 0.002
	5/18/2016	1.7	160	140	0.34	7.67	300	1200	< 0.003	0.0029	0.16	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.036	< 0.0002	0.0069	0.417	< 0.0025	< 0.002
	8/17/2016	1.0	150	230	0.33	7.33	360	1400	< 0.003	0.0032	0.15	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.023	< 0.0002	0.013	< 0.519	< 0.0025	< 0.002
	11/15/2016	1.2	140	290	0.33	6.90	230	1300	< 0.003	0.0012	0.076	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.016	0.583	< 0.0025	< 0.002
	2/16/2017	1.5	150	460	0.28	7.00	230	1500	< 0.003	0.003	0.086	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0007	< 0.01	< 0.0002	0.026	< 0.375	< 0.0025	< 0.002
	5/2/2017	0.55	140	300	0.33	7.30	320	1300	< 0.003	0.0029	0.13	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.022	< 0.0002	0.0083	< 0.480	< 0.0025	< 0.002
	6/21/2017	1.2	160	490	0.30	7.27	350	1700	< 0.003	0.0045	0.14	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.031	< 0.439	< 0.0025	< 0.002
	8/29/2017	1.2	150	360	0.47	7.29	300	1500	< 0.003	0.0011	0.062	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.034	0.699	< 0.0025	< 0.002
	11/8/2017	0.68	130	260	0.45	7.27	270	1200	< 0.003	0.0027	0.10	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.019	< 0.0002	0.014	0.806	< 0.0025	< 0.002
	5/17/2018	1.2	130	200	0.37	6.79	170	1000	< 0.003	0.003	0.07	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.024	0.655	< 0.0025	< 0.002
	8/8/2018	1.1	140	270	0.33	6.93	190	1200	< 0.003	0.0055	0.07	<^ 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.019	0.410	< 0.0025	< 0.002
	5/1/2019	0.54	95	73	0.35	7.60	85	600	< 0.003	0.0018	0.07	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.021	< 0.0002	0.0069	0.892	< 0.0025	< 0.002
	11/13/2019	0.98	110	92	0.33	7.66	110	640	NA	0.0025	0.087	NA	< 0.0005	NA	< 0.001	0.00094	0.022	< 0.0002	0.013	< 0.498	< 0.0025	< 0.002
	4/28/2020	0.74	110	120	0.38	7.58	58	660	NA	0.0026	0.095	NA	< 0.0005	NA	< 0.001	< 0.0005	0.026	< 0.0002	0.011	< 0.450	< 0.0025	< 0.002
	12/14/2020	0.73	120	150	0.38	7.40	92	530	NA	0.0024	0.110	NA	< 0.0005	NA	< 0.001	0.00093	0.03	< 0.0002	0.012	1.310	< 0.0025	< 0.002
	5/11/2021	0.54	97	120	0.39	7.64	110	680	< 0.003	0.002	0.092	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.021	< 0.0002	0.011	< 0.695	< 0.0025	< 0.002
	8/25/2021	0.6	100	110	0.35	7.28	100	550	< 0.003	0.0015	0.059	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.018	< 0.0002	0.011	< 0.494	< 0.0025	< 0.002
	12/1/2021	0.64	110	97	0.36	7.50	~ 66	690	< 0.003	0.0025	0.11	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.023	< 0.0002	0.011	1.02	< 0.0025	< 0.002
	2/10/2022	0.81	110	130	0.37	7.54	55	670	< 0.003	0.0029	0.13	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.023	< 0.0002	0.0092	0.935	< 0.0025	< 0.002
	6/8/2022	0.73	130	180	0.3	7.71	53	790	< 0.003	0.0024	0.14	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.022	< 0.0002	0.0086	< 0.52	< 0.0025	< 0.002
	8/30/2022	0.7	140	210	0.32	7.37	50	1200	< 0.003	0.0027	0.15	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.023	< 0.0002	0.0083	0.859	< 0.0025	< 0.002

Notes: All units are in mg/l except pH is in standard units.
F1 - MS and/or MSD Recovery outside criteria.
H - Sample was prepped or analyzed beyond the specified holding time.
V- Serial dilution exceeds control limits.

*- LCS or LCSD is outside acceptance limits.
^- Denotes instrument related QC exceeds the control limits
(R) - Resample Event
NA - Not Analyzed

R000493

Table 1. Groundwater Analytical Results - Midwest Generation, LLC, Powerton Station, Pekin, IL. Ash By-Pass Basin Ash Surge Basin.

Well	Date	Boron	Calcium	Chloride	Fluoride	pH	Sulfide	Total Dissolved	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Radium 226 + 228	Selenium	Thallium
MW-11 (S) down-gradient	11/18/2015	1.7	110 H	54 H	0.55	7.06 H	160 H	670	< 0.003	0.017	0.18	^< 0.001	< 0.0005	< 0.005	0.002	< 0.0005	< 0.01	H < 0.0002	0.0120	0.788	< 0.0025	< 0.002
	2/26/2016	1.5	140	120	0.55	7.25	220	850	< 0.003	0.023	0.23	< 0.001	< 0.0005	< 0.005	0.0023	< 0.0005	< 0.01	< 0.0002	0.013	0.562	< 0.0025	< 0.002
	5/20/2016	1.6	140	120	0.56	7.10	210	920	< 0.003	0.027	0.26	< 0.001	< 0.0005	< 0.005	0.0024	0.00076	< 0.01	< 0.0002	0.014	0.524	< 0.0025	< 0.002
	8/17/2016	1.0	130	93	0.67	7.08	180	910	< 0.003	F1 0.29	1.4	< 0.001	< 0.0005	< 0.005	0.0034	0.001	< 0.0010	< 0.0002	0.011	1.110	< 0.0025	< 0.002
	11/17/2016	1.2	140	130	0.44	7.21	240	1100	< 0.003	0.071	0.44	< 0.001	< 0.0005	< 0.005	0.0037	0.0013	< 0.01	< 0.0002	0.0088	0.734	< 0.0025	< 0.002
	2/16/2017	1.6	140	110	0.40	6.62	260	910	< 0.003	0.04	0.3	< 0.001	< 0.0005	< 0.005	0.003	0.00094	< 0.01	< 0.0002	0.013	0.341	< 0.0025	< 0.002
	5/3/2017	1.3	160	160	0.42	7.36	440	1300	< 0.003	0.039	0.26	< 0.001	< 0.0005	< 0.005	0.0035	0.00093	< 0.01	< 0.0002	0.015	0.662	< 0.0025	< 0.002
	6/22/2017	1.2	140	120	0.60	7.21	260	1000	< 0.003	0.07	0.36	< 0.001	< 0.0005	< 0.005	0.0025	< 0.0005	< 0.01	< 0.0002	0.014	< 0.418	< 0.0025	< 0.002
	8/29/2017	2.2	130	83	0.52	7.23	310	1100	< 0.003	0.017	0.21	< 0.001	< 0.0005	< 0.005	0.0026	< 0.0005	< 0.01	< 0.0002	0.016	< 0.313	< 0.0025	< 0.002
	11/9/2017	1.5	140	100	0.59	6.96	230	970	< 0.003	0.092	0.54	< 0.001	< 0.0005	< 0.005	0.0034	< 0.0005	< 0.01	< 0.0002	0.014	1.24	< 0.0025	< 0.002
	5/16/2018	2.0	140	88	0.61	7.89	270	1000	< 0.003	0.089	0.47	< 0.001	< 0.0005	< 0.005	0.0041	< 0.0005	< 0.01	< 0.0002	0.014	1.12	< 0.0025	< 0.002
	8/9/2018	1.4	160	120	0.65	7.24	220	1000	< 0.003	0.68	3.0	^< 0.0010	< 0.0008	< 0.005	0.0053	< 0.0012	< 0.01	< 0.0002	0.013	1.48	< 0.0025	< 0.002
	5/1/2019	2.3	110	60	0.62	7.08	200	730	< 0.003	0.11	0.6	< 0.001	< 0.0005	< 0.005	0.0026	0.0011	< 0.01	< 0.0002	0.014	1.59	< 0.0025	< 0.002
	11/14/2019	1.8	120	83	0.55	7.43	150	890	NA	0.14	0.72	NA	< 0.0005	NA	0.0041	0.0021	< 0.01	< 0.0002	0.02	2.64	< 0.0025	< 0.002
	4/29/2020	1.2	100	110	0.62	7.08	320	950	NA	0.019	0.21	NA	< 0.0005	NA	0.0019	< 0.0005	< 0.01	< 0.0002	0.024	0.47	< 0.0025	< 0.002
	12/8/2020	0.7	86	94	0.67	7.26	200	650	NA	0.027	0.26	NA	< 0.0005	NA	0.0021	< 0.0005	< 0.01	< 0.0002	0.03	< 0.523	< 0.0025	< 0.002
	5/11/2021	1.0	99	130	0.72	7.26	230	820	< 0.003	0.024	0.25	< 0.001	< 0.0005	< 0.005	0.0019	< 0.0005	0.012	< 0.0002	0.032	1.59	< 0.0025	< 0.002
	8/25/2021	0.9	100	100	0.65	7.03	210	800	< 0.003	0.015	0.16	< 0.001	< 0.0005	< 0.005	0.0016	< 0.0005	< 0.01	< 0.0002	0.03	< 0.472	< 0.0025	< 0.002
	12/1/2021	1.2	100	85	0.67	7.17 ^	160	850	< 0.003	0.0093	0.17	< 0.001	< 0.0005	< 0.005	0.0019	< 0.0005	0.0067	< 0.0002	0.032	1.3	< 0.0025	< 0.002
	2/10/2022	0.9	110	110	0.68	7.11	220	920	< 0.003	0.015	0.2	< 0.001	< 0.0005	< 0.005	0.0024	< 0.0059	0.007	< 0.0002	0.027	0.839	< 0.0025	< 0.002
	6/8/2022	1.7	110	75	0.64	7.35	150	710	< 0.003	0.028	0.2	< 0.001	0.00058	< 0.005	0.0018	< 0.0005	< 0.01	< 0.0002	0.021	0.786	< 0.0025	< 0.002
	8/31/2022	1.2	120	100	0.61	6.97	190	830	< 0.003	0.016	0.2	< 0.001	< 0.0005	< 0.005	0.0017	< 0.0005	< 0.01	< 0.0002	0.02	1.04	< 0.0025	< 0.002
MW-12 (CL) down-gradient	11/19/2015	0.94	160 H	220 H	0.57	7.12 H	650 H	1400	< 0.003	0.10	0.180	^< 0.001	0.00068	< 0.005	< 0.001	0.00063	0.023	H < 0.0002	0.0280	< 0.685	< 0.0025	< 0.002
	2/26/2016	0.42	130	200	0.40	7.96	530	1200	< 0.003	0.077	0.130	< 0.001	0.0016	< 0.005	< 0.001	0.0014	0.014	< 0.0002	0.0150	1.11	< 0.0025	< 0.002
	5/20/2016	0.65	150	200	0.49	7.28	550	1400	< 0.003	0.065	0.16	F1 < 0.001	0.00077	< 0.005	< 0.001	0.0016	0.013	< 0.0002	0.028	0.576	< 0.0025	< 0.002
	8/18/2016	0.69	170	200	0.49	7.06	620	1600	< 0.003	0.33	0.88	0.0013	0.007	< 0.005	0.001	0.0011	0.015	< 0.0002	0.011	3.68	< 0.0025	< 0.002
	11/18/2016	0.83	140	180	0.46	7.34	340	1300	< 0.003	0.23	0.67	< 0.001	0.0028	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	< 0.01	1.86	< 0.0025	< 0.002
	2/16/2017	0.48	140	190	0.37	7.54	630	1300	< 0.003	0.29	0.26	< 0.001	0.0057	< 0.005	< 0.001	0.0042	0.010	< 0.0002	0.015	1.15	< 0.0025	< 0.002
	5/3/2017	0.49	120	190	0.37	7.47	500	1200	< 0.003	0.10	0.17	< 0.001	0.0022	< 0.005	< 0.001	0.0038	0.011	< 0.0002	0.017	0.518	< 0.0025	< 0.002
	6/22/2017	0.50	130	190	0.48	7.36	580	1400	< 0.003	0.025	0.11	< 0.001	< 0.0005	< 0.005	< 0.001	0.00096	< 0.010	< 0.0002	0.028	0.376	< 0.0025	< 0.002
	8/29/2017	0.78	140	180	0.52	7.34	520	1400	< 0.003	0.02	0.095	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.014	< 0.0002	0.024	0.529	< 0.0025	< 0.002
	11/10/2017	0.94	130	170	0.48	7.38	370	1200	< 0.003	0.50	0.45	< 0.001	0.0015	< 0.005	< 0.001	0.00097	0.018	< 0.0002	0.023	1.67	< 0.0025	< 0.002
	5/16/2018	0.46	100	180	0.47	8.12	720	1500	< 0.003	0.09	0.1	< 0.001	0.00052	< 0.005	< 0.001	0.00067	0.012	< 0.0002	0.021	0.741	< 0.0025	< 0.002
	8/9/2018	0.61	120	190	0.44	7.42	480	1300	< 0.003	0.12	0.15	^< 0.001	0.00084	< 0.005	< 0.001	0.00072	< 0.010	< 0.0002	0.026	0.735	< 0.0025	< 0.002
	5/1/2019	0.4	100	170	0.38	7.68	330	1000	< 0.003	0.04	0.13	< 0.001	0.00054	< 0.005	< 0.001	0.0012	0.014	< 0.0002	0.011	0.666	< 0.0025	< 0.002
	11/14/2019	0.74	120	160	0.45	7.61	280	1100	NA	0.026	0.072	NA	< 0.0005	NA	< 0.001	< 0.0005	0.014	< 0.0002	0.027	0.568	< 0.0025	< 0.002
	4/29/2020	0.34	71	150	0.34	7.96	360	980	NA	0.003	0.034	NA	< 0.0005	NA	< 0.001	< 0.0005	0.012	< 0.0002	0.015	0.578	< 0.0025	< 0.002
	12/8/2020	0.61	92	160	0.56	7.36	320	990	NA	0.025	0.069	NA	< 0.0005	NA	< 0.001	< 0.0005	0.012	< 0.0002	0.027	< 0.476	< 0.0025	< 0.002
	5/13/2021	0.4	89	140	0.23	7.39	350	990	< 0.003	0.003	0.058	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.016	0.563	< 0.0025	< 0.002
	8/25/2021	0.5	82	130	0.46	7.43	220	740	< 0.003	0.0083	0.04	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.019	< 0.502	< 0.0025	< 0.002
	12/1/2021	0.53	72	130	0.52	7.38 ^	170	730	< 0.003	0.018	0.045	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.009	< 0.0002	0.017	0.623	< 0.0025	< 0.002
	2/10/2022	0.35	96	140	0.27	7.28	320	980	< 0.003	0.0072	0.059	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.012	< 0.0002	0.017	0.602	< 0.0025	< 0.002
	6/8/2022	0.49	98	140	0.41	7.65	320	950	< 0.003	0.0079	0.064	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.012	< 0.0002	0.02	0.495	< 0.0025	< 0.002
	8/31/2022	0.62	100	150	0.5	7.33	260	870	< 0.003	0.099	0.11	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.014	< 0.0002	0.021	0.618	< 0.0025	< 0.002
MW-15 (CL) down-gradient	11/18/2015	1.5	270 H	210 H	0.53	6.55 H	1400 H	2400	< 0.003	0.03	0.096	^< 0.001	0.00061	< 0.005	< 0.001	< 0.0005	0.042	H < 0.0002	0.023	< 0.599	0.0065	< 0.002
	2/25/2016	2.0	240	110	0.61	6.84	640	1700	< 0.003	0.025	0.083	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.041	< 0.0002	0.035	0.870	0.045	< 0.002
	5/19/2016	2.7	320	240	0.53	6.83	1200	2800	< 0.003	0.04	0.097	< 0.001	0.00098	< 0.005	< 0.001	< 0.0005	0.044	< 0.0002	0.041	< 0.420	0.0067	< 0.002
	8/18/2016	1.5	200 F1	170	0.54	6.96	660	1900	< 0.003	0.13	0.11	< 0.001	0.0041	< 0.005	< 0.001	< 0.0005	0.028	< 0.0002	0.027	< 0.672	0.0061	< 0.002
	11/17/2016	1.3	120	180	0.47	6.91	560	1900	< 0.003	0.0033	0.031	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.016	< 0.0002	0.018	< 0.570	0.0078	< 0.002
	2/17/2017	1.9	200	190	0.43	7.24	670	1700	< 0.003	0.02	0.056	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.025	< 0.0002	0.027	< 0.392	0.0032	< 0.002
	5/4/2017	1.5	180	190	0.57	7.35	670	1700	< 0.003	0.011	0.049	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.023	< 0.0002	0.023	< 0.456	0.0034	< 0.002
	6/21/2017	1.6	180	200	0.56	7.30	530	1600	< 0.003	0.0093	0.054	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.027	< 0.0002	0.03	< 0.347	0.019	< 0.002
	8/29/2017	2.2	190	200	0.53	6.87	540	1800	< 0.003	0.0018	0.044	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.023	< 0.0002	0.032	< 0.377	0.0092	< 0.002
	11/10/2017	1.6	170	180	0.63	7.09	530	1500	< 0.003	0.0063	0.046	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.025	< 0.0002	0.02	< 0.313	0.016	< 0.002
	5/17/2018	2.3	200	160	0.5	6.75	680	1800	< 0.003	0.0081	0.05	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.029	< 0.0002	0.03	0.397	0.077	< 0.002
	8/9/2018	2.3	200	200	0.48	7.06	520	1700	< 0.003	0.0083	0.048	^< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.026	< 0.0002	0.033	0.566	0.06	< 0.002
	5/2/2019	1.5	180	200	0.52	6.89	420	1500	< 0.003	0.0045	0.052	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.027	< 0.0002	0.023	< 0.424	< 0.0025	< 0.002
	11/14/2019	1.8	170	170	0.5	7.24	260	1300	NA	0.0044	0.053	NA	< 0.0005	NA	< 0.001	< 0.0005	0.029	< 0.0002	0.025	< 0.475	0.002	< 0.002
	4/29/2020	1.2	160	200	0.58	6.90	370	1300	NA	0.0036	0.06	NA	< 0.0005	NA	< 0.0010	< 0.0005	0.027	< 0.0002	0.023	0.578	< 0.0025	< 0.002
	12/8/2020	1.5	170	200	0.55	7.04	540	1400	NA	0.02	0.1	NA	0.00059	NA	0.0012	< 0.0005	0.035	< 0.0002	0.02	0.626	0.012	< 0.002
	5/12/2021	1.3	180	180	0.54	6.97	520	1500	< 0.003	0.0048	0.065	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.026	< 0.0002	0.014	< 0.648	0.0071	< 0.002
	8/23/2021	1.5	200	180	0.52	6.76	470	1500	< 0.003	0.0019	0.055	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.025	< 0.0002	0.024	0.465	0.015	< 0.002
	11/29/2021	1.9	220	250	0.48	6.71	480	1700	< 0.003	0.0022	0.075	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.024	< 0.0002	0.016	0.649	0.059	< 0.002
	2/9/2022	0.93	140	160	0.59	6.91	320	1200	< 0.003	0.008	0.055	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.024	< 0.0002	0.014	< 0.424	0.0034	< 0.002
	6/8/2022	2	330	240	0.43	6.87	980	2700	< 0.003	0.0032	0.088	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.027	< 0.0002	0.019	0.485	0.1	< 0.002
	8/31/2022	1.5	210	270	0.48	6.80	530	1800	< 0.003	0.0049	0.057	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.032	< 0.0002	0.021	< 0.55	0.0078	< 0.002
MW-17 (CL) down-gradient	11/19/2015	1.6	210 H	230 H	0.43	7.11 H	850 H	1800	< 0.003	0.0028	0.14	^< 0.001	< 0.0005	< 0.005	0.0012	0.0012	0.019	H < 0.0002	0.035	< 0.790	< 0.0025	< 0.002
	2/22/2016	1.8	290	280	0.55	7.19	960	2100	< 0.003	0.021	0.051	< 0.001	< 0.0005	< 0.005	0.0012	< 0.0005	0.038	< 0.0002	0.093	1.07	< 0.0025	< 0.002
	5/18/2016	1.4	200	230	0.64	7.02	700	1800	< 0.003	0.32	0.12	< 0.001	0.0011	< 0.005	0.0015	< 0.0005	0.026	< 0.0002	0.12	8.27	< 0.0025	0.0028
	8/15/2016	1.1	220	220	0.60	7.08	860	2100	< 0.003	0.34	0.12	< 0.001	0.001	< 0.005	0.0016	< 0.0005	0.022	< 0.0002	0.1	0.606	< 0.0025	0.0031
	11/14/2016	1.5	200	210	0.56	7.26	560	2000	< 0.003	0.19	0.073	< 0.001	0.00051	< 0.005	0.0012	< 0.0005	0.022	< 0.0002	0.042	3.76	< 0.0025	0.0021
	2/13/2017	1.6	190	230	0.56	6.84	770	1600	< 0.003	0.35	0.16	< 0.001	0.00093	< 0.005	0.0014	0.00079	0.019	< 0.0002	0.088	2.08	< 0.0025	0.0025
	5/4/2017	1.2	170	210	0.61	7.29	720	1500	< 0.003	0.24	0.19	0.0013	0.0023	< 0.005	0.0023	0.00066	0.016	< 0.0002	0.036	1.91	< 0.0025	0.0065
	6/22/2017	0.95	150	230	0.72	7.38	580	1600	< 0.003	0.41	0.13	< 0.001	0.0041	< 0.005	0.0012	0.0011	0.022	< 0.0002	0.11	1.21	< 0.0025	0.0022
	8/29/2017	1.4	190	230	0.64	7.19	640	1900	< 0.003	0.24	0.092	< 0.001	< 0.0005	< 0.005	< 0.001	0.00058	0.021	< 0.0002	0.13	3.32	< 0.0025	0.0025
	11/6/2017	1.7	190	240	0.62	7.27	840	1800	< 0.003	0.17	0.38	< 0.001	0.0022	< 0.005	0.0015	< 0.0005	< 0.01	< 0.0002	0.019	2.54	< 0.0025	0.0075
	5/14/2018	1.6	170	220	0.6	7.79	800	1700	< 0.003	0.42	0.17	< 0.001	0.002	< 0.005	0.0029	0.0021	0.015	< 0.0002	0.13	2.03	< 0.0025	0.0068
	8/6/2018	1.3	170	230	0.6	7.12	620	1600	< 0.003	0.087	0.055	^< 0.001	0.00094	< 0.005	0.0015	< 0.0005	0.019	< 0.0002	0.084	1.34	< 0.0025	0.0023
	4/29/2019	0.98	150	190	0.66	7.25	660	1500	< 0.003	0.042	0.04	< 0.001	0.00052	< 0.005	< 0.001	0.00069	0.015	< 0.0002	0.06	0.517	< 0.0025	< 0.002
	11/13/2019	1.9	230	600	0.55	7.16	730	2300	NA	0.088	0.1	NA	0.0015	NA	0.0011	0.00093	0.021	< 0.0002	0.058	0.643	< 0.0025	0.0029
	4/27/2020	1.2	150	170	0.79	7.27	520	1300	NA	0.026	0.036	NA	< 0.0005	NA	< 0.001	0.00081	0.021	< 0.0002	0.075	0.498	< 0.0025	< 0.002
	12/7/2020	1.3	140	160	0.8	7.22	430	1100	NA	0.08	0.05	NA	0.001	NA	< 0.001	0.0011	0.022	< 0.0002	0.056	< 0.438	< 0.0025	< 0.002
	5/12/2021	0.99	130	160	0.77	7.52	480	1200	< 0.003	0.0053	0.027	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.018	< 0.0002	0.049	< 0.478	< 0.0025	< 0.002
	8/23/2021	0.92	140	150	0.7	7.37	500	1100	< 0.003	0.0058	0.028	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.043	0.553	< 0.0025	< 0.002
	11/29/2021	1	140	150	0.76	7.30	430	1200	< 0.003	0.0039	0.025	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.04	0.892	< 0.0025	< 0.002
	2/7/2022	0.9	140	160	0.82	7.27	430	1300	< 0.003	0.0044	0.026	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.016	< 0.0002	0.038	0.693	< 0.0025	< 0.002
	6/8/2022	1.3	200	190	0.69	7.51	810	1900	< 0.003	0.0051	0.037	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.018	< 0.0002	0.052	< 0.601	< 0.0025	< 0.002
	8/31/2022	1.1	150	170	0.73	7.12	430	1200	< 0.003	0.003	0.031	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.016	< 0.0002	0.024	< 0.533	< 0.0025	< 0.002
MW-18 (S) down-gradient	11/19/2015	0.80	140 H	220 H	0.66	7.62 H	310 H	1200	< 0.003	0.0014	0.14	^< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	H < 0.0002	0.0051	< 0.845	< 0.0025	< 0.002
	2/22/2016	0.76	150	220	0.68	7.06	310	1200	< 0.003	0.0012	0.15	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.022	< 0.0002	0.0055	1.88	< 0.0025	< 0.002
	5/18/2016	0.72	120	210	0.71	7.68	230	1200	< 0.003	0.0013	0.13	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.014	< 0.0002	0.0052	< 0.493	< 0.0025	< 0.002
	8/15/2016	0.67	130	210	0.64	7.52	330	1300	< 0.003	< 0.001	0.14	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.012	< 0.0002	0.0059	0.836	< 0.0025	< 0.002
	11/18/2016	0.94	130	200	0.58	7.69	250	1300	< 0.003	< 0.001	0.14	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.013	< 0.0002	0.0053	0.488	< 0.0025	< 0.002
	2/15/2017	0.56	140	190	0.50	7.81	340	1200	< 0.003	< 0.001	0.14	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.014	< 0.0002	0.0058	0.347	< 0.0025	< 0.002
	5/5/2017	0.46	130	180	0.52	8.12	360	1100	< 0.003	0.0032	0.12	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.01	< 0.0002	< 0.005	0.612	< 0.0025	< 0.002
	6/21/2017	0.53	120	190	0.51	8.10	320	1200	< 0.003	< 0.001	0.12	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.014	< 0.0002	0.0051	0.629	< 0.0025	< 0.002
	8/28/2017	0.65	120	200	0.51	7.81	310	1200	< 0.003	< 0.001	0.12	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.012	< 0.0002	0.005	0.498	< 0.0025	< 0.002
	11/6/2017	0.67	120	190	0.57	7.74	400	1200	< 0.003	< 0.001	0.12	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.011	< 0.0002	0.0057	0.755	< 0.0025	< 0.002
	5/14/2018	0.57	130	180	0.59	8.27	440	1200	< 0.003	< 0.001	0.13	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.013	< 0.0002	0.0052	0.641	< 0.0025	< 0.002
	8/6/2018	0.58	120	230	0.57	7.88	270	1100	< 0.003	< 0.001	0.12	^< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.013	< 0.0002	0.0052	1.02	< 0.0025	< 0.002
	4/29/2019	0.54	120	180	0.61	7.77	170	1000	< 0.003	< 0.001	0.12	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.013	< 0.0002	< 0.005	< 0.445	< 0.0025	< 0.002
	11/13/2019	0.79	130	180	0.56	8.26	210	1100	NA	0.0013	0.12	NA	< 0.0005	NA	< 0.001	< 0.0005	0.014	< 0.0002	< 0.005	< 0.49	< 0.0025	< 0.002
	4/27/2020	0.60	120	170	0.69	7.90	180	1000	NA	< 0.001	0.12	NA	< 0.0005	NA	< 0.001	< 0.0005	0.016	< 0.0002	< 0.005	< 0.526	< 0.0025	< 0.002
	12/7/2020	0.75	110 F1	150	0.70	7.70	160	910	NA	0.0032	0.11	NA	< 0.0005	NA	< 0.001	< 0.0005	0.014	< 0.0002	0.061	< 0.497	< 0.0025	< 0.002
	5/10/2021	0.66	130	140	0.66	8.02	350	880	< 0.003	< 0.001	0.12	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.013	< 0.0002	0.005	< 0.544	< 0.0025	< 0.002
	8/26/2021	0.52	140	140	0.56	7.97	340	1000	< 0.003	0.0023	0.13	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.014	< 0.0002	0.03	0.633	< 0.0025	< 0.002
	12/1/2021	0.61	140	150	0.59	7.93 ^	310	1200	< 0.003	0.0036	0.15	< 0.001	< 0.005	< 0.0005	< 0.001	0.00062	0.015	< 0.0002	0.018	< 0.514	< 0.0025	< 0.002
	2/8/2022	0.55	130	150	0.60	7.81	270	1200	< 0.003	0.01	0.26	< 0.001	< 0.0005	0.01	0.0034	0.005	0.014	< 0.0002	0.013	1.6	< 0.0025	< 0.002
	6/6/2022	0.65	120	150	0.55	8.01	230	1000	< 0.003	< 0.001	0.11	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.012	< 0.0002	0.0067	0.832	< 0.0025	< 0.002
	8/30/2022	0.66	130	160	0.55	7.82	240	1400	< 0.003	0.0085	0.23	< 0.001	< 0

Table 2. Groundwater Turbidity - Midwest Generation, LLC, Powerton Station, Pekin, IL. Ash Bypass Basin Ash Surge Basin.

Well	Date	Turbidity (NTU)
MW-01	2/23/2021	78.20
	4/9/2021	6.96
	5/11/2021	3.24
	6/2/2021	3.80
	6/28/2021	4.30
	7/19/2021	4.88
	8/24/2021	3.34
	9/30/2021	3.04
	11/30/2021	5.43
	2/9/2022	11.5
	6/7/2022	3.63
	8/30/2022	4.73
MW-09	2/24/2021	16.90
	4/9/2021	5.73
	5/13/2021	0.49
	6/2/2021	2.37
	6/29/2021	4.53
	7/19/2021	6.12
	8/25/2021	16.65
	9/30/2021	3.2
	12/1/2021	0.0
	2/10/2022	0.0
	6/8/2022	6.93
	8/31/2022	4.95
MW-19	2/22/2021	0.56
	4/9/2021	4.25
	5/10/2021	1.80
	6/2/2021	5.77
	6/29/2021	8.79
	7/19/2021	7.30
	8/26/2021	30.91
	9/30/2021	2.92
	12/1/2021	0.0
	2/7/2022	3.54
	6/6/2022	2.35
	8/30/2022	3.56
MW-08	2/23/2021	47.30
	4/9/2021	23.05
	5/11/2021	8.93
	6/3/2021	11.11
	6/29/2021	5.48
	7/19/2021	6.86
	8/25/2021	6.80
	9/30/2021	5.01
	12/1/2021	5.01
	2/10/2022	14.98
	6/8/2022	8.65
	8/30/2022	9.75

Table 2. Groundwater Turbidity - Midwest Generation, LLC, Powerton Station, Pekin, IL. Ash Bypass Basin Ash Surge Basin.

Well	Date	Turbidity (NTU)
MW-11	2/25/2021	35.10
	4/9/2021	41.53
	5/13/2021	14.70
	6/3/2021	14.92
	6/29/2021	40.48
	7/19/2021	25.73
	8/25/2021	55.39
	9/30/2021	4.06
	12/1/2021	2.48
	2/10/2022	9.29
	6/8/2022	77.21
	8/31/2022	66.8
MW-12	2/25/2021	26.50
	4/9/2021	66.11
	5/13/2021	5.17
	6/3/2021	106.47
	6/29/2021	21.40
	7/19/2021	22.70
	8/25/2021	12.62
	9/30/2021	18.66
	12/1/2021	29.27
	2/10/2022	7.08
	6/8/2022	57.5
	8/31/2022	703.1
MW-15	2/24/2021	64.90
	4/9/2021	16.80
	5/12/2021	16.45
	6/3/2021	7.85
	6/29/2021	6.58
	7/20/2021	5.82
	8/23/2021	4.28
	10/1/2021	13.13
	11/29/2021	12.35
	2/9/2022	9.38
	6/8/2022	10.32
	8/31/2022	28.7
MW-17	2/24/2021	42.00
	4/8/2021	17.10
	5/12/2021	10.90
	6/3/2021	38.15
	6/28/2021	29.15
	7/20/2021	16.38
	8/23/2021	26.51
	10/1/2021	21.26
	11/29/2021	8.86
	2/7/2022	11.19
	6/8/2022	41.49
	8/31/2022	22.58
MW-18	2/22/2021	3.40
	4/9/2021	4.62
	5/10/2021	2.28
	6/3/2021	2.38
	6/29/2021	3.96
	7/19/2021	5.19
	8/26/2021	7.96
	9/30/2021	37.94
	12/1/2021	5.88
	2/8/2022	39.3
	6/6/2022	2.73
	8/30/2022	5.66

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ANALYTICAL REPORT

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Tel: (708)534-5200

Laboratory Job ID: 500-221556-1
Client Project/Site: Powerton CCR

For:
KPRG and Associates, Inc.
14665 West Lisbon Road,
Suite 1A
Brookfield, Wisconsin 53005

Attn: Richard Gnat

Diana Mockler

Authorized for release by:
9/29/2022 9:26:27 AM

Diana Mockler, Project Manager I
(219)252-7570
Diana.Mockler@et.eurofinsus.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-221556-1

Job ID: 500-221556-1

Laboratory: Eurofins Chicago

Narrative

Job Narrative
500-221556-1

Comments
No additional comments.

Receipt
The samples were received on 8/31/2022 9:30 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 4 coolers at receipt time were 0.3º C, 0.9º C, 4.0º C and 5.9º C.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-221556-1

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	EET CHI
7470A	Mercury (CVAA)	SW846	EET CHI
SM 2540C	Solids, Total Dissolved (TDS)	SM	EET CHI
SM 4500 Cl- E	Chloride, Total	SM	EET CHI
SM 4500 F C	Fluoride	SM	EET CHI
SM 4500 SO4 E	Sulfate, Total	SM	EET CHI
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET CHI
7470A	Preparation, Mercury	SW846	EET CHI

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Sample Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-221556-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-221556-1	MW-01	Water	08/30/22 09:32	08/31/22 09:30
500-221556-2	MW-08	Water	08/30/22 14:13	08/31/22 09:30
500-221556-3	MW-18	Water	08/30/22 15:20	08/31/22 09:30
500-221556-4	MW-19	Water	08/30/22 15:56	08/31/22 09:30
500-221556-5	Duplicate	Water	08/30/22 00:00	08/31/22 09:30
500-221556-6	MW-09	Water	08/31/22 09:03	09/01/22 09:30
500-221556-7	MW-11	Water	08/31/22 10:14	09/01/22 09:30
500-221556-8	MW-12	Water	08/31/22 11:25	09/01/22 09:30
500-221556-9	MW-15	Water	08/31/22 12:31	09/01/22 09:30
500-221556-10	MW-17	Water	08/31/22 14:04	09/01/22 09:30

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-221556-1

Client Sample ID: MW-01

Date Collected: 08/30/22 09:32
Date Received: 08/31/22 09:30

Lab Sample ID: 500-221556-1

Matrix: Water

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		09/02/22 07:45	09/08/22 23:34	1
Arsenic	<0.0010		0.0010		mg/L		09/02/22 07:45	09/08/22 23:34	1
Barium	**0.076**		0.0025		mg/L		09/02/22 07:45	09/08/22 23:34	1
Beryllium	<0.0010		0.0010		mg/L		09/02/22 07:45	09/08/22 23:34	1
Boron	**0.59**		0.050		mg/L		09/02/22 07:45	09/09/22 16:17	1
Cadmium	<0.00050		0.00050		mg/L		09/02/22 07:45	09/08/22 23:34	1
Calcium	**100**		0.20		mg/L		09/02/22 07:45	09/08/22 23:34	1
Chromium	<0.0050		0.0050		mg/L		09/02/22 07:45	09/08/22 23:34	1
Cobalt	<0.0010		0.0010		mg/L		09/02/22 07:45	09/08/22 23:34	1
Lead	<0.00050		0.00050		mg/L		09/02/22 07:45	09/08/22 23:34	1
Lithium	<0.010		0.010		mg/L		09/02/22 07:45	09/09/22 16:17	1
Molybdenum	<0.0050		0.0050		mg/L		09/02/22 07:45	09/08/22 23:34	1
Selenium	<0.0025		0.0025		mg/L		09/02/22 07:45	09/08/22 23:34	1
Thallium	<0.0020		0.0020		mg/L		09/02/22 07:45	09/08/22 23:34	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		09/09/22 09:20	09/12/22 08:16	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**700**		10		mg/L			09/06/22 17:42	1
Chloride	**44**		4.0		mg/L			09/01/22 12:40	2
Fluoride	**0.13**		0.10		mg/L			09/10/22 13:54	1
Sulfate	**66**		10		mg/L			09/01/22 15:00	2

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-221556-1

Client Sample ID: MW-08

Date Collected: 08/30/22 14:13
Date Received: 08/31/22 09:30

Lab Sample ID: 500-221556-2

Matrix: Water

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		09/02/22 07:45	09/08/22 23:38	1
Arsenic	**0.0027**		0.0010		mg/L		09/02/22 07:45	09/08/22 23:38	1
Barium	**0.15**		0.0025		mg/L		09/02/22 07:45	09/08/22 23:38	1
Beryllium	<0.0010		0.0010		mg/L		09/02/22 07:45	09/08/22 23:38	1
Boron	**0.70**		0.050		mg/L		09/02/22 07:45	09/09/22 16:20	1
Cadmium	<0.00050		0.00050		mg/L		09/02/22 07:45	09/08/22 23:38	1
Calcium	**140**		0.20		mg/L		09/02/22 07:45	09/08/22 23:38	1
Chromium	<0.0050		0.0050		mg/L		09/02/22 07:45	09/08/22 23:38	1
Cobalt	<0.0010		0.0010		mg/L		09/02/22 07:45	09/08/22 23:38	1
Lead	<0.00050		0.00050		mg/L		09/02/22 07:45	09/08/22 23:38	1
Lithium	**0.023**		0.010		mg/L		09/02/22 07:45	09/09/22 16:20	1
Molybdenum	**0.0083**		0.0050		mg/L		09/02/22 07:45	09/08/22 23:38	1
Selenium	<0.0025		0.0025		mg/L		09/02/22 07:45	09/08/22 23:38	1
Thallium	<0.0020		0.0020		mg/L		09/02/22 07:45	09/08/22 23:38	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		09/09/22 09:20	09/12/22 08:18	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**1200**		10		mg/L			09/06/22 17:43	1
Chloride	**210**		20		mg/L			09/01/22 12:40	10
Fluoride	**0.32**		0.10		mg/L			09/10/22 13:57	1
Sulfate	**50**		10		mg/L			09/01/22 15:00	2

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-221556-1

Client Sample ID: MW-18

Date Collected: 08/30/22 15:20
Date Received: 08/31/22 09:30

Lab Sample ID: 500-221556-3

Matrix: Water

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		09/02/22 07:45	09/08/22 23:41	1
Arsenic	**0.0085**		0.0010		mg/L		09/02/22 07:45	09/08/22 23:41	1
Barium	**0.23**		0.0025		mg/L		09/02/22 07:45	09/08/22 23:41	1
Beryllium	<0.0010		0.0010		mg/L		09/02/22 07:45	09/08/22 23:41	1
Boron	**0.66**		0.050		mg/L		09/02/22 07:45	09/09/22 16:24	1
Cadmium	<0.00050		0.00050		mg/L		09/02/22 07:45	09/08/22 23:41	1
Calcium	**130**		0.20		mg/L		09/02/22 07:45	09/08/22 23:41	1
Chromium	**0.0071**		0.0050		mg/L		09/02/22 07:45	09/08/22 23:41	1
Cobalt	**0.0027**		0.0010		mg/L		09/02/22 07:45	09/08/22 23:41	1
Lead	**0.0039**		0.00050		mg/L		09/02/22 07:45	09/08/22 23:41	1
Lithium	**0.016**		0.010		mg/L		09/02/22 07:45	09/09/22 16:24	1
Molybdenum	**0.0056**		0.0050		mg/L		09/02/22 07:45	09/08/22 23:41	1
Selenium	<0.0025		0.0025		mg/L		09/02/22 07:45	09/08/22 23:41	1
Thallium	<0.0020		0.0020		mg/L		09/02/22 07:45	09/08/22 23:41	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		09/09/22 09:20	09/12/22 08:20	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**1400**		10		mg/L			09/06/22 17:45	1
Chloride	**160**		20		mg/L			09/01/22 12:41	10
Fluoride	**0.55**		0.10		mg/L			09/10/22 13:59	1
Sulfate	**240**		50		mg/L			09/01/22 15:01	10

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-221556-1

Client Sample ID: MW-19

Date Collected: 08/30/22 15:56
Date Received: 08/31/22 09:30

Lab Sample ID: 500-221556-4

Matrix: Water

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		09/02/22 07:45	09/08/22 23:45	1
Arsenic	**0.0027**		0.0010		mg/L		09/02/22 07:45	09/08/22 23:45	1
Barium	**0.15**		0.0025		mg/L		09/02/22 07:45	09/08/22 23:45	1
Beryllium	<0.0010		0.0010		mg/L		09/02/22 07:45	09/08/22 23:45	1
Boron	**0.69**		0.050		mg/L		09/02/22 07:45	09/09/22 16:27	1
Cadmium	<0.00050		0.00050		mg/L		09/02/22 07:45	09/08/22 23:45	1
Calcium	**140**		0.20		mg/L		09/02/22 07:45	09/08/22 23:45	1
Chromium	<0.0050		0.0050		mg/L		09/02/22 07:45	09/08/22 23:45	1
Cobalt	<0.0010		0.0010		mg/L		09/02/22 07:45	09/08/22 23:45	1
Lead	<0.00050		0.00050		mg/L		09/02/22 07:45	09/08/22 23:45	1
Lithium	**0.023**		0.010		mg/L		09/02/22 07:45	09/09/22 16:27	1
Molybdenum	**0.0082**		0.0050		mg/L		09/02/22 07:45	09/08/22 23:45	1
Selenium	<0.0025		0.0025		mg/L		09/02/22 07:45	09/08/22 23:45	1
Thallium	<0.0020		0.0020		mg/L		09/02/22 07:45	09/08/22 23:45	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		09/09/22 09:20	09/12/22 08:22	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**1100**		10		mg/L			09/06/22 17:46	1
Chloride	**200**		20		mg/L			09/01/22 13:59	10
Fluoride	**0.32**		0.10		mg/L			09/10/22 14:03	1
Sulfate	**45**		25		mg/L			09/01/22 14:44	5

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-221556-1

Client Sample ID: Duplicate

Date Collected: 08/30/22 00:00
Date Received: 08/31/22 09:30

Lab Sample ID: 500-221556-5

Matrix: Water

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		09/02/22 07:45	09/08/22 23:48	1
Arsenic	<0.0010		0.0010		mg/L		09/02/22 07:45	09/08/22 23:48	1
Barium	**0.063**		0.0025		mg/L		09/02/22 07:45	09/08/22 23:48	1
Beryllium	<0.0010		0.0010		mg/L		09/02/22 07:45	09/08/22 23:48	1
Boron	**3.3**		0.50		mg/L		09/02/22 07:45	09/09/22 16:31	10
Cadmium	<0.00050		0.00050		mg/L		09/02/22 07:45	09/08/22 23:48	1
Calcium	**80**		0.20		mg/L		09/02/22 07:45	09/08/22 23:48	1
Chromium	<0.0050		0.0050		mg/L		09/02/22 07:45	09/08/22 23:48	1
Cobalt	<0.0010		0.0010		mg/L		09/02/22 07:45	09/08/22 23:48	1
Lead	<0.00050		0.00050		mg/L		09/02/22 07:45	09/08/22 23:48	1
Lithium	<0.010		0.010		mg/L		09/02/22 07:45	09/13/22 13:08	1
Molybdenum	**0.043**		0.0050		mg/L		09/02/22 07:45	09/08/22 23:48	1
Selenium	<0.0025		0.0025		mg/L		09/02/22 07:45	09/08/22 23:48	1
Thallium	<0.0020		0.0020		mg/L		09/02/22 07:45	09/08/22 23:48	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		09/09/22 09:20	09/12/22 08:24	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**940**		10		mg/L			09/06/22 17:47	1
Chloride	**36**		20		mg/L			09/01/22 12:41	10
Fluoride	**0.16**		0.10		mg/L			09/10/22 14:06	1
Sulfate	**140**		50		mg/L			09/01/22 14:45	10

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-221556-1

Client Sample ID: MW-09

Date Collected: 08/31/22 09:03
Date Received: 09/01/22 09:30

Lab Sample ID: 500-221556-6

Matrix: Water

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		09/02/22 07:45	09/08/22 23:52	1
Arsenic	<0.0010		0.0010		mg/L		09/02/22 07:45	09/08/22 23:52	1
Barium	**0.036**		0.0025		mg/L		09/02/22 07:45	09/08/22 23:52	1
Beryllium	<0.0010		0.0010		mg/L		09/02/22 07:45	09/08/22 23:52	1
Boron	**3.2**		0.50		mg/L		09/02/22 07:45	09/09/22 16:34	10
Cadmium	<0.00050		0.00050		mg/L		09/02/22 07:45	09/08/22 23:52	1
Calcium	**79**		0.20		mg/L		09/02/22 07:45	09/08/22 23:52	1
Chromium	<0.0050		0.0050		mg/L		09/02/22 07:45	09/08/22 23:52	1
Cobalt	<0.0010		0.0010		mg/L		09/02/22 07:45	09/08/22 23:52	1
Lead	<0.00050		0.00050		mg/L		09/02/22 07:45	09/08/22 23:52	1
Lithium	<0.010		0.010		mg/L		09/02/22 07:45	09/13/22 13:12	1
Molybdenum	**0.024**		0.0050		mg/L		09/02/22 07:45	09/08/22 23:52	1
Selenium	<0.0025		0.0025		mg/L		09/02/22 07:45	09/08/22 23:52	1
Thallium	<0.0020		0.0020		mg/L		09/02/22 07:45	09/08/22 23:52	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		09/09/22 09:20	09/12/22 08:26	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**530**		10		mg/L			09/07/22 18:43	1
Chloride	**30**		4.0		mg/L			09/09/22 17:28	2
Fluoride	**0.18**		0.10		mg/L			09/10/22 14:08	1
Sulfate	**140**		50		mg/L			09/09/22 19:07	10

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-221556-1

Client Sample ID: MW-11

Date Collected: 08/31/22 10:14
Date Received: 09/01/22 09:30

Lab Sample ID: 500-221556-7

Matrix: Water

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		09/02/22 07:45	09/09/22 00:02	1
Arsenic	**0.016**		0.0010		mg/L		09/02/22 07:45	09/09/22 00:02	1
Barium	**0.20**		0.0025		mg/L		09/02/22 07:45	09/09/22 00:02	1
Beryllium	<0.0010		0.0010		mg/L		09/02/22 07:45	09/09/22 00:02	1
Boron	**1.2**		0.25		mg/L		09/02/22 07:45	09/09/22 16:37	5
Cadmium	<0.00050		0.00050		mg/L		09/02/22 07:45	09/09/22 00:02	1
Calcium	**120**		0.20		mg/L		09/02/22 07:45	09/09/22 00:02	1
Chromium	<0.0050		0.0050		mg/L		09/02/22 07:45	09/09/22 00:02	1
Cobalt	**0.0017**		0.0010		mg/L		09/02/22 07:45	09/09/22 00:02	1
Lead	<0.00050		0.00050		mg/L		09/02/22 07:45	09/09/22 00:02	1
Lithium	<0.010		0.010		mg/L		09/02/22 07:45	09/13/22 13:15	1
Molybdenum	**0.020**		0.0050		mg/L		09/02/22 07:45	09/09/22 00:02	1
Selenium	<0.0025		0.0025		mg/L		09/02/22 07:45	09/09/22 00:02	1
Thallium	<0.0020		0.0020		mg/L		09/02/22 07:45	09/09/22 00:02	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		09/09/22 09:20	09/12/22 08:33	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**830**		10		mg/L			09/07/22 18:44	1
Chloride	**100**		20		mg/L			09/09/22 17:29	10
Fluoride	**0.61**		0.10		mg/L			09/10/22 14:17	1
Sulfate	**190**		50		mg/L			09/09/22 19:08	10

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-221556-1

Client Sample ID: MW-12

Date Collected: 08/31/22 11:25
Date Received: 09/01/22 09:30

Lab Sample ID: 500-221556-8

Matrix: Water

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		09/02/22 07:45	09/09/22 00:05	1
Arsenic	**0.099**		0.0010		mg/L		09/02/22 07:45	09/09/22 00:05	1
Barium	**0.11**		0.0025		mg/L		09/02/22 07:45	09/09/22 00:05	1
Beryllium	<0.0010		0.0010		mg/L		09/02/22 07:45	09/09/22 00:05	1
Boron	**0.62**		0.050		mg/L		09/02/22 07:45	09/09/22 16:41	1
Cadmium	<0.00050		0.00050		mg/L		09/02/22 07:45	09/09/22 00:05	1
Calcium	**100**		0.20		mg/L		09/02/22 07:45	09/09/22 00:05	1
Chromium	<0.0050		0.0050		mg/L		09/02/22 07:45	09/09/22 00:05	1
Cobalt	<0.0010		0.0010		mg/L		09/02/22 07:45	09/09/22 00:05	1
Lead	<0.00050		0.00050		mg/L		09/02/22 07:45	09/09/22 00:05	1
Lithium	**0.014**		0.010		mg/L		09/02/22 07:45	09/09/22 16:41	1
Molybdenum	**0.021**		0.0050		mg/L		09/02/22 07:45	09/09/22 00:05	1
Selenium	<0.0025		0.0025		mg/L		09/02/22 07:45	09/09/22 00:05	1
Thallium	<0.0020		0.0020		mg/L		09/02/22 07:45	09/09/22 00:05	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		09/09/22 09:20	09/12/22 08:41	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**870**		10		mg/L			09/07/22 18:46	1
Chloride	**150**		20		mg/L			09/09/22 17:29	10
Fluoride	**0.50**		0.10		mg/L			09/10/22 14:20	1
Sulfate	**260**		50		mg/L			09/09/22 19:08	10

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-221556-1

Client Sample ID: MW-15

Date Collected: 08/31/22 12:31
Date Received: 09/01/22 09:30

Lab Sample ID: 500-221556-9

Matrix: Water

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		09/02/22 07:45	09/09/22 00:09	1
Arsenic	**0.0049**		0.0010		mg/L		09/02/22 07:45	09/09/22 00:09	1
Barium	**0.057**		0.0025		mg/L		09/02/22 07:45	09/09/22 00:09	1
Beryllium	<0.0010		0.0010		mg/L		09/02/22 07:45	09/09/22 00:09	1
Boron	**1.5**		0.25		mg/L		09/02/22 07:45	09/09/22 16:44	5
Cadmium	<0.00050		0.00050		mg/L		09/02/22 07:45	09/09/22 00:09	1
Calcium	**210**		0.20		mg/L		09/02/22 07:45	09/09/22 00:09	1
Chromium	<0.0050		0.0050		mg/L		09/02/22 07:45	09/09/22 00:09	1
Cobalt	<0.0010		0.0010		mg/L		09/02/22 07:45	09/09/22 00:09	1
Lead	<0.00050		0.00050		mg/L		09/02/22 07:45	09/09/22 00:09	1
Lithium	**0.032**		0.010		mg/L		09/02/22 07:45	09/13/22 13:19	1
Molybdenum	**0.021**		0.0050		mg/L		09/02/22 07:45	09/09/22 00:09	1
Selenium	**0.0078**		0.0025		mg/L		09/02/22 07:45	09/09/22 00:09	1
Thallium	<0.0020		0.0020		mg/L		09/02/22 07:45	09/09/22 00:09	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		09/09/22 09:20	09/12/22 08:43	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**1800**		10		mg/L			09/07/22 18:47	1
Chloride	**270**		20		mg/L			09/09/22 17:29	10
Fluoride	**0.48**		0.10		mg/L			09/10/22 14:22	1
Sulfate	**530**		250		mg/L			09/09/22 19:08	50

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-221556-1

Client Sample ID: MW-17

Date Collected: 08/31/22 14:04
Date Received: 09/01/22 09:30

Lab Sample ID: 500-221556-10

Matrix: Water

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		09/02/22 07:45	09/09/22 00:12	1
Arsenic	**0.0030**		0.0010		mg/L		09/02/22 07:45	09/09/22 00:12	1
Barium	**0.031**		0.0025		mg/L		09/02/22 07:45	09/09/22 00:12	1
Beryllium	<0.0010		0.0010		mg/L		09/02/22 07:45	09/09/22 00:12	1
Boron	**1.1**		0.25		mg/L		09/02/22 07:45	09/09/22 16:48	5
Cadmium	<0.00050		0.00050		mg/L		09/02/22 07:45	09/09/22 00:12	1
Calcium	**150**		0.20		mg/L		09/02/22 07:45	09/09/22 00:12	1
Chromium	<0.0050		0.0050		mg/L		09/02/22 07:45	09/09/22 00:12	1
Cobalt	<0.0010		0.0010		mg/L		09/02/22 07:45	09/09/22 00:12	1
Lead	<0.00050		0.00050		mg/L		09/02/22 07:45	09/09/22 00:12	1
Lithium	**0.016**		0.010		mg/L		09/02/22 07:45	09/13/22 19:04	1
Molybdenum	**0.024**		0.0050		mg/L		09/02/22 07:45	09/09/22 00:12	1
Selenium	<0.0025		0.0025		mg/L		09/02/22 07:45	09/09/22 00:12	1
Thallium	<0.0020		0.0020		mg/L		09/02/22 07:45	09/09/22 00:12	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		09/09/22 09:20	09/12/22 08:45	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**1200**		10		mg/L			09/07/22 18:48	1
Chloride	**170**		20		mg/L			09/09/22 17:30	10
Fluoride	**0.73**		0.10		mg/L			09/10/22 14:25	1
Sulfate	**430**		250		mg/L			09/09/22 19:09	50

Definitions/Glossary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-221556-1

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

QC Association Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-221556-1

Metals

Prep Batch: 672889

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221556-1	MW-01	Total Recoverable	Water	3005A	
500-221556-2	MW-08	Total Recoverable	Water	3005A	
500-221556-3	MW-18	Total Recoverable	Water	3005A	
500-221556-4	MW-19	Total Recoverable	Water	3005A	
500-221556-5	Duplicate	Total Recoverable	Water	3005A	
500-221556-6	MW-09	Total Recoverable	Water	3005A	
500-221556-7	MW-11	Total Recoverable	Water	3005A	
500-221556-8	MW-12	Total Recoverable	Water	3005A	
500-221556-9	MW-15	Total Recoverable	Water	3005A	
500-221556-10	MW-17	Total Recoverable	Water	3005A	
MB 500-672889/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 500-672889/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 673830

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221556-1	MW-01	Total/NA	Water	7470A	
500-221556-2	MW-08	Total/NA	Water	7470A	
500-221556-3	MW-18	Total/NA	Water	7470A	
500-221556-4	MW-19	Total/NA	Water	7470A	
500-221556-5	Duplicate	Total/NA	Water	7470A	
500-221556-6	MW-09	Total/NA	Water	7470A	
500-221556-7	MW-11	Total/NA	Water	7470A	
500-221556-8	MW-12	Total/NA	Water	7470A	
500-221556-9	MW-15	Total/NA	Water	7470A	
500-221556-10	MW-17	Total/NA	Water	7470A	
MB 500-673830/12-A	Method Blank	Total/NA	Water	7470A	
LCS 500-673830/13-A	Lab Control Sample	Total/NA	Water	7470A	
500-221556-7 MS	MW-11	Total/NA	Water	7470A	
500-221556-7 MSD	MW-11	Total/NA	Water	7470A	
500-221556-7 DU	MW-11	Total/NA	Water	7470A	

Analysis Batch: 673884

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221556-1	MW-01	Total Recoverable	Water	6020A	672889
500-221556-2	MW-08	Total Recoverable	Water	6020A	672889
500-221556-3	MW-18	Total Recoverable	Water	6020A	672889
500-221556-4	MW-19	Total Recoverable	Water	6020A	672889
500-221556-5	Duplicate	Total Recoverable	Water	6020A	672889
500-221556-6	MW-09	Total Recoverable	Water	6020A	672889
500-221556-7	MW-11	Total Recoverable	Water	6020A	672889
500-221556-8	MW-12	Total Recoverable	Water	6020A	672889
500-221556-9	MW-15	Total Recoverable	Water	6020A	672889
500-221556-10	MW-17	Total Recoverable	Water	6020A	672889
MB 500-672889/1-A	Method Blank	Total Recoverable	Water	6020A	672889
LCS 500-672889/2-A	Lab Control Sample	Total Recoverable	Water	6020A	672889

Analysis Batch: 674091

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221556-1	MW-01	Total Recoverable	Water	6020A	672889
500-221556-2	MW-08	Total Recoverable	Water	6020A	672889
500-221556-3	MW-18	Total Recoverable	Water	6020A	672889

QC Association Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-221556-1

Metals (Continued)

Analysis Batch: 674091 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221556-4	MW-19	Total Recoverable	Water	6020A	672889
500-221556-5	Duplicate	Total Recoverable	Water	6020A	672889
500-221556-6	MW-09	Total Recoverable	Water	6020A	672889
500-221556-7	MW-11	Total Recoverable	Water	6020A	672889
500-221556-8	MW-12	Total Recoverable	Water	6020A	672889
500-221556-9	MW-15	Total Recoverable	Water	6020A	672889
500-221556-10	MW-17	Total Recoverable	Water	6020A	672889
MB 500-672889/1-A	Method Blank	Total Recoverable	Water	6020A	672889
LCS 500-672889/2-A	Lab Control Sample	Total Recoverable	Water	6020A	672889

Analysis Batch: 674169

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221556-1	MW-01	Total/NA	Water	7470A	673830
500-221556-2	MW-08	Total/NA	Water	7470A	673830
500-221556-3	MW-18	Total/NA	Water	7470A	673830
500-221556-4	MW-19	Total/NA	Water	7470A	673830
500-221556-5	Duplicate	Total/NA	Water	7470A	673830
500-221556-6	MW-09	Total/NA	Water	7470A	673830
500-221556-7	MW-11	Total/NA	Water	7470A	673830
500-221556-8	MW-12	Total/NA	Water	7470A	673830
500-221556-9	MW-15	Total/NA	Water	7470A	673830
500-221556-10	MW-17	Total/NA	Water	7470A	673830
MB 500-673830/12-A	Method Blank	Total/NA	Water	7470A	673830
LCS 500-673830/13-A	Lab Control Sample	Total/NA	Water	7470A	673830
500-221556-7 MS	MW-11	Total/NA	Water	7470A	673830
500-221556-7 MSD	MW-11	Total/NA	Water	7470A	673830
500-221556-7 DU	MW-11	Total/NA	Water	7470A	673830

Analysis Batch: 674440

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221556-5	Duplicate	Total Recoverable	Water	6020A	672889
500-221556-6	MW-09	Total Recoverable	Water	6020A	672889
500-221556-7	MW-11	Total Recoverable	Water	6020A	672889
500-221556-9	MW-15	Total Recoverable	Water	6020A	672889

Analysis Batch: 674538

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221556-10	MW-17	Total Recoverable	Water	6020A	672889

General Chemistry

Analysis Batch: 672805

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221556-1	MW-01	Total/NA	Water	SM 4500 Cl- E	
500-221556-2	MW-08	Total/NA	Water	SM 4500 Cl- E	
500-221556-3	MW-18	Total/NA	Water	SM 4500 Cl- E	
500-221556-4	MW-19	Total/NA	Water	SM 4500 Cl- E	
500-221556-5	Duplicate	Total/NA	Water	SM 4500 Cl- E	
MB 500-672805/58	Method Blank	Total/NA	Water	SM 4500 Cl- E	
LCS 500-672805/59	Lab Control Sample	Total/NA	Water	SM 4500 Cl- E	

QC Association Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-221556-1

General Chemistry

Analysis Batch: 672849

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221556-1	MW-01	Total/NA	Water	SM 4500 SO4 E	
500-221556-2	MW-08	Total/NA	Water	SM 4500 SO4 E	
500-221556-3	MW-18	Total/NA	Water	SM 4500 SO4 E	
500-221556-4	MW-19	Total/NA	Water	SM 4500 SO4 E	
500-221556-5	Duplicate	Total/NA	Water	SM 4500 SO4 E	
MB 500-672849/16	Method Blank	Total/NA	Water	SM 4500 SO4 E	
LCS 500-672849/17	Lab Control Sample	Total/NA	Water	SM 4500 SO4 E	

Analysis Batch: 673325

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221556-1	MW-01	Total/NA	Water	SM 2540C	
500-221556-2	MW-08	Total/NA	Water	SM 2540C	
500-221556-3	MW-18	Total/NA	Water	SM 2540C	
500-221556-4	MW-19	Total/NA	Water	SM 2540C	
500-221556-5	Duplicate	Total/NA	Water	SM 2540C	
MB 500-673325/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 500-673325/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 673533

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221556-6	MW-09	Total/NA	Water	SM 2540C	
500-221556-7	MW-11	Total/NA	Water	SM 2540C	
500-221556-8	MW-12	Total/NA	Water	SM 2540C	
500-221556-9	MW-15	Total/NA	Water	SM 2540C	
500-221556-10	MW-17	Total/NA	Water	SM 2540C	
MB 500-673533/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 500-673533/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 673960

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221556-6	MW-09	Total/NA	Water	SM 4500 Cl- E	
500-221556-7	MW-11	Total/NA	Water	SM 4500 Cl- E	
500-221556-8	MW-12	Total/NA	Water	SM 4500 Cl- E	
500-221556-9	MW-15	Total/NA	Water	SM 4500 Cl- E	
500-221556-10	MW-17	Total/NA	Water	SM 4500 Cl- E	
MB 500-673960/16	Method Blank	Total/NA	Water	SM 4500 Cl- E	
LCS 500-673960/17	Lab Control Sample	Total/NA	Water	SM 4500 Cl- E	

Analysis Batch: 673965

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221556-6	MW-09	Total/NA	Water	SM 4500 SO4 E	
500-221556-7	MW-11	Total/NA	Water	SM 4500 SO4 E	
500-221556-8	MW-12	Total/NA	Water	SM 4500 SO4 E	
500-221556-9	MW-15	Total/NA	Water	SM 4500 SO4 E	
500-221556-10	MW-17	Total/NA	Water	SM 4500 SO4 E	
MB 500-673965/16	Method Blank	Total/NA	Water	SM 4500 SO4 E	
LCS 500-673965/17	Lab Control Sample	Total/NA	Water	SM 4500 SO4 E	

Analysis Batch: 674042

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221556-1	MW-01	Total/NA	Water	SM 4500 F C	

QC Association Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-221556-1

General Chemistry (Continued)

Analysis Batch: 674042 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221556-2	MW-08	Total/NA	Water	SM 4500 F C	
500-221556-3	MW-18	Total/NA	Water	SM 4500 F C	
500-221556-4	MW-19	Total/NA	Water	SM 4500 F C	
500-221556-5	Duplicate	Total/NA	Water	SM 4500 F C	
500-221556-6	MW-09	Total/NA	Water	SM 4500 F C	
500-221556-7	MW-11	Total/NA	Water	SM 4500 F C	
500-221556-8	MW-12	Total/NA	Water	SM 4500 F C	
500-221556-9	MW-15	Total/NA	Water	SM 4500 F C	
500-221556-10	MW-17	Total/NA	Water	SM 4500 F C	
MB 500-674042/3	Method Blank	Total/NA	Water	SM 4500 F C	
LCS 500-674042/4	Lab Control Sample	Total/NA	Water	SM 4500 F C	

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-221556-1

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 500-672889/1-A
Matrix: Water
Analysis Batch: 673884

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 672889

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		09/02/22 07:45	09/08/22 23:21	1
Arsenic	<0.0010		0.0010		mg/L		09/02/22 07:45	09/08/22 23:21	1
Barium	<0.0025		0.0025		mg/L		09/02/22 07:45	09/08/22 23:21	1
Beryllium	<0.0010		0.0010		mg/L		09/02/22 07:45	09/08/22 23:21	1
Cadmium	<0.00050		0.00050		mg/L		09/02/22 07:45	09/08/22 23:21	1
Calcium	<0.20		0.20		mg/L		09/02/22 07:45	09/08/22 23:21	1
Chromium	<0.0050		0.0050		mg/L		09/02/22 07:45	09/08/22 23:21	1
Cobalt	<0.0010		0.0010		mg/L		09/02/22 07:45	09/08/22 23:21	1
Lead	<0.00050		0.00050		mg/L		09/02/22 07:45	09/08/22 23:21	1
Molybdenum	<0.0050		0.0050		mg/L		09/02/22 07:45	09/08/22 23:21	1
Selenium	<0.0025		0.0025		mg/L		09/02/22 07:45	09/08/22 23:21	1
Thallium	<0.0020		0.0020		mg/L		09/02/22 07:45	09/08/22 23:21	1

Lab Sample ID: MB 500-672889/1-A
Matrix: Water
Analysis Batch: 674091

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 672889

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	<0.050		0.050		mg/L		09/02/22 07:45	09/09/22 15:39	1
Lithium	<0.010		0.010		mg/L		09/02/22 07:45	09/09/22 15:39	1

Lab Sample ID: LCS 500-672889/2-A
Matrix: Water
Analysis Batch: 673884

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 672889

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	0.500	0.487		mg/L		97	80 - 120
Arsenic	0.100	0.0969		mg/L		97	80 - 120
Barium	0.500	0.514		mg/L		103	80 - 120
Beryllium	0.0500	0.0525		mg/L		105	80 - 120
Cadmium	0.0500	0.0489		mg/L		98	80 - 120
Calcium	10.0	10.3		mg/L		103	80 - 120
Chromium	0.200	0.207		mg/L		103	80 - 120
Cobalt	0.500	0.512		mg/L		102	80 - 120
Lead	0.100	0.105		mg/L		105	80 - 120
Molybdenum	1.00	0.952		mg/L		95	80 - 120
Selenium	0.100	0.0982		mg/L		98	80 - 120
Thallium	0.100	0.106		mg/L		106	80 - 120

Lab Sample ID: LCS 500-672889/2-A
Matrix: Water
Analysis Batch: 674091

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 672889

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	1.00	1.02		mg/L		102	80 - 120
Lithium	0.100	0.106		mg/L		106	80 - 120

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-221556-1

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 500-673830/12-A
Matrix: Water
Analysis Batch: 674169

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 673830

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		09/09/22 09:20	09/12/22 07:35	1

Lab Sample ID: LCS 500-673830/13-A
Matrix: Water
Analysis Batch: 674169

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 673830

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.00200	0.00190		mg/L		95	80 - 120

Lab Sample ID: 500-221556-7 MS
Matrix: Water
Analysis Batch: 674169

Client Sample ID: MW-11
Prep Type: Total/NA
Prep Batch: 673830

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	<0.00020		0.00100	0.00101		mg/L		101	75 - 125

Lab Sample ID: 500-221556-7 MSD
Matrix: Water
Analysis Batch: 674169

Client Sample ID: MW-11
Prep Type: Total/NA
Prep Batch: 673830

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	<0.00020		0.00100	0.000993		mg/L		99	75 - 125	2	20

Lab Sample ID: 500-221556-7 DU
Matrix: Water
Analysis Batch: 674169

Client Sample ID: MW-11
Prep Type: Total/NA
Prep Batch: 673830

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Mercury	<0.00020		<0.00020		mg/L		NC	20

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 500-673325/1
Matrix: Water
Analysis Batch: 673325

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<10		10		mg/L			09/06/22 17:40	1

Lab Sample ID: LCS 500-673325/2
Matrix: Water
Analysis Batch: 673325

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	250	290		mg/L		116	80 - 120

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-221556-1

Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: MB 500-673533/1
Matrix: Water
Analysis Batch: 673533

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<10		10		mg/L			09/07/22 18:30	1

Lab Sample ID: LCS 500-673533/2
Matrix: Water
Analysis Batch: 673533

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	250	260		mg/L		104	80 - 120

Method: SM 4500 Cl- E - Chloride, Total

Lab Sample ID: MB 500-672805/58
Matrix: Water
Analysis Batch: 672805

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<2.0		2.0		mg/L			09/01/22 12:38	1

Lab Sample ID: LCS 500-672805/59
Matrix: Water
Analysis Batch: 672805

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	20.0	20.7		mg/L		104	85 - 115

Lab Sample ID: MB 500-673960/16
Matrix: Water
Analysis Batch: 673960

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<2.0		2.0		mg/L			09/09/22 17:23	1

Lab Sample ID: LCS 500-673960/17
Matrix: Water
Analysis Batch: 673960

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	20.0	19.8		mg/L		99	85 - 115

Method: SM 4500 F C - Fluoride

Lab Sample ID: MB 500-674042/3
Matrix: Water
Analysis Batch: 674042

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<0.10		0.10		mg/L			09/10/22 13:12	1

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-221556-1

Method: SM 4500 F C - Fluoride (Continued)

Lab Sample ID: LCS 500-674042/4
Matrix: Water
Analysis Batch: 674042

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Fluoride			10.0	10.3		mg/L		103	90 - 119		

Method: SM 4500 SO4 E - Sulfate, Total

Lab Sample ID: MB 500-672849/16
Matrix: Water
Analysis Batch: 672849

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	<5.0		5.0		mg/L			09/01/22 14:37	1

Lab Sample ID: LCS 500-672849/17
Matrix: Water
Analysis Batch: 672849

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Sulfate			20.0	21.4		mg/L		107	88 - 123		

Lab Sample ID: MB 500-673965/16
Matrix: Water
Analysis Batch: 673965

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	<5.0		5.0		mg/L			09/09/22 19:01	1

Lab Sample ID: LCS 500-673965/17
Matrix: Water
Analysis Batch: 673965

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Sulfate			20.0	20.9		mg/L		105	88 - 123		

Eurofins Chicago
241 Bond Street
University Park IL 60484
Phone 708-534 5200 Fax 708-534 5211

Chain of Custody Record

MKE 232

eurofins

Client Information	Sampler: Kaelyn Sperle	Lab PM: Mockler Diana J	Carrier Tracking No(s):	COC No: 500-104267-43259
Client Contact: Mitchell Dolan	Phone: 262-278-1621	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: IL	Page: Page 1 of 1
Company: KPRG and Associates Inc	PWSID:			Job #: 500-221556
Address: 14665 West Lisbon Road Suite 1A	Due Date Requested: Standard			
City: Brookfield	TAT Requested (days): standard			
State Zip: WI 53005	Compliance Project: Δ Yes Δ No			
Phone: 262 781-0475(Tel)	PO #: 4502081030			
Email: mitcheld@kprginc.com	WO #:			
Project Name: Powerton CCR Event Desc Quarterly Powerton CCR Sampling	Project #: 50011612			
Site: Illinois	SSOW#:			

500-221556 COC

Analysis Requested

Preservation Codes: A HCL; B NaOH; C Zn Acetate; D Nitric Acid; E NaHSO4; F MeOH; G Amchlor; H Ascorbic Acid; I Ice; J DI Water; K EDTA; L EDA; M Hexane; N None; O AsNaO2; Na2O4S; Q Na2SO3; R Na2S2O3; S H2SO4; T TSP Dodecahydrate; Acetone; V MCAA; W pH 4.5; Y Trizma; Z other (specify); Other:

	Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, 904.0	6020A 7470A	2540C 4500_F_C, SM4500_Cl_E, SM4500_SO4_E	SM4500 SO4_E Sulfate	Total Number of containers	Special Instructions/Note
				Preservation Code:		X	X	D	D	N	N	X	
1	MW-01	8/30/22	0932	G	Water	N	N	X	X	X	X		
2	MW 08	8/30/22	1413	G	Water	N	N	X	X	X	X		
	~~MW-09~~				Water								
	~~MW-11~~				Water								
	~~MW-12~~				Water								
	~~MW-15~~				Water								
3	~~MW-17~~ MW-18	8/30/22	1520	G	Water	N	N	X	X	X	X		
4	MW 19	8/30/22	1556	G	Water	N	N	X	X	X	X		
	~~MW-18~~				Water								
5	Duplicate	8/30/22	–	G	Water	N	N	X	X	X	X		
					Water								

Possible Hazard Identification: [X] Non-Hazard [ ] Flammable [ ] Skin Irritant [ ] Poison B [ ] Unknown [ ] Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): [ ] Return To Client [X] Disposal By Lab [ ] Archive For ____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Kaelyn Sperle	8/30/22/1645	KPRG	FedEx	8/30/22/1645	FedEx
			[signature]	8/31/22 0930	[signature]

Custody Seals Intact: Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks
		1.8-70.3, 5.3-74.0

Eurofins Chicago
2417 Bond Street
University Park IL 60484
Phone 708-534-5200 Fax 708-534-5211

Chain of Custody Record

MKE 232

eurofins Environment Testing America

Client Information	Sampler: Kaelyn Sperle	Lab PM: Mockler Diana J	Carrier Tracking No(s):	COC No: 500-104267-43259 1
Client Contact: Mitchel Dolan	Phone: 262-278-1621	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: IL	Page: Page 1 of 1
Company: KPRG and Associates Inc.	PWS ID:	Analysis Requested		Job #: 500-221556
Address: 14665 West Lisbon Road Suite 1A	Due Date Requested: Standard			Preservation Codes: A - HCL; B - NaOH; C - Zn Acetate; D - Nitric Acid; E - NaHSO4; F - MeOH; G - Amchlor; H - Ascorbic Acid; I - Ice; J - DI Water; K - EDTA; L - EDA; M - Hexane; N - None; O - AsNaO2; P - Na2O4S; Q - Na2SO3; R - Na2S2O3; S - H2SO4; T - TSP Dodecahydrate; U - Acetone; V - MCAA; W - pH 4-5; Y - Trizma; Z - other (specify); Other:
City: Brookfield	TAT Requested (days): Standard			
State, Zip: WI 53005	Compliance Project: Δ Yes Δ No			
Phone: 262-781-0475(Tel)	PO #: 4502081030			
Email: mitcheld@kprginc.com	WO #:			
Project Name: Powerton CCR Event Desc Quarterly Powerton CCR Sampling	Project #: 50011612			
Site: Illinois	SSOW#:			

	Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, 904.0	6020A, 7470A	2540C, 4500_F_C, SM4500_Cl_E, SM4500_SO4_E	SM4500_SO4_E - Sulfate										Total Number of containers	Special Instructions/Note:
				Preservation Code:		X	X	D	D	N	N											
	~~MW-08~~				Water																	
	~~MW-08~~				Water																	
6	MW-09	8/31/22	0903	G	Water	N	N	X	X	X	X											
7	MW-11	8/31/22	1014	G	Water	N	N	X	X	X	X											
8	MW-12	8/31/22	1125	G	Water	N	N	X	X	X	X											
9	MW-15	8/31/22	1231	G	Water	N	N	X	X	X	X											
10	MW-17	8/31/22	1404	G	Water	N	N	X	X	X	X											
	~~MW-19~~				Water																	
	~~MW-19~~				Water																	
					Water																	
					Water																	

500-221556 COC

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	Kaelyn Sperle	8/31/22/1745	KPRG	FedEx	8/31/22/1745	FedEx
2	Relinquished by	Date/Time	Company	Received by: Stephanie Hernandez	Date/Time: 9/1/22 0930	Company: EETA
3	Relinquished by	Date/Time	Company	Received by	Date/Time	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No

Cooler Temperature(s) °C and Other Remarks: 6.1 → 5.9, 2.2-TD

500-221556 Waybi



ORIGIN ID:PIAA (262) 278-1621
KAELYN SPERLE
KPRG AND ASSOCIATES
414 PLAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 30AUG22
ACTWGT: 50.85 LB
CAD: 6994780/SSFE2322
DIMS: 24x13x13 IN

BILL THIRD PARTY

TO EUROFINS

2417 BOND ST.

UNIVERSITY PARK IL 60484

(555) 555-5555
INV:
PO:
REF:
DEPT:

Part # 156297-435 RRDB2 EXP 04/23

FedEx Express

REL# 3785346

5 of 6
MPS# 2774 0693 6126
Mstr# 2774 0693 6089

0263
0201

XN JOTA

WED - 31 AUG 10:30A
PRIORITY OVERNIGHT
AHS
60484
IL-US ORD



ORIGIN ID:PIAA (262) 278-1621
KAELYN SPERLE
KPRG AND ASSOCIATES
414 PLAZA DR STE 106

IL 60559
STATES US

SHIP DATE: 30AUG22
ACTWGT: 50.85 LB
CAD: 6994780/SSFE2322
DIMS: 24x13x13 IN

BILL THIRD PARTY

ROFINS

417 BOND ST.

UNIVERSITY PARK IL 60484

(555) 555-5555
INV:
PO:
REF:
DEPT:

Part # 156297-435 RRDB2 EXP 04/23

FedEx Express

REL# 3785346

6 of 6
MPS# 2774 0693 6137
1str# 2774 0693 6089

0263
0201

XN JOTA

WED - 31 AUG 10:30A
PRIORITY OVERNIGHT
AHS
60484
IL-US ORD



-162
SHIP DATE: 31AUG22
ACTWGT: 48.00 LB
CAD: 6994780/SSFE2322
DIMS: 24x13x13 IN
BILL THIRD PARTY
AGO
AGO
PARK IL 60484
REF:
DEPT:
FedEx Express
REL# 3765346
1 of 5
2774 5684 7044
MASTER
XN JOTA
THU - 01 SEP 10:30A
PRIORITY OVERNIGHT
AHS
60484
IL-US ORD
Part # 156297-435 RRDB2 EXP 04/23



ORIGIN ID:PIAA (262) 278-1621
KAELYN SPERLE
KPRG AND ASSOCIATES
414 PLAZA DR STE 106
WESTMONT, IL 60559
UNITED STATES US
SHIP DATE: 31AUG22
ACTWGT: 48.00 LB
CAD: 6994780/SSFE232
DIMS: 24x13x13 IN
BILL THIRD PARTY
500-221556 Waybi
TO EUROFINS CHICAGO
EUROFINS CHICAGO
2417 BOND ST
UNIVERSITY PARK IL 60484
(708) 534-5200
INV:
PO:
REF:
DEPT:
FedEx Express
REL# 3765346
3 of 5
MPS# 0283 2774 5684 7066
Mstr# 2774 5684 7044
0201
XN JOTA
THU - 01 SEP 10:30A
PRIORITY OVERNIGHT
AHS
60484
IL-US ORD
Part # 156297-435 RRDB2 EXP 04/23

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-221556-1

Login Number: 221556
List Number: 1
Creator: Scott, Sherri L

List Source: Eurofins Chicago

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.3,4.0,5.9,0.9
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-221556-1

Client Sample ID: MW-01
Date Collected: 08/30/22 09:32
Date Received: 08/31/22 09:30

Lab Sample ID: 500-221556-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			672889	BDE	EET CHI	09/02/22 07:45 - 09/02/22 08:15 [1]
Total Recoverable	Analysis	6020A		1	673884	FXG	EET CHI	09/08/22 23:34
Total Recoverable	Prep	3005A			672889	BDE	EET CHI	09/02/22 07:45 - 09/02/22 08:15 [1]
Total Recoverable	Analysis	6020A		1	674091	FXG	EET CHI	09/09/22 16:17
Total/NA	Prep	7470A			673830	MJG	EET CHI	09/09/22 09:20 - 09/09/22 11:20 [1]
Total/NA	Analysis	7470A		1	674169	MJG	EET CHI	09/12/22 08:16
Total/NA	Analysis	SM 2540C		1	673325	SMO	EET CHI	09/06/22 17:42
Total/NA	Analysis	SM 4500 Cl- E		2	672805	LP	EET CHI	09/01/22 12:40
Total/NA	Analysis	SM 4500 F C		1	674042	EAT	EET CHI	09/10/22 13:54
Total/NA	Analysis	SM 4500 SO4 E		2	672849	LP	EET CHI	09/01/22 15:00

Client Sample ID: MW-08
Date Collected: 08/30/22 14:13
Date Received: 08/31/22 09:30

Lab Sample ID: 500-221556-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			672889	BDE	EET CHI	09/02/22 07:45 - 09/02/22 08:15 [1]
Total Recoverable	Analysis	6020A		1	673884	FXG	EET CHI	09/08/22 23:38
Total Recoverable	Prep	3005A			672889	BDE	EET CHI	09/02/22 07:45 - 09/02/22 08:15 [1]
Total Recoverable	Analysis	6020A		1	674091	FXG	EET CHI	09/09/22 16:20
Total/NA	Prep	7470A			673830	MJG	EET CHI	09/09/22 09:20 - 09/09/22 11:20 [1]
Total/NA	Analysis	7470A		1	674169	MJG	EET CHI	09/12/22 08:18
Total/NA	Analysis	SM 2540C		1	673325	SMO	EET CHI	09/06/22 17:43
Total/NA	Analysis	SM 4500 Cl- E		10	672805	LP	EET CHI	09/01/22 12:40
Total/NA	Analysis	SM 4500 F C		1	674042	EAT	EET CHI	09/10/22 13:57
Total/NA	Analysis	SM 4500 SO4 E		2	672849	LP	EET CHI	09/01/22 15:00

Client Sample ID: MW-18
Date Collected: 08/30/22 15:20
Date Received: 08/31/22 09:30

Lab Sample ID: 500-221556-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			672889	BDE	EET CHI	09/02/22 07:45 - 09/02/22 08:15 [1]
Total Recoverable	Analysis	6020A		1	673884	FXG	EET CHI	09/08/22 23:41
Total Recoverable	Prep	3005A			672889	BDE	EET CHI	09/02/22 07:45 - 09/02/22 08:15 [1]
Total Recoverable	Analysis	6020A		1	674091	FXG	EET CHI	09/09/22 16:24
Total/NA	Prep	7470A			673830	MJG	EET CHI	09/09/22 09:20 - 09/09/22 11:20 [1]
Total/NA	Analysis	7470A		1	674169	MJG	EET CHI	09/12/22 08:20
Total/NA	Analysis	SM 2540C		1	673325	SMO	EET CHI	09/06/22 17:45
Total/NA	Analysis	SM 4500 Cl- E		10	672805	LP	EET CHI	09/01/22 12:41
Total/NA	Analysis	SM 4500 F C		1	674042	EAT	EET CHI	09/10/22 13:59
Total/NA	Analysis	SM 4500 SO4 E		10	672849	LP	EET CHI	09/01/22 15:01

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-221556-1

Client Sample ID: MW-19

Lab Sample ID: 500-221556-4
Matrix: Water
Date Collected: 08/30/22 15:56
Date Received: 08/31/22 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			672889	BDE	EET CHI	09/02/22 07:45 - 09/02/22 08:15 [1]
Total Recoverable	Analysis	6020A		1	673884	FXG	EET CHI	09/08/22 23:45
Total Recoverable	Prep	3005A			672889	BDE	EET CHI	09/02/22 07:45 - 09/02/22 08:15 [1]
Total Recoverable	Analysis	6020A		1	674091	FXG	EET CHI	09/09/22 16:27
Total/NA	Prep	7470A			673830	MJG	EET CHI	09/09/22 09:20 - 09/09/22 11:20 [1]
Total/NA	Analysis	7470A		1	674169	MJG	EET CHI	09/12/22 08:22
Total/NA	Analysis	SM 2540C		1	673325	SMO	EET CHI	09/06/22 17:46
Total/NA	Analysis	SM 4500 Cl- E		10	672805	LP	EET CHI	09/01/22 13:59
Total/NA	Analysis	SM 4500 F C		1	674042	EAT	EET CHI	09/10/22 14:03
Total/NA	Analysis	SM 4500 SO4 E		5	672849	LP	EET CHI	09/01/22 14:44

Client Sample ID: Duplicate

Lab Sample ID: 500-221556-5
Matrix: Water
Date Collected: 08/30/22 00:00
Date Received: 08/31/22 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			672889	BDE	EET CHI	09/02/22 07:45 - 09/02/22 08:15 [1]
Total Recoverable	Analysis	6020A		1	673884	FXG	EET CHI	09/08/22 23:48
Total Recoverable	Prep	3005A			672889	BDE	EET CHI	09/02/22 07:45 - 09/02/22 08:15 [1]
Total Recoverable	Analysis	6020A		10	674091	FXG	EET CHI	09/09/22 16:31
Total Recoverable	Prep	3005A			672889	BDE	EET CHI	09/02/22 07:45 - 09/02/22 08:15 [1]
Total Recoverable	Analysis	6020A		1	674440	FXG	EET CHI	09/13/22 13:08
Total/NA	Prep	7470A			673830	MJG	EET CHI	09/09/22 09:20 - 09/09/22 11:20 [1]
Total/NA	Analysis	7470A		1	674169	MJG	EET CHI	09/12/22 08:24
Total/NA	Analysis	SM 2540C		1	673325	SMO	EET CHI	09/06/22 17:47
Total/NA	Analysis	SM 4500 Cl- E		10	672805	LP	EET CHI	09/01/22 12:41
Total/NA	Analysis	SM 4500 F C		1	674042	EAT	EET CHI	09/10/22 14:06
Total/NA	Analysis	SM 4500 SO4 E		10	672849	LP	EET CHI	09/01/22 14:45

Client Sample ID: MW-09

Lab Sample ID: 500-221556-6
Matrix: Water
Date Collected: 08/31/22 09:03
Date Received: 09/01/22 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			672889	BDE	EET CHI	09/02/22 07:45 - 09/02/22 08:15 [1]
Total Recoverable	Analysis	6020A		1	673884	FXG	EET CHI	09/08/22 23:52
Total Recoverable	Prep	3005A			672889	BDE	EET CHI	09/02/22 07:45 - 09/02/22 08:15 [1]
Total Recoverable	Analysis	6020A		10	674091	FXG	EET CHI	09/09/22 16:34
Total Recoverable	Prep	3005A			672889	BDE	EET CHI	09/02/22 07:45 - 09/02/22 08:15 [1]
Total Recoverable	Analysis	6020A		1	674440	FXG	EET CHI	09/13/22 13:12
Total/NA	Prep	7470A			673830	MJG	EET CHI	09/09/22 09:20 - 09/09/22 11:20 [1]
Total/NA	Analysis	7470A		1	674169	MJG	EET CHI	09/12/22 08:26
Total/NA	Analysis	SM 2540C		1	673533	SMO	EET CHI	09/07/22 18:43
Total/NA	Analysis	SM 4500 Cl- E		2	673960	LP	EET CHI	09/09/22 17:28

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-221556-1

Client Sample ID: MW-09
Date Collected: 08/31/22 09:03
Date Received: 09/01/22 09:30

Lab Sample ID: 500-221556-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	SM 4500 F C		1	674042	EAT	EET CHI	09/10/22 14:08
Total/NA	Analysis	SM 4500 SO4 E		10	673965	LP	EET CHI	09/09/22 19:07

Client Sample ID: MW-11
Date Collected: 08/31/22 10:14
Date Received: 09/01/22 09:30

Lab Sample ID: 500-221556-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			672889	BDE	EET CHI	09/02/22 07:45 - 09/02/22 08:15 [1]
Total Recoverable	Analysis	6020A		1	673884	FXG	EET CHI	09/09/22 00:02
Total Recoverable	Prep	3005A			672889	BDE	EET CHI	09/02/22 07:45 - 09/02/22 08:15 [1]
Total Recoverable	Analysis	6020A		5	674091	FXG	EET CHI	09/09/22 16:37
Total Recoverable	Prep	3005A			672889	BDE	EET CHI	09/02/22 07:45 - 09/02/22 08:15 [1]
Total Recoverable	Analysis	6020A		1	674440	FXG	EET CHI	09/13/22 13:15
Total/NA	Prep	7470A			673830	MJG	EET CHI	09/09/22 09:20 - 09/09/22 11:20 [1]
Total/NA	Analysis	7470A		1	674169	MJG	EET CHI	09/12/22 08:33
Total/NA	Analysis	SM 2540C		1	673533	SMO	EET CHI	09/07/22 18:44
Total/NA	Analysis	SM 4500 Cl- E		10	673960	LP	EET CHI	09/09/22 17:29
Total/NA	Analysis	SM 4500 F C		1	674042	EAT	EET CHI	09/10/22 14:17
Total/NA	Analysis	SM 4500 SO4 E		10	673965	LP	EET CHI	09/09/22 19:08

Client Sample ID: MW-12
Date Collected: 08/31/22 11:25
Date Received: 09/01/22 09:30

Lab Sample ID: 500-221556-8
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			672889	BDE	EET CHI	09/02/22 07:45 - 09/02/22 08:15 [1]
Total Recoverable	Analysis	6020A		1	673884	FXG	EET CHI	09/09/22 00:05
Total Recoverable	Prep	3005A			672889	BDE	EET CHI	09/02/22 07:45 - 09/02/22 08:15 [1]
Total Recoverable	Analysis	6020A		1	674091	FXG	EET CHI	09/09/22 16:41
Total/NA	Prep	7470A			673830	MJG	EET CHI	09/09/22 09:20 - 09/09/22 11:20 [1]
Total/NA	Analysis	7470A		1	674169	MJG	EET CHI	09/12/22 08:41
Total/NA	Analysis	SM 2540C		1	673533	SMO	EET CHI	09/07/22 18:46
Total/NA	Analysis	SM 4500 Cl- E		10	673960	LP	EET CHI	09/09/22 17:29
Total/NA	Analysis	SM 4500 F C		1	674042	EAT	EET CHI	09/10/22 14:20
Total/NA	Analysis	SM 4500 SO4 E		10	673965	LP	EET CHI	09/09/22 19:08

Client Sample ID: MW-15
Date Collected: 08/31/22 12:31
Date Received: 09/01/22 09:30

Lab Sample ID: 500-221556-9
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			672889	BDE	EET CHI	09/02/22 07:45 - 09/02/22 08:15 [1]
Total Recoverable	Analysis	6020A		1	673884	FXG	EET CHI	09/09/22 00:09

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-221556-1

Client Sample ID: MW-15

Lab Sample ID: 500-221556-9

Date Collected: 08/31/22 12:31

Matrix: Water

Date Received: 09/01/22 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			672889	BDE	EET CHI	09/02/22 07:45 - 09/02/22 08:15 [1]
Total Recoverable	Analysis	6020A		5	674091	FXG	EET CHI	09/09/22 16:44
Total Recoverable	Prep	3005A			672889	BDE	EET CHI	09/02/22 07:45 - 09/02/22 08:15 [1]
Total Recoverable	Analysis	6020A		1	674440	FXG	EET CHI	09/13/22 13:19
Total/NA	Prep	7470A			673830	MJG	EET CHI	09/09/22 09:20 - 09/09/22 11:20 [1]
Total/NA	Analysis	7470A		1	674169	MJG	EET CHI	09/12/22 08:43
Total/NA	Analysis	SM 2540C		1	673533	SMO	EET CHI	09/07/22 18:47
Total/NA	Analysis	SM 4500 Cl- E		10	673960	LP	EET CHI	09/09/22 17:29
Total/NA	Analysis	SM 4500 F C		1	674042	EAT	EET CHI	09/10/22 14:22
Total/NA	Analysis	SM 4500 SO4 E		50	673965	LP	EET CHI	09/09/22 19:08

Client Sample ID: MW-17

Lab Sample ID: 500-221556-10

Date Collected: 08/31/22 14:04

Matrix: Water

Date Received: 09/01/22 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			672889	BDE	EET CHI	09/02/22 07:45 - 09/02/22 08:15 [1]
Total Recoverable	Analysis	6020A		1	673884	FXG	EET CHI	09/09/22 00:12
Total Recoverable	Prep	3005A			672889	BDE	EET CHI	09/02/22 07:45 - 09/02/22 08:15 [1]
Total Recoverable	Analysis	6020A		5	674091	FXG	EET CHI	09/09/22 16:48
Total Recoverable	Prep	3005A			672889	BDE	EET CHI	09/02/22 07:45 - 09/02/22 08:15 [1]
Total Recoverable	Analysis	6020A		1	674538	FXG	EET CHI	09/13/22 19:04
Total/NA	Prep	7470A			673830	MJG	EET CHI	09/09/22 09:20 - 09/09/22 11:20 [1]
Total/NA	Analysis	7470A		1	674169	MJG	EET CHI	09/12/22 08:45
Total/NA	Analysis	SM 2540C		1	673533	SMO	EET CHI	09/07/22 18:48
Total/NA	Analysis	SM 4500 Cl- E		10	673960	LP	EET CHI	09/09/22 17:30
Total/NA	Analysis	SM 4500 F C		1	674042	EAT	EET CHI	09/10/22 14:25
Total/NA	Analysis	SM 4500 SO4 E		50	673965	LP	EET CHI	09/09/22 19:09

[1] Completion dates and times are reported or not reported per method requirements or individual lab discretion.

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Accreditation/Certification Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-221556-1

Laboratory: Eurofins Chicago

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Illinois	NELAP	IL00035	04-30-23

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Tel: (708)534-5200

Laboratory Job ID: 500-221556-2
Client Project/Site: Powerton CCR (RAD)

For:
KPRG and Associates, Inc.
14665 West Lisbon Road,
Suite 1A
Brookfield, Wisconsin 53005

Attn: Richard Gnat

Diana Mockler

Authorized for release by:
10/5/2022 11:10:32 AM

Diana Mockler, Project Manager I
(219)252-7570
Diana.Mockler@et.eurofinsus.com

LINKS

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Have a Question? Ask The Expert

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-221556-2

Job ID: 500-221556-2

Laboratory: Eurofins Chicago

Narrative

Job Narrative
500-221556-2

Comments
No additional comments.

Receipt
The samples were received on 8/31/2022 9:30 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 4 coolers at receipt time were 0.3º C, 0.9º C, 4.0º C and 5.9º C.

RAD
Methods 903.0, 9315: Radium-226 batch 581008
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
MW-01 (500-221556-1), MW-08 (500-221556-2), MW-18 (500-221556-3), MW-19 (500-221556-4), Duplicate (500-221556-5), MW-09 (500-221556-6), MW-11 (500-221556-7), MW-12 (500-221556-8), MW-15 (500-221556-9), MW-17 (500-221556-10), (LCS 160-581008/2-A), (MB 160-581008/1-A) and (500-221556-E-1-A DU)

Methods 904.0, 9320: Radium-228 batch 582886
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
MW-01 (500-221556-1), MW-08 (500-221556-2), MW-18 (500-221556-3), MW-19 (500-221556-4), Duplicate (500-221556-5), MW-09 (500-221556-6), MW-11 (500-221556-7), MW-12 (500-221556-8), MW-15 (500-221556-9), MW-17 (500-221556-10), (LCS 160-582886/2-A), (MB 160-582886/1-A) and (500-221556-E-2-A DU)

Method PrecSep_0:

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Method Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-221556-2

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	EET SL
904.0	Radium-228 (GFPC)	EPA	EET SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	EET SL
PrecSep_0	Preparation, Precipitate Separation	None	EET SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	EET SL

Protocol References:

EPA = US Environmental Protection Agency

None = None

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-221556-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-221556-1	MW-01	Water	08/30/22 09:32	08/31/22 09:30
500-221556-2	MW-08	Water	08/30/22 14:13	08/31/22 09:30
500-221556-3	MW-18	Water	08/30/22 15:20	08/31/22 09:30
500-221556-4	MW-19	Water	08/30/22 15:56	08/31/22 09:30
500-221556-5	Duplicate	Water	08/30/22 00:00	08/31/22 09:30
500-221556-6	MW-09	Water	08/31/22 09:03	09/01/22 09:30
500-221556-7	MW-11	Water	08/31/22 10:14	09/01/22 09:30
500-221556-8	MW-12	Water	08/31/22 11:25	09/01/22 09:30
500-221556-9	MW-15	Water	08/31/22 12:31	09/01/22 09:30
500-221556-10	MW-17	Water	08/31/22 14:04	09/01/22 09:30

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-221556-2

Client Sample ID: MW-01

Date Collected: 08/30/22 09:32
Date Received: 08/31/22 09:30

Lab Sample ID: 500-221556-1

Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0340	U	0.0579	0.0580	1.00	0.102	pCi/L	09/06/22 15:03	09/28/22 14:43	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.6*		*40 - 110*	*09/06/22 15:03*	*09/28/22 14:43*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.594**		0.346	0.350	1.00	0.498	pCi/L	09/20/22 15:24	09/30/22 12:04	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.9*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:04*	*1*
Y Carrier	*84.9*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:04*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.628**		0.351	0.355	5.00	0.498	pCi/L		10/03/22 13:21	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-221556-2

Client Sample ID: MW-08

Date Collected: 08/30/22 14:13
Date Received: 08/31/22 09:30

Lab Sample ID: 500-221556-2

Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.150		0.0788	0.0800	1.00	0.0930	pCi/L	09/06/22 15:03	09/28/22 14:44	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*93.1*		*40 - 110*	*09/06/22 15:03*	*09/28/22 14:44*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.709		0.363	0.369	1.00	0.505	pCi/L	09/20/22 15:24	09/30/22 12:04	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*88.9*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:04*	*1*
Y Carrier	*85.6*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:04*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.859		0.371	0.378	5.00	0.505	pCi/L		10/03/22 13:21	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-221556-2

Client Sample ID: MW-18

Date Collected: 08/30/22 15:20
Date Received: 08/31/22 09:30

Lab Sample ID: 500-221556-3

Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.173**		0.0865	0.0879	1.00	0.0959	pCi/L	09/06/22 15:03	09/28/22 14:44	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*84.2*		*40 - 110*	*09/06/22 15:03*	*09/28/22 14:44*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.472	U	0.329	0.332	1.00	0.491	pCi/L	09/20/22 15:24	09/30/22 12:04	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*85.5*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:04*	*1*
Y Carrier	*85.6*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:04*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.645**		0.340	0.343	5.00	0.491	pCi/L		10/03/22 13:21	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-221556-2

Client Sample ID: MW-19

Date Collected: 08/30/22 15:56
Date Received: 08/31/22 09:30

Lab Sample ID: 500-221556-4

Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.253**		0.101	0.104	1.00	0.109	pCi/L	09/06/22 15:03	09/28/22 14:44	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95.3*		*40 - 110*	*09/06/22 15:03*	*09/28/22 14:44*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.187	U	0.259	0.260	1.00	0.436	pCi/L	09/20/22 15:24	09/30/22 12:04	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*89.2*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:04*	*1*
Y Carrier	*87.5*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:04*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.440**		0.278	0.280	5.00	0.436	pCi/L		10/03/22 13:21	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-221556-2

Client Sample ID: Duplicate

Date Collected: 08/30/22 00:00
Date Received: 08/31/22 09:30

Lab Sample ID: 500-221556-5

Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0526	U	0.0583	0.0585	1.00	0.0932	pCi/L	09/06/22 15:03	09/28/22 14:44	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.0*		*40 - 110*	*09/06/22 15:03*	*09/28/22 14:44*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.678**		0.339	0.345	1.00	0.465	pCi/L	09/20/22 15:24	09/30/22 12:08	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.6*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:08*	*1*
Y Carrier	*87.5*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:08*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.731**		0.344	0.350	5.00	0.465	pCi/L		10/03/22 13:21	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-221556-2

Client Sample ID: MW-09

Date Collected: 08/31/22 09:03
Date Received: 09/01/22 09:30

Lab Sample ID: 500-221556-6

Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.00325	U	0.0452	0.0452	1.00	0.101	pCi/L	09/06/22 15:03	09/28/22 14:44	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*83.7*		*40 - 110*	*09/06/22 15:03*	*09/28/22 14:44*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.139	U	0.263	0.263	1.00	0.458	pCi/L	09/20/22 15:24	09/30/22 12:08	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.6*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:08*	*1*
Y Carrier	*86.7*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:08*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.136	U	0.267	0.267	5.00	0.458	pCi/L		10/03/22 13:21	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-221556-2

Client Sample ID: MW-11

Date Collected: 08/31/22 10:14
Date Received: 09/01/22 09:30

Lab Sample ID: 500-221556-7

Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.286		0.103	0.106	1.00	0.101	pCi/L	09/06/22 15:03	09/28/22 17:04	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*93.8*		*40 - 110*	*09/06/22 15:03*	*09/28/22 17:04*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.751		0.371	0.378	1.00	0.511	pCi/L	09/20/22 15:24	09/30/22 12:08	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.9*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:08*	*1*
Y Carrier	*86.4*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:08*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.04		0.385	0.393	5.00	0.511	pCi/L		10/03/22 13:21	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-221556-2

Client Sample ID: MW-12

Date Collected: 08/31/22 11:25
Date Received: 09/01/22 09:30

Lab Sample ID: 500-221556-8

Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.386**		0.117	0.122	1.00	0.102	pCi/L	09/06/22 15:03	09/28/22 17:04	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.3*		*40 - 110*	*09/06/22 15:03*	*09/28/22 17:04*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.232	U	0.337	0.338	1.00	0.569	pCi/L	09/20/22 15:24	09/30/22 12:09	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*86.5*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:09*	*1*
Y Carrier	*86.4*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:09*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.618**		0.357	0.359	5.00	0.569	pCi/L		10/03/22 13:21	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-221556-2

Client Sample ID: MW-15

Date Collected: 08/31/22 12:31
Date Received: 09/01/22 09:30

Lab Sample ID: 500-221556-9

Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0868	U	0.0682	0.0686	1.00	0.0982	pCi/L	09/06/22 15:03	09/28/22 17:04	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95.3*		*40 - 110*	*09/06/22 15:03*	*09/28/22 17:04*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.284	U	0.334	0.335	1.00	0.550	pCi/L	09/20/22 15:24	09/30/22 12:09	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*88.9*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:09*	*1*
Y Carrier	*86.7*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:09*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.371	U	0.341	0.342	5.00	0.550	pCi/L		10/03/22 13:21	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-221556-2

Client Sample ID: MW-17

Date Collected: 08/31/22 14:04
Date Received: 09/01/22 09:30

Lab Sample ID: 500-221556-10

Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0193	U	0.0492	0.0492	1.00	0.0925	pCi/L	09/06/22 15:03	09/28/22 17:05	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.6*		*40 - 110*	*09/06/22 15:03*	*09/28/22 17:05*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.172	U	0.309	0.309	1.00	0.533	pCi/L	09/20/22 15:24	09/30/22 12:09	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*82.1*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:09*	*1*
Y Carrier	*87.9*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:09*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.191	U	0.313	0.313	5.00	0.533	pCi/L		10/03/22 13:21	1

Definitions/Glossary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR ¤RADL

Job ID: 500-221556-2

Qualifiers

Rad

Qualifier	Qualifier Description
u	Reshlt is less t" an t" e samgle detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
p	yisted hnder t" e %D%colhmn to desivnate t" at t" e reshlt is regorted on a drF weiv" t basis
q R	Percent RecoUerF
CNy	Contains Nree yiEhid
CNu	ColonF Norminv u nit
C(N	Contains (o Nree yiEhid
Dz R	Dhglicate z rror Ratio ¤normalif ed absolhte di))erenceL
Dil Nac	Dilhtion Nactor
Dy	Detection yimit ¤DoD/DOz L
Dy, RA, Rz , I(	Indicates a Dilhtion, Re-analFsis, Re-extraction, or additional Initial metals/anion analFsis o) t" e samgle
DyC	Decision yeUel Concentration ¤Radioc" emistrFL
z Dy	z stimated Detection yimit ¤DioxinL
yOD	yimit o) Detection ¤DoD/DOz L
yOQ	yimit o) Qhantitation ¤DoD/DOz L
MCy	z PA recommended %Maximhm Contaminant yeUel%
MDA	Minimhm Detectable ActiUtF ¤Radioc" emistrFL
MDC	Minimhm Detectable Concentration ¤Radioc" emistrFL
MDy	Met" od Detection yimit
My	Minimhm yeUel ¤DioxinL
MP(	Most Probable (hmber
MQy	Met" od Qhantitation yimit
(C	(ot Calchlated
(D	(ot Detected at t" e regortinv limit ¤or MDy or z Dy i) s" ownL
(z G	(evatiUe / Absent
POS	PositiUe / Present
PQy	Practical Qhantitation yimit
PRz S	PreshmgtiUe
QC	QhalitF Control
Rz R	RelatiUe z rror Ratio ¤Radioc" emistrFL
Ry	Regortinv yimit or ReEhested yimit ¤Radioc" emistrFL
RPD	RelatiUe Percent Di))erence, a meashre o) t" e relatiUe di))erence between two goints
Tz N	ToxicitF z EhiUalent Nactor ¤DioxinL
Tz Q	ToxicitF z EhiUalent Qhotient ¤DioxinL
T(TC	Too (hmerohs To Cohnt

z hro)ins C" icavo

QC Association Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-221556-2

Rad

Prep Batch: 581008

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221556-1	MW-01	Total/NA	Water	PrecSep-21	
500-221556-2	MW-08	Total/NA	Water	PrecSep-21	
500-221556-3	MW-18	Total/NA	Water	PrecSep-21	
500-221556-4	MW-19	Total/NA	Water	PrecSep-21	
500-221556-5	Duplicate	Total/NA	Water	PrecSep-21	
500-221556-6	MW-09	Total/NA	Water	PrecSep-21	
500-221556-7	MW-11	Total/NA	Water	PrecSep-21	
500-221556-8	MW-12	Total/NA	Water	PrecSep-21	
500-221556-9	MW-15	Total/NA	Water	PrecSep-21	
500-221556-10	MW-17	Total/NA	Water	PrecSep-21	
MB 160-581008/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-581008/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
500-221556-1 DU	MW-01	Total/NA	Water	PrecSep-21	

Prep Batch: 582886

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221556-1	MW-01	Total/NA	Water	PrecSep_0	
500-221556-2	MW-08	Total/NA	Water	PrecSep_0	
500-221556-3	MW-18	Total/NA	Water	PrecSep_0	
500-221556-4	MW-19	Total/NA	Water	PrecSep_0	
500-221556-5	Duplicate	Total/NA	Water	PrecSep_0	
500-221556-6	MW-09	Total/NA	Water	PrecSep_0	
500-221556-7	MW-11	Total/NA	Water	PrecSep_0	
500-221556-8	MW-12	Total/NA	Water	PrecSep_0	
500-221556-9	MW-15	Total/NA	Water	PrecSep_0	
500-221556-10	MW-17	Total/NA	Water	PrecSep_0	
MB 160-582886/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-582886/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
500-221556-2 DU	MW-08	Total/NA	Water	PrecSep_0	

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-221556-2

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-581008/1-A
Matrix: Water
Analysis Batch: 583796

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 581008

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.02655	U	0.0369	0.0370	1.00	0.0964	pCi/L	09/06/22 15:03	09/28/22 14:43	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*99.0*		*40 - 110*	*09/06/22 15:03*	*09/28/22 14:43*	*1*

Lab Sample ID: LCS 160-581008/2-A
Matrix: Water
Analysis Batch: 583796

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 581008

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			11.3	9.855		1.03	1.00	0.0904	pCi/L	87	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*98.0*		*40 - 110*

Lab Sample ID: 500-221556-1 DU
Matrix: Water
Analysis Batch: 583796

Client Sample ID: MW-01
Prep Type: Total/NA
Prep Batch: 581008

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Radium-226	0.0340	U		0.06580	U	0.0615	1.00	0.0913	pCi/L			0.27	1

Carrier	*DU %Yield*	*DU Qualifier*	*Limits*
Ba Carrier	*88.9*		*40 - 110*

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-582886/1-A
Matrix: Water
Analysis Batch: 584234

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 582886

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.4739	U	0.321	0.324	1.00	0.476	pCi/L	09/20/22 15:24	09/30/22 12:03	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*88.0*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:03*	*1*
Y Carrier	*86.4*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:03*	*1*

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-221556-2

Method: 904.0 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-582886/2-A
Matrix: Water
Analysis Batch: 584234

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 582886

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			8.24	9.668		1.32	1.00	0.545	pCi/L	117	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*83.0*		*40 - 110*
Y Carrier	*86.4*		*40 - 110*

Lab Sample ID: 500-221556-2 DU
Matrix: Water
Analysis Batch: 584234

Client Sample ID: MW-08
Prep Type: Total/NA
Prep Batch: 582886

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Radium-228	0.709			0.7090		0.335	1.00	0.440	pCi/L			0	1

Carrier	*DU %Yield*	*DU Qualifier*	*Limits*
Ba Carrier	*98.0*		*40 - 110*
Y Carrier	*85.6*		*40 - 110*

Eurofins Chicago
241 Bond Street
University Park IL 60484
Phone 708-534 5200 Fax 708-534 5211

Chain of Custody Record

MKE 232

eurofins

Client Information	Sampler: Kaelyn Sperle	Lab PM: Mockler Diana J	Carrier Tracking No(s):	COC No: 500-104267-43259
Client Contact: Mitchell Dolan	Phone: 262-278-1621	E-Mail: Diana Mockler@et eurofinsus com	State of Origin: IL	Page: Page 1 of 1
Company: KPRG and Associates Inc	PWSID:			Job #: 500-221556
Address: 14665 West Lisbon Road Suite 1A	Due Date Requested: Standard			
City: Brookfield	TAT Requested (days): standard			
State Zip: WI 53005	Compliance Project: Δ Yes Δ No			
Phone: 262 781-0475(Tel)	PO #: 4502081030			
Email: mitcheld@kprginc com	WO #:			
Project Name: Powerton CCR Event Desc Quarterly Powerton CCR Sampling	Project #: 50011612			
Site: Illinois	SSOW#:			

500-221556 COC

Analysis Requested

Preservation Codes: A HCL; B NaOH; C Zn Acetate; D Nitric Acid; E NaHSO4; F MeOH; G Amchlor; H Ascorbic Acid; I Ice; J DI Water; K EDTA; L EDA; M Hexane; N None; O AsNaO2; Na2O4S; Q Na2SO3; R Na2S2O3; S H2SO4; T TSP Dodecahydrate; Acetone; V MCAA; W pH 4.5; Y Trizma; Z other (specify); Other:

	Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, 904.0	6020A 7470A	2540C 4500_F_C, SM4500_Cl_E, SM4500_SO4_E	SM4500 SO4_E Sulfate	Total Number of containers	Special Instructions/Note
				Preservation Code:		X	X	D	D	N	N	X	
1	MW-01	8/30/22	0932	G	Water	N	N	X	X	X	X		
2	MW 08	8/30/22	1413	G	Water	N	N	X	X	X	X		
	~~MW-09~~				Water								
	~~MW-11~~				Water								
	~~MW-12~~				Water								
	~~MW-15~~				Water								
3	~~MW-17~~ MW-18	8/30/22	1520	G	Water	N	N	X	X	X	X		
4	MW 19	8/30/22	1556	G	Water	N	N	X	X	X	X		
	~~MW-18~~				Water								
5	Duplicate	8/30/22	–	G	Water	N	N	X	X	X	X		
					Water								

Possible Hazard Identification: [X] Non-Hazard [ ] Flammable [ ] Skin Irritant [ ] Poison B [ ] Unknown [ ] Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): [ ] Return To Client [X] Disposal By Lab [ ] Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Kaelyn Sperle	8/30/22/1645	KPRG	FedEx	8/30/22/1645	FedEx
			[signature]	8/31/22 0930	[signature]

Custody Seals Intact: Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks
		1.8 - 70.3, 5.3 - 74.0

Eurofins Chicago
2417 Bond Street
University Park IL 60484
Phone 708-534-5200 Fax 708-534-5211

Chain of Custody Record

MKE 232

eurofins Environment Testing America

Client Information	Sampler: Kaelyn Sperle	Lab PM: Mockler Diana J	Carrier Tracking No(s):	COC No: 500-104267-43259 1
Client Contact: Mitchel Dolan	Phone: 262-278-1621	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: IL	Page: Page 1 of 1
Company: KPRG and Associates Inc.	PWS ID:	Analysis Requested		Job #: 500-221556
Address: 14665 West Lisbon Road Suite 1A	Due Date Requested: Standard			Preservation Codes: A - HCL; B - NaOH; C - Zn Acetate; D - Nitric Acid; E - NaHSO4; F - MeOH; G - Amchlor; H - Ascorbic Acid; I - Ice; J - DI Water; K - EDTA; L - EDA; M - Hexane; N - None; O - AsNaO2; P - Na2O4S; Q - Na2SO3; R - Na2S2O3; S - H2SO4; T - TSP Dodecahydrate; U - Acetone; V - MCAA; W - pH 4-5; Y - Trizma; Z - other (specify); Other:
City: Brookfield	TAT Requested (days): Standard			
State, Zip: WI 53005	Compliance Project: Δ Yes Δ No			
Phone: 262-781-0475(Tel)	PO #: 4502081030			
Email: mitcheld@kprginc.com	WO #:			
Project Name: Powerton CCR Event Desc Quarterly Powerton CCR Sampling	Project #: 50011612			
Site: Illinois	SSOW#:			

	Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, 904.0	6020A, 7470A	2540C, 4500_F_C, SM4500_Cl_E, SM4500_SO4_E	SM4500_SO4_E - Sulfate										Total Number of containers	Special Instructions/Note:
	~~MW-08~~				Water																	
	~~MW-08~~				Water																	
6	MW-09	8/31/22	0903	G	Water	N	N	X	X	X	X											
7	MW-11	8/31/22	1014	G	Water	N	N	X	X	X	X											
8	MW-12	8/31/22	1125	G	Water	N	N	X	X	X	X											
9	MW-15	8/31/22	1231	G	Water	N	N	X	X	X	X											
10	MW-17	8/31/22	1404	G	Water	N	N	X	X	X	X											
	~~MW-19~~				Water																	
	~~MW-19~~				Water																	
					Water																	
					Water																	

500-221556 COC

Preservation Code:

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Kaelyn Sperle	8/31/22/1745	KPRG	FedEx	8/31/22/1745	FedEx
Relinquished by	Date/Time	Company	Received by	Date/Time	Company
			Stephanie Hernandez	9/1/22 0930	EETA
Relinquished by	Date/Time	Company	Received by	Date/Time	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No

Cooler Temperature(s) °C and Other Remarks: 6.1 → 5.9, 2.2-TD9

500-221556 Waybi

ORIGIN ID:PIAA (262) 278-1621
KAELYN SPERLE
KPRG AND ASSOCIATES
414 PLAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 30AUG22
ACTWGT: 50.85 LB
CAD: 6994780/SSFE2322
DIMS: 24x13x13 IN

BILL THIRD PARTY

TO EUROFINS

2417 BOND ST.

UNIVERSITY PARK IL 60484

(555) 555-5555
INV:
PO:
REF:
DEPT:

Part # 156297-435 RRDB2 EXP 04/23

FedEx Express

REL# 3785346

5 of 6
MPS# 0263 2774 0693 6126
Mstr# 2774 0693 6089

XN JOTA

0201

WED - 31 AUG 10:30A
PRIORITY OVERNIGHT
AHS
60484
IL-US ORD

ORIGIN ID:PIAA (262) 278-1621
KAELYN SPERLE
KPRG AND ASSOCIATES
414 PLAZA DR STE 106

SHIP DATE: 30AUG22
ACTWGT: 50.85 LB
CAD: 6994780/SSFE2322
DIMS: 24x13x13 IN

BILL THIRD PARTY

ROFINS

417 BOND ST.

UNIVERSITY PARK IL 60484

(555) 555-5555
INV:
PO:
REF:
DEPT:

Part # 156297-435 RRDB2 EXP 04/23

FedEx Express

REL# 3785346

6 of 6
MPS# 0263 2774 0693 6137
Mstr# 2774 0693 6089

XN JOTA

0201

WED - 31 AUG 10:30A
PRIORITY OVERNIGHT
AHS
60484
IL-US ORD



-162
SHIP DATE: 31AUG22
ACTWGT: 48.00 LB
CAD: 6994780/SSFE2322
DIMS: 24x13x13 IN
BILL THIRD PARTY
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AGO
PARK IL 60484
REF:
DEPT:
FedEx Express
REL# 3765346
1 of 5
2774 5684 7044
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XN JOTA
THU - 01 SEP 10:30A
PRIORITY OVERNIGHT
AHS
60484
IL-US ORD
Part # 156297-435 RRDB2 EXP 04/23



ORIGIN ID:PIAA (262) 278-1621
KAELYN SPERLE
KPRG AND ASSOCIATES
414 PLAZA DR STE 106
WESTMONT, IL 60559
UNITED STATES US
SHIP DATE: 31AUG22
ACTWGT: 48.00 LB
CAD: 6994780/SSFE232
DIMS: 24x13x13 IN
BILL THIRD PARTY
500-221556 Waybi
TO EUROFINS CHICAGO
EUROFINS CHICAGO
2417 BOND ST
UNIVERSITY PARK IL 60484
(708) 534-5200
INV:
PO:
REF:
DEPT:
FedEx Express
REL# 3765346
3 of 5
MPS# 0283 2774 5684 7066
Mstr# 2774 5684 7044
0201
XN JOTA
THU - 01 SEP 10:30A
PRIORITY OVERNIGHT
AHS
60484
IL-US ORD
Part # 156297-435 RRDB2 EXP 04/23

R000554

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone: 708-534-5200 Fax: 708-534-5211

Chain of Custody Record

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	COC No: 500-164793.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: Illinois	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Illinois		Job #: 500-221556-2
Address: 13715 Rider Trail North, ,	Due Date Requested: 9/21/2022			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Powerton CCR (RAD)	Project #: 50011612			
Site: MWG - Powerton	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_21 Standard Target List	904.0/PrecSep_0 Standard Target List	Ra226Ra228_GFPC	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
MW-01 (500-221556-1)	8/30/22	09:32 Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
MW-08 (500-221556-2)	8/30/22	14:13 Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
MW-18 (500-221556-3)	8/30/22	15:20 Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
MW-19 (500-221556-4)	8/30/22	15:56 Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
Duplicate (500-221556-5)	8/30/22	Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no

Note: Since laboratory accreditations are subject to change, Eurofins Chicago places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Chicago laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Chicago attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Chicago.

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by: FED EX	Date/Time: 8/31/22 1415	Company: FEDEX	Received by: FED EX
Relinquished by:	Date/Time:	Company	Received by: Date/Time: SEP 01 2022 0825 Company: TAL STL
Relinquished by:	Date/Time:	Company	Received by: Autumn R. Johnson Date/Time: Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks.

R000555

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone: 708-534-5200 Fax: 708-534-5211

Chain of Custody Record

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	COC No: 500-164823.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: Illinois	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Illinois		Job #: 500-221556-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 9/21/2022			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Powerton CCR	Project #: 50011612			
Site: MWG - Powerton	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Ra226Ra228_GFPC	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
MW-09 (500-221556-6)	8/31/22	09:03 Central		Water			X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;
MW-11 (500-221556-7)	8/31/22	10:14 Central		Water			X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;
MW-12 (500-221556-8)	8/31/22	11:25 Central		Water			X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;
MW-15 (500-221556-9)	8/31/22	12:31 Central		Water			X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;
MW-17 (500-221556-10)	8/31/22	14:04 Central		Water			X	3	Batch QC must be performed (dup, spikes, etc) - no NCMs concerning limited volume;

Note: Since laboratory accreditations are subject to change, Eurofins Chicago places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Chicago laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Chicago attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Chicago.

Possible Hazard Identification: Unconfirmed	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	Paula Buckley	9/1/22 1600	EDA	FED EX		
2	FED EX				SEP 0 2 2022 0920	FedEx
3				Autumn R. Johnson		

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

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10/5/2022

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-221556-2

Login Number: 221556
List Number: 1
Creator: Scott, Sherri L

List Source: Eurofins Chicago

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.3,4.0,5.9,0.9
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-221556-2

Login Number: 221556
List Number: 2
Creator: Booker, Autumn R

List Source: Eurofins St. Louis
List Creation: 09/01/22 10:59 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-221556-2

Login Number: 221556
List Number: 3
Creator: Booker, Autumn R

List Source: Eurofins St. Louis
List Creation: 09/02/22 11:54 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-221556-2

Client Sample ID: MW-01
Date Collected: 08/30/22 09:32
Date Received: 08/31/22 09:30

Lab Sample ID: 500-221556-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			581008	TJ	EET SL	09/06/22 15:03
Total/NA	Analysis	903.0		1	583796	CLP	EET SL	09/28/22 14:43
Total/NA	Prep	PrecSep_0			582886	MLK	EET SL	09/20/22 15:24
Total/NA	Analysis	904.0		1	584234	FLC	EET SL	09/30/22 12:04
Total/NA	Analysis	Ra226_Ra228		1	584450	CAH	EET SL	10/03/22 13:21

Client Sample ID: MW-08
Date Collected: 08/30/22 14:13
Date Received: 08/31/22 09:30

Lab Sample ID: 500-221556-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			581008	TJ	EET SL	09/06/22 15:03
Total/NA	Analysis	903.0		1	583796	CLP	EET SL	09/28/22 14:44
Total/NA	Prep	PrecSep_0			582886	MLK	EET SL	09/20/22 15:24
Total/NA	Analysis	904.0		1	584234	FLC	EET SL	09/30/22 12:04
Total/NA	Analysis	Ra226_Ra228		1	584450	CAH	EET SL	10/03/22 13:21

Client Sample ID: MW-18
Date Collected: 08/30/22 15:20
Date Received: 08/31/22 09:30

Lab Sample ID: 500-221556-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			581008	TJ	EET SL	09/06/22 15:03
Total/NA	Analysis	903.0		1	583796	CLP	EET SL	09/28/22 14:44
Total/NA	Prep	PrecSep_0			582886	MLK	EET SL	09/20/22 15:24
Total/NA	Analysis	904.0		1	584234	FLC	EET SL	09/30/22 12:04
Total/NA	Analysis	Ra226_Ra228		1	584450	CAH	EET SL	10/03/22 13:21

Client Sample ID: MW-19
Date Collected: 08/30/22 15:56
Date Received: 08/31/22 09:30

Lab Sample ID: 500-221556-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			581008	TJ	EET SL	09/06/22 15:03
Total/NA	Analysis	903.0		1	583796	CLP	EET SL	09/28/22 14:44
Total/NA	Prep	PrecSep_0			582886	MLK	EET SL	09/20/22 15:24
Total/NA	Analysis	904.0		1	584234	FLC	EET SL	09/30/22 12:04
Total/NA	Analysis	Ra226_Ra228		1	584450	CAH	EET SL	10/03/22 13:21

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-221556-2

Client Sample ID: Duplicate
Date Collected: 08/30/22 00:00
Date Received: 08/31/22 09:30

Lab Sample ID: 500-221556-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			581008	TJ	EET SL	09/06/22 15:03
Total/NA	Analysis	903.0		1	583796	CLP	EET SL	09/28/22 14:44
Total/NA	Prep	PrecSep_0			582886	MLK	EET SL	09/20/22 15:24
Total/NA	Analysis	904.0		1	584224	FLC	EET SL	09/30/22 12:08
Total/NA	Analysis	Ra226_Ra228		1	584450	CAH	EET SL	10/03/22 13:21

Client Sample ID: MW-09
Date Collected: 08/31/22 09:03
Date Received: 09/01/22 09:30

Lab Sample ID: 500-221556-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			581008	TJ	EET SL	09/06/22 15:03
Total/NA	Analysis	903.0		1	583796	CLP	EET SL	09/28/22 14:44
Total/NA	Prep	PrecSep_0			582886	MLK	EET SL	09/20/22 15:24
Total/NA	Analysis	904.0		1	584224	FLC	EET SL	09/30/22 12:08
Total/NA	Analysis	Ra226_Ra228		1	584450	CAH	EET SL	10/03/22 13:21

Client Sample ID: MW-11
Date Collected: 08/31/22 10:14
Date Received: 09/01/22 09:30

Lab Sample ID: 500-221556-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			581008	TJ	EET SL	09/06/22 15:03
Total/NA	Analysis	903.0		1	583796	CLP	EET SL	09/28/22 17:04
Total/NA	Prep	PrecSep_0			582886	MLK	EET SL	09/20/22 15:24
Total/NA	Analysis	904.0		1	584224	FLC	EET SL	09/30/22 12:08
Total/NA	Analysis	Ra226_Ra228		1	584450	CAH	EET SL	10/03/22 13:21

Client Sample ID: MW-12
Date Collected: 08/31/22 11:25
Date Received: 09/01/22 09:30

Lab Sample ID: 500-221556-8
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			581008	TJ	EET SL	09/06/22 15:03
Total/NA	Analysis	903.0		1	583796	CLP	EET SL	09/28/22 17:04
Total/NA	Prep	PrecSep_0			582886	MLK	EET SL	09/20/22 15:24
Total/NA	Analysis	904.0		1	584224	FLC	EET SL	09/30/22 12:09
Total/NA	Analysis	Ra226_Ra228		1	584450	CAH	EET SL	10/03/22 13:21

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-221556-2

Client Sample ID: MW-15

Lab Sample ID: 500-221556-9

Date Collected: 08/31/22 12:31

Matrix: Water

Date Received: 09/01/22 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			581008	TJ	EET SL	09/06/22 15:03
Total/NA	Analysis	903.0		1	583796	CLP	EET SL	09/28/22 17:04
Total/NA	Prep	PrecSep_0			582886	MLK	EET SL	09/20/22 15:24
Total/NA	Analysis	904.0		1	584224	FLC	EET SL	09/30/22 12:09
Total/NA	Analysis	Ra226_Ra228		1	584450	CAH	EET SL	10/03/22 13:21

Client Sample ID: MW-17

Lab Sample ID: 500-221556-10

Date Collected: 08/31/22 14:04

Matrix: Water

Date Received: 09/01/22 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			581008	TJ	EET SL	09/06/22 15:03
Total/NA	Analysis	903.0		1	583796	CLP	EET SL	09/28/22 17:05
Total/NA	Prep	PrecSep_0			582886	MLK	EET SL	09/20/22 15:24
Total/NA	Analysis	904.0		1	584224	FLC	EET SL	09/30/22 12:09
Total/NA	Analysis	Ra226_Ra228		1	584450	CAH	EET SL	10/03/22 13:21

Laboratory References:

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-221556-2

Laboratory: Eurofins St. Louis

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Illinois	NELAP	200023	11-30-22

Tracer/Carrier Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-221556-2

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water **Prep Type: Total/NA**

Lab Sample ID	Client Sample ID	Percent Yield (Acceptance Limits) Ba (40-110)
500-221556-1	MW-01	92.6
500-221556-1 DU	MW-01	88.9
500-221556-2	MW-08	93.1
500-221556-3	MW-18	84.2
500-221556-4	MW-19	95.3
500-221556-5	Duplicate	97.0
500-221556-6	MW-09	83.7
500-221556-7	MW-11	93.8
500-221556-8	MW-12	92.3
500-221556-9	MW-15	95.3
500-221556-10	MW-17	94.6
LCS 160-581008/2-A	Lab Control Sample	98.0
MB 160-581008/1-A	Method Blank	99.0

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water **Prep Type: Total/NA**

Lab Sample ID	Client Sample ID	Percent Yield (Acceptance Limits) Ba (40-110)	Y (40-110)
500-221556-1	MW-01	91.9	84.9
500-221556-2	MW-08	88.9	85.6
500-221556-2 DU	MW-08	98.0	85.6
500-221556-3	MW-18	85.5	85.6
500-221556-4	MW-19	89.2	87.5
500-221556-5	Duplicate	94.6	87.5
500-221556-6	MW-09	91.6	86.7
500-221556-7	MW-11	90.9	86.4
500-221556-8	MW-12	86.5	86.4
500-221556-9	MW-15	88.9	86.7
500-221556-10	MW-17	82.1	87.9
LCS 160-582886/2-A	Lab Control Sample	83.0	86.4
MB 160-582886/1-A	Method Blank	88.0	86.4

Tracer/Carrier Legend

Ba = Ba Carrier
Y = Y Carrier

PROJECT NAME	NRG – POWERTON STATION (12313.1)		DATE	8/30/21
Sample Name	MW-01	Start Time	0920	
Condition of Well	good			
Water Level	27.61	Total Depth	—	
Well Diameter	PVC – 2 inch	Volume in Well	—	
Method of Purge	Low-Flow	Purge Characteristics	clear	
Volume Removed	4 gals	WL at Sample Time	27.62	
Method of Sample	Low-Flow	Sample Characteristics	clear	
Sample Analysis	CCA, FAB CCR, ABBASB CCR	Sample Time	0932	
Water Quality Meter	YSI ProDss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
0922	27.61	7.15	19.1	.784	8.25	157.3	4.16
0925	—	7.10	18.9	.885	7.10	161.8	4.61
0928	—	7.11	18.9	.893	3.27	162.6	5.13
0931	27.62	7.10	18.8	.885	3.08	163.0	4.73

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates K.L.S

PROJECT NAME	NRG – POWERTON STATION (12313.1)		DATE	8/30/22
Sample Name	MW-08	Start Time	1402	
Condition of Well	good			
Water Level	25.69	Total Depth	–	
Well Diameter	PVC – 2 inch	Volume in Well	–	
Method of Purge	Low-Flow	Purge Characteristics	clear	
Volume Removed	4.5 gals	WL at Sample Time	25.69	
Method of Sample	Low-Flow	Sample Characteristics	Clear	
Sample Analysis	CCA, ABB/ASB CCR	Sample Time	1413	
Water Quality Meter	YSI ProDss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1403	25.69	7.22	16.8	1.424	7.18	161.5	6.05
1406	–	7.31	15.6	1.572	1.63	-53.4	9.81
1409	–	7.36	15.2	1.567	0.97	-121.8	10.19
1412	25.69	7.37	15.1	1.561	0.69	-150.6	9.75

SAMPLING NOTES:

ABB/ASB CCR Duplicate

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION (12313.1)		DATE	8/31/22
Sample Name	MW-09	Start Time	0850	
Condition of Well	good			
Water Level	26.64	Total Depth	–	
Well Diameter	PVC – 2 inch	Volume in Well	–	
Method of Purge	Low-Flow	Purge Characteristics	clear	
Volume Removed	3 gals	W L at Sample Time	26.64	
Method of Sample	Low-Flow	Sample Characteristics	clear	
Sample Analysis	CCA, ABB/ASB CCR	Sample Time	0903	
Water Quality Meter	YSI ProDss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
0853	26.64	7.63	14.1	.880	5.26	103.8	4.34
0856	–	7.34	15.2	.887	1.75	101.3	5.61
0859	–	7.22	13.9	.885	1.04	111.2	5.54
0902	26.64	7.18	13.8	.888	0.78	113.2	4.95

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION (12313.1)		DATE	8/31/12
Sample Name	MW-11	Start Time	1002	
Condition of Well	good			
Water Level	32.02	Total Depth	–	
Well Diameter	PVC – 2 inch	Volume in Well	–	
Method of Purge	Low-Flow	Purge Characteristics	cloudy, brown	
Volume Removed	4.5 gals	WL at Sample Time	32.02	
Method of Sample	Low-Flow	Sample Characteristics	clear	
Sample Analysis	CCA, ABB/ASB CCR	Sample Time	1014	
Water Quality Meter	YSI ProDss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1004	32.02	7.24	18.6	1.136	7.15	117.2	67.15
1007	–	6.94	17.1	1.490	1.90	35.3	150.72
1010	–	6.96	16.8	1.449	1.00	-38.1	371.75
1013	32.02	6.97	16.9	1.414	0.70	-71.9	66.80

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION (12313.1)		DATE	8/31/22
Sample Name	MW-12	Start Time	1113	
Condition of Well	good			
Water Level	23.85	Total Depth	–	
Well Diameter	PVC – 2 inch	Volume in Well	–	
Method of Purge	Low-Flow	Purge Characteristics	cloudy, orange	
Volume Removed	4.5 gts	WL at Sample Time	23.85	
Method of Sample	Low-Flow	Sample Characteristics	orange, slightly cloudy	
Sample Analysis	CCA, ABB/ASB CCR	Sample Time	1125	
Water Quality Meter	YSI ProDss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1115	23.85	7.69	18.7	1.476	6.77	109.2	105.71
1118	–	7.43	15.7	1.393	2.08	95.6	932.18
1121	–	7.39	14.8	1.406	1.14	92.2	1832.47
1124	23.85	7.33	15.2	1.426	0.81	82.0	703.10

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION (12313.1)		DATE	8/31/22
Sample Name	MW-15	Start Time	1220	
Condition of Well	good			
Water Level	25.44	Total Depth	–	
Well Diameter	PVC – 2 inch	Volume in Well	–	
Method of Purge	Low-Flow	Purge Characteristics	Cloudy, brown	
Volume Removed	4 qts	WL at Sample Time	25.44	
Method of Sample	Low-Flow	Sample Characteristics	sl. cloudy	
Sample Analysis	CCA, MCB + ABB/ASB CCR	Sample Time	1231	
Water Quality Meter	YSI ProDss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1221	25.44	7.05	17.7	3.376	7.37	131.5	16.90
1224	–	6.84	16.9	2.700	2.34	114.7	255.14
1227	–	6.81	16.5	2.667	1.13	82.8	73.76
1230	25.44	6.80	16.4	2.669	0.83	50.1	28.70

SAMPLING NOTES: MCB duplicate

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION (12313.1)		DATE	8/31/22
Sample Name	MW-17	Start Time	1353	
Condition of Well	good			
Water Level	25.95	Total Depth	–	
Well Diameter	PVC – 2 inch	Volume in Well	–	
Method of Purge	Low-Flow	Purge Characteristics	sl. cloudy	
Volume Removed	4 gals	WL at Sample Time	25.95	
Method of Sample	Low-Flow	Sample Characteristics	clear	
Sample Analysis	MCB & ABB/ASB CCR	Sample Time	1404	
Water Quality Meter	YSI ProDss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1355	25.95	7.25	17.8	2.503	5.82	137.7	73.56
1358	–	7.12	16.5	1.834	4.18	136.4	95.00
1401	–	7.10	16.1	1.809	4.83	136.7	34.38
1403	25.95	7.12	16.0	1.812	5.25	136.7	22.58

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION (12313.1)		DATE	8/30/22
Sample Name	MW-18	Start Time	1508	
Condition of Well	Good			
Water Level	30.10	Total Depth	–	
Well Diameter	PVC – 2 inch	Volume in Well	–	
Method of Purge	Low-Flow	Purge Characteristics	clear to sl. gray	
Volume Removed	3 gals	W L at Sample Time	33.10	
Method of Sample	Low-Flow	Sample Characteristics	gray bottle ↑ w/ each sample	
Sample Analysis	ABB/ASB CCR	Sample Time	1520	
Water Quality Meter	YSI ProDss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1510	30.10	7.83	22.5	1.742	5.37	127.7	3.86
1513	–	7.75	16.4	1.795	1.89	107.9	9.69
1516	–	7.80	16.0	1.800	0.94	68.3	5.60
1519	33.10	7.82	16.3	1.798	0.63	15.0	5.66

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION (12313.1)		DATE	8/30/22
Sample Name	MW-19	Start Time	1544	
Condition of Well	good			
Water Level	25.07	Total Depth	–	
Well Diameter	PVC – 2 inch	Volume in Well	–	
Method of Purge	Low-Flow	Purge Characteristics	clear	
Volume Removed	4.5 gals	WL at Sample Time	25.07	
Method of Sample	Low-Flow	Sample Characteristics	clear	
Sample Analysis	ABB/ASB CCR	Sample Time	1556	
Water Quality Meter	YSI ProDss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1546	25.07	7.52	16.5	.954	6.13	106.2	2.62
1549	–	7.39	14.8	.886	1.68	104.2	3.15
1552	–	7.32	14.4	.888	0.94	102.2	2.87
1555	25.07	7.29	14.3	.891	0.73	100.5	3.56

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates KLS

DATA SUMMARY POSTING

Station: Midwest Generation Powerton Generating Station

Regulated Unit(s): Metal Cleaning Basin (IEPA ID No. W1798010008-03)

In accordance with the new Ill. Adm. Code Title 35, Part 845: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments (State CCR Rule) groundwater monitoring was completed during the 3rd quarter 2022 which includes the entire list of parameters specified under Section 845.600(a)(1) and (b). Table 1 is a summary table of all available CCR monitoring data to date including any data generated previously as part of the Federal CCR Rule monitoring. Table 2 provides a summary of turbidity data which was collected as part of State CCR Rule requirements which is a data parameter that was not required under the Federal CCR Rule. MW-21 was not sampled as it was determined there was not a sufficient enough water column within the well to allow for sample collection.

No background statistics or proposed Groundwater Protection Standards are included on these tables. The background statistics and proposed Groundwater Protection Standards were submitted to Illinois Environmental Protection Agency (EPA) as part of the Application for Initial Operating Permit for the Metal Cleaning Basin dated March 31, 2022. Upon Illinois EPA approval of the Operating Permit and Proposed Groundwater Protection Standards, the approved comparison values will be included on the tables for subsequent data comparisons/evaluations.

Table 1. Groundwater Analytical Results - Midwest Generation, LLC, Powerton Station, Pekin, IL. Metals Cleaning Basin.

Well	Date	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Radium 226 + 228	Selenium	Thallium
MW-13 (S) up-gradient	4/8/2021	2.6	380	130	0.4	8.08	1500	2700	< 0.003	0.021	0.21	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.025	0.77	< 0.0025	< 0.002
	5/13/2021	2.6	340	130	0.39	7.86	1400	2500	< 0.003	0.023	0.23	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.022	0.84	< 0.0025	< 0.002
	6/3/2021	3.2	370	150	0.41	7.63	1500	2600	< 0.003	0.025	0.22	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.026	0.79	< 0.0025	< 0.002
	8/23/2021	3	340	110	0.36	7.72	980	2000	< 0.003	0.021	0.19	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.022	0.9	< 0.0025	< 0.002
	10/1/2021	2.8	320	120	0.36	7.78	1300	2500	< 0.003	0.025	0.25	< 0.001	< 0.0005	< 0.005	< 0.001	0.00065	< ^1+ 0.01	< 0.0002	0.023	< 0.577	< 0.0025	< 0.002
	11/30/2021	3.1	330	120	0.36	7.79	^- 1000	2100	< 0.003	0.024	0.19	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.021	0.635	< 0.0025	< 0.002
	1/6/2022	3.1	280	120	0.4	7.77	950	2000	< 0.003	0.028	0.25	< 0.001	< 0.0005	< 0.005	< 0.001	0.00055	< 0.002	< 0.0002	0.022	1.57	< 0.0025	< 0.002
	2/9/2022	2.8	310	120	0.41	7.67	1000	2200	< 0.003	0.026	0.25	< 0.001	< 0.0005	< 0.005	< 0.001	0.00061	< 0.002	< 0.0002	0.02	1.34	< 0.0025	< 0.002
	6/8/2022	3.2	240	100	0.37	7.96	860	1800	< 0.003	0.021	0.17	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.002	< 0.0002	0.021	< 0.502	< 0.0025	< 0.002
	8/31/2022	2.9 B	250	110	0.39	7.64	F1 790	1900	< 0.003	0.022	0.19	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.019	0.819	< 0.0025	< 0.002
MW-15 (CL) down-gradient	11/18/2015	1.5	270 H	210 H	0.53	6.55	H 1400	H 2400	< 0.003	0.03	0.096	^ < 0.001	0.00061	< 0.005	< 0.001	< 0.0005	0.042	H < 0.0002	0.023	< 0.599	0.0065	< 0.002
	2/25/2016	2.0	240	110	0.61	6.84	640	1700	< 0.003	0.025	0.083	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.041	< 0.0002	0.035	0.870	0.045	< 0.002
	5/19/2016	2.7	320	240	0.53	6.83	1200	2800	< 0.003	0.04	0.097	< 0.001	0.00098	< 0.005	< 0.001	< 0.0005	0.044	< 0.0002	0.041	< 0.420	0.0067	< 0.002
	8/18/2016	1.5	200 F1	170	0.54	6.96	660	1900	< 0.003	0.13	0.11	< 0.001	0.0041	< 0.005	< 0.001	< 0.0005	0.028	< 0.0002	0.027	< 0.672	0.0061	< 0.002
	11/17/2016	1.3	120	180	0.47	6.91	560	1900	< 0.003	0.0033	0.031	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.016	< 0.0002	0.018	< 0.570	0.0078	< 0.002
	2/17/2017	1.9	200	190	0.43	7.24	670	1700	< 0.003	0.02	0.056	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.025	< 0.0002	0.027	< 0.392	0.0032	< 0.002
	5/4/2017	1.5	180	190	0.57	7.35	670	1700	< 0.003	0.011	0.049	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.023	< 0.0002	0.023	< 0.456	0.0034	< 0.002
	6/21/2017	1.6	180	200	0.56	7.30	530	1600	< 0.003	0.0093	0.054	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.027	< 0.0002	0.03	< 0.347	0.019	< 0.002
	8/29/2017	2.2	190	200	0.53	6.87	540	1800	< 0.003	0.0018	0.044	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.023	< 0.0002	0.032	0.377	0.0092	< 0.002
	11/10/2017	1.6	170	180	0.63	7.09	530	1500	< 0.003	0.0063	0.046	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.025	< 0.0002	0.02	< 0.313	0.016	< 0.002
	5/17/2018	2.3	200	160	0.5	6.75	680	1800	< 0.003	0.0081	0.05	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.029	< 0.0002	0.03	0.397	0.077	< 0.002
	8/9/2018	2.3	200	200	0.48	7.06	520	1700	< 0.003	0.0083	0.048	<^ 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.026	< 0.0002	0.033	0.566	0.06	< 0.002
	5/2/2019	1.5	180	200	0.52	6.89	420	1500	< 0.003	0.0045	0.052	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.027	< 0.0002	0.023	< 0.424	< 0.0025	< 0.002
	11/14/2019	1.8	170	170	0.5	7.24	260	1300	< 0.003	0.0044	0.053	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.029	< 0.0002	0.025	< 0.475	< 0.0025	< 0.002
	4/29/2020	1.2	160	200	0.58	6.90	370	1300	NA	0.0036	0.06	NA	< 0.0005	NA	< 0.0010	< 0.0005	0.027	< 0.0002	0.023	0.578	< 0.0025	< 0.002
	12/8/2020	1.5	170	200	0.55	7.04	540	1400	NA	0.02	0.10	NA	0.00059	NA	0.0012	< 0.0005	0.035	< 0.0002	0.02	0.626	0.012	< 0.002
	5/12/2021	1.3	180	180	0.54	6.97	520	1500	< 0.003	0.0048	0.065	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.026	< 0.0002	0.014	< 0.648	0.0071	< 0.002
	7/20/2021	1.5	190	180	0.49	6.80	440	1500	< 0.003	0.0027	0.057	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.028	< 0.0002	0.02	< 0.398	< 0.0025	< 0.002
	8/23/2021	1.6	200	180	0.52	6.76	440	1500	< 0.003	0.0019	0.052	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.026	< 0.0002	0.024	< 0.794	0.012	< 0.002
	10/1/2021	1.2	180	180	0.53	6.97	430	1400	< 0.003	0.0087	0.065	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	^1+ 0.028	< 0.0002	0.018	< 0.511	0.009	< 0.002
	11/29/2021	1.9	230	240	0.5	6.71	^- 450	1700	< 0.003	0.0031	0.074	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.024	< 0.0002	0.016	< 0.353	0.055	< 0.002
	2/9/2022	0.84	140	160	0.58	6.91	320	1200	< 0.003	0.0075	0.054	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.023	< 0.0002	0.014	< 0.51	0.0025	< 0.002
	6/8/2022	2	310	230	0.43	6.87	970	2600	< 0.003	0.004	0.09	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.027	< 0.0002	0.019	< 0.612	0.12	< 0.002
	8/31/2022	1.5 B	210	270	0.5	6.80	550	1900	< 0.003	0.0054	0.057	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.03	< 0.0002	0.022	0.548	0.008	< 0.002
MW-17 (CL) up-gradient	11/19/2015	1.6	210 H	230 H	0.43	7.11	H 850	H 1800	< 0.003	0.0028	0.14	^ < 0.001	< 0.0005	< 0.005	< 0.001	0.0012	0.019	H < 0.0002	0.025	< 0.790	< 0.0025	< 0.002
	2/22/2016	1.8	290	280	0.55	7.19	960	2100	< 0.003	0.021	0.051	< 0.001	< 0.0005	< 0.005	0.0012	< 0.0005	0.038	< 0.0002	0.093	1.07	< 0.0025	< 0.002
	5/18/2016	1.4	200	230	0.64	7.02	700	1800	< 0.003	0.32	0.12	< 0.001	0.0011	< 0.005	0.0015	< 0.0005	0.026	< 0.0002	0.12	8.27	< 0.0025	0.0028
	8/15/2016	1.1	220	220	0.60	7.08	860	2100	< 0.003	0.34	0.12	< 0.001	0.001	< 0.005	0.0016	< 0.0005	0.022	< 0.0002	0.1	0.606	< 0.0025	0.0031
	11/14/2016	1.5	200	210	0.56	7.26	560	2000	< 0.003	0.19	0.073	< 0.001	0.00051	< 0.005	0.0012	< 0.0005	0.022	< 0.0002	0.042	3.76	< 0.0025	0.0021
	2/13/2017	1.6	190	230	0.56	6.84	770	1600	< 0.003	0.35	0.16	< 0.001	0.00093	< 0.005	0.0014	0.00079	0.019	< 0.0002	0.088	2.08	< 0.0025	0.0025
	5/4/2017	1.2	170	210	0.61	7.29	720	1500	< 0.003	0.24	0.39	< 0.0013	0.0023	< 0.005	0.0023	0.00066	0.016	< 0.0002	0.036	1.91	< 0.0025	0.0065
	6/22/2017	0.95	150	230	0.72	7.38	580	1600	< 0.003	0.41	0.13	< 0.001	0.0007	< 0.005	0.0012	0.0011	0.022	< 0.0002	0.11	1.21	< 0.0025	0.0022
	8/29/2017	1.4	190	230	0.64	7.19	640	1900	< 0.003	0.24	0.092	< 0.001	< 0.0005	< 0.005	< 0.001	0.00058	0.021	< 0.0002	0.13	3.32	< 0.0025	0.0025
	11/6/2017	1.7	190	240	0.62	7.27	840	1800	< 0.003	0.17	0.38	< 0.001	0.0022	< 0.005	0.0015	< 0.0005	< 0.01	< 0.0002	0.019	2.54	< 0.0025	0.0075
	5/14/2018	1.6	170	220	0.6	7.79	800	1700	< 0.003	0.42	0.17	< 0.001	0.002	< 0.005	0.0029	0.0021	0.015	< 0.0002	0.13	2.03	< 0.0025	0.0068
	8/6/2018	1.3	170	230	0.6	7.12	620	1600	< 0.003	0.087	0.055	<^ 0.001	0.00094	< 0.005	0.0015	< 0.0005	0.019	< 0.0002	0.084	1.34	< 0.0025	0.0023
	4/29/2019	0.98	150	190	0.66	7.25	660	1500	< 0.003	0.042	0.04	< 0.001	0.00052	< 0.005	< 0.001	0.00069	0.015	< 0.0002	0.06	0.517	< 0.0025	< 0.002
	11/13/2019	1.9	230	600	0.55	7.16	730	2300	< 0.003	0.088	0.10	< 0.001	0.0015	< 0.005	0.0011	0.00093	0.021	< 0.0002	0.058	0.643	< 0.0025	0.0029
	4/27/2020	1.2	150	170	0.79	7.27	520	1300	NA	0.026	0.036	NA	< 0.0005	NA	< 0.001	0.00081	0.021	< 0.0002	0.075	0.498	< 0.0025	< 0.002
	12/7/2020	1.3	140	160	0.8	7.22	430	1100	NA	0.08	0.05	NA	0.001	NA	< 0.001	0.0011	0.022	< 0.0002	0.056	< 0.438	< 0.0025	< 0.002
	4/8/2021	1.1	140	160	0.71	7.75	480	1200	< 0.003	0.0061	0.028	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.019	< 0.0002	0.057	< 0.485	< 0.0025	< 0.002
	5/12/2021	1.1	130	160	0.75	7.52	470	1100	< 0.003	0.0042	0.027	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.051	< 0.398	< 0.0025	< 0.002
	6/3/2021	0.4	150	96	0.74	7.27	500	1300	< 0.003	0.011	0.029	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.055	< 0.463	< 0.0025	< 0.002
	6/28/2021 B	1.1	150	150	0.69	7.34	500	1200	^+ < 0.003	0.018	0.034	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.018	< 0.0002	0.050	1.20	< 0.0025	< 0.002
	7/20/2021	0.94	180	150	0.67	7.31	450	1200	< 0.003	0.0074	0.035	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.029	< 0.0002	0.028	< 0.43	0.051	0.0031
	8/23/2021	0.93	140	150	0.7	7.37	470	1300	< 0.003	0.0083	0.029	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.043	< 0.55	< 0.0025	< 0.002
	10/1/2021	0.85	130	140	0.7	7.26	430	1100	< 0.003	0.0052	0.028	< 0.001	< 0.0005	< 0.005	< 0.001	0.00056	^1+ 0.022	< 0.0002	0.028	< 0.44	< 0.0025	< 0.002
	11/29/2021	0.97	140	150	0.72	7.30	^- 400	1100	< 0.003	0.0065	0.025	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.038	< 0.39	< 0.0025	< 0.002
	2/7/2022	0.99	140	160	0.78	7.27	450	1300	< 0.003	0.0079	0.027	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.016	< 0.0002	0.037	0.53	< 0.0025	< 0.002
	6/8/2022	1.3	190	190	0.69	7.51	820	1900	< 0.003	0.0071	0.038	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.053	< 0.42	< 0.0025	< 0.002
	8/31/2022	0.89 B	140	170	0.71	7.12	440	1300	< 0.003	0.0042	0.029	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.022	0.708	< 0.0025	< 0.002
MW-14 (CL) down-gradient	4/8/2021	2.1	200	98	1.1	7.33	630	1600	< 0.003	0.0028	0.036	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.028	< 0.0002	0.035	< 0.605	0.029	0.0022
	5/12/2021	2.6	210	100	1.1	7.13	640	1700	< 0.003	0.0047	0.038	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.028	< 0.0002	0.034	< 0.43	0.0039	0.0028
	6/3/2021	2.1	200	26	1.0	6.79	590	1600	< 0.003	0.0025	0.036	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.025	< 0.0002	0.028	< 0.357	0.094	0.0025
	6/28/2021 B	2.0	210	93	0.99	6.90	570	1700	^+ < 0.003	0.0014	0.034	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.028	< 0.0002	0.03	0.758	0.034	0.0023
	7/20/2021	2.0	190	81	0.89	6.88	500	1700	< 0.003	0.0025	0.057	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.027	< 0.0002	0.021	< 0.434	< 0.0025	< 0.002
	8/23/2021	2.1	210	91	0.96	6.91	560	1800	< 0.003	0.0022	0.035	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.03	< 0.0002	0.031	0.515	0.01	0.0021
	10/1/2021	1.9	200	100	0.95	7.06	640	1700	< 0.003	0.0045	0.039	< 0.001	< 0.0005	< 0.005	< 0.001	0.00065	^1+ 0.034	< 0.0002	0.037	< 0.581	< 0.0025	0.002
	11/29/2021	2.0	180	94	1.10	7.01	^- 480	1400	< 0.003	0.0025	0.032	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.026	< 0.0002	0.033	< 0.442	0.01	< 0.002
	2/9/2022	1.9	180	67	1.10	6.91	430	1500	< 0.003	0.013	0.046	< 0.001	0.00056	< 0.005	< 0.001	< 0.0005	0.026	< 0.0002	0.03	0.724	< 0.0025	0.0022
	6/8/2022	2.2	220	87	0.96	7.12	810	2100	< 0.003	0.0041	0.057	< 0.001	0.00056	< 0.005	< 0.001	< 0.0005	0.022	< 0.0002	0.038	< 0.429	0.013	0.0033
	8/31/2022	2.2 B	200	120	0.86	6.74	610	1800	< 0.003	0.004	0.056	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.027	< 0.0002	0.024	0.743	< 0.0025	< 0.002
MW-20 (CL) down-gradient	4/8/2021	2.2	310	150	0.20	7.18	850	2200	< 0.003	0.0027	0.19	< 0.001	< 0.0005	< 0.005	0.0015	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.673	< 0.0025	< 0.002
	5/12/2021	0.43	130	150	0.19	6.90	850	2200	< 0.003	0.019	0.21	< 0.001	< 0.0005	< 0.005	0.0039	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.79	< 0.0025	< 0.002
	6/3/2021	1.5	260	26	0.12	6.35	500	1500	< 0.003	< 0.001	0.085	< 0.001	< 0.0005	< 0.005	0.0039	< 0.0005	< 0.01	< 0.0002	< 0.005	0.708	< 0.0025	< 0.002
	6/28/2021 B	1.8	270	96	0.14	6.49	570	1800	^+ < 0.003	0.002	0.13	< 0.001	< 0.0005	< 0.005	0.0025	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.453	< 0.0025	< 0.002
	7/20/2021	1.5	230	64	0.13	6.43	440	1600	< 0.003	0.0025	0.1	< 0.001	< 0.0005	< 0.005	0.0022	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.484	< 0.0025	< 0.002
	8/23/2021	1.5	220	54	0.12	6.66	170	1400	< 0.003	0.0014	0.12	< 0.001	< 0.0005	< 0.005	0.0017	< 0.0005	< 0.01	< 0.0002	< 0.005	0.792	< 0.0025	< 0.002
	10/1/2021	1.7	210	80	0.13	6.74	180	1600	< 0.003	0.0029	0.13	< 0.001	< 0.0005	< 0.005	0.0016	< 0.0005	< ^1+ 0.01	< 0.0002	< 0.005	0.763	< 0.0025	< 0.002
	11/29/2021	1.7	250	120	0.16	6.73	^- 550	1900	< 0.003	0.0071	0.16	< 0.001	< 0.0005	< 0.005	0.0019	0.0024	< 0.01	< 0.0002	< 0.005	< 0.639	< 0.0025	< 0.002
	2/8/2022	1.9	220	110	0.17	6.67	440	1700	< 0.003	0.0098	0.16	< 0.001	< 0.0005	< 0.005	0.0013	0.00089	< 0.002	< 0.0002	< 0.005	< 0.607	< 0.0025	< 0.002
	6/9/2022	1.5	230	65	0.13	6.73	400	1600	< 0.003	0.0024	0.1	< 0.001	< 0.0005	< 0.005	0.0018	< 0.0005	< 0.01	< 0.0002	< 0.005	0.636	< 0.0025	< 0.002
	9/1/2022	2 B	230	110	0.15	6.28	370	2100	< 0.003	0.0013	0.12	< 0.001	< 0.0005	< 0.005	0.0012	< 0.0005	< 0.01	< 0.0002	< 0.005	0.596	< 0.0025	< 0.002
MW-21 (CL) down-gradient	4/8/2021	0.48	140	34	0.25	7.08	26	770	< 0.003	0.025	0.34	< 0.001	< 0.0005	< 0.005	0.0042	< 0.0005	< 0.01	< 0.0002	< 0.005	1.18	< 0.0025	< 0.002
	5/12/2021	0.42	66	22	0.16	6.72	57	680	< 0.003	0.0023	0.19	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.708	< 0.0025	< 0.002
	6/3/2021	0.39	130	23	0.17	6.58	41	690	< 0.003	0.0069	0.25	< 0.001	< 0.0005	< 0.005	0.002	< 0.0005	< 0.01	< 0.0002	< 0.005	1.01	< 0.0025	< 0.002
	6/28/2021	0.60	140	17	0.16	6.55	6.9	660	^+ < 0.003	0.025	0.35	< 0.001	< 0.0005	< 0.005	0.002	< 0.0005	< 0.01	< 0.0002	< 0.005	0.487	< 0.0025	< 0.002
	7/20/2021	0.38	130	28	0.15	6.49	32	650	< 0.003	0.017	0.35	< 0.001	< 0.0005	< 0.005	0.0083	0.001	< 0.01	< 0.0002	< 0.005	0.97	< 0.0025	< 0.002
	8/23/2021	0.66	130	29	0.17	6.66	< 5	550	< 0.003	0.022	0.32	< 0.001	< 0.0005	< 0.005	0.0016	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.588	< 0.0025	< 0.002
	10/8/2021	0.35	160	38	0.19	6.72	< 5	810	< 0.003	0.036	0.45	< 0.001	< 0.0005	0.0072	0.0072	0.0026	< ^1+ 0.01	< 0.0002	< 0.005	< 1.08	< 0.0025	< 0.002
	11/29/2021	0.66	130	30	0.18	6.55	< ^- 5	660	< 0.003	0.031	0.37	< 0.001	< 0.0005	< 0.005	0.0015	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.747	< 0.0025	< 0.002
	3/1/2022	0.21	210	43	0.24	6.71	< 5	900	< 0.003	0.063	0.48	< 0.001	< 0.0005	< 0.005	0.0085	< 0.0005	< 0.002	< 0.0002	< 0.005	1.2	< 0.0025	< 0.002
	6/9/2022	0.45	130	24	0.16	6.91	12	660	< 0.003	0.028	0.4	< 0.001	< 0.0005	< 0.005	0.0028	< 0.0005	< 0.01	< 0.0002	< 0.005	0.953	< 0.0025	< 0.002
	9/1/2022	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Notes: All units are in mg/l except pH is in standard units.
NA - Not Analyzed
^+ - Continuing Calibration Verification is outside acceptance limits, high bias
B - Compound was found in the blank and sample
(CL) - Silty Clay Unit
F1 - MS and/or MSD Recovery outside of limits.
H - Sample was prepped or analyzed beyond the specified holding time.
V- Serial dilution exceeds control limits.
^- - Continuing Calibration Verification (CCV) is outside acceptance limits, low biased.
^1+ - Initial Calibration Verification (ICV) is outside acceptance limits, high biased.
DNYA - Data Not Yet Available

R000574

Table 2. Groundwater Turbidity - Midwest Generation, LLC, Powerton Station, Pekin, IL. Metal Cleaning Basin.

Well	Date	Turbidity (NTU)
MW-13	2/24/2021	8.90
	4/8/2021	6.50
	5/13/2021	2.17
	6/3/2021	2.81
	6/29/2021	4.00
	8/23/2021	3.99
	10/1/2021	4.82
	11/30/2021	5.51
	1/6/2022	16.87
	2/9/2022	1.99
	6/8/2022	30.66
	8/31/2022	16.22
MW-15	2/24/2021	64.90
	4/9/2021	16.80
	5/12/2021	16.45
	6/3/2021	7.85
	6/29/2021	6.58
	7/20/2021	5.82
	8/23/2021	4.28
	10/1/2021	13.13
	11/29/2021	12.35
	2/7/2022	9.38
	6/8/2022	10.32
	8/31/2022	28.7
MW-17	2/24/2021	42.00
	4/8/2021	17.10
	5/12/2021	10.90
	6/3/2021	38.15
	6/28/2021	29.15
	7/20/2021	16.38
	8/23/2021	26.51
	10/1/2021	21.26
	11/30/2021	8.86
	2/9/2022	11.19
	6/8/2022	41.49
	8/31/2022	22.58
MW-14	2/24/2021	13.90
	4/8/2021	5.39
	5/12/2021	1.22
	6/3/2021	2.63
	6/28/2021	3.74
	7/20/2021	4.34
	8/23/2021	4.26
	10/1/2021	10.27
	11/29/2021	12.29
	2/9/2022	8.66
	6/8/2022	19.54
	8/31/2022	40.75
MW-20	3/12/2021	343.30
	4/8/2021	14.45
	5/12/2021	3.89
	6/3/2021	6.01
	6/28/2021	8.28
	7/20/2021	9.16
	8/23/2021	27.31
	10/1/2021	8.27
	11/29/2021	8.35
	2/8/2022	76.4
	6/9/2022	19.31
	9/1/2022	63.5
MW-21	3/12/2021	49.20
	4/8/2021	5.88
	5/12/2021	26.09
	6/3/2021	17.61
	6/28/2021	6.33
	7/20/2021	44.93
	8/23/2021	19.43
	10/8/2021	94.82
	11/29/2021	20.2
	3/1/2022	7.64
	6/9/2022	7.56
	9/1/2022	NS

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ANALYTICAL REPORT

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Tel: (708)534-5200

Laboratory Job ID: 500-221621-1
Client Project/Site: Powerton CCR MCB

For:
KPRG and Associates, Inc.
14665 West Lisbon Road,
Suite 1A
Brookfield, Wisconsin 53005

Attn: Richard Gnat

Diana Mockler

Authorized for release by:
9/29/2022 9:33:53 AM

Diana Mockler, Project Manager I
(219)252-7570
Diana.Mockler@et.eurofinsus.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-221621-1

Job ID: 500-221621-1

Laboratory: Eurofins Chicago

Narrative

Job Narrative
500-221621-1

Comments
No additional comments.

Receipt
The samples were received on 9/1/2022 9:30 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 12.3º C and 14.0º C.

Receipt Exceptions
The following sample(s) was received at the laboratory outside the required temperature criteria: Samples #1-5 for TDS, Chloride,Fluoride and Sulfate. No ice in cooler just water. Receiving cooler temp 14.0°C .

Metals
Method 6020A: The method blank for preparation batch 500-673175 and analytical batch 500-673884 contained Calcium above the reporting limit (RL). Associated sample(s) were not re-extracted and/or re-analyzed because results were greater than 10X the value found in the method blank.

Method 6020A: The continuing calibration verification (CCV) associated with batch 674091 recovered above the upper control limit for Li. The reported samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
Method SM 2540C: The following sample was analyzed outside of analytical holding time due to the sample bottle was accidentally dropped. The bottle leaked and volume was lost. The sample was analyzed with the remaining sample: MW-20 (500-221621-6).

Method SM 4500 Cl- E: Due to the high concentration of Chloride, the matrix spike / matrix spike duplicate (MS/MSD) for analytical batch 500-673960 could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria.

Methods 9038, SM 4500 SO4 E: Due to the high concentration of Sulfate, the matrix spike / matrix spike duplicate (MS/MSD) for analytical batch 500-673965 could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria.

Method SM 4500 SO4 E: Due to the high concentration of Sulfate, the matrix spike / matrix spike duplicate (MS/MSD) for analytical batch 500-673965 could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Method Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR WC8

Job ID: 500-221621-1

Method	Method Description	Protocol	Laboratory
6020A	Wetals)ICP/WSE	S4 M(6	TTHC7I
u(u0A	WercyrV)CvAAE	S4 M(6	TTHC7I
SW25(0C	Solids, Hotal Dissolhed)HDSE	SW	TTHC7I
SW(500 Cl-T	CFloride, Hotal	SW	TTHC7I
SW(500 OC	Clyoride	SW	TTHC7I
SW(500 Sf(T	Syl3ate, Hotal	SW	TTHC7I
p005A	Pre=aration, Hotal Recoherable or Dissolhed Wetals	S4 M(6	TTHC7I
u(u0A	Pre=aration, WercyrV	S4 M(6	TTHC7I

Protocol References:

SW" xStandard WetFods Cor HFe Tmag ination f 34 ater And 4 astewaterx

S4 M(6" xHest WetFods Cor ThalyatinN Solid 4 aste, PFVsical/CFeg ical WetFodsx, HFird Tdition, 9 oheg ber 1UM6 And Its B=dates.

Laboratory References:

TTHC7I" Tyro3ns CFicaNo, 2(1u 8ond Street, BnihersitV Park, IL 60(M(, HTL)u0ME5p(-5200

Sample Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-221621-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-221621-1	MW-15	Water	08/31/22 12:31	09/01/22 09:30
500-221621-2	MW-14	Water	08/31/22 16:13	09/01/22 09:30
500-221621-3	MW-17	Water	08/31/22 14:04	09/01/22 09:30
500-221621-4	Duplicate	Water	08/31/22 00:00	09/01/22 09:30
500-221621-5	MW-13	Water	08/31/22 15:08	09/01/22 09:30
500-221621-6	MW-20	Water	09/01/22 10:15	09/02/22 10:00

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR mCy

Job ID: 500-221621-1

Client Sample ID: MW-15

Date Collected: 08/31/22 12:31
Date Recei9ed: 0v/01/22 0v:30

Lab Sample ID: 500-221621-1
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Total Reco9erable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Anti< on3	g0.00L0		0.00L0		< 9/7		04/06/22 08:22	04/08/22 22:26	1
Arsenic	**0B05.**		0.0010		< 9/7		04/06/22 08:22	04/08/22 22:26	1
7 arium	**0B054**		0.0025		< 9/7		04/06/22 08:22	04/08/22 22:26	1
y er3lliB<	g0.0010		0.0010		< 9/7		04/06/22 08:22	04/08/22 22:26	1
7 oron	**1B5**		0.25		< 9/7		04/06/22 08:22	04/04/22 1u:2L	5
Cad< iB<	g0.00050		0.00050		< 9/7		04/06/22 08:22	04/08/22 22:26	1
Calcium	**210**	**7**	0.20		< 9/7		04/06/22 08:22	04/08/22 22:26	1
Chro< iB<	g0.0050		0.0050		< 9/7		04/06/22 08:22	04/08/22 22:26	1
Cobalt	g0.0010		0.0010		< 9/7		04/06/22 08:22	04/08/22 22:26	1
7ead	g0.00050		0.00050		< 9/7		04/06/22 08:22	04/08/22 22:26	1
Lithium	**0B030**		0.010		< 9/7		04/06/22 08:22	04/1L/22 12:M8	1
Molybdenum	**0B022**		0.0050		< 9/7		04/06/22 08:22	04/08/22 22:26	1
Selenium	**0B080**		0.0025		< 9/7		04/06/22 08:22	04/08/22 22:26	1
ThalliB<	g0.0020		0.0020		< 9/7		04/06/22 08:22	04/08/22 22:26	1

Method: 4. 40A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
mercBr3	g0.00020		0.00020		< 9/7		04/12/22 10:20	04/1L/22 04:16	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissol9ed Solids	**1v00**		10		< 9/7			04/0u/22 1u:16	1
Chloride	**240**		20		< 9/7			04/04/22 1u:L1	10
Fluoride	**0B50**		0.10		< 9/7			04/10/22 15:01	1
Sulfate	**550**		250		< 9/7			04/04/22 14:21	50

Client Sample ID: MW-1.

Date Collected: 08/31/22 16:13
Date Recei9ed: 0v/01/22 0v:30

Lab Sample ID: 500-221621-2
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Total Reco9erable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Anti< on3	g0.00L0		0.00L0		< 9/7		04/06/22 08:22	04/08/22 22:24	1
Arsenic	**0B0. 0**		0.0010		< 9/7		04/06/22 08:22	04/08/22 22:24	1
7 arium	**0B056**		0.0025		< 9/7		04/06/22 08:22	04/08/22 22:24	1
y er3lliB<	g0.0010		0.0010		< 9/7		04/06/22 08:22	04/08/22 22:24	1
7 oron	**2B2**		0.25		< 9/7		04/06/22 08:22	04/04/22 1u:26	5
Cad< iB<	g0.00050		0.00050		< 9/7		04/06/22 08:22	04/08/22 22:24	1
Calcium	**200**	**7**	0.20		< 9/7		04/06/22 08:22	04/08/22 22:24	1
Chro< iB<	g0.0050		0.0050		< 9/7		04/06/22 08:22	04/08/22 22:24	1
Cobalt	g0.0010		0.0010		< 9/7		04/06/22 08:22	04/08/22 22:24	1
7ead	g0.00050		0.00050		< 9/7		04/06/22 08:22	04/08/22 22:24	1
Lithium	**0B024**		0.010		< 9/7		04/06/22 08:22	04/1L/22 12:51	1
Molybdenum	**0B02.**		0.0050		< 9/7		04/06/22 08:22	04/08/22 22:24	1
SeleniB<	g0.0025		0.0025		< 9/7		04/06/22 08:22	04/08/22 22:24	1
ThalliB<	g0.0020		0.0020		< 9/7		04/06/22 08:22	04/08/22 22:24	1

Method: 4. 40A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
mercBr3	g0.00020		0.00020		< 9/7		04/12/22 10:20	04/1L/22 04:25	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR mCy

Job ID: 500-221621-1

Client Sample ID: MW-1.

Lab Sample ID: 500-221621-2

Date Collected: 08/31/22 16:13

Matrix: Water

Date Recei9ed: 0v/01/22 0v:30

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissol9ed Solids	1800		10		< 9/7			04/0u/22 1u:16	1
Chloride	120		20		< 9/7			04/04/22 1u:L1	10
Fluoride	0B6		0.10		< 9/7			04/10/22 15:0M	1
Sulfate	610		250		< 9/7			04/04/22 14:22	50

Client Sample ID: MW-14

Lab Sample ID: 500-221621-3

Date Collected: 08/31/22 1. :0.

Matrix: Water

Date Recei9ed: 0v/01/22 0v:30

Method: 6020A - Metals (ICP/MS) - Total Reco9erable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Anti< on3	g0.00L0		0.00L0		< 9/7		04/06/22 08:22	04/08/22 22:LL	1
Arsenic	0B0. 2		0.0010		< 9/7		04/06/22 08:22	04/08/22 22:LL	1
7 arium	0B2v		0.0025		< 9/7		04/06/22 08:22	04/08/22 22:LL	1
y er3lliB<	g0.0010		0.0010		< 9/7		04/06/22 08:22	04/08/22 22:LL	1
7 oron	0Bv		0.050		< 9/7		04/06/22 08:22	04/04/22 1u:L6	1
Cad< iB<	g0.00050		0.00050		< 9/7		04/06/22 08:22	04/08/22 22:LL	1
Calcium	1. 0	7	0.20		< 9/7		04/06/22 08:22	04/08/22 22:LL	1
Chro< iB<	g0.0050		0.0050		< 9/7		04/06/22 08:22	04/08/22 22:LL	1
Cobalt	g0.0010		0.0010		< 9/7		04/06/22 08:22	04/08/22 22:LL	1
7ead	g0.00050		0.00050		< 9/7		04/06/22 08:22	04/08/22 22:LL	1
Lithium	0B14		0.010		< 9/7		04/06/22 08:22	04/1L/22 12:55	1
Molybdenum	0B22		0.0050		< 9/7		04/06/22 08:22	04/08/22 22:LL	1
SeleniB<	g0.0025		0.0025		< 9/7		04/06/22 08:22	04/08/22 22:LL	1
ThalliB<	g0.0020		0.0020		< 9/7		04/06/22 08:22	04/08/22 22:LL	1

Method: 4. 40A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
mercBr3	g0.00020		0.00020		< 9/7		04/12/22 10:20	04/1L/22 04:2u	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissol9ed Solids	1300		10		< 9/7			04/0u/22 1u:16	1
Chloride	140		20		< 9/7			04/04/22 1u:M8	10
Fluoride	0E1		0.10		< 9/7			04/10/22 15:06	1
Sulfate	. . 0		250		< 9/7			04/04/22 14:22	50

Client Sample ID: Duplicate

Lab Sample ID: 500-221621-.

Date Collected: 08/31/22 00:00

Matrix: Water

Date Recei9ed: 0v/01/22 0v:30

Method: 6020A - Metals (ICP/MS) - Total Reco9erable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Anti< on3	g0.00L0		0.00L0		< 9/7		04/06/22 08:22	04/08/22 22:L6	1
Arsenic	0B056		0.0010		< 9/7		04/06/22 08:22	04/08/22 22:L6	1
7 arium	0B055		0.0025		< 9/7		04/06/22 08:22	04/08/22 22:L6	1
y er3lliB<	g0.0010		0.0010		< 9/7		04/06/22 08:22	04/08/22 22:L6	1
7 oron	1B		0.25		< 9/7		04/06/22 08:22	04/04/22 1u:M0	5
Cad< iB<	g0.00050		0.00050		< 9/7		04/06/22 08:22	04/08/22 22:L6	1
Calcium	200	7	0.20		< 9/7		04/06/22 08:22	04/08/22 22:L6	1
Chro< iB<	g0.0050		0.0050		< 9/7		04/06/22 08:22	04/08/22 22:L6	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR mCy

Job ID: 500-221621-1

Client Sample ID: Duplicate

Date Collected: 08/31/22 00:00
Date Recei9ed: 0v/01/22 0v:30

Lab Sample ID: 500-221621-.
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Total Reco9erable (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	g0.0010		0.0010		< 9/7		04/06/22 08:22	04/08/22 22:L6	1
7ead	g0.00050		0.00050		< 9/7		04/06/22 08:22	04/08/22 22:L6	1
Lithium	**0[illegible]2v**		0.010		< 9/7		04/06/22 08:22	04/1L/22 12:58	1
Molybdenum	**0[illegible]22**		0.0050		< 9/7		04/06/22 08:22	04/08/22 22:L6	1
Selenium	**0[illegible]040**		0.0025		< 9/7		04/06/22 08:22	04/08/22 22:L6	1
ThalliB<	g0.0020		0.0020		< 9/7		04/06/22 08:22	04/08/22 22:L6	1

Method: 4. 40A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
mercBr3	g0.00020		0.00020		< 9/7		04/12/22 10:20	04/1L/22 04:24	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissol9ed Solids	**1v00**		10		< 9/7			04/0u/22 1u:16	1
Chloride	**240**		20		< 9/7			04/04/22 1u:M4	10
Fluoride	**0[illegible]50**		0.10		< 9/7			04/10/22 15:04	1
Sulfate	**540**		250		< 9/7			04/04/22 14:22	50

Client Sample ID: MW-13

Date Collected: 08/31/22 15:08
Date Recei9ed: 0v/01/22 0v:30

Lab Sample ID: 500-221621-5
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Total Reco9erable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Anti< on3	g0.00L0		0.00L0		< 9/7		04/06/22 08:22	04/08/22 22:M6	1
Arsenic	**0[illegible]22**		0.0010		< 9/7		04/06/22 08:22	04/08/22 22:M6	1
7 arium	**0[illegible]v**		0.0025		< 9/7		04/06/22 08:22	04/08/22 22:M6	1
y er3lliB<	g0.0010		0.0010		< 9/7		04/06/22 08:22	04/08/22 22:M6	1
7 oron	**2[illegible]**		0.25		< 9/7		04/06/22 08:22	04/04/22 1u:ML	5
Cad< iB<	g0.00050		0.00050		< 9/7		04/06/22 08:22	04/08/22 22:M6	1
Calcium	**250**	**7**	0.20		< 9/7		04/06/22 08:22	04/08/22 22:M6	1
Chro< iB<	g0.0050		0.0050		< 9/7		04/06/22 08:22	04/08/22 22:M6	1
Cobalt	g0.0010		0.0010		< 9/7		04/06/22 08:22	04/08/22 22:M6	1
7ead	g0.00050		0.00050		< 9/7		04/06/22 08:22	04/08/22 22:M6	1
7ithiB<	g0.010		0.010		< 9/7		04/06/22 08:22	04/1L/22 1L:01	1
Molybdenum	**0[illegible]1v**		0.0050		< 9/7		04/06/22 08:22	04/08/22 22:M6	1
SeleniB<	g0.0025		0.0025		< 9/7		04/06/22 08:22	04/08/22 22:M6	1
ThalliB<	g0.0020		0.0020		< 9/7		04/06/22 08:22	04/08/22 22:M6	1

Method: 4. 40A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
mercBr3	g0.00020		0.00020		< 9/7		04/12/22 10:20	04/1L/22 04:L5	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissol9ed Solids	**1v00**		10		< 9/7			04/0u/22 1u:16	1
Chloride	**110**		20		< 9/7			04/04/22 1u:M4	10
Fluoride	**0[illegible]v**		0.10		< 9/7			04/10/22 15:11	1
Sulfate	**4v0**	**F1**	500		< 9/7			04/04/22 14:2L	100

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR mCy

Job ID: 500-221621-1

Client Sample ID: MW-20

Date Collected: 0v/01/22 10:15
Date Recei9ed: 0v/02/22 10:00

Lab Sample ID: 500-221621-6

Matrix: Water

Method: 6020A - Metals (ICP/MS) - Total Reco9erable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Anti< on3	g0.00L0		0.00L0		< 9/7		04/06/22 08:22	04/08/22 22:50	1
Arsenic	**0.0013**		0.0010		< 9/7		04/06/22 08:22	04/08/22 22:50	1
7 arium	**0.012**		0.0025		< 9/7		04/06/22 08:22	04/08/22 22:50	1
y er3lliB<	g0.0010		0.0010		< 9/7		04/06/22 08:22	04/08/22 22:50	1
7 oron	**2.9**		0.25		< 9/7		04/06/22 08:22	04/04/22 1u:Mu	5
Cad< iB<	g0.00050		0.00050		< 9/7		04/06/22 08:22	04/08/22 22:50	1
Calcium	**230**	**7**	0.20		< 9/7		04/06/22 08:22	04/08/22 22:50	1
Chro< iB<	g0.0050		0.0050		< 9/7		04/06/22 08:22	04/08/22 22:50	1
Cobalt	**0.0012**		0.0010		< 9/7		04/06/22 08:22	04/08/22 22:50	1
7ead	g0.00050		0.00050		< 9/7		04/06/22 08:22	04/08/22 22:50	1
7ithiB<	g0.010		0.010		< 9/7		04/06/22 08:22	04/1L/22 1L:05	1
mol3bdenB<	g0.0050		0.0050		< 9/7		04/06/22 08:22	04/08/22 22:50	1
SeleniB<	g0.0025		0.0025		< 9/7		04/06/22 08:22	04/08/22 22:50	1
ThalliB<	g0.0020		0.0020		< 9/7		04/06/22 08:22	04/08/22 22:50	1

Method: 4. 40A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
mercBr3	g0.00020		0.00020		< 9/7		04/12/22 10:20	04/1L/22 04:Lu	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**110**		20		< 9/7			04/04/22 1u:M4	10
Sulfate	**340**		250		< 9/7			04/04/22 14:L8	50

Definitions/Glossary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-221621-1

Qualifiers

Metals

Qualifier	Qualifier Description
^+	Continuing Calibration Verification (CCV) is outside acceptance limits, high biased.
B	Compound was found in the blank and sample.

General Chemistry

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
F1	MS and/or MSD recovery exceeds control limits.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

QC Association Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-221621-1

Metals

Prep Batch: 672879

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221621-1	MW-15	Total Recoverable	Water	3005A	
500-221621-2	MW-14	Total Recoverable	Water	3005A	
500-221621-3	MW-17	Total Recoverable	Water	3005A	
500-221621-4	Duplicate	Total Recoverable	Water	3005A	
500-221621-5	MW-13	Total Recoverable	Water	3005A	
500-221621-6	MW-20	Total Recoverable	Water	3005A	
MB 500-673175/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 500-673175/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 672330

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221621-1	MW-15	Total Recoverable	Water	6020A	673175
500-221621-2	MW-14	Total Recoverable	Water	6020A	673175
500-221621-3	MW-17	Total Recoverable	Water	6020A	673175
500-221621-4	Duplicate	Total Recoverable	Water	6020A	673175
500-221621-5	MW-13	Total Recoverable	Water	6020A	673175
500-221621-6	MW-20	Total Recoverable	Water	6020A	673175
MB 500-673175/1-A	Method Blank	Total Recoverable	Water	6020A	673175
LCS 500-673175/2-A	Lab Control Sample	Total Recoverable	Water	6020A	673175

Analysis Batch: 670418

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221621-1	MW-15	Total Recoverable	Water	6020A	673175
500-221621-2	MW-14	Total Recoverable	Water	6020A	673175
500-221621-3	MW-17	Total Recoverable	Water	6020A	673175
500-221621-4	Duplicate	Total Recoverable	Water	6020A	673175
500-221621-5	MW-13	Total Recoverable	Water	6020A	673175
500-221621-6	MW-20	Total Recoverable	Water	6020A	673175
MB 500-673175/1-A	Method Blank	Total Recoverable	Water	6020A	673175
LCS 500-673175/2-A	Lab Control Sample	Total Recoverable	Water	6020A	673175

Prep Batch: 67080(

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221621-1	MW-15	Total/NA	Water	7470A	
500-221621-2	MW-14	Total/NA	Water	7470A	
500-221621-3	MW-17	Total/NA	Water	7470A	
500-221621-4	Duplicate	Total/NA	Water	7470A	
500-221621-5	MW-13	Total/NA	Water	7470A	
500-221621-6	MW-20	Total/NA	Water	7470A	
MB 500-674142/12-A	Method Blank	Total/NA	Water	7470A	
LCS 500-674142/15-A	Lab Control Sample	Total/NA	Water	7470A	
500-221621-1 MS	MW-15	Total/NA	Water	7470A	
500-221621-1 MSD	MW-15	Total/NA	Water	7470A	
500-221621-1 DU	MW-15	Total/NA	Water	7470A	

Analysis Batch: 670238

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221621-1	MW-15	Total/NA	Water	7470A	674142
500-221621-2	MW-14	Total/NA	Water	7470A	674142
500-221621-3	MW-17	Total/NA	Water	7470A	674142
500-221621-4	Duplicate	Total/NA	Water	7470A	674142

QC Association Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-221621-1

Metals)Continued5

Analysis Batch: 670238)Continued5

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221621-5	MW-13	Total/NA	Water	7470A	674142
500-221621-6	MW-20	Total/NA	Water	7470A	674142
MB 500-674142/12-A	Method Blank	Total/NA	Water	7470A	674142
LCS 500-674142/15-A	Lab Control Sample	Total/NA	Water	7470A	674142
500-221621-1 MS	MW-15	Total/NA	Water	7470A	674142
500-221621-1 MSD	MW-15	Total/NA	Water	7470A	674142
500-221621-1 DU	MW-15	Total/NA	Water	7470A	674142

Analysis Batch: 670004

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221621-1	MW-15	Total Recoverable	Water	6020A	673175
500-221621-2	MW-14	Total Recoverable	Water	6020A	673175
500-221621-3	MW-17	Total Recoverable	Water	6020A	673175
500-221621-4	Duplicate	Total Recoverable	Water	6020A	673175
500-221621-5	MW-13	Total Recoverable	Water	6020A	673175
500-221621-6	MW-20	Total Recoverable	Water	6020A	673175

General Chemistry

Analysis Batch: 672920

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221621-1	MW-15	Total/NA	Water	SM 2540C	
500-221621-2	MW-14	Total/NA	Water	SM 2540C	
500-221621-3	MW-17	Total/NA	Water	SM 2540C	
500-221621-4	Duplicate	Total/NA	Water	SM 2540C	
500-221621-5	MW-13	Total/NA	Water	SM 2540C	
MB 500-673534/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 500-673534/2	Lab Control Sample	Total/NA	Water	SM 2540C	
500-221621-3 MS	MW-17	Total/NA	Water	SM 2540C	
500-221621-3 DU	MW-17	Total/NA	Water	SM 2540C	

Analysis Batch: 672164

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221621-1	MW-15	Total/NA	Water	SM 4500 Cl- E	
500-221621-2	MW-14	Total/NA	Water	SM 4500 Cl- E	
500-221621-3	MW-17	Total/NA	Water	SM 4500 Cl- E	
500-221621-4	Duplicate	Total/NA	Water	SM 4500 Cl- E	
500-221621-5	MW-13	Total/NA	Water	SM 4500 Cl- E	
500-221621-6	MW-20	Total/NA	Water	SM 4500 Cl- E	
MB 500-673960/16	Method Blank	Total/NA	Water	SM 4500 Cl- E	
MB 500-673960/52	Method Blank	Total/NA	Water	SM 4500 Cl- E	
LCS 500-673960/17	Lab Control Sample	Total/NA	Water	SM 4500 Cl- E	
LCS 500-673960/53	Lab Control Sample	Total/NA	Water	SM 4500 Cl- E	
500-221621-3 MS	MW-17	Total/NA	Water	SM 4500 Cl- E	
500-221621-3 MSD	MW-17	Total/NA	Water	SM 4500 Cl- E	

Analysis Batch: 672169

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221621-1	MW-15	Total/NA	Water	SM 4500 SO4 E	
500-221621-2	MW-14	Total/NA	Water	SM 4500 SO4 E	
500-221621-3	MW-17	Total/NA	Water	SM 4500 SO4 E	

QC Association Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-221621-1

General Chemistry)Continued5

Analysis Batch: 672169)Continued5

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221621-4	Duplicate	Total/NA	Water	SM 4500 SO4 E	
500-221621-5	MW-13	Total/NA	Water	SM 4500 SO4 E	
500-221621-6	MW-20	Total/NA	Water	SM 4500 SO4 E	
MB 500-673965/16	Method Blank	Total/NA	Water	SM 4500 SO4 E	
MB 500-673965/49	Method Blank	Total/NA	Water	SM 4500 SO4 E	
LCS 500-673965/17	Lab Control Sample	Total/NA	Water	SM 4500 SO4 E	
LCS 500-673965/50	Lab Control Sample	Total/NA	Water	SM 4500 SO4 E	
500-221621-5 MS	MW-13	Total/NA	Water	SM 4500 SO4 E	
500-221621-5 MSD	MW-13	Total/NA	Water	SM 4500 SO4 E	

Analysis Batch: 67040(

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221621-1	MW-15	Total/NA	Water	SM 4500 F C	
500-221621-2	MW-14	Total/NA	Water	SM 4500 F C	
500-221621-3	MW-17	Total/NA	Water	SM 4500 F C	
500-221621-4	Duplicate	Total/NA	Water	SM 4500 F C	
500-221621-5	MW-13	Total/NA	Water	SM 4500 F C	
MB 500-674042/31	Method Blank	Total/NA	Water	SM 4500 F C	
LCS 500-674042/32	Lab Control Sample	Total/NA	Water	SM 4500 F C	

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-221621-1

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 500-678975/9-A
Mat1ir : x ate1
AnalTsis Batyh: 678vv3

Client Sample ID: Method Blank
P1ep WTpe: Wbtal Reyoce1able
P1ep Batyh: 678975

AnalTte	MB Result	MB QualiUe1	RL	MDL	z nit	D	P1epa1ed	AnalTFed	Dil 4ay
Antimony	<0.0030		0.0030		mg/L		09/06/22 08:22	09/08/22 21:45	1
Arsenic	<0.0010		0.0010		mg/L		09/06/22 08:22	09/08/22 21:45	1
Barium	<0.0025		0.0025		mg/L		09/06/22 08:22	09/08/22 21:45	1
Beryllium	<0.0010		0.0010		mg/L		09/06/22 08:22	09/08/22 21:45	1
Cadmium	<0.00050		0.00050		mg/L		09/06/22 08:22	09/08/22 21:45	1
Calcium	0.219		0.20		mg/L		09/06/22 08:22	09/08/22 21:45	1
Chromium	<0.0050		0.0050		mg/L		09/06/22 08:22	09/08/22 21:45	1
Cobalt	<0.0010		0.0010		mg/L		09/06/22 08:22	09/08/22 21:45	1
Lead	<0.00050		0.00050		mg/L		09/06/22 08:22	09/08/22 21:45	1
Molybdenum	<0.0050		0.0050		mg/L		09/06/22 08:22	09/08/22 21:45	1
Selenium	<0.0025		0.0025		mg/L		09/06/22 08:22	09/08/22 21:45	1
Thallium	<0.0020		0.0020		mg/L		09/06/22 08:22	09/08/22 21:45	1

Lab Sample ID: MB 500-678975/9-A
Mat1ir : x ate1
AnalTsis Batyh: 6730f 9

Client Sample ID: Method Blank
P1ep WTpe: Wbtal Reyoce1able
P1ep Batyh: 678975

AnalTte	MB Result	MB QualiUe1	RL	MDL	z nit	D	P1epa1ed	AnalTFed	Dil 4ay
Boron	<0.050		0.050		mg/L		09/06/22 08:22	09/09/22 17:16	1
Lithium	<0.010	^+	0.010		mg/L		09/06/22 08:22	09/09/22 17:16	1

Lab Sample ID: LCS 500-678975/2-A
Mat1ir : x ate1
AnalTsis Batyh: 678vv3

Client Sample ID: Lab Cont1ol Sample
P1ep WTpe: Wbtal Reyoce1able
P1ep Batyh: 678975

AnalTte	Spike Added	LCS Result	LCS QualiUe1	z nit	D	%Rey	%Rey Limits
Antimony	0.500	0.520		mg/L		104	80 - 120
Arsenic	0.100	0.103		mg/L		103	80 - 120
Barium	0.500	0.555		mg/L		111	80 - 120
Beryllium	0.0500	0.0569		mg/L		114	80 - 120
Cadmium	0.0500	0.0529		mg/L		106	80 - 120
Calcium	10.0	11.0		mg/L		110	80 - 120
Chromium	0.200	0.226		mg/L		113	80 - 120
Cobalt	0.500	0.567		mg/L		113	80 - 120
Lead	0.100	0.114		mg/L		114	80 - 120
Molybdenum	1.00	1.01		mg/L		101	80 - 120
Selenium	0.100	0.104		mg/L		104	80 - 120
Thallium	0.100	0.114		mg/L		114	80 - 120

Lab Sample ID: LCS 500-678975/2-A
Mat1ir : x ate1
AnalTsis Batyh: 6730f 9

Client Sample ID: Lab Cont1ol Sample
P1ep WTpe: Wbtal Reyoce1able
P1ep Batyh: 678975

AnalTte	Spike Added	LCS Result	LCS QualiUe1	z nit	D	%Rey	%Rey Limits
Boron	1.00	1.05		mg/L		105	80 - 120
Lithium	0.100	0.110	^+	mg/L		110	80 - 120

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-221621-1

Method: 7370A - Me1yu1T (CVAA)

Lab Sample ID: MB 500-673932/92-A
Mat1ir: x ate1
AnalTsis Batyh: 6738v9

Client Sample ID: Method Blank
P1ep WTpe: Wotal/NA
P1ep Batyh: 673932

AnalTte	MB Result	MB QualiUe1	RL	MDL	z nit	D	P1epa1ed	AnalTFed	Dil 4ay
Mercury	<0.00020		0.00020		mg/L		09/12/22 10:20	09/13/22 07:49	1

Lab Sample ID: LCS 500-673932/95-A
Mat1ir: x ate1
AnalTsis Batyh: 6738v9

Client Sample ID: Lab Cont1ol Sample
P1ep WTpe: Wotal/NA
P1ep Batyh: 673932

AnalTte	Spike Added	LCS Result	LCS QualiUe1	z nit	D	%Rey	%Rey Limits
Mercury	0.00200	0.00171		mg/L		86	80 - 120

Lab Sample ID: 500-229629-9 MS
Mat1ir: x ate1
AnalTsis Batyh: 6738v9

Client Sample ID: Mx -95
P1ep WTpe: Wotal/NA
P1ep Batyh: 673932

AnalTte	Sample Result	Sample QualiUe1	Spike Added	MS Result	MS QualiUe1	z nit	D	%Rey	%Rey Limits
Mercury	<0.00020		0.00100	0.000967		mg/L		97	75 - 125

Lab Sample ID: 500-229629-9 MSD
Mat1ir: x ate1
AnalTsis Batyh: 6738v9

Client Sample ID: Mx -95
P1ep WTpe: Wotal/NA
P1ep Batyh: 673932

AnalTte	Sample Result	Sample QualiUe1	Spike Added	MSD Result	MSD QualiUe1	z nit	D	%Rey	%Rey Limits	RPD	RPD Limit
Mercury	<0.00020		0.00100	0.000932		mg/L		93	75 - 125	4	20

Lab Sample ID: 500-229629-9 Dz
Mat1ir: x ate1
AnalTsis Batyh: 6738v9

Client Sample ID: Mx -95
P1ep WTpe: Wotal/NA
P1ep Batyh: 673932

AnalTte	Sample Result	Sample QualiUe1	Dz Result	Dz QualiUe1	z nit	D	RPD	RPD Limit
Mercury	<0.00020		<0.00020		mg/L		NC	20

Method: SM 2530C - Solids, Wotal Dissolced (WDS)

Lab Sample ID: MB 500-678583/9
Mat1ir: x ate1
AnalTsis Batyh: 678583

Client Sample ID: Method Blank
P1ep WTpe: Wotal/NA

AnalTte	MB Result	MB QualiUe1	RL	MDL	z nit	D	P1epa1ed	AnalTFed	Dil 4ay
Total Dissolved Solids	<10		10		mg/L			09/07/22 17:16	1

Lab Sample ID: LCS 500-678583/2
Mat1ir: x ate1
AnalTsis Batyh: 678583

Client Sample ID: Lab Cont1ol Sample
P1ep WTpe: Wotal/NA

AnalTte	Spike Added	LCS Result	LCS QualiUe1	z nit	D	%Rey	%Rey Limits
Total Dissolved Solids	500	484		mg/L		97	80 - 120

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-221621-1

Method: SM 2530C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: 500-229629-8 MS
Matrix: Water
Analysis Batch: 678583

Client Sample ID: MW-97
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	1300		500	1660		mg/L		76	75 - 125

Lab Sample ID: 500-229629-8 DU
Matrix: Water
Analysis Batch: 678583

Client Sample ID: MW-97
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	1300		1260		mg/L		2	5

Method: SM 3500 Cl- E - Chloride, Total

Lab Sample ID: MB 500-678760/96
Matrix: Water
Analysis Batch: 678760

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<2.0		2.0		mg/L			09/09/22 17:23	1

Lab Sample ID: MB 500-678760/52
Matrix: Water
Analysis Batch: 678760

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<2.0		2.0		mg/L			09/09/22 17:48	1

Lab Sample ID: LCS 500-678760/97
Matrix: Water
Analysis Batch: 678760

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	20.0	19.8		mg/L		99	85 - 115

Lab Sample ID: LCS 500-678760/58
Matrix: Water
Analysis Batch: 678760

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	20.0	20.0		mg/L		100	85 - 115

Lab Sample ID: 500-229629-8 MS
Matrix: Water
Analysis Batch: 678760

Client Sample ID: MW-97
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	170		20.0	183	4	mg/L		68	75 - 125

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-221621-1

Method: SM 3500 Cl- E - Chlo1ide, W0tal (Continued)

Lab Sample ID: 500-229629-8 MSD
Mat1ir : x ate1
AnalTsis Batyh: 678f 60

Client Sample ID: Mx -97
P1ep WTpe: W0tal/NA

AnalTte	Sample Result	Sample QualiUe1	Spike Added	MSD Result	MSD QualiUe1	z nit	D	%Rey	%Rey Limits	RPD	RPD Limit
Chloride	170		20.0	183	4	mg/L		66	75 - 125	0	20

Method: SM 3500 4 C - 4luo1ide

Lab Sample ID: MB 500-673032/89
Mat1ir : x ate1
AnalTsis Batyh: 673032

Client Sample ID: Method Blank
P1ep WTpe: W0tal/NA

AnalTte	MB Result	MB QualiUe1	RL	MDL	z nit	D	P1epa1ed	AnalTFed	Dil 4ay
Fluoride	<0.10		0.10		mg/L			09/10/22 14:28	1

Lab Sample ID: LCS 500-673032/82
Mat1ir : x ate1
AnalTsis Batyh: 673032

Client Sample ID: Lab Cont1ol Sample
P1ep WTpe: W0tal/NA

AnalTte	Spike Added	LCS Result	LCS QualiUe1	z nit	D	%Rey	%Rey Limits
Fluoride	10.0	10.8		mg/L		108	90 - 119

Method: SM 3500 SO3 E - SulUate, W0tal

Lab Sample ID: MB 500-678f 65/96
Mat1ir : x ate1
AnalTsis Batyh: 678f 65

Client Sample ID: Method Blank
P1ep WTpe: W0tal/NA

AnalTte	MB Result	MB QualiUe1	RL	MDL	z nit	D	P1epa1ed	AnalTFed	Dil 4ay
Sulfate	<5.0		5.0		mg/L			09/09/22 19:01	1

Lab Sample ID: MB 500-678f 65/3f
Mat1ir : x ate1
AnalTsis Batyh: 678f 65

Client Sample ID: Method Blank
P1ep WTpe: W0tal/NA

AnalTte	MB Result	MB QualiUe1	RL	MDL	z nit	D	P1epa1ed	AnalTFed	Dil 4ay
Sulfate	<5.0		5.0		mg/L			09/09/22 19:22	1

Lab Sample ID: LCS 500-678f 65/97
Mat1ir : x ate1
AnalTsis Batyh: 678f 65

Client Sample ID: Lab Cont1ol Sample
P1ep WTpe: W0tal/NA

AnalTte	Spike Added	LCS Result	LCS QualiUe1	z nit	D	%Rey	%Rey Limits
Sulfate	20.0	20.9		mg/L		105	88 - 123

Lab Sample ID: LCS 500-678f 65/50
Mat1ir : x ate1
AnalTsis Batyh: 678f 65

Client Sample ID: Lab Cont1ol Sample
P1ep WTpe: W0tal/NA

AnalTte	Spike Added	LCS Result	LCS QualiUe1	z nit	D	%Rey	%Rey Limits
Sulfate	20.0	21.1		mg/L		106	88 - 123

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-221621-1

Method: SM 3500 SO3 E - Sulfate, Total (Continued)

Lab Sample ID: 500-229629-5 MS
Matrix: Water
Analysis Batch: 678765

Client Sample ID: MW-98
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Sulfate	790	F1	20.0	889	4	mg/L		496	75 - 125		

Lab Sample ID: 500-229629-5 MSD
Matrix: Water
Analysis Batch: 678765

Client Sample ID: MW-98
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Sulfate	790	F1	20.0	790	4	mg/L		-3	75 - 125	12	20

Eurofins Chicago
2417 Bond Street
University Park IL 60484
Phone 708-534-5200 Fax 708-534-5211

Chain of Custody Record

MKE 232

eurofins

Client Information	Sampler	Lab PM	Carrier Tracking No(s)	COC No.
	Kaelyn Sperle	Mockler Diana J		500-104269-44026 1
Client Contact	Phone	E-Mail	State of Origin	Page
Mitchel Dolan	262-278-1621	Diana.Mockler@et.eurofinsus.com	IL	Page 1 of 1
Company	PWS.D	Analysis Requested		Job #:
KPRG and Associates Inc				500-221621

Address: 414 Plaza Drive Suite 106	Due Date Requested: Standard	Preservation Codes
City: Westmont	TAT Requested (days): Standard	A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I Ice, J - DI Water, K - EDTA, L - EDA, M Hexane, N None, O AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S H2SO4, T TSP Dodecahydrate, U Acetone, V MCAA, W pH 4-5, Y - Trizma, Z other (specify)
State, Zip: IL 60559	Compliance Project: Δ Yes Δ No	
Phone: 262-781-0475(Tel)	PO #: 4502081030	
Email: mitcheld@kprginc.com	WO #:	
Project Name: Powerton CCR MCB	Project #: 50018578	
Site: Illinois	SSOW#:	Other:

500-221621 COC

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2540C, 4500_F_C, SM4500_Cl_E, SM4500_SO4_E	903.0 - Radium 226	904.0 - Radium 228	Ra226Ra228_GFPC - Rad Combined	6010C, 6020A, 7470A	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	D	D	D	D		
1 MW-15	8/31/22	1231	G	Water	N	N	X	X	X	X	X		
2 MW-14	8/31/22	1613	G	Water	N	N	X	X	X	X	X		
3 MW-17	8/31/22	1404	G	Water	N	N	X	X	X	X	X		
~~MW-16~~				Water									
~~MW-18~~				Water									
4 Duplicate	8/31/22	—	G	Water	N	N	X	X	X	X	X		
5 MW-13	8/31/22	1508	G	Water	N	N	X	X	X	X	X		
				Water									

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Kaelyn Sperle	8/31/22/1745	KPRG	FedEx	8/31/22/1745	FedEx
Relinquished by	Date/Time:	Company	Received by: Stephanie Hernandez	Date/Time: 9/1/22 0930	Company: EEHA
Relinquished by	Date/Time	Company	Received by	Date/Time	Company

Custody Seals Intact. Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks
		1.2-1.4.0

Ver 06/08/2021



ORIGIN ID:PIAA (262) 278-1621
KAELYN SPERLE
KPRG AND ASSOCIATES
414 PLAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 31AUG22
ACTWGT: 48.00 LB
CAD: 6994780/SSFE2322
DIMS: 24x13x13 IN

BILL THIRD PARTY

Part # 156297-435 REV02 EXP 04/23

TO EUROFINS CHICAGO
EUROFINS CHICAGO
2417 BOND ST

UNIVERSITY PARK IL 60484

(708) 534-5200 REF:
INV:
PO: DEPT:

FedEx Express

REL# 3785346

4 of 5

MPS# 0263 2774 5684 7077

Mstr# 2774 5684 7044

0201

XN JOTA

THU - 01 SEP 10:30A
PRIORITY OVERNIGHT
AHS
60484
IL-US ORD

Eurofins Chicago
24 7 Bond Street
University Park IL 60484
Phone 708-534-5200 Fax 708-534-5211

Chain of Custody Record

MKE 232

eurofins

Client Information	Sampler: Kaelyn Sperle	Lab PM: Mockler Diana J	Carrier Tracking No(s):	COC No.: 500-104269-44026 1
Client Contact: Mitchel Dolan	Phone: 262-278-1621	E-Mail: Diana.Mockler@et.eurofinsus com	State of Origin: IL	Page: Page 1 of 1
Company: KPRG and Associates Inc.	PWSID:			Job #: 500-221621
Address: 414 Plaza Drive Suite 106	Due Date Requested: Standard			
City: Westmont	TAT Requested (days): standard			
State Zip: IL 60559	Compliance Project. Δ Yes Δ No			
Phone: 262-781-0475(Tel)	PO #: 4502081030			
Email: mitchel@kprginc.com	WO #:			
Project Name: Powerton CCR MCB	Project #: 50018578			
Site:	SSOW#:			

500-221621 COC

Analysis Requested

Preservation Codes:
A HCL, B - NaOH, C Zn Acetate, D - Nitric Acid, E - NaHSO4, F MeOH, G - Amchlor, H - Ascorbic Acid, I Ice, J - DI Water, K - EDTA, L EDA, M Hexane, N None, O AsNaO2, P - Na2O4S, Q - Na2SO3, R Na2S2O3, S H2SO4, T TSP Dodecahydrate, U Acetone, V MCAA, W pH 4-5, Y Trizma, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2540C, 4500_F_C, SM4500_Cl_E, SM4500_SO4_E	903.0 - Radium 226	904.0 - Radium 228	Ra226Ra228_GFPC Rad Combined	6010C, 6020A, 7470A	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	D	D	D	D	X	
[redacted]				Water									
[redacted]				Water									
[redacted]				Water									
6 MW-20	9/1/22	1015	G	Water									
[redacted]				Water	N	N	X	X	X	X	X		
[redacted]				Water									
[redacted]				Water									
				Water									

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Kaelyn Sperle	9/1/22/1400	KPRG	FedEx	9/1/22/1400	FedEx
			[illegible]	9/2/22 1000	EETA

Custody Seals Intact. Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks
		125→123

Ver 06/08/2021

9/29/2022


ORIGIN ID:PIAA (000) 000-0000
KPRG AND ASSOCIATES
414 PLAZA DR STE 106
WESTMONT, IL 60559
UNITED STATES US
SHIP DATE: 01SEP22
ACTWGT: 25.90 LB
CAD: 6994779/SSFE2322
DIMS: 24x18x12 IN
BILL THIRD PARTY
TO SAMPLE RECEIVING
EUROFINS CHICAGO
2417 BOND ST
UNIVERSITY PARK IL 60484
(708) 534-6211
INV:
PO:
REF:
DEPT:
500-221621 Waybi
FedEx
Express
2 of 2
MPS# 2774 9228 5985
0263
Mstr# 2774 9228 5974
0201
XN JOTA
FRI - 02 SEP 10:30A
PRIORITY OVERNIGHT
60484
IL-US ORD

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-221621-1

Login Number: 221621
List Number: 1
Creator: Hernandez, Stephanie

List Source: Eurofins Chicago

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	
Cooler Temperature is acceptable.	False	
Cooler Temperature is recorded.	True	14.0,12.3
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR p C3

Job ID: 500-221621-1

Client Sample ID: MW-01

Date Collected: 58/30/22 02:30
Date 9 eceiRed: 5v/50/22 5v:35

Lab Sample ID: 155-220620-0

Matrix: Water

Prep Type	Batch Type	Batch Method	9un	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
9otal RecoHerable	PreB	E005A			68E185	3D7	779 CTI	0v/06/22 04:22 - 0v/06/22 04:52 ¹
9otal RecoHerable	Analysis	6020A		1	68E44F	XMG	779 CTI	0v/04/22 22:26
9otal RecoHerable	PreB	E005A			68E185	3D7	779 CTI	0v/06/22 04:22 - 0v/06/22 04:52 ¹
9otal RecoHerable	Analysis	6020A		5	68F0v1	XMG	779 CTI	0v/0v/22 18:2E
9otal RecoHerable	PreB	E005A			68E185	3D7	779 CTI	0v/06/22 04:22 - 0v/06/22 04:52 ¹
9otal RecoHerable	Analysis	6020A		1	68FFF0	XMG	779 CTI	0v/1E/22 12:F4
9otal/NA	PreB	8F80A			68F1F2	p JG	779 CTI	0v/12/22 10:20 - 0v/12/22 12:20 ¹
9otal/NA	Analysis	8F80A		1	68FE41	p JG	779 CTI	0v/1E/22 0v:16
9otal/NA	Analysis	Sp 25F0C		1	68E5EF	Sp O	779 CTI	0v/08/22 18:16
9otal/NA	Analysis	Sp F500 Cl- 7		10	68Ev60	LP	779 CTI	0v/0v/22 18:E1
9otal/NA	Analysis	Sp F500 X C		1	68F0F2	7A9	779 CTI	0v/10/22 15:01
9otal/NA	Analysis	Sp F500 SOF 7		50	68Ev65	LP	779 CTI	0v/0v/22 1v:21

Client Sample ID: MW-04

Date Collected: 58/30/22 06:03
Date 9 eceiRed: 5v/50/22 5v:35

Lab Sample ID: 155-220620-2

Matrix: Water

Prep Type	Batch Type	Batch Method	9un	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
9otal RecoHerable	PreB	E005A			68E185	3D7	779 CTI	0v/06/22 04:22 - 0v/06/22 04:52 ¹
9otal RecoHerable	Analysis	6020A		1	68E44F	XMG	779 CTI	0v/04/22 22:2v
9otal RecoHerable	PreB	E005A			68E185	3D7	779 CTI	0v/06/22 04:22 - 0v/06/22 04:52 ¹
9otal RecoHerable	Analysis	6020A		5	68F0v1	XMG	779 CTI	0v/0v/22 18:26
9otal RecoHerable	PreB	E005A			68E185	3D7	779 CTI	0v/06/22 04:22 - 0v/06/22 04:52 ¹
9otal RecoHerable	Analysis	6020A		1	68FFF0	XMG	779 CTI	0v/1E/22 12:51
9otal/NA	PreB	8F80A			68F1F2	p JG	779 CTI	0v/12/22 10:20 - 0v/12/22 12:20 ¹
9otal/NA	Analysis	8F80A		1	68FE41	p JG	779 CTI	0v/1E/22 0v:25
9otal/NA	Analysis	Sp 25F0C		1	68E5EF	Sp O	779 CTI	0v/08/22 18:16
9otal/NA	Analysis	Sp F500 Cl- 7		10	68Ev60	LP	779 CTI	0v/0v/22 18:E1
9otal/NA	Analysis	Sp F500 X C		1	68F0F2	7A9	779 CTI	0v/10/22 15:0F
9otal/NA	Analysis	Sp F500 SOF 7		50	68Ev65	LP	779 CTI	0v/0v/22 1v:22

Client Sample ID: MW-07

Date Collected: 58/30/22 04:54
Date 9 eceiRed: 5v/50/22 5v:35

Lab Sample ID: 155-220620-3

Matrix: Water

Prep Type	Batch Type	Batch Method	9un	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
9otal RecoHerable	PreB	E005A			68E185	3D7	779 CTI	0v/06/22 04:22 - 0v/06/22 04:52 ¹
9otal RecoHerable	Analysis	6020A		1	68E44F	XMG	779 CTI	0v/04/22 22:EE
9otal RecoHerable	PreB	E005A			68E185	3D7	779 CTI	0v/06/22 04:22 - 0v/06/22 04:52 ¹
9otal RecoHerable	Analysis	6020A		1	68F0v1	XMG	779 CTI	0v/0v/22 18:E6
9otal RecoHerable	PreB	E005A			68E185	3D7	779 CTI	0v/06/22 04:22 - 0v/06/22 04:52 ¹
9otal RecoHerable	Analysis	6020A		1	68FFF0	XMG	779 CTI	0v/1E/22 12:55
9otal/NA	PreB	8F80A			68F1F2	p JG	779 CTI	0v/12/22 10:20 - 0v/12/22 12:20 ¹
9otal/NA	Analysis	8F80A		1	68FE41	p JG	779 CTI	0v/1E/22 0v:28

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR p C3

Job ID: 500-221621-1

Client Sample ID: MW-07

Lab Sample ID: 155-220620-3

Date Collected: 58/30/22 04:54

Matrix: Water

Date 9 eceiRed: 5v/50/22 5v:35

Prep Type	Batch Type	Batch Method	9 un	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
9otal/NA	Analysis	Sp 25F0C		1	68E5EF	Sp O	779 CTI	0v/08/22 18:16
9otal/NA	Analysis	Sp F500 Cl- 7		10	68Ev60	LP	779 CTI	0v/0v/22 18:F4
9otal/NA	Analysis	Sp F500 X C		1	68F0F2	7A9	779 CTI	0v/10/22 15:06
9otal/NA	Analysis	Sp F500 SOF 7		50	68Ev65	LP	779 CTI	0v/0v/22 1v:22

Client Sample ID: Duplicate

Lab Sample ID: 155-220620-4

Date Collected: 58/30/22 55:55

Matrix: Water

Date 9 eceiRed: 5v/50/22 5v:35

Prep Type	Batch Type	Batch Method	9 un	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
9otal RecoHerable	PreB	E005A			68E185	3D7	779 CTI	0v/06/22 04:22 - 0v/06/22 04:52 ¹
9otal RecoHerable	Analysis	6020A		1	68E44F	XMG	779 CTI	0v/04/22 22:E6
9otal RecoHerable	PreB	E005A			68E185	3D7	779 CTI	0v/06/22 04:22 - 0v/06/22 04:52 ¹
9otal RecoHerable	Analysis	6020A		5	68F0v1	XMG	779 CTI	0v/0v/22 18:F0
9otal RecoHerable	PreB	E005A			68E185	3D7	779 CTI	0v/06/22 04:22 - 0v/06/22 04:52 ¹
9otal RecoHerable	Analysis	6020A		1	68FFF0	XMG	779 CTI	0v/1E/22 12:54
9otal/NA	PreB	8F80A			68F1F2	p JG	779 CTI	0v/12/22 10:20 - 0v/12/22 12:20 ¹
9otal/NA	Analysis	8F80A		1	68FE41	p JG	779 CTI	0v/1E/22 0v:2v
9otal/NA	Analysis	Sp 25F0C		1	68E5EF	Sp O	779 CTI	0v/08/22 18:16
9otal/NA	Analysis	Sp F500 Cl- 7		10	68Ev60	LP	779 CTI	0v/0v/22 18:Fv
9otal/NA	Analysis	Sp F500 X C		1	68F0F2	7A9	779 CTI	0v/10/22 15:0v
9otal/NA	Analysis	Sp F500 SOF 7		50	68Ev65	LP	779 CTI	0v/0v/22 1v:22

Client Sample ID: MW-03

Lab Sample ID: 155-220620-1

Date Collected: 58/30/22 01:58

Matrix: Water

Date 9 eceiRed: 5v/50/22 5v:35

Prep Type	Batch Type	Batch Method	9 un	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
9otal RecoHerable	PreB	E005A			68E185	3D7	779 CTI	0v/06/22 04:22 - 0v/06/22 04:52 ¹
9otal RecoHerable	Analysis	6020A		1	68E44F	XMG	779 CTI	0v/04/22 22:F6
9otal RecoHerable	PreB	E005A			68E185	3D7	779 CTI	0v/06/22 04:22 - 0v/06/22 04:52 ¹
9otal RecoHerable	Analysis	6020A		5	68F0v1	XMG	779 CTI	0v/0v/22 18:FE
9otal RecoHerable	PreB	E005A			68E185	3D7	779 CTI	0v/06/22 04:22 - 0v/06/22 04:52 ¹
9otal RecoHerable	Analysis	6020A		1	68FFF0	XMG	779 CTI	0v/1E/22 1E:01
9otal/NA	PreB	8F80A			68F1F2	p JG	779 CTI	0v/12/22 10:20 - 0v/12/22 12:20 ¹
9otal/NA	Analysis	8F80A		1	68FE41	p JG	779 CTI	0v/1E/22 0v:E5
9otal/NA	Analysis	Sp 25F0C		1	68E5EF	Sp O	779 CTI	0v/08/22 18:16
9otal/NA	Analysis	Sp F500 Cl- 7		10	68Ev60	LP	779 CTI	0v/0v/22 18:Fv
9otal/NA	Analysis	Sp F500 X C		1	68F0F2	7A9	779 CTI	0v/10/22 15:11
9otal/NA	Analysis	Sp F500 SOF 7		100	68Ev65	LP	779 CTI	0v/0v/22 1v:2E

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR p C3

Job ID: 500-221621-1

Client Sample ID: MW-25

Date Collected: 5v/50/22 05:01
Date 9 eceiRed: 5v/52/22 05:55

Lab Sample ID: 155-220620-6

Matrix: Water

Prep Type	Batch Type	Batch Method	9un	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
9otal RecoHerable	PreB	E005A			68E185	3D7	779 CTI	0v/06/22 04:22 - 0v/06/22 04:52 [1]
9otal RecoHerable	Analysis	6020A		1	68E44F	XMG	779 CTI	0v/04/22 22:50
9otal RecoHerable	PreB	E005A			68E185	3D7	779 CTI	0v/06/22 04:22 - 0v/06/22 04:52 [1]
9otal RecoHerable	Analysis	6020A		5	68F0v1	XMG	779 CTI	0v/0v/22 18:F8
9otal RecoHerable	PreB	E005A			68E185	3D7	779 CTI	0v/06/22 04:22 - 0v/06/22 04:52 [1]
9otal RecoHerable	Analysis	6020A		1	68FFF0	XMG	779 CTI	0v/1E/22 1E:05
9otal/NA	PreB	8F80A			68F1F2	p JG	779 CTI	0v/12/22 10:20 - 0v/12/22 12:20 [1]
9otal/NA	Analysis	8F80A		1	68FE41	p JG	779 CTI	0v/1E/22 0v:E8
9otal/NA	Analysis	Sp F500 Cl- 7		10	68Ev60	LP	779 CTI	0v/0v/22 18:Fv
9otal/NA	Analysis	Sp F500 SOF 7		50	68Ev65	LP	779 CTI	0v/0v/22 1v:E4

[1] ComBletion dates and times are reBorted or not reBorted Ber method requirements or indiHdual lab discretion.

Laboratory 9eferences:

779 CTI = 7urofins Chicago, 2F18 3ond Street, UniHersity Park, IL 60F4F, 97L (804)5EF-5200

Accreditation/Certification Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-221621-1

Laboratory: Eurofins Chicago

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Illinois	NELAP	IL00035	04-30-23

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Tel: (708)534-5200

Laboratory Job ID: 500-221621-2
Client Project/Site: Powerton CCR MCB (RAD)

For:
KPRG and Associates, Inc.
14665 West Lisbon Road,
Suite 1A
Brookfield, Wisconsin 53005

Attn: Richard Gnat

Diana Mockler

Authorized for release by:
9/30/2022 8:33:03 AM

Diana Mockler, Project Manager I
(219)252-7570
Diana.Mockler@et.eurofinsus.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB (RAD)

Job ID: 500-221621-2

Job ID: 500-221621-2

Laboratory: Eurofins Chicago

Narrative

Job Narrative
500-221621-2

Comments
No additional comments.

Receipt
The samples were received on 9/1/2022 9:30 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 12.3º C and 14.0º C.

Receipt Exceptions
The following sample(s) was received at the laboratory outside the required temperature criteria: Samples #1-5 for TDS, Chloride,Fluoride and Sulfate. No ice in cooler just water. Receiving cooler temp 14.0°C .

RAD
Methods 903.0, 9315: Radium-226 batch 581076
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
MW-15 (500-221621-1), MW-14 (500-221621-2), MW-17 (500-221621-3), Duplicate (500-221621-4), MW-13 (500-221621-5), MW-20 (500-221621-6), (LCS 160-581076/2-A), (MB 160-581076/1-A), (500-221498-K-14-A) and (500-221498-L-14-D DU)

Methods 904.0, 9320: Radium-228 batch 583206
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
MW-15 (500-221621-1), MW-14 (500-221621-2), MW-17 (500-221621-3), Duplicate (500-221621-4), MW-13 (500-221621-5), MW-20 (500-221621-6), (LCS 160-583206/2-A), (MB 160-583206/1-A), (500-221498-J-14-A) and (500-221498-J-14-B DU)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Method Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB (RAD)

Job ID: 500-221621-2

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	EET SL
904.0	Radium-228 (GFPC)	EPA	EET SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	EET SL
PrecSep_0	Preparation, Precipitate Separation	None	EET SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	EET SL

Protocol References:

EPA = US Environmental Protection Agency

None = None

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB (RAD)

Job ID: 500-221621-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-221621-1	MW-15	Water	08/31/22 12:31	09/01/22 09:30
500-221621-2	MW-14	Water	08/31/22 16:13	09/01/22 09:30
500-221621-3	MW-17	Water	08/31/22 14:04	09/01/22 09:30
500-221621-4	Duplicate	Water	08/31/22 00:00	09/01/22 09:30
500-221621-5	MW-13	Water	08/31/22 15:08	09/01/22 09:30
500-221621-6	MW-20	Water	09/01/22 10:15	09/02/22 10:00

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB (RAD)

Job ID: 500-221621-2

Client Sample ID: MW-15

Date Collected: 08/31/22 12:31
Date Recei9ed: 0v/01/22 0v:30

Lab Sample ID: 500-221621-1

Matrix: Water

Method: v03.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.130		0.0891	0.0899	1.00	0.125	pCi/L	09/07/22 12:48	09/29/22 08:09	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	913		40 - 110	09/06/22 1254:	09/29/22 0: 509	1

Method: v04.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.513	U	0.330	0.332	1.00	0.513	pCi/L	09/22/22 15:49	09/29/22 12:12	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	963		40 - 110	09/22/22 1. 549	09/29/22 1251 2	1
Y Carrier	: . 32		40 - 110	09/22/22 1. 549	09/29/22 1251 2	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.548		0.342	0.344	5.00	0.513	pCi/L		09/29/22 18:28	1

Client Sample ID: MW-14

Date Collected: 08/31/22 16:13
Date Recei9ed: 0v/01/22 0v:30

Lab Sample ID: 500-221621-2

Matrix: Water

Method: v03.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.182		0.114	0.115	1.00	0.157	pCi/L	09/07/22 12:48	09/29/22 08:09	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	683		40 - 110	09/06/22 1254:	09/29/22 0: 509	1

Method: v04.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.561		0.349	0.353	1.00	0.517	pCi/L	09/22/22 15:49	09/29/22 12:11	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	943		40 - 110	09/22/22 1. 549	09/29/22 1251 1	1
Y Carrier	: 63		40 - 110	09/22/22 1. 549	09/29/22 1251 1	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB (RAD)

Job ID: 500-221621-2

Client Sample ID: MW-14
Date Collected: 08/31/22 16:13
Date Recei9ed: 0v/01/22 0v:30

Lab Sample ID: 500-221621-2
Matrix: Water

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.743		0.367	0.371	5.00	0.517	pCi/L		09/29/22 18:28	1

Client Sample ID: MW-17
Date Collected: 08/31/22 14:04
Date Recei9ed: 0v/01/22 0v:30

Lab Sample ID: 500-221621-3
Matrix: Water

Method: v03.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.134	U	0.0864	0.0869	1.00	0.134	pCi/L	09/07/22 12:48	09/29/22 08:09	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*923*		*40 - 110*	*09/06/22 1254:*	*09/29/22 0: 509*	*1*

Method: v04.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.613		0.357	0.362	1.00	0.525	pCi/L	09/22/22 15:49	09/29/22 12:12	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*9: 37*		*40 - 110*	*09/22/22 1. 549*	*09/29/22 125 12*	*1*
Y Carrier	*: 834*		*40 - 110*	*09/22/22 1. 549*	*09/29/22 125 12*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.708		0.367	0.372	5.00	0.525	pCi/L		09/29/22 18:28	1

Client Sample ID: Duplicate
Date Collected: 08/31/22 00:00
Date Recei9ed: 0v/01/22 0v:30

Lab Sample ID: 500-221621-4
Matrix: Water

Method: v03.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.133	U	0.0774	0.0775	1.00	0.133	pCi/L	09/07/22 12:48	09/29/22 08:09	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*903*		*40 - 110*	*09/06/22 1254:*	*09/29/22 0: 509*	*1*

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB (RAD)

Job ID: 500-221621-2

Client Sample ID: Duplicate

Date Collected: 08/31/22 00:00
Date Recei9ed: 0v/01/22 0v:30

Lab Sample ID: 500-221621-4

Matrix: Water

Method: v04.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.705		0.364	0.369	1.00	0.515	pCi/L	09/22/22 15:49	09/29/22 12:12	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*943*		*40 - 110*	*09/22/22 1. 549*	*09/29/22 125 12*	*1*
Y Carrier	*: : 32*		*40 - 110*	*09/22/22 1. 549*	*09/29/22 125 12*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.755		0.372	0.377	5.00	0.515	pCi/L		09/29/22 18:28	1

Client Sample ID: MW-13

Date Collected: 08/31/22 15:08
Date Recei9ed: 0v/01/22 0v:30

Lab Sample ID: 500-221621-5

Matrix: Water

Method: v03.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.224		0.0952	0.0973	1.00	0.0978	pCi/L	09/07/22 12:48	09/29/22 08:09	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*903*		*40 - 110*	*09/06/22 1254:*	*09/29/22 0: 509*	*1*

Method: v04.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.5v5		0.312	0.316	1.00	0.436	pCi/L	09/22/22 15:49	09/29/22 12:12	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*102*		*40 - 110*	*09/22/22 1. 549*	*09/29/22 125 12*	*1*
Y Carrier	*: 63*		*40 - 110*	*09/22/22 1. 549*	*09/29/22 125 12*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.81v		0.326	0.331	5.00	0.436	pCi/L		09/29/22 18:28	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB (RAD)

Job ID: 500-221621-2

Client Sample ID: MW-20

Date Collected: 0v/01/22 10:15
Date Recei9ed: 0v/02/22 10:00

Lab Sample ID: 500-221621-6

Matrix: Water

Method: v03.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.180**		0.0927	0.0941	1.00	0.112	pCi/L	09/07/22 12:48	09/29/22 08:09	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*903*		*40 - 110*	*09/06/22 125*4:*	*09/29/22 0: 509*	*1*

Method: v04.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.441	U	0.294	0.297	1.00	0.441	pCi/L	09/22/22 15:49	09/29/22 12:12	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*9. 37*		*40 - 110*	*09/22/22 1. 549*	*09/29/22 125*12*	*1*
Y Carrier	*: 631*		*40 - 110*	*09/22/22 1. 549*	*09/29/22 125*12*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.5v6**		0.308	0.312	5.00	0.441	pCi/L		09/29/22 18:28	1

Definitions/Glossary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB (RAD)

Job ID: 500-221621-2

Qualifiers

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

QC Association Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB (RAD)

Job ID: 500-221621-2

Rad

Prep Batch: 581076

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221621-1	MW-15	Total/NA	Water	PrecSep-21	
500-221621-2	MW-14	Total/NA	Water	PrecSep-21	
500-221621-3	MW-17	Total/NA	Water	PrecSep-21	
500-221621-4	Duplicate	Total/NA	Water	PrecSep-21	
500-221621-5	MW-13	Total/NA	Water	PrecSep-21	
500-221621-6	MW-20	Total/NA	Water	PrecSep-21	
MB 160-581076/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-581076/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 583206

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221621-1	MW-15	Total/NA	Water	PrecSep_0	
500-221621-2	MW-14	Total/NA	Water	PrecSep_0	
500-221621-3	MW-17	Total/NA	Water	PrecSep_0	
500-221621-4	Duplicate	Total/NA	Water	PrecSep_0	
500-221621-5	MW-13	Total/NA	Water	PrecSep_0	
500-221621-6	MW-20	Total/NA	Water	PrecSep_0	
MB 160-583206/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-583206/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB (RAD)

Job ID: 500-221621-2

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-581076/1-A
Matrix: Water
Analysis Batch: 583994

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 581076

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radi89 -226	30.040p	7	0.06uu	0.06up	1.00	0.040p	mCi/<	04/0L/22 12:up	04/24/22 0p:01	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95.6*		*40 - 110*	*09/07/22 12:48*	*09/29/22 08:01*	*1*

Lab Sample ID: LCS 160-581076/2-A
Matrix: Water
Analysis Batch: 583994

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 581076

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radi89 -226			11.U	4.p40		1.0u	1.00	0.042U	mCi/<	pL	L5 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*95.3*		*40 - 110*

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-583206/1-A
Matrix: Water
Analysis Batch: 584007

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 583206

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radi89 -22p	0.p6u1		0.u01	0.u04	1.00	0.5U1	mCi/<	04/22/22 15:u4	04/24/22 12:0u	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*80.0*		*40 - 110*	*09/22/22 15:49*	*09/29/22 12:04*	*1*
Y Carrier	*83.4*		*40 - 110*	*09/22/22 15:49*	*09/29/22 12:04*	*1*

Lab Sample ID: LCS 160-583206/2-A
Matrix: Water
Analysis Batch: 584007

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 583206

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radi89 -22p			p.2u	p.u42		1.15	1.00	0.uL2	mCi/<	10U	L5 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*94.8*		*40 - 110*
Y Carrier	*85.6*		*40 - 110*

R000615

Eurofins Chicago
2417 Bond Street
University Park IL 60484
Phone 708-534-5200 Fax 708-534-5211

Chain of Custody Record

MKE 232

eurofins

Client Information	Sampler: Kaelyn Sperle	Lab PM: Mockler Diana J	Carrier Tracking No(s):	COC No.: 500-104269-44026 1
Client Contact: Mitchel Dolan	Phone: 262-278-1621	E-Mail: Diana.Mockler@et.eurofinsus com	State of Origin: IL	Page: Page 1 of 1
Company: KPRG and Associates Inc	PWS.D:			Job #: 500-221621
Address: 414 Plaza Drive Suite 106	Due Date Requested: Standard			
City: Westmont	TAT Requested (days): Standard			
State Zip: IL 60559	Compliance Project. Δ Yes Δ No			
Phone: 262-781-0475(Tel)	PO #: 4502081030			
Email: mitcheld@kprginc.com	WO #:			
Project Name: Powerton CCR MCB	Project #: 50018578			
Site: Illinois	SSOW#:			

Analysis Requested

500-221621 COC

Preservation Codes

A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I Ice
J - DI Water
K - EDTA
L - EDA
M Hexane
N None
O AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S H2SO4
T TSP Dodecahydrate
U Acetone
V MCAA
W pH 4-5
Y - Trizma
Z other (specify)
Other:

	Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2540C, 4500_F_C, SM4500_Cl_E, SM4500_SO4_E	903.0 - Radium 226	904.0 - Radium 228	Ra226Ra228_GFPC - Rad Combined	6010C, 6020A, 7470A	Total Number of containers	Special Instructions/Note:
				Preservation Code				N	D	D	D	D		
1	MW-15	8/31/22	1231	G	Water	N	N	X	X	X	X	X		
2	MW-14	8/31/22	1613	G	Water	N	N	X	X	X	X	X		
3	MW-17	8/31/22	1404	G	Water	N	N	X	X	X	X	X		
	~~MW-20~~				Water									
	~~MW-21~~				Water									
4	Duplicate	8/31/22	—	G	Water	N	N	X	X	X	X	X		
5	MW-13	8/31/22	1508	G	Water	N	N	X	X	X	X	X		
					Water									

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Kaelyn Sperle	8/31/22/1745	KPRG	FedEx	8/31/22/1745	FedEx
			Stephanie Hernandez	9/1/22 0930	EETA

Custody Seals Intact. Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks
		14.2 → 14.0

Ver 06/08/2021

9/30/2022



ORIGIN ID:PIAA (262) 278-1621
KAELYN SPERLE
KPRG AND ASSOCIATES
414 PLAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 31AUG22
ACTWGT: 48.00 LB
CAD: 6994780/SSFE2322
DIMS: 24x13x13 IN

BILL THIRD PARTY

Part # 156297-435 RRDB2 EXP 04/23

TO **EUROFINS CHICAGO**
EUROFINS CHICAGO
2417 BOND ST

UNIVERSITY PARK IL 60484

(708) 534-5200 REF:
INV:
PO: DEPT:

FedEx
Express

E

REL#
3785346

4 of 5

MPS# 0263 **2774 5684 7077**

Mstr# 2774 5684 7044 0201

XN JOTA

THU - 01 SEP 10:30A
PRIORITY OVERNIGHT
AHS
60484
IL-US **ORD**

Eurofins Chicago
24 7 Bond Street
University Park IL 60484
Phone 708-534-5200 Fax 708-534-5211

Chain of Custody Record

MKE 232

eurofins

Client Information	Sampler: Kaelyn Sperle	Lab PM: Mockler Diana J	Carrier Tracking No(s):	COC No.: 500-104269-44026 1
Client Contact: Mitchel Dolan	Phone: 262-278-1621	E-Mail: Diana.Mockler@et.eurofinsus com	State of Origin: IL	Page: Page 1 of 1
Company: KPRG and Associates Inc.	PWSID:			Job #: 500-221621
Address: 414 Plaza Drive Suite 106	Due Date Requested: Standard			
City: Westmont	TAT Requested (days): standard			
State Zip: IL 60559	Compliance Project: Δ Yes Δ No			
Phone: 262-781-0475(Tel)	PO #: 4502081030			
Email: mitchel@kprginc.com	WO #:			
Project Name: Powerton CCR MCB	Project #: 50018578			
Site:	SSOW#:			

500-221621 COC

Analysis Requested

Preservation Codes:
A HCL, B - NaOH, C Zn Acetate, D - Nitric Acid, E - NaHSO4, F MeOH, G - Amchlor, H - Ascorbic Acid, I Ice, J - DI Water, K - EDTA, L EDA, M Hexane, N None, O AsNaO2, P - Na2O4S, Q - Na2SO3, R Na2S2O3, S H2SO4, T TSP Dodecahydrate, U Acetone, V MCAA, W pH 4-5, Y Trizma, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2540C, 4500_F_C, SM4500_Cl_E, SM4500_SO4_E	903.0 - Radium 226	904.0 - Radium 228	Ra226Ra228_GFPC Rad Combined	6010C, 6020A, 7470A	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	D	D	D	D	X	
[redacted]				Water									
[redacted]				Water									
[redacted]				Water									
6 MW-20	9/1/22	1015	G	Water									
[redacted]				Water	N	N	X	X	X	X	X		
[redacted]				Water									
[redacted]				Water									
				Water									

Possible Hazard Identification: [X] Non-Hazard [ ] Flammable [ ] Skin Irritant [ ] Poison B [ ] Unknown [ ] Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): [ ] Return To Client [X] Disposal By Lab [ ] Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Kaelyn Sperle	9/1/22/1400	KPRG	FedEx	9/1/22/1400	FedEx
			[signature]	9/2/22 1000	EETA

Custody Seals Intact: Δ Yes Δ No | Custody Seal No | Cooler Temperature(s) °C and Other Remarks: 125→123

Ver 06/08/2021

9/30/2022



ORIGIN ID:PIAA (000) 000-0000

KPRG AND ASSOCIATES
414 PLAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 01SEP22
ACTWGT: 25.90 LB
CAD: 6994779/SSFE2322
DIMS: 24x18x12 IN

BILL THIRD PARTY

TO SAMPLE RECEIVING
EUROFINS CHICAGO
2417 BOND ST

UNIVERSITY PARK IL 60484
(708) 534-5211
INV:
PO:
REF:
DEPT:

500-221621 Waybi

Part # 1562[illegible] EXP 04/23

FedEx
Express

E

J223022031201uv

2 of 2
MPS# 0263 2774 9228 5985
Mstr# 2774 9228 5974

FRI - 02 SEP 10:30A
PRIORITY OVERNIGHT

0201

XN JOTA

60484
IL-US ORD

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone: 708-534-5200 Fax: 708-534-5211

Chain of Custody Record

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	COC No: 500-164875.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: Illinois	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Illinois		Job #: 500-221621-2
Address: 13715 Rider Trail North, ,	Due Date Requested: 9/23/2022			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Powerton CCR MCB (RAD)	Project #: 50018578			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_21 Standard Target List	904.0/PrecSep_0 Standard Target List	Ra226Ra228_GFPC	Total Number of containers	Special Instructions/Note:
				Preservation Code:							
MW-20 (500-221621-6)	9/1/22	10:15 Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no

Note: Since laboratory accreditations are subject to change, Eurofins Chicago places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Chicago laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Chicago attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Chicago.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	FED EX	9/2/22 1530	EETA	FED EX		
2	FED EX				SEP 06 2022 0820	ETASTL
3						

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-221621-2

Login Number: 221621
List Number: 1
Creator: Hernandez, Stephanie

List Source: Eurofins Chicago

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	
Cooler Temperature is acceptable.	False	
Cooler Temperature is recorded.	True	14.0,12.3
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-221621-2

Login Number: 221621
List Number: 2
Creator: Booker, Autumn R

List Source: Eurofins St. Louis
List Creation: 09/02/22 11:56 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-221621-2

Login Number: 221621
List Number: 3
Creator: Booker, Autumn R

List Source: Eurofins St. Louis
List Creation: 09/06/22 11:59 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB (RAD)

Job ID: 500-221621-2

Client Sample ID: MW-01
Date Collected: 58/30/22 02:30
Date 9 eceiRed: 5v/50/22 5v:35

Lab Sample ID: 155-220620-0
Matrix: Water

Prep Type	Batch Type	Batch Method	9 un	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			581076	TJ	EET SL	09/07/22 12:48
Total/NA	Analysis	903.0		1	584004	FLC	EET SL	09/29/22 08:09
Total/NA	Prep	PrecSep_0			583206	ASG	EET SL	09/22/22 15:49
Total/NA	Analysis	904.0		1	583994	FLC	EET SL	09/29/22 12:12
Total/NA	Analysis	Ra226_Ra228		1	584089	CLP	EET SL	09/29/22 18:28

Client Sample ID: MW-04
Date Collected: 58/30/22 06:03
Date 9 eceiRed: 5v/50/22 5v:35

Lab Sample ID: 155-220620-2
Matrix: Water

Prep Type	Batch Type	Batch Method	9 un	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			581076	TJ	EET SL	09/07/22 12:48
Total/NA	Analysis	903.0		1	584004	FLC	EET SL	09/29/22 08:09
Total/NA	Prep	PrecSep_0			583206	ASG	EET SL	09/22/22 15:49
Total/NA	Analysis	904.0		1	583994	FLC	EET SL	09/29/22 12:11
Total/NA	Analysis	Ra226_Ra228		1	584089	CLP	EET SL	09/29/22 18:28

Client Sample ID: MW-07
Date Collected: 58/30/22 04:54
Date 9 eceiRed: 5v/50/22 5v:35

Lab Sample ID: 155-220620-3
Matrix: Water

Prep Type	Batch Type	Batch Method	9 un	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			581076	TJ	EET SL	09/07/22 12:48
Total/NA	Analysis	903.0		1	584004	FLC	EET SL	09/29/22 08:09
Total/NA	Prep	PrecSep_0			583206	ASG	EET SL	09/22/22 15:49
Total/NA	Analysis	904.0		1	583994	FLC	EET SL	09/29/22 12:12
Total/NA	Analysis	Ra226_Ra228		1	584089	CLP	EET SL	09/29/22 18:28

Client Sample ID: Duplicate
Date Collected: 58/30/22 55:55
Date 9 eceiRed: 5v/50/22 5v:35

Lab Sample ID: 155-220620-4
Matrix: Water

Prep Type	Batch Type	Batch Method	9 un	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			581076	TJ	EET SL	09/07/22 12:48
Total/NA	Analysis	903.0		1	584004	FLC	EET SL	09/29/22 08:09
Total/NA	Prep	PrecSep_0			583206	ASG	EET SL	09/22/22 15:49
Total/NA	Analysis	904.0		1	583994	FLC	EET SL	09/29/22 12:12
Total/NA	Analysis	Ra226_Ra228		1	584089	CLP	EET SL	09/29/22 18:28

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB (RAD)

Job ID: 500-221621-2

Client Sample ID: MW-03

Lab Sample ID: 155-220620-1

Date Collected: 58/30/22 01:58

Matrix: Water

Date 9 eceiRed: 5v/50/22 5v:35

Prep Type	Batch Type	Batch Method	9 un	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			581076	TJ	EET SL	09/07/22 12:48
Total/NA	Analysis	903.0		1	584004	FLC	EET SL	09/29/22 08:09
Total/NA	Prep	PrecSep_0			583206	ASG	EET SL	09/22/22 15:49
Total/NA	Analysis	904.0		1	583994	FLC	EET SL	09/29/22 12:12
Total/NA	Analysis	Ra226_Ra228		1	584089	CLP	EET SL	09/29/22 18:28

Client Sample ID: MW-25

Lab Sample ID: 155-220620-6

Date Collected: 5v/50/22 05:01

Matrix: Water

Date 9 eceiRed: 5v/52/22 05:55

Prep Type	Batch Type	Batch Method	9 un	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			581076	TJ	EET SL	09/07/22 12:48
Total/NA	Analysis	903.0		1	584004	FLC	EET SL	09/29/22 08:09
Total/NA	Prep	PrecSep_0			583206	ASG	EET SL	09/22/22 15:49
Total/NA	Analysis	904.0		1	583994	FLC	EET SL	09/29/22 12:12
Total/NA	Analysis	Ra226_Ra228		1	584089	CLP	EET SL	09/29/22 18:28

Laboratory 9 eferences:

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: KPRG and Associates, Inc.
Job ID: 500-221621-2
Project/Site: Powerton CCR MCB (RAD)

Laboratory: Eurofins St. Louis

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Illinois	NELAP	200023	11-30-22

Tracer/Carrier Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB (RAD)

Job ID: 500-221621-2

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)
		Ba
Lab Sample ID	Client Sample ID	(40-110)
500-221621-1	MW-15	91.6
500-221621-2	MW-14	76.0
500-221621-3	MW-17	92.3
500-221621-4	Duplicate	90.9
500-221621-5	MW-13	90.9
500-221621-6	MW-20	90.9
LCS 160-581076/2-A	Lab Control Sample	95.3
MB 160-581076/1-A	Method Blank	95.6

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)	
		Ba	Y
Lab Sample ID	Client Sample ID	(40-110)	(40-110)
500-221621-1	MW-15	97.8	85.2
500-221621-2	MW-14	94.3	87.5
500-221621-3	MW-17	98.3	86.4
500-221621-4	Duplicate	94.3	88.2
500-221621-5	MW-13	102	87.5
500-221621-6	MW-20	95.3	87.1
LCS 160-583206/2-A	Lab Control Sample	94.8	85.6
MB 160-583206/1-A	Method Blank	80.0	83.4

Tracer/Carrier Legend

Ba = Ba Carrier
Y = Y Carrier

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ANALYTICAL REPORT

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Tel: (708)534-5200

Laboratory Job ID: 500-221621-3
Client Project/Site: Powerton CCR MCB MW-20 TDS/Fluoride)

For:
KPRG and Associates, Inc.
14665 West Lisbon Road,
Suite 1A
Brookfield, Wisconsin 53005

Attn: Richard Gnat

Diana Mockler

Authorized for release by:
10/12/2022 4:37:50 PM

Diana Mockler, Project Manager I
(219)252-7570
Diana.Mockler@et.eurofinsus.com

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB MW-20 TDS/Fluoride)

Job ID: 500-221621-3

Job ID: 500-221621-3

Laboratory: Eurofins Chicago

Narrative

Job Narrative
500-221621-3

Comments
No additional comments.

Receipt
The samples were received on 9/1/2022 9:30 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were -1.1º C, 12.3º C and 14.0º C.

Receipt Exceptions
The following sample(s) was received at the laboratory outside the required temperature criteria: Samples #1-5 for TDS, Chloride,Fluoride and Sulfate. No ice in cooler just water. Receiving cooler temp 14.0°C

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB MW-20 TDS/Fluoride)

Job ID: 500-221621-3

Method	Method Description	Protocol	Laboratory
SM 2540C	Solids, Total Dissolved (TDS)	SM	EET CHI
SM 4500 F C	Fluoride	SM	EET CHI

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater"

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Sample Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB MW-20 TDS/Fluoride)

Job ID: 500-221621-3

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-221621-7	MW-20	Water	09/29/22 08:00	09/30/22 09:15

Client Sample Results

Client: KPRG and Associates, Inc.
Job ID: 500-221621-3
Project/Site: Powerton CCR MCB MW-20 TDS/Fluoride)

Client Sample ID: MW-20
Date Collected: 09/29/22 08:00
Date Received: 09/30/22 09:15

Lab Sample ID: 500-221621-7
Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	2100		10		mg/L			09/30/22 14:08	1
Fluoride (SM 4500 F C)	0.15		0.10		mg/L			10/01/22 12:10	1

Definitions/Glossary

Client: KPRG and Associates, Inc. Job ID: 500-221621-3
Project/Site: Powerton CCR MCB MW-20 TDS/Fluoride)

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

QC Association Summary

Client: KPRG and Associates, Inc.
Job ID: 500-221621-3
Project/Site: Powerton CCR MCB MW-20 TDS/Fluoride)

General Chemistry

Analysis Batch: 677333

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221621-7	MW-20	Total/NA	Water	SM 2540C	
MB 500-677333/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 500-677333/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 677387

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221621-7	MW-20	Total/NA	Water	SM 4500 F C	
MB 500-677387/3	Method Blank	Total/NA	Water	SM 4500 F C	
LCS 500-677387/4	Lab Control Sample	Total/NA	Water	SM 4500 F C	

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB MW-20 TDS/Fluoride)

Job ID: 500-221621-3

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 500-677333/1
Matrix: Water
Analysis Batch: 677333

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<10		10		mg/L			09/30/22 14:08	1

Lab Sample ID: LCS 500-677333/2
Matrix: Water
Analysis Batch: 677333

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	250	240		mg/L		96	80 - 120

Method: SM 4500 F C - Fluoride

Lab Sample ID: MB 500-677387/3
Matrix: Water
Analysis Batch: 677387

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<0.10		0.10		mg/L			10/01/22 10:53	1

Lab Sample ID: LCS 500-677387/4
Matrix: Water
Analysis Batch: 677387

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Fluoride	10.0	10.2		mg/L		102	90 - 119

Eurofins TestAmerica, Chicago
2417 Bond Street
University Park IL 60484
Phone (708) 534-5200 Phone (708) 534-5211

Chain of Custody Record

eurofins

Client Information	Sampler: Kaelyn Sperle	Lab PM: Mockler Diana J	Carrier Tracking No(s):	COC No: 500-92070-41037 1
Client Contact: Mitchel Dolan	Phone: 262-278-1621	E-Mail: Diana Mockler@Eurofinset com	State of Origin: IL	Page: Page 1 of 1
Company: KPRG and Associates Inc	PWSID:			Job #: 500-221621
Address: 14665 West Lisbon Road Suite 1A	Due Date Requested: Standard			
City: Brookfield	TAT Requested (days): Standard			
State Zip: WI 53005	Compliance Project: Δ Yes Δ No			
Phone: 262 781 0475(Tel)	PO #: 4502051132			
Email: mitcheld@kprginc com	WO #:			
Project Name: Powerton CCR MCB	Project #: 50018578			
Site: Powerton Generating Station	SSOW#:			

Analysis Requested

500-221621 COC

Preservation Codes

A HCL	M Hexane
B NaOH	N None
C Zn Acetate	O AsNaO2
D Nitric Acid	P Na2O4S
E NaHSO4	Q Na2SO3
F MeOH	R Na2S2O3
G Amchlor	S H2SO4
H Ascorbic Acid	T TSP Dodecahydrate
I Ice	U Acetone
J DI Water	V MCAA
K EDTA	W pH 4-5
L EDA	Z other (specify)

Other:

	Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010C - Lithium, 6020A - *13 elemenets 7470A - Mercury	2540C - TDS	4500FC - Fluoride	SM00CLE - Chloride	SM4500SO4 - Sulfate	903- Rad 226	904 - Rad 228	Rad Combined	Total Number of containers	Special Instructions/Note.
				Preservation Code				D	N	N	N	N	D	D	D		
7	MW-20	9/29/22	0800	G	W	N	N		X	X						1	*Metals List Sb,As,Ba,Be,B,Cd,Ca,Cr,Co,Pb,Mo,SeTl
																	Project #~~500-[illegible]~~ #500-221621-1

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment.

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Kaelyn Sperle/KPRG	9/29/22/1345	KPRG	FedEx	9/29/22/1345	KPRG
			Stephanie Hernandez	9/30/22 0915	EEIA

Custody Seals Intact Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks
		-0.6+-1.1

Ver 01/16/2019

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-221621-T

Login Number: 221621
List Number: 1
Creator: Hernandez, Stephanie

List Source: Eurofins Chicago

Question	Answer	Comment
Radioactiyitw' asnht ckec<ed or is / =g bac<f round as measured bwa suryew meter.	vrue	
vke coolerhs custodwseal, ipSresent, is intact.	vrue	
FamSle custodwseals, ipSresent, are intact.	vrue	
vke cooler or samSles do not aSSear to kaye been comSromised or tamSered ' itk.	vrue	
FamSles ' ere receiyed on ice.	4alse	
Cooler vemSerature is acceStable.	4alse	
Cooler vemSerature is recorded.	vrue	13.0,12.T,-1.1 FamSles not proQen
C? C is Sresent.	vrue	
C? C is pilled out in in< and lef ible.	vrue	
C? C is pilled out ' itk all Sertinent inpormation.	vrue	
Is tke 4ield FamSlerhs name Sresent on C? CH	vrue	
vkere are no discreSancies bet' een tke containers receiyed and tke C? C.	vrue	
FamSles are receiyed ' itkin (oldinf vime xe) cludinf tests ' itk immediate (vsV	vrue	
FamSle containers kaye lef ible labels.	vrue	
Containers are not bro<en or lea<inf .	vrue	
FamSle collection date=times are Sroyided.	vrue	
ASSroSriate samSle containers are used.	vrue	
FamSle bottles are comSletelwpilled.	vrue	
FamSle Preseryation qeripied.	vrue	
vkere is supficient yol. por all reMuested analwses, incl. anwreMuested DF=DFz s	vrue	
Containers reMuirinf Qero keadsSace kaye no keadsSace or bubble is / 6mm x1=3"V	N=A	
DultiSkasic samSles are not Sresent.	vrue	
FamSles do not reMuire sSlittinf or comSositinf .	vrue	
Residual Cklorine Ckec<ed.	N=A	

Lab Chronicle

Client: KPRG and Associates, Inc.
Job ID: 500-221621-3
Project/Site: Powerton CCR MCB MW-20 TDS/Fluoride)

Client Sample ID: MW-20
Date Collected: 09/29/22 08:00
Date Received: 09/30/22 09:15

Lab Sample ID: 500-221621-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	SM 2540C		1	677333	SMO	EET CHI	09/30/22 14:08
Total/NA	Analysis	SM 4500 F C		1	677387	EAT	EET CHI	10/01/22 12:10

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Accreditation/Certification Summary

Client: KPRG and Associates, Inc.
Job ID: 500-221621-3
Project/Site: Powerton CCR MCB MW-20 TDS/Fluoride)

Laboratory: Eurofins Chicago

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Illinois	NELAP	IL00035	04-30-23

PROJECT NAME	NRG – POWERTON STATION (12313.1)		DATE	8/31/22
Sample Name	MW-13	Start Time	1455	
Condition of Well	good			
Water Level	32.01	Total Depth	–	
Well Diameter	PVC – 2 inch	Volume in Well	–	
Method of Purge	Low-Flow	Purge Characteristics	clear	
Volume Removed	4.5 gals	WL at Sample Time	33.51	
Method of Sample	Low-Flow	Sample Characteristics	clear	
Sample Analysis	CCA & MCB CCR	Sample Time	1508	
Water Quality Meter	YSI ProDss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1458	32.01	7.58	17.7	2.160	6.96	136.5	22.63
1501	–	7.60	15.6	2.729	2.22	106.2	46.12
1504	–	7.63	15.5	2.720	1.12	21.8	23.81
1507	33.51	7.64	15.4	2.709	0.77	-53.8	16.22

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION (12313.1)		DATE	8/31/22
Sample Name	MW-14	Start Time	1600	
Condition of Well	good			
Water Level	28.50	Total Depth	–	
Well Diameter	PVC – 2 inch	Volume in Well	–	
Method of Purge	Low-Flow	Purge Characteristics	cloudy, orange	
Volume Removed	4.5 gals	WL at Sample Time	32.10	
Method of Sample	Low-Flow	Sample Characteristics	sl. cloudy	
Sample Analysis	CCA, MCB CCR	Sample Time	1613	
Water Quality Meter	YSI ProDss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1603	28.50	7.01	17.3	2.630	5.27	131.6	142.10
1606	–	6.79	16.3	2.399	2.73	137.8	493.00
1609	–	6.75	16.0	2.394	1.90	139.5	75.96
1612	32.10	6.74	16.0	2.406	1.69	140.3	40.75

SAMPLING NOTES: 8/31/22 – well starts to go dry, stopped at 1502 to resume CCA sampling in the morning

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION (12313.1)		DATE	8/31/22
Sample Name	MW-15	Start Time	1220	
Condition of Well	good			
Water Level	25.44	Total Depth	–	
Well Diameter	PVC – 2 inch	Volume in Well	–	
Method of Purge	Low-Flow	Purge Characteristics	Cloudy, brown	
Volume Removed	4 gals	W L at Sample Time	25.44	
Method of Sample	Low-Flow	Sample Characteristics	sl. cloudy	
Sample Analysis	CCA, MCB + ABB/ASB CCR	Sample Time	1231	
Water Quality Meter	YSI ProDss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1221	25.44	7.05	17.7	3.376	7.37	131.5	16.90
1224	–	6.84	16.9	2.700	2.34	114.7	255.14
1227	–	6.81	16.5	2.667	1.13	82.8	73.76
1230	25.44	6.80	16.4	2.669	0.83	50.1	28.70

SAMPLING NOTES: MCB duplicate

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION (12313.1)		DATE	8/31/22
Sample Name	MW-17	Start Time	1353	
Condition of Well	good			
Water Level	25.95	Total Depth	–	
Well Diameter	PVC – 2 inch	Volume in Well	–	
Method of Purge	Low-Flow	Purge Characteristics	sl. cloudy	
Volume Removed	4 gals	WL at Sample Time	25.95	
Method of Sample	Low-Flow	Sample Characteristics	clear	
Sample Analysis	MCB & ABB/ASB CCR	Sample Time	1404	
Water Quality Meter	YSI ProDss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1355	25.95	7.25	17.8	2.503	5.82	137.7	73.56
1358	–	7.12	16.5	1.834	4.18	136.4	95.00
1401	–	7.10	16.1	1.809	4.83	136.7	34.38
1403	25.95	7.12	16.0	1.812	5.25	136.7	22.58

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION (12313.1)		DATE 9/1/22
Sample Name	MW-20	Start Time	1001
Condition of Well	good		
Water Level	31.22	Total Depth	–
Well Diameter	PVC – 2 inch	Volume in Well	–
Method of Purge	Low-Flow	Purge Characteristics	Clear
Volume Removed	0.5 gals	W L at Sample Time	31.22
Method of Sample	Low-Flow	Sample Characteristics	Clear
Sample Analysis	MCB CCR	Sample Time	1015
Water Quality Meter	YSI ProDss		

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1005	31.22	6.01	21.4	2.232	6.48	201.4	12.01
1008	–	6.24	20.7	2.203	5.55	199.1	23.66
1011	–	6.27	20.1	2.161	4.25	195.8	36.88
1014	31.22	6.28	19.9	2.106	2.85	193.3	63.50

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION (12313.1)		DATE	9/1/22
Sample Name	MW-21	Start Time	1224	
Condition of Well	good			
Water Level	32.04	Total Depth		
Well Diameter	PVC – 2 inch	Volume in Well		
Method of Purge	Low-Flow	Purge Characteristics		
Volume Removed		W L at Sample Time		
Method of Sample	Low-Flow	Sample Characteristics		
Sample Analysis	MCB CCR	Sample Time		
Water Quality Meter	YSI ProDss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)

SAMPLING NOTES:
Water below pump, left without sampling

Sampler Name and Company: KPRG and Associates KLS

DATA SUMMARY POSTING

Station: Midwest Generation Powerton Generating Station

Regulated Unit(s): Former Ash Basin (IEPA ID No. W1798010008-05)

In accordance with the new Ill. Adm. Code Title 35, Part 845: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments (State CCR Rule) groundwater monitoring was completed during the 3rd quarter 2022 which includes the entire list of parameters specified under Section 845.600(a)(1) and (b). Table 1 is a summary table of all available CCR monitoring data to date including any data generated previously as part of the Federal CCR Rule monitoring. In addition, Table 2 provides a summary of turbidity data which was collected as part of State CCR Rule requirements which is a data parameter that was not required under the Federal CCR Rule.

No background statistics or proposed Groundwater Protection Standards are included on these tables. The background statistics and Proposed Groundwater Protection Standards were submitted to Illinois Environmental Protection Agency (EPA) as part of the Application for Initial Operating Permit submitted October 31, 2021. Upon Illinois EPA approval of the Operating Permit and Proposed Groundwater Protection Standards, the approved comparison values will be included on the tables for subsequent data comparisons/evaluations.

Table 1. Groundwater Analytical Results - Midwest Generation, LLC, Powerton Station, Pekin, IL Former Ash Basin.

Well	Date	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Radium 226 + 228	Selenium	Thallium
MW-01 up-gradient	11/16/2015	1.0	98	44	0.17	7.07	93	530	< 0.003	< 0.001	0.057	^< 0.001	< 0.0005	< 0.005	< 0.001	* < 0.0005	< 0.01	< 0.0002	< 0.0050	0.744	< 0.0025	* < 0.002
	2/25/2016	0.2	110	42	0.16	7.23	54	460	< 0.003	0.0025	0.053	< 0.001	< 0.0005	< 0.005	0.0014	0.0019	< 0.01	< 0.0002	< 0.005	< 0.722	0.0029	< 0.002
	5/20/2016	0.34	100	44	0.17	6.95	65	430	< 0.003	0.0081	0.062	< 0.001	< 0.0005	0.007	0.0053	0.011	< 0.01	< 0.0002	< 0.005	< 0.953	< 0.0025	< 0.002
	8/17/2016	0.27	78	39	0.25	7.16	50	530	< 0.003	0.0014	0.048	< 0.001	< 0.0005	< 0.005	< 0.001	0.0014	< 0.01	< 0.0002	0.0057	< 0.491	< 0.0025	< 0.002
	11/16/2016	0.18	97	39	0.21	7.22	32	500	< 0.003	0.0051	0.056	< 0.001	< 0.0005	< 0.005	0.0044	0.0082	< 0.01	< 0.0002	0.0059	< 0.618	< 0.0025	< 0.002
	2/14/2017	0.18	120	55	0.17	7.30	60	550	< 0.003	0.0041	0.056	< 0.001	< 0.0005	< 0.005	0.0045	0.0076	< 0.01	< 0.0002	0.0056	< 0.837	< 0.0025	< 0.002
	5/3/2017	0.19	86	66	0.16	7.41	45	460	< 0.003	0.0015	0.045	< 0.001	< 0.0005	< 0.005	0.0033	0.0067	< 0.01	< 0.0002	< 0.005	0.574	< 0.0025	< 0.002
	6/21/2017	0.18	85	58	0.18	7.60	47	540	< 0.003	< 0.001	0.040	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0061	< 0.418	< 0.0025	< 0.002
	8/25/2017	0.56	86	41	0.18	7.41	63	490	< 0.003	< 0.001	0.049	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0059	0.775	< 0.0025	< 0.002
	11/8/2017	0.57	130	38	0.12	6.69	61	640	< 0.003	< 0.001	0.083	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.343	< 0.0025	< 0.002
	5/17/2018	0.15	88	50	0.12	6.70	48	540	< 0.003	< 0.001	0.045	< 0.001	< 0.0005	< 0.005	< 0.001	0.00068	< 0.01	< 0.0002	< 0.005	< 0.396	< 0.0025	< 0.002
	8/8/2018	0.14	86	48	0.13	6.80	43	430	< 0.003	< 0.001	0.051	<^ 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.579	< 0.0025	< 0.002
	4/30/2019	0.07	78	54	0.17	7.20	27	450	< 0.003	0.0014	0.039	< 0.001	< 0.0005	< 0.005	< 0.001	0.0017	< 0.01	< 0.0002	< 0.005	< 0.656	< 0.0025	< 0.002
	8/26/2019	0.57	100	39	0.13	7.15	71	550	< 0.003	< 0.001	0.053	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.802	< 0.0025	< 0.002
	2/24/2020	0.28	87	53	0.21	7.19	34	410	< 0.003	< 0.001	0.044	<^ 0.001	< 0.0005	< 0.005	< 0.001	0.00057	< 0.01	< 0.0002	< 0.005	< 0.478	< 0.0025	< 0.002
	4/28/2020	0.33	110	46	0.19	7.17	41	470	NA	< 0.001	0.051	NA	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.628	< 0.0025	< 0.002
	12/7/2020	0.59	100	54	0.25	7.22	55	640	NA	< 0.001	0.058	NA	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0052	< 0.542	< 0.0025	< 0.002
	5/11/2021	0.21	85	51	0.21	7.52	37	450	< 0.003	< 0.001	0.043	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.01	0.521	< 0.0025	< 0.002
	8/24/2021	0.27	99	40	0.18	7.19	56	430	< 0.003	< 0.001	0.061	< 0.001	< 0.0005	< 0.005	< 0.001	0.00088	< 0.01	< 0.0002	0.007	< 0.463	< 0.0025	< 0.002
	11/30/2021	0.35	84	41	0.19	7.14	^- 28	410	< 0.003	< 0.001	0.06	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.005	< 0.0002	0.0072	< 0.434	0.0026	< 0.002
	2/9/2022	0.18	96	47	0.17	7.33	48	520	< 0.003	0.0017	0.052	< 0.001	< 0.0005	< 0.005	< 0.001	0.0012	0.003	< 0.0002	0.0074	< 0.527	< 0.0025	< 0.002
	6/7/2022	0.21	81	51	0.14	7.62	27	430	< 0.003	< 0.001	0.04	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0057	0.531	< 0.0025	< 0.002
	8/30/2022	0.59	92	44	0.15	7.10	66	810	< 0.003	< 0.001	0.073	< ^+ 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< ^+ 0.01	< 0.0002	< 0.005	< 0.441	< 0.0025	< 0.002
MW-10 up-gradient	6/22/2017	0.46	100	48	0.19	6.81	54	1.0	< 0.003	0.0023	0.250	< 0.001	< 0.0005	< 0.005	0.008	0.003	< 0.01	< 0.0002	< 0.005	0.408	0.0042	< 0.002
	8/24/2017	0.32	93	51	0.18	7.14	57	480	< 0.003	0.0020	0.220	< 0.001	< 0.0005	< 0.005	0.007	0.003	< 0.01	< 0.0002	< 0.005	0.564	0.0044	< 0.002
	11/9/2017	0.36	98	48	0.18	6.78	64	500	< 0.003	< 0.0010	0.220	< 0.001	< 0.0005	< 0.005	0.004	< 0.001	< 0.01	< 0.0002	< 0.005	1.020	0.0034	< 0.002
	5/16/2018	0.42	93	44	0.19	7.64	80	530	< 0.003	0.0010	0.220	< 0.001	< 0.0005	< 0.005	0.021	0.001	< 0.01	< 0.0002	< 0.005	1.550	0.0050	< 0.002
	8/8/2018	0.39	99	58	0.19	7.10	60	550	< 0.003	0.0012	0.220	<^ 0.001	< 0.0005	< 0.005	0.014	0.001	< 0.01	< 0.0002	< 0.005	< 0.551	0.0062	< 0.002
	10/30/2018	0.34	110	49	0.22	7.65	49	510	< 0.003	0.0110	0.410	< 0.001	0.0008	0.024	0.047	0.023	0.02	< 0.0002	< 0.005	3.00	0.0046	< 0.002
	2/26/2019	0.39	150	48	0.21	6.77	36	540	< 0.003	0.0220	0.590	< 0.005	0.0015	0.063	0.081	0.036	0.03	< 0.0002	0.007	4.130	0.0041	< 0.002
	5/1/2019	0.35	92	50	0.22	6.81	30	470	< 0.003	0.0023	0.270	< 0.001	< 0.0005	< 0.005	0.011	0.0028	< 0.01	< 0.0002	< 0.005	1.330	0.0037	< 0.002
	8/26/2019	0.30	84	48	0.19	7.09	30	410	< 0.003	0.0017	0.190	< 0.001	< 0.001	< 0.005	0.007	0.0016	< 0.01	< 0.0002	< 0.005	1.540	0.0050	< 0.002
	2/25/2020	1.40	110	45	0.23	6.82	59	500	< 0.003	0.0033	0.280	<^ 0.001	< 0.0005	0.0086	0.011	0.0046	< 0.01	< 0.0002	< 0.005	1.07	0.0058	< 0.002
	4/28/2020	1.00	110	41	0.24	6.80	64	550	NA	0.0022	0.250	NA	NA	< 0.005	0.0065	0.0017	NA	NA	< 0.005	0.639	0.0054	NA
	12/8/2020	2.40	120	44	0.26	7.11	71	550	NA	0.0015	0.280	NA	NA	< 0.005	0.0089	0.0023	NA	< 0.0002	< 0.005	1.76	0.0031	NA
	5/11/2021	0.64	100	52	0.24	7.01	59	540	< 0.003	0.0011	0.260	< 0.001	< 0.0005	< 0.005	0.008	0.00085	< 0.01	< 0.0002	< 0.005	1.42	0.0049	< 0.002
	8/24/2021	0.42	98	53	0.21	6.87	46	420	< 0.003	0.0017	0.24	< 0.001	< 0.0005	< 0.005	0.0082	0.002	< 0.01	< 0.0002	< 0.005	0.638	0.0051	< 0.002
	11/30/2021	0.42	100	47	0.19	6.99	^- 36	530	< 0.003	0.0015	0.2	< 0.001	< 0.0005	< 0.005	0.0037	0.00051	0.0031	< 0.0002	< 0.005	1.39	< 0.0025	< 0.002
	2/9/2022	0.41	94	48	0.22	6.88	50	530	< 0.003	0.011	0.6	< 0.001	0.00064	0.026	0.054	0.021	0.011	< 0.0002	< 0.005	6.51	0.0045	< 0.002
	3/29/2 2 (R)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.811	NS	NS
	6/7/2022	0.43	85	44	0.21	7.09	38	390	< 0.003	0.0011	0.18	< 0.001	< 0.0005	< 0.005	0.0028	< 0.0005	< 0.01	< 0.0002	< 0.005	0.687	0.0049	< 0.002
	8/30/2022	0.38	92	45	0.22	6.83	38	590	< 0.003	0.0012	0.24	< ^+ 0.001	< 0.0005	< 0.005	0.0086	0.00074	< ^+ 0.01	< 0.0002	< 0.005	1.4	< 0.0025	< 0.002
MW-02 down-gradient	6/20/2017	0.33	90	55	0.19	7.01	47	500	< 0.003	0.0012	0.075	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.341	< 0.0025	< 0.002
	8/23/2017	V 1.30	86	49	0.19	7.40	61	440	< 0.003	< 0.001	0.062	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.833	< 0.0025	< 0.002
	11/7/2017	3.70	98	46	0.17	7.10	88	550	< 0.003	0.0014	0.091	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.309	0.0027	< 0.002
	5/15/2018	0.22	80	45	0.23	7.71	54	500	< 0.003	0.0013	0.065	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	0.0004	< 0.005	< 0.408	< 0.0025	< 0.002
	8/7/2018	1.50	89	54	0.15	7.09	51	530	< 0.003	0.0016	0.067	<^ 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.622	< 0.0025	< 0.002
	10/30/2018	0.23	86	43	0.17	7.83	34	480	< 0.003	0.0015	0.067	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.564	< 0.0025	< 0.002
	2/26/2019	0.07	69	49	0.16	7.82	23	400	< 0.003	0.0026	0.041	< 0.001	< 0.0005	< 0.005	< 0.001	0.0013	< 0.01	< 0.0002	< 0.005	< 0.425	< 0.0025	< 0.002
	4/30/2019	0.12	79	48	0.16	7.60	30	440	< 0.003	0.0013	0.048	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.441	< 0.0025	< 0.002
	8/26/2019	0.51	86	50	0.18	7.13	32	400	< 0.003	0.0011	0.065	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	1.180	< 0.0025	< 0.002
	2/24/2020	0.33	89	53	0.20	7.43	37	410	< 0.003	0.0011	0.061	<^ 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.485	< 0.0025	< 0.002
	4/28/2020	0.33	90	50	0.20	7.32	41	430	NA	0.0016	0.06	NA	NA	< 0.005	< 0.001	< 0.0005	NA	NA	< 0.005	< 0.54	< 0.0025	NA
	12/9/2020	0.66	100	41	0.15	7.78	64	430	NA	< 0.001	0.076	NA	NA	< 0.005	< 0.001	< 0.0005	NA	< 0.0002	0.0059	< 0.471	< 0.0025	NA
	5/11/2021	0.23	79	51	0.21	7.70	37	370	< 0.003	0.0015	0.057	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0095	< 0.528	< 0.0025	< 0.002
	8/24/2021	0.63	94	47	0.17	7.31	56	340	< 0.003	0.0014	0.073	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.47	< 0.0025	< 0.002
	11/30/2021	0.22	87	41	0.14	7.39	^- 36	380	< 0.003	0.0017	0.065	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.0045	< 0.0002	< 0.005	0.575	< 0.0025	< 0.002
	2/8/2022	0.27	95	47	0.2	7.69	49	550	< 0.003	0.0017	0.054	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.0025	< 0.0002	0.0076	0.554	< 0.0025	< 0.002
	6/7/2022	0.23	86	49	0.16	7.73	32	440	< 0.003	0.0016	0.064	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.0100	< 0.0002	0.0063	0.665	< 0.0025	< 0.002
	8/30/2022	1.1	95	45	0.15	7.22	75	690	< 0.003	< 0.001	0.073	<^+ 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< ^+ 0.01	< 0.0002	< 0.005	0.535	< 0.0025	< 0.002

Notes: All units are in mg/l except pH is in standard units.
V- Serial dilution exceeds control limits.
H- Sample was prepped or analyzed beyond specified holding time
F1 - MS and/or MSD Recovery outside of limits.
* - LCS or LCSD is outside acceptance limits.
^ - Denotes instrument related QC exceeds the control limits
NA - Not Analyzed

R000647

Table 1. Groundwater Analytical Results - Midwest Generation, LLC, Powerton Station, Pekin, IL. Former Ash Basin.

Well	Date	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Radium 226 + 228	Selenium	Thallium
MW-03 down-gradient	6/20/2017	0.4	76	54	0.29	7.26	49	480	< 0.003	0.0013	0.066	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.325	< 0.0025	< 0.002
	8/23/2017	0.40	79	52	0.28	7.44	52	430	< 0.003	0.0010	0.066	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	1.200	< 0.0025	< 0.002
	11/7/2017	0.31	79	62	0.26	7.04	61	460	< 0.003	0.0013	0.068	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.588	< 0.0025	< 0.002
	5/15/2018	0.35	87	66	0.27	7.53	77	520	< 0.003	0.0010	0.059	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.489	< 0.0025	< 0.002
	8/7/2018	0.40	82	67	0.22	6.60	49	500	< 0.003	0.0015	0.067	<^ 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.341	< 0.0025	< 0.002
	10/30/2018	0.20	74	44	0.25	7.84	26	400	< 0.003	0.0014	0.056	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.354	< 0.0025	< 0.002
	2/26/2019	0.06	74	56	0.24	7.49	25	410	< 0.003	0.0013	0.054	< 0.001	< 0.0005	< 0.005	< 0.001	0.0007	< 0.01	< 0.0002	< 0.005	< 0.399	< 0.0025	< 0.002
	4/30/2019	0.28	74	49	0.22	7.17	38	390	< 0.003	< 0.001	0.060	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.668	< 0.0025	< 0.002
	8/26/2019	0.31	75	50	0.26	7.17	14	380	< 0.003	0.0014	0.069	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.444	< 0.0025	< 0.002
	2/24/2020	0.33	87	53	0.22	7.10	65	470	< 0.003	< 0.001	0.066	<^ 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.400	< 0.0025	< 0.002
	4/28/2020	0.24	86	46	0.22	7.03	79	410	NA	0.0013	0.066	NA	NA	< 0.005	< 0.001	< 0.0005	NA	NA	< 0.005	< 0.498	0.0036	NA
	12/9/2020	0.86	92	45	0.28	7.46	60	390	NA	< 0.001	0.086	NA	NA	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.432	< 0.0025	NA
	5/11/2021	0.22	75	49	0.21	7.33	38	390	< 0.003	< 0.001	0.07	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.519	< 0.0025	< 0.002
	8/24/2021	0.41	81	46	0.25	7.15	32	310	< 0.003	0.0012	0.072	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.444	< 0.0025	< 0.002
	11/30/2021	0.3	76	47	0.26	7.20	^- 23	350	< 0.003	0.0014	0.063	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.004	< 0.0002	< 0.005	< 0.436	< 0.0025	< 0.002
	2/8/2022	0.2	94	47	0.21	7.22	50	550	< 0.003	0.001	0.058	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.003	< 0.0002	< 0.005	0.593	< 0.0025	< 0.002
	6/7/2022	0.37	79	45	0.22	7.37	47	370	< 0.003	0.0012	0.064	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.851	< 0.0025	< 0.002
	8/30/2022	0.57	87	50	0.21	7.10	51	710	< 0.003	< 0.001	0.1	<^+ 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	<^+ 0.01	< 0.0002	< 0.005	0.589	< 0.0025	< 0.002
MW-04 down-gradient	6/20/2017	0.5	77	55	0.29	7.45	53	480	< 0.003	< 0.001	0.0025	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.343	< 0.0025	< 0.002
	8/28/2017	V 0.73	90	89	0.33	7.13	110	680	< 0.003	< 0.001	0.028	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.013	< 0.246	< 0.0025	< 0.002
	11/7/2017	0.60	110	94	0.24	6.80	130	650	< 0.003	< 0.001	0.051	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.332	0.0092	< 0.002
	5/15/2018	0.68	87	66	0.27	7.63	100	630	< 0.003	< 0.001	0.037	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.661	< 0.0025	< 0.002
	8/7/2018	0.79	84	71	0.32	6.72	49	510	< 0.003	0.0011	0.031	<^ 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.006	< 0.334	< 0.0025	< 0.002
	10/30/2018	0.54	100	80	0.24	7.55	91	690	< 0.003	< 0.001	0.049	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.423	< 0.0025	< 0.002
	2/26/2019	0.38	79	55	0.25	7.18	52	490	< 0.003	0.0013	0.033	< 0.001	< 0.0005	< 0.005	0.001	0.0012	< 0.01	< 0.0002	< 0.005	0.366	< 0.0025	< 0.002
	4/30/2019	0.36	74	48	0.25	7.08	35	380	< 0.003	< 0.001	0.026	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.684	< 0.0025	< 0.002
	8/26/2019	0.64	91	60	0.24	7.08	14	490	< 0.003	< 0.001	0.032	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.008	1.090	< 0.0025	< 0.002
	2/24/2020	0.34	81	49	0.20	7.05	67	440	< 0.003	< 0.001	0.024	<^ 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.595	< 0.0025	< 0.002
	4/28/2020	0.55	76	52	0.27	7.03	47	380	NA	< 0.001	0.025	NA	NA	< 0.005	< 0.001	< 0.0005	NA	NA	< 0.005	< 0.465	< 0.0025	NA
	12/9/2020	0.57	92	88	0.32	7.10	94	580	NA	< 0.001	0.034	NA	NA	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0076	< 0.411	< 0.0025	NA
	5/11/2021	0.61	77	44	0.33	7.22	76	410	< 0.003	< 0.001	0.025	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.533	< 0.0025	< 0.002
	8/24/2021	0.72	78	48	0.34	7.12	15	100	< 0.003	< 0.001	0.024	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.014	< 0.427	< 0.0025	< 0.002
	11/30/2021	0.51	99	56	0.25	6.95	^- 62	560	< 0.003	0.0012	0.035	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.0035	< 0.0002	< 0.005	< 0.419	< 0.0025	< 0.002
	2/8/2022	0.47	88	59	0.29	7.15	52	580	< 0.003	< 0.001	0.03	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.0038	< 0.0002	0.006	0.818	< 0.0025	< 0.002
	6/7/2022	0.48	73	43	0.3	7.31	30	320	< 0.003	< 0.001	0.025	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0051	< 0.473	< 0.0025	< 0.002
	8/30/2022	0.67	94	61	0.21	6.80	67	720	< 0.003	< 0.001	0.034	<^+ 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	<^+ 0.01	< 0.0002	< 0.005	< 0.546	< 0.0025	< 0.002
MW-05 down-gradient	5/17/2016	0.70	100	85	0.35	7.08	120	660	< 0.003	< 0.001	0.051	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.373	< 0.0025	< 0.002
	8/16/2016	0.69	110	97	0.30	6.85	150	830	< 0.003	< 0.001	0.060	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.452	< 0.0025	< 0.002
	11/15/2016	0.93	94	66	0.23	6.96	77	620	< 0.003	< 0.001	0.051	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.449	< 0.0025	< 0.002
	2/14/2017	0.79	100	100	0.25	7.25	170	760	< 0.003	< 0.001	0.062	< 0.001	< 0.0005	< 0.005	< 0.001	0.00091	< 0.01	< 0.0002	< 0.005	< 0.359	< 0.0025	< 0.002
	5/1/2017	0.70	100	92	0.28	7.60	170	710	< 0.003	< 0.001	0.059	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0066	< 0.439	< 0.0025	< 0.002
	6/20/2017	0.64	89	63	0.28	7.32	78	550	< 0.003	< 0.001	0.048	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0061	< 0.365	< 0.0025	< 0.002
	8/28/2017	0.62	110	120	0.33	7.05	210	870	< 0.003	< 0.001	0.064	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0085	0.381	< 0.0025	< 0.002
	11/7/2017	0.51	99	110	0.31	6.87	160	990	< 0.003	< 0.001	0.058	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.341	< 0.0025	< 0.002
	5/15/2018	0.61	130	89	0.29	7.70	210	910	< 0.003	< 0.001	0.062	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.390	< 0.0025	< 0.002
	8/7/2018	0.49	110	120	0.32	6.56	180	890	< 0.003	< 0.001	0.054	<^ 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0069	0.523	< 0.0025	< 0.002
	4/30/2019	0.56	84	73	0.36	6.96	120	590	< 0.003	< 0.001	0.041	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0061	< 0.709	< 0.0025	< 0.002
	8/26/2019	0.57	110	75	0.29	7.01	110	660	< 0.003	< 0.001	0.050	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0067	0.651	< 0.0025	< 0.002
	2/24/2020	0.54	110	70	0.36	6.90	120 H	700	< 0.003	< 0.001	0.057	<^ 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0061	0.506	< 0.0025	< 0.002
	4/28/2020	0.49	110	56	0.37	6.87	130	620	NA	0.001	0.052	NA	NA	< 0.005	< 0.001	< 0.0005	NA	NA	< 0.005	0.0074	0.508	< 0.0025	NA
	12/9/2020	0.53	98	78	0.31	6.91	110	670	NA	< 0.001	0.05	NA	NA	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0072	0.569	< 0.0025	NA
	5/11/2021	0.50	83	52	0.38	7.20	100	530	< 0.003	< 0.001	0.04	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0062	< 0.525	< 0.0025	< 0.002
	8/24/2021	0.55	88	69	0.32	6.84	99	500	< 0.003	< 0.001	0.041	< 0.001	< 0.0005	0.007	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0073	0.863	< 0.0025	< 0.002
	11/30/2021	0.68	99	67	0.3	6.92	^- 92	620	< 0.003	0.0011	0.048	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.0052	< 0.0002	0.0051	0.632	< 0.0025	< 0.002
	2/8/2022	0.56	88	68	0.36	6.95	91	650	< 0.003	< 0.001	0.043	< 0.001	0.00066	< 0.005	0.0023	0.0017	0.0051	< 0.0002	0.007	< 0.438	< 0.0025	< 0.002
	6/7/2022	0.59	110	58	0.27	7.15	120	650	< 0.003	< 0.001	0.052	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	0.00034	< 0.005	< 0.468	< 0.0025	< 0.002
	8/30/2022	0.69	79	73	0.38	6.94	86	720	< 0.003	< 0.001	0.029	<^+ 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	<^+ 0.01	< 0.0002	0.0073	< 0.538	< 0.0025	< 0.002

Notas: All units are in mg/l except pH is in standard units.
V- Serial dilution exceeds control limits.
H- Sample was prepped or analyzed beyond specified holding time
F1 - MS and/or MSD Recovery outside of limits.
* - LCS or LCSD is outside acceptance limits.
^ - Denotes instrument related QC exceeds the control limits
NA - Not Analyzed

R000648

Table 2. Groundwater Turbidity - Midwest Generation, LLC, Powerton Station, Pekin, IL. Former Ash Basin.

Well	Date	Turbidity (NTU)
MW-01	2/23/2021	78.20
	4/9/2021	6.96
	5/10/2021	3.24
	6/2/2021	3.80
	6/28/2021	4.30
	7/19/2021	4.88
	8/24/2021	3.34
	9/30/2021	3.04
	11/30/2021	5.43
	2/9/2022	11.5
	6/7/2022	3.63
	8/30/2022	4.73
MW-10	2/23/2021	257.70
	4/9/2021	54.91
	5/11/2021	24.74
	6/2/2021	6.02
	6/28/2021	14.11
	7/19/2021	17.53
	8/24/2021	41.55
	9/30/2021	17.07
	11/30/2021	11.92
	2/9/2022	224.6
	6/7/2022	7.88
	8/30/2022	13.34
MW-02	2/22/2021	19.60
	4/8/2021	4.55
	5/11/2021	1.82
	6/2/2021	2.06
	6/28/2021	2.67
	7/19/2021	3.56
	8/24/2021	5.23
	10/1/2021	2.76
	11/30/2021	0.0
	2/8/2022	0.0
	6/7/2022	2.03
	8/30/2022	2.46
MW-03	2/22/2021	8.20
	4/8/2021	4.00
	5/11/2021	2.68
	6/2/2021	3.63
	6/28/2021	3.32
	7/19/2021	4.22
	8/24/2021	5.75
	10/1/2021	2.45
	11/30/2021	0.0
	2/8/2022	0.0
	6/7/2022	1.72
	8/30/2022	2.67
MW-04	2/22/2021	4.20
	4/8/2021	4.05
	5/11/2021	4.33
	6/2/2021	2.12
	6/28/2021	8.21
	7/19/2021	3.84
	8/24/2021	2.92
	10/1/2021	2.72
	11/30/2021	0.0
	2/8/2022	11.09
	6/7/2022	1.62
	8/30/2022	4.05
MW-05	2/22/2021	1.72
	4/8/2021	4.00
	5/11/2021	1.82
	6/2/2021	1.88
	6/28/2021	3.49
	7/19/2021	8.39
	8/24/2021	3.20
	10/1/2021	3.12
	11/30/2021	0.0
	2/8/2022	0.0
	6/7/2022	2.33
	8/30/2022	2.70

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Tel: (708)534-5200

Laboratory Job ID: 500-221573-1
Client Project/Site: Powerton CCR FAB

For:
KPRG and Associates, Inc.
14665 West Lisbon Road,
Suite 1A
Brookfield, Wisconsin 53005

Attn: Richard Gnat

Diana Mockler

Authorized for release by:
9/29/2022 9:30:19 AM

Diana Mockler, Project Manager I
(219)252-7570
Diana.Mockler@et.eurofinsus.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-221573-1

Job ID: 500-221573-1

Laboratory: Eurofins Chicago

Narrative

Job Narrative
500-221573-1

Comments
No additional comments.

Receipt
The samples were received on 8/31/2022 9:30 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 2.0º C and 4.5º C.

Metals
Method 6020A: The continuing calibration verification (CCV) associated with batch 500-673884 recovered above the upper control limit for Beryllium and Lithium. The low level continuing calibration verification (CCVL) at line 33, associated with batch 500-673884 recovered above the upper control limit for Beryllium. The samples associated with this CCV/CCVL were non-detects for the affected analytes; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Lient K.PRGa dt A s cco, edKnc. It , r
Rjo/n, KSwekn: RoWnjKot I I G 8s 4

Job ID: 500-22156C-1

Method	Method Description	Protocol	Laboratory
E020s	T nkdic HI RST w7	wM( ) E	uuy I VI
6) 60s	T nj, vjh HI Fs s 7	wM( ) E	uuy I VI
wT 25) 0l	woieAc. yokdi DeccoiOnA HyDw7	wT	uuy I VI
wT) 500 I i- u	I f ioje An. yokdi	wT	uuy I VI
wT) 500 8 I	8ivoje An	wT	uuy I VI
wT) 500 w3) u	wvipdKn. yokdi	wT	uuy I VI
C005s	Rjn=djdKot . yokdi Gn, oOnjdbin oj DeccoiOnA T nkdic	wM( ) E	uuy I VI
6) 60s	Rjn=djdKot . T nj, vjh	wM( ) E	uuy I VI

Protocol References:

wT " xwKdt AdjA T nKf oAc 8oj yf n undg e dKot 3 pMdKnj s t A MdcKnWdKnjx

wM( ) E " xyncKT nKf oAc 8oj uOdivdKt N woieA MdcKn. Rf hce, diS f ng e, di T nKf oAcx. yf ej A uAeKot . 9 oOng bnj 1U(E s t A IKc B=AdKncr

Laboratory References:

uuy I VI " uvjopt c I f e, dNo. 2) 16 4 ot A wKjnnK Bt eOnjceKn Rdjk. IL E0) ( ) . yuL H60(75C) -5200

Sample Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-221573-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-221573-1	MW-01	Water	08/30/22 09:32	08/31/22 09:30
500-221573-2	MW-02	Water	08/30/22 10:48	08/31/22 09:30
500-221573-3	MW-03	Water	08/30/22 11:34	08/31/22 09:30
500-221573-4	MW-04	Water	08/30/22 12:37	08/31/22 09:30
500-221573-5	MW-05	Water	08/30/22 13:25	08/31/22 09:30
500-221573-6	MW-10	Water	08/30/22 08:42	08/31/22 09:30
500-221573-7	Duplicate	Water	08/30/22 00:00	08/31/22 09:30

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-221573-1

Client Sample ID: Wr -01

Date Cclledte8: 0/ 3M032 2 09:M2
Date Redeive8: 0/ 3M132 2 09:M0

Lab Sample ID: 500-22156M-1

Watxio: r atex

Wethc8: A020(- Wetals RC) 3WST- yctal Redcvexable

(nalFte	Result	f ualiBex	RL	WDL	Qnit	D	) xepaxe8	(nalFUe8	Dil zad
Antimony	<0.0030		0.0030		mg/L		09/01/22 08:19	09/01/22 21:50	1
Arsenic	<0.0010		0.0010		mg/L		09/01/22 08:19	09/01/22 21:50	1
. axium	0706M		0.0025		mg/L		09/01/22 08:19	09/01/22 21:50	1
Beryllium	<0.0010	^+	0.0010		mg/L		09/01/22 08:19	09/08/22 20:09	1
. cxcn	0759		0.050		mg/L		09/01/22 08:19	09/08/22 20:09	1
Cadmium	<0.00050		0.00050		mg/L		09/01/22 08:19	09/01/22 21:50	1
Caldium	92		0.20		mg/L		09/01/22 08:19	09/01/22 21:50	1
Chromium	<0.0050		0.0050		mg/L		09/01/22 08:19	09/01/22 21:50	1
Cobalt	<0.0010		0.0010		mg/L		09/01/22 08:19	09/01/22 21:50	1
Lead	<0.00050		0.00050		mg/L		09/01/22 08:19	09/01/22 21:50	1
Lithium	<0.010	^+	0.010		mg/L		09/01/22 08:19	09/08/22 20:09	1
Molybdenum	<0.0050		0.0050		mg/L		09/01/22 08:19	09/01/22 21:50	1
Selenium	<0.0025		0.0025		mg/L		09/01/22 08:19	09/01/22 21:50	1
Thallium	<0.0020		0.0020		mg/L		09/01/22 08:19	09/08/22 20:09	1

Wethc8: 6460(- WexduxF RCV((T

(nalFte	Result	f ualiBex	RL	WDL	Qnit	D	) xepaxe8	(nalFUe8	Dil zad
Mercury	<0.00020		0.00020		mg/L		09/08/22 10:05	09/09/22 08:29	1

Genexal ChemistxF

(nalFte	Result	f ualiBex	RL	WDL	Qnit	D	) xepaxe8	(nalFUe8	Dil zad
yctal Disscive8 Scli8s	/ 10		10		mg/L			09/06/22 17:26	1
Chlcxi8e	44		4.0		mg/L			09/01/22 12:41	2
zlucxi8e	0715		0.10		mg/L			09/10/22 14:33	1
SulBate	AA		10		mg/L			09/01/22 14:45	2

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-221573-1

Client Sample ID: Wr -02

Date Cclledte8: 0/ 3M032 22 10:4/
Date Redeive8: 0/ 3M13 22 09:M0

Lab Sample ID: 500-22156M-2

Watxio: r atex

Wethc8: A020(- Wetals RC) 3WST- yctal Redcvexable

(nalFte	Result	f ualiBex	RL	WDL	Qnit	D	) xepaxe8	(nalFUe8	Dil zad
Antimony	<0.0030		0.0030		mg/L		09/01/22 08:19	09/01/22 21:53	1
Arsenic	<0.0010		0.0010		mg/L		09/01/22 08:19	09/01/22 21:53	1
. axium	0706M		0.0025		mg/L		09/01/22 08:19	09/01/22 21:53	1
Beryllium	<0.0010	^+	0.0010		mg/L		09/01/22 08:19	09/08/22 20:12	1
. cxcn	171		0.050		mg/L		09/01/22 08:19	09/08/22 20:12	1
Cadmium	<0.00050		0.00050		mg/L		09/01/22 08:19	09/01/22 21:53	1
Caldium	95		0.20		mg/L		09/01/22 08:19	09/01/22 21:53	1
Chromium	<0.0050		0.0050		mg/L		09/01/22 08:19	09/01/22 21:53	1
Cobalt	<0.0010		0.0010		mg/L		09/01/22 08:19	09/01/22 21:53	1
Lead	<0.00050		0.00050		mg/L		09/01/22 08:19	09/01/22 21:53	1
Lithium	<0.010	^+	0.010		mg/L		09/01/22 08:19	09/08/22 20:12	1
Molybdenum	<0.0050		0.0050		mg/L		09/01/22 08:19	09/01/22 21:53	1
Selenium	<0.0025		0.0025		mg/L		09/01/22 08:19	09/01/22 21:53	1
Thallium	<0.0020		0.0020		mg/L		09/01/22 08:19	09/08/22 20:12	1

Wethc8: 6460(- WexduxF RCV((T

(nalFte	Result	f ualiBex	RL	WDL	Qnit	D	) xepaxe8	(nalFUe8	Dil zad
Mercury	<0.00020		0.00020		mg/L		09/08/22 10:05	09/09/22 08:31	1

Genexal ChemistxF

(nalFte	Result	f ualiBex	RL	WDL	Qnit	D	) xepaxe8	(nalFUe8	Dil zad
yctal Disscive8 Scli8s	A90		10		mg/L			09/06/22 17:29	1
Chlcxi8e	45		4.0		mg/L			09/01/22 12:42	2
zlucxi8e	0715		0.10		mg/L			09/10/22 14:40	1
SulBate	65		10		mg/L			09/01/22 14:46	2

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-221573-1

Client Sample ID: Wr -0M

Date Cclledte8: 0/ 3M032 2 11:M4
Date Redeive8: 0/ 3M132 2 09:M0

Lab Sample ID: 500-22156M-M

Watxio: r atex

Wethc8: A020(- Wetals RC) 3WST- yctal Redcvexable

(nalFte	Result	f ualiBex	RL	WDL	Qnit	D	) xepaxe8	(nalFUe8	Dil zad
Antimony	<0.0030		0.0030		mg/L		09/01/22 08:19	09/01/22 21:57	1
Arsenic	<0.0010		0.0010		mg/L		09/01/22 08:19	09/01/22 21:57	1
. axium	0710		0.0025		mg/L		09/01/22 08:19	09/01/22 21:57	1
Beryllium	<0.0010	^+	0.0010		mg/L		09/01/22 08:19	09/08/22 20:16	1
. cxcn	0756		0.050		mg/L		09/01/22 08:19	09/08/22 20:16	1
Cadmium	<0.00050		0.00050		mg/L		09/01/22 08:19	09/01/22 21:57	1
Caldium	/ 6		0.20		mg/L		09/01/22 08:19	09/01/22 21:57	1
Chromium	<0.0050		0.0050		mg/L		09/01/22 08:19	09/01/22 21:57	1
Cobalt	<0.0010		0.0010		mg/L		09/01/22 08:19	09/01/22 21:57	1
Lead	<0.00050		0.00050		mg/L		09/01/22 08:19	09/01/22 21:57	1
Lithium	<0.010	^+	0.010		mg/L		09/01/22 08:19	09/08/22 20:16	1
Molybdenum	<0.0050		0.0050		mg/L		09/01/22 08:19	09/01/22 21:57	1
Selenium	<0.0025		0.0025		mg/L		09/01/22 08:19	09/01/22 21:57	1
Thallium	<0.0020		0.0020		mg/L		09/01/22 08:19	09/08/22 20:16	1

Wethc8: 6460(- WexduxF RCV((T

(nalFte	Result	f ualiBex	RL	WDL	Qnit	D	) xepaxe8	(nalFUe8	Dil zad
Mercury	<0.00020		0.00020		mg/L		09/08/22 10:05	09/09/22 08:34	1

Genexal ChemistxF

(nalFte	Result	f ualiBex	RL	WDL	Qnit	D	) xepaxe8	(nalFUe8	Dil zad
yctal Disscive8 Scli8s	610		10		mg/L			09/06/22 17:30	1
Chlcxi8e	50		4.0		mg/L			09/01/22 12:44	2
zlucxi8e	0721		0.10		mg/L			09/10/22 14:49	1
SulBate	51		10		mg/L			09/01/22 15:34	2

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-221573-1

Client Sample ID: Wr -04

Date Cclledte8: 0/ 3M032 2 12:M6
Date Redeive8: 0/ 3M132 2 09:M0

Lab Sample ID: 500-22156M-4

Watxio: r atex

Wethc8: A020(- Wetals RC) 3WST- yctal Redcvexable

(nalFte	Result	f ualiBex	RL	WDL	Qnit	D	) xepaxe8	(nalFUe8	Dil zad
Antimony	<0.0030		0.0030		mg/L		09/01/22 08:19	09/01/22 22:00	1
Arsenic	<0.0010		0.0010		mg/L		09/01/22 08:19	09/01/22 22:00	1
. axium	070M4		0.0025		mg/L		09/01/22 08:19	09/01/22 22:00	1
Beryllium	<0.0010	^+	0.0010		mg/L		09/01/22 08:19	09/08/22 20:19	1
. cxcn	07A6		0.050		mg/L		09/01/22 08:19	09/08/22 20:19	1
Cadmium	<0.00050		0.00050		mg/L		09/01/22 08:19	09/01/22 22:00	1
Caldium	94		0.20		mg/L		09/01/22 08:19	09/01/22 22:00	1
Chromium	<0.0050		0.0050		mg/L		09/01/22 08:19	09/01/22 22:00	1
Cobalt	<0.0010		0.0010		mg/L		09/01/22 08:19	09/01/22 22:00	1
Lead	<0.00050		0.00050		mg/L		09/01/22 08:19	09/01/22 22:00	1
Lithium	<0.010	^+	0.010		mg/L		09/01/22 08:19	09/08/22 20:19	1
Molybdenum	<0.0050		0.0050		mg/L		09/01/22 08:19	09/01/22 22:00	1
Selenium	<0.0025		0.0025		mg/L		09/01/22 08:19	09/01/22 22:00	1
Thallium	<0.0020		0.0020		mg/L		09/01/22 08:19	09/08/22 20:19	1

Wethc8: 6460(- WexduxF RCV((T

(nalFte	Result	f ualiBex	RL	WDL	Qnit	D	) xepaxe8	(nalFUe8	Dil zad
Mercury	<0.00020		0.00020		mg/L		09/08/22 10:05	09/09/22 08:36	1

Genexal ChemistxF

(nalFte	Result	f ualiBex	RL	WDL	Qnit	D	) xepaxe8	(nalFUe8	Dil zad
yctal Disscive8 Scli8s	620		10		mg/L			09/06/22 17:31	1
Chlcxi8e	A1		4.0		mg/L			09/01/22 12:45	2
zlucxi8e	0721		0.10		mg/L			09/10/22 14:52	1
SulBate	A6		10		mg/L			09/01/22 15:35	2

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-221573-1

Client Sample ID: Wr -05

Date Cclledte8: 0/ 3M032 2 1M25
Date Redeive8: 0/ 3M13 22 09:M0

Lab Sample ID: 500-22156M-5

Watxio: r atex

Wethc8: A020(- Wetals RC) 3WST- yctal Redcvexable

(nalFte	Result	f ualiBex	RL	WDL	Qnit	D	) xepaxe8	(nalFUe8	Dil zad
Antimony	<0.0030		0.0030		mg/L		09/01/22 08:19	09/01/22 22:04	1
Arsenic	<0.0010		0.0010		mg/L		09/01/22 08:19	09/01/22 22:04	1
. axium	07029		0.0025		mg/L		09/01/22 08:19	09/01/22 22:04	1
Beryllium	<0.0010	^+	0.0010		mg/L		09/01/22 08:19	09/08/22 20:23	1
. cxcn	07A9		0.050		mg/L		09/01/22 08:19	09/08/22 20:23	1
Cadmium	<0.00050		0.00050		mg/L		09/01/22 08:19	09/01/22 22:04	1
Caldium	69		0.20		mg/L		09/01/22 08:19	09/01/22 22:04	1
Chromium	<0.0050		0.0050		mg/L		09/01/22 08:19	09/01/22 22:04	1
Cobalt	<0.0010		0.0010		mg/L		09/01/22 08:19	09/01/22 22:04	1
Lead	<0.00050		0.00050		mg/L		09/01/22 08:19	09/01/22 22:04	1
Lithium	<0.010	^+	0.010		mg/L		09/01/22 08:19	09/08/22 20:23	1
WclFb8enum	07006M		0.0050		mg/L		09/01/22 08:19	09/01/22 22:04	1
Selenium	<0.0025		0.0025		mg/L		09/01/22 08:19	09/01/22 22:04	1
Thallium	<0.0020		0.0020		mg/L		09/01/22 08:19	09/08/22 20:23	1

Wethc8: 6460(- WexduxF RCV((T

(nalFte	Result	f ualiBex	RL	WDL	Qnit	D	) xepaxe8	(nalFUe8	Dil zad
Mercury	<0.00020		0.00020		mg/L		09/08/22 10:05	09/09/22 08:38	1

Genexal ChemistxF

(nalFte	Result	f ualiBex	RL	WDL	Qnit	D	) xepaxe8	(nalFUe8	Dil zad
yctal Disscive8 Scli8s	620		10		mg/L			09/06/22 17:32	1
Chlcxi8e	6M		4.0		mg/L			09/01/22 12:45	2
zlucxi8e	07M		0.10		mg/L			09/10/22 14:54	1
SulBate	/ A		25		mg/L			09/01/22 15:36	5

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-221573-1

Client Sample ID: Wr -10

Date Cclledte8: 0/ 3M032 2 0/ :42
Date Redeive8: 0/ 3M132 2 09:M0

Lab Sample ID: 500-22156M-A

Watxio: r atex

Wethc8: A020(- Wetals RC) 3WST- yctal Redcvexable

(nalFte	Result	f ualiBex	RL	WDL	Qnit	D	) xepaxe8	(nalFUe8	Dil zad
Antimony	<0.0030		0.0030		mg/L		09/01/22 08:19	09/01/22 22:07	1
(xsenid	070012		0.0010		mg/L		09/01/22 08:19	09/01/22 22:07	1
. axium	0724		0.0025		mg/L		09/01/22 08:19	09/01/22 22:07	1
Beryllium	<0.0010	^+	0.0010		mg/L		09/01/22 08:19	09/08/22 20:26	1
. cxcn	07M		0.050		mg/L		09/01/22 08:19	09/08/22 20:26	1
Cadmium	<0.00050		0.00050		mg/L		09/01/22 08:19	09/01/22 22:07	1
Caldium	92		0.20		mg/L		09/01/22 08:19	09/01/22 22:07	1
Chromium	<0.0050		0.0050		mg/L		09/01/22 08:19	09/01/22 22:07	1
Ccbalt	0700/ A		0.0010		mg/L		09/01/22 08:19	09/01/22 22:07	1
Lea8	0700064		0.00050		mg/L		09/01/22 08:19	09/01/22 22:07	1
Lithium	<0.010	^+	0.010		mg/L		09/01/22 08:19	09/08/22 20:26	1
Molybdenum	<0.0050		0.0050		mg/L		09/01/22 08:19	09/01/22 22:07	1
Selenium	<0.0025		0.0025		mg/L		09/01/22 08:19	09/01/22 22:07	1
Thallium	<0.0020		0.0020		mg/L		09/01/22 08:19	09/08/22 20:26	1

Wethc8: 6460(- WexduxF RCV((T

(nalFte	Result	f ualiBex	RL	WDL	Qnit	D	) xepaxe8	(nalFUe8	Dil zad
Mercury	<0.00020		0.00020		mg/L		09/08/22 10:05	09/09/22 08:40	1

Genexal ChemistxF

(nalFte	Result	f ualiBex	RL	WDL	Qnit	D	) xepaxe8	(nalFUe8	Dil zad
yctal Disscive8 Scli8s	590		10		mg/L			09/06/22 18:03	1
Chlcxi8e	45		4.0		mg/L			09/01/22 12:45	2
zlucxi8e	0722		0.10		mg/L			09/10/22 14:56	1
SulBate	M		10		mg/L			09/01/22 15:36	2

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-221573-1

Client Sample ID: Duplidate

Date Cclledte8: 0/ 3M032 22 00:00
Date Redeive8: 0/ 3M132 22 09:M0

Lab Sample ID: 500-22156M-6

Watxio: r atex

Wethc8: A020(- Wetals RC) 3WST- yctal Redcvexable

(nalFte	Result	f ualiBex	RL	WDL	Qnit	D	) xepaxe8	(nalFUe8	Dil zad
Antimony	<0.0030		0.0030		mg/L		09/01/22 08:19	09/01/22 22:11	1
Arsenic	<0.0010		0.0010		mg/L		09/01/22 08:19	09/01/22 22:11	1
. axium	0710		0.0025		mg/L		09/01/22 08:19	09/01/22 22:11	1
Beryllium	<0.0010	^+	0.0010		mg/L		09/01/22 08:19	09/08/22 20:30	1
. cxcn	075/		0.050		mg/L		09/01/22 08:19	09/08/22 20:30	1
Cadmium	<0.00050		0.00050		mg/L		09/01/22 08:19	09/01/22 22:11	1
Caldium	/ /		0.20		mg/L		09/01/22 08:19	09/01/22 22:11	1
Chromium	<0.0050		0.0050		mg/L		09/01/22 08:19	09/01/22 22:11	1
Cobalt	<0.0010		0.0010		mg/L		09/01/22 08:19	09/01/22 22:11	1
Lead	<0.00050		0.00050		mg/L		09/01/22 08:19	09/01/22 22:11	1
Lithium	<0.010	^+	0.010		mg/L		09/01/22 08:19	09/08/22 20:30	1
Molybdenum	<0.0050		0.0050		mg/L		09/01/22 08:19	09/01/22 22:11	1
Selenium	<0.0025		0.0025		mg/L		09/01/22 08:19	09/01/22 22:11	1
Thallium	<0.0020		0.0020		mg/L		09/01/22 08:19	09/08/22 20:30	1

Wethc8: 6460(- WexduxF RCV((T

(nalFte	Result	f ualiBex	RL	WDL	Qnit	D	) xepaxe8	(nalFUe8	Dil zad
Mercury	<0.00020		0.00020		mg/L		09/08/22 10:05	09/09/22 08:48	1

Genexal ChemistxF

(nalFte	Result	f ualiBex	RL	WDL	Qnit	D	) xepaxe8	(nalFUe8	Dil zad
yctal Disscive8 Scli8s	A60		10		mg/L			09/06/22 17:33	1
Chlcxi8e	4/		10		mg/L			09/01/22 14:01	5
zlucxi8e	0722		0.10		mg/L			09/10/22 14:59	1
SulBate	4A		25		mg/L			09/01/22 15:36	5

Definitions/Glossary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-221573-1

Qualifiers

Metals

Qualifier	Qualifier Description
^+	Continuing Calibration Verification (CCV) is outside acceptance limits, high biased.

General Chemistry

Qualifier	Qualifier Description
F3	Duplicate RPD exceeds the control limit

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

QC Association Summary

Client: KPRGa dt As cco, edkc. It , r
Rjo/n, kwek: RoWnjkot I I G 3s M
Job ID: 500-22156C-1

Metals

Prep Batch: 672695

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-22156C-1	v T -01	8okdi Gn, o4njdbin	T dkj	C005s	
500-22156C-2	v T -02	8okdi Gn, o4njdbin	T dkj	C005s	
500-22156C-C	v T -0C	8okdi Gn, o4njdbin	T dkj	C005s	
500-22156C-9	v T -09	8okdi Gn, o4njdbin	T dkj	C005s	
500-22156C-5	v T -05	8okdi Gn, o4njdbin	T dkj	C005s	
500-22156C-u	v T -10	8okdi Gn, o4njdbin	T dkj	C005s	
500-22156C-6	Dp7ię dkn	8okdi Gn, o4njdbin	T dkj	C005s	
v M500-u62uB5S1-s	v nkhoA Midt k	8okdi Gn, o4njdbin	T dkj	C005s	
LI w 500-u62uB5S2-s	Ldb I ot Kjoi wdm7in	8okdi Gn, o4njdbin	T dkj	C005s	

Analysis Batch: 673460

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-22156C-1	v T -01	8okdi Gn, o4njdbin	T dkj	u020s	u62uB5
500-22156C-2	v T -02	8okdi Gn, o4njdbin	T dkj	u020s	u62uB5
500-22156C-C	v T -0C	8okdi Gn, o4njdbin	T dkj	u020s	u62uB5
500-22156C-9	v T -09	8okdi Gn, o4njdbin	T dkj	u020s	u62uB5
500-22156C-5	v T -05	8okdi Gn, o4njdbin	T dkj	u020s	u62uB5
500-22156C-u	v T -10	8okdi Gn, o4njdbin	T dkj	u020s	u62uB5
500-22156C-6	Dp7ię dkn	8okdi Gn, o4njdbin	T dkj	u020s	u62uB5
v M500-u62uB5S1-s	v nkhoA Midt k	8okdi Gn, o4njdbin	T dkj	u020s	u62uB5
LI w 500-u62uB5S2-s	Ldb I ot Kjoi wdm7in	8okdi Gn, o4njdbin	T dkj	u020s	u62uB5

Prep Batch: 673622

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-22156C-1	v T -01	8okdiSNs	T dkj	6960s	
500-22156C-2	v T -02	8okdiSNs	T dkj	6960s	
500-22156C-C	v T -0C	8okdiSNs	T dkj	6960s	
500-22156C-9	v T -09	8okdiSNs	T dkj	6960s	
500-22156C-5	v T -05	8okdiSNs	T dkj	6960s	
500-22156C-u	v T -10	8okdiSNs	T dkj	6960s	
500-22156C-6	Dp7ię dkn	8okdiSNs	T dkj	6960s	
v M500-u6Cu22S12-s	v nkhoA Midt k	8okdiSNs	T dkj	6960s	
LI w 500-u6Cu22S1C-s	Ldb I ot Kjoi wdm7in	8okdiSNs	T dkj	6960s	
500-22156C-u v w	v T -10	8okdiSNs	T dkj	6960s	
500-22156C-u v wD	v T -10	8okdiSNs	T dkj	6960s	
500-22156C-u DU	v T -10	8okdiSNs	T dkj	6960s	

Analysis Batch: 673884

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-22156C-1	v T -01	8okdi Gn, o4njdbin	T dkj	u020s	u62uB5
500-22156C-2	v T -02	8okdi Gn, o4njdbin	T dkj	u020s	u62uB5
500-22156C-C	v T -0C	8okdi Gn, o4njdbin	T dkj	u020s	u62uB5
500-22156C-9	v T -09	8okdi Gn, o4njdbin	T dkj	u020s	u62uB5
500-22156C-5	v T -05	8okdi Gn, o4njdbin	T dkj	u020s	u62uB5
500-22156C-u	v T -10	8okdi Gn, o4njdbin	T dkj	u020s	u62uB5
500-22156C-6	Dp7ię dkn	8okdi Gn, o4njdbin	T dkj	u020s	u62uB5
v M500-u62uB5S1-s	v nkhoA Midt k	8okdi Gn, o4njdbin	T dkj	u020s	u62uB5
LI w 500-u62uB5S2-s	Ldb I ot Kjoi wdm7in	8okdi Gn, o4njdbin	T dkj	u020s	u62uB5

QC Association Summary

Client: KPRGa dt Ascco, edKnc. It , r
Rjo/n, KwekN: RoWnjKot I I G 3s M
Job ID: 500-22156C-1

Metals

Analysis Batch: 673899

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-22156C-1	v T -01	8okdiSNs	T dKnj	6960s	u6Cu22
500-22156C-2	v T -02	8okdiSNs	T dKnj	6960s	u6Cu22
500-22156C-C	v T -0C	8okdiSNs	T dKnj	6960s	u6Cu22
500-22156C-9	v T -09	8okdiSNs	T dKnj	6960s	u6Cu22
500-22156C-5	v T -05	8okdiSNs	T dKnj	6960s	u6Cu22
500-22156C-u	v T -10	8okdiSNs	T dKnj	6960s	u6Cu22
500-22156C-6	Dp7ię dKn	8okdiSNs	T dKnj	6960s	u6Cu22
v M500-u6Cu22S12-s	v nKnoA Midt k	8okdiSNs	T dKnj	6960s	u6Cu22
LI w 500-u6Cu22S1C-s	Ldb I ot Kjoi wdm7in	8okdiSNs	T dKnj	6960s	u6Cu22
500-22156C-u v w	v T -10	8okdiSNs	T dKnj	6960s	u6Cu22
500-22156C-u v wD	v T -10	8okdiSNs	T dKnj	6960s	u6Cu22
500-22156C-u DU	v T -10	8okdiSNs	T dKnj	6960s	u6Cu22

General Chemistry

Analysis Batch: 672805

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-22156C-1	v T -01	8okdiSNs	T dKnj	wv 9500 I i- E	
500-22156C-2	v T -02	8okdiSNs	T dKnj	wv 9500 I i- E	
500-22156C-C	v T -0C	8okdiSNs	T dKnj	wv 9500 I i- E	
500-22156C-9	v T -09	8okdiSNs	T dKnj	wv 9500 I i- E	
500-22156C-5	v T -05	8okdiSNs	T dKnj	wv 9500 I i- E	
500-22156C-u	v T -10	8okdiSNs	T dKnj	wv 9500 I i- E	
500-22156C-6	Dp7ię dKn	8okdiSNs	T dKnj	wv 9500 I i- E	
v M500-u62C05S5O	v nKnoA Midt k	8okdiSNs	T dKnj	wv 9500 I i- E	
v M500-u62C05S39	v nKnoA Midt k	8okdiSNs	T dKnj	wv 9500 I i- E	
LI w 500-u62C05S5B	Ldb I ot Kjoi wdm7in	8okdiSNs	T dKnj	wv 9500 I i- E	
LI w 500-u62C05S35	Ldb I ot Kjoi wdm7in	8okdiSNs	T dKnj	wv 9500 I i- E	

Analysis Batch: 672849

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-22156C-1	v T -01	8okdiSNs	T dKnj	wv 9500 wF 9 E	
500-22156C-2	v T -02	8okdiSNs	T dKnj	wv 9500 wF 9 E	
500-22156C-C	v T -0C	8okdiSNs	T dKnj	wv 9500 wF 9 E	
500-22156C-9	v T -09	8okdiSNs	T dKnj	wv 9500 wF 9 E	
500-22156C-5	v T -05	8okdiSNs	T dKnj	wv 9500 wF 9 E	
500-22156C-u	v T -10	8okdiSNs	T dKnj	wv 9500 wF 9 E	
500-22156C-6	Dp7ię dKn	8okdiSNs	T dKnj	wv 9500 wF 9 E	
v M500-u62C9BS1u	v nKnoA Midt k	8okdiSNs	T dKnj	wv 9500 wF 9 E	
v M500-u62C9BS62	v nKnoA Midt k	8okdiSNs	T dKnj	wv 9500 wF 9 E	
LI w 500-u62C9BS16	Ldb I ot Kjoi wdm7in	8okdiSNs	T dKnj	wv 9500 wF 9 E	
LI w 500-u62C9BS6C	Ldb I ot Kjoi wdm7in	8okdiSNs	T dKnj	wv 9500 wF 9 E	
500-22156C-C v w	v T -0C	8okdiSNs	T dKnj	wv 9500 wF 9 E	
500-22156C-C v wD	v T -0C	8okdiSNs	T dKnj	wv 9500 wF 9 E	

Analysis Batch: 673324

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-22156C-1	v T -01	8okdiSNs	T dKnj	wv 2590I	
500-22156C-2	v T -02	8okdiSNs	T dKnj	wv 2590I	
500-22156C-C	v T -0C	8okdiSNs	T dKnj	wv 2590I	
500-22156C-9	v T -09	8okdiSNs	T dKnj	wv 2590I	

QC Association Summary

Client: KPRGa dt Ascco, edkc. It , r
Rjo/n, kwek: RoWhjkot I I G 3s M
Job ID: 500-22156C-1

General Chemistry (Continued)

Analysis Batch: 673324 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-22156C-5	v T -05	8okdiSNs	T dkj	wv 2590l	
500-22156C-6	Dp7ię dk	8okdiSNs	T dkj	wv 2590l	
v M500-u6CC29S1	v nkhoA Midt k	8okdiSNs	T dkj	wv 2590l	
Ll w 500-u6CC29S2	Ldb l ot Kjoi wdm7in	8okdiSNs	T dkj	wv 2590l	
500-22156C-1 DU	v T -01	8okdiSNs	T dkj	wv 2590l	

Analysis Batch: 673325

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-22156C-u	v T -10	8okdiSNs	T dkj	wv 2590l	
v M500-u6CC25S1	v nkhoA Midt k	8okdiSNs	T dkj	wv 2590l	
Ll w 500-u6CC25S2	Ldb l ot Kjoi wdm7in	8okdiSNs	T dkj	wv 2590l	

Analysis Batch: 674042

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-22156C-1	v T -01	8okdiSNs	T dkj	wv 9500 3 l	
500-22156C-2	v T -02	8okdiSNs	T dkj	wv 9500 3 l	
500-22156C-C	v T -0C	8okdiSNs	T dkj	wv 9500 3 l	
500-22156C-9	v T -09	8okdiSNs	T dkj	wv 9500 3 l	
500-22156C-5	v T -05	8okdiSNs	T dkj	wv 9500 3 l	
500-22156C-u	v T -10	8okdiSNs	T dkj	wv 9500 3 l	
500-22156C-6	Dp7ię dk	8okdiSNs	T dkj	wv 9500 3 l	
v M500-u69092SC1	v nkhoA Midt k	8okdiSNs	T dkj	wv 9500 3 l	
Ll w 500-u69092SC2	Ldb l ot Kjoi wdm7in	8okdiSNs	T dkj	wv 9500 3 l	
500-22156C-1 v w	v T -01	8okdiSNs	T dkj	wv 9500 3 l	
500-22156C-1 v wD	v T -01	8okdiSNs	T dkj	wv 9500 3 l	

QC Sample Results

I ient K PRGa dt As cco, edKic. It , r
Rjo/n, KSvek: RoMnjKot I I G Bs m

Job ID: 500-22156C-1

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 500-672685/9-A
Mat1ir: x ate1
AnalTsis Batyh: 67v360

Client Sample ID: Method Blank
P1ep WTpe: Wotal Reyoce1able
P1ep Batyh: 672685

AnalTte	MB Result	MB QualiUe1	RL	MDL	z nit	D	P1epa1ed	AnalTFed	Dil 4ay
st Key ot <	30r00C0		0r00C0		y gS1		09S01S22 08:19	09S01S22 20:C8	1
sjcnt e	30r0010		0r0010		y gS1		09S01S22 08:19	09S01S22 20:C8	1
mdje4y	30r0025		0r0025		y gS1		09S01S22 08:19	09S01S22 20:C8	1
l dAy e4y	30r00050		0r00050		y gS1		09S01S22 08:19	09S01S22 20:C8	1
l di, e4y	30r20		0r20		y gS1		09S01S22 08:19	09S01S22 20:C8	1
l ujoy e4y	30r0050		0r0050		y gS1		09S01S22 08:19	09S01S22 20:C8	1
l obdiK	30r0010		0r0010		y gS1		09S01S22 08:19	09S01S22 20:C8	1
LndA	30r00050		0r00050		y gS1		09S01S22 08:19	09S01S22 20:C8	1
h oi<bAnt 4y	30r0050		0r0050		y gS1		09S01S22 08:19	09S01S22 20:C8	1
wnint e4y	30r0025		0r0025		y gS1		09S01S22 08:19	09S01S22 20:C8	1

Lab Sample ID: MB 500-672685/9-A
Mat1ir: x ate1
AnalTsis Batyh: 67vf f 3

Client Sample ID: Method Blank
P1ep WTpe: Wotal Reyoce1able
P1ep Batyh: 672685

AnalTte	MB Result	MB QualiUe1	RL	MDL	z nit	D	P1epa1ed	AnalTFed	Dil 4ay
mnj<iie4y	30r0010	T7	0r0010		y gS1		09S01S22 08:19	09S08S22 20:02	1
mojot	30r050		0r050		y gS1		09S01S22 08:19	09S08S22 20:02	1
LeKue4y	30r010	T7	0r010		y gS1		09S01S22 08:19	09S08S22 20:02	1
^udiie4y	30r0020		0r0020		y gS1		09S01S22 08:19	09S08S22 20:02	1

Lab Sample ID: LCS 500-672685/2-A
Mat1ir: x ate1
AnalTsis Batyh: 67v360

Client Sample ID: Lab Cont1ol Sample
P1ep WTpe: Wotal Reyoce1able
P1ep Batyh: 672685

AnalTte	Spike Added	LCS Result	LCS QualiUe1	z nit	D	%Rey	%Rey Limits
st Key ot <	0r500	0r+E5		y gS1		9C	80 - 120
sjcnt e	0r100	0r091E		y gS1		92	80 - 120
mdje4y	0r500	0r+50		y gS1		90	80 - 120
l dAy e4y	0r0500	0r0+8C		y gS1		96	80 - 120
l di, e4y	10r0	8rE1		y gS1		8E	80 - 120
l ujoy e4y	0r200	0r18C		y gS1		92	80 - 120
l obdiK	0r500	0r+5C		y gS1		91	80 - 120
LndA	0r100	0r0980		y gS1		98	80 - 120
h oi<bAnt 4y	1r00	0r885		y gS1		88	80 - 120
wnint e4y	0r100	0r09+1		y gS1		9+	80 - 120

Lab Sample ID: LCS 500-672685/2-A
Mat1ir: x ate1
AnalTsis Batyh: 67vf f 3

Client Sample ID: Lab Cont1ol Sample
P1ep WTpe: Wotal Reyoce1able
P1ep Batyh: 672685

AnalTte	Spike Added	LCS Result	LCS QualiUe1	z nit	D	%Rey	%Rey Limits
mnj<iie4y	0r0500	0r05C2	T7	y gS1		10E	80 - 120
mojot	1r00	1r0C		y gS1		10C	80 - 120
LeKue4y	0r100	0r111	T7	y gS1		111	80 - 120
^udiie4y	0r100	0r10C		y gS1		10C	80 - 120

f 4jo e c l ue dgo

QC Sample Results

I ient K PRGa dt As cco, edKic. It , r
Rjo/n, KSvek: RoMnjKot I I G Bs m

Job ID: 500-22156C-1

Method: 7370A - Me1yu1T (CVAA)

Lab Sample ID: MB 500-67v622/92-A
Mat1ir: x ate1
AnalTsis Batyh: 67vf 88

Client Sample ID: Method Blank
P1ep WTpe: Wotal/NA
P1ep Batyh: 67v622

AnalTte	MB Result	MB QualiUe1	RL	MDL	z nit	D	P1epa1ed	AnalTFed	Dil 4ay
h nj, 4j<	30r00020		0r00020		y gS1		09S08S22 10:05	09S09S22 08:16	1

Lab Sample ID: LCS 500-67v622/9v-A
Mat1ir: x ate1
AnalTsis Batyh: 67vf 88

Client Sample ID: Lab Cont1ol Sample
P1ep WTpe: Wotal/NA
P1ep Batyh: 67v622

AnalTte			Spike Added	LCS Result	LCS QualiUe1	z nit	D	%Rey	%Rey Limits		
h nj, 4j<			0r00200	0r00181		y gS1		91	80 - 120		

Lab Sample ID: 500-22957v-6 MS
Mat1ir: x ate1
AnalTsis Batyh: 67vf 88

Client Sample ID: Mx -90
P1ep WTpe: Wotal/NA
P1ep Batyh: 67v622

AnalTte	Sample Result	Sample QualiUe1	Spike Added	MS Result	MS QualiUe1	z nit	D	%Rey	%Rey Limits		
h nj, 4j<	30r00020		0r00100	0r00111		y gS1		111	65 - 125		

Lab Sample ID: 500-22957v-6 MSD
Mat1ir: x ate1
AnalTsis Batyh: 67vf 88

Client Sample ID: Mx -90
P1ep WTpe: Wotal/NA
P1ep Batyh: 67v622

AnalTte	Sample Result	Sample QualiUe1	Spike Added	MSD Result	MSD QualiUe1	z nit	D	%Rey	%Rey Limits	RPD	RPD Limit
h nj, 4j<	30r00020		0r00100	0r00112		y gS1		112	65 - 125	1	20

Lab Sample ID: 500-22957v-6 Dz
Mat1ir: x ate1
AnalTsis Batyh: 67vf 88

Client Sample ID: Mx -90
P1ep WTpe: Wotal/NA
P1ep Batyh: 67v622

AnalTte	Sample Result	Sample QualiUe1	Dz Result	Dz QualiUe1	z nit	D	RPD	RPD Limit
h nj, 4j<	30r00020		30r00020		y gS1		v l	20

Method: SM 2530C - Solids, Wotal Dissolced (WDS)

Lab Sample ID: MB 500-67vv23/9
Mat1ir: x ate1
AnalTsis Batyh: 67vv23

Client Sample ID: Method Blank
P1ep WTpe: Wotal/NA

AnalTte	MB Result	MB QualiUe1	RL	MDL	z nit	D	P1epa1ed	AnalTFed	Dil 4ay
^okKi DeccoiFnA woieAc	310		10		y gS1			09S0ES22 16:10	1

Lab Sample ID: LCS 500-67vv23/2
Mat1ir: x ate1
AnalTsis Batyh: 67vv23

Client Sample ID: Lab Cont1ol Sample
P1ep WTpe: Wotal/NA

AnalTte			Spike Added	LCS Result	LCS QualiUe1	z nit	D	%Rey	%Rey Limits		
^okKi DeccoiFnA woieAc			250	29E		y gS1		118	80 - 120		

f 4jokNc l ue,dgo

QC Sample Results

Method: SM 2530C - Solids, Total Dissolced (TDS) (Continued)

Lab Sample ID: 500-22957v-9 Dz — **Client Sample ID: Mx -09**
Mat1ir : x ate1 — **P1ep WTpe: Total/NA**
AnalTsis Batyh: 67vv23

AnalTte	Sample Result	Sample QualiUe1		Dz Result	Dz QualiUe1	z nit	D			RPD	RPD Limit
^okli DeccoiFnA woieAc	810			6+0	BC	y gSL				9	5

Lab Sample ID: MB 500-67vv25/9 — **Client Sample ID: Method Blank**
Mat1ir : x ate1 — **P1ep WTpe: Total/NA**
AnalTsis Batyh: 67vv25

AnalTte	MB Result	MB QualiUe1	RL	MDL	z nit	D	P1epa1ed	AnalTFed	Dil 4ay
^okli DeccoiFnA woieAc	310		10		y gSL			09S0ES22 16:+0	1

Lab Sample ID: LCS 500-67vv25/2 — **Client Sample ID: Lab Cont1ol Sample**
Mat1ir : x ate1 — **P1ep WTpe: Total/NA**
AnalTsis Batyh: 67vv25

AnalTte			Spike Added	LCS Result	LCS QualiUe1	z nit	D	%Rey	%Rey Limits		
^okli DeccoiFnA woieAc			250	290		y gSL		11E	80 - 120		

Method: SM 3500 Cl- E - Chlo1ide, Total

Lab Sample ID: MB 500-672f 05/5f — **Client Sample ID: Method Blank**
Mat1ir : x ate1 — **P1ep WTpe: Total/NA**
AnalTsis Batyh: 672f 05

AnalTte	MB Result	MB QualiUe1	RL	MDL	z nit	D	P1epa1ed	AnalTFed	Dil 4ay
I uioje An	32r0		2r0		y gSL			09S01S22 12:C8	1

Lab Sample ID: MB 500-672f 05/83 — **Client Sample ID: Method Blank**
Mat1ir : x ate1 — **P1ep WTpe: Total/NA**
AnalTsis Batyh: 672f 05

AnalTte	MB Result	MB QualiUe1	RL	MDL	z nit	D	P1epa1ed	AnalTFed	Dil 4ay
I uioje An	32r0		2r0		y gSL			09S01S22 1+:00	1

Lab Sample ID: LCS 500-672f 05/58 — **Client Sample ID: Lab Cont1ol Sample**
Mat1ir : x ate1 — **P1ep WTpe: Total/NA**
AnalTsis Batyh: 672f 05

AnalTte			Spike Added	LCS Result	LCS QualiUe1	z nit	D	%Rey	%Rey Limits		
I uioje An			20r0	20r6		y gSL		10+	85 - 115		

Lab Sample ID: LCS 500-672f 05/85 — **Client Sample ID: Lab Cont1ol Sample**
Mat1ir : x ate1 — **P1ep WTpe: Total/NA**
AnalTsis Batyh: 672f 05

AnalTte			Spike Added	LCS Result	LCS QualiUe1	z nit	D	%Rey	%Rey Limits		
I uioje An			20r0	19r8		y gSL		99	85 - 115		

QC Sample Results

I ient K PRGa dt As cco, edKic. It , r
Rjo/n, KSvek: RoMnjKot I I G Bs m

Job ID: 500-22156C-1

Method: SM 3500 4 C - 4luo1ide

Lab Sample ID: MB 500-673032/v9
Mat1ir : x ate1
AnalTsis Batyh: 673032

Client Sample ID: Method Blank
P1ep WTpe: Wotal/NA

AnalTte	MB Result	MB QualiUe1	RL	MDL	z nit	D	P1epa1ed	AnalTFed	Dil 4ay
Bi4ojeAn	30r10		0r10		y gS1			09S10S22 1+:28	1

Lab Sample ID: LCS 500-673032/v2
Mat1ir : x ate1
AnalTsis Batyh: 673032

Client Sample ID: Lab Cont1ol Sample
P1ep WTpe: Wotal/NA

AnalTte			Spike Added	LCS Result	LCS QualiUe1	z nit	D	%Rey	%Rey Limits		
Bi4ojeAn			10r0	10r8		y gS1		108	90 - 119		

Lab Sample ID: 500-22957v-9 MS
Mat1ir : x ate1
AnalTsis Batyh: 673032

Client Sample ID: Mx -09
P1ep WTpe: Wotal/NA

AnalTte	Sample Result	Sample QualiUe1	Spike Added	MS Result	MS QualiUe1	z nit	D	%Rey	%Rey Limits		
Bi4ojeAn	0r15		5r00	5r+9		y gS1		106	65 - 125		

Lab Sample ID: 500-22957v-9 MSD
Mat1ir : x ate1
AnalTsis Batyh: 673032

Client Sample ID: Mx -09
P1ep WTpe: Wotal/NA

AnalTte	Sample Result	Sample QualiUe1	Spike Added	MSD Result	MSD QualiUe1	z nit	D	%Rey	%Rey Limits	RPD	RPD Limit
Bi4ojeAn	0r15		5r00	5r+C		y gS1		10E	65 - 125	1	20

Method: SM 3500 SO3 E - SulUate, Wotal

Lab Sample ID: MB 500-672f 38/96
Mat1ir : x ate1
AnalTsis Batyh: 672f 38

Client Sample ID: Method Blank
P1ep WTpe: Wotal/NA

AnalTte	MB Result	MB QualiUe1	RL	MDL	z nit	D	P1epa1ed	AnalTFed	Dil 4ay
w4iNdKn	35r0		5r0		y gS1			09S01S22 1+:C6	1

Lab Sample ID: MB 500-672f 38/72
Mat1ir : x ate1
AnalTsis Batyh: 672f 38

Client Sample ID: Method Blank
P1ep WTpe: Wotal/NA

AnalTte	MB Result	MB QualiUe1	RL	MDL	z nit	D	P1epa1ed	AnalTFed	Dil 4ay
w4iNdKn	35r0		5r0		y gS1			09S01S22 15:CC	1

Lab Sample ID: LCS 500-672f 38/97
Mat1ir : x ate1
AnalTsis Batyh: 672f 38

Client Sample ID: Lab Cont1ol Sample
P1ep WTpe: Wotal/NA

AnalTte			Spike Added	LCS Result	LCS QualiUe1	z nit	D	%Rey	%Rey Limits		
w4iNdKn			20r0	21r+		y gS1		106	88 - 12C		

f 4jo Ne c l ue dgo

QC Sample Results

Client: KPRG and Associates, Inc. Job ID: 500-22156C-1
Project/Site: Rowan Kotter Ill Gas Sm

Method: SM 3500 SO3 E - Sulfate, Total (Continued)

Lab Sample ID: LCS 500-672f38/7v **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 672f38

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Nitrate			20.0	21.5		mg/L		108	88 - 120		

Lab Sample ID: 500-22957v-v MS **Client Sample ID: Mx-0v**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 672f38

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Nitrate	51		20.0	66.9		mg/L		86	65 - 125		

Lab Sample ID: 500-22957v-v MSD **Client Sample ID: Mx-0v**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 672f38

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Nitrate	51		20.0	68.5		mg/L		90	65 - 125	1	20

Eurofins Chicago
241 Bo d Street
Un ve sity Park IL 60484
Phone 708-534 5200 Fax 708 534 5211

Chain of Custody Record

MKE 232

eurofins

Client Information	Sampler: Kaelyn Sperle	Lab PM: Mockler Diana J	Carrier Tracking No(s):	COC No: 500-104268-44025 1
Client Contact: Mitchel Dolan	Phone: 262-278-1621	E Mail: Diana Mockler@et eurofinsus com	State of Origin: IL	Page: Page 1 of 1
Company: KPRG and Associates Inc.	PWSID:			Job #: 500-221573
Address: 14665 West L sbon Road Su e 1A	Due Date Requested: Standard			
City: Brookfield	TAT Requested (days): Standard			
State Zip: WI 53005	Compliance Project: Δ Yes Δ No			
Phone: 262 781-0475(Tel)	PO #: 4502081030			
Email: mitcheld@kprginc.com	WO #:			
Project Name: Powerton CCR FAB	Project #: 50011610			
Site: Illinois	SSOW#:			

500-221573 COC

Analysis Requested

Preservation Codes
A HCL M Hexane
B NaOH N None
C Zn Acetate O AsNaO2
D Nitric Acid P Na2O4S
E NaHSO4 Q Na2SO3
F MeOH R Na2S2O3
G Amchl S H2SO4
H Ascorbic Acid T TSP Dodecahydrate
I Ice U Acetone
J DI Water V MCAA
K EDTA W pH 4 5
L EDA Y Trizma
Z other (specify)
Other:

	Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0 Standard Target List	Ra226Ra228_GFPC Local Method	904.0 Standard Target List	6020A, 7470A	2540C, 4500_F_C, SM4500_Cl_E, SM4500_SO4_E	Total Number of containers	Special Instructions/Note
				Preservation Code:				D	D	D	D	N		
1	MW-01	8/30/22	0932	G	Water	N	N	X	X	X	X	X		
2	MW-02	8/30/22	1048	G	Water	N	N	X	X	X	X	X		
3	MW-03	8/30/22	1134	G	Water	N	N	X	X	X	X	X		
4	MW-04	8/30/22	1237	G	Water	N	N	X	X	X	X	X		
5	MW-05	8/30/22	1325	G	Water	N	N	X	X	X	X	X		
6	MW-10	8/30/22	0842	G	Water	N	N	X	X	X	X	X		
7	Duplicate	8/30/22		G	Water	N	N	X	X	X	X	X		
					Water									

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Kaelyn Sperle	8/30/22/1645	KPRG	FedEx	8/30/22/1645	FedEx
Relinquished by	Date/Time	Company	Received by	Date/Time	Company
				8/31/22 0930	BETA
Relinquished by	Date/Time	Company	Received by	Date/Time	Company

Custody Seals Intact: Δ Yes No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks: 5.8→6.5, 3.3→2.0



D:PIAA (262) 278-1621
SPERLE
ND ASSOCIATES
LAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 30AUG22
ACTWGT: 50.85 LB
CAD: 6994780/SSFE2322
DIMS: 24x13x13 IN

BILL THIRD PARTY

TO EUROFINS

2417 BOND ST.

UNIVERSITY PARK IL 60484

(555) 555-5555 REF:
INV:
PO: DEPT:

500-221573 Waybi

Part # 156297-435 RRDB2 EXP 04/23

FedEx Express

REL# 3785346

4 of 6

MPS# 0263 2774 0693 6115

Mstr# 2774 0693 6089

0201

WED - 31 AUG 10:30A
PRIORITY OVERNIGHT

AHS
60484
IL-US ORD

XN JOTA



ORIGIN ID:PIAA (262) 278-1621
KAELYN SPERLE
KPRG AND ASSOCIATES
414 PLAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 30AUG22
ACTWGT: 50.85 LB
CAD: 6994780/SSFE2322
DIMS: 24x13x13 IN

BILL THIRD PARTY

TO EUROFINS

2417 BOND ST.

UNIVERSITY PARK IL 60484

(555) 555-5555 REF:
DEPT:

Part # 156297-435 RRDB2 EXP 04/23

Fed Exp

REL# 3785346

2 of 6

MPS# 0263 2774 0693 60

Mstr# 2774 0693 6089 00

0201

WED - 31 AUG 10:30A
PRIORITY OVERNIGHT

AHS
60484
IL-US ORD

XN JOTA

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-221573-1

Login Number: 221573
List Number: 1
Creator: Scott, Sherri L

List Source: Eurofins Chicago

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	4.5,2.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Lab Chronicle

Client: KPRG and Associates, Inc.
Pjo/ectSwite: Pop ejton CCR 3AB

Job ID: 500-22156r -1

Client Sample ID: MW-01
Date Collecte8: 0/ 3x03 22 09:x2
Date Receive8: 0/ 3x13 22 09:x0

Lab Sample ID: 500-22156x-1
Matrid: Water

Prep Type	Batch Type	Batch Metho8	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepare8 or Analyze8
Total Recovejable	PjeE	r 005A			862895	BD7	77T CHI	09S 01S 22 04:19 - 09S 01S 22 04:¹ 9 y
Total Recovejable	AnalFsis	8020A		1	86r 44¹	3XG	77T CHI	09S 04S 22 20:09
Total Recovejable	PjeE	r 005A			862895	BD7	77T CHI	09S 01S 22 04:19 - 09S 01S 22 04:¹ 9 y
Total Recovejable	AnalFsis	8020A		1	86r ¹ 80	3XG	77T CHI	09S 01S 22 21:50
TotalSNA	PjeE	6¹ 60A			86r 822	MJG	77T CHI	09S 04S 22 10:05 - 09S 04S 22 12:05 y
TotalSNA	AnalFsis	6¹ 60A		1	86r 499	MJG	77T CHI	09S 09S 22 04:29
TotalSNA	AnalFsis	wM 25¹ 0C		1	86r r 2¹	wMO	77T CHI	09S 08S 22 16:28
TotalSNA	AnalFsis	wM ¹ 500 Cl- 7		2	862405	LP	77T CHI	09S 01S 22 12:¹ 1
TotalSNA	AnalFsis	wM ¹ 500 3 C		1	86¹ 0¹ 2	7AT	77T CHI	09S 10S 22 1¹ :r r
TotalSNA	AnalFsis	wM ¹ 500 wO¹ 7		2	8624¹ 9	LP	77T CHI	09S 01S 22 1¹ :¹ 5

Client Sample ID: MW-02
Date Collecte8: 0/ 3x03 22 10:4/
Date Receive8: 0/ 3x13 22 09:x0

Lab Sample ID: 500-22156x-2
Matrid: Water

Prep Type	Batch Type	Batch Metho8	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepare8 or Analyze8
Total Recovejable	PjeE	r 005A			862895	BD7	77T CHI	09S 01S 22 04:19 - 09S 01S 22 04:¹ 9 y
Total Recovejable	AnalFsis	8020A		1	86r 44¹	3XG	77T CHI	09S 04S 22 20:12
Total Recovejable	PjeE	r 005A			862895	BD7	77T CHI	09S 01S 22 04:19 - 09S 01S 22 04:¹ 9 y
Total Recovejable	AnalFsis	8020A		1	86r ¹ 80	3XG	77T CHI	09S 01S 22 21:5r
TotalSNA	PjeE	6¹ 60A			86r 822	MJG	77T CHI	09S 04S 22 10:05 - 09S 04S 22 12:05 y
TotalSNA	AnalFsis	6¹ 60A		1	86r 499	MJG	77T CHI	09S 09S 22 04:r 1
TotalSNA	AnalFsis	wM 25¹ 0C		1	86r r 2¹	wMO	77T CHI	09S 08S 22 16:29
TotalSNA	AnalFsis	wM ¹ 500 Cl- 7		2	862405	LP	77T CHI	09S 01S 22 12:¹ 2
TotalSNA	AnalFsis	wM ¹ 500 3 C		1	86¹ 0¹ 2	7AT	77T CHI	09S 10S 22 1¹ :¹ 0
TotalSNA	AnalFsis	wM ¹ 500 wO¹ 7		2	8624¹ 9	LP	77T CHI	09S 01S 22 1¹ :¹ 8

Client Sample ID: MW-0x
Date Collecte8: 0/ 3x03 22 11:x4
Date Receive8: 0/ 3x13 22 09:x0

Lab Sample ID: 500-22156x-x
Matrid: Water

Prep Type	Batch Type	Batch Metho8	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepare8 or Analyze8
Total Recovejable	PjeE	r 005A			862895	BD7	77T CHI	09S 01S 22 04:19 - 09S 01S 22 04:¹ 9 y
Total Recovejable	AnalFsis	8020A		1	86r 44¹	3XG	77T CHI	09S 04S 22 20:18
Total Recovejable	PjeE	r 005A			862895	BD7	77T CHI	09S 01S 22 04:19 - 09S 01S 22 04:¹ 9 y
Total Recovejable	AnalFsis	8020A		1	86r ¹ 80	3XG	77T CHI	09S 01S 22 21:56
TotalSNA	PjeE	6¹ 60A			86r 822	MJG	77T CHI	09S 04S 22 10:05 - 09S 04S 22 12:05 y
TotalSNA	AnalFsis	6¹ 60A		1	86r 499	MJG	77T CHI	09S 09S 22 04:r ¹
TotalSNA	AnalFsis	wM 25¹ 0C		1	86r r 2¹	wMO	77T CHI	09S 08S 22 16:r 0
TotalSNA	AnalFsis	wM ¹ 500 Cl- 7		2	862405	LP	77T CHI	09S 01S 22 12:¹ ¹
TotalSNA	AnalFsis	wM ¹ 500 3 C		1	86¹ 0¹ 2	7AT	77T CHI	09S 10S 22 1¹ :¹ 9
TotalSNA	AnalFsis	wM ¹ 500 wO¹ 7		2	8624¹ 9	LP	77T CHI	09S 01S 22 15:r ¹

Lab Chronicle

Client: KPRG and Associates, Inc.
Pjo/ectSwite: Pop ejton CCR 3AB

Job ID: 500-22156r -1

Client Sample ID: MW-04

Date Collecte8: 0/ 3x03 22 12:x6
Date Receive8: 0/ 3x13 22 09:x0

Lab Sample ID: 500-22156x-4

Matrid: Water

Prep Type	Batch Type	Batch Metho8	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepare8 or Analyze8
Total Recovejable	PjeE	r 005A			862895	BD7	77T CHI	09S 1S 22 04:19 - 09S 1S 22 04:¹ 9 y
Total Recovejable	AnalFsis	8020A		1	86r 44¹	3XG	77T CHI	09S 4S 22 20:19
Total Recovejable	PjeE	r 005A			862895	BD7	77T CHI	09S 1S 22 04:19 - 09S 1S 22 04:¹ 9 y
Total Recovejable	AnalFsis	8020A		1	86r ¹ 80	3XG	77T CHI	09S 1S 22 22:00
TotalSNA	PjeE	6¹ 60A			86r 822	MJG	77T CHI	09S 4S 22 10:05 - 09S 4S 22 12:05 y
TotalSNA	AnalFsis	6¹ 60A		1	86r 499	MJG	77T CHI	09S 9S 22 04:r 8
TotalSNA	AnalFsis	wM 25¹ 0C		1	86r r 2¹	wMO	77T CHI	09S 8S 22 16:r 1
TotalSNA	AnalFsis	wM ¹ 500 Cl- 7		2	862405	LP	77T CHI	09S 1S 22 12:¹ 5
TotalSNA	AnalFsis	wM ¹ 500 3 C		1	86¹ 0¹ 2	7AT	77T CHI	09S 10S 22 1¹ :52
TotalSNA	AnalFsis	wM ¹ 500 wO¹ 7		2	8624¹ 9	LP	77T CHI	09S 1S 22 15:r 5

Client Sample ID: MW-05

Date Collecte8: 0/ 3x03 22 1x:25
Date Receive8: 0/ 3x13 22 09:x0

Lab Sample ID: 500-22156x-5

Matrid: Water

Prep Type	Batch Type	Batch Metho8	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepare8 or Analyze8
Total Recovejable	PjeE	r 005A			862895	BD7	77T CHI	09S 1S 22 04:19 - 09S 1S 22 04:¹ 9 y
Total Recovejable	AnalFsis	8020A		1	86r 44¹	3XG	77T CHI	09S 4S 22 20:2r
Total Recovejable	PjeE	r 005A			862895	BD7	77T CHI	09S 1S 22 04:19 - 09S 1S 22 04:¹ 9 y
Total Recovejable	AnalFsis	8020A		1	86r ¹ 80	3XG	77T CHI	09S 1S 22 22:0¹
TotalSNA	PjeE	6¹ 60A			86r 822	MJG	77T CHI	09S 4S 22 10:05 - 09S 4S 22 12:05 y
TotalSNA	AnalFsis	6¹ 60A		1	86r 499	MJG	77T CHI	09S 9S 22 04:r 4
TotalSNA	AnalFsis	wM 25¹ 0C		1	86r r 2¹	wMO	77T CHI	09S 8S 22 16:r 2
TotalSNA	AnalFsis	wM ¹ 500 Cl- 7		2	862405	LP	77T CHI	09S 1S 22 12:¹ 5
TotalSNA	AnalFsis	wM ¹ 500 3 C		1	86¹ 0¹ 2	7AT	77T CHI	09S 10S 22 1¹ :5¹
TotalSNA	AnalFsis	wM ¹ 500 wO¹ 7		5	8624¹ 9	LP	77T CHI	09S 1S 22 15:r 8

Client Sample ID: MW-10

Date Collecte8: 0/ 3x03 22 0/ :42
Date Receive8: 0/ 3x13 22 09:x0

Lab Sample ID: 500-22156x-7

Matrid: Water

Prep Type	Batch Type	Batch Metho8	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepare8 or Analyze8
Total Recovejable	PjeE	r 005A			862895	BD7	77T CHI	09S 1S 22 04:19 - 09S 1S 22 04:¹ 9 y
Total Recovejable	AnalFsis	8020A		1	86r 44¹	3XG	77T CHI	09S 4S 22 20:28
Total Recovejable	PjeE	r 005A			862895	BD7	77T CHI	09S 1S 22 04:19 - 09S 1S 22 04:¹ 9 y
Total Recovejable	AnalFsis	8020A		1	86r ¹ 80	3XG	77T CHI	09S 1S 22 22:06
TotalSNA	PjeE	6¹ 60A			86r 822	MJG	77T CHI	09S 4S 22 10:05 - 09S 4S 22 12:05 y
TotalSNA	AnalFsis	6¹ 60A		1	86r 499	MJG	77T CHI	09S 9S 22 04:¹ 0
TotalSNA	AnalFsis	wM 25¹ 0C		1	86r r 25	wMO	77T CHI	09S 8S 22 14:0r
TotalSNA	AnalFsis	wM ¹ 500 Cl- 7		2	862405	LP	77T CHI	09S 1S 22 12:¹ 5
TotalSNA	AnalFsis	wM ¹ 500 3 C		1	86¹ 0¹ 2	7AT	77T CHI	09S 10S 22 1¹ :58
TotalSNA	AnalFsis	wM ¹ 500 wO¹ 7		2	8624¹ 9	LP	77T CHI	09S 1S 22 15:r 8

Lab Chronicle

Client: KPRG and Associates, Inc.
Pjo/ectSwite: Popejton CCR 3AB

Job ID: 500-22156r-1

Client Sample ID: Duplicate

Date Collecte8: 0/ 3x03/22 00:00
Date Receive8: 0/ 3x13/22 09:x0

Lab Sample ID: 500-22156x-6

Matrid: Water

Prep Type	Batch Type	Batch Metho8	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepare8 or Analyze8
Total Recovejable	PjeE	r 005A			862895	BD7	77T CHI	09S01S22 04:19 - 09S01S22 04:¹9 y
Total Recovejable	AnalFsis	8020A		1	86r44¹	3XG	77T CHI	09S04S22 20:r0
Total Recovejable	PjeE	r 005A			862895	BD7	77T CHI	09S01S22 04:19 - 09S01S22 04:¹9 y
Total Recovejable	AnalFsis	8020A		1	86r¹80	3XG	77T CHI	09S01S22 22:11
TotalSNA	PjeE	6¹60A			86r822	MJG	77T CHI	09S04S22 10:05 - 09S04S22 12:05 y
TotalSNA	AnalFsis	6¹60A		1	86r499	MJG	77T CHI	09S09S22 04:¹4
TotalSNA	AnalFsis	wM 25¹0C		1	86rr2¹	wMO	77T CHI	09S08S22 16:rr
TotalSNA	AnalFsis	wM ¹500 Cl- 7		5	862405	LP	77T CHI	09S01S22 1¹:01
TotalSNA	AnalFsis	wM ¹500 3 C		1	86¹0¹2	7AT	77T CHI	09S10S22 1¹:59
TotalSNA	AnalFsis	wM ¹500 wO¹ 7		5	8624¹9	LP	77T CHI	09S01S22 15:r8

yComEletion dates and times ajejeEojted oj not jeEojted Eej method jequijements oj individual lab discjetion.

Laboratory References:

77T CHI = 7ujofins Chicago, 2¹16 Bond wtjeet, UnivejsitF Pajk, IL 80¹4¹, T7L (604)5r¹-5200

Accreditation/Certification Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-221573-1

Laboratory: Eurofins Chicago

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Illinois	NELAP	IL00035	04-30-23

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Tel: (708)534-5200

Laboratory Job ID: 500-221573-2
Client Project/Site: Powerton CCR FAB (RAD)

For:
KPRG and Associates, Inc.
14665 West Lisbon Road,
Suite 1A
Brookfield, Wisconsin 53005

Attn: Richard Gnat

Diana Mockler

Authorized for release by:
10/5/2022 11:15:11 AM

Diana Mockler, Project Manager I
(219)252-7570
Diana.Mockler@et.eurofinsus.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-221573-2

Job ID: 500-221573-2

Laboratory: Eurofins Chicago

Narrative

Job Narrative
500-221573-2

Comments
No additional comments.

Receipt
The samples were received on 8/31/2022 9:30 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 2.0º C and 4.5º C.

RAD
Methods 903.0, 9315: Radium-226 batch 581076
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
Duplicate (500-221573-7), (LCS 160-581076/2-A), (MB 160-581076/1-A), (500-221498-K-14-A) and (500-221498-L-14-D DU)

Methods 903.0, 9315: Radium-226 batch 581008
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
MW-01 (500-221573-1), MW-02 (500-221573-2), MW-03 (500-221573-3), MW-04 (500-221573-4), MW-05 (500-221573-5), MW-10 (500-221573-6), (LCS 160-581008/2-A), (MB 160-581008/1-A), (500-221556-F-1-A) and (500-221556-E-1-A DU)

Methods 904.0, 9320: Radium-228 batch 583206
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
Duplicate (500-221573-7), (LCS 160-583206/2-A), (MB 160-583206/1-A), (500-221498-J-14-A) and (500-221498-J-14-B DU)

Methods 904.0, 9320: Radium-228 batch 582886
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
MW-01 (500-221573-1), MW-02 (500-221573-2), MW-03 (500-221573-3), MW-04 (500-221573-4), MW-05 (500-221573-5), MW-10 (500-221573-6), (LCS 160-582886/2-A), (MB 160-582886/1-A), (500-221556-F-2-A) and (500-221556-E-2-A DU)

Method PrecSep_0:

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Method Summary

Lient K PRGa dt A s cco, edKnc. It , r
Rjo/n, KSwekn: RoMnjKot I I G Bs ( )Gs DE

Job ID: 500-22156C-2

Method	Method Description	Protocol	Laboratory
30Cr0	GdAeum-22F)a BRl E	9Rs	99T wL
304r0	GdAeum-228)a BRl E	9Rs	99T wL
Gd22F_Gd228	l ombet nA GdAeum-22F dt A GdAeum-228	Ts L-wTL	99T wL
Rjn, wnp_0	Rjnpdjdkot . Rjn, epekdkn wnpdjdkot	Not n	99T wL
Rjn, wnp-21	Rjnpdjdkot . Rjn, epekdkn wnpdjdkot)21-Ddy It -a joMKnE	Not n	99T wL

Protocol References:

9Rs = Uw 9t vejot mnt kdi Rjokn, kot s gnt , y

Not n = Not n

Ts L-wTL = Tncks mnje, d Ldbojdkojenc. wkt Louec. Bd, eiky wkdt AdjA Opnjdkt g Rjo, nAujnr

Laboratory References:

99T wL = 9ujofet c wkt Louec. 1C615 GeAnj Tjdei Nojkn. 9djkn I eky. 7 O FC045. T9L)C14E238-85FF

9ujofet c l he, dgo

Sample Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-221573-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-221573-1	MW-01	Water	08/30/22 09:32	08/31/22 09:30
500-221573-2	MW-02	Water	08/30/22 10:48	08/31/22 09:30
500-221573-3	MW-03	Water	08/30/22 11:34	08/31/22 09:30
500-221573-4	MW-04	Water	08/30/22 12:37	08/31/22 09:30
500-221573-5	MW-05	Water	08/30/22 13:25	08/31/22 09:30
500-221573-6	MW-10	Water	08/30/22 08:42	08/31/22 09:30
500-221573-7	Duplicate	Water	08/30/22 00:00	08/31/22 09:30

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-221573-2

Client Sample ID: MW-01

Date Collected: 08/30/22 09:32
Date Received: 08/31/22 09:30

Lab Sample ID: 500-221573-1

Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0557	U	0.0631	0.0633	1.00	0.102	pCi/L	09/06/22 15:03	09/28/22 17:06	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.8*		*40 - 110*	*09/06/22 15:03*	*09/28/22 1. :06*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.278	U	0.276	0.277	1.00	0.441	pCi/L	09/20/22 15:24	09/30/22 12:09	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*88.9*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:09*	*1*
7 Carrier	*86.4*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:09*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.333	U	0.283	0.284	5.00	0.441	pCi/L		10/03/22 13:21	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-221573-2

Client Sample ID: MW-02

Date Collected: 08/30/22 10:48
Date Received: 08/31/22 09:30

Lab Sample ID: 500-221573-2

Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0108	U	0.0424	0.0424	1.00	0.0850	pCi/L	09/06/22 15:03	09/28/22 17:06	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*9. Y0*		*40 - 110*	*09/06/22 15:03*	*09/28/22 1. :06*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.524**		0.320	0.324	1.00	0.465	pCi/L	09/20/22 15:24	09/30/22 12:09	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92Y4*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:09*	*1*
7 Carrier	*89Y0*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:09*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.535**		0.323	0.327	5.00	0.465	pCi/L		10/03/22 13:21	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-221573-2

Client Sample ID: MW-03

Date Collected: 08/30/22 11:34
Date Received: 08/31/22 09:30

Lab Sample ID: 500-221573-3

Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0402	U	0.0533	0.0534	1.00	0.0892	pCi/L	09/06/22 15:03	09/28/22 17:06	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*98%*		*40 - 110*	*09/06/22 15:03*	*09/28/22 1. :06*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.549**		0.333	0.337	1.00	0.480	pCi/L	09/20/22 15:24	09/30/22 12:10	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92%*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:10*	*1*
7 Carrier	*84%*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:10*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.589**		0.337	0.341	5.00	0.480	pCi/L		10/03/22 13:21	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-221573-2

Client Sample ID: MW-04

Date Collected: 08/30/22 12:37
Date Received: 08/31/22 09:30

Lab Sample ID: 500-221573-4

Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0248	U	0.0476	0.0477	1.00	0.0865	pCi/L	09/06/22 15:03	09/28/22 17:06	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95%*		*40 - 110*	*09/06/22 15:03*	*09/28/22 1. :06*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.239	U	0.326	0.327	1.00	0.546	pCi/L	09/20/22 15:24	09/30/22 12:10	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91%*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:10*	*1*
7 Carrier	*86%*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:10*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.264	U	0.329	0.330	5.00	0.546	pCi/L		10/03/22 13:21	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-221573-2

Client Sample ID: MW-05

Date Collected: 08/30/22 13:25
Date Received: 08/31/22 09:30

Lab Sample ID: 500-221573-5

Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0280	U	0.0611	0.0612	1.00	0.111	pCi/L	09/06/22 15:03	09/28/22 17:06	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*93Y8*		*40 - 110*	*09/06/22 15:03*	*09/28/22 1. :06*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.461	U	0.348	0.351	1.00	0.538	pCi/L	09/20/22 15:24	09/30/22 12:10	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96Y1*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:10*	*1*
7 Carrier	*8. Y5*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:10*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.489	U	0.353	0.356	5.00	0.538	pCi/L		10/03/22 13:21	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-221573-2

Client Sample ID: MW-10

Date Collected: 08/30/22 08:42
Date Received: 08/31/22 09:30

Lab Sample ID: 500-221573-6

Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.512		0.130	0.138	1.00	0.0953	pCi/L	09/06/22 15:03	09/28/22 17:06	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*9. Y8*		*40 - 110*	*09/06/22 15:03*	*09/28/22 1. :06*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.892		0.414	0.422	1.00	0.561	pCi/L	09/20/22 15:24	09/30/22 12:11	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92Y9*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:11*	*1*
7 Carrier	*80Y*		*40 - 110*	*09/20/22 15:24*	*09/30/22 12:11*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.40		0.434	0.444	5.00	0.561	pCi/L		10/03/22 13:21	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-221573-2

Client Sample ID: Duplicate

Date Collected: 08/30/22 00:00
Date Received: 08/31/22 09:30

Lab Sample ID: 500-221573-7

Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0114	U	0.0448	0.0448	1.00	0.0899	pCi/L	09/07/22 12:48	09/29/22 08:04	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96%*		*40 - 110*	*09/0. /22 12:48*	*09/29/22 08:04*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.315	U	0.309	0.310	1.00	0.495	pCi/L	09/22/22 15:49	09/29/22 12:10	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91%*		*40 - 110*	*09/22/22 15:49*	*09/29/22 12:10*	*1*
7 Carrier	*85%*		*40 - 110*	*09/22/22 15:49*	*09/29/22 12:10*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.326	U	0.312	0.313	5.00	0.495	pCi/L		09/29/22 18:28	1

Definitions/Glossary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-221573-2

Qualifiers

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

QC Association Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-221573-2

Rad

Prep Batch: 581008

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221573-1	MW-01	Total/NA	Water	PrecSep-21	
500-221573-2	MW-02	Total/NA	Water	PrecSep-21	
500-221573-3	MW-03	Total/NA	Water	PrecSep-21	
500-221573-4	MW-04	Total/NA	Water	PrecSep-21	
500-221573-5	MW-05	Total/NA	Water	PrecSep-21	
500-221573-6	MW-10	Total/NA	Water	PrecSep-21	
MB 160-581008/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-581008/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 581076

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221573-7	Duplicate	Total/NA	Water	PrecSep-21	
MB 160-581076/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-581076/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 582886

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221573-1	MW-01	Total/NA	Water	PrecSep_0	
500-221573-2	MW-02	Total/NA	Water	PrecSep_0	
500-221573-3	MW-03	Total/NA	Water	PrecSep_0	
500-221573-4	MW-04	Total/NA	Water	PrecSep_0	
500-221573-5	MW-05	Total/NA	Water	PrecSep_0	
500-221573-6	MW-10	Total/NA	Water	PrecSep_0	
MB 160-582886/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-582886/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Prep Batch: 583206

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-221573-7	Duplicate	Total/NA	Water	PrecSep_0	
MB 160-583206/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-583206/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-221573-2

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-581008 71-/
MatAr: x ateA
/ nalTsis BatNh: 583c96

Client Sample ID: Method Blank
PAep WTpe: WotalTy /
PAep BatNh: 581008

/ nalTte	MB Result	MB QualiUeA	Count z nNeAt. (24 σ7-)	Wotal z nNeAt. (24 σ7-)	RL	MDC	z nit	PAepaAed	/ nalT+ed	Dil FaN
Radium-226	-0.02655	U	0.0369	0.0370	1.00	0.0964	pCi/L	09/06/22 15:03	09/28/22 14:43	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*9960*		*40 - 110*	*09/07/22 1: 805*	*09/2. /22 1484 5*	*1*

Lab Sample ID: LCS 160-581008 72-/
MatAr: x ateA
/ nalTsis BatNh: 583c96

Client Sample ID: Lab ContAol Sample
PAep WTpe: WotalTy /
PAep BatNh: 581008

/ nalTte			Spike / dded	LCS Result	LCS Qual	Wotal z nNeAt. (24 σ7-)	RL	MDC	z nit	f ReN	f ReN Limits		
Radium-226			11.3	9.855		1.03	1.00	0.0904	pCi/L	87	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*9. 60*		*40 - 110*

Lab Sample ID: MB 160-5810c671-/
MatAr: x ateA
/ nalTsis BatNh: 58399%

Client Sample ID: Method Blank
PAep WTpe: WotalTy /
PAep BatNh: 5810c6

/ nalTte	MB Result	MB QualiUeA	Count z nNeAt. (24 σ7-)	Wotal z nNeAt. (24 σ7-)	RL	MDC	z nit	PAepaAed	/ nalT+ed	Dil FaN
Radium-226	0.08112	U	0.0644	0.0648	1.00	0.0908	pCi/L	09/07/22 12:48	09/29/22 08:01	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*9: 67*		*40 - 110*	*09/03/22 128 4.*	*09/29/22 0. 801*	*1*

Lab Sample ID: LCS 160-5810c672-/
MatAr: x ateA
/ nalTsis BatNh: 58399%

Client Sample ID: Lab ContAol Sample
PAep WTpe: WotalTy /
PAep BatNh: 5810c6

/ nalTte			Spike / dded	LCS Result	LCS Qual	Wotal z nNeAt. (24 σ7-)	RL	MDC	z nit	f ReN	f ReN Limits		
Radium-226			11.3	9.890		1.04	1.00	0.0923	pCi/L	87	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*9: 65*		*40 - 110*

Method: 90%0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-582886 71-/
MatAr: x ateA
/ nalTsis BatNh: 58%23%

Client Sample ID: Method Blank
PAep WTpe: WotalTy /
PAep BatNh: 582886

/ nalTte	MB Result	MB QualiUeA	Count z nNeAt. (24 σ7-)	Wotal z nNeAt. (24 σ7-)	RL	MDC	z nit	PAepaAed	/ nalT+ed	Dil FaN
Radium-228	0.4739	U	0.321	0.324	1.00	0.476	pCi/L	09/20/22 15:24	09/30/22 12:03	1

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-221573-2

Method: 90%0 - Radium-228 (GFPC) (Continued)

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	. . 60		40 - 110	09/20/22 1: 824	09/50/22 128 05	1
Y Carrier	. 764		40 - 110	09/20/22 1: 824	09/50/22 128 05	1

Lab Sample ID: LCS 160-582886 72-/
MatAir : x ateA
/ nalTsis BatNh: 58%23%

Client Sample ID: Lab ContAol Sample
PAep WTpe: Wotal7y /
PAep BatNh: 582886

/ nalTte			Spike / dded	LCS Result	LCS Qual	Wotal z nNeAt. (24 o7-)	RL	MDC	z nit	f ReN	f ReN Limits		
Radium-228			8.24	9.668		1.32	1.00	0.545	pCi/L	117	75 - 125		

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	. 560		40 - 110
Y Carrier	. 764		40 - 110

Lab Sample ID: MB 160-583206 71-/
MatAir : x ateA
/ nalTsis BatNh: 58%00c

Client Sample ID: Method Blank
PAep WTpe: Wotal7y /
PAep BatNh: 583206

/ nalTte	MB Result	MB QualiUeA	Count z nNeAt. (24 o7-)	Wotal z nNeAt. (24 o7-)	RL	MDC	z nit	PAepaAed	/ nalT+ed	Dil FaN
Radium-228	0.8641		0.401	0.409	1.00	0.531	pCi/L	09/22/22 15:49	09/29/22 12:04	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	. 060		40 - 110	09/22/22 1: 849	09/29/22 128 04	1
Y Carrier	. 564		40 - 110	09/22/22 1: 849	09/29/22 128 04	1

Lab Sample ID: LCS 160-583206 72-/
MatAir : x ateA
/ nalTsis BatNh: 58%00c

Client Sample ID: Lab ContAol Sample
PAep WTpe: Wotal7y /
PAep BatNh: 583206

/ nalTte			Spike / dded	LCS Result	LCS Qual	Wotal z nNeAt. (24 o7-)	RL	MDC	z nit	f ReN	f ReN Limits		
Radium-228			8.24	8.492		1.15	1.00	0.472	pCi/L	103	75 - 125		

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	946		40 - 110
Y Carrier	. : 67		40 - 110

R000694

Eurofins Chicago
241 Bond Street
University Park IL 60484
Phone 708-534 5200 Fax 708 534 5211

Chain of Custody Record

MKE 232 eurofins

Client Information	Sampler: Kaelyn Sperle	Lab PM: Mockler Diana J	Carrier Tracking No(s):	COC No: 500-104268-44025 1
Client Contact: Mitchel Dolan	Phone: 262-278-1621	E Mail: Diana Mockler@et eurofinsus com	State of Origin: IL	Page: Page 1 of 1
Company: KPRG and Associates Inc.	PWSID:			Job #: 500-221573
Address: 14665 West Lisbon Road Suite 1A	Due Date Requested: Standard			
City: Brookfield	TAT Requested (days): Standard			
State Zip: WI 53005	Compliance Project Δ Yes Δ No			
Phone: 262 781-0475(Tel)	PO #: 4502081030			
Email: mitcheld@kprginc.com	WO #:			
Project Name: Powerton CCR FAB	Project #: 50011612			
Site: Illinois	SSOW#:			

500-221573 COC

Analysis Requested

Preservation Codes: A HCL; B NaOH; C Zn Acetate; D Nitric Acid; E NaHSO4; F MeOH; G Amchi; H Ascorbic Acid; I Ice; J DI Water; K EDTA; L EDA; M Hexane; N None; O AsNaO2; P Na2O4S; Q Na2SO3; R Na2S2O3; S H2SO4; T TSP Dodecahydrate; U Aceton; V MCAA; W pH 4 5; Y Trizma; Z other (specify); Other:

	Sample Identification	Sample Date	Sample Time	Sample Type (C=comp G=grab)	Matrix (W=water =solid O=waste/oil, BT Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0 Standard Target List	Ra226Ra228_GFPC Local Method	904.0 Standard Target List	6020A, 7470A	2540C, 4500_F_C, SM4500_Cl_E, SM4500_SO4_E	Total Number of containers	Special Instructions/Note
				Preservation Code				D	D	D	D	N		
1	MW-01 [redacted]	8/30/22	0932	G	Water	N	N	X	X	X	X	X		
2	MW-02 [redacted]	8/30/22	1048	G	Water	N	N	X	X	X	X	X		
3	MW-03 [redacted]	8/30/22	1134	G	Water	N	N	X	X	X	X	X		
4	MW-04 [redacted]	8/30/22	1237	G	Water	N	N	X	X	X	X	X		
5	MW-05 [redacted]	8/30/22	1325	G	Water	N	N	X	X	X	X	X		
6	MW-10 [redacted]	8/30/22	0842	G	Water	N	N	X	X	X	X	X		
7	Duplicate	8/30/22		G	Water	N	N	X	X	X	X	X		
					Water									

Possible Hazard Identification: [X] Non-Hazard [ ] Flammable [ ] Skin Irritant [ ] Poison B [ ] Unknown [ ] Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): [ ] Return To Client [X] Disposal By Lab [ ] Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Kaelyn Sperle	8/30/22/1645	KPRG	FedEx	8/30/22/1645	FedEx
			[signature]	8/31/22 0930	[signature]

Custody Seals Intact Δ Yes No	Custody Seal No	Cooler Temperature(s) °C and other Remarks
		5.8 → 4.5, 3.3 → 2.0

10/5/2022


ORIGIN ID:PIAA (262) 278-1621
SHIP DATE: 30AUG22
ACTWGT: 50.85 LB
CAD: 6994780/SSFE2322
DIMS: 24x13x13 IN
BILL THIRD PARTY
TO EUROFINS
2417 BOND ST.
UNIVERSITY PARK IL 60484
(555) 555-5555
REF:
DEPT:
FedEx Express
REL# 3785346
4 of 6
MPS# 2774 0693 6115
Mstr# 2774 0693 6089
0263
0201
WED - 31 AUG 10:30A
PRIORITY OVERNIGHT
AHS
60484
IL-US ORD
XN JOTA


ORIGIN ID:PIAA (262) 278-1621
KAELYN SPERLE
KPRG AND ASSOCIATES
414 PLAZA DR STE 106
WESTMONT, IL 60559
UNITED STATES US
SHIP DATE: 30AUG22
ACTWGT: 50.85 LB
CAD: 6994780/SSFE2322
DIMS: 24x13x13 IN
BILL THIRD PARTY
TO EUROFINS
2417 BOND ST.
UNIVERSITY PARK IL 60484
REF:
DEPT:
Fed Exp
REL# 3785346
2 of 6
MPS# 2774 0693 60
Mstr# 2774 0693 6089
0263
0201
WED - 31 AUG 10:30A
PRIORITY OVERNIGHT
AHS
60484
IL-US ORD
XN JOTA

R000696

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone: 708-534-5200 Fax: 708-534-5211

Chain of Custody Record

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	COC No: 500-164794.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: Illinois	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Illinois		Job #: 500-221573-2
Address: 13715 Rider Trail North,	Due Date Requested: 10/3/2022			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Powerton CCR	Project #: 50011612			
Site: MWG - Powerton	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_21 Standard Target List	904.0/PrecSep_0 Standard Target List	Ra226Ra228_GFPC	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
MW-01 (500-221573-1)	8/30/22	09:32 Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
MW-02 (500-221573-2)	8/30/22	10:48 Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
MW-03 (500-221573-3)	8/30/22	11:34 Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
MW-04 (500-221573-4)	8/30/22	12:37 Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
MW-05 (500-221573-5)	8/30/22	13:25 Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
MW-15 (500-221573-6)	8/30/22	08:42 Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
Duplicate (500-221573-7)	8/30/22	Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no

Note: Since laboratory accreditations are subject to change, Eurofins Chicago places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Chicago laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Chicago attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Chicago.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by: [signature] FED EX	Date/Time: 8/31/22 1415	Company EETA	Received by: FED EX	Date/Time:	Company
Relinquished by: FED EX	Date/Time:	Company	Received by: [signature]	Date/Time: SEP 0 1 2022 0825	Company EETC
Relinquished by:	Date/Time:	Company	Received by: Autumn R. Johnson	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-221573-2

Login Number: 221573
List Number: 1
Creator: Scott, Sherri L

List Source: Eurofins Chicago

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	4.5,2.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-221573-2

Login Number: 221573
List Number: 2
Creator: Booker, Autumn R

List Source: Eurofins St. Louis
List Creation: 09/01/22 11:04 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-221573-2

Client Sample ID: MW-01
Lab Sample ID: 500-22156x-1

Date Collecte8: 0/ 3x03 22 09:x2
Matrid: Water
Date Receive8: 0/ 3x13 22 09:x0

Prep Type	Batch Type	Batch Metho8	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepare8 or Analyze8
Total/NA	Prep	PrecSep-21			581008	TJ	EET SL	09/06/22 15:03
Total/NA	Analysis	903.0		1	583796	CLP	EET SL	09/28/22 17:06
Total/NA	Prep	PrecSep_0			582886	MLK	EET SL	09/20/22 15:24
Total/NA	Analysis	904.0		1	584224	FLC	EET SL	09/30/22 12:09
Total/NA	Analysis	Ra226_Ra228		1	584450	CAH	EET SL	10/03/22 13:21

Client Sample ID: MW-02
Lab Sample ID: 500-22156x-2

Date Collecte8: 0/ 3x03 22 10:4/
Matrid: Water
Date Receive8: 0/ 3x13 22 09:x0

Prep Type	Batch Type	Batch Metho8	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepare8 or Analyze8
Total/NA	Prep	PrecSep-21			581008	TJ	EET SL	09/06/22 15:03
Total/NA	Analysis	903.0		1	583796	CLP	EET SL	09/28/22 17:06
Total/NA	Prep	PrecSep_0			582886	MLK	EET SL	09/20/22 15:24
Total/NA	Analysis	904.0		1	584224	FLC	EET SL	09/30/22 12:09
Total/NA	Analysis	Ra226_Ra228		1	584450	CAH	EET SL	10/03/22 13:21

Client Sample ID: MW-0x
Lab Sample ID: 500-22156x-x

Date Collecte8: 0/ 3x03 22 11:x4
Matrid: Water
Date Receive8: 0/ 3x13 22 09:x0

Prep Type	Batch Type	Batch Metho8	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepare8 or Analyze8
Total/NA	Prep	PrecSep-21			581008	TJ	EET SL	09/06/22 15:03
Total/NA	Analysis	903.0		1	583796	CLP	EET SL	09/28/22 17:06
Total/NA	Prep	PrecSep_0			582886	MLK	EET SL	09/20/22 15:24
Total/NA	Analysis	904.0		1	584224	FLC	EET SL	09/30/22 12:10
Total/NA	Analysis	Ra226_Ra228		1	584450	CAH	EET SL	10/03/22 13:21

Client Sample ID: MW-04
Lab Sample ID: 500-22156x-4

Date Collecte8: 0/ 3x03 22 12:x6
Matrid: Water
Date Receive8: 0/ 3x13 22 09:x0

Prep Type	Batch Type	Batch Metho8	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepare8 or Analyze8
Total/NA	Prep	PrecSep-21			581008	TJ	EET SL	09/06/22 15:03
Total/NA	Analysis	903.0		1	583796	CLP	EET SL	09/28/22 17:06
Total/NA	Prep	PrecSep_0			582886	MLK	EET SL	09/20/22 15:24
Total/NA	Analysis	904.0		1	584224	FLC	EET SL	09/30/22 12:10
Total/NA	Analysis	Ra226_Ra228		1	584450	CAH	EET SL	10/03/22 13:21

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-221573-2

Client Sample ID: MW-05

Lab Sample ID: 500-22156x-5

Date Collecte8: 0/ 3x03 22 1x:25

Matrid: Water

Date Receive8: 0/ 3x13 22 09:x0

Prep Type	Batch Type	Batch Metho8	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepare8 or Analyze8
Total/NA	Prep	PrecSep-21			581008	TJ	EET SL	09/06/22 15:03
Total/NA	Analysis	903.0		1	583796	CLP	EET SL	09/28/22 17:06
Total/NA	Prep	PrecSep_0			582886	MLK	EET SL	09/20/22 15:24
Total/NA	Analysis	904.0		1	584273	FLC	EET SL	09/30/22 12:10
Total/NA	Analysis	Ra226_Ra228		1	584450	CAH	EET SL	10/03/22 13:21

Client Sample ID: MW-10

Lab Sample ID: 500-22156x-7

Date Collecte8: 0/ 3x03 22 0/ :42

Matrid: Water

Date Receive8: 0/ 3x13 22 09:x0

Prep Type	Batch Type	Batch Metho8	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepare8 or Analyze8
Total/NA	Prep	PrecSep-21			581008	TJ	EET SL	09/06/22 15:03
Total/NA	Analysis	903.0		1	583796	CLP	EET SL	09/28/22 17:06
Total/NA	Prep	PrecSep_0			582886	MLK	EET SL	09/20/22 15:24
Total/NA	Analysis	904.0		1	584273	FLC	EET SL	09/30/22 12:11
Total/NA	Analysis	Ra226_Ra228		1	584450	CAH	EET SL	10/03/22 13:21

Client Sample ID: Duplicate

Lab Sample ID: 500-22156x-6

Date Collecte8: 0/ 3x03 22 00:00

Matrid: Water

Date Receive8: 0/ 3x13 22 09:x0

Prep Type	Batch Type	Batch Metho8	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepare8 or Analyze8
Total/NA	Prep	PrecSep-21			581076	TJ	EET SL	09/07/22 12:48
Total/NA	Analysis	903.0		1	583994	FLC	EET SL	09/29/22 08:04
Total/NA	Prep	PrecSep_0			583206	ASG	EET SL	09/22/22 15:49
Total/NA	Analysis	904.0		1	583994	FLC	EET SL	09/29/22 12:10
Total/NA	Analysis	Ra226_Ra228		1	584089	CLP	EET SL	09/29/22 18:28

Laboratory References:

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: KPRG and Associates, Inc.
Job ID: 500-221573-2
Project/Site: Powerton CCR FAB (RAD)

Laboratory: Eurofins St. Louis

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Illinois	NELAP	200023	11-30-22

Tracer/Carrier Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-221573-2

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water | **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)
Lab Sample ID	Client Sample ID	Ba (40-110)
500-221573-1	MW-01	92.8
500-221573-2	MW-02	97.0
500-221573-3	MW-03	98.3
500-221573-4	MW-04	95.3
500-221573-5	MW-05	93.3
500-221573-6	MW-10	97.3
500-221573-7	Duplicate	96.8
LCS 160-581008/2-A	Lab Control Sample	98.0
LCS 160-581076/2-A	Lab Control Sample	95.3
MB 160-581008/1-A	Method Blank	99.0
MB 160-581076/1-A	Method Blank	95.6

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water | **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (40-110)	Y (40-110)
500-221573-1	MW-01	88.9	86.4
500-221573-2	MW-02	92.4	89.0
500-221573-3	MW-03	92.4	84.5
500-221573-4	MW-04	91.6	86.7
500-221573-5	MW-05	96.1	87.5
500-221573-6	MW-10	92.9	80.7
500-221573-7	Duplicate	91.4	85.6
LCS 160-582886/2-A	Lab Control Sample	83.0	86.4
LCS 160-583206/2-A	Lab Control Sample	94.8	85.6
MB 160-582886/1-A	Method Blank	88.0	86.4
MB 160-583206/1-A	Method Blank	80.0	83.4

Tracer/Carrier Legend

Ba = Ba Carrier
Y = Y Carrier

PROJECT NAME	NRG – POWERTON STATION (12313.1)		DATE	8/30/21
Sample Name	MW-01	Start Time	0920	
Condition of Well	good			
Water Level	27.61	Total Depth	—	
Well Diameter	PVC – 2 inch	Volume in Well	—	
Method of Purge	Low-Flow	Purge Characteristics	clear	
Volume Removed	4 gals	WL at Sample Time	27.62	
Method of Sample	Low-Flow	Sample Characteristics	clear	
Sample Analysis	CCA, FAB CCR, ABBASB CCR	Sample Time	0932	
Water Quality Meter	YSI ProDss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
0922	27.61	7.15	19.1	.784	8.25	157.3	4.16
0925	—	7.10	18.9	.885	7.10	161.8	4.61
0928	—	7.11	18.9	.893	3.27	162.6	5.13
0931	27.62	7.10	18 8	.885	3.08	163.0	4.73

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates K.L.S

PROJECT NAME	NRG – POWERTON STATION (12313.1)		DATE	8/30/22
Sample Name	MW-02	Start Time	1037	
Condition of Well	good			
Water Level	30.55	Total Depth	–	
Well Diameter	PVC – 2 inch	Volume in Well	–	
Method of Purge	Low-Flow	Purge Characteristics	clear	
Volume Removed	4.5 qts	W L at Sample Time	30.56	
Method of Sample	Low-Flow	Sample Characteristics	clear	
Sample Analysis	CCA, FAB CCR	Sample Time	1048	
Water Quality Meter	YSI ProDss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1038	30.55	7.56	14.4	.850	7.00	159.6	3.56
1041	–	7.27	14.0	.871	1.78	164.7	2.73
1044	–	7.23	14.0	.868	1.11	165.1	2.64
1047	30.56	7.22	14.0	.869	0.74	165.4	2.46

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION (12313.1)		DATE	8/30/22
Sample Name	MW-03	Start Time	1122	
Condition of Well	good			
Water Level	30.56	Total Depth	-	
Well Diameter	PVC – 2 inch	Volume in Well	-	
Method of Purge	Low-Flow	Purge Characteristics	Clear	
Volume Removed	4 qts	W L at Sample Time	30.56	
Method of Sample	Low-Flow	Sample Characteristics	clear	
Sample Analysis	CCA, FAB CCR	Sample Time	1134	
Water Quality Meter	YSI ProDss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1124	30.56	7.56	16.2	.754	9.09	155.4	2.64
1127	-	7.17	14.5	.849	3.02	162.5	2.88
1130	-	7.13	13.8	.851	2.04	163.2	2.79
1133	30.56	7.10	16.0	.850	1.64	163.0	2.67

SAMPLING NOTES:

FAB CCR Duplicate

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION (12313.1)		DATE	8/30/22
Sample Name	MW-04	Start Time	1225	
Condition of Well	good			
Water Level	30.10	Total Depth	–	
Well Diameter	PVC – 2 inch	Volume in Well	–	
Method of Purge	Low-Flow	Purge Characteristics	clear	
Volume Removed	3 pts	W L at Sample Time	30.10	
Method of Sample	Low-Flow	Sample Characteristics	clear	
Sample Analysis	CCA, FAB CCR	Sample Time	1237	
Water Quality Meter	YSI ProDss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1227	30.10	6.80	17.9	.708	6.19	163.1	4.29
1230	–	6.80	16.9	.972	4.70	172.3	3.97
1233	–	6.80	16.6	.969	4.43	172.9	4.02
1236	30.10	6.80	16.3	.966	3.43	172.9	4.05

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION (12313.1)		DATE	8/30/22
Sample Name	MW-05	Start Time	1314	
Condition of Well	good			
Water Level	26.96	Total Depth	-	
Well Diameter	PVC – 2 inch	Volume in Well	-	
Method of Purge	Low-Flow	Purge Characteristics	Clear	
Volume Removed	5 gals	WL at Sample Time	26.96	
Method of Sample	Low-Flow	Sample Characteristics	Clear	
Sample Analysis	CCA, FAB CCR	Sample Time	1325	
Water Quality Meter	YSI ProDss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1315	26.96	7.01	16.7	1.081	5.38	165.3	3.19
1318	-	6.94	15.6	.985	0.82	167.6	3.16
1321	-	6.95	15.7	.983	0.73	167.6	2.90
1324	26.96	6.94	15.7	.984	0.63	167.9	2.70

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION (12313.1)		DATE	8/30/12
Sample Name	MW-1D	Start Time	0830	
Condition of Well	good			
Water Level	19.16	Total Depth	—	
Well Diameter	PVC – 2 inch	Volume in Well	—	
Method of Purge	Low-Flow	Purge Characteristics	clear	
Volume Removed	4.5 gals	W L at Sample Time	19.16	
Method of Sample	Low-Flow	Sample Characteristics	clear	
Sample Analysis	CCA & FAB CCR	Sample Time	0842	
Water Quality Meter	YSI ProDss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
0832	19.16	8.24	14.2	.765	7.73	107.2	3.06
0835	—	7.19	13.3	.871	3.15	134.3	28.82
0838	—	6.92	13.1	.862	1.26	150.7	17.46
0841	19.16	6.83	13.2	.858	0.80	151.3	13.34

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates KLS

DOCUMENT 6

From: Dunaway, Lynn
To: Samson, Sara B.; Rompot, Derek
Subject: FW: MWG Powerton Station - ASB/BB/FAB/MCB 3rd Quarter 2022 Groundwater Data
Date: Wednesday, October 26, 2022 4:41:47 PM
Attachments: image001.png
2022 Q3 Powerton ASB_BB GW Data Monitoring.pdf
2022 Q3 Powerton FAB GW Data Monitoring.pdf
2022 Q3 Powerton MCB GW Data Monitoring.pdf

Did you see this?

From: EPA.CCR.Part845.Coordinator <EPA.CCR.Part845.Coordinator@Illinois.gov>
Sent: Wednesday, October 26, 2022 3:30 PM
To: Liska, Mark <Mark.Liska@Illinois.gov>; Dunaway, Lynn <LYNN.DUNAWAY@Illinois.gov>; Hunt, Lauren <Lauren.Hunt@Illinois.gov>; Zimmer, Amy <AMY.ZIMMER@Illinois.gov>
Subject: FW: MWG Powerton Station - ASB/BB/FAB/MCB 3rd Quarter 2022 Groundwater Data

We have received an electronic submittal for Powerton's CCR Groundwater Monitoring data for Q3. Attached is copy of the pdf. It has also been placed on the N drive.

From: Buckley, Jill <Jill.Buckley@nrg.com>
Sent: Wednesday, October 26, 2022 9:08 AM
To: EPA.CCR.Part845.Coordinator <EPA.CCR.Part845.Coordinator@Illinois.gov>
Subject: [External] MWG Powerton Station - ASB/BB/FAB/MCB 3rd Quarter 2022 Groundwater Data

Hello,

As requested, the 3rd quarter 2022 groundwater data packages for the Ash Surge Basin, Bypass Basin, Former Ash Basin, and Metal Cleaning Basin at Powerton Station (W1798010008) are attached. These have already been mailed to IEPA and will be posted on our public website. www.Midwestgenerationllc.com

Thanks,
Jill

NRG Energy

Jill Buckley
Environmental Manager
NRG Energy
724-448-9732
Jill.Buckley@nrg.com

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DOCUMENT 7

From: Samson, Sara B.
To: Dunaway, Lynn
Subject: RE: MWG Powerton Station - ASB/BB/FAB/MCB 3rd Quarter 2022 Groundwater Data
Date: Wednesday, October 26, 2022 5:13:49 PM
Attachments: image001.png

Yes

From: Dunaway, Lynn <LYNN.DUNAWAY@Illinois.gov>
Sent: Wednesday, October 26, 2022 4:42 PM
To: Samson, Sara B. <Sara.Samson@Illinois.gov>; Rompot, Derek <Derek.Rompot@Illinois.gov>
Subject: FW: MWG Powerton Station - ASB/BB/FAB/MCB 3rd Quarter 2022 Groundwater Data

Did you see this?

From: EPA.CCR.Part845.Coordinator <EPA.CCR.Part845.Coordinator@Illinois.gov>
Sent: Wednesday, October 26, 2022 3:30 PM
To: Liska, Mark <Mark.Liska@Illinois.gov>; Dunaway, Lynn <LYNN.DUNAWAY@Illinois.gov>; Hunt, Lauren <Lauren.Hunt@Illinois.gov>; Zimmer, Amy <AMY.ZIMMER@Illinois.gov>
Subject: FW: MWG Powerton Station - ASB/BB/FAB/MCB 3rd Quarter 2022 Groundwater Data

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Sent: Wednesday, October 26, 2022 9:08 AM
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Subject: [External] MWG Powerton Station - ASB/BB/FAB/MCB 3rd Quarter 2022 Groundwater Data

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Thanks,
Jill

NRG Energy

Jill Buckley
Environmental Manager
NRG Energy
724-448-9732
Jill.Buckley@nrg.com

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DOCUMENT 8

R000716

National Flood Hazard Layer FIRMette

FEMA

89°40'55"W 40°32'55"N



89°40'18"W 40°32'28"N

Feet 1:6,000

0 250 500 1,000 1,500 2,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 10/31/2022 at 2:00 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

DOCUMENT 9

From: Seif, Josiah
To: Hunt, Lauren; Liska, Mark
Cc: LeCrone, Darin; Rompot, Derek; Samson, Sara B.; Dunaway, Lynn; Zimmer, Amy
Subject: 4th quarter 2022 Powerton Station groundwater data packages
Date: Tuesday, January 17, 2023 11:57:59 AM

Reports for the 4th quarter 2022 Powerton Station groundwater data packages for the Ash Surge Basin(ASB), Bypass Basin(BB), Former Ash Basin(FAB), and Metal Cleaning Basin(MCB) at Powerton Station (W1798010008 have been received and placed on the N:Drive.

Thank you,

Josiah M. Seif

Josiah M. Seif
CCR Office Coordinator
Bureau of Water
Illinois Environmental Protection Agency
217-782-0610
Josiah.Seif@illinois.gov

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DOCUMENT 10

From: Dunaway, Lynn
To: Seif, Josiah
Subject: RE: 4th quarter 2022 Powerton Station groundwater data packages
Date: Tuesday, January 17, 2023 2:32:04 PM

---

thanks

From: Seif, Josiah <Josiah.Seif@Illinois.gov>
Sent: Tuesday, January 17, 2023 11:58 AM
To: Hunt, Lauren <Lauren.Hunt@Illinois.gov>; Liska, Mark <Mark.Liska@Illinois.gov>
Cc: LeCrone, Darin <Darin.LeCrone@Illinois.gov>; Rompot, Derek <Derek.Rompot@Illinois.gov>; Samson, Sara B. <Sara.Samson@Illinois.gov>; Dunaway, Lynn <LYNN.DUNAWAY@Illinois.gov>; Zimmer, Amy <AMY.ZIMMER@Illinois.gov>
Subject: 4th quarter 2022 Powerton Station groundwater data packages

Reports for the 4th quarter 2022 Powerton Station groundwater data packages for the Ash Surge Basin(ASB), Bypass Basin(BB), Former Ash Basin(FAB), and Metal Cleaning Basin(MCB) at Powerton Station (W1798010008 have been received and placed on the N:Drive.

Thank you,

Josiah M. Seif
Josiah M. Seif
CCR Office Coordinator
Bureau of Water
Illinois Environmental Protection Agency
217-782-0610
Josiah.Seif@illinois.gov

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DOCUMENT 11

From: Shealey, Sharene
To: Dunaway, Lynn; Darin.LeCrone@Illinois.gov
Subject: [External] MWG CCR impoundment invoices
Date: Friday, June 9, 2023 4:00:48 PM

Hi Lynn & Darin,

Hope all is well.

Midwest Generation, LLC has not received any CCR annual invoices and I think the payment due date is July 1, 2023. Would it be possible for you to check whether the invoices have been sent and/or have someone send the invoices for the Midwest Generation Stations to me via email? The facility names/account numbers are listed in the below table. The invoices are needed to order the payment checks.

Thank you,
Sharene

Facility Name	Acct. Number
Joliet 9	W1970450046
Joliet 29	W1970450047
Powerton	W1798010008
Waukegan	W0971900021
Will County	W1978100011

Sharene Shealey
Director, Environmental
Will County Generating Station – 529 E. 135th Street – Romeoville, IL 60446
(724) 255-3220

DOCUMENT 12

From: Kotas, Joseph
To: EPA.AcctsReceivable@illinois.gov
Cc: Wolff, Paula; Buckley, Jill; Liska, Mark; Shealey, Sharene
Subject: [External] CCR fee invoice
Date: Monday, June 12, 2023 9:19:30 AM
Attachments: image001.png
image002.jpg

Dear EPA official,

We have not seen an invoice for CCR fees this year. Can you please send (another?) one or let me know where I might find a copy?
I've pasted an older invoice in this email below. (The fee amount has changed since then.)

Thank you.
Joe Kotas





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DOCUMENT 13

From: Liska, Mark
To: Blood, Phillip; Suthar, Anil
Subject: FW: CCR fee invoice
Date: Monday, June 12, 2023 10:47:16 AM
Attachments: image001.png
image002.jpg

Phil and Anil, the permittee below has a question about an invoice. Can either of you help him? I have both of you as the contact for this type of question. Let me know if have the wrong people for this question.

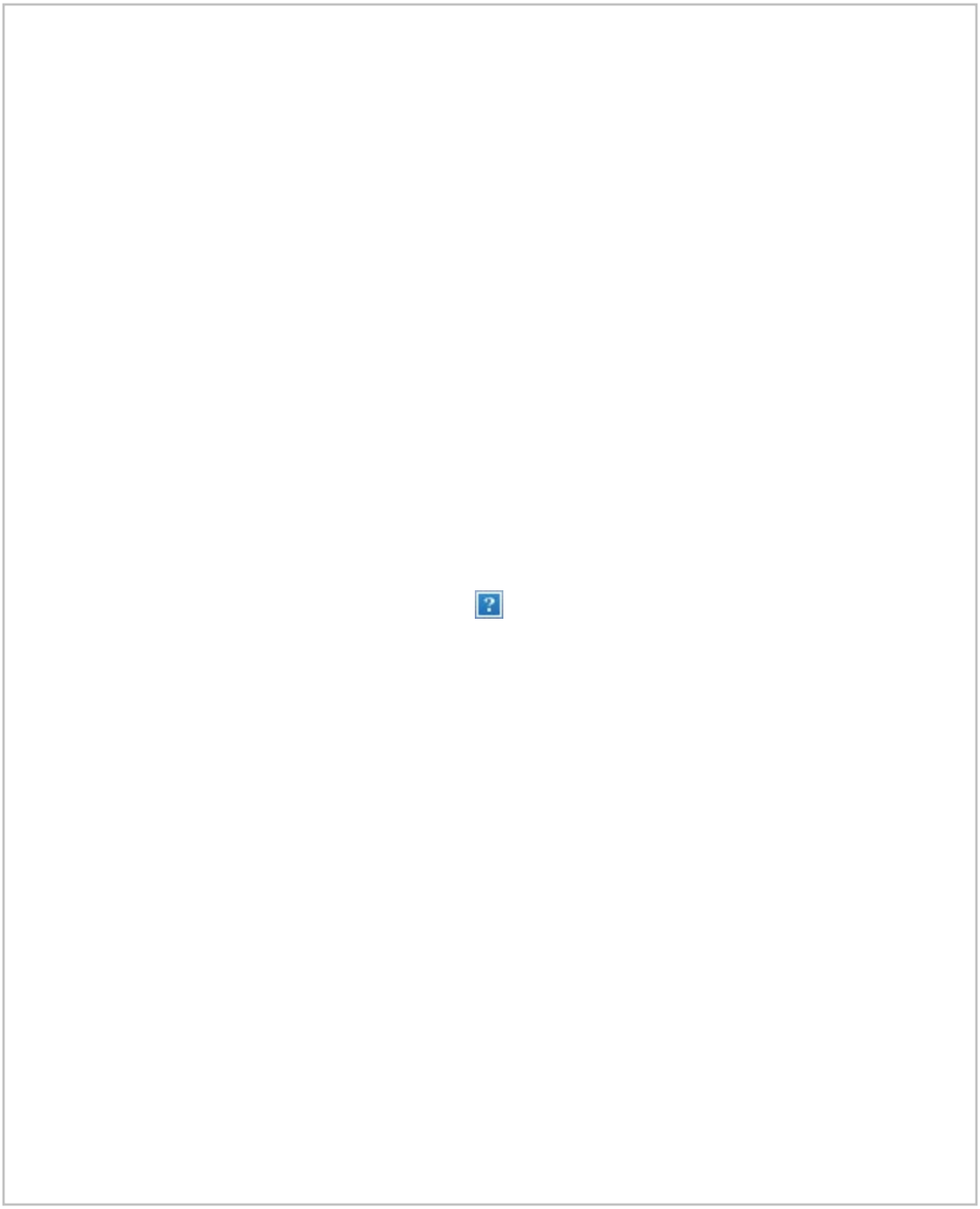
Mark E. Liska
Environmental Protection Engineer
Industrial Permits Section, Bureau of Water
Illinois Environmental Protection Agency
1021 N. Grand Ave. East, P.O. Box 19276
Springfield, IL 62794-9276
Phone: (217) 782-0610
Fax: (217) 782-9891

From: Kotas, Joseph <Joseph.Kotas@nrg.com>
Sent: Monday, June 12, 2023 9:19 AM
To: EPA.AcctsReceivable <EPA.AcctsReceivable@illinois.gov>
Cc: Wolff, Paula <Paula.Wolff@nrg.com>; Buckley, Jill <Jill.Buckley@nrg.com>; Liska, Mark <Mark.Liska@Illinois.gov>; Shealey, Sharene <Sharene.Shealey@nrg.com>
Subject: [External] CCR fee invoice

Dear EPA official,

We have not seen an invoice for CCR fees this year. Can you please send (another?) one or let me know where I might find a copy?
I've pasted an older invoice in this email below. (The fee amount has changed since then.)

Thank you.
Joe Kotas





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DOCUMENT 14

From: Seif, Josiah
To: Hunt, Lauren; Liska, Mark
Cc: LeCrone, Darin; Summers, Michael; Dunaway, Lynn
Subject: 2nd quarter 2023 groundwater data packages for the Ash Surge Basin, Bypass Basin, Former Ash Basin, and Metal Cleaning Basin at Powerton Station (W1798010008)
Date: Monday, July 17, 2023 11:55:51 AM

Good morning,

Electronic copies of the **2nd quarter 2023 groundwater data packages for the Ash Surge Basin, Bypass Basin, Former Ash Basin, and Metal Cleaning Basin at Powerton Station (W1798010008)**, have been received and placed on the N:Drive. Now awaiting hard copies.

Thank you,

Josiah M. Seif
Josiah M. Seif
CCR Office Coordinator
Bureau of Water
Illinois Environmental Protection Agency
217-782-0610
Josiah.Seif@illinois.gov

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DOCUMENT 15

From: EPA.CCR.Part845.Notify <EPA.CCR.Part845.Notify@Illinois.gov>
Sent: Monday, July 31, 2023 9:20 AM
Cc: Hunt, Lauren; Liska, Mark; LeCrone, Darin
Subject: Midwest Generation, LLC- Powerton Generating Station - Application for Retrofit Construction Permit (W1798010008-03)

The **Midwest Generation, LLC- Powerton Generating Station - Application for Retrofit Construction Permit (W1798010008-03)** has been received. The application has been posted and is available for review at the Midwest Generation, LLC - Powerton Website.

Thank you,

Josiah M. Seif

Josiah M. Seif
CCR Office Coordinator
Bureau of Water
Illinois Environmental Protection Agency
217-782-0610
Josiah.Seif@illinois.gov

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DOCUMENT

16

From: EPA.CCR.Part845.Coordinator <EPA.CCR.Part845.Coordinator@Illinois.gov>
Sent: Wednesday, August 30, 2023 11:19 AM
To: Hunt, Lauren
Subject: FW: MWG Powerton Station - ASB/BB/FAB/MCB 2nd Quarter 2023 Groundwater Data - please advise
Attachments: 500-234016-1_StdChi.xls; 500-234016-2_StdChi.xls; 500-233887-2_StdChi.xls; 500-233887-1_StdChi.xls; 500-233887-3_StdChi.xls; 500-233887-4_StdChi.xls; 500-233911-1_StdChi.xls; 500-233911-2_StdChi.xls; 500-235818-1_StdChi.xls; 2023 Q2 Powerton ASB_BB CCR Groundwater Data.pdf; 2023 Q2 Powerton FAB CCR Groundwater Data.pdf; 2023 Q2 Powerton MCB CCR Groundwater Data.pdf

Lauren,

Is this the information we are looking for? I remember putting it on the N:Drive, but don't know why it did not save. Please let me know. Thanks.

~Josiah

From: Buckley, Jill <Jill.Buckley@nrg.com>
Sent: Thursday, July 13, 2023 10:35 AM
To: EPA.CCR.Part845.Coordinator <EPA.CCR.Part845.Coordinator@Illinois.gov>
Subject: [External] MWG Powerton Station - ASB/BB/FAB/MCB 2nd Quarter 2023 Groundwater Data

Hello,

As requested, the 2nd quarter 2023 groundwater data packages for the Ash Surge Basin, Bypass Basin, Former Ash Basin, and Metal Cleaning Basin at Powerton Station (W1798010008) are attached. These have already been mailed to IEPA and will be posted on our public website. www.Midwestgenerationllc.com

Thanks,
Jill

Jill Buckley
Environmental Manager
NRG Energy
724-448-9732
Jill.Buckley@nrg.com

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R000737

Client ID	Sample Collection Date	Laboratory Name	Sample Matrix	Job Number	Prep Date	Analysis Date	Batch Number	Method Number	Result Identifier	CAS Numbers	Result	Result Qualifier	Unit of Measure	Method Reference	Parameter Name	Detection Limit	Dilution Factor
MW-09	05/16/23	EUROFINS CHICAGO	WATER	500-233887-1	05/17/23	05/17/23	713900	SM 2540C	TRG	STL00242	510		mg/L	SM	Total Dissolved Solids	10	1
MW-11	05/16/23	EUROFINS CHICAGO	WATER	500-233887-2	05/17/23	05/17/23	713900	SM 2540C	TRG	STL00242	690		mg/L	SM	Total Dissolved Solids	10	1
MW-12	05/16/23	EUROFINS CHICAGO	WATER	500-233887-3	05/17/23	05/17/23	713900	SM 2540C	TRG	STL00242	840		mg/L	SM	Total Dissolved Solids	10	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233887-4	05/22/23	05/22/23	714420	SM 2540C	TRG	STL00242	450		mg/L	SM	Total Dissolved Solids	10	1
MW-08	05/17/23	EUROFINS CHICAGO	WATER	500-233887-5	05/22/23	05/22/23	714420	SM 2540C	TRG	STL00242	720		mg/L	SM	Total Dissolved Solids	10	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-233887-6	05/22/23	05/22/23	714420	SM 2540C	TRG	STL00242	2500		mg/L	SM	Total Dissolved Solids	10	1
MW-09	05/16/23	EUROFINS CHICAGO	WATER	500-233887-1	05/24/23	05/24/23	715089	SM 4500 Cl- E	TRG	16887-00-6	30		mg/L	SM	Chloride	2.0	1
MW-11	05/16/23	EUROFINS CHICAGO	WATER	500-233887-2	05/24/23	05/24/23	715089	SM 4500 Cl- E	TRG	16887-00-6	65		mg/L	SM	Chloride	10	5
MW-12	05/16/23	EUROFINS CHICAGO	WATER	500-233887-3	05/24/23	05/24/23	715089	SM 4500 Cl- E	TRG	16887-00-6	150		mg/L	SM	Chloride	20	10
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233887-4	05/24/23	05/24/23	715089	SM 4500 Cl- E	TRG	16887-00-6	55		mg/L	SM	Chloride	4.0	2
MW-08	05/17/23	EUROFINS CHICAGO	WATER	500-233887-5	05/24/23	05/24/23	715089	SM 4500 Cl- E	TRG	16887-00-6	110		mg/L	SM	Chloride	20	10
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-233887-6	05/24/23	05/24/23	715089	SM 4500 Cl- E	TRG	16887-00-6	310		mg/L	SM	Chloride	20	10
MW-09	05/16/23	EUROFINS CHICAGO	WATER	500-233887-1	05/21/23	05/21/23	714514	SM 4500 F C	TRG	16984-48-8	0.16		mg/L	SM	Fluoride	0.10	1
MW-11	05/16/23	EUROFINS CHICAGO	WATER	500-233887-2	05/21/23	05/21/23	714514	SM 4500 F C	TRG	16984-48-8	0.52		mg/L	SM	Fluoride	0.10	1
MW-12	05/16/23	EUROFINS CHICAGO	WATER	500-233887-3	05/21/23	05/21/23	714514	SM 4500 F C	TRG	16984-48-8	0.34		mg/L	SM	Fluoride	0.10	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233887-4	05/24/23	05/24/23	715052	SM 4500 F C	TRG	16984-48-8	0.12		mg/L	SM	Fluoride	0.10	1
MW-08	05/17/23	EUROFINS CHICAGO	WATER	500-233887-5	05/24/23	05/24/23	715052	SM 4500 F C	TRG	16984-48-8	0.34		mg/L	SM	Fluoride	0.10	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-233887-6	05/24/23	05/24/23	715052	SM 4500 F C	TRG	16984-48-8	0.42		mg/L	SM	Fluoride	0.10	1
MW-09	05/16/23	EUROFINS CHICAGO	WATER	500-233887-1	05/26/23	05/26/23	715553	SM 4500 SO4 E	TRG	14808-79-8	130		mg/L	SM	Sulfate	50	10
MW-11	05/16/23	EUROFINS CHICAGO	WATER	500-233887-2	05/26/23	05/26/23	715553	SM 4500 SO4 E	TRG	14808-79-8	120		mg/L	SM	Sulfate	50	10
MW-12	05/16/23	EUROFINS CHICAGO	WATER	500-233887-3	05/26/23	05/26/23	715553	SM 4500 SO4 E	TRG	14808-79-8	240		mg/L	SM	Sulfate	100	20
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233887-4	05/26/23	05/26/23	715553	SM 4500 SO4 E	TRG	14808-79-8	33		mg/L	SM	Sulfate	10	2
MW-08	05/17/23	EUROFINS CHICAGO	WATER	500-233887-5	05/26/23	05/26/23	715553	SM 4500 SO4 E	TRG	14808-79-8	62		mg/L	SM	Sulfate	10	2
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-233887-6	05/26/23	05/26/23	715553	SM 4500 SO4 E	TRG	14808-79-8	850		mg/L	SM	Sulfate	100	20
MW-09	05/16/23	EUROFINS CHICAGO	WATER	500-233887-1	05/22/23	05/23/23	714515	6020A	TRG	7440-38-2	0.0010	U	mg/L	SW846	Arsenic	0.0010	1
MW-09	05/16/23	EUROFINS CHICAGO	WATER	500-233887-1	05/22/23	05/23/23	714515	6020A	TRG	7440-39-3	0.029		mg/L	SW846	Barium	0.0025	1
MW-09	05/16/23	EUROFINS CHICAGO	WATER	500-233887-1	05/22/23	05/23/23	714515	6020A	TRG	7440-41-7	0.0010	U ^+ ^1+	mg/L	SW846	Beryllium	0.0010	1
MW-09	05/16/23	EUROFINS CHICAGO	WATER	500-233887-1	05/22/23	05/23/23	714515	6020A	TRG	7440-42-8	3.9		mg/L	SW846	Boron	0.050	1
MW-09	05/16/23	EUROFINS CHICAGO	WATER	500-233887-1	05/22/23	05/23/23	714515	6020A	TRG	7440-43-9	0.00050	U	mg/L	SW846	Cadmium	0.00050	1
MW-09	05/16/23	EUROFINS CHICAGO	WATER	500-233887-1	05/22/23	05/23/23	714515	6020A	TRG	7440-47-3	0.0050	U	mg/L	SW846	Chromium	0.0050	1
MW-09	05/16/23	EUROFINS CHICAGO	WATER	500-233887-1	05/22/23	05/23/23	714515	6020A	TRG	7440-48-4	0.0010	U	mg/L	SW846	Cobalt	0.0010	1
MW-09	05/16/23	EUROFINS CHICAGO	WATER	500-233887-1	05/22/23	05/23/23	714515	6020A	TRG	7439-92-1	0.00050	U	mg/L	SW846	Lead	0.00050	1
MW-09	05/16/23	EUROFINS CHICAGO	WATER	500-233887-1	05/22/23	05/23/23	714515	6020A	TRG	7439-98-7	0.032		mg/L	SW846	Molybdenum	0.0050	1
MW-09	05/16/23	EUROFINS CHICAGO	WATER	500-233887-1	05/22/23	05/23/23	714515	6020A	TRG	7782-49-2	0.0025	U	mg/L	SW846	Selenium	0.0025	1
MW-09	05/16/23	EUROFINS CHICAGO	WATER	500-233887-1	05/22/23	05/23/23	714515	6020A	TRG	7440-28-0	0.0020	U	mg/L	SW846	Thallium	0.0020	1
MW-09	05/16/23	EUROFINS CHICAGO	WATER	500-233887-1	05/22/23	05/24/23	714515	6020A	TRG	7440-36-0	0.0030	U	mg/L	SW846	Antimony	0.0030	1
MW-09	05/16/23	EUROFINS CHICAGO	WATER	500-233887-1	05/22/23	05/24/23	714515	6020A	TRG	7440-70-2	70		mg/L	SW846	Calcium	0.20	1
MW-09	05/16/23	EUROFINS CHICAGO	WATER	500-233887-1	05/22/23	05/25/23	714515	6020A	TRG	7439-93-2	0.010	U	mg/L	SW846	Lithium	0.010	1
MW-11	05/16/23	EUROFINS CHICAGO	WATER	500-233887-2	05/22/23	05/23/23	714515	6020A	TRG	7440-38-2	0.011		mg/L	SW846	Arsenic	0.0010	1
MW-11	05/16/23	EUROFINS CHICAGO	WATER	500-233887-2	05/22/23	05/23/23	714515	6020A	TRG	7440-39-3	0.18		mg/L	SW846	Barium	0.0025	1
MW-11	05/16/23	EUROFINS CHICAGO	WATER	500-233887-2	05/22/23	05/23/23	714515	6020A	TRG	7440-41-7	0.0010	U ^+ ^1+	mg/L	SW846	Beryllium	0.0010	1
MW-11	05/16/23	EUROFINS CHICAGO	WATER	500-233887-2	05/22/23	05/23/23	714515	6020A	TRG	7440-42-8	2.5		mg/L	SW846	Boron	0.050	1
MW-11	05/16/23	EUROFINS CHICAGO	WATER	500-233887-2	05/22/23	05/23/23	714515	6020A	TRG	7440-43-9	0.00050	U	mg/L	SW846	Cadmium	0.00050	1
MW-11	05/16/23	EUROFINS CHICAGO	WATER	500-233887-2	05/22/23	05/23/23	714515	6020A	TRG	7440-47-3	0.0050	U	mg/L	SW846	Chromium	0.0050	1
MW-11	05/16/23	EUROFINS CHICAGO	WATER	500-233887-2	05/22/23	05/23/23	714515	6020A	TRG	7440-48-4	0.0018		mg/L	SW846	Cobalt	0.0010	1
MW-11	05/16/23	EUROFINS CHICAGO	WATER	500-233887-2	05/22/23	05/23/23	714515	6020A	TRG	7439-92-1	0.00050	U	mg/L	SW846	Lead	0.00050	1
MW-11	05/16/23	EUROFINS CHICAGO	WATER	500-233887-2	05/22/23	05/23/23	714515	6020A	TRG	7439-98-7	0.016		mg/L	SW846	Molybdenum	0.0050	1
MW-11	05/16/23	EUROFINS CHICAGO	WATER	500-233887-2	05/22/23	05/23/23	714515	6020A	TRG	7782-49-2	0.0025	U	mg/L	SW846	Selenium	0.0025	1
MW-11	05/16/23	EUROFINS CHICAGO	WATER	500-233887-2	05/22/23	05/23/23	714515	6020A	TRG	7440-28-0	0.0020	U	mg/L	SW846	Thallium	0.0020	1
MW-11	05/16/23	EUROFINS CHICAGO	WATER	500-233887-2	05/22/23	05/24/23	714515	6020A	TRG	7440-36-0	0.0030	U	mg/L	SW846	Antimony	0.0030	1
MW-11	05/16/23	EUROFINS CHICAGO	WATER	500-233887-2	05/22/23	05/24/23	714515	6020A	TRG	7440-70-2	120		mg/L	SW846	Calcium	0.20	1
MW-11	05/16/23	EUROFINS CHICAGO	WATER	500-233887-2	05/22/23	05/25/23	714515	6020A	TRG	7439-93-2	0.010	U	mg/L	SW846	Lithium	0.010	1
MW-12	05/16/23	EUROFINS CHICAGO	WATER	500-233887-3	05/22/23	05/23/23	714515	6020A	TRG	7440-38-2	0.0023		mg/L	SW846	Arsenic	0.0010	1
MW-12	05/16/23	EUROFINS CHICAGO	WATER	500-233887-3	05/22/23	05/23/23	714515	6020A	TRG	7440-39-3	0.043		mg/L	SW846	Barium	0.0025	1
MW-12	05/16/23	EUROFINS CHICAGO	WATER	500-233887-3	05/22/23	05/23/23	714515	6020A	TRG	7440-41-7	0.0010	U ^+ ^1+	mg/L	SW846	Beryllium	0.0010	1
MW-12	05/16/23	EUROFINS CHICAGO	WATER	500-233887-3	05/22/23	05/23/23	714515	6020A	TRG	7440-42-8	0.32		mg/L	SW846	Boron	0.050	1
MW-12	05/16/23	EUROFINS CHICAGO	WATER	500-233887-3	05/22/23	05/23/23	714515	6020A	TRG	7440-43-9	0.00050	U	mg/L	SW846	Cadmium	0.00050	1
MW-12	05/16/23	EUROFINS CHICAGO	WATER	500-233887-3	05/22/23	05/23/23	714515	6020A	TRG	7440-47-3	0.0050	U	mg/L	SW846	Chromium	0.0050	1
MW-12	05/16/23	EUROFINS CHICAGO	WATER	500-233887-3	05/22/23	05/23/23	714515	6020A	TRG	7440-48-4	0.0010	U	mg/L	SW846	Cobalt	0.0010	1
MW-12	05/16/23	EUROFINS CHICAGO	WATER	500-233887-3	05/22/23	05/23/23	714515	6020A	TRG	7439-92-1	0.00050	U	mg/L	SW846	Lead	0.00050	1
MW-12	05/16/23	EUROFINS CHICAGO	WATER	500-233887-3	05/22/23	05/23/23	714515	6020A	TRG	7439-98-7	0.013		mg/L	SW846	Molybdenum	0.0050	1
MW-12	05/16/23	EUROFINS CHICAGO	WATER	500-233887-3	05/22/23	05/23/23	714515	6020A	TRG	7782-49-2	0.0025	U	mg/L	SW846	Selenium	0.0025	1
MW-12	05/16/23	EUROFINS CHICAGO	WATER	500-233887-3	05/22/23	05/23/23	714515	6020A	TRG	7440-28-0	0.0020	U	mg/L	SW846	Thallium	0.0020	1
MW-12	05/16/23	EUROFINS CHICAGO	WATER	500-233887-3	05/22/23	05/24/23	714515	6020A	TRG	7440-36-0	0.0030	U	mg/L	SW846	Antimony	0.0030	1
MW-12	05/16/23	EUROFINS CHICAGO	WATER	500-233887-3	05/22/23	05/24/23	714515	6020A	TRG	7440-70-2	89		mg/L	SW846	Calcium	0.20	1
MW-12	05/16/23	EUROFINS CHICAGO	WATER	500-233887-3	05/22/23	05/25/23	714515	6020A	TRG	7439-93-2	0.010	U	mg/L	SW846	Lithium	0.010	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233887-4	05/22/23	05/23/23	714515	6020A	TRG	7440-38-2	0.0010	U	mg/L	SW846	Arsenic	0.0010	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233887-4	05/22/23	05/23/23	714515	6020A	TRG	7440-39-3	0.056		mg/L	SW846	Barium	0.0025	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233887-4	05/22/23	05/23/23	714515	6020A	TRG	7440-41-7	0.0010	U ^+ ^1+	mg/L	SW846	Beryllium	0.0010	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233887-4	05/22/23	05/23/23	714515	6020A	TRG	7440-42-8	0.32		mg/L	SW846	Boron	0.050	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233887-4	05/22/23	05/23/23	714515	6020A	TRG	7440-43-9	0.00050	U	mg/L	SW846	Cadmium	0.00050	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233887-4	05/22/23	05/23/23	714515	6020A	TRG	7440-47-3	0.0050	U	mg/L	SW846	Chromium	0.0050	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233887-4	05/22/23	05/23/23	714515	6020A	TRG	7440-48-4	0.0010	U	mg/L	SW846	Cobalt	0.0010	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233887-4	05/22/23	05/23/23	714515	6020A	TRG	7439-92-1	0.00050	U	mg/L	SW846	Lead	0.00050	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233887-4	05/22/23	05/23/23	714515	6020A	TRG	7439-98-7	0.0050	U	mg/L	SW846	Molybdenum	0.0050	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233887-4	05/22/23	05/23/23	714515	6020A	TRG	7782-49-2	0.0025	U	mg/L	SW846	Selenium	0.0025	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233887-4	05/22/23	05/23/23	714515	6020A	TRG	7440-28-0	0.0020	U	mg/L	SW846	Thallium	0.0020	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233887-4	05/22/23	05/24/23	714515	6020A	TRG	7440-36-0	0.0030	U	mg/L	SW846	Antimony	0.0030	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233887-4	05/22/23	05/24/23	714515	6020A	TRG	7440-70-2	91		mg/L	SW846	Calcium	0.20	1

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MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233887-4	05/22/23	05/25/23	714515	6020A	TRG	7439-93-2	0.010	U	mg/L	SW846	Lithium	0.010	1
MW-08	05/17/23	EUROFINS CHICAGO	WATER	500-233887-5	05/22/23	05/23/23	714515	6020A	TRG	7440-38-2	0.0029		mg/L	SW846	Arsenic	0.0010	1
MW-08	05/17/23	EUROFINS CHICAGO	WATER	500-233887-5	05/22/23	05/23/23	714515	6020A	TRG	7440-39-3	0.13		mg/L	SW846	Barium	0.0025	1
MW-08	05/17/23	EUROFINS CHICAGO	WATER	500-233887-5	05/22/23	05/23/23	714515	6020A	TRG	7440-41-7	0.0010	U ^+ ^1+	mg/L	SW846	Beryllium	0.0010	1
MW-08	05/17/23	EUROFINS CHICAGO	WATER	500-233887-5	05/22/23	05/23/23	714515	6020A	TRG	7440-42-8	0.61		mg/L	SW846	Boron	0.050	1
MW-08	05/17/23	EUROFINS CHICAGO	WATER	500-233887-5	05/22/23	05/23/23	714515	6020A	TRG	7440-43-9	0.00050	U	mg/L	SW846	Cadmium	0.00050	1
MW-08	05/17/23	EUROFINS CHICAGO	WATER	500-233887-5	05/22/23	05/23/23	714515	6020A	TRG	7440-47-3	0.0050	U	mg/L	SW846	Chromium	0.0050	1
MW-08	05/17/23	EUROFINS CHICAGO	WATER	500-233887-5	05/22/23	05/23/23	714515	6020A	TRG	7440-48-4	0.0010	U	mg/L	SW846	Cobalt	0.0010	1
MW-08	05/17/23	EUROFINS CHICAGO	WATER	500-233887-5	05/22/23	05/23/23	714515	6020A	TRG	7439-92-1	0.00050	U	mg/L	SW846	Lead	0.00050	1
MW-08	05/17/23	EUROFINS CHICAGO	WATER	500-233887-5	05/22/23	05/23/23	714515	6020A	TRG	7439-98-7	0.0077		mg/L	SW846	Molybdenum	0.0050	1
MW-08	05/17/23	EUROFINS CHICAGO	WATER	500-233887-5	05/22/23	05/23/23	714515	6020A	TRG	7782-49-2	0.0025	U	mg/L	SW846	Selenium	0.0025	1
MW-08	05/17/23	EUROFINS CHICAGO	WATER	500-233887-5	05/22/23	05/23/23	714515	6020A	TRG	7440-28-0	0.0020	U	mg/L	SW846	Thallium	0.0020	1
MW-08	05/17/23	EUROFINS CHICAGO	WATER	500-233887-5	05/22/23	05/24/23	714515	6020A	TRG	7440-36-0	0.0030	U	mg/L	SW846	Antimony	0.0030	1
MW-08	05/17/23	EUROFINS CHICAGO	WATER	500-233887-5	05/22/23	05/24/23	714515	6020A	TRG	7440-70-2	120		mg/L	SW846	Calcium	0.20	1
MW-08	05/17/23	EUROFINS CHICAGO	WATER	500-233887-5	05/22/23	05/25/23	714515	6020A	TRG	7439-93-2	0.023		mg/L	SW846	Lithium	0.010	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-233887-6	05/22/23	05/23/23	714515	6020A	TRG	7440-38-2	0.0027		mg/L	SW846	Arsenic	0.0010	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-233887-6	05/22/23	05/23/23	714515	6020A	TRG	7440-39-3	0.075		mg/L	SW846	Barium	0.0025	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-233887-6	05/22/23	05/23/23	714515	6020A	TRG	7440-41-7	0.0010	U ^+ ^1+	mg/L	SW846	Beryllium	0.0010	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-233887-6	05/22/23	05/23/23	714515	6020A	TRG	7440-42-8	1.3		mg/L	SW846	Boron	0.050	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-233887-6	05/22/23	05/23/23	714515	6020A	TRG	7440-43-9	0.00050	U	mg/L	SW846	Cadmium	0.00050	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-233887-6	05/22/23	05/23/23	714515	6020A	TRG	7440-47-3	0.0050	U	mg/L	SW846	Chromium	0.0050	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-233887-6	05/22/23	05/23/23	714515	6020A	TRG	7440-48-4	0.0012		mg/L	SW846	Cobalt	0.0010	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-233887-6	05/22/23	05/23/23	714515	6020A	TRG	7439-92-1	0.00050	U	mg/L	SW846	Lead	0.00050	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-233887-6	05/22/23	05/23/23	714515	6020A	TRG	7439-98-7	0.039		mg/L	SW846	Molybdenum	0.0050	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-233887-6	05/22/23	05/23/23	714515	6020A	TRG	7782-49-2	0.18		mg/L	SW846	Selenium	0.0025	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-233887-6	05/22/23	05/23/23	714515	6020A	TRG	7440-28-0	0.0020	U	mg/L	SW846	Thallium	0.0020	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-233887-6	05/22/23	05/24/23	714515	6020A	TRG	7440-36-0	0.0030	U	mg/L	SW846	Antimony	0.0030	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-233887-6	05/22/23	05/25/23	714515	6020A	TRG	7439-93-2	0.024		mg/L	SW846	Lithium	0.010	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-233887-6	05/22/23	05/25/23	714515	6020A	TRG	7440-70-2	1400		mg/L	SW846	Calcium	2.0	10
MW-09	05/16/23	EUROFINS CHICAGO	WATER	500-233887-1	06/06/23	06/07/23	716983	7470A	TRG	7439-97-6	0.00020	U	mg/L	SW846	Mercury	0.00020	1
MW-11	05/16/23	EUROFINS CHICAGO	WATER	500-233887-2	06/06/23	06/07/23	716983	7470A	TRG	7439-97-6	0.00020	U	mg/L	SW846	Mercury	0.00020	1
MW-12	05/16/23	EUROFINS CHICAGO	WATER	500-233887-3	06/06/23	06/07/23	716983	7470A	TRG	7439-97-6	0.00020	U	mg/L	SW846	Mercury	0.00020	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233887-4	06/06/23	06/07/23	716983	7470A	TRG	7439-97-6	0.00020	U	mg/L	SW846	Mercury	0.00020	1
MW-08	05/17/23	EUROFINS CHICAGO	WATER	500-233887-5	06/06/23	06/07/23	716983	7470A	TRG	7439-97-6	0.00020	U	mg/L	SW846	Mercury	0.00020	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-233887-6	06/06/23	06/07/23	716983	7470A	TRG	7439-97-6	0.00020	U	mg/L	SW846	Mercury	0.00020	1

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Client ID	Sample Collection Date	Laboratory Name	Sample Matrix	Job Number	Prep Date	Analysis Date	Batch Number	Method Number		Result Identifier	CAS Numbers	Result	Result Qualifier	Unit of Measure	Method Reference	Parameter Name	Detection Limit	Dilution Factor
MW-09	05/16/23	EUROFINS ST. LOUIS	WATER	500-233887-1	05/25/23	06/20/23	613094	903.0		TRG	13982-63-3	0.228	U	pCi/L	EPA	Radium-226	0.228	1
MW-11	05/16/23	EUROFINS ST. LOUIS	WATER	500-233887-2	05/25/23	06/20/23	613094	903.0		TRG	13982-63-3	0.290	U	pCi/L	EPA	Radium-226	0.290	1
MW-12	05/16/23	EUROFINS ST. LOUIS	WATER	500-233887-3	05/25/23	06/20/23	613094	903.0		TRG	13982-63-3	0.285	U	pCi/L	EPA	Radium-226	0.285	1
MW-01	05/17/23	EUROFINS ST. LOUIS	WATER	500-233887-4	05/26/23	06/20/23	613260	903.0		TRG	13982-63-3	0.259	U	pCi/L	EPA	Radium-226	0.259	1
MW-08	05/17/23	EUROFINS ST. LOUIS	WATER	500-233887-5	05/26/23	06/20/23	613260	903.0		TRG	13982-63-3	0.350		pCi/L	EPA	Radium-226	0.267	1
MW-15	05/17/23	EUROFINS ST. LOUIS	WATER	500-233887-6	05/26/23	06/20/23	613260	903.0		TRG	13982-63-3	0.265	U	pCi/L	EPA	Radium-226	0.265	1
MW-09	05/16/23	EUROFINS ST. LOUIS	WATER	500-233887-1	05/25/23	06/19/23	613098	904.0		TRG	15262-20-1	0.534	U	pCi/L	EPA	Radium-228	0.534	1
MW-11	05/16/23	EUROFINS ST. LOUIS	WATER	500-233887-2	05/25/23	06/19/23	613098	904.0		TRG	15262-20-1	0.625	U	pCi/L	EPA	Radium-228	0.625	1
MW-12	05/16/23	EUROFINS ST. LOUIS	WATER	500-233887-3	05/25/23	06/19/23	613098	904.0		TRG	15262-20-1	0.588	U	pCi/L	EPA	Radium-228	0.588	1
MW-01	05/17/23	EUROFINS ST. LOUIS	WATER	500-233887-4	05/26/23	06/20/23	613360	904.0		TRG	15262-20-1	0.493	U	pCi/L	EPA	Radium-228	0.493	1
MW-08	05/17/23	EUROFINS ST. LOUIS	WATER	500-233887-5	05/26/23	06/20/23	613360	904.0		TRG	15262-20-1	0.519	U	pCi/L	EPA	Radium-228	0.519	1
MW-15	05/17/23	EUROFINS ST. LOUIS	WATER	500-233887-6	05/26/23	06/20/23	613360	904.0		TRG	15262-20-1	0.538	U	pCi/L	EPA	Radium-228	0.538	1
MW-09	05/16/23	EUROFINS ST. LOUIS	WATER	500-233887-1	06/21/23	06/21/23	616996	Ra226	Ra228	TRG	STL02186	0.534	U	pCi/L	TAL-STL	Combined Radium 226 + 228	0.534	1
MW-11	05/16/23	EUROFINS ST. LOUIS	WATER	500-233887-2	06/21/23	06/21/23	616996	Ra226	Ra228	TRG	STL02186	0.625	U	pCi/L	TAL-STL	Combined Radium 226 + 228	0.625	1
MW-12	05/16/23	EUROFINS ST. LOUIS	WATER	500-233887-3	06/21/23	06/21/23	616996	Ra226	Ra228	TRG	STL02186	0.588	U	pCi/L	TAL-STL	Combined Radium 226 + 228	0.588	1
MW-01	05/17/23	EUROFINS ST. LOUIS	WATER	500-233887-4	06/21/23	06/21/23	617159	Ra226	Ra228	TRG	STL02186	0.493	U	pCi/L	TAL-STL	Combined Radium 226 + 228	0.493	1
MW-08	05/17/23	EUROFINS ST. LOUIS	WATER	500-233887-5	06/21/23	06/21/23	617159	Ra226	Ra228	TRG	STL02186	0.714		pCi/L	TAL-STL	Combined Radium 226 + 228	0.519	1
MW-15	05/17/23	EUROFINS ST. LOUIS	WATER	500-233887-6	06/21/23	06/21/23	617159	Ra226	Ra228	TRG	STL02186	0.538	U	pCi/L	TAL-STL	Combined Radium 226 + 228	0.538	1

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Client ID	Sample Collection Date	Laboratory Name	Sample Matrix	Job Number	Prep Date	Analysis Date	Batch Number	Method Number	Result Identifier	CAS Numbers	Result	Result Qualifier	Unit of Measure	Method Reference	Parameter Name	Detection Limit	Dilution Factor
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-233887-7	05/22/23	05/22/23	714420	SM 2540C	TRG	STL00242	1400		mg/L	SM	Total Dissolved Solids	10	1
MW-18	05/18/23	EUROFINS CHICAGO	WATER	500-233887-8	05/22/23	05/22/23	714420	SM 2540C	TRG	STL00242	1000		mg/L	SM	Total Dissolved Solids	10	1
MW-19	05/18/23	EUROFINS CHICAGO	WATER	500-233887-9	05/22/23	05/22/23	714420	SM 2540C	TRG	STL00242	580		mg/L	SM	Total Dissolved Solids	10	1
Duplicate	05/18/23	EUROFINS CHICAGO	WATER	500-233887-10	05/22/23	05/22/23	714420	SM 2540C	TRG	STL00242	1100		mg/L	SM	Total Dissolved Solids	10	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-233887-7	05/24/23	05/24/23	715089	SM 4500 Cl- E	TRG	16887-00-6	190		mg/L	SM	Chloride	20	10
MW-18	05/18/23	EUROFINS CHICAGO	WATER	500-233887-8	05/24/23	05/24/23	715089	SM 4500 Cl- E	TRG	16887-00-6	140		mg/L	SM	Chloride	10	5
MW-19	05/18/23	EUROFINS CHICAGO	WATER	500-233887-9	05/24/23	05/24/23	715089	SM 4500 Cl- E	TRG	16887-00-6	31		mg/L	SM	Chloride	2.0	1
Duplicate	05/18/23	EUROFINS CHICAGO	WATER	500-233887-10	05/24/23	05/24/23	715089	SM 4500 Cl- E	TRG	16887-00-6	150		mg/L	SM	Chloride	20	10
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-233887-7	05/24/23	05/24/23	715052	SM 4500 F C	TRG	16984-48-8	0.65		mg/L	SM	Fluoride	0.10	1
MW-18	05/18/23	EUROFINS CHICAGO	WATER	500-233887-8	05/24/23	05/24/23	715052	SM 4500 F C	TRG	16984-48-8	0.52		mg/L	SM	Fluoride	0.10	1
MW-19	05/18/23	EUROFINS CHICAGO	WATER	500-233887-9	05/24/23	05/24/23	715052	SM 4500 F C	TRG	16984-48-8	0.13		mg/L	SM	Fluoride	0.10	1
Duplicate	05/18/23	EUROFINS CHICAGO	WATER	500-233887-10	05/24/23	05/24/23	715052	SM 4500 F C	TRG	16984-48-8	0.56		mg/L	SM	Fluoride	0.10	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-233887-7	05/26/23	05/26/23	715553	SM 4500 SO4 E	TRG	14808-79-8	460		mg/L	SM	Sulfate	250	50
MW-18	05/18/23	EUROFINS CHICAGO	WATER	500-233887-8	05/26/23	05/26/23	715553	SM 4500 SO4 E	TRG	14808-79-8	120		mg/L	SM	Sulfate	50	10
MW-19	05/18/23	EUROFINS CHICAGO	WATER	500-233887-9	05/26/23	05/26/23	715553	SM 4500 SO4 E	TRG	14808-79-8	150		mg/L	SM	Sulfate	50	10
Duplicate	05/18/23	EUROFINS CHICAGO	WATER	500-233887-10	05/26/23	05/26/23	715553	SM 4500 SO4 E	TRG	14808-79-8	110		mg/L	SM	Sulfate	50	10
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-233887-7	05/22/23	05/23/23	714515	6020A	TRG	7440-38-2	0.0026		mg/L	SW846	Arsenic	0.0010	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-233887-7	05/22/23	05/23/23	714515	6020A	TRG	7440-39-3	0.023		mg/L	SW846	Barium	0.0025	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-233887-7	05/22/23	05/23/23	714515	6020A	TRG	7440-41-7	0.0010	U ^+ ^1+	mg/L	SW846	Beryllium	0.0010	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-233887-7	05/22/23	05/23/23	714515	6020A	TRG	7440-42-8	0.98		mg/L	SW846	Boron	0.050	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-233887-7	05/22/23	05/23/23	714515	6020A	TRG	7440-43-9	0.00050	U	mg/L	SW846	Cadmium	0.00050	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-233887-7	05/22/23	05/23/23	714515	6020A	TRG	7440-47-3	0.0050	U	mg/L	SW846	Chromium	0.0050	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-233887-7	05/22/23	05/23/23	714515	6020A	TRG	7440-48-4	0.0010	U	mg/L	SW846	Cobalt	0.0010	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-233887-7	05/22/23	05/23/23	714515	6020A	TRG	7439-92-1	0.00050	U	mg/L	SW846	Lead	0.00050	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-233887-7	05/22/23	05/23/23	714515	6020A	TRG	7439-98-7	0.058		mg/L	SW846	Molybdenum	0.0050	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-233887-7	05/22/23	05/23/23	714515	6020A	TRG	7782-49-2	0.0025	U	mg/L	SW846	Selenium	0.0025	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-233887-7	05/22/23	05/23/23	714515	6020A	TRG	7440-28-0	0.0020	U	mg/L	SW846	Thallium	0.0020	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-233887-7	05/22/23	05/24/23	714515	6020A	TRG	7440-36-0	0.0030	U	mg/L	SW846	Antimony	0.0030	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-233887-7	05/22/23	05/24/23	714515	6020A	TRG	7440-70-2	150		mg/L	SW846	Calcium	0.20	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-233887-7	05/22/23	05/25/23	714515	6020A	TRG	7439-93-2	0.011		mg/L	SW846	Lithium	0.010	1
MW-18	05/18/23	EUROFINS CHICAGO	WATER	500-233887-8	05/22/23	05/23/23	714515	6020A	TRG	7440-38-2	0.0010	U	mg/L	SW846	Arsenic	0.0010	1
MW-18	05/18/23	EUROFINS CHICAGO	WATER	500-233887-8	05/22/23	05/23/23	714515	6020A	TRG	7440-39-3	0.12		mg/L	SW846	Barium	0.0025	1
MW-18	05/18/23	EUROFINS CHICAGO	WATER	500-233887-8	05/22/23	05/23/23	714515	6020A	TRG	7440-41-7	0.0010	U ^+ ^1+	mg/L	SW846	Beryllium	0.0010	1
MW-18	05/18/23	EUROFINS CHICAGO	WATER	500-233887-8	05/22/23	05/23/23	714515	6020A	TRG	7440-42-8	0.61		mg/L	SW846	Boron	0.050	1
MW-18	05/18/23	EUROFINS CHICAGO	WATER	500-233887-8	05/22/23	05/23/23	714515	6020A	TRG	7440-43-9	0.00050	U	mg/L	SW846	Cadmium	0.00050	1
MW-18	05/18/23	EUROFINS CHICAGO	WATER	500-233887-8	05/22/23	05/23/23	714515	6020A	TRG	7440-47-3	0.0050	U	mg/L	SW846	Chromium	0.0050	1
MW-18	05/18/23	EUROFINS CHICAGO	WATER	500-233887-8	05/22/23	05/23/23	714515	6020A	TRG	7440-48-4	0.0010	U	mg/L	SW846	Cobalt	0.0010	1
MW-18	05/18/23	EUROFINS CHICAGO	WATER	500-233887-8	05/22/23	05/23/23	714515	6020A	TRG	7439-92-1	0.00050	U	mg/L	SW846	Lead	0.00050	1
MW-18	05/18/23	EUROFINS CHICAGO	WATER	500-233887-8	05/22/23	05/23/23	714515	6020A	TRG	7439-98-7	0.0060		mg/L	SW846	Molybdenum	0.0050	1
MW-18	05/18/23	EUROFINS CHICAGO	WATER	500-233887-8	05/22/23	05/23/23	714515	6020A	TRG	7782-49-2	0.0025	U	mg/L	SW846	Selenium	0.0025	1
MW-18	05/18/23	EUROFINS CHICAGO	WATER	500-233887-8	05/22/23	05/23/23	714515	6020A	TRG	7440-28-0	0.0020	U	mg/L	SW846	Thallium	0.0020	1
MW-18	05/18/23	EUROFINS CHICAGO	WATER	500-233887-8	05/22/23	05/24/23	714515	6020A	TRG	7440-36-0	0.0030	U	mg/L	SW846	Antimony	0.0030	1
MW-18	05/18/23	EUROFINS CHICAGO	WATER	500-233887-8	05/22/23	05/24/23	714515	6020A	TRG	7440-70-2	130		mg/L	SW846	Calcium	0.20	1
MW-18	05/18/23	EUROFINS CHICAGO	WATER	500-233887-8	05/22/23	05/25/23	714515	6020A	TRG	7439-93-2	0.010	U	mg/L	SW846	Lithium	0.010	1
MW-19	05/18/23	EUROFINS CHICAGO	WATER	500-233887-9	05/22/23	05/23/23	714515	6020A	TRG	7440-38-2	0.0010	U	mg/L	SW846	Arsenic	0.0010	1
MW-19	05/18/23	EUROFINS CHICAGO	WATER	500-233887-9	05/22/23	05/23/23	714515	6020A	TRG	7440-39-3	0.069		mg/L	SW846	Barium	0.0025	1
MW-19	05/18/23	EUROFINS CHICAGO	WATER	500-233887-9	05/22/23	05/23/23	714515	6020A	TRG	7440-41-7	0.0010	U ^+ ^1+	mg/L	SW846	Beryllium	0.0010	1
MW-19	05/18/23	EUROFINS CHICAGO	WATER	500-233887-9	05/22/23	05/23/23	714515	6020A	TRG	7440-42-8	3.8		mg/L	SW846	Boron	0.050	1
MW-19	05/18/23	EUROFINS CHICAGO	WATER	500-233887-9	05/22/23	05/23/23	714515	6020A	TRG	7440-43-9	0.00050	U	mg/L	SW846	Cadmium	0.00050	1
MW-19	05/18/23	EUROFINS CHICAGO	WATER	500-233887-9	05/22/23	05/23/23	714515	6020A	TRG	7440-47-3	0.0050	U	mg/L	SW846	Chromium	0.0050	1
MW-19	05/18/23	EUROFINS CHICAGO	WATER	500-233887-9	05/22/23	05/23/23	714515	6020A	TRG	7440-48-4	0.0010	U	mg/L	SW846	Cobalt	0.0010	1
MW-19	05/18/23	EUROFINS CHICAGO	WATER	500-233887-9	05/22/23	05/23/23	714515	6020A	TRG	7439-92-1	0.00050	U	mg/L	SW846	Lead	0.00050	1
MW-19	05/18/23	EUROFINS CHICAGO	WATER	500-233887-9	05/22/23	05/23/23	714515	6020A	TRG	7439-98-7	0.030		mg/L	SW846	Molybdenum	0.0050	1
MW-19	05/18/23	EUROFINS CHICAGO	WATER	500-233887-9	05/22/23	05/23/23	714515	6020A	TRG	7782-49-2	0.0035		mg/L	SW846	Selenium	0.0025	1
MW-19	05/18/23	EUROFINS CHICAGO	WATER	500-233887-9	05/22/23	05/23/23	714515	6020A	TRG	7440-28-0	0.0020	U	mg/L	SW846	Thallium	0.0020	1
MW-19	05/18/23	EUROFINS CHICAGO	WATER	500-233887-9	05/22/23	05/24/23	714515	6020A	TRG	7440-36-0	0.0030	U	mg/L	SW846	Antimony	0.0030	1
MW-19	05/18/23	EUROFINS CHICAGO	WATER	500-233887-9	05/22/23	05/24/23	714515	6020A	TRG	7440-70-2	78		mg/L	SW846	Calcium	0.20	1
MW-19	05/18/23	EUROFINS CHICAGO	WATER	500-233887-9	05/22/23	05/25/23	714515	6020A	TRG	7439-93-2	0.010		mg/L	SW846	Lithium	0.010	1
Duplicate	05/18/23	EUROFINS CHICAGO	WATER	500-233887-10	05/22/23	05/23/23	714515	6020A	TRG	7440-38-2	0.0015		mg/L	SW846	Arsenic	0.0010	1
Duplicate	05/18/23	EUROFINS CHICAGO	WATER	500-233887-10	05/22/23	05/23/23	714515	6020A	TRG	7440-39-3	0.11		mg/L	SW846	Barium	0.0025	1
Duplicate	05/18/23	EUROFINS CHICAGO	WATER	500-233887-10	05/22/23	05/23/23	714515	6020A	TRG	7440-41-7	0.0010	U ^+ ^1+	mg/L	SW846	Beryllium	0.0010	1
Duplicate	05/18/23	EUROFINS CHICAGO	WATER	500-233887-10	05/22/23	05/23/23	714515	6020A	TRG	7440-42-8	0.59		mg/L	SW846	Boron	0.050	1
Duplicate	05/18/23	EUROFINS CHICAGO	WATER	500-233887-10	05/22/23	05/23/23	714515	6020A	TRG	7440-43-9	0.00050	U	mg/L	SW846	Cadmium	0.00050	1
Duplicate	05/18/23	EUROFINS CHICAGO	WATER	500-233887-10	05/22/23	05/23/23	714515	6020A	TRG	7440-47-3	0.0050	U	mg/L	SW846	Chromium	0.0050	1
Duplicate	05/18/23	EUROFINS CHICAGO	WATER	500-233887-10	05/22/23	05/23/23	714515	6020A	TRG	7440-48-4	0.0010	U	mg/L	SW846	Cobalt	0.0010	1
Duplicate	05/18/23	EUROFINS CHICAGO	WATER	500-233887-10	05/22/23	05/23/23	714515	6020A	TRG	7439-92-1	0.00050	U	mg/L	SW846	Lead	0.00050	1
Duplicate	05/18/23	EUROFINS CHICAGO	WATER	500-233887-10	05/22/23	05/23/23	714515	6020A	TRG	7439-98-7	0.0059		mg/L	SW846	Molybdenum	0.0050	1
Duplicate	05/18/23	EUROFINS CHICAGO	WATER	500-233887-10	05/22/23	05/23/23	714515	6020A	TRG	7782-49-2	0.0025	U	mg/L	SW846	Selenium	0.0025	1
Duplicate	05/18/23	EUROFINS CHICAGO	WATER	500-233887-10	05/22/23	05/23/23	714515	6020A	TRG	7440-28-0	0.0020	U	mg/L	SW846	Thallium	0.0020	1
Duplicate	05/18/23	EUROFINS CHICAGO	WATER	500-233887-10	05/22/23	05/24/23	714515	6020A	TRG	7440-36-0	0.0030	U	mg/L	SW846	Antimony	0.0030	1
Duplicate	05/18/23	EUROFINS CHICAGO	WATER	500-233887-10	05/22/23	05/24/23	714515	6020A	TRG	7440-70-2	130		mg/L	SW846	Calcium	0.20	1
Duplicate	05/18/23	EUROFINS CHICAGO	WATER	500-233887-10	05/22/23	06/08/23	714515	6020A	TRG	7439-93-2	0.011		mg/L	SW846	Lithium	0.010	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-233887-7	06/06/23	06/07/23	716983	7470A	TRG	7439-97-6	0.00020	U	mg/L	SW846	Mercury	0.00020	1
MW-18	05/18/23	EUROFINS CHICAGO	WATER	500-233887-8	06/06/23	06/07/23	716983	7470A	TRG	7439-97-6	0.00020	U	mg/L	SW846	Mercury	0.00020	1
MW-19	05/18/23	EUROFINS CHICAGO	WATER	500-233887-9	06/06/23	06/07/23	716983	7470A	TRG	7439-97-6	0.00020	U	mg/L	SW846	Mercury	0.00020	1
Duplicate	05/18/23	EUROFINS CHICAGO	WATER	500-233887-10	06/06/23	06/07/23	716983	7470A	TRG	7439-97-6	0.00020	U	mg/L	SW846	Mercury	0.00020	1

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Client ID	Sample Collection Date	Laboratory Name	Sample Matrix	Job Number	Prep Date	Analysis Date	Batch Number	Method Number		Result Identifier	CAS Numbers	Result	Result Qualifier	Unit of Measure	Method Reference	Parameter Name	Detection Limit	Dilution Factor
MW-17	05/18/23	EUROFINS ST. LOUIS	WATER	500-233887-7	05/26/23	06/20/23	613260	903.0		TRG	13982-63-3	0.268	U	pCi/L	EPA	Radium-226	0.268	1
MW-18	05/18/23	EUROFINS ST. LOUIS	WATER	500-233887-8	05/26/23	06/20/23	613260	903.0		TRG	13982-63-3	0.234	U	pCi/L	EPA	Radium-226	0.234	1
MW-19	05/18/23	EUROFINS ST. LOUIS	WATER	500-233887-9	05/26/23	06/20/23	613260	903.0		TRG	13982-63-3	0.209	U	pCi/L	EPA	Radium-226	0.209	1
Duplicate	05/18/23	EUROFINS ST. LOUIS	WATER	500-233887-10	05/26/23	06/20/23	613260	903.0		TRG	13982-63-3	0.238	U	pCi/L	EPA	Radium-226	0.238	1
MW-17	05/18/23	EUROFINS ST. LOUIS	WATER	500-233887-7	05/26/23	06/20/23	613360	904.0		TRG	15262-20-1	0.521	U	pCi/L	EPA	Radium-228	0.521	1
MW-18	05/18/23	EUROFINS ST. LOUIS	WATER	500-233887-8	05/26/23	06/20/23	613360	904.0		TRG	15262-20-1	0.433	U	pCi/L	EPA	Radium-228	0.433	1
MW-19	05/18/23	EUROFINS ST. LOUIS	WATER	500-233887-9	05/26/23	06/20/23	613360	904.0		TRG	15262-20-1	0.533		pCi/L	EPA	Radium-228	0.479	1
Duplicate	05/18/23	EUROFINS ST. LOUIS	WATER	500-233887-10	05/26/23	06/20/23	613360	904.0		TRG	15262-20-1	0.514	U	pCi/L	EPA	Radium-228	0.514	1
MW-17	05/18/23	EUROFINS ST. LOUIS	WATER	500-233887-7	06/21/23	06/21/23	617159	Ra226	Ra228	TRG	STL02186	0.521	U	pCi/L	TAL-STL	Combined Radium 226 + 228	0.521	1
MW-18	05/18/23	EUROFINS ST. LOUIS	WATER	500-233887-8	06/21/23	06/21/23	617159	Ra226	Ra228	TRG	STL02186	0.433	U	pCi/L	TAL-STL	Combined Radium 226 + 228	0.433	1
MW-19	05/18/23	EUROFINS ST. LOUIS	WATER	500-233887-9	06/21/23	06/21/23	617159	Ra226	Ra228	TRG	STL02186	0.604		pCi/L	TAL-STL	Combined Radium 226 + 228	0.479	1
Duplicate	05/18/23	EUROFINS ST. LOUIS	WATER	500-233887-10	06/21/23	06/21/23	617159	Ra226	Ra228	TRG	STL02186	0.514	U	pCi/L	TAL-STL	Combined Radium 226 + 228	0.514	1

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Client ID	Sample Collection Date	Laboratory Name	Sample Matrix	Job Number	Prep Date	Analysis Date	Batch Number	Method Number	Result Identifier	CAS Numbers	Result	Result Qualifier	Unit of Measure	Method Reference	Parameter Name	Detection Limit	Dilution Factor
MW-02	05/16/23	EUROFINS CHICAGO	WATER	500-233911-1	05/18/23	05/18/23	713901	SM 2540C	TRG	STL00242	400		mg/L	SM	Total Dissolved Solids	10	1
MW-03	05/16/23	EUROFINS CHICAGO	WATER	500-233911-2	05/18/23	05/18/23	713901	SM 2540C	TRG	STL00242	420		mg/L	SM	Total Dissolved Solids	10	1
MW-04	05/16/23	EUROFINS CHICAGO	WATER	500-233911-3	05/18/23	05/18/23	713901	SM 2540C	TRG	STL00242	550		mg/L	SM	Total Dissolved Solids	10	1
MW-05	05/16/23	EUROFINS CHICAGO	WATER	500-233911-4	05/18/23	05/18/23	713901	SM 2540C	TRG	STL00242	690		mg/L	SM	Total Dissolved Solids	10	1
MW-10	05/17/23	EUROFINS CHICAGO	WATER	500-233911-5	05/22/23	05/22/23	714420	SM 2540C	TRG	STL00242	610		mg/L	SM	Total Dissolved Solids	10	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233911-6	05/22/23	05/22/23	714420	SM 2540C	TRG	STL00242	400		mg/L	SM	Total Dissolved Solids	10	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-233911-7	05/22/23	05/22/23	714421	SM 2540C	TRG	STL00242	650		mg/L	SM	Total Dissolved Solids	10	1
MW-02	05/16/23	EUROFINS CHICAGO	WATER	500-233911-1	05/24/23	05/24/23	715089	SM 4500 Cl- E	TRG	16887-00-6	47		mg/L	SM	Chloride	4.0	2
MW-03	05/16/23	EUROFINS CHICAGO	WATER	500-233911-2	05/24/23	05/24/23	715089	SM 4500 Cl- E	TRG	16887-00-6	69		mg/L	SM	Chloride	4.0	2
MW-04	05/16/23	EUROFINS CHICAGO	WATER	500-233911-3	05/24/23	05/24/23	715089	SM 4500 Cl- E	TRG	16887-00-6	51		mg/L	SM	Chloride	10	5
MW-05	05/16/23	EUROFINS CHICAGO	WATER	500-233911-4	05/24/23	05/24/23	715089	SM 4500 Cl- E	TRG	16887-00-6	79		mg/L	SM	Chloride	10	5
MW-10	05/17/23	EUROFINS CHICAGO	WATER	500-233911-5	05/24/23	05/24/23	715089	SM 4500 Cl- E	TRG	16887-00-6	34		mg/L	SM	Chloride	4.0	2
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-233911-7	05/24/23	05/24/23	715089	SM 4500 Cl- E	TRG	16887-00-6	34		mg/L	SM	Chloride	2.0	1
MW-02	05/16/23	EUROFINS CHICAGO	WATER	500-233911-1	05/21/23	05/21/23	714514	SM 4500 F C	TRG	16984-48-8	0.15		mg/L	SM	Fluoride	0.10	1
MW-03	05/16/23	EUROFINS CHICAGO	WATER	500-233911-2	05/21/23	05/21/23	714514	SM 4500 F C	TRG	16984-48-8	0.21		mg/L	SM	Fluoride	0.10	1
MW-04	05/16/23	EUROFINS CHICAGO	WATER	500-233911-3	05/21/23	05/21/23	714514	SM 4500 F C	TRG	16984-48-8	0.27		mg/L	SM	Fluoride	0.10	1
MW-05	05/16/23	EUROFINS CHICAGO	WATER	500-233911-4	05/21/23	05/21/23	714514	SM 4500 F C	TRG	16984-48-8	0.30		mg/L	SM	Fluoride	0.10	1
MW-10	05/17/23	EUROFINS CHICAGO	WATER	500-233911-5	05/24/23	05/24/23	715052	SM 4500 F C	TRG	16984-48-8	0.25		mg/L	SM	Fluoride	0.10	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-233911-7	05/24/23	05/24/23	715052	SM 4500 F C	TRG	16984-48-8	0.25		mg/L	SM	Fluoride	0.10	1
MW-02	05/16/23	EUROFINS CHICAGO	WATER	500-233911-1	05/26/23	05/26/23	715553	SM 4500 SO4 E	TRG	14808-79-8	33		mg/L	SM	Sulfate	25	5
MW-03	05/16/23	EUROFINS CHICAGO	WATER	500-233911-2	05/26/23	05/26/23	715553	SM 4500 SO4 E	TRG	14808-79-8	31		mg/L	SM	Sulfate	10	2
MW-04	05/16/23	EUROFINS CHICAGO	WATER	500-233911-3	05/26/23	05/26/23	715553	SM 4500 SO4 E	TRG	14808-79-8	120		mg/L	SM	Sulfate	50	10
MW-05	05/16/23	EUROFINS CHICAGO	WATER	500-233911-4	05/26/23	05/26/23	715553	SM 4500 SO4 E	TRG	14808-79-8	130		mg/L	SM	Sulfate	25	5
MW-10	05/17/23	EUROFINS CHICAGO	WATER	500-233911-5	05/26/23	05/26/23	715553	SM 4500 SO4 E	TRG	14808-79-8	84		mg/L	SM	Sulfate	10	2
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-233911-7	05/26/23	05/26/23	715553	SM 4500 SO4 E	TRG	14808-79-8	79		mg/L	SM	Sulfate	50	10
MW-02	05/16/23	EUROFINS CHICAGO	WATER	500-233911-1	05/22/23	05/23/23	714516	6020A	TRG	7440-38-2	0.0011		mg/L	SW846	Arsenic	0.0010	1
MW-02	05/16/23	EUROFINS CHICAGO	WATER	500-233911-1	05/22/23	05/23/23	714516	6020A	TRG	7440-41-7	0.0010	U ^+ ^1+	mg/L	SW846	Beryllium	0.0010	1
MW-02	05/16/23	EUROFINS CHICAGO	WATER	500-233911-1	05/22/23	05/23/23	714516	6020A	TRG	7440-42-8	0.53		mg/L	SW846	Boron	0.050	1
MW-02	05/16/23	EUROFINS CHICAGO	WATER	500-233911-1	05/22/23	05/23/23	714516	6020A	TRG	7440-43-9	0.00050	U	mg/L	SW846	Cadmium	0.00050	1
MW-02	05/16/23	EUROFINS CHICAGO	WATER	500-233911-1	05/22/23	05/23/23	714516	6020A	TRG	7440-47-3	0.0050	U	mg/L	SW846	Chromium	0.0050	1
MW-02	05/16/23	EUROFINS CHICAGO	WATER	500-233911-1	05/22/23	05/23/23	714516	6020A	TRG	7440-48-4	0.0010	U	mg/L	SW846	Cobalt	0.0010	1
MW-02	05/16/23	EUROFINS CHICAGO	WATER	500-233911-1	05/22/23	05/23/23	714516	6020A	TRG	7439-92-1	0.00050	U	mg/L	SW846	Lead	0.00050	1
MW-02	05/16/23	EUROFINS CHICAGO	WATER	500-233911-1	05/22/23	05/23/23	714516	6020A	TRG	7439-98-7	0.0050	U	mg/L	SW846	Molybdenum	0.0050	1
MW-02	05/16/23	EUROFINS CHICAGO	WATER	500-233911-1	05/22/23	05/23/23	714516	6020A	TRG	7782-49-2	0.0025	U	mg/L	SW846	Selenium	0.0025	1
MW-02	05/16/23	EUROFINS CHICAGO	WATER	500-233911-1	05/22/23	05/23/23	714516	6020A	TRG	7440-28-0	0.0020	U	mg/L	SW846	Thallium	0.0020	1
MW-02	05/16/23	EUROFINS CHICAGO	WATER	500-233911-1	05/22/23	05/24/23	714516	6020A	TRG	7440-36-0	0.0030	U	mg/L	SW846	Antimony	0.0030	1
MW-02	05/16/23	EUROFINS CHICAGO	WATER	500-233911-1	05/22/23	05/24/23	714516	6020A	TRG	7440-39-3	0.065		mg/L	SW846	Barium	0.0025	1
MW-02	05/16/23	EUROFINS CHICAGO	WATER	500-233911-1	05/22/23	05/24/23	714516	6020A	TRG	7440-70-2	83		mg/L	SW846	Calcium	0.20	1
MW-02	05/16/23	EUROFINS CHICAGO	WATER	500-233911-1	05/22/23	05/25/23	714516	6020A	TRG	7439-93-2	0.010	U	mg/L	SW846	Lithium	0.010	1
MW-03	05/16/23	EUROFINS CHICAGO	WATER	500-233911-2	05/22/23	05/23/23	714516	6020A	TRG	7440-38-2	0.0010	U	mg/L	SW846	Arsenic	0.0010	1
MW-03	05/16/23	EUROFINS CHICAGO	WATER	500-233911-2	05/22/23	05/23/23	714516	6020A	TRG	7440-41-7	0.0010	U ^+ ^1+	mg/L	SW846	Beryllium	0.0010	1
MW-03	05/16/23	EUROFINS CHICAGO	WATER	500-233911-2	05/22/23	05/23/23	714516	6020A	TRG	7440-42-8	0.15		mg/L	SW846	Boron	0.050	1
MW-03	05/16/23	EUROFINS CHICAGO	WATER	500-233911-2	05/22/23	05/23/23	714516	6020A	TRG	7440-43-9	0.00050	U	mg/L	SW846	Cadmium	0.00050	1
MW-03	05/16/23	EUROFINS CHICAGO	WATER	500-233911-2	05/22/23	05/23/23	714516	6020A	TRG	7440-47-3	0.0050	U	mg/L	SW846	Chromium	0.0050	1
MW-03	05/16/23	EUROFINS CHICAGO	WATER	500-233911-2	05/22/23	05/23/23	714516	6020A	TRG	7440-48-4	0.0010	U	mg/L	SW846	Cobalt	0.0010	1
MW-03	05/16/23	EUROFINS CHICAGO	WATER	500-233911-2	05/22/23	05/23/23	714516	6020A	TRG	7439-92-1	0.00050	U	mg/L	SW846	Lead	0.00050	1
MW-03	05/16/23	EUROFINS CHICAGO	WATER	500-233911-2	05/22/23	05/23/23	714516	6020A	TRG	7439-98-7	0.0050	U	mg/L	SW846	Molybdenum	0.0050	1
MW-03	05/16/23	EUROFINS CHICAGO	WATER	500-233911-2	05/22/23	05/23/23	714516	6020A	TRG	7782-49-2	0.0038		mg/L	SW846	Selenium	0.0025	1
MW-03	05/16/23	EUROFINS CHICAGO	WATER	500-233911-2	05/22/23	05/23/23	714516	6020A	TRG	7440-28-0	0.0020	U	mg/L	SW846	Thallium	0.0020	1
MW-03	05/16/23	EUROFINS CHICAGO	WATER	500-233911-2	05/22/23	05/24/23	714516	6020A	TRG	7440-36-0	0.0030	U	mg/L	SW846	Antimony	0.0030	1
MW-03	05/16/23	EUROFINS CHICAGO	WATER	500-233911-2	05/22/23	05/24/23	714516	6020A	TRG	7440-39-3	0.068		mg/L	SW846	Barium	0.0025	1
MW-03	05/16/23	EUROFINS CHICAGO	WATER	500-233911-2	05/22/23	05/24/23	714516	6020A	TRG	7440-70-2	80		mg/L	SW846	Calcium	0.20	1
MW-03	05/16/23	EUROFINS CHICAGO	WATER	500-233911-2	05/22/23	05/25/23	714516	6020A	TRG	7439-93-2	0.010	U	mg/L	SW846	Lithium	0.010	1
MW-04	05/16/23	EUROFINS CHICAGO	WATER	500-233911-3	05/22/23	05/24/23	714516	6020A	TRG	7440-38-2	0.0010	U	mg/L	SW846	Arsenic	0.0010	1
MW-04	05/16/23	EUROFINS CHICAGO	WATER	500-233911-3	05/22/23	05/24/23	714516	6020A	TRG	7440-41-7	0.0010	U ^+ ^1+	mg/L	SW846	Beryllium	0.0010	1
MW-04	05/16/23	EUROFINS CHICAGO	WATER	500-233911-3	05/22/23	05/24/23	714516	6020A	TRG	7440-42-8	0.66		mg/L	SW846	Boron	0.050	1
MW-04	05/16/23	EUROFINS CHICAGO	WATER	500-233911-3	05/22/23	05/24/23	714516	6020A	TRG	7440-43-9	0.00050	U	mg/L	SW846	Cadmium	0.00050	1
MW-04	05/16/23	EUROFINS CHICAGO	WATER	500-233911-3	05/22/23	05/24/23	714516	6020A	TRG	7440-47-3	0.0050	U	mg/L	SW846	Chromium	0.0050	1
MW-04	05/16/23	EUROFINS CHICAGO	WATER	500-233911-3	05/22/23	05/24/23	714516	6020A	TRG	7440-48-4	0.0010	U	mg/L	SW846	Cobalt	0.0010	1
MW-04	05/16/23	EUROFINS CHICAGO	WATER	500-233911-3	05/22/23	05/24/23	714516	6020A	TRG	7439-92-1	0.00050	U	mg/L	SW846	Lead	0.00050	1
MW-04	05/16/23	EUROFINS CHICAGO	WATER	500-233911-3	05/22/23	05/24/23	714516	6020A	TRG	7439-98-7	0.0050	U	mg/L	SW846	Molybdenum	0.0050	1
MW-04	05/16/23	EUROFINS CHICAGO	WATER	500-233911-3	05/22/23	05/24/23	714516	6020A	TRG	7782-49-2	0.0025	U	mg/L	SW846	Selenium	0.0025	1
MW-04	05/16/23	EUROFINS CHICAGO	WATER	500-233911-3	05/22/23	05/24/23	714516	6020A	TRG	7440-28-0	0.0020	U	mg/L	SW846	Thallium	0.0020	1
MW-04	05/16/23	EUROFINS CHICAGO	WATER	500-233911-3	05/22/23	05/24/23	714516	6020A	TRG	7440-36-0	0.0030	U	mg/L	SW846	Antimony	0.0030	1
MW-04	05/16/23	EUROFINS CHICAGO	WATER	500-233911-3	05/22/23	05/24/23	714516	6020A	TRG	7440-39-3	0.034		mg/L	SW846	Barium	0.0025	1
MW-04	05/16/23	EUROFINS CHICAGO	WATER	500-233911-3	05/22/23	05/24/23	714516	6020A	TRG	7440-70-2	100		mg/L	SW846	Calcium	0.20	1
MW-04	05/16/23	EUROFINS CHICAGO	WATER	500-233911-3	05/22/23	05/25/23	714516	6020A	TRG	7439-93-2	0.010	U	mg/L	SW846	Lithium	0.010	1
MW-05	05/16/23	EUROFINS CHICAGO	WATER	500-233911-4	05/22/23	05/24/23	714516	6020A	TRG	7440-38-2	0.0010	U	mg/L	SW846	Arsenic	0.0010	1
MW-05	05/16/23	EUROFINS CHICAGO	WATER	500-233911-4	05/22/23	05/24/23	714516	6020A	TRG	7440-41-7	0.0010	U ^+ ^1+	mg/L	SW846	Beryllium	0.0010	1
MW-05	05/16/23	EUROFINS CHICAGO	WATER	500-233911-4	05/22/23	05/24/23	714516	6020A	TRG	7440-42-8	0.78		mg/L	SW846	Boron	0.050	1
MW-05	05/16/23	EUROFINS CHICAGO	WATER	500-233911-4	05/22/23	05/24/23	714516	6020A	TRG	7440-43-9	0.00050	U	mg/L	SW846	Cadmium	0.00050	1
MW-05	05/16/23	EUROFINS CHICAGO	WATER	500-233911-4	05/22/23	05/24/23	714516	6020A	TRG	7440-47-3	0.0050	U	mg/L	SW846	Chromium	0.0050	1
MW-05	05/16/23	EUROFINS CHICAGO	WATER	500-233911-4	05/22/23	05/24/23	714516	6020A	TRG	7440-48-4	0.0010	U	mg/L	SW846	Cobalt	0.0010	1
MW-05	05/16/23	EUROFINS CHICAGO	WATER	500-233911-4	05/22/23	05/24/23	714516	6020A	TRG	7439-92-1	0.00050	U	mg/L	SW846	Lead	0.00050	1
MW-05	05/16/23	EUROFINS CHICAGO	WATER	500-233911-4	05/22/23	05/24/23	714516	6020A	TRG	7439-98-7	0.0050	U	mg/L	SW846	Molybdenum	0.0050	1
MW-05	05/16/23	EUROFINS CHICAGO	WATER	500-233911-4	05/22/23	05/24/23	714516	6020A	TRG	7782-49-2	0.0025	U	mg/L	SW846	Selenium	0.0025	1
MW-05	05/16/23	EUROFINS CHICAGO	WATER	500-233911-4	05/22/23	05/24/23	714516	6020A	TRG	7440-28-0	0.0020	U	mg/L	SW846	Thallium	0.0020	1
MW-05	05/16/23	EUROFINS CHICAGO	WATER	500-233911-4	05/22/23	05/24/23	714516	6020A	TRG	7440-36-0	0.0030	U	mg/L	SW846	Antimony	0.0030	1
MW-05	05/16/23	EUROFINS CHICAGO	WATER	500-233911-4	05/22/23	05/24/23	714516	6020A	TRG	7440-39-3	0.053		mg/L	SW846	Barium	0.0025	1

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MW-05	05/16/23	EUROFINS CHICAGO	WATER	500-233911-4	05/22/23	05/24/23	714516	6020A	TRG	7440-70-2	110		mg/L	SW846	Calcium	0.20	1
MW-05	05/16/23	EUROFINS CHICAGO	WATER	500-233911-4	05/22/23	05/25/23	714516	6020A	TRG	7439-93-2	0.010	U	mg/L	SW846	Lithium	0.010	1
MW-10	05/17/23	EUROFINS CHICAGO	WATER	500-233911-5	05/22/23	05/24/23	714516	6020A	TRG	7440-38-2	0.0017		mg/L	SW846	Arsenic	0.0010	1
MW-10	05/17/23	EUROFINS CHICAGO	WATER	500-233911-5	05/22/23	05/24/23	714516	6020A	TRG	7440-41-7	0.0010	U ^+ ^1+	mg/L	SW846	Beryllium	0.0010	1
MW-10	05/17/23	EUROFINS CHICAGO	WATER	500-233911-5	05/22/23	05/24/23	714516	6020A	TRG	7440-42-8	1.8		mg/L	SW846	Boron	0.050	1
MW-10	05/17/23	EUROFINS CHICAGO	WATER	500-233911-5	05/22/23	05/24/23	714516	6020A	TRG	7440-43-9	0.00050	U	mg/L	SW846	Cadmium	0.00050	1
MW-10	05/17/23	EUROFINS CHICAGO	WATER	500-233911-5	05/22/23	05/24/23	714516	6020A	TRG	7440-47-3	0.0050	U	mg/L	SW846	Chromium	0.0050	1
MW-10	05/17/23	EUROFINS CHICAGO	WATER	500-233911-5	05/22/23	05/24/23	714516	6020A	TRG	7440-48-4	0.012		mg/L	SW846	Cobalt	0.0010	1
MW-10	05/17/23	EUROFINS CHICAGO	WATER	500-233911-5	05/22/23	05/24/23	714516	6020A	TRG	7439-92-1	0.0018		mg/L	SW846	Lead	0.00050	1
MW-10	05/17/23	EUROFINS CHICAGO	WATER	500-233911-5	05/22/23	05/24/23	714516	6020A	TRG	7439-98-7	0.0050	U	mg/L	SW846	Molybdenum	0.0050	1
MW-10	05/17/23	EUROFINS CHICAGO	WATER	500-233911-5	05/22/23	05/24/23	714516	6020A	TRG	7782-49-2	0.0047		mg/L	SW846	Selenium	0.0025	1
MW-10	05/17/23	EUROFINS CHICAGO	WATER	500-233911-5	05/22/23	05/24/23	714516	6020A	TRG	7440-28-0	0.0020	U	mg/L	SW846	Thallium	0.0020	1
MW-10	05/17/23	EUROFINS CHICAGO	WATER	500-233911-5	05/22/23	05/24/23	714516	6020A	TRG	7440-36-0	0.0030	U	mg/L	SW846	Antimony	0.0030	1
MW-10	05/17/23	EUROFINS CHICAGO	WATER	500-233911-5	05/22/23	05/24/23	714516	6020A	TRG	7440-39-3	0.32		mg/L	SW846	Barium	0.0025	1
MW-10	05/17/23	EUROFINS CHICAGO	WATER	500-233911-5	05/22/23	05/24/23	714516	6020A	TRG	7440-70-2	130		mg/L	SW846	Calcium	0.20	1
MW-10	05/17/23	EUROFINS CHICAGO	WATER	500-233911-5	05/22/23	05/25/23	714516	6020A	TRG	7439-93-2	0.010	U	mg/L	SW846	Lithium	0.010	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233911-6	05/22/23	05/24/23	714516	6020A	TRG	7440-38-2	0.0010	U	mg/L	SW846	Arsenic	0.0010	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233911-6	05/22/23	05/24/23	714516	6020A	TRG	7440-41-7	0.0010	U ^+ ^1+	mg/L	SW846	Beryllium	0.0010	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233911-6	05/22/23	05/24/23	714516	6020A	TRG	7440-42-8	0.29		mg/L	SW846	Boron	0.050	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233911-6	05/22/23	05/24/23	714516	6020A	TRG	7440-43-9	0.00050	U	mg/L	SW846	Cadmium	0.00050	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233911-6	05/22/23	05/24/23	714516	6020A	TRG	7440-47-3	0.0050	U	mg/L	SW846	Chromium	0.0050	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233911-6	05/22/23	05/24/23	714516	6020A	TRG	7440-48-4	0.0010	U	mg/L	SW846	Cobalt	0.0010	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233911-6	05/22/23	05/24/23	714516	6020A	TRG	7439-92-1	0.00050	U	mg/L	SW846	Lead	0.00050	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233911-6	05/22/23	05/24/23	714516	6020A	TRG	7439-98-7	0.0050	U	mg/L	SW846	Molybdenum	0.0050	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233911-6	05/22/23	05/24/23	714516	6020A	TRG	7782-49-2	0.0025	U	mg/L	SW846	Selenium	0.0025	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233911-6	05/22/23	05/24/23	714516	6020A	TRG	7440-28-0	0.0020	U	mg/L	SW846	Thallium	0.0020	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233911-6	05/22/23	05/24/23	714516	6020A	TRG	7440-36-0	0.0030	U	mg/L	SW846	Antimony	0.0030	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233911-6	05/22/23	05/24/23	714516	6020A	TRG	7440-39-3	0.055		mg/L	SW846	Barium	0.0025	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233911-6	05/22/23	05/24/23	714516	6020A	TRG	7440-70-2	91		mg/L	SW846	Calcium	0.20	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233911-6	05/22/23	05/25/23	714516	6020A	TRG	7439-93-2	0.010	U	mg/L	SW846	Lithium	0.010	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-233911-7	05/22/23	05/24/23	714516	6020A	TRG	7440-38-2	0.0019		mg/L	SW846	Arsenic	0.0010	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-233911-7	05/22/23	05/24/23	714516	6020A	TRG	7440-41-7	0.0010	U ^+ ^1+	mg/L	SW846	Beryllium	0.0010	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-233911-7	05/22/23	05/24/23	714516	6020A	TRG	7440-42-8	1.9		mg/L	SW846	Boron	0.050	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-233911-7	05/22/23	05/24/23	714516	6020A	TRG	7440-43-9	0.00050	U	mg/L	SW846	Cadmium	0.00050	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-233911-7	05/22/23	05/24/23	714516	6020A	TRG	7440-47-3	0.0050	U	mg/L	SW846	Chromium	0.0050	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-233911-7	05/22/23	05/24/23	714516	6020A	TRG	7440-48-4	0.0052		mg/L	SW846	Cobalt	0.0010	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-233911-7	05/22/23	05/24/23	714516	6020A	TRG	7439-92-1	0.0019		mg/L	SW846	Lead	0.00050	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-233911-7	05/22/23	05/24/23	714516	6020A	TRG	7439-98-7	0.0050	U	mg/L	SW846	Molybdenum	0.0050	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-233911-7	05/22/23	05/24/23	714516	6020A	TRG	7782-49-2	0.0052		mg/L	SW846	Selenium	0.0025	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-233911-7	05/22/23	05/24/23	714516	6020A	TRG	7440-28-0	0.0020	U	mg/L	SW846	Thallium	0.0020	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-233911-7	05/22/23	05/24/23	714516	6020A	TRG	7440-36-0	0.0030	U	mg/L	SW846	Antimony	0.0030	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-233911-7	05/22/23	05/24/23	714516	6020A	TRG	7440-39-3	0.30		mg/L	SW846	Barium	0.0025	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-233911-7	05/22/23	05/24/23	714516	6020A	TRG	7440-70-2	130		mg/L	SW846	Calcium	0.20	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-233911-7	05/22/23	05/25/23	714516	6020A	TRG	7439-93-2	0.010	U	mg/L	SW846	Lithium	0.010	1
MW-02	05/16/23	EUROFINS CHICAGO	WATER	500-233911-1	06/05/23	06/06/23	716804	7470A	TRG	7439-97-6	0.00020	U	mg/L	SW846	Mercury	0.00020	1
MW-03	05/16/23	EUROFINS CHICAGO	WATER	500-233911-2	06/05/23	06/06/23	716804	7470A	TRG	7439-97-6	0.00020	U	mg/L	SW846	Mercury	0.00020	1
MW-04	05/16/23	EUROFINS CHICAGO	WATER	500-233911-3	06/05/23	06/06/23	716804	7470A	TRG	7439-97-6	0.00020	U	mg/L	SW846	Mercury	0.00020	1
MW-05	05/16/23	EUROFINS CHICAGO	WATER	500-233911-4	06/05/23	06/06/23	716804	7470A	TRG	7439-97-6	0.00020	U	mg/L	SW846	Mercury	0.00020	1
MW-10	05/17/23	EUROFINS CHICAGO	WATER	500-233911-5	06/05/23	06/06/23	716804	7470A	TRG	7439-97-6	0.00020	U	mg/L	SW846	Mercury	0.00020	1
MW-01	05/17/23	EUROFINS CHICAGO	WATER	500-233911-6	06/05/23	06/06/23	716804	7470A	TRG	7439-97-6	0.00020	U	mg/L	SW846	Mercury	0.00020	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-233911-7	06/05/23	06/06/23	716804	7470A	TRG	7439-97-6	0.00020	U	mg/L	SW846	Mercury	0.00020	1

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Client ID	Sample Collection Date	Laboratory Name	Sample Matrix	Job Number	Prep Date	Analysis Date	Batch Number	Method Number	Result Identifier	CAS Numbers	Result	Result Qualifier	Unit of Measure	Method Reference	Parameter Name	Detection Limit	Dilution Factor
MW-02	05/16/23	EUROFINS ST. LOUIS	WATER	500-233911-1	05/26/23	06/20/23	613264	903.0	TRG	13982-63-3	0.371	U	pCi/L	EPA	Radium-226	0.371	1
MW-03	05/16/23	EUROFINS ST. LOUIS	WATER	500-233911-2	05/26/23	06/20/23	613264	903.0	TRG	13982-63-3	0.301	U	pCi/L	EPA	Radium-226	0.301	1
MW-04	05/16/23	EUROFINS ST. LOUIS	WATER	500-233911-3	05/25/23	06/20/23	613094	903.0	TRG	13982-63-3	0.308	U	pCi/L	EPA	Radium-226	0.308	1
MW-05	05/16/23	EUROFINS ST. LOUIS	WATER	500-233911-4	05/25/23	06/20/23	613094	903.0	TRG	13982-63-3	0.330	U	pCi/L	EPA	Radium-226	0.330	1
MW-10	05/17/23	EUROFINS ST. LOUIS	WATER	500-233911-5	05/26/23	06/20/23	613260	903.0	TRG	13982-63-3	1.05		pCi/L	EPA	Radium-226	0.554	1
MW-01	05/17/23	EUROFINS ST. LOUIS	WATER	500-233911-6	05/26/23	06/20/23	613260	903.0	TRG	13982-63-3	0.278	U	pCi/L	EPA	Radium-226	0.278	1
Duplicate	05/17/23	EUROFINS ST. LOUIS	WATER	500-233911-7	05/26/23	06/20/23	613260	903.0	TRG	13982-63-3	1.01		pCi/L	EPA	Radium-226	0.336	1
MW-02	05/16/23	EUROFINS ST. LOUIS	WATER	500-233911-1	05/26/23	06/20/23	613351	904.0	TRG	15262-20-1	0.519	U	pCi/L	EPA	Radium-228	0.519	1
MW-03	05/16/23	EUROFINS ST. LOUIS	WATER	500-233911-2	05/26/23	06/20/23	613351	904.0	TRG	15262-20-1	0.921		pCi/L	EPA	Radium-228	0.713	1
MW-04	05/16/23	EUROFINS ST. LOUIS	WATER	500-233911-3	05/25/23	06/19/23	613098	904.0	TRG	15262-20-1	0.624	U	pCi/L	EPA	Radium-228	0.624	1
MW-05	05/16/23	EUROFINS ST. LOUIS	WATER	500-233911-4	05/25/23	06/19/23	613098	904.0	TRG	15262-20-1	0.648	U	pCi/L	EPA	Radium-228	0.648	1
MW-10	05/17/23	EUROFINS ST. LOUIS	WATER	500-233911-5	05/26/23	06/20/23	613360	904.0	TRG	15262-20-1	1.47		pCi/L	EPA	Radium-228	0.931	1
MW-01	05/17/23	EUROFINS ST. LOUIS	WATER	500-233911-6	05/26/23	06/20/23	613360	904.0	TRG	15262-20-1	0.357	U	pCi/L	EPA	Radium-228	0.357	1
Duplicate	05/17/23	EUROFINS ST. LOUIS	WATER	500-233911-7	05/26/23	06/20/23	613360	904.0	TRG	15262-20-1	0.900		pCi/L	EPA	Radium-228	0.605	1
MW-02	05/16/23	EUROFINS ST. LOUIS	WATER	500-233911-1	06/21/23	06/21/23	616966	Ra226 Ra228	TRG	STL02186	0.519	U	pCi/L	TAL-STL	Combined Radium 226 + 228	0.519	1
MW-03	05/16/23	EUROFINS ST. LOUIS	WATER	500-233911-2	06/21/23	06/21/23	616966	Ra226 Ra228	TRG	STL02186	0.993		pCi/L	TAL-STL	Combined Radium 226 + 228	0.713	1
MW-04	05/16/23	EUROFINS ST. LOUIS	WATER	500-233911-3	06/21/23	06/21/23	616996	Ra226 Ra228	TRG	STL02186	0.624	U	pCi/L	TAL-STL	Combined Radium 226 + 228	0.624	1
MW-05	05/16/23	EUROFINS ST. LOUIS	WATER	500-233911-4	06/21/23	06/21/23	616996	Ra226 Ra228	TRG	STL02186	0.648	U	pCi/L	TAL-STL	Combined Radium 226 + 228	0.648	1
MW-10	05/17/23	EUROFINS ST. LOUIS	WATER	500-233911-5	06/21/23	06/21/23	617159	Ra226 Ra228	TRG	STL02186	2.52		pCi/L	TAL-STL	Combined Radium 226 + 228	0.931	1
MW-01	05/17/23	EUROFINS ST. LOUIS	WATER	500-233911-6	06/21/23	06/21/23	617159	Ra226 Ra228	TRG	STL02186	0.357	U	pCi/L	TAL-STL	Combined Radium 226 + 228	0.357	1
Duplicate	05/17/23	EUROFINS ST. LOUIS	WATER	500-233911-7	06/21/23	06/21/23	617159	Ra226 Ra228	TRG	STL02186	1.91		pCi/L	TAL-STL	Combined Radium 226 + 228	0.605	1

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Client ID	Sample Collection Date	Laboratory Name	Sample Matrix	Job Number	Prep Date	Analysis Date	Batch Number	Method Number	Result Identifier	CAS Numbers	Result	Result Qualifier	Unit of Measure	Method Reference	Parameter Name	Detection Limit	Dilution Factor
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-234016-1	05/22/23	05/22/23	714421	SM 2540C	TRG	STL00242	2700		mg/L	SM	Total Dissolved Solids	10	1
MW-14	05/17/23	EUROFINS CHICAGO	WATER	500-234016-2	05/22/23	05/22/23	714421	SM 2540C	TRG	STL00242	2600		mg/L	SM	Total Dissolved Solids	10	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-234016-3	05/22/23	05/22/23	714421	SM 2540C	TRG	STL00242	1600		mg/L	SM	Total Dissolved Solids	10	1
MW-13	05/17/23	EUROFINS CHICAGO	WATER	500-234016-4	05/22/23	05/22/23	714421	SM 2540C	TRG	STL00242	1700		mg/L	SM	Total Dissolved Solids	10	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-234016-5	05/23/23	05/23/23	714883	SM 2540C	TRG	STL00242	1400		mg/L	SM	Total Dissolved Solids	10	1
MW-21	05/18/23	EUROFINS CHICAGO	WATER	500-234016-6	05/23/23	05/23/23	714883	SM 2540C	TRG	STL00242	630		mg/L	SM	Total Dissolved Solids	10	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-234016-1	05/31/23	05/31/23	716123	SM 4500 Cl- E	TRG	16887-00-6	330		mg/L	SM	Chloride	20	10
MW-14	05/17/23	EUROFINS CHICAGO	WATER	500-234016-2	05/31/23	05/31/23	716123	SM 4500 Cl- E	TRG	16887-00-6	100		mg/L	SM	Chloride	20	10
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-234016-3	05/31/23	05/31/23	716123	SM 4500 Cl- E	TRG	16887-00-6	130		mg/L	SM	Chloride	20	10
MW-13	05/17/23	EUROFINS CHICAGO	WATER	500-234016-4	05/31/23	05/31/23	716123	SM 4500 Cl- E	TRG	16887-00-6	130		mg/L	SM	Chloride	20	10
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-234016-5	05/31/23	05/31/23	716123	SM 4500 Cl- E	TRG	16887-00-6	200	F1	mg/L	SM	Chloride	20	10
MW-21	05/18/23	EUROFINS CHICAGO	WATER	500-234016-6	05/31/23	05/31/23	716123	SM 4500 Cl- E	TRG	16887-00-6	24		mg/L	SM	Chloride	2.0	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-234016-1	05/24/23	05/24/23	715052	SM 4500 F C	TRG	16984-48-8	0.42		mg/L	SM	Fluoride	0.10	1
MW-14	05/17/23	EUROFINS CHICAGO	WATER	500-234016-2	05/24/23	05/24/23	715052	SM 4500 F C	TRG	16984-48-8	1.0		mg/L	SM	Fluoride	0.10	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-234016-3	05/24/23	05/24/23	715052	SM 4500 F C	TRG	16984-48-8	0.40		mg/L	SM	Fluoride	0.10	1
MW-13	05/17/23	EUROFINS CHICAGO	WATER	500-234016-4	05/24/23	05/24/23	715052	SM 4500 F C	TRG	16984-48-8	0.41		mg/L	SM	Fluoride	0.10	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-234016-5	05/24/23	05/24/23	715052	SM 4500 F C	TRG	16984-48-8	0.64		mg/L	SM	Fluoride	0.10	1
MW-21	05/18/23	EUROFINS CHICAGO	WATER	500-234016-6	05/25/23	05/25/23	715327	SM 4500 F C	TRG	16984-48-8	0.15		mg/L	SM	Fluoride	0.10	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-234016-1	05/26/23	05/26/23	715553	SM 4500 SO4 E	TRG	14808-79-8	860		mg/L	SM	Sulfate	100	20
MW-14	05/17/23	EUROFINS CHICAGO	WATER	500-234016-2	05/26/23	05/26/23	715553	SM 4500 SO4 E	TRG	14808-79-8	1100		mg/L	SM	Sulfate	500	100
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-234016-3	05/26/23	05/26/23	715553	SM 4500 SO4 E	TRG	14808-79-8	590		mg/L	SM	Sulfate	250	50
MW-13	05/17/23	EUROFINS CHICAGO	WATER	500-234016-4	05/26/23	05/26/23	715553	SM 4500 SO4 E	TRG	14808-79-8	640		mg/L	SM	Sulfate	250	50
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-234016-5	05/26/23	05/26/23	715553	SM 4500 SO4 E	TRG	14808-79-8	470		mg/L	SM	Sulfate	250	50
MW-21	05/18/23	EUROFINS CHICAGO	WATER	500-234016-6	05/26/23	05/26/23	715553	SM 4500 SO4 E	TRG	14808-79-8	5.0	U	mg/L	SM	Sulfate	5.0	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-234016-1	05/24/23	05/25/23	714956	6020A	TRG	7440-36-0	0.0030	U	mg/L	SW846	Antimony	0.0030	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-234016-1	05/24/23	05/25/23	714956	6020A	TRG	7440-38-2	0.0032		mg/L	SW846	Arsenic	0.0010	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-234016-1	05/24/23	05/25/23	714956	6020A	TRG	7440-39-3	0.071		mg/L	SW846	Barium	0.0025	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-234016-1	05/24/23	05/25/23	714956	6020A	TRG	7440-43-9	0.00052		mg/L	SW846	Cadmium	0.00050	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-234016-1	05/24/23	05/25/23	714956	6020A	TRG	7440-47-3	0.0050	U	mg/L	SW846	Chromium	0.0050	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-234016-1	05/24/23	05/25/23	714956	6020A	TRG	7440-48-4	0.0015		mg/L	SW846	Cobalt	0.0010	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-234016-1	05/24/23	05/25/23	714956	6020A	TRG	7439-92-1	0.00050	U	mg/L	SW846	Lead	0.00050	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-234016-1	05/24/23	05/25/23	714956	6020A	TRG	7439-93-2	0.023		mg/L	SW846	Lithium	0.010	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-234016-1	05/24/23	05/25/23	714956	6020A	TRG	7439-98-7	0.045		mg/L	SW846	Molybdenum	0.0050	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-234016-1	05/24/23	05/25/23	714956	6020A	TRG	7782-49-2	0.17		mg/L	SW846	Selenium	0.0025	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-234016-1	05/24/23	05/25/23	714956	6020A	TRG	7440-28-0	0.0020	U	mg/L	SW846	Thallium	0.0020	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-234016-1	05/24/23	05/26/23	714956	6020A	TRG	7440-41-7	0.0010	U ^1+ ^+	mg/L	SW846	Beryllium	0.0010	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-234016-1	05/24/23	05/26/23	714956	6020A	TRG	7440-42-8	2.1		mg/L	SW846	Boron	0.25	5
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-234016-1	05/24/23	05/26/23	714956	6020A	TRG	7440-70-2	280		mg/L	SW846	Calcium	1.0	5
MW-14	05/17/23	EUROFINS CHICAGO	WATER	500-234016-2	05/24/23	05/25/23	714956	6020A	TRG	7440-36-0	0.0030	U	mg/L	SW846	Antimony	0.0030	1
MW-14	05/17/23	EUROFINS CHICAGO	WATER	500-234016-2	05/24/23	05/25/23	714956	6020A	TRG	7440-38-2	0.0016		mg/L	SW846	Arsenic	0.0010	1
MW-14	05/17/23	EUROFINS CHICAGO	WATER	500-234016-2	05/24/23	05/25/23	714956	6020A	TRG	7440-39-3	0.054		mg/L	SW846	Barium	0.0025	1
MW-14	05/17/23	EUROFINS CHICAGO	WATER	500-234016-2	05/24/23	05/25/23	714956	6020A	TRG	7440-43-9	0.00050	U	mg/L	SW846	Cadmium	0.00050	1
MW-14	05/17/23	EUROFINS CHICAGO	WATER	500-234016-2	05/24/23	05/25/23	714956	6020A	TRG	7440-47-3	0.0050	U	mg/L	SW846	Chromium	0.0050	1
MW-14	05/17/23	EUROFINS CHICAGO	WATER	500-234016-2	05/24/23	05/25/23	714956	6020A	TRG	7440-48-4	0.0010	U	mg/L	SW846	Cobalt	0.0010	1
MW-14	05/17/23	EUROFINS CHICAGO	WATER	500-234016-2	05/24/23	05/25/23	714956	6020A	TRG	7439-92-1	0.00050	U	mg/L	SW846	Lead	0.00050	1
MW-14	05/17/23	EUROFINS CHICAGO	WATER	500-234016-2	05/24/23	05/25/23	714956	6020A	TRG	7439-93-2	0.021		mg/L	SW846	Lithium	0.010	1
MW-14	05/17/23	EUROFINS CHICAGO	WATER	500-234016-2	05/24/23	05/25/23	714956	6020A	TRG	7439-98-7	0.044		mg/L	SW846	Molybdenum	0.0050	1
MW-14	05/17/23	EUROFINS CHICAGO	WATER	500-234016-2	05/24/23	05/25/23	714956	6020A	TRG	7782-49-2	0.090		mg/L	SW846	Selenium	0.0025	1
MW-14	05/17/23	EUROFINS CHICAGO	WATER	500-234016-2	05/24/23	05/25/23	714956	6020A	TRG	7440-28-0	0.0027		mg/L	SW846	Thallium	0.0020	1
MW-14	05/17/23	EUROFINS CHICAGO	WATER	500-234016-2	05/24/23	05/26/23	714956	6020A	TRG	7440-41-7	0.0010	U ^1+ ^+	mg/L	SW846	Beryllium	0.0010	1
MW-14	05/17/23	EUROFINS CHICAGO	WATER	500-234016-2	05/24/23	05/26/23	714956	6020A	TRG	7440-42-8	2.3		mg/L	SW846	Boron	0.25	5
MW-14	05/17/23	EUROFINS CHICAGO	WATER	500-234016-2	05/24/23	05/26/23	714956	6020A	TRG	7440-70-2	280		mg/L	SW846	Calcium	1.0	5
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-234016-3	05/24/23	05/25/23	714956	6020A	TRG	7440-36-0	0.0030	U	mg/L	SW846	Antimony	0.0030	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-234016-3	05/24/23	05/25/23	714956	6020A	TRG	7440-38-2	0.021		mg/L	SW846	Arsenic	0.0010	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-234016-3	05/24/23	05/25/23	714956	6020A	TRG	7440-39-3	0.12		mg/L	SW846	Barium	0.0025	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-234016-3	05/24/23	05/25/23	714956	6020A	TRG	7440-43-9	0.00050	U	mg/L	SW846	Cadmium	0.00050	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-234016-3	05/24/23	05/25/23	714956	6020A	TRG	7440-70-2	190		mg/L	SW846	Calcium	0.20	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-234016-3	05/24/23	05/25/23	714956	6020A	TRG	7440-47-3	0.0050	U	mg/L	SW846	Chromium	0.0050	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-234016-3	05/24/23	05/25/23	714956	6020A	TRG	7440-48-4	0.0010	U	mg/L	SW846	Cobalt	0.0010	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-234016-3	05/24/23	05/25/23	714956	6020A	TRG	7439-92-1	0.00050	U	mg/L	SW846	Lead	0.00050	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-234016-3	05/24/23	05/25/23	714956	6020A	TRG	7439-93-2	0.010	U	mg/L	SW846	Lithium	0.010	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-234016-3	05/24/23	05/25/23	714956	6020A	TRG	7439-98-7	0.018		mg/L	SW846	Molybdenum	0.0050	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-234016-3	05/24/23	05/25/23	714956	6020A	TRG	7782-49-2	0.0025	U	mg/L	SW846	Selenium	0.0025	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-234016-3	05/24/23	05/25/23	714956	6020A	TRG	7440-28-0	0.0020	U	mg/L	SW846	Thallium	0.0020	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-234016-3	05/24/23	05/26/23	714956	6020A	TRG	7440-41-7	0.0010	U ^1+ ^+	mg/L	SW846	Beryllium	0.0010	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-234016-3	05/24/23	05/26/23	714956	6020A	TRG	7440-42-8	2.8		mg/L	SW846	Boron	0.50	10
MW-13	05/17/23	EUROFINS CHICAGO	WATER	500-234016-4	05/24/23	05/25/23	714956	6020A	TRG	7440-36-0	0.0030	U	mg/L	SW846	Antimony	0.0030	1
MW-13	05/17/23	EUROFINS CHICAGO	WATER	500-234016-4	05/24/23	05/25/23	714956	6020A	TRG	7440-38-2	0.022		mg/L	SW846	Arsenic	0.0010	1
MW-13	05/17/23	EUROFINS CHICAGO	WATER	500-234016-4	05/24/23	05/25/23	714956	6020A	TRG	7440-39-3	0.13		mg/L	SW846	Barium	0.0025	1
MW-13	05/17/23	EUROFINS CHICAGO	WATER	500-234016-4	05/24/23	05/25/23	714956	6020A	TRG	7440-43-9	0.00050	U	mg/L	SW846	Cadmium	0.00050	1
MW-13	05/17/23	EUROFINS CHICAGO	WATER	500-234016-4	05/24/23	05/25/23	714956	6020A	TRG	7440-70-2	200		mg/L	SW846	Calcium	0.20	1
MW-13	05/17/23	EUROFINS CHICAGO	WATER	500-234016-4	05/24/23	05/25/23	714956	6020A	TRG	7440-47-3	0.0050	U	mg/L	SW846	Chromium	0.0050	1
MW-13	05/17/23	EUROFINS CHICAGO	WATER	500-234016-4	05/24/23	05/25/23	714956	6020A	TRG	7440-48-4	0.0010	U	mg/L	SW846	Cobalt	0.0010	1
MW-13	05/17/23	EUROFINS CHICAGO	WATER	500-234016-4	05/24/23	05/25/23	714956	6020A	TRG	7439-92-1	0.00050	U	mg/L	SW846	Lead	0.00050	1
MW-13	05/17/23	EUROFINS CHICAGO	WATER	500-234016-4	05/24/23	05/25/23	714956	6020A	TRG	7439-93-2	0.010	U	mg/L	SW846	Lithium	0.010	1
MW-13	05/17/23	EUROFINS CHICAGO	WATER	500-234016-4	05/24/23	05/25/23	714956	6020A	TRG	7439-98-7	0.017		mg/L	SW846	Molybdenum	0.0050	1
MW-13	05/17/23	EUROFINS CHICAGO	WATER	500-234016-4	05/24/23	05/25/23	714956	6020A	TRG	7782-49-2	0.0025	U	mg/L	SW846	Selenium	0.0025	1
MW-13	05/17/23	EUROFINS CHICAGO	WATER	500-234016-4	05/24/23	05/25/23	714956	6020A	TRG	7440-28-0	0.0020	U	mg/L	SW846	Thallium	0.0020	1
MW-13	05/17/23	EUROFINS CHICAGO	WATER	500-234016-4	05/24/23	05/26/23	714956	6020A	TRG	7440-41-7	0.0010	U ^1+ ^+	mg/L	SW846	Beryllium	0.0010	1

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MW-13	05/17/23	EUROFINS CHICAGO	WATER	500-234016-4	05/24/23	05/26/23	714956	6020A	TRG	7440-42-8	3.0		mg/L	SW846	Boron	0.50	10
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-234016-5	05/24/23	05/25/23	714956	6020A	TRG	7440-36-0	0.0030	U	mg/L	SW846	Antimony	0.0030	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-234016-5	05/24/23	05/25/23	714956	6020A	TRG	7440-38-2	0.0033		mg/L	SW846	Arsenic	0.0010	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-234016-5	05/24/23	05/25/23	714956	6020A	TRG	7440-39-3	0.022		mg/L	SW846	Barium	0.0025	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-234016-5	05/24/23	05/25/23	714956	6020A	TRG	7440-43-9	0.00050	U	mg/L	SW846	Cadmium	0.00050	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-234016-5	05/24/23	05/25/23	714956	6020A	TRG	7440-70-2	130		mg/L	SW846	Calcium	0.20	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-234016-5	05/24/23	05/25/23	714956	6020A	TRG	7440-47-3	0.0050	U	mg/L	SW846	Chromium	0.0050	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-234016-5	05/24/23	05/25/23	714956	6020A	TRG	7440-48-4	0.0010	U	mg/L	SW846	Cobalt	0.0010	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-234016-5	05/24/23	05/25/23	714956	6020A	TRG	7439-92-1	0.00050	U	mg/L	SW846	Lead	0.00050	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-234016-5	05/24/23	05/25/23	714956	6020A	TRG	7439-93-2	0.010		mg/L	SW846	Lithium	0.010	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-234016-5	05/24/23	05/25/23	714956	6020A	TRG	7439-98-7	0.055		mg/L	SW846	Molybdenum	0.0050	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-234016-5	05/24/23	05/25/23	714956	6020A	TRG	7782-49-2	0.0025	U	mg/L	SW846	Selenium	0.0025	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-234016-5	05/24/23	05/25/23	714956	6020A	TRG	7440-28-0	0.0020	U	mg/L	SW846	Thallium	0.0020	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-234016-5	05/24/23	05/26/23	714956	6020A	TRG	7440-41-7	0.0010	U ^1+ ^+	mg/L	SW846	Beryllium	0.0010	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-234016-5	05/24/23	05/26/23	714956	6020A	TRG	7440-42-8	1.3		mg/L	SW846	Boron	0.25	5
MW-21	05/18/23	EUROFINS CHICAGO	WATER	500-234016-6	05/24/23	05/25/23	714956	6020A	TRG	7440-36-0	0.0030	U	mg/L	SW846	Antimony	0.0030	1
MW-21	05/18/23	EUROFINS CHICAGO	WATER	500-234016-6	05/24/23	05/25/23	714956	6020A	TRG	7440-38-2	0.038		mg/L	SW846	Arsenic	0.0010	1
MW-21	05/18/23	EUROFINS CHICAGO	WATER	500-234016-6	05/24/23	05/25/23	714956	6020A	TRG	7440-39-3	0.39		mg/L	SW846	Barium	0.0025	1
MW-21	05/18/23	EUROFINS CHICAGO	WATER	500-234016-6	05/24/23	05/25/23	714956	6020A	TRG	7440-43-9	0.00050	U	mg/L	SW846	Cadmium	0.00050	1
MW-21	05/18/23	EUROFINS CHICAGO	WATER	500-234016-6	05/24/23	05/25/23	714956	6020A	TRG	7440-70-2	130		mg/L	SW846	Calcium	0.20	1
MW-21	05/18/23	EUROFINS CHICAGO	WATER	500-234016-6	05/24/23	05/25/23	714956	6020A	TRG	7440-47-3	0.0050	U	mg/L	SW846	Chromium	0.0050	1
MW-21	05/18/23	EUROFINS CHICAGO	WATER	500-234016-6	05/24/23	05/25/23	714956	6020A	TRG	7440-48-4	0.0023		mg/L	SW846	Cobalt	0.0010	1
MW-21	05/18/23	EUROFINS CHICAGO	WATER	500-234016-6	05/24/23	05/25/23	714956	6020A	TRG	7439-92-1	0.00050	U	mg/L	SW846	Lead	0.00050	1
MW-21	05/18/23	EUROFINS CHICAGO	WATER	500-234016-6	05/24/23	05/25/23	714956	6020A	TRG	7439-93-2	0.010	U	mg/L	SW846	Lithium	0.010	1
MW-21	05/18/23	EUROFINS CHICAGO	WATER	500-234016-6	05/24/23	05/25/23	714956	6020A	TRG	7439-98-7	0.0050	U	mg/L	SW846	Molybdenum	0.0050	1
MW-21	05/18/23	EUROFINS CHICAGO	WATER	500-234016-6	05/24/23	05/25/23	714956	6020A	TRG	7782-49-2	0.0025	U	mg/L	SW846	Selenium	0.0025	1
MW-21	05/18/23	EUROFINS CHICAGO	WATER	500-234016-6	05/24/23	05/25/23	714956	6020A	TRG	7440-28-0	0.0020	U	mg/L	SW846	Thallium	0.0020	1
MW-21	05/18/23	EUROFINS CHICAGO	WATER	500-234016-6	05/24/23	05/26/23	714956	6020A	TRG	7440-41-7	0.0010	U ^1+ ^+	mg/L	SW846	Beryllium	0.0010	1
MW-21	05/18/23	EUROFINS CHICAGO	WATER	500-234016-6	05/24/23	05/26/23	714956	6020A	TRG	7440-42-8	0.63		mg/L	SW846	Boron	0.050	1
MW-15	05/17/23	EUROFINS CHICAGO	WATER	500-234016-1	06/08/23	06/09/23	717594	7470A	TRG	7439-97-6	0.00020	U	mg/L	SW846	Mercury	0.00020	1
MW-14	05/17/23	EUROFINS CHICAGO	WATER	500-234016-2	06/08/23	06/09/23	717594	7470A	TRG	7439-97-6	0.00020	U	mg/L	SW846	Mercury	0.00020	1
Duplicate	05/17/23	EUROFINS CHICAGO	WATER	500-234016-3	06/08/23	06/09/23	717594	7470A	TRG	7439-97-6	0.00020	U	mg/L	SW846	Mercury	0.00020	1
MW-13	05/17/23	EUROFINS CHICAGO	WATER	500-234016-4	06/08/23	06/09/23	717594	7470A	TRG	7439-97-6	0.00020	U	mg/L	SW846	Mercury	0.00020	1
MW-17	05/18/23	EUROFINS CHICAGO	WATER	500-234016-5	06/08/23	06/09/23	717594	7470A	TRG	7439-97-6	0.00020	U	mg/L	SW846	Mercury	0.00020	1
MW-21	05/18/23	EUROFINS CHICAGO	WATER	500-234016-6	06/08/23	06/09/23	717594	7470A	TRG	7439-97-6	0.00020	U	mg/L	SW846	Mercury	0.00020	1

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Client ID	Sample Collection Date	Laboratory Name	Sample Matrix	Job Number	Prep Date	Analysis Date	Batch Number	Method Number	Result Identifier	CAS Numbers	Result	Result Qualifier	Unit of Measure	Method Reference	Parameter Name	Detection Limit	Dilution Factor
MW-15	05/17/23	EUROFINS ST. LOUIS	WATER	500-234016-1	05/26/23	06/20/23	613262	903.0	TRG	13982-63-3	0.245	U	pCi/L	EPA	Radium-226	0.245	1
MW-14	05/17/23	EUROFINS ST. LOUIS	WATER	500-234016-2	05/26/23	06/20/23	613262	903.0	TRG	13982-63-3	0.338		pCi/L	EPA	Radium-226	0.288	1
Duplicate	05/17/23	EUROFINS ST. LOUIS	WATER	500-234016-3	05/26/23	06/20/23	613262	903.0	TRG	13982-63-3	0.372		pCi/L	EPA	Radium-226	0.217	1
MW-13	05/17/23	EUROFINS ST. LOUIS	WATER	500-234016-4	05/26/23	06/20/23	613262	903.0	TRG	13982-63-3	0.205	U	pCi/L	EPA	Radium-226	0.205	1
MW-17	05/18/23	EUROFINS ST. LOUIS	WATER	500-234016-5	05/26/23	06/20/23	613262	903.0	TRG	13982-63-3	0.251	U	pCi/L	EPA	Radium-226	0.251	1
MW-21	05/18/23	EUROFINS ST. LOUIS	WATER	500-234016-6	05/26/23	06/20/23	613262	903.0	TRG	13982-63-3	0.571		pCi/L	EPA	Radium-226	0.397	1
MW-15	05/17/23	EUROFINS ST. LOUIS	WATER	500-234016-1	05/26/23	06/19/23	613362	904.0	TRG	15262-20-1	0.491	U	pCi/L	EPA	Radium-228	0.491	1
MW-14	05/17/23	EUROFINS ST. LOUIS	WATER	500-234016-2	05/26/23	06/19/23	613362	904.0	TRG	15262-20-1	0.712	U	pCi/L	EPA	Radium-228	0.712	1
Duplicate	05/17/23	EUROFINS ST. LOUIS	WATER	500-234016-3	05/26/23	06/19/23	613362	904.0	TRG	15262-20-1	0.539	U	pCi/L	EPA	Radium-228	0.539	1
MW-13	05/17/23	EUROFINS ST. LOUIS	WATER	500-234016-4	05/26/23	06/19/23	613362	904.0	TRG	15262-20-1	0.447	U	pCi/L	EPA	Radium-228	0.447	1
MW-17	05/18/23	EUROFINS ST. LOUIS	WATER	500-234016-5	05/26/23	06/19/23	613362	904.0	TRG	15262-20-1	0.488	U	pCi/L	EPA	Radium-228	0.488	1
MW-21	05/18/23	EUROFINS ST. LOUIS	WATER	500-234016-6	05/26/23	06/19/23	613362	904.0	TRG	15262-20-1	0.702	U	pCi/L	EPA	Radium-228	0.702	1
MW-15	05/17/23	EUROFINS ST. LOUIS	WATER	500-234016-1	06/21/23	06/21/23	616994	Ra226 Ra228	TRG	STL02186	0.547		pCi/L	TAL-STL	Combined Radium 226 + 228	0.491	1
MW-14	05/17/23	EUROFINS ST. LOUIS	WATER	500-234016-2	06/21/23	06/21/23	616994	Ra226 Ra228	TRG	STL02186	0.712	U	pCi/L	TAL-STL	Combined Radium 226 + 228	0.712	1
Duplicate	05/17/23	EUROFINS ST. LOUIS	WATER	500-234016-3	06/21/23	06/21/23	616994	Ra226 Ra228	TRG	STL02186	0.549		pCi/L	TAL-STL	Combined Radium 226 + 228	0.539	1
MW-13	05/17/23	EUROFINS ST. LOUIS	WATER	500-234016-4	06/21/23	06/21/23	616994	Ra226 Ra228	TRG	STL02186	0.447	U	pCi/L	TAL-STL	Combined Radium 226 + 228	0.447	1
MW-17	05/18/23	EUROFINS ST. LOUIS	WATER	500-234016-5	06/21/23	06/21/23	616994	Ra226 Ra228	TRG	STL02186	0.488	U	pCi/L	TAL-STL	Combined Radium 226 + 228	0.488	1
MW-21	05/18/23	EUROFINS ST. LOUIS	WATER	500-234016-6	06/21/23	06/21/23	616994	Ra226 Ra228	TRG	STL02186	0.761		pCi/L	TAL-STL	Combined Radium 226 + 228	0.702	1

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Client ID	Sample Collection Date	Laboratory Name	Sample Matrix	Job Number	Prep Date	Analysis Date	Batch Number	Method Number	Result Identifier	CAS Numbers	Result	Result Qualifier	Unit of Measure	Method Reference	Parameter Name	Detection Limit	Dilution Factor
MW-01	06/26/23	EUROFINS CHICAGO	WATER	500-235818-1	06/28/23	06/28/23	720896	SM 4500 Cl- E	TRG	16887-00-6	39		mg/L	SM	Chloride	4.0	2
MW-01	06/26/23	EUROFINS CHICAGO	WATER	500-235818-1	06/28/23	06/28/23	720973	SM 4500 F C	TRG	16984-48-8	0.10	U	mg/L	SM	Fluoride	0.10	1
MW-01	06/26/23	EUROFINS CHICAGO	WATER	500-235818-1	06/29/23	06/29/23	721056	SM 4500 SO4 E	TRG	14808-79-8	39		mg/L	SM	Sulfate	10	2

DATA SUMMARY POSTING

Station: Midwest Generation Powerton Generating Station

Regulated Unit(s): Ash By-pass Basin (IEPA ID No. W1798010008-04)
Ash Surge Basin (IEPA ID No. W1798010008-01)

In accordance with the new Ill. Adm. Code Title 35, Part 845: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments (State CCR Rule) groundwater monitoring was completed during the 2nd quarter 2023 which includes the entire list of parameters specified under Section 845.600(a)(1) and (b). Table 1 is a summary table of all available CCR monitoring data to date including any data generated previously as part of the Federal CCR Rule monitoring. In addition, Table 2 provides a summary of turbidity data which was collected as part of State CCR Rule requirements which is a data parameter that was not required under the Federal CCR Rule.

No background statistics or proposed Groundwater Protection Standards are included on these tables. The background statistics and Proposed Groundwater Protection Standards were submitted to Illinois Environmental Protection Agency (EPA) as part of the Application for Initial Operating Permit submitted October 31, 2021. Upon Illinois EPA approval of the Operating Permit and Proposed Groundwater Protection Standards, the approved comparison values will be included on the tables for subsequent data comparisons/evaluations.

Table 1. Groundwater Analytical Results - Midwest Generation, LLC, Powerton Station, Pekin, IL. Ash By-Pass Basin Ash Surge Basin.

Well	Date	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids	Antimony	Arsenic	Barium	Beryllium
MW-01 (S) up-gradient	11/16/2015	1.0	98	44	0.17	7.07	93	530	< 0.003	< 0.001	0.057	^< 0.001
	2/25/2016	0.2	110	42	0.16	7.23	54	460	< 0.003	0.0025	0.053	< 0.001
	5/20/2016	0.34	100	44	0.17	6.95	65	430	< 0.003	0.0081	0.062	< 0.001
	8/17/2016	0.27	78	39	0.25	7.16	50	530	< 0.003	0.0014	0.048	< 0.001
	11/16/2016	0.18	97	39	0.21	7.22	32	500	< 0.003	0.0051	0.056	< 0.001
	2/14/2017	0.18	120	55	0.17	7.30	60	550	< 0.003	0.0041	0.056	< 0.001
	5/3/2017	0.19	86	66	0.16	7.41	45	460	< 0.003	0.0015	0.045	< 0.001
	6/21/2017	0.18	85	58	0.18	7.60	47	540	< 0.003	< 0.001	0.04	< 0.001
	8/25/2017	0.56	86	41	0.18	7.41	63	490	< 0.003	< 0.001	0.049	< 0.001
	11/8/2017	0.57	130	38	0.12	6.69	61	640	< 0.003	< 0.001	0.083	< 0.001
	5/17/2018	0.15	88	50	0.12	6.7	48	540	< 0.003	< 0.001	0.045	< 0.001
	8/8/2018	0.14	86	48	0.13	6.8	43	430	< 0.003	< 0.001	0.051	<^ 0.001
	4/30/2019	0.07	78	54	0.17	7.2	27	450	< 0.003	0.0014	0.039	< 0.001
	11/13/2019	0.52	95	47	0.18	7.51	41	390	NA	0.029	0.091	NA
	12/26/2019	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/28/2020	0.33	110	46	0.19	7.17	41	470	NA	< 0.001	0.051	NA
	12/7/2020	0.6	100	54	0.25	7.22	55	490	NA	< 0.001	0.058	NA
	5/11/2021	0.23	84	53	0.2	7.52	38	450	< 0.003	< 0.001	0.043	< 0.001
	8/24/2021	0.26	98	40	0.18	7.19	56	450	< 0.003	< 0.001	0.06	< 0.001
	11/30/2021	0.33	97	42	0.2	7.14	^- 28	410	< 0.003	< 0.001	0.06	< 0.001
	2/9/2022	0.18	95	47	0.17	7.33	47	520	< 0.003	0.0013	0.051	< 0.001
	6/7/2022	0.23	82	51	0.15	7.62	27	440	< 0.003	< 0.001	0.041	< 0.001
	8/30/2022	0.59	100	44	0.13	7.1	66	700	< 0.003	< 0.001	0.076	< 0.001
	11/15/2022	0.71	110	45	0.1	7.15	44	520	< 0.003	< 0.001	0.088	< 0.001
	2/22/2023	0.47	110	53	< 0.10	7.51	47	550	< 0.0030	< 0.0010	0.083	< 0.0010
	5/17/2023	0.32	91	55	0.12	7.23	33	450	< 0.0030	< 0.0010	0.056	^+^1+< 0.0010
MW-09 (S) up-gradient	11/18/2015	2.0	63	H 31	H 0.19	7.15	H 110	H 440	< 0.003	< 0.001	0.027	^< 0.001
	2/25/2016	2.3	77	36	0.19	7.34	120	500	< 0.003	0.0042	0.036	< 0.001
	5/19/2016	2.0	73	38	0.17	7.30	100	520	< 0.003	< 0.001	0.029	< 0.001
	8/17/2016	2.7	74	39	0.15	7.32	120	750	< 0.003	< 0.001	0.031	< 0.001
	11/17/2016	4.5	85	38	0.13	7.37	110	630	< 0.003	0.0038	0.039	< 0.001
	2/15/2017	4.1	84	38	0.13	6.94	160	620	< 0.003	0.0032	0.043	< 0.001
	5/3/2017	3.5	85	38	0.17	7.48	170	680	< 0.003	0.0012	0.034	< 0.001
	6/21/2017	3.3	82	38	0.14	7.63	180	760	< 0.003	< 0.001	0.037	< 0.001
	8/25/2017	3.8	85	36	0.14	7.30	150	630	< 0.003	< 0.001	0.044	< 0.001
	11/8/2017	4	89	37	0.13	6.92	190	650	< 0.003	0.0012	0.048	< 0.001
	5/16/2018	4.1	89	36	0.15	7.83	180	550	< 0.003	< 0.001	0.038	< 0.001
	8/8/2018	4.3	86	39	0.14	7.31	180	690	< 0.003	< 0.001	0.037	<^ 0.001
	5/1/2019	4.6	79	37	0.17	7.11	170	640	< 0.003	< 0.001	0.038	< 0.001
	11/14/2019	2.5	85	36	0.18	7.49	82	500	NA	0.0056	0.057	NA
	4/29/2020	2	71	34	0.2	7.19	140	510	NA	0.0012	0.031	NA
	12/8/2020	2.6	65	34	0.22	7.29	63	400	NA	0.0013	0.042	NA
	5/13/2021	2	74	33	0.2	7.33	120	410	< 0.003	< 0.001	0.035	< 0.001
	8/25/2021	2.2	80	32	0.17	7.11	130	420	< 0.003	< 0.001	0.035	< 0.001
	12/1/2021	3.2	79	32	0.2	7.22	^- 100	570	< 0.003	< 0.001	0.036	< 0.001
	2/10/2022	3.5	79	33	0.23	7.12	120	510	< 0.003	0.0019	0.043	< 0.001
	6/8/2022	3.2	70	31	0.21	7.52	150	510	< 0.003	0.002	0.042	< 0.001
	8/31/2022	3.2	79	30	0.18	7.18	140	530	< 0.003	< 0.001	0.036	< 0.001
	11/15/2022	3.7	77	32	0.25	7.39	130	490	< 0.003	< 0.001	0.039	< 0.001
	2/23/2023	4.6	71	31	0.18	7.92	150	520	< 0.0030	< 0.0010	0.037	^1+^+< 0.0010
	5/16/2023	3.9	70	30	0.16	7.46	130	510	< 0.0030	< 0.0010	0.029	^+^1+< 0.0010
MW-19^ (S) up-gradient	11/18/2016	3.8	89	38	0.13	7.34	120	670	< 0.003	< 0.001	0.084	< 0.001
	2/15/2017	4.7	88	37	0.13	7.50	180	630	< 0.003	< 0.001	0.088	< 0.001
	5/5/2017	3.3	88	38	0.14	7.51	160	640	< 0.003	< 0.001	0.076	< 0.001
	6/21/2017	2.3	110	35	0.12	7.30	170	690	< 0.003	< 0.001	0.089	< 0.001
	8/28/2017	3.5	97	36	0.16	7.20	160	700	< 0.003	< 0.001	0.073	< 0.001
	11/6/2017	4.5	86	35	0.17	7.26	190	640	< 0.003	< 0.001	0.071	< 0.001
	5/14/2018	4.1	96	35	0.16	7.92	180	820	< 0.003	< 0.001	0.079	< 0.001
	8/6/2018	3.8	100	37	0.13	7.57	170	720	< 0.003	< 0.001	0.078	<^ 0.001
	5/2/2019	3.7	100	39	0.13	6.86	160	700	< 0.003	< 0.001	0.076	< 0.001
	11/13/2019	2.5	130	53	0.15	7.51	140	740	NA	0.0014	0.100	NA
	4/27/2020	2.3	100	43	0.17	6.87	110	570	NA	< 0.001	0.077	NA
	12/7/2020	3.3	74	34	0.19	7.30	F1 76	420	NA	< 0.001	0.062	NA
	5/10/2021	2.3	68	33	0.17	7.36	110	420	< 0.003	< 0.001	0.060	< 0.001
	8/26/2021	2.1	85	32	0.11	7.12	130	320	< 0.003	< 0.001	0.066	< 0.001
	12/1/2021	3.5	89	31	0.17	7.25	^- 120	620	< 0.003	< 0.001	0.07	< 0.001
	2/7/2022	3.9	77	34	0.17	7.18	140	600	< 0.003	< 0.001	0.074	< 0.001
	6/6/2022	2.7	92	33	0.12	7.08	130	560	< 0.003	< 0.001	0.082	< 0.001
	8/30/2022	0.7	140	200	0.32	7.29	45	1100	< 0.003	0.0027	0.15	< 0.001
	11/16/2022	4.3	80	34	0.22	7.27	160	580	< 0.003	< 0.001	0.064	< 0.001
	2/21/2023	3.9	70	33	0.14	7.79	170	680	< 0.0030	< 0.0010	0.063	< 0.0010
	5/18/2023	3.8	78	31	0.13	7.26	150	580	< 0.0030	< 0.0010	0.069	^+^1+< 0.0010
MW-08 (CL) down-gradient	11/18/2015	1.5	160	H 170	H 0.44	7.61	H 470	H 1300	< 0.003	0.0029	0.15	^ < 0.001
	2/25/2016	1.7	160	200	0.30	7.00	280	1100	< 0.003	0.0018	0.11	< 0.001
	5/18/2016	1.7	160	140	0.34	7.67	300	1200	< 0.003	0.0029	0.16	< 0.001
	8/17/2016	1.0	150	230	0.35	7.33	360	1400	< 0.003	0.0032	0.15	< 0.001
	11/15/2016	1.2	140	290	0.33	6.90	230	1300	< 0.003	0.0012	0.076	< 0.001
	2/16/2017	1.5	150	460	0.28	7.00	230	1500	< 0.003	0.003	0.086	< 0.001
	5/2/2017	0.55	140	300	0.33	7.30	320	1300	< 0.003	0.0029	0.13	< 0.001
	6/21/2017	1.2	160	490	0.30	7.27	350	1700	< 0.003	0.0045	0.14	< 0.001
	8/29/2017	1.2	150	360	0.47	7.29	300	1500	< 0.003	0.0011	0.062	< 0.001
	11/8/2017	0.68	130	260	0.45	7.27	270	1200	< 0.003	0.0027	0.10	< 0.001
	5/17/2018	1.2	130	200	0.37	6.79	170	1000	< 0.003	0.003	0.07	< 0.001
	8/8/2018	1.1	140	270	0.32	6.93	190	1200	< 0.003	0.0055	0.07	<^ 0.001
	5/1/2019	0.54	95	73	0.35	7.60	85	600	< 0.003	0.0018	0.07	< 0.001
	11/13/2019	0.98	110	92	0.33	7.66	110	640	NA	0.0025	0.087	NA
	4/28/2020	0.74	110	120	0.38	7.58	58	660	NA	0.0026	0.095	NA
	12/14/2020	0.73	120	150	0.38	7.40	92	530	NA	0.0024	0.110	NA
	5/11/2021	0.54	97	120	0.39	7.64	110	680	< 0.003	0.002	0.092	< 0.001
	8/25/2021	0.6	100	110	0.35	7.28	100	550	< 0.003	0.0015	0.059	< 0.001
	12/1/2021	0.64	110	97	0.36	7.50	^- 66	690	< 0.003	0.0025	0.11	< 0.001
	2/10/2022	0.81	110	130	0.37	7.54	55	670	< 0.003	0.0029	0.13	< 0.001
	6/8/2022	0.73	130	180	0.3	7.71	53	790	< 0.003	0.0024	0.14	< 0.001
	8/30/2022	0.7	140	210	0.32	7.37	50	1200	< 0.003	0.0027	0.15	< 0.001
	11/15/2022	0.68	130	200	0.45	7.67	41	780	< 0.003	0.003	0.13	< 0.001
	2/22/2023	0.66	130	140	0.32	8.11	61	800	< 0.0030	0.0029	0.13	< 0.0010
	5/17/2023	0.61	120	110	0.34	7.68	62	720	< 0.0030	0.0029	0.13	< ^+^1+ 0.0010

Well	Date	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Radium 226 + 228 Combined	Selenium	Thallium
MW-01 (S) up-gradient	11/16/2015	< 0.0005	< 0.005	< 0.001	* < 0.0005	< 0.01	< 0.0002	< 0.0050	0.744	< 0.0025	* < 0.002
	2/25/2016	< 0.0005	< 0.005	0.0014	0.0019	< 0.01	< 0.0002	< 0.005	< 0.722	0.0029	< 0.002
	5/20/2016	< 0.0005	0.007	0.0053	0.011	< 0.01	< 0.0002	< 0.005	< 0.953	< 0.0025	< 0.002
	8/17/2016	< 0.0005	< 0.005	< 0.001	0.0014	< 0.010	< 0.0002	0.0057	< 0.491	< 0.0025	< 0.002
	11/16/2016	< 0.0005	< 0.005	0.0044	0.0082	< 0.01	< 0.0002	0.0059	< 0.618	< 0.0025	< 0.002
	2/14/2017	< 0.0005	< 0.005	0.0045	0.0076	< 0.01	< 0.0002	0.0056	< 0.837	< 0.0025	< 0.002
	5/3/2017	< 0.0005	< 0.005	0.0033	0.0067	< 0.01	< 0.0002	< 0.005	0.574	< 0.0025	< 0.002
	6/21/2017	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0061	< 0.418	< 0.0025	< 0.002
	8/25/2017	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0059	0.775	< 0.0025	< 0.002
	11/8/2017	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.343	< 0.0025	< 0.002
	5/17/2018	< 0.0005	< 0.005	< 0.001	0.00068	< 0.01	< 0.0002	< 0.005	< 0.396	< 0.0025	< 0.002
	8/8/2018	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.579	< 0.0025	< 0.002
	4/30/2019	< 0.0005	< 0.005	< 0.001	0.0017	< 0.01	< 0.0002	< 0.005	< 0.656	< 0.0025	< 0.002
	11/13/2019	0.00085	NA	0.016	0.034	0.012	< 0.0002	0.0079	0.884	< 0.0025	< 0.002
	12/26/2019	NA	NA	0.0021	0.0041	NA	NA	NA	NA	NA	NA
	4/28/2020	< 0.0005	NA	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.628	< 0.0025	< 0.002
	12/7/2020	< 0.0005	NA	< 0.001	0.00055	<^ 0.01	< 0.0002	0.0051	0.724	< 0.0025	< 0.002
	5/11/2021	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.01	< 0.523	< 0.0025	< 0.002
	8/24/2021	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0069	1.08	< 0.0025	< 0.002
	11/30/2021	< 0.0005	< 0.005	< 0.001	< 0.0005	0.005	< 0.0002	0.0072	1.1	0.0026	< 0.002
	2/9/2022	< 0.0005	< 0.005	< 0.001	0.00089	0.0026	< 0.0002	0.0075	< 0.628	< 0.0025	< 0.002
	6/7/2022	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0057	0.386	< 0.0025	< 0.002
	8/30/2022	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.628	< 0.0025	< 0.002
	11/15/2022	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.446	< 0.0025	< 0.002
	2/22/2023	< 0.00050	< 0.0050	< 0.0010	< 0.00050	< 0.010	< 0.00020	< 0.0050	< 0.523	0.003	< 0.0020
	5/17/2023	< 0.00050	< 0.0050	< 0.0010	< 0.00050	< 0.010	< 0.00020	< 0.0050	< 0.493	< 0.0025	< 0.0020
MW-09 (S) up-gradient	11/18/2015	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	H < 0.0002	0.043	< 0.655	< 0.0025	< 0.002
	2/25/2016	< 0.0005	< 0.005	0.0011	< 0.0005	< 0.01	< 0.0002	0.053	< 0.361	< 0.0025	< 0.002
	5/19/2016	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.042	< 0.394	0.0032	< 0.002
	8/17/2016	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.036	< 0.498	< 0.0025	< 0.002
	11/17/2016	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.036	0.646	0.0025	< 0.002
	2/15/2017	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.035	< 0.377	0.0062	< 0.002
	5/3/2017	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.034	< 0.445	0.011	< 0.002
	6/21/2017	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.033	< 0.380	0.0072	< 0.002
	8/25/2017	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.028	< 0.160	0.0043	< 0.002
	11/8/2017	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.026	0.344	< 0.0025	< 0.002
	5/16/2018	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	0.00029	0.031	< 0.424	0.006	< 0.002
	8/8/2018	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.032	0.44	0.0078	< 0.002
	5/1/2019	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.031	< 0.66	0.0036	< 0.002
	11/14/2019	< 0.0005	NA	0.0032	0.00076	< 0.010	< 0.0002	0.026	< 0.457	< 0.0025	< 0.002
	4/29/2020	< 0.0005	NA	< 0.001	< 0.0005	< 0.010	< 0.0002	0.028	0.698	< 0.0025	< 0.002
	12/8/2020	< 0.0005	NA	< 0.001	< 0.0005	< 0.010	< 0.0002	0.025	< 0.479	< 0.0025	< 0.002
	5/13/2021	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.025	< 0.612	< 0.0025	< 0.002
	8/25/2021	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.022	< 0.579	< 0.0025	< 0.002
	12/1/2021	< 0.0005	< 0.005	< 0.001	< 0.0005	0.002	< 0.0002	0.028	< 0.365	< 0.0025	< 0.002
	2/10/2022	< 0.0005	< 0.005	< 0.001	< 0.0005	0.003	< 0.0002	0.03	< 0.393	< 0.0025	< 0.002
	6/8/2022	< 0.0005	< 0.005	0.0011	< 0.0005	< 0.010	< 0.0002	0.028	< 0.548	< 0.0025	< 0.002
	8/31/2022	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.024	< 0.458	< 0.0025	< 0.002
	11/15/2022	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.010	< 0.0002	0.031	< 0.448	< 0.0025	< 0.002
	2/23/2023	< 0.00050	< 0.0050	< 0.0010	< 0.00050	< 0.010	< 0.00020	0.034	0.676	< 0.0025	< 0.0020
	5/16/2023	< 0.00050	< 0.0050	< 0.0010	< 0.00050	< 0.010	< 0.00020	0.032	< 0.534	< 0.0025	< 0.0020
MW-19^ (S) up-gradient	11/18/2016	< 0.0005	< 0.005	0.001	0.00068	< 0.01	< 0.0002	0.035	< 0.476	0.0043	< 0.002
	2/15/2017	< 0.0005	< 0.005	< 0.001	0.00061	< 0.01	< 0.0002	0.046	< 0.482	0.0063	< 0.002
	5/5/2017	< 0.0005	< 0.005	0.0013	0.0012	< 0.01	< 0.0002	0.035	0.923	0.0068	< 0.002
	6/21/2017	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.024	< 0.334	0.0028	< 0.002
	8/28/2017	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.041	0.370	0.0035	< 0.002
	11/6/2017	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.042	0.360	< 0.0025	< 0.002
	5/14/2018	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.043	0.562	0.0044	< 0.002
	8/6/2018	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.032	0.835	0.0052	< 0.002
	5/2/2019	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.03	< 0.431	0.0035	< 0.002
	11/13/2019	< 0.0005	NA	< 0.001	0.00056	< 0.01	< 0.0002	0.04	< 0.447	< 0.0025	< 0.002
	4/27/2020	< 0.0005	NA	< 0.001	< 0.0005	< 0.01	< 0.0002	0.04	0.630	< 0.0025	< 0.002
	12/7/2020	< 0.0005	NA	< 0.001	< 0.0005	<^ 0.01	< 0.0002	0.05	< 0.509	< 0.0025	< 0.002
	5/10/2021	< 0.0005	< 0.0005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.05	< 0.524	< 0.0025	< 0.002
	8/26/2021	< 0.0005	< 0.0005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.028	< 0.543	< 0.0025	< 0.002
	12/1/2021	< 0.0005	< 0.005	< 0.001	< 0.0005	0.0038	< 0.0002	0.05	1.18	< 0.0025	< 0.002
	2/7/2022	< 0.0005	< 0.005	< 0.001	< 0.0005	0.003	< 0.0002	0.043	0.881	< 0.0025	< 0.002
	6/6/2022	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.03	< 0.419	< 0.0025	< 0.002
	8/30/2022	< 0.0005	< 0.005	< 0.001	< 0.0005	0.023	< 0.0002	0.0082	0.44	< 0.0025	< 0.002
	11/16/2022	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.041	0.746	0.0029	< 0.002
	2/21/2023	< 0.00050	< 0.0050	< 0.0010	< 0.00050	< 0.010	< 0.00020	0.032	< 0.528	0.003	< 0.0020
	5/18/2023	< 0.00050	< 0.0050	< 0.0010	< 0.00050	0.010	< 0.00020	0.030	0.604	0.0035	< 0.0020
MW-08 (CL) down-gradient	11/18/2015	< 0.0005	< 0.005	< 0.001	< 0.0005	0.028	H < 0.0002	0.01	< 0.559	< 0.0025	< 0.002
	2/25/2016	0.00052	< 0.005	< 0.001	0.00072	0.015	< 0.0002	0.02	0.535	< 0.0025	< 0.002
	5/18/2016	< 0.0005	< 0.005	< 0.001	< 0.0005	0.036	< 0.0002	0.0069	0.417	< 0.0025	< 0.002
	8/17/2016	< 0.0005	< 0.005	< 0.001	< 0.0005	0.023	< 0.0002	0.013	< 0.519	< 0.0025	< 0.002
	11/15/2016	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.016	0.583	< 0.0025	< 0.002
	2/16/2017	< 0.0005	< 0.005	< 0.001	0.00087	< 0.01	< 0.0002	0.026	< 0.375	< 0.0025	< 0.002
	5/2/2017	< 0.0005	< 0.005	< 0.001	< 0.0005	0.022	< 0.0002	0.0083	< 0.480	< 0.0025	< 0.002
	6/21/2017	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.031	< 0.439	< 0.0025	< 0.002
	8/29/2017	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.034	0.699	< 0.0025	< 0.002
	11/8/2017	< 0.0005	< 0.005	< 0.001	< 0.0005	0.019	< 0.0002	0.014	0.806	< 0.0025	< 0.002
	5/17/2018	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.024	0.655	< 0.0025	< 0.002
	8/8/2018	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.019	< 0.410	< 0.0025	< 0.002
	5/1/2019	< 0.0005	< 0.005	< 0.001	< 0.0005	0.021	< 0.0002	0.0069	0.892	< 0.0025	< 0.002
	11/13/2019	< 0.0005	NA	< 0.001	0.00094	0.022	< 0.0002	0.013	< 0.498	< 0.0025	< 0.002
	4/28/2020	< 0.0005	NA	< 0.001	< 0.0005	0.026	< 0.0002	0.011	< 0.450	< 0.0025	< 0.002
	12/14/2020	< 0.0005	NA	< 0.001	0.00093	0.03	< 0.0002	0.012	1.310	< 0.0025	< 0.002
	5/11/2021	< 0.0005	< 0.005	< 0.001	< 0.0005	0.021	< 0.0002	0.011	< 0.695	< 0.0025	< 0.002
	8/25/2021	< 0.0005	< 0.005	< 0.001	< 0.0005	0.018	< 0.0002	0.011	< 0.494	< 0.0025	< 0.002
	12/1/2021	< 0.0005	< 0.005	< 0.001	< 0.0005	0.023	< 0.0002	0.011	1.02	< 0.0025	< 0.002
	2/10/2022	< 0.0005	< 0.005	< 0.001	< 0.0005	0.023	< 0.0002	0.0092	0.935	< 0.0025	< 0.002
	6/8/2022	< 0.0005	< 0.005	< 0.001	< 0.0005	0.022	< 0.0002	0.0086	< 0.52	< 0.0025	< 0.002
	8/30/2022	< 0.0005	< 0.005	< 0.001	< 0.0005	0.023	< 0.0002	0.0083	0.859	< 0.0025	< 0.002
	11/15/2022	< 0.0005	< 0.005	< 0.001	< 0.0005	0.023	< 0.0002	0.0083	0.451	< 0.0025	< 0.002
	2/22/2023	< 0.00050	< 0.0050	< 0.0010	< 0.00050	0.022	< 0.00020	0.0070	0.676	< 0.003	< 0.0020
	5/17/2023	< 0.00050	< 0.0050	< 0.0010	< 0.00050	0.023	< 0.00020	0.0077	0.714	< 0.0025	< 0.0020

Notes: All units are in mg/l except pH is in standard units.
F1 - MS and/or MSD Recovery outside of limits.
H - Sample was prepped or analyzed beyond the specified holding time.
V- Serial dilution exceeds control limits.
* - LCS or LCSD is outside acceptance limits.
^ - Denotes instrument related QC exceeds the control limits
(R) - Resample Event
NA - Not Analyzed

R000751

Table 1. Groundwater Analytical Results - Midwest Generation, LLC, Powerton Station, Pekin, IL. Ash Bypass Basin Ash Surge Basin.

Well	Date	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Radium 226 + 228 Combined	Selenium	Thallium
MW-11 (S) down-gradient	11/18/2015	1.7	1.10	H 5.4	H 0.55	7.06	H 160	H 670	< 0.003	0.017	0.18	^< 0.001	< 0.0005	< 0.005	0.012	< 0.0005	< 0.01	H= 0.0002	0.0120	0.788	< 0.0025	< 0.002
	2/26/2016	1.5	1.40	120	0.55	7.25	220	8.50	< 0.003	0.023	0.23	< 0.001	< 0.0005	< 0.005	0.0023	< 0.0005	< 0.01	< 0.0002	0.013	0.562	< 0.0025	< 0.002
	5/20/2016	1.6	1.40	120	0.56	7.10	210	920	< 0.003	0.027	0.26	< 0.001	< 0.0005	< 0.005	0.0024	< 0.0076	< 0.01	< 0.0002	0.014	0.524	< 0.0025	< 0.002
	8/17/2016	1.0	130	93	0.67	7.08	180	910	< 0.003	F1 0.29	1.4	< 0.001	< 0.0005	< 0.005	0.0034	0.001	< 0.010	< 0.0002	0.011	1.130	< 0.0025	< 0.002
	11/17/2016	1.2	1.40	130	0.48	7.21	200	1.100	< 0.003	0.071	0.44	< 0.001	< 0.0005	< 0.005	0.0037	0.0013	< 0.01	< 0.0002	0.0088	0.734	< 0.0025	< 0.002
	2/16/2017	1.6	1.40	1.10	0.40	6.62	260	910	< 0.003	0.04	0.3	< 0.001	< 0.0005	< 0.005	0.003	0.00094	< 0.01	< 0.0002	0.015	0.341	< 0.0025	< 0.002
	5/3/2017	1.3	1.60	160	0.42	7.36	440	1.300	< 0.003	0.039	0.26	< 0.001	< 0.0005	< 0.005	0.0035	0.00093	< 0.01	< 0.0002	0.015	0.662	< 0.0025	< 0.002
	6/22/2017	1.3	1.40	120	0.60	7.21	260	1.000	< 0.003	0.07	0.36	< 0.001	< 0.0005	< 0.005	0.0025	< 0.0005	< 0.01	< 0.0002	0.014	< 0.418	< 0.0025	< 0.002
	8/29/2017	2.2	130	83	0.52	7.23	310	1.100	< 0.003	0.017	0.21	< 0.001	< 0.0005	< 0.005	0.0026	< 0.0005	< 0.01	< 0.0002	0.016	< 0.313	< 0.0025	< 0.002
	11/8/2017	1.5	1.40	1.90	0.59	6.96	230	970	< 0.003	0.092	0.54	< 0.001	< 0.0005	< 0.005	0.0034	< 0.0005	< 0.01	< 0.0002	0.014	1.24	< 0.0025	< 0.002
	5/16/2018	2.0	1.40	88	0.61	7.89	220	1.000	< 0.003	0.089	0.47	< 0.001	< 0.0005	< 0.005	0.0041	< 0.0005	< 0.01	< 0.0002	0.014	1.12	< 0.0025	< 0.002
	8/9/2018	1.4	1.60	120	0.65	7.24	220	1.000	< 0.003	0.68	3.0	<= 0.0010	0.0008	< 0.005	0.0053	0.0012	< 0.01	< 0.0002	0.013	1.48	< 0.0025	< 0.002
	5/1/2019	2.3	1.10	60	0.62	7.08	200	730	< 0.003	0.11	0.6	< 0.001	< 0.0005	< 0.005	0.0020	< 0.001	< 0.01	< 0.0002	0.014	1.59	< 0.0025	< 0.002
	11/14/2019	1.8	120	83	0.53	7.43	150	860	NA	0.14	0.72	NA	< 0.0005	NA	0.0041	0.0021	< 0.01	< 0.0002	0.02	2.64	< 0.0025	< 0.002
	4/29/2020	1.2	1.00	110	0.62	7.08	320	9.50	NA	0.019	0.21	NA	< 0.0005	NA	0.0019	< 0.0005	< 0.01	< 0.0002	0.024	0.47	< 0.0025	< 0.002
	12/8/2020	0.7	86	94	0.67	7.26	200	6.90	NA	0.027	0.26	NA	< 0.0005	NA	0.0021	< 0.0005	< 0.01	< 0.0002	0.03	< 0.523	< 0.0025	< 0.002
	5/11/2021	1.0	9.9	130	0.72	7.26	230	8.20	< 0.003	0.024	0.25	< 0.001	< 0.0005	< 0.005	0.0019	< 0.0005	0.012	< 0.0002	0.032	1.59	< 0.0025	< 0.002
	8/25/2021	0.9	1.00	100	0.65	7.03	210	8.00	< 0.003	0.015	0.16	< 0.001	< 0.0005	< 0.005	0.0016	< 0.0005	< 0.01	< 0.0002	0.03	< 0.472	< 0.0025	< 0.002
	12/1/2021	1.2	1.00	85	0.67	7.17	^< 160	850	< 0.003	0.0093	0.17	< 0.001	< 0.0005	< 0.005	0.0019	< 0.0005	0.0067	< 0.0002	0.032	1.3	< 0.0025	< 0.002
	2/10/2022	0.9	1.10	110	0.68	7.11	220	920	< 0.003	0.015	0.2	< 0.001	< 0.0005	< 0.005	0.0024	0.00099	0.007	< 0.0002	0.027	0.839	< 0.0025	< 0.002
	6/8/2022	1.7	1.10	7.5	0.64	7.35	150	710	< 0.003	0.028	0.2	< 0.001	0.00058	< 0.005	0.0018	< 0.0005	< 0.01	< 0.0002	0.021	0.786	< 0.0025	< 0.002
	8/31/2022	1.2	1.20	100	0.61	6.97	190	8.30	< 0.003	0.016	0.2	< 0.001	< 0.0005	< 0.005	0.0017	< 0.0005	< 0.01	< 0.0002	0.02	1.04	< 0.0025	< 0.002
	11/15/2022	2.2	1.10	61	0.84	7.21	110	690	< 0.003	0.015	0.16	< 0.001	< 0.0005	< 0.005	0.0017	< 0.0005	< 0.01	< 0.0002	0.016	0.785	< 0.0025	< 0.002
	2/23/2023	3.1	1.10	63	0.58	7.70	120	660	< 0.0030	0.012	0.17	^1+^1= 0.0010	< 0.00050	< 0.0050	0.002	< 0.0050	0.010	< 0.00020	0.016	0.934	< 0.005	< 0.0020
	5/16/2023	2.5	120	6.5	0.52	7.19	120	660	< 0.0030	0.011	0.18	^6^7= 0.0010	< 0.00050	< 0.0050	0.0018	< 0.0050	< 0.010	< 0.00020	0.016	< 0.625	< 0.0025	< 0.0020
MW-12 (CL) down-gradient	11/19/2015	0.94	1.60	H 220	H 0.57	7.12	H 650	H 1400	< 0.003	0.10	0.180	^< 0.001	0.00068	< 0.005	< 0.001	0.00083	0.023	H= 0.0002	0.0280	< 0.685	< 0.0025	< 0.002
	2/26/2016	0.42	1.30	200	0.60	7.96	530	1.200	< 0.003	0.077	0.130	< 0.001	0.0016	< 0.005	< 0.001	0.0014	0.014	< 0.0002	0.0130	1.11	< 0.0025	< 0.002
	5/20/2016	0.65	1.50	200	0.49	7.28	550	1.400	< 0.003	0.065	0.16	F1< 0.001	0.00077	< 0.005	< 0.001	0.0016	0.013	< 0.0002	0.028	0.576	< 0.0025	< 0.002
	8/18/2016	0.69	1.70	220	0.49	7.06	620	1.600	< 0.003	0.33	0.88	0.0013	0.007	< 0.005	0.001	0.0011	0.015	< 0.0002	0.011	3.68	< 0.0025	< 0.002
	11/18/2016	0.83	1.40	180	0.66	7.54	340	1.500	< 0.003	0.23	0.67	< 0.001	0.0028	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	< 0.01	1.86	< 0.0025	< 0.002
	2/16/2017	0.48	1.40	1.90	0.37	7.54	630	1.300	< 0.003	0.29	0.26	< 0.001	0.0057	< 0.005	0.0013	0.0042	0.010	< 0.0002	0.015	1.15	< 0.0025	< 0.002
	5/3/2017	0.49	1.20	1.90	0.37	7.47	500	1.200	< 0.003	0.10	0.17	< 0.001	0.0022	< 0.005	< 0.001	0.0038	0.011	< 0.0002	0.017	0.518	< 0.0025	< 0.002
	6/22/2017	0.50	1.30	1.90	0.48	7.16	580	1.400	< 0.003	0.025	0.11	< 0.001	< 0.0005	< 0.005	< 0.001	0.00096	< 0.010	< 0.0002	0.028	0.376	< 0.0025	< 0.002
	8/29/2017	0.78	1.40	1.90	0.52	7.34	520	1.400	< 0.003	0.02	0.095	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.014	< 0.0002	0.024	0.529	< 0.0025	< 0.002
	11/10/2017	0.94	1.30	1.60	0.48	7.38	370	1.200	< 0.003	0.50	0.45	< 0.001	< 0.0005	< 0.005	< 0.001	0.0097	0.018	< 0.0002	0.023	1.67	< 0.0025	< 0.002
	5/16/2018	0.46	1.00	1.80	0.47	8.12	720	1.500	< 0.003	0.09	0.1	< 0.001	0.00052	< 0.005	< 0.001	0.00167	0.012	< 0.0002	0.021	0.741	< 0.0025	< 0.002
	8/9/2018	0.61	1.20	1.90	0.44	7.42	480	1.100	< 0.003	0.12	0.15	<= 0.001	0.00084	< 0.005	< 0.001	0.00072	0.010	< 0.0002	0.026	0.755	< 0.0025	< 0.002
	5/1/2019	0.4	1.00	170	0.38	7.68	330	1000	< 0.003	0.04	0.13	< 0.001	0.00054	< 0.005	< 0.001	0.0012	0.014	< 0.0002	0.011	0.666	< 0.0025	< 0.002
	11/14/2019	0.74	120	1.60	0.45	7.61	260	1100	NA	0.026	0.072	NA	< 0.0005	NA	< 0.001	< 0.0005	0.014	< 0.0002	0.027	0.568	< 0.0025	< 0.002
	4/29/2020	0.34	71	1.50	0.34	7.96	360	960	NA	0.003	0.014	NA	< 0.0005	NA	< 0.001	< 0.0005	0.012	< 0.0002	0.015	0.578	< 0.0025	< 0.002
	12/8/2020	0.01	92	1.60	0.56	7.16	320	990	NA	0.025	0.069	NA	< 0.0005	NA	< 0.001	< 0.0005	0.012	< 0.0002	0.027	< 0.476	< 0.0025	< 0.002
	5/13/2021	0.4	9.9	1.40	0.23	7.39	350	990	< 0.003	0.003	0.058	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.030	0.963	< 0.0025	< 0.002
	8/25/2021	0.5	8.2	1.30	0.46	7.43	220	760	< 0.003	0.0093	0.04	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.019	< 0.502	< 0.0025	< 0.002
	12/1/2021	0.33	7.2	1.30	0.52	7.38	^< 130	710	< 0.003	0.018	0.045	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.009	< 0.0002	0.017	0.623	< 0.0025	< 0.002
	2/10/2022	0.35	9.6	1.40	0.27	7.28	320	980	< 0.003	0.0072	0.059	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.012	< 0.0002	0.017	0.902	< 0.0025	< 0.002
	6/8/2022	0.49	9.8	1.40	0.41	7.65	320	950	< 0.003	0.0079	0.064	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.012	< 0.0002	0.02	0.495	< 0.0025	< 0.002
	8/31/2022	0.62	1.00	1.50	0.5	7.33	260	870	< 0.003	0.039	0.11	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.014	< 0.0002	0.021	0.618	< 0.0025	< 0.002
	11/15/2022	0.58	9.0	1.60	0.74	7.66	220	810	< 0.003	0.032	0.072	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.014	< 0.0002	0.02	< 0.622	< 0.0025	< 0.002
	2/23/2023	0.28	1.00	1.60	0.38	8.18	340	970	< 0.0030	0.032	0.068	^1+^1= 0.0010	< 0.00050	< 0.0050	< 0.0010	< 0.0050	< 0.010	< 0.00020	0.013	< 0.874	< 0.005	< 0.0020
	5/16/2023	0.33	89	1.90	0.38	7.96	200	840	< 0.0030	0.0025	0.043	^6^7= 0.0010	< 0.00050	< 0.0050	< 0.0010	< 0.0050	< 0.010	< 0.00020	0.013	< 0.589	< 0.0025	< 0.0020
MW-13 (CL) down-gradient	11/18/2015	1.5	270	H 2.10	H 0.53	6.55	H 1400	H 2.400	< 0.003	0.03	0.090	^< 0.001	< 0.0006	< 0.005	< 0.001	< 0.0005	0.042	H= 0.0002	0.025	< 0.599	0.0065	< 0.002
	2/25/2016	2.0	2.40	110	0.61	6.84	640	1.700	< 0.003	0.025	0.083	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.041	< 0.0002	0.035	0.830	0.045	< 0.002
	5/19/2016	2.7	3.20	240	0.53	6.83	1.200	2.800	< 0.003	0.014	0.097	< 0.001	0.00098	< 0.005	< 0.001	< 0.0005	0.044	< 0.0002	0.041	< 0.420	0.0067	< 0.002
	8/18/2016	1.5	2.00	F1 1.70	0.54	6.96	660	1.900	< 0.003	0.13	0.11	< 0.001	0.0041	< 0.005	< 0.001	< 0.0005	0.028	< 0.0002	0.027	< 0.672	0.0061	< 0.002
	11/17/2016	1.3	1.20	1.80	0.47	6.91	560	1.900	< 0.003	0.0033	0.071	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.016	< 0.0002	0.018	< 0.570	0.0078	< 0.002
	2/17/2017	1.9	2.00	1.90	0.43	7.24	670	1.700	< 0.003	0.023	0.056	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.025	< 0.0002	0.027	< 0.592	0.0052	< 0.002
	5/4/2017	1.5	1.80	1.90	0.57	7.35	670	1.700	< 0.003	0.011	0.049	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.023	< 0.0002	0.023	< 0.456	0.0054	< 0.002
	6/21/2017	1.6	2.00	1.90	0.56	7.30	550	1.600	< 0.003	0.0093	0.054	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.027	< 0.0002	0.03	< 0.347	0.0119	< 0.002
	8/29/2017	2.2	1.90	2.00	0.53	6.87	540	1.800	< 0.003	0.0018	0.048	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.023	< 0.0002	0.032	0.377	0.0092	< 0.002
	11/10/2017	1.6	1.70	1.80	0.63	7.09	530	1.500	< 0.003	0.0063	0.046	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.025	< 0.0002	0.02	< 0.313	0.016	< 0.002
	5/17/2018	2.3	2.00	1.60	0.5	6.75	680	1.800	< 0.003	0.0081	0.05	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.029	< 0.0002	0.03	0.397	0.017	< 0.002
	8/9/2018	2.3	2.00	2.00	0.48	7.06	520	1.700	< 0.003	0.0083	0.048	<= 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.026	< 0.0002	0.033	0.566	0.06	< 0.002
	5/2/2019	1.5	1.80	2.00	0.52	6.89	420	1.900	< 0.003	0.0045	0.052	< 0.001	< 0.0005	< 0.005	< 0.0010	< 0.0005	0.027	< 0.0002	0.023	< 0.424	< 0.0025	< 0.002
	11/14/2019	1.8	1.70	1.70	0.53	7.24	260	1.300	NA	0.0048	0.053	NA	< 0.0005	NA	< 0.0010	< 0.0005	0.029	< 0.0002	0.025	< 0.475	< 0.0025	< 0.002
	4/29/2020	1.2	1.60	2.00	0.58	6.90	370	1.300	NA	0.0036	0.06	NA	< 0.0005	NA	< 0.0010	< 0.0005	0.027	< 0.0002	0.023	0.578	< 0.0025	< 0.002
	12/8/2020	1.3	1.70	2.00	0.55	7.04	540	1.400	NA	0.02	0.1	NA	< 0.00059	NA	< 0.0010	< 0.0005	0.035	< 0.0002	0.02	< 0.626	0.0012	< 0.002
	5/12/2021	1.3	1.80	1.80	0.54	6.97	520	1.500	< 0.003	0.0048	0.065	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.026	< 0.0002	0.014	< 0.648	0.0071	< 0.002
	8/23/2021	1.5	2.00	1.80	0.52	6.76	470	1.500	< 0.003	0.0019	0.055	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.025	< 0.0002	0.024	0.465	0.015	< 0.002
	11/29/2021	1.9	2.20	2.50	0.48	6.71	480	1.700	< 0.003	0.0022	0.075	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.024	< 0.0002	0.016	0.649	0.039	< 0.002
	2/9/2022	0.93	1.40	1.60	0.59	6.91	320	1.200	< 0.003	0.018	0.055	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.024	< 0.0002	0.014	< 0.424	0.0054	< 0.002
	6/8/2022	2	3.30	2.40	0.43	6.87	980	2.700	< 0.003	0.0032	0.088	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.027	< 0.0002	0.019	0.485	0.1	< 0.002
	8/31/2022	1.5	2.10	2.70	0.68	6.80	530	1.800	< 0.003	0.0049	0.057	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.032	< 0.0002	0.021	0.55	0.0078	< 0.002
	11/16/2022	1.3	1.90	2.30	0.71	7.26	490	1.500	< 0.003	0.0071	0.06	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.025	< 0.0002	0.035	0.49	< 0.0025	< 0.002
	2/23/2023	1.2	2.00	2.10	0.38	7.52	390	1.500	< 0.0030	0.0049	0.056	^1+^1= 0.0010	< 0.00050	< 0.0050	0.0089	< 0.0050	0.025	< 0.00020	0.035	0.657	0.029	0.0029
	5/17/2023	1.3	1.400	3.10	0.42	6.84	850	2.500	< 0.0030	0.0027	0.075	^6^7= 0.0010	< 0.00050	< 0.0050	0.0012	< 0.0050	0.024	< 0.00020	0.039	< 0.538	0.18	< 0.0020
MW-17 (CL) down-gradient	11/19/2015	1.6	2.10	H 2.30	H 0.43	7.11	H 850	H 1800	< 0.003	0.0028	0.14	^< 0.001	< 0.0005	< 0.005	0.0012	0.0012	0.019	H= 0.0002	0.035	< 0.790	< 0.0025	< 0.002
	2/22/2016	1.8	2.90	2.80	0.55	7.19	960	2.100	< 0.003	0.021	0.151	< 0.001	< 0.0005	< 0.005	0.0012	< 0.0005	0.038	< 0.0002	0.0093	1.07	< 0.0025	< 0.002
	5/18/2016	1.4	2.00	2.30	0.68	7.02	700	1.800	< 0.003	0.22	0.12	< 0.001	0.0011	< 0.005	0.0015	< 0.0005	0.026	< 0.0002	0.12	8.27	< 0.0025	0.0028
	8/15/2016	1.1	2.20	2.20	0.60	7.08	860	2.100	< 0.003	0.34	0.12	< 0.001	0.001	< 0.005	0.0016	< 0.0005	0.022	< 0.0002	0.1	0.606	< 0.0025	0.0031
	11/14/2016	1.5	2.00	2.10	0.56	7.26	900	2.000	< 0.003	0.19	0.073	< 0.001	0.00051	< 0.005	0.0012	< 0.0005	0.022	< 0.0002	0.042	3.76	< 0.0025	0.0021
	2/13/2017	1.6	1.90	2.30	0.56	6.84	720	1.600	< 0.003	0.35	0.16	< 0.001	0.00093	< 0.005	0.0014	0.00079	0.019	< 0.0002	0.088	2.08	< 0.0025	0.0025
	5/4/2017	1.2	1.70	2.10	0.61	7.29	720	1.500	< 0.003	0.24	0.39	0.0013	0.0023	< 0.005	0.0023	0.00066	0.016	< 0.0002	0.036	1.91	< 0.0025	0.0065
	6/22/2017	0.95	1.50	2.30	0.72	7.38	580	1.600	< 0.003	0.41	0.13	< 0.001	0.0007	< 0.005	0.0012	0.0011	0.022	< 0.0002	0.11	1.21	< 0.0025	0.0022
	8/29/2017	1.4	1.90	2.30	0.64	7.19	640	1.900	< 0.003	0.24	0.092	< 0.001	< 0.0005	< 0.005	< 0.001	0.00098	0.021	< 0.0002	0.13	3.32	< 0.0025	0.0025
	11/6/2017	1.7	1.90	2.40	0.62	7.27	640	1.800	< 0.003	0.17	0.38	< 0.001	0.0022	< 0.005	0.0015	< 0.0005	0.01	< 0.0002	0.19	2.54	< 0.0025	0.0079
	5/14/2018	1.6	1.70	2.20	0.6	7.79	800	1.700	< 0.003	0.42	0.17	< 0.001	0.002	< 0.005	0.0029	0.0021	0.015	< 0.0002	0.13	2.03	< 0.0025	0.0068
	8/6/2018	1.3	1.70	2.30	0.6	7.12	620	1.600	< 0.003	0.187	0.055	< 0.001	0.00094	< 0.005	0.0015	< 0.0005	0.019	< 0.0002	0.084	1.34	< 0.0025	0.0023
	4/29/2019	0.898	1.90	1.60	0.625	7.25	660	1.900	< 0.003	0.062	0.04	< 0.001	0.00052	< 0.005	< 0.001	< 0.0005	0.019	< 0.0002	0.06	0.517	< 0.0025	0.0022
	11/13/2019	1.9	2.30	6.00	0.55	7.16	730	2.300	NA	0.088	0.1	NA	0.0015	NA	0.0011	0.00093	0.021	< 0.0002	0.038	0.643	< 0.0025	0.0029
	4/27/2020	1.2	1.50	1.70	0.79	7.27	520	1.300	NA	0.026	0.016	NA	< 0.0005	NA	< 0.001	0.00101	0.021	< 0.0002	0.075	0.498	< 0.0025	< 0.002
	12/7/2020	1.3	1.40	1.60	0.8	7.22	430	1.100	NA	0.08	0.05	NA	0.001	NA	< 0.001	0.0011	0.022	< 0.0002	0.056	< 0.438	< 0.0025	< 0.002
	5/12/2021	0.99	1.30	1.60	0.77	7.52	460	1.200	< 0.003	0.0053	0.027	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.018	< 0.0002	0.049	< 0.478	< 0.0025	< 0.002
	8/23/2021	0.92	1.40	1.50	0.7	7.37	500	1.100	< 0.003	0.0058	0.028	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.043	0.553	< 0.0025	< 0.002
	11/29/2021	1	1.40	1.50	0.76	7.30	430	1.200	< 0.003	0.0039	0.025	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.04	0.892	< 0.0025	< 0.002
	2/7/2022	0.9	1.40	1.60	0.82	7.27	430	1.300	< 0.003	0.0046	0.026	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.016	< 0.0002	0.038	0.693	< 0.0025	< 0.002
	6/8/2022	1.3	2.00	1.90	0.69	7.51	810	1.900	< 0.003	0.0051	0.037	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.018	< 0.0002	0.032	< 0.601	< 0.0025	< 0.002
	8/31/2022	1.1	1.50	1.70	0.73	7.12	430	1.200	< 0.003	0.003	0.031	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.016	< 0.0002	0.024	< 0.533	< 0.0025	< 0.002
	11/16/2022	1.1	1.50	1.70	0.98	7.56	530	1.400	< 0.003	0.0058	0.04	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.013	< 0.0002	0.028	< 0.512	< 0.0025	< 0.002
	2/23/2023	1.6	170	2.10	0.67	7.87	690	1.700	< 0.0030	0.0034	0.027	^1+^1= 0.0010	< 0.00050	< 0.0050	< 0.0010	< 0.0050	0.0150	< 0.00020	0.045	< 0.583	< 0.0025	0.0020
	5/18/2023	0.98	1.50	1.90	0.65	7.34	460	1.400	< 0.0030	0.0020	0.023	^6^7= 0.0010	< 0.00050	< 0.0050	< 0.0010	< 0.0050	0.011	< 0.00020	0.038	< 0.521	< 0.0025	< 0.0020
MW-18 (S) down-gradient	11/19/2015	0.80	1.40	H 2.30	H 0.66	7.62	H 110	H 1.700	< 0.003	0.0014	0.14	^< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.007	H= 0.0002	0.0051	< 0.845	< 0.0025	< 0.002
	2/22/2016	0.76	1.50	2.20	0.68	7.06	310	1.200	< 0.003	0.0012	0.15	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.022	< 0.0002	0.0055	1.88	< 0.0025	< 0.002
	5/18/2016	0.27	1.20	2.10	0.71	7.68	230	1.200	< 0.003	0.001	0.13	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.014	< 0.0002	0.0032	< 0.493	< 0.0025	< 0.002
	8/15/2016	0.67	1.30	2.10	0.64	7.52	330	1.300	< 0.003	< 0.001	0.14	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.012	< 0.0002	0.0059	0.836	< 0.0025	< 0.002
	11/18/2016	0.94	1.30	2.00	0.58	7.69	250	1.300	< 0.003	< 0.001	0.14	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.013	< 0.0002	0.0053	0.488	< 0.0025	< 0.002
	2/15/2017	1.56	1.40	1.90	0.59	7.81	340	1.200	< 0.003	< 0.001	0.14	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.014	< 0.0002	0.0058

Table 2. Groundwater Turbidity - Midwest Generation, LLC, Powerton Station, Pekin, IL. Ash Bypass Basin Ash Surge Basin.

Well	Date	Turbidity (NTU)
MW-01	2/23/2021	78.20
	4/9/2021	6.96
	5/11/2021	3.24
	6/2/2021	3.80
	6/28/2021	4.30
	7/19/2021	4.88
	8/24/2021	3.34
	9/30/2021	3.04
	11/30/2021	5.43
	2/9/2022	11.5
	6/7/2022	3.63
	8/30/2022	4.73
	11/15/2022	3.90
	2/22/2023	4.54
	5/17/2023	4.33
MW-09	2/24/2021	16.90
	4/9/2021	5.73
	5/13/2021	0.49
	6/2/2021	2.37
	6/29/2021	4.53
	7/19/2021	6.12
	8/25/2021	16.65
	9/30/2021	3.2
	12/1/2021	0.0
	2/10/2022	0.0
	6/8/2022	6.93
	8/31/2022	4.95
	11/15/2022	1.82
	2/23/2023	3.22
	5/16/2023	15.52
MW-19	2/22/2021	0.56
	4/9/2021	4.25
	5/10/2021	1.80
	6/2/2021	5.77
	6/29/2021	8.79
	7/19/2021	7.30
	8/26/2021	30.91
	9/30/2021	2.92
	12/1/2021	0.0
	2/7/2022	3.54
	6/6/2022	2.35
	8/30/2022	3.56
	11/16/2022	2.02
	2/21/2023	2.13
	5/18/2023	2.25
MW-08	2/23/2021	47.30
	4/9/2021	23.05
	5/11/2021	8.93
	6/3/2021	11.11
	6/29/2021	5.48
	7/19/2021	6.86
	8/25/2021	6.80
	9/30/2021	5.01
	12/1/2021	5.01
	2/10/2022	14.98
	6/8/2022	8.65
	8/30/2022	9.75
	11/15/2022	12.65
	2/22/2023	4.12
	5/17/2023	17.75

Table 2. Groundwater Turbidity - Midwest Generation, LLC, Powerton Station, Pekin, IL. Ash Bypass Basin Ash Surge Basin.

Well	Date	Turbidity (NTU)
MW-11	2/25/2021	35.10
	4/9/2021	41.53
	5/13/2021	14.70
	6/3/2021	14.92
	6/29/2021	40.48
	7/19/2021	25.73
	8/25/2021	55.39
	9/30/2021	4.06
	12/1/2021	2.48
	2/10/2022	9.29
	6/8/2022	77.21
	8/31/2022	66.8
	11/15/2022	36.1
	2/23/2023	14.07
	5/16/2023	10.18
MW-12	2/25/2021	26.50
	4/9/2021	66.11
	5/13/2021	5.17
	6/3/2021	106.47
	6/29/2021	21.40
	7/19/2021	22.70
	8/25/2021	12.62
	9/30/2021	18.66
	12/1/2021	29.27
	2/10/2022	7.08
	6/8/2022	57.5
	8/31/2022	703.1
	11/15/2022	335.9
	2/23/2023	18.01
	5/16/2023	21.37
MW-15	2/24/2021	64.90
	4/9/2021	16.80
	5/12/2021	16.45
	6/3/2021	7.85
	6/29/2021	6.58
	7/20/2021	5.82
	8/23/2021	4.28
	10/1/2021	13.13
	11/29/2021	12.35
	2/9/2022	9.38
	6/8/2022	10.32
	8/31/2022	28.7
	11/16/2022	55.82
	2/23/2023	21.36
	5/17/2023	13.90
MW-17	2/24/2021	42.00
	4/8/2021	17.10
	5/12/2021	10.90
	6/3/2021	38.15
	6/28/2021	29.15
	7/20/2021	16.38
	8/23/2021	26.51
	10/1/2021	21.26
	11/29/2021	8.86
	2/7/2022	11.19
	6/8/2022	41.49
	8/31/2022	22.58
	11/16/2022	116.69
	2/23/2023	20.65
	5/18/2023	9.92
MW-18	2/22/2021	3.40
	4/9/2021	4.62
	5/10/2021	2.28
	6/3/2021	2.38
	6/29/2021	3.96
	7/19/2021	5.19
	8/26/2021	7.96
	9/30/2021	37.94
	12/1/2021	5.88
	2/8/2022	39.3
	6/6/2022	2.73
	8/30/2022	5.66
	11/16/2022	28.47
	2/21/2023	17.88
	5/18/2023	3.04

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ANALYTICAL REPORT

PREPARED FOR

Attn: Richard Gnat
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Brookfield, Wisconsin 53005

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JOB DESCRIPTION

Powerton CCR

JOB NUMBER

500-233887-1

Eurofins Chicago
2417 Bond Street
University Park IL 60484

See page two for job notes and contact information.

my EOL

Eurofins Chicago

Job Notes

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Authorization



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Authorized for release by
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Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Laboratory Job ID: 500-233887-1

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Case Narrative

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-233887-1

Job ID: 500-233887-1

Laboratory: Eurofins Chicago

Narrative

Job Narrative
500-233887-1

Receipt
The samples were received on 5/17/2023 10:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were -2.0º C, 0.1º C and 5.3º C.

Metals
Methods 6020A, 6020B: The initial low level and continuing calibration verification (ICVL/CCVL) associated with batch 500-715021 recovered above the upper control limit for Beryllium. The samples associated with this CCV were non-detects for the affected analyte; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-233887-1

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	EET CHI
7470A	Mercury (CVAA)	SW846	EET CHI
SM 2540C	Solids, Total Dissolved (TDS)	SM	EET CHI
SM 4500 Cl- E	Chloride, Total	SM	EET CHI
SM 4500 F C	Fluoride	SM	EET CHI
SM 4500 SO4 E	Sulfate, Total	SM	EET CHI
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET CHI
7470A	Preparation, Mercury	SW846	EET CHI

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Sample Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-233887-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-233887-1	MW-09	Water	05/16/23 15:18	05/17/23 10:00
500-233887-2	MW-11	Water	05/16/23 14:01	05/17/23 10:00
500-233887-3	MW-12	Water	05/16/23 12:57	05/17/23 10:00
500-233887-4	MW-01	Water	05/17/23 12:36	05/18/23 09:40
500-233887-5	MW-08	Water	05/17/23 11:32	05/18/23 09:40
500-233887-6	MW-15	Water	05/17/23 13:48	05/18/23 09:40

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-233887-1

Client Sample ID: MW-09

Date Collected: 05/16/23 15:18
Date Received: 05/17/23 10:00

Lab Sample ID: 500-233887-1

Matrix: Water

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		05/22/23 09:02	05/24/23 19:39	1
Arsenic	<0.0010		0.0010		mg/L		05/22/23 09:02	05/23/23 22:38	1
Barium	**0.029**		0.0025		mg/L		05/22/23 09:02	05/23/23 22:38	1
Beryllium	<0.0010	^+ ^1+	0.0010		mg/L		05/22/23 09:02	05/23/23 22:38	1
Boron	**3.9**		0.050		mg/L		05/22/23 09:02	05/23/23 22:38	1
Cadmium	<0.00050		0.00050		mg/L		05/22/23 09:02	05/23/23 22:38	1
Calcium	**70**		0.20		mg/L		05/22/23 09:02	05/24/23 19:39	1
Chromium	<0.0050		0.0050		mg/L		05/22/23 09:02	05/23/23 22:38	1
Cobalt	<0.0010		0.0010		mg/L		05/22/23 09:02	05/23/23 22:38	1
Lead	<0.00050		0.00050		mg/L		05/22/23 09:02	05/23/23 22:38	1
Lithium	<0.010		0.010		mg/L		05/22/23 09:02	05/25/23 16:20	1
Molybdenum	**0.032**		0.0050		mg/L		05/22/23 09:02	05/23/23 22:38	1
Selenium	<0.0025		0.0025		mg/L		05/22/23 09:02	05/23/23 22:38	1
Thallium	<0.0020		0.0020		mg/L		05/22/23 09:02	05/23/23 22:38	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/06/23 09:55	06/07/23 08:22	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**510**		10		mg/L			05/17/23 21:55	1
Chloride (SM 4500 Cl- E)	**30**		2.0		mg/L			05/24/23 16:30	1
Fluoride (SM 4500 F C)	**0.16**		0.10		mg/L			05/21/23 10:10	1
Sulfate (SM 4500 SO4 E)	**130**		50		mg/L			05/26/23 14:08	10

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-233887-1

Client Sample ID: MW-11

Date Collected: 05/16/23 14:01
Date Received: 05/17/23 10:00

Lab Sample ID: 500-233887-2

Matrix: Water

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		05/22/23 09:02	05/24/23 19:42	1
Arsenic	**0.011**		0.0010		mg/L		05/22/23 09:02	05/23/23 22:41	1
Barium	**0.18**		0.0025		mg/L		05/22/23 09:02	05/23/23 22:41	1
Beryllium	<0.0010	^+ ^1+	0.0010		mg/L		05/22/23 09:02	05/23/23 22:41	1
Boron	**2.5**		0.050		mg/L		05/22/23 09:02	05/23/23 22:41	1
Cadmium	<0.00050		0.00050		mg/L		05/22/23 09:02	05/23/23 22:41	1
Calcium	**120**		0.20		mg/L		05/22/23 09:02	05/24/23 19:42	1
Chromium	<0.0050		0.0050		mg/L		05/22/23 09:02	05/23/23 22:41	1
Cobalt	**0.0018**		0.0010		mg/L		05/22/23 09:02	05/23/23 22:41	1
Lead	<0.00050		0.00050		mg/L		05/22/23 09:02	05/23/23 22:41	1
Lithium	<0.010		0.010		mg/L		05/22/23 09:02	05/25/23 16:23	1
Molybdenum	**0.016**		0.0050		mg/L		05/22/23 09:02	05/23/23 22:41	1
Selenium	<0.0025		0.0025		mg/L		05/22/23 09:02	05/23/23 22:41	1
Thallium	<0.0020		0.0020		mg/L		05/22/23 09:02	05/23/23 22:41	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/06/23 09:55	06/07/23 08:24	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**690**		10		mg/L			05/17/23 21:57	1
Chloride (SM 4500 Cl- E)	**65**		10		mg/L			05/24/23 16:31	5
Fluoride (SM 4500 F C)	**0.52**		0.10		mg/L			05/21/23 10:10	1
Sulfate (SM 4500 SO4 E)	**120**		50		mg/L			05/26/23 14:08	10

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-233887-1

Client Sample ID: MW-12

Date Collected: 05/16/23 12:57
Date Received: 05/17/23 10:00

Lab Sample ID: 500-233887-3

Matrix: Water

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		05/22/23 09:02	05/24/23 19:46	1
Arsenic	**0.0023**		0.0010		mg/L		05/22/23 09:02	05/23/23 22:45	1
Barium	**0.043**		0.0025		mg/L		05/22/23 09:02	05/23/23 22:45	1
Beryllium	<0.0010	^+ ^1+	0.0010		mg/L		05/22/23 09:02	05/23/23 22:45	1
Boron	**0.32**		0.050		mg/L		05/22/23 09:02	05/23/23 22:45	1
Cadmium	<0.00050		0.00050		mg/L		05/22/23 09:02	05/23/23 22:45	1
Calcium	**89**		0.20		mg/L		05/22/23 09:02	05/24/23 19:46	1
Chromium	<0.0050		0.0050		mg/L		05/22/23 09:02	05/23/23 22:45	1
Cobalt	<0.0010		0.0010		mg/L		05/22/23 09:02	05/23/23 22:45	1
Lead	<0.00050		0.00050		mg/L		05/22/23 09:02	05/23/23 22:45	1
Lithium	<0.010		0.010		mg/L		05/22/23 09:02	05/25/23 16:26	1
Molybdenum	**0.013**		0.0050		mg/L		05/22/23 09:02	05/23/23 22:45	1
Selenium	<0.0025		0.0025		mg/L		05/22/23 09:02	05/23/23 22:45	1
Thallium	<0.0020		0.0020		mg/L		05/22/23 09:02	05/23/23 22:45	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/06/23 09:55	06/07/23 08:26	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**840**		10		mg/L			05/17/23 22:00	1
Chloride (SM 4500 Cl- E)	**150**		20		mg/L			05/24/23 16:31	10
Fluoride (SM 4500 F C)	**0.34**		0.10		mg/L			05/21/23 10:10	1
Sulfate (SM 4500 SO4 E)	**240**		100		mg/L			05/26/23 14:08	20

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-233887-1

Client Sample ID: MW-01

Date Collected: 05/17/23 12:36
Date Received: 05/18/23 09:40

Lab Sample ID: 500-233887-4

Matrix: Water

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		05/22/23 09:02	05/24/23 19:49	1
Arsenic	<0.0010		0.0010		mg/L		05/22/23 09:02	05/23/23 22:48	1
Barium	**0.056**		0.0025		mg/L		05/22/23 09:02	05/23/23 22:48	1
Beryllium	<0.0010	^+ ^1+	0.0010		mg/L		05/22/23 09:02	05/23/23 22:48	1
Boron	**0.32**		0.050		mg/L		05/22/23 09:02	05/23/23 22:48	1
Cadmium	<0.00050		0.00050		mg/L		05/22/23 09:02	05/23/23 22:48	1
Calcium	**91**		0.20		mg/L		05/22/23 09:02	05/24/23 19:49	1
Chromium	<0.0050		0.0050		mg/L		05/22/23 09:02	05/23/23 22:48	1
Cobalt	<0.0010		0.0010		mg/L		05/22/23 09:02	05/23/23 22:48	1
Lead	<0.00050		0.00050		mg/L		05/22/23 09:02	05/23/23 22:48	1
Lithium	<0.010		0.010		mg/L		05/22/23 09:02	05/25/23 16:30	1
Molybdenum	<0.0050		0.0050		mg/L		05/22/23 09:02	05/23/23 22:48	1
Selenium	<0.0025		0.0025		mg/L		05/22/23 09:02	05/23/23 22:48	1
Thallium	<0.0020		0.0020		mg/L		05/22/23 09:02	05/23/23 22:48	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/06/23 09:55	06/07/23 08:28	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**450**		10		mg/L			05/22/23 01:02	1
Chloride (SM 4500 Cl- E)	**55**		4.0		mg/L			05/24/23 16:31	2
Fluoride (SM 4500 F C)	**0.12**		0.10		mg/L			05/24/23 08:35	1
Sulfate (SM 4500 SO4 E)	**33**		10		mg/L			05/26/23 14:09	2

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-233887-1

Client Sample ID: MW-08

Date Collected: 05/17/23 11:32
Date Received: 05/18/23 09:40

Lab Sample ID: 500-233887-5

Matrix: Water

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		05/22/23 09:02	05/24/23 20:03	1
Arsenic	**0.0029**		0.0010		mg/L		05/22/23 09:02	05/23/23 22:52	1
Barium	**0.13**		0.0025		mg/L		05/22/23 09:02	05/23/23 22:52	1
Beryllium	<0.0010	^+ ^1+	0.0010		mg/L		05/22/23 09:02	05/23/23 22:52	1
Boron	**0.61**		0.050		mg/L		05/22/23 09:02	05/23/23 22:52	1
Cadmium	<0.00050		0.00050		mg/L		05/22/23 09:02	05/23/23 22:52	1
Calcium	**120**		0.20		mg/L		05/22/23 09:02	05/24/23 20:03	1
Chromium	<0.0050		0.0050		mg/L		05/22/23 09:02	05/23/23 22:52	1
Cobalt	<0.0010		0.0010		mg/L		05/22/23 09:02	05/23/23 22:52	1
Lead	<0.00050		0.00050		mg/L		05/22/23 09:02	05/23/23 22:52	1
Lithium	**0.023**		0.010		mg/L		05/22/23 09:02	05/25/23 16:33	1
Molybdenum	**0.0077**		0.0050		mg/L		05/22/23 09:02	05/23/23 22:52	1
Selenium	<0.0025		0.0025		mg/L		05/22/23 09:02	05/23/23 22:52	1
Thallium	<0.0020		0.0020		mg/L		05/22/23 09:02	05/23/23 22:52	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/06/23 09:55	06/07/23 08:30	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**720**		10		mg/L			05/22/23 01:05	1
Chloride (SM 4500 Cl- E)	**110**		20		mg/L			05/24/23 16:32	10
Fluoride (SM 4500 F C)	**0.34**		0.10		mg/L			05/24/23 08:35	1
Sulfate (SM 4500 SO4 E)	**62**		10		mg/L			05/26/23 14:09	2

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-233887-1

Client Sample ID: MW-15

Date Collected: 05/17/23 13:48
Date Received: 05/18/23 09:40

Lab Sample ID: 500-233887-6

Matrix: Water

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		05/22/23 09:02	05/24/23 20:07	1
Arsenic	**0.0027**		0.0010		mg/L		05/22/23 09:02	05/23/23 23:02	1
Barium	**0.075**		0.0025		mg/L		05/22/23 09:02	05/23/23 23:02	1
Beryllium	<0.0010	^+ ^1+	0.0010		mg/L		05/22/23 09:02	05/23/23 23:02	1
Boron	**1.3**		0.050		mg/L		05/22/23 09:02	05/23/23 23:02	1
Cadmium	<0.00050		0.00050		mg/L		05/22/23 09:02	05/23/23 23:02	1
Calcium	**1400**		2.0		mg/L		05/22/23 09:02	05/25/23 16:40	10
Chromium	<0.0050		0.0050		mg/L		05/22/23 09:02	05/23/23 23:02	1
Cobalt	**0.0012**		0.0010		mg/L		05/22/23 09:02	05/23/23 23:02	1
Lead	<0.00050		0.00050		mg/L		05/22/23 09:02	05/23/23 23:02	1
Lithium	**0.024**		0.010		mg/L		05/22/23 09:02	05/25/23 16:37	1
Molybdenum	**0.039**		0.0050		mg/L		05/22/23 09:02	05/23/23 23:02	1
Selenium	**0.18**		0.0025		mg/L		05/22/23 09:02	05/23/23 23:02	1
Thallium	<0.0020		0.0020		mg/L		05/22/23 09:02	05/23/23 23:02	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/06/23 09:55	06/07/23 08:33	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**2500**		10		mg/L			05/22/23 01:07	1
Chloride (SM 4500 Cl- E)	**310**		20		mg/L			05/24/23 16:32	10
Fluoride (SM 4500 F C)	**0.42**		0.10		mg/L			05/24/23 08:35	1
Sulfate (SM 4500 SO4 E)	**850**		100		mg/L			05/26/23 14:09	20

Definitions/Glossary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-233887-1

Qualifiers

Metals

Qualifier	Qualifier Description
^+	Continuing Calibration Verification (CCV) is outside acceptance limits, high biased.
^1+	Initial Calibration Verification (ICV) is outside acceptance limits, high biased.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

QC Association Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-233887-1

Metals

Prep Batch: 714515

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233887-1	MW-09	Total Recoverable	Water	3005A	
500-233887-2	MW-11	Total Recoverable	Water	3005A	
500-233887-3	MW-12	Total Recoverable	Water	3005A	
500-233887-4	MW-01	Total Recoverable	Water	3005A	
500-233887-5	MW-08	Total Recoverable	Water	3005A	
500-233887-6	MW-15	Total Recoverable	Water	3005A	
MB 500-714515/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 500-714515/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 715021

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233887-1	MW-09	Total Recoverable	Water	6020A	714515
500-233887-2	MW-11	Total Recoverable	Water	6020A	714515
500-233887-3	MW-12	Total Recoverable	Water	6020A	714515
500-233887-4	MW-01	Total Recoverable	Water	6020A	714515
500-233887-5	MW-08	Total Recoverable	Water	6020A	714515
500-233887-6	MW-15	Total Recoverable	Water	6020A	714515
MB 500-714515/1-A	Method Blank	Total Recoverable	Water	6020A	714515
LCS 500-714515/2-A	Lab Control Sample	Total Recoverable	Water	6020A	714515

Analysis Batch: 715273

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233887-1	MW-09	Total Recoverable	Water	6020A	714515
500-233887-2	MW-11	Total Recoverable	Water	6020A	714515
500-233887-3	MW-12	Total Recoverable	Water	6020A	714515
500-233887-4	MW-01	Total Recoverable	Water	6020A	714515
500-233887-5	MW-08	Total Recoverable	Water	6020A	714515
500-233887-6	MW-15	Total Recoverable	Water	6020A	714515
MB 500-714515/1-A	Method Blank	Total Recoverable	Water	6020A	714515
LCS 500-714515/2-A	Lab Control Sample	Total Recoverable	Water	6020A	714515

Analysis Batch: 715492

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233887-1	MW-09	Total Recoverable	Water	6020A	714515
500-233887-2	MW-11	Total Recoverable	Water	6020A	714515
500-233887-3	MW-12	Total Recoverable	Water	6020A	714515
500-233887-4	MW-01	Total Recoverable	Water	6020A	714515
500-233887-5	MW-08	Total Recoverable	Water	6020A	714515
500-233887-6	MW-15	Total Recoverable	Water	6020A	714515
500-233887-6	MW-15	Total Recoverable	Water	6020A	714515
MB 500-714515/1-A	Method Blank	Total Recoverable	Water	6020A	714515
LCS 500-714515/2-A	Lab Control Sample	Total Recoverable	Water	6020A	714515

Prep Batch: 716983

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233887-1	MW-09	Total/NA	Water	7470A	
500-233887-2	MW-11	Total/NA	Water	7470A	
500-233887-3	MW-12	Total/NA	Water	7470A	
500-233887-4	MW-01	Total/NA	Water	7470A	
500-233887-5	MW-08	Total/NA	Water	7470A	
500-233887-6	MW-15	Total/NA	Water	7470A	

QC Association Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-233887-1

Metals (Continued)

Prep Batch: 716983 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 500-716983/12-A	Method Blank	Total/NA	Water	7470A	
LCS 500-716983/13-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 717281

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233887-1	MW-09	Total/NA	Water	7470A	716983
500-233887-2	MW-11	Total/NA	Water	7470A	716983
500-233887-3	MW-12	Total/NA	Water	7470A	716983
500-233887-4	MW-01	Total/NA	Water	7470A	716983
500-233887-5	MW-08	Total/NA	Water	7470A	716983
500-233887-6	MW-15	Total/NA	Water	7470A	716983
MB 500-716983/12-A	Method Blank	Total/NA	Water	7470A	716983
LCS 500-716983/13-A	Lab Control Sample	Total/NA	Water	7470A	716983

General Chemistry

Analysis Batch: 713900

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233887-1	MW-09	Total/NA	Water	SM 2540C	
500-233887-2	MW-11	Total/NA	Water	SM 2540C	
500-233887-3	MW-12	Total/NA	Water	SM 2540C	
MB 500-713900/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 500-713900/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 714420

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233887-4	MW-01	Total/NA	Water	SM 2540C	
500-233887-5	MW-08	Total/NA	Water	SM 2540C	
500-233887-6	MW-15	Total/NA	Water	SM 2540C	
MB 500-714420/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 500-714420/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 714514

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233887-1	MW-09	Total/NA	Water	SM 4500 F C	
500-233887-2	MW-11	Total/NA	Water	SM 4500 F C	
500-233887-3	MW-12	Total/NA	Water	SM 4500 F C	
MB 500-714514/31	Method Blank	Total/NA	Water	SM 4500 F C	
LCS 500-714514/32	Lab Control Sample	Total/NA	Water	SM 4500 F C	

Analysis Batch: 715052

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233887-4	MW-01	Total/NA	Water	SM 4500 F C	
500-233887-5	MW-08	Total/NA	Water	SM 4500 F C	
500-233887-6	MW-15	Total/NA	Water	SM 4500 F C	
MB 500-715052/3	Method Blank	Total/NA	Water	SM 4500 F C	
LCS 500-715052/4	Lab Control Sample	Total/NA	Water	SM 4500 F C	

Analysis Batch: 715089

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233887-1	MW-09	Total/NA	Water	SM 4500 Cl- E	

QC Association Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-233887-1

General Chemistry (Continued)

Analysis Batch: 715089 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233887-2	MW-11	Total/NA	Water	SM 4500 Cl- E	
500-233887-3	MW-12	Total/NA	Water	SM 4500 Cl- E	
500-233887-4	MW-01	Total/NA	Water	SM 4500 Cl- E	
500-233887-5	MW-08	Total/NA	Water	SM 4500 Cl- E	
500-233887-6	MW-15	Total/NA	Water	SM 4500 Cl- E	
MB 500-715089/113	Method Blank	Total/NA	Water	SM 4500 Cl- E	
LCS 500-715089/114	Lab Control Sample	Total/NA	Water	SM 4500 Cl- E	

Analysis Batch: 715553

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233887-1	MW-09	Total/NA	Water	SM 4500 SO4 E	
500-233887-2	MW-11	Total/NA	Water	SM 4500 SO4 E	
500-233887-3	MW-12	Total/NA	Water	SM 4500 SO4 E	
500-233887-4	MW-01	Total/NA	Water	SM 4500 SO4 E	
500-233887-5	MW-08	Total/NA	Water	SM 4500 SO4 E	
500-233887-6	MW-15	Total/NA	Water	SM 4500 SO4 E	
MB 500-715553/16	Method Blank	Total/NA	Water	SM 4500 SO4 E	
LCS 500-715553/17	Lab Control Sample	Total/NA	Water	SM 4500 SO4 E	

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-233887-1

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 500-714515/1-A
Matrix: Water
Analysis Batch: 715021

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 714515

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.0010		0.0010		mg/L		05/22/23 09:02	05/23/23 22:21	1
Barium	<0.0025		0.0025		mg/L		05/22/23 09:02	05/23/23 22:21	1
Beryllium	<0.0010	^+ ^1+	0.0010		mg/L		05/22/23 09:02	05/23/23 22:21	1
Boron	<0.050		0.050		mg/L		05/22/23 09:02	05/23/23 22:21	1
Cadmium	<0.00050		0.00050		mg/L		05/22/23 09:02	05/23/23 22:21	1
Chromium	<0.0050		0.0050		mg/L		05/22/23 09:02	05/23/23 22:21	1
Cobalt	<0.0010		0.0010		mg/L		05/22/23 09:02	05/23/23 22:21	1
Lead	<0.00050		0.00050		mg/L		05/22/23 09:02	05/23/23 22:21	1
Molybdenum	<0.0050		0.0050		mg/L		05/22/23 09:02	05/23/23 22:21	1
Selenium	<0.0025		0.0025		mg/L		05/22/23 09:02	05/23/23 22:21	1
Thallium	<0.0020		0.0020		mg/L		05/22/23 09:02	05/23/23 22:21	1

Lab Sample ID: MB 500-714515/1-A
Matrix: Water
Analysis Batch: 715273

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 714515

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		05/22/23 09:02	05/24/23 19:19	1
Calcium	<0.20		0.20		mg/L		05/22/23 09:02	05/24/23 19:19	1

Lab Sample ID: MB 500-714515/1-A
Matrix: Water
Analysis Batch: 715492

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 714515

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	<0.010		0.010		mg/L		05/22/23 09:02	05/25/23 16:13	1

Lab Sample ID: LCS 500-714515/2-A
Matrix: Water
Analysis Batch: 715021

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 714515

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	0.100	0.0987		mg/L		99	80 - 120
Barium	2.00	1.98		mg/L		99	80 - 120
Beryllium	0.0500	0.0541	^+ ^1+	mg/L		108	80 - 120
Boron	1.00	1.00		mg/L		100	80 - 120
Cadmium	0.0500	0.0485		mg/L		97	80 - 120
Chromium	0.200	0.192		mg/L		96	80 - 120
Cobalt	0.500	0.477		mg/L		95	80 - 120
Lead	0.100	0.101		mg/L		101	80 - 120
Molybdenum	1.00	0.885		mg/L		88	80 - 120
Selenium	0.100	0.0992		mg/L		99	80 - 120
Thallium	0.100	0.0978		mg/L		98	80 - 120

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-233887-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 500-714515/2-A
Matrix: Water
Analysis Batch: 715273

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 714515

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	0.500	0.485		mg/L		97	80 - 120
Calcium	10.0	8.73		mg/L		87	80 - 120

Lab Sample ID: LCS 500-714515/2-A
Matrix: Water
Analysis Batch: 715492

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 714515

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Lithium	0.500	0.486		mg/L		97	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 500-716983/12-A
Matrix: Water
Analysis Batch: 717281

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 716983

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/06/23 09:55	06/07/23 08:18	1

Lab Sample ID: LCS 500-716983/13-A
Matrix: Water
Analysis Batch: 717281

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 716983

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.00198	0.00202		mg/L		102	80 - 120

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 500-713900/1
Matrix: Water
Analysis Batch: 713900

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<10		10		mg/L			05/17/23 21:14	1

Lab Sample ID: LCS 500-713900/2
Matrix: Water
Analysis Batch: 713900

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	250	240		mg/L		96	80 - 120

Lab Sample ID: MB 500-714420/1
Matrix: Water
Analysis Batch: 714420

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<10		10		mg/L			05/22/23 00:24	1

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-233887-1

Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: LCS 500-714420/2
Matrix: Water
Analysis Batch: 714420

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	250	242		mg/L		97	80 - 120

Method: SM 4500 Cl- E - Chloride, Total

Lab Sample ID: MB 500-715089/113
Matrix: Water
Analysis Batch: 715089

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<2.0		2.0		mg/L			05/24/23 16:30	1

Lab Sample ID: LCS 500-715089/114
Matrix: Water
Analysis Batch: 715089

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	20.0	19.5		mg/L		98	85 - 115

Method: SM 4500 F C - Fluoride

Lab Sample ID: MB 500-714514/31
Matrix: Water
Analysis Batch: 714514

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<0.10		0.10		mg/L			05/21/23 10:10	1

Lab Sample ID: LCS 500-714514/32
Matrix: Water
Analysis Batch: 714514

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Fluoride	10.0	9.96		mg/L		100	90 - 119

Lab Sample ID: MB 500-715052/3
Matrix: Water
Analysis Batch: 715052

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<0.10		0.10		mg/L			05/24/23 08:35	1

Lab Sample ID: LCS 500-715052/4
Matrix: Water
Analysis Batch: 715052

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Fluoride	10.0	10.0		mg/L		100	90 - 119

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-233887-1

Method: SM 4500 SO4 E - Sulfate, Total

Lab Sample ID: MB 500-715553/16
Matrix: Water
Analysis Batch: 715553

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	<5.0		5.0		mg/L			05/26/23 14:07	1

Lab Sample ID: LCS 500-715553/17
Matrix: Water
Analysis Batch: 715553

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Sulfate			20.0	20.2		mg/L		101	88 - 123		

R000774

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone (708) 534-5200 Phone (708) 534-5211

Chain of Custody Record

Environment Testing

500-233887 COC 1

Page 1 of 1

Job #: 500-233887

Client Information	Sampler: Kaelyn Sperle	Lab PM: Mockler Diana J	Carrier Tracking No(s):	
Client Contact: Kaelyn Sperle	Phone: 262-278-1621	E-Mail: Diana Mockler@et.eurofinsus com	State of Origin: IL	
Company: KPRG and Associates, Inc	PWSID:			
Address: 14665 West Lisbon Road, Suite 1A	Due Date Requested: Standard			
City: Brookfield	TAT Requested (days): Standard			
State, Zip: WI, 53005	Compliance Project: Δ Yes Δ No			
Phone: 262-781-0475(Tel)	PO #: 4502125100			
Email: kaelyns@kprginc com	WO #:			
Project Name: Powerton CCR Event Desc. Quarterly Powerton CCR Samplling	Project #: 50011612			
Site: Illinois	SSOW#:			

Analysis Requested

Preservation Codes

A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4-5
Y - Trizma
Z - other (specify)
Other:

	Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, 904.0	6020A, 7470A	2540C, 4500_F_C, SM4500_Cl_E	SM4500_SO4_E - Sulfate	Total Number of containers	Special Instructions/Note:
				Preservation Code				D	D	N	N		
	~~MW-01~~				Water								
	~~MW-08~~				Water								
1	MW-09	5/16/23	1518	G	Water	N	N	X	X	X	X		
2	MW-11	5/16/23	1401	↓	Water	N	N	X	X	X	X		
3	MW-12	5/16/23	1257	↓	Water	N	N	↓	↓	↓	↓		
	~~MW-15~~				Water								
	~~MW-17~~				Water								
	~~MW-18~~				Water								
	~~MW-19~~				Water								
					Water								
					Water								

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I, II, III, IV, Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by:	Date	Time	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time	Company
1	Kaelyn Sperle	5/16/23/1700	KPRG	FedEx	5/16/23/1700	FedEx
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 5/17/23 1000	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact. Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks: 5.4-5.3

Ver: 01/16/2019

6/12/2023

R000775

Eurofins Chicago
2417 Bond Street
University Park IL 60484
Phone (708) 534-5200 Phone (708) 534-5211

Chain of Custody Record

Environment Testing

500-233887 COC

Client Information	Sampler: Kaelyn Sperle	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	Page 1 of 1
Client Contact: Kaelyn Sperle	Phone: 262-278-1621	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: IL	Job #: 500-233887
Company: KPRG and Associates, Inc	PWSID:			
Address: 14665 West Lisbon Road, Suite 1A	Due Date Requested: Standard			
City: Brookfield	TAT Requested (days): Standard			
State, Zip: WI, 53005	Compliance Project. Δ Yes Δ No			
Phone: 262-781-0475(Tel)	PO #: 4502125100			
Email: kaelyns@kprginc com	WO #:			
Project Name: Powerton CCR Event Desc Quarterly Powerton CCR Sampling	Project #: 50011612			
Site: Illinois	SSOW#:			

Analysis Requested

Preservation Codes

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, 904.0	6020A, 7470A	2540C, 4500_F_C, SM4500_Cl_E	SM4500_SO4_E - Sulfate	Total Number of containers	Special Instructions/Note:
			Preservation Code				D	D	N	N		
4 MW-01	5/17/23	1236	G	Water	N	N	X	X	X	X		
5 MW-08	5/17/23	1132	G	Water	N	N	X	X	X	X		
~~MW-09~~				Water								
~~MW-11~~				Water								
~~MW-12~~				Water								
6 MW-15	5/17/23	1348	G	Water	N	N	X	X	X	X		
~~MW-17~~				Water								
~~MW-18~~				Water								
~~MW-19~~				Water								
				Water								
				Water								

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II, III IV, Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by:	Date	Time	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	Kaelyn Sperle	5/17/23/1730	KPRG	FedEx	5/17/23/1730	FedEx
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 5/18/23 0840	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks. 0.4 - 0.1

Ver: 01/16/2019

6/12/2023

R000776

Eurofins Chicago
2417 Bond Street
University Park IL 60484
Phone (708) 534-5200 Phone (708) 534-5211

Chain of Custody Record

eurofins | Environment Testing

500-233887 COC

Client Information	Sampler: Kaelyn Sperle	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	COC No: 500-112087-46458 1
Client Contact: Kaelyn Sperle	Phone: 262-278-1621	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: IL	Page: Page 1 of 1
Company: KPRG and Associates, Inc	PWSID:			Job #: 500-233887

Address: 14665 West Lisbon Road, Suite 1A	Due Date Requested: Standard
City: Brookfield	TAT Requested (days): Standard
State, Zip: WI, 53005	Compliance Project: Δ Yes Δ No
Phone: 262-781-0475(Tel)	PO #: 4502125100
Email: kaelyns@kprginc.com	WO #:
Project Name: Powerton CCR Event Desc. Quarterly Powerton CCR Sampling ABBASB	Project #: 50011612
Site: Illinois	SSOW#:

Analysis Requested

Preservation Codes

A - HCL; B - NaOH; C - Zn Acetate; D - Nitric Acid; E - NaHSO4; F - MeOH; G - Amchlor; H - Ascorbic Acid; I - Ice; J - DI Water; K - EDTA; L - EDA; M - Hexane; N - None; O - AsNaO2; P - Na2O4S; Q - Na2SO3; R - Na2S2O3; S - H2SO4; T - TSP Dodecahydrate; U - Acetone; V - MCAA; W - pH 4-5; Y - Trizma; Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, 904.0	6020A, 7470A	2540C, 4500_F_C, SM4500_Cl_E	SM4500_SO4_E - Sulfate	Total Number of containers	Special Instructions/Note:
			Preservation Code				D	D	N	N		
~~MW-01~~				Water								
~~MW-08~~				Water								
~~MW-09~~				Water								
~~MW-11~~				Water								
~~MW-12~~				Water								
~~MW-15~~	~~X~~			Water								
7 MW-17	5/18/23	1337	G	Water	N	N	X	X	X	X		
8 MW-18	5/18/23	1234	↓	Water	N	N	↓	↓	↓	↓		
9 MW-19	5/18/23	1441		Water	N	N						
10 Duplicate	5/18/23	–		Water	N	N						
				Water								

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I, II, III IV, Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment:

Relinquished by: Kaelyn Sperle	Date/Time: 5/18/23/1715	Company: KPRG	Received by: FedEx	Date/Time: 5/18/23/1715	Company: FedEx
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 5/18/23 1000	Company

Custody Seals Intact. Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks: -2.4 -2.0



ORIGIN ID:PIAA (262) 278-1621

KPRG AND ASSOCIATES
414 PLAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 16MAY23
ACTWGT: 58.00 LB
CAD: 6994779/SSFE2420
DIMS: 24x18x12 IN

BILL THIRD PARTY

TO SAMPLE RECEIVING
EUROFINS CHICAGO
2417 BOND ST

UNIVERSITY PARK IL 60

(000) 000-0000
INV:
PO

REF

500-233887 Waybi

DEPT.

ST TO

05 17

FedEx
Express

1 of 4

TRK# 0201 3983 9576 9626

MASTER

XN JOTA

WED - 17 MAY 10:30A
PRIORITY OVERNIGHT

60484
IL-US ORD

Part # 156297-4

R000778

500-233887 Waybi

ORIGIN ID:PIAA (262) 278-1621
KPRG AND ASSOCIATES
414 PLAZA DR STE 106
WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 17MAY23
ACTWGT: 50.00 LB
CAD: 6994779/SSFE2420
DIMS: 24x18x12 IN
BILL THIRD PARTY

Part # 156297-435 RRDB2 EXP 09/23

TO SAMPLE RECEIVING
EUROFINS
2417 BOND ST

UNIVERSITY PARK IL 60484
(000) 000-0000 REF:
INV:
PO: DEPT:

FedEx Express

4 of 5
MPS# 0263 3984 4873 0174
Mstr# 3984 4873 0141

THU - 18 MAY 10:30A
PRIORITY OVERNIGHT

0201

XN JOTA

60484
IL-US ORD

6/12/2023

Do Not Lift Using This Tag

R000779

5 10:30 A 7203 05 19

RT 519 ST 20

IGIN ID:PIAA (000) 000-0000

RG AND ASSOCIATES
4 PLAZA DR STE 106

ESTMONT, IL 60559
NITED STATES US

E: 18MAY23
T: 43.00 LB
CAD: 6994779/SSFE2420
DIMS: 24x18x12 IN

BILL THIRD PARTY

Part # 156297-435 REV# EXP: 11/23

SAMPLE RECEIVING
EUROFINS CHICAGO
2417 BOND ST

UNIVERSITY PARK IL 60484

(000) 000-0000
INV:
PO:
REF:
DEPT:

FedEx Express

2 of 3

MPS# 0263 3984 9766 7203
Mstr# 3984 9766 7199

0201

FRI - 19 MAY 10:30A
PRIORITY OVERNIGHT

60484
IL-US ORD

XN JOTA

Do Not Lift Using This Tag

ORIGIN ID:PIAA (000) 000-0000

KPRG AND ASSOCIATES
414 PLAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 18MAY23
ACTWGT: 43.00 LB
CAD: 6994779/SSFE2420
DIMS: 24x18x12 IN

BILL THIRD P

TO SAMPLE RECEIVING
EUROFINS CHICAGO
2417 BOND ST

UNIVERSITY PARK I

RT 519 ST 20

5 10:30 A 7199 05 19

Part # 156297-435 REV# EXP: 11/23

(000) 000-0000
INV:
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REF:
DEPT:

FedEx Express

1 of 3

TRK# 0201 3984 9766 7199
MASTER

FRI - 19 MAY 10:30A
PRIORITY OVERNIGHT

XN JOTA

60484
IL-US ORD

500-233887 Waybi

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-233887-1

Login Number: 233887
List Number: 1
Creator: James, Jeff A

List Source: Eurofins Chicago

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	5.3,0.1,-2.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-233887-1

Client Sample ID: MW-09
Date Collected: 05/16/23 15:18
Date Received: 05/17/23 10:00

Lab Sample ID: 500-233887-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			714515	BDE	EET CHI	05/22/23 09:02 - 05/22/23 09:32 [1]
Total Recoverable	Analysis	6020A		1	715021	FXG	EET CHI	05/23/23 22:38
Total Recoverable	Prep	3005A			714515	BDE	EET CHI	05/22/23 09:02 - 05/22/23 09:32 [1]
Total Recoverable	Analysis	6020A		1	715273	FXG	EET CHI	05/24/23 19:39
Total Recoverable	Prep	3005A			714515	BDE	EET CHI	05/22/23 09:02 - 05/22/23 09:32 [1]
Total Recoverable	Analysis	6020A		1	715492	FXG	EET CHI	05/25/23 16:20
Total/NA	Prep	7470A			716983	MJG	EET CHI	06/06/23 09:55 - 06/06/23 11:55 [1]
Total/NA	Analysis	7470A		1	717281	MJG	EET CHI	06/07/23 08:22
Total/NA	Analysis	SM 2540C		1	713900	CLB	EET CHI	05/17/23 21:55
Total/NA	Analysis	SM 4500 Cl- E		1	715089	MM	EET CHI	05/24/23 16:30
Total/NA	Analysis	SM 4500 F C		1	714514	EH	EET CHI	05/21/23 10:10
Total/NA	Analysis	SM 4500 SO4 E		10	715553	MM	EET CHI	05/26/23 14:08

Client Sample ID: MW-11
Date Collected: 05/16/23 14:01
Date Received: 05/17/23 10:00

Lab Sample ID: 500-233887-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			714515	BDE	EET CHI	05/22/23 09:02 - 05/22/23 09:32 [1]
Total Recoverable	Analysis	6020A		1	715021	FXG	EET CHI	05/23/23 22:41
Total Recoverable	Prep	3005A			714515	BDE	EET CHI	05/22/23 09:02 - 05/22/23 09:32 [1]
Total Recoverable	Analysis	6020A		1	715273	FXG	EET CHI	05/24/23 19:42
Total Recoverable	Prep	3005A			714515	BDE	EET CHI	05/22/23 09:02 - 05/22/23 09:32 [1]
Total Recoverable	Analysis	6020A		1	715492	FXG	EET CHI	05/25/23 16:23
Total/NA	Prep	7470A			716983	MJG	EET CHI	06/06/23 09:55 - 06/06/23 11:55 [1]
Total/NA	Analysis	7470A		1	717281	MJG	EET CHI	06/07/23 08:24
Total/NA	Analysis	SM 2540C		1	713900	CLB	EET CHI	05/17/23 21:57
Total/NA	Analysis	SM 4500 Cl- E		5	715089	MM	EET CHI	05/24/23 16:31
Total/NA	Analysis	SM 4500 F C		1	714514	EH	EET CHI	05/21/23 10:10
Total/NA	Analysis	SM 4500 SO4 E		10	715553	MM	EET CHI	05/26/23 14:08

Client Sample ID: MW-12
Date Collected: 05/16/23 12:57
Date Received: 05/17/23 10:00

Lab Sample ID: 500-233887-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			714515	BDE	EET CHI	05/22/23 09:02 - 05/22/23 09:32 [1]
Total Recoverable	Analysis	6020A		1	715021	FXG	EET CHI	05/23/23 22:45
Total Recoverable	Prep	3005A			714515	BDE	EET CHI	05/22/23 09:02 - 05/22/23 09:32 [1]
Total Recoverable	Analysis	6020A		1	715273	FXG	EET CHI	05/24/23 19:46
Total Recoverable	Prep	3005A			714515	BDE	EET CHI	05/22/23 09:02 - 05/22/23 09:32 [1]
Total Recoverable	Analysis	6020A		1	715492	FXG	EET CHI	05/25/23 16:26
Total/NA	Prep	7470A			716983	MJG	EET CHI	06/06/23 09:55 - 06/06/23 11:55 [1]
Total/NA	Analysis	7470A		1	717281	MJG	EET CHI	06/07/23 08:26

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-233887-1

Client Sample ID: MW-12
Date Collected: 05/16/23 12:57
Date Received: 05/17/23 10:00

Lab Sample ID: 500-233887-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	SM 2540C		1	713900	CLB	EET CHI	05/17/23 22:00
Total/NA	Analysis	SM 4500 Cl- E		10	715089	MM	EET CHI	05/24/23 16:31
Total/NA	Analysis	SM 4500 F C		1	714514	EH	EET CHI	05/21/23 10:10
Total/NA	Analysis	SM 4500 SO4 E		20	715553	MM	EET CHI	05/26/23 14:08

Client Sample ID: MW-01
Date Collected: 05/17/23 12:36
Date Received: 05/18/23 09:40

Lab Sample ID: 500-233887-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			714515	BDE	EET CHI	05/22/23 09:02 - 05/22/23 09:32 [1]
Total Recoverable	Analysis	6020A		1	715021	FXG	EET CHI	05/23/23 22:48
Total Recoverable	Prep	3005A			714515	BDE	EET CHI	05/22/23 09:02 - 05/22/23 09:32 [1]
Total Recoverable	Analysis	6020A		1	715273	FXG	EET CHI	05/24/23 19:49
Total Recoverable	Prep	3005A			714515	BDE	EET CHI	05/22/23 09:02 - 05/22/23 09:32 [1]
Total Recoverable	Analysis	6020A		1	715492	FXG	EET CHI	05/25/23 16:30
Total/NA	Prep	7470A			716983	MJG	EET CHI	06/06/23 09:55 - 06/06/23 11:55 [1]
Total/NA	Analysis	7470A		1	717281	MJG	EET CHI	06/07/23 08:28
Total/NA	Analysis	SM 2540C		1	714420	CLB	EET CHI	05/22/23 01:02
Total/NA	Analysis	SM 4500 Cl- E		2	715089	MM	EET CHI	05/24/23 16:31
Total/NA	Analysis	SM 4500 F C		1	715052	EH	EET CHI	05/24/23 08:35
Total/NA	Analysis	SM 4500 SO4 E		2	715553	MM	EET CHI	05/26/23 14:09

Client Sample ID: MW-08
Date Collected: 05/17/23 11:32
Date Received: 05/18/23 09:40

Lab Sample ID: 500-233887-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			714515	BDE	EET CHI	05/22/23 09:02 - 05/22/23 09:32 [1]
Total Recoverable	Analysis	6020A		1	715021	FXG	EET CHI	05/23/23 22:52
Total Recoverable	Prep	3005A			714515	BDE	EET CHI	05/22/23 09:02 - 05/22/23 09:32 [1]
Total Recoverable	Analysis	6020A		1	715273	FXG	EET CHI	05/24/23 20:03
Total Recoverable	Prep	3005A			714515	BDE	EET CHI	05/22/23 09:02 - 05/22/23 09:32 [1]
Total Recoverable	Analysis	6020A		1	715492	FXG	EET CHI	05/25/23 16:33
Total/NA	Prep	7470A			716983	MJG	EET CHI	06/06/23 09:55 - 06/06/23 11:55 [1]
Total/NA	Analysis	7470A		1	717281	MJG	EET CHI	06/07/23 08:30
Total/NA	Analysis	SM 2540C		1	714420	CLB	EET CHI	05/22/23 01:05
Total/NA	Analysis	SM 4500 Cl- E		10	715089	MM	EET CHI	05/24/23 16:32
Total/NA	Analysis	SM 4500 F C		1	715052	EH	EET CHI	05/24/23 08:35
Total/NA	Analysis	SM 4500 SO4 E		2	715553	MM	EET CHI	05/26/23 14:09

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-233887-1

Client Sample ID: MW-15

Date Collected: 05/17/23 13:48
Date Received: 05/18/23 09:40

Lab Sample ID: 500-233887-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			714515	BDE	EET CHI	05/22/23 09:02 - 05/22/23 09:32 [1]
Total Recoverable	Analysis	6020A		1	715021	FXG	EET CHI	05/23/23 23:02
Total Recoverable	Prep	3005A			714515	BDE	EET CHI	05/22/23 09:02 - 05/22/23 09:32 [1]
Total Recoverable	Analysis	6020A		1	715273	FXG	EET CHI	05/24/23 20:07
Total Recoverable	Prep	3005A			714515	BDE	EET CHI	05/22/23 09:02 - 05/22/23 09:32 [1]
Total Recoverable	Analysis	6020A		1	715492	FXG	EET CHI	05/25/23 16:37
Total Recoverable	Prep	3005A			714515	BDE	EET CHI	05/22/23 09:02 - 05/22/23 09:32 [1]
Total Recoverable	Analysis	6020A		10	715492	FXG	EET CHI	05/25/23 16:40
Total/NA	Prep	7470A			716983	MJG	EET CHI	06/06/23 09:55 - 06/06/23 11:55 [1]
Total/NA	Analysis	7470A		1	717281	MJG	EET CHI	06/07/23 08:33
Total/NA	Analysis	SM 2540C		1	714420	CLB	EET CHI	05/22/23 01:07
Total/NA	Analysis	SM 4500 Cl- E		10	715089	MM	EET CHI	05/24/23 16:32
Total/NA	Analysis	SM 4500 F C		1	715052	EH	EET CHI	05/24/23 08:35
Total/NA	Analysis	SM 4500 SO4 E		20	715553	MM	EET CHI	05/26/23 14:09

[1] This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Accreditation/Certification Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR

Job ID: 500-233887-1

Laboratory: Eurofins Chicago

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Illinois	NELAP	IL00035	04-29-24

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Richard Gnat
KPRG and Associates, Inc.
14665 West Lisbon Road,
Suite 1A
Brookfield, Wisconsin 53005

Generated 6/21/2023 4:23:08 PM

JOB DESCRIPTION

Powerton CCR (RAD)

JOB NUMBER

500-233887-2

Eurofins Chicago
2417 Bond Street
University Park IL 60484

See page two for job notes and contact information.

my EOL

Eurofins Chicago

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Chicago Project Manager.

Authorization



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Authorized for release by
Diana Mockler, Project Manager I
Diana.Mockler@et.eurofinsus.com
(219)252-7570

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Case Narrative

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-233887-2

Job ID: 500-233887-2

Laboratory: Eurofins Chicago

Narrative

Job Narrative
500-233887-2

Receipt
The samples were received on 5/17/2023 10:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were -2.0º C, 0.1º C and 5.3º C.

RAD
Method 903.0: Radium-226 batch 613094
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
MW-09 (500-233887-1), MW-11 (500-233887-2), MW-12 (500-233887-3), (LCS 160-613094/2-A), (MB 160-613094/1-A) and (500-233887-F-3-A DU)

Methods 903.0, 9315: Radium-226 batch 613260
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
MW-01 (500-233887-4), MW-08 (500-233887-5), MW-15 (500-233887-6), (LCS 160-613260/2-A), (MB 160-613260/1-A) and (500-233887-G-4-B DU)

Method 904.0: Radium-228 batch 613098
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

MW-09 (500-233887-1), MW-11 (500-233887-2), MW-12 (500-233887-3), (LCS 160-613098/2-A), (MB 160-613098/1-A) and (500-233887-F-3-B DU)

Methods 904.0, 9320: Radium-228 batch 613360
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
MW-01 (500-233887-4), MW-08 (500-233887-5), MW-15 (500-233887-6), (LCS 160-613360/2-A), (MB 160-613360/1-A) and (500-233887-G-4-C DU)

Method PrecSep_0:

Method PrecSep-21:

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Method Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-233887-2

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	EET SL
904.0	Radium-228 (GFPC)	EPA	EET SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	EET SL
PrecSep_0	Preparation, Precipitate Separation	None	EET SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	EET SL

Protocol References:

EPA = US Environmental Protection Agency

None = None

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-233887-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-233887-1	MW-09	Water	05/16/23 15:18	05/17/23 10:00
500-233887-2	MW-11	Water	05/16/23 14:01	05/17/23 10:00
500-233887-3	MW-12	Water	05/16/23 12:57	05/17/23 10:00
500-233887-4	MW-01	Water	05/17/23 12:36	05/18/23 09:40
500-233887-5	MW-08	Water	05/17/23 11:32	05/18/23 09:40
500-233887-6	MW-15	Water	05/17/23 13:48	05/18/23 09:40

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-233887-2

Client Sample ID: MW-09

Date Collected: 05/16/23 15:18
Date Received: 05/17/23 10:00

Lab Sample ID: 500-233887-1

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.129	U	0.144	0.144	1.00	0.228	pCi/L	05/25/23 10:10	06/20/23 08:18	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.0*		*30 - 110*	*05/25/23 10:10*	*06/20/23 08:18*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.000	U	0.282	0.282	1.00	0.534	pCi/L	05/25/23 10:14	06/19/23 14:37	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.0*		*30 - 110*	*05/25/23 10:14*	*06/19/23 14:37*	*1*
Y Carrier	*85.6*		*30 - 110*	*05/25/23 10:14*	*06/19/23 14:37*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.129	U	0.317	0.317	5.00	0.534	pCi/L		06/21/23 11:14	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-233887-2

Client Sample ID: MW-11

Date Collected: 05/16/23 14:01
Date Received: 05/17/23 10:00

Lab Sample ID: 500-233887-2

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.206	U	0.189	0.190	1.00	0.290	pCi/L	05/25/23 10:10	06/20/23 08:18	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*87.0*		*30 - 110*	*05/25/23 10:10*	*06/20/23 08:18*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0336	U	0.338	0.338	1.00	0.625	pCi/L	05/25/23 10:14	06/19/23 14:38	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*87.0*		*30 - 110*	*05/25/23 10:14*	*06/19/23 14:38*	*1*
Y Carrier	*80.4*		*30 - 110*	*05/25/23 10:14*	*06/19/23 14:38*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.239	U	0.387	0.388	5.00	0.625	pCi/L		06/21/23 11:14	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-233887-2

Client Sample ID: MW-12

Date Collected: 05/16/23 12:57
Date Received: 05/17/23 10:00

Lab Sample ID: 500-233887-3

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0828	U	0.160	0.160	1.00	0.285	pCi/L	05/25/23 10:10	06/20/23 08:18	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*86.4*		*30 - 110*	*05/25/23 10:10*	*06/20/23 08:18*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.245	U	0.349	0.350	1.00	0.588	pCi/L	05/25/23 10:14	06/19/23 14:38	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*86.4*		*30 - 110*	*05/25/23 10:14*	*06/19/23 14:38*	*1*
Y Carrier	*83.0*		*30 - 110*	*05/25/23 10:14*	*06/19/23 14:38*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.328	U	0.384	0.385	5.00	0.588	pCi/L		06/21/23 11:14	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-233887-2

Client Sample ID: MW-01

Date Collected: 05/17/23 12:36
Date Received: 05/18/23 09:40

Lab Sample ID: 500-233887-4

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.129	U	0.158	0.159	1.00	0.259	pCi/L	05/26/23 09:29	06/20/23 22:35	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.6*		*30 - 110*	*05/26/23 09:29*	*06/20/23 22:35*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.153	U	0.284	0.285	1.00	0.493	pCi/L	05/26/23 13:14	06/20/23 11:17	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.6*		*30 - 110*	*05/26/23 13:14*	*06/20/23 11:17*	*1*
Y Carrier	*80.4*		*30 - 110*	*05/26/23 13:14*	*06/20/23 11:17*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.282	U	0.325	0.326	5.00	0.493	pCi/L		06/21/23 15:27	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-233887-2

Client Sample ID: MW-08

Date Collected: 05/17/23 11:32
Date Received: 05/18/23 09:40

Lab Sample ID: 500-233887-5

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.350**		0.209	0.211	1.00	0.267	pCi/L	05/26/23 09:29	06/20/23 22:35	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.1*		*30 - 110*	*05/26/23 09:29*	*06/20/23 22:35*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.365	U	0.328	0.330	1.00	0.519	pCi/L	05/26/23 13:14	06/20/23 11:21	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.1*		*30 - 110*	*05/26/23 13:14*	*06/20/23 11:21*	*1*
Y Carrier	*83.0*		*30 - 110*	*05/26/23 13:14*	*06/20/23 11:21*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.714**		0.389	0.392	5.00	0.519	pCi/L		06/21/23 15:27	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-233887-2

Client Sample ID: MW-15

Date Collected: 05/17/23 13:48
Date Received: 05/18/23 09:40

Lab Sample ID: 500-233887-6

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0106	U	0.126	0.126	1.00	0.265	pCi/L	05/26/23 09:29	06/20/23 22:37	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.1*		*30 - 110*	*05/26/23 09:29*	*06/20/23 22:37*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.279	U	0.327	0.328	1.00	0.538	pCi/L	05/26/23 13:14	06/20/23 11:21	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.1*		*30 - 110*	*05/26/23 13:14*	*06/20/23 11:21*	*1*
Y Carrier	*84.9*		*30 - 110*	*05/26/23 13:14*	*06/20/23 11:21*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.290	U	0.350	0.351	5.00	0.538	pCi/L		06/21/23 15:27	1

Definitions/Glossary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-233887-2

Qualifiers

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

QC Association Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-233887-2

Rad

Prep Batch: 613094

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233887-1	MW-09	Total/NA	Water	PrecSep-21	
500-233887-2	MW-11	Total/NA	Water	PrecSep-21	
500-233887-3	MW-12	Total/NA	Water	PrecSep-21	
MB 160-613094/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-613094/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
500-233887-3 DU	MW-12	Total/NA	Water	PrecSep-21	

Prep Batch: 613098

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233887-1	MW-09	Total/NA	Water	PrecSep_0	
500-233887-2	MW-11	Total/NA	Water	PrecSep_0	
500-233887-3	MW-12	Total/NA	Water	PrecSep_0	
MB 160-613098/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-613098/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
500-233887-3 DU	MW-12	Total/NA	Water	PrecSep_0	

Prep Batch: 613260

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233887-4	MW-01	Total/NA	Water	PrecSep-21	
500-233887-5	MW-08	Total/NA	Water	PrecSep-21	
500-233887-6	MW-15	Total/NA	Water	PrecSep-21	
MB 160-613260/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-613260/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
500-233887-4 DU	MW-01	Total/NA	Water	PrecSep-21	

Prep Batch: 613360

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233887-4	MW-01	Total/NA	Water	PrecSep_0	
500-233887-5	MW-08	Total/NA	Water	PrecSep_0	
500-233887-6	MW-15	Total/NA	Water	PrecSep_0	
MB 160-613360/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-613360/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
500-233887-4 DU	MW-01	Total/NA	Water	PrecSep_0	

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-233887-2

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-613094/1-A
Matrix: Water
Analysis Batch: 616862

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 613094

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.003634	U	0.101	0.101	1.00	0.218	pCi/L	05/25/23 10:10	06/20/23 08:13	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.5*		*30 - 110*	*05/25/23 10:10*	*06/20/23 08:13*	*1*

Lab Sample ID: LCS 160-613094/2-A
Matrix: Water
Analysis Batch: 616862

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 613094

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			11.3	9.528		1.19	1.00	0.208	pCi/L	84	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*93.4*		*30 - 110*

Lab Sample ID: 500-233887-3 DU
Matrix: Water
Analysis Batch: 616862

Client Sample ID: MW-12
Prep Type: Total/NA
Prep Batch: 613094

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Radium-226	0.0828	U		0.1925	U	0.173	1.00	0.257	pCi/L			0.33	1

Carrier	*DU %Yield*	*DU Qualifier*	*Limits*
Ba Carrier	*87.5*		*30 - 110*

Lab Sample ID: MB 160-613260/1-A
Matrix: Water
Analysis Batch: 616866

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 613260

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.03010	U	0.129	0.129	1.00	0.292	pCi/L	05/26/23 09:29	06/20/23 20:52	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*87.0*		*30 - 110*	*05/26/23 09:29*	*06/20/23 20:52*	*1*

Lab Sample ID: LCS 160-613260/2-A
Matrix: Water
Analysis Batch: 616866

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 613260

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			11.3	9.751		1.28	1.00	0.348	pCi/L	86	75 - 125		

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-233887-2

Method: 903.0 - Radium-226 (GFPC) (Continued)

Lab Sample ID: LCS 160-613260/2-A
Matrix: Water
Analysis Batch: 616866

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 613260

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	85.4		30 - 110

Lab Sample ID: 500-233887-4 DU
Matrix: Water
Analysis Batch: 616862

Client Sample ID: MW-01
Prep Type: Total/NA
Prep Batch: 613260

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Radium-226	0.129	U		0.009911	U	0.144	1.00	0.291	pCi/L			0.39	1

Carrier	DU %Yield	DU Qualifier	Limits
Ba Carrier	91.3		30 - 110

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-613098/1-A
Matrix: Water
Analysis Batch: 616572

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 613098

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.4105	U	0.369	0.370	1.00	0.584	pCi/L	05/25/23 10:14	06/19/23 14:27	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	90.5		30 - 110	05/25/23 10:14	06/19/23 14:27	1
Y Carrier	84.1		30 - 110	05/25/23 10:14	06/19/23 14:27	1

Lab Sample ID: LCS 160-613098/2-A
Matrix: Water
Analysis Batch: 616572

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 613098

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			8.11	9.727		1.35	1.00	0.644	pCi/L	120	75 - 125		

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	93.4		30 - 110
Y Carrier	82.2		30 - 110

Lab Sample ID: 500-233887-3 DU
Matrix: Water
Analysis Batch: 616575

Client Sample ID: MW-12
Prep Type: Total/NA
Prep Batch: 613098

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Radium-228	0.245	U		0.2001	U	0.317	1.00	0.540	pCi/L			0.07	1

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-233887-2

Method: 904.0 - Radium-228 (GFPC) (Continued)

Lab Sample ID: 500-233887-3 DU
Matrix: Water
Analysis Batch: 616575

Client Sample ID: MW-12
Prep Type: Total/NA
Prep Batch: 613098

Carrier	DU %Yield	DU Qualifier	Limits
Ba Carrier	87.5		30 - 110
Y Carrier	83.0		30 - 110

Lab Sample ID: MB 160-613360/1-A
Matrix: Water
Analysis Batch: 616868

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 613360

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.1566	U	0.299	0.299	1.00	0.517	pCi/L	05/26/23 13:14	06/20/23 11:15	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	87.0		30 - 110	05/26/23 13:14	06/20/23 11:15	1
Y Carrier	86.4		30 - 110	05/26/23 13:14	06/20/23 11:15	1

Lab Sample ID: LCS 160-613360/2-A
Matrix: Water
Analysis Batch: 616868

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 613360

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			8.10	8.095		1.15	1.00	0.499	pCi/L	100	75 - 125		

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	85.4		30 - 110
Y Carrier	88.2		30 - 110

Lab Sample ID: 500-233887-4 DU
Matrix: Water
Analysis Batch: 616863

Client Sample ID: MW-01
Prep Type: Total/NA
Prep Batch: 613360

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Radium-228	0.153	U		0.3729	U	0.352	1.00	0.560	pCi/L			0.34	1

Carrier	DU %Yield	DU Qualifier	Limits
Ba Carrier	91.3		30 - 110
Y Carrier	80.7		30 - 110

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone (708) 534-5200 Phone (708) 534-5211

Chain of Custody Record

Environment Testing

500-233887 COC 1

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Job #: 500-233887-2

Client Information	Sampler: Kaelyn Sperle	Lab PM: Mockler Diana J	Carrier Tracking No(s):
Client Contact: Kaelyn Sperle	Phone: 262-278-1621	E-Mail: Diana Mockler@et.eurofinsus com	State of Origin: IL
Company: KPRG and Associates, Inc	PWSID:		
Address: 14665 West Lisbon Road, Suite 1A	Due Date Requested: Standard		
City: Brookfield	TAT Requested (days): Standard		
State, Zip: WI, 53005	Compliance Project: Δ Yes Δ No		
Phone: 262-781-0475(Tel)	PO #: 4502125100		
Email: kaelyns@kprginc com	WO #:		
Project Name: Powerton CCR Event Desc. Quarterly Powerton CCR Samplling	Project #: 50011612		
Site: Illinois	SSOW#:		

Analysis Requested

Preservation Codes

A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4-5
Y - Trizma
Z - other (specify)
Other:

	Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, 904.0	6020A, 7470A	2540C, 4500_F_C, SM4500_Cl_E	SM4500_SO4_E - Sulfate	Total Number of containers	Special Instructions/Note:
				Preservation Code				D	D	N	N		
	~~MW-01~~				Water								
	~~MW-08~~				Water								
1	MW-09	5/16/23	1518	G	Water	N	N	X	X	X	X		
2	MW-11	5/16/23	1401	↓	Water	N	N	X	X	X	X		
3	MW-12	5/16/23	1257	↓	Water	N	N	↓	↓	↓	↓		
	~~MW-15~~				Water								
	~~MW-17~~				Water								
	~~MW-18~~				Water								
	~~MW-19~~				Water								
					Water								
					Water								

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I, II, III, IV, Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by:	Date	Time	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time	Company
1	Kaelyn Sperle	5/16/23/1700	KPRG	FedEx	5/16/23/1700	FedEx
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 5/17/23 1000	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact. Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks: 5.4-5.3

Eurofins Chicago
2417 Bond Street
University Park IL 60484
Phone (708) 534-5200 Phone (708) 534-5211

Chain of Custody Record

Environment Testing

500-233887 COC

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233887

Client Information	Sampler: Kaelyn Sperle	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	Job #: 500-
Client Contact: Kaelyn Sperle	Phone: 262-278-1621	E-Mail: Diana Mockler@et.eurofinsus.com	State of Origin: IL	
Company: KPRG and Associates, Inc	PWSID:			

Address: 14665 West Lisbon Road, Suite 1A	Due Date Requested: Standard	
City: Brookfield	TAT Requested (days): Standard	
State, Zip: WI, 53005	Compliance Project. Δ Yes Δ No	
Phone: 262-781-0475(Tel)	PO #: 4502125100	
Email: kaelyns@kprginc com	WO #:	
Project Name: Powerton CCR Event Desc Quarterly Powerton CCR Sampling	Project #: 50011612	
Site: Illinois	SSOW#:	

Analysis Requested

Preservation Codes

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, 904.0	6020A, 7470A	2540C, 4500_F_C, SM4500_Cl_E	SM4500_SO4_E - Sulfate	Total Number of containers	Special Instructions/Note:
			Preservation Code				D	D	N	N		
4 MW-01	5/17/23	1236	G	Water	N	N	X	X	X	X		
5 MW-08	5/17/23	1132	G	Water	N	N	X	X	X	X		
~~MW-09~~				Water								
~~MW-11~~				Water								
~~MW-12~~				Water								
6 MW-15	5/17/23	1348	G	Water	N	N	X	X	X	X		
~~MW-17~~				Water								
~~MW-18~~				Water								
~~MW-19~~				Water								
				Water								
				Water								

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II, III IV, Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by:	Date	Time	Method of Shipment:

	Date/Time:	Company		Date/Time	Company
Relinquished by: Kaelyn Sperle	5/17/23/1730	KPRG	Received by: FedEx	5/17/23/1730	FedEx
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 5/18/23 0840	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks: 0.4 - 0.1

Ver: 01/16/2019

Eurofins Chicago
2417 Bond Street
University Park IL 60484
Phone (708) 534-5200 Phone (708) 534-5211

Chain of Custody Record

eurofins | Environment Testing

500-233887 COC

Client Information	Sampler: Kaelyn Sperle	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	COC No: 500-112087-46458 1
Client Contact: Kaelyn Sperle	Phone: 262-278-1621	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: IL	Page: Page 1 of 1
Company: KPRG and Associates, Inc	PWSID:			Job #: 500-233887
Address: 14665 West Lisbon Road, Suite 1A	Due Date Requested: Standard			
City: Brookfield	TAT Requested (days): Standard			
State, Zip: WI, 53005	Compliance Project: Δ Yes Δ No			
Phone: 262-781-0475(Tel)	PO #: 4502125100			
Email: kaelyns@kprginc.com	WO #:			
Project Name: Powerton CCR Event Desc. Quarterly Powerton CCR Sampling ABBASB	Project #: 50011612			
Site: Illinois	SSOW#:			

Analysis Requested

Preservation Codes

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)

Other:

	Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, 904.0	6020A, 7470A	2540C, 4500_F_C, SM4500_Cl_E	SM4500_SO4_E - Sulfate	Total Number of containers	Special Instructions/Note:
				Preservation Code				D	D	N	N		
	~~MW-01~~				Water								
	~~MW-08~~				Water								
	~~MW-09~~				Water								
	~~MW-11~~				Water								
	~~MW-12~~				Water								
	~~MW-15~~	X			Water								
7	MW-17	5/18/23	1337	G	Water	N	N	X	X	X	X		
8	MW-18	5/18/23	1234		Water	N	N						
9	MW-19	5/18/23	1441		Water	N	N						
10	Duplicate	5/18/23	-	↓	Water	N	N	↓	↓	↓	↓		
					Water								

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I, II, III IV, Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	Kaelyn Sperle	5/18/23/1715	KPRG	FedEx	5/18/23/1715	FedEx
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 5/18/23 1000	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No

Cooler Temperature(s) °C and Other Remarks: -2.4 -2.0


ORIGIN ID:PIAA (262) 278-1621
KPRG AND ASSOCIATES
414 PLAZA DR STE 106
WESTMONT, IL 60559
UNITED STATES US
SHIP DATE: 16MAY23
ACTWGT: 58.00 LB
CAD: 6994779/SSFE2420
DIMS: 24x18x12 IN
BILL THIRD PARTY
TO SAMPLE RECEIVING
EUROFINS CHICAGO
2417 BOND ST
UNIVERSITY PARK IL 60
(000) 000-0000
INV:
PO
REF
500-233887 Waybi
DEPT.
ST TO
05 17
FedEx
Express
1 of 4
TRK# 0201 3983 9576 9626
MASTER
XN JOTA
WED - 17 MAY 10:30A
PRIORITY OVERNIGHT
60484
IL-US ORD

500-233887 Waybi



Do Not Lift Using This Tag

RT 519 ST 20

5 10:30 A 7203 05 19

IGIN ID:PIAA (000) 000-0000

RG AND ASSOCIATES
4 PLAZA DR STE 106

STMONT, IL 60559
NITED STATES US

E: 18MAY23
T: 43.00 LB
CAD: 6994779/SSFE2420
DIMS: 24x18x12 IN

BILL THIRD PARTY

Part # 156297-435 REV# EXP: 11/23

SAMPLE RECEIVING
EUROFINS CHICAGO
2417 BOND ST

UNIVERSITY PARK IL 60484

(000) 000-0000
INV:
PO:
REF:
DEPT:

FedEx Express

2 of 3

MPS# 0263 3984 9766 7203
Mstr# 3984 9766 7199

0201

FRI - 19 MAY 10:30A
PRIORITY OVERNIGHT

60484
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XN JOTA

Do Not Lift Using This Tag

ORIGIN ID:PIAA (000) 000-0000

KPRG AND ASSOCIATES
414 PLAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 18MAY23
ACTWGT: 43.00 LB
CAD: 6994779/SSFE2420
DIMS: 24x18x12 IN

BILL THIRD P

TO SAMPLE RECEIVING
EUROFINS CHICAGO
2417 BOND ST

UNIVERSITY PARK I

RT 519 ST 20

5 10:30 A 7199 05 19

Part # 156297-435 REV# EXP: 11/23

(000) 000-0000
INV:
PO:
REF:
DEPT:

FedEx Express

1 of 3

TRK# 0201 3984 9766 7199
MASTER

FRI - 19 MAY 10:30A
PRIORITY OVERNIGHT

XN JOTA

60484
IL-US ORD

500-233887 Waybi

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone: 708-534-5200 Fax: 708-534-5211

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	COC No: 500-173985.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: Illinois	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Illinois		Job #: 500-233887-2
Address: 13715 Rider Trail North, ,	Due Date Requested: 6/19/2023			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Powerton CCR (RAD)	Project #: 50011612			
Site: MWG - Powerton	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4-5
Y - Trizma
Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_21 Standard Target List	904.0/PrecSep_0 Standard Target List	Ra226Ra228_GFPC	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
MW-09 (500-233887-1)	5/16/23	15:18 Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
MW-11 (500-233887-2)	5/16/23	14:01 Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
MW-12 (500-233887-3)	5/16/23	12:57 Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no

Note: Since laboratory accreditations are subject to change, Eurofins Chicago places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Chicago laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Chicago attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Chicago.

Possible Hazard Identification
Unconfirmed

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	5/17/23 1510		Fedex		
Fedex			Conor Gorrell	08:40 May 18 2023	ETA STL

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone: 708-534-5200 Fax: 708-534-5211

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	COC No: 500-174049.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: Illinois	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Illinois		Job #: 500-233887-2
Address: 13715 Rider Trail North, ,	Due Date Requested: 6/21/2023			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Powerton CCR (RAD)	Project #: 50011612			
Site: MWG - Powerton	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4-5
Y - Trizma
Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_21 Standard Target List	904.0/PrecSep_0 Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
MW-01 (500-233887-4)	5/17/23	12:36 Central		Water			X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
MW-08 (500-233887-5)	5/17/23	11:32 Central		Water			X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
MW-15 (500-233887-6)	5/17/23	13:48 Central		Water			X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
									9	

Note: Since laboratory accreditations are subject to change, Eurofins Chicago places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Chicago laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Chicago attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Chicago.

Possible Hazard Identification
Unconfirmed

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	5/19/23 1600		fedex		
fedex			Briana Sharkey-Gazalez	5/22/23 0805	EIASTL

Custody Seals Intact: Δ Yes Δ No

Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

6/21/2023

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-233887-2

Login Number: 233887
List Number: 1
Creator: James, Jeff A

List Source: Eurofins Chicago

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	5.3,0.1,-2.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-233887-2

Login Number: 233887
List Number: 2
Creator: Farrell, Conor P

List Source: Eurofins St. Louis
List Creation: 05/18/23 01:47 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-233887-2

Login Number: 233887
List Number: 3
Creator: Sharkey-Gonzalez, Briana L

List Source: Eurofins St. Louis
List Creation: 05/22/23 06:02 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-233887-2

Client Sample ID: MW-09
Date Collected: 05/16/23 15:18
Date Received: 05/17/23 10:00

Lab Sample ID: 500-233887-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			613094	KAC	EET SL	05/25/23 10:10
Total/NA	Analysis	903.0		1	616862	FLC	EET SL	06/20/23 08:18
Total/NA	Prep	PrecSep_0			613098	KAC	EET SL	05/25/23 10:14
Total/NA	Analysis	904.0		1	616575	FLC	EET SL	06/19/23 14:37
Total/NA	Analysis	Ra226_Ra228		1	616996	SCB	EET SL	06/21/23 11:14

Client Sample ID: MW-11
Date Collected: 05/16/23 14:01
Date Received: 05/17/23 10:00

Lab Sample ID: 500-233887-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			613094	KAC	EET SL	05/25/23 10:10
Total/NA	Analysis	903.0		1	616862	FLC	EET SL	06/20/23 08:18
Total/NA	Prep	PrecSep_0			613098	KAC	EET SL	05/25/23 10:14
Total/NA	Analysis	904.0		1	616575	FLC	EET SL	06/19/23 14:38
Total/NA	Analysis	Ra226_Ra228		1	616996	SCB	EET SL	06/21/23 11:14

Client Sample ID: MW-12
Date Collected: 05/16/23 12:57
Date Received: 05/17/23 10:00

Lab Sample ID: 500-233887-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			613094	KAC	EET SL	05/25/23 10:10
Total/NA	Analysis	903.0		1	616862	FLC	EET SL	06/20/23 08:18
Total/NA	Prep	PrecSep_0			613098	KAC	EET SL	05/25/23 10:14
Total/NA	Analysis	904.0		1	616575	FLC	EET SL	06/19/23 14:38
Total/NA	Analysis	Ra226_Ra228		1	616996	SCB	EET SL	06/21/23 11:14

Client Sample ID: MW-01
Date Collected: 05/17/23 12:36
Date Received: 05/18/23 09:40

Lab Sample ID: 500-233887-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			613260	KAC	EET SL	05/26/23 09:29
Total/NA	Analysis	903.0		1	616862	FLC	EET SL	06/20/23 22:35
Total/NA	Prep	PrecSep_0			613360	KAC	EET SL	05/26/23 13:14
Total/NA	Analysis	904.0		1	616868	FLC	EET SL	06/20/23 11:17
Total/NA	Analysis	Ra226_Ra228		1	617159	EMH	EET SL	06/21/23 15:27

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-233887-2

Client Sample ID: MW-08

Lab Sample ID: 500-233887-5

Date Collected: 05/17/23 11:32

Matrix: Water

Date Received: 05/18/23 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			613260	KAC	EET SL	05/26/23 09:29
Total/NA	Analysis	903.0		1	616862	FLC	EET SL	06/20/23 22:35
Total/NA	Prep	PrecSep_0			613360	KAC	EET SL	05/26/23 13:14
Total/NA	Analysis	904.0		1	616863	FLC	EET SL	06/20/23 11:21
Total/NA	Analysis	Ra226_Ra228		1	617159	EMH	EET SL	06/21/23 15:27

Client Sample ID: MW-15

Lab Sample ID: 500-233887-6

Date Collected: 05/17/23 13:48

Matrix: Water

Date Received: 05/18/23 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			613260	KAC	EET SL	05/26/23 09:29
Total/NA	Analysis	903.0		1	616862	FLC	EET SL	06/20/23 22:37
Total/NA	Prep	PrecSep_0			613360	KAC	EET SL	05/26/23 13:14
Total/NA	Analysis	904.0		1	616863	FLC	EET SL	06/20/23 11:21
Total/NA	Analysis	Ra226_Ra228		1	617159	EMH	EET SL	06/21/23 15:27

Laboratory References:

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-233887-2

Laboratory: Eurofins St. Louis

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Illinois	NELAP	200023	11-30-23

Tracer/Carrier Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR (RAD)

Job ID: 500-233887-2

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water — **Prep Type: Total/NA**

Lab Sample ID	Client Sample ID	Percent Yield (Acceptance Limits) Ba (30-110)
500-233887-1	MW-09	90.0
500-233887-2	MW-11	87.0
500-233887-3	MW-12	86.4
500-233887-3 DU	MW-12	87.5
500-233887-4	MW-01	91.6
500-233887-4 DU	MW-01	91.3
500-233887-5	MW-08	92.1
500-233887-6	MW-15	94.1
LCS 160-613094/2-A	Lab Control Sample	93.4
LCS 160-613260/2-A	Lab Control Sample	85.4
MB 160-613094/1-A	Method Blank	90.5
MB 160-613260/1-A	Method Blank	87.0

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water — **Prep Type: Total/NA**

Lab Sample ID	Client Sample ID	Percent Yield (Acceptance Limits) Ba (30-110)	Y (30-110)
500-233887-1	MW-09	90.0	85.6
500-233887-2	MW-11	87.0	80.4
500-233887-3	MW-12	86.4	83.0
500-233887-3 DU	MW-12	87.5	83.0
500-233887-4	MW-01	91.6	80.4
500-233887-4 DU	MW-01	91.3	80.7
500-233887-5	MW-08	92.1	83.0
500-233887-6	MW-15	94.1	84.9
LCS 160-613098/2-A	Lab Control Sample	93.4	82.2
LCS 160-613360/2-A	Lab Control Sample	85.4	88.2
MB 160-613098/1-A	Method Blank	90.5	84.1
MB 160-613360/1-A	Method Blank	87.0	86.4

Tracer/Carrier Legend

Ba = Ba Carrier
Y = Y Carrier

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ANALYTICAL REPORT

PREPARED FOR

Attn: Richard Gnat
KPRG and Associates, Inc.
14665 West Lisbon Road,
Suite 1A
Brookfield, Wisconsin 53005

Generated 6/8/2023 3:23:35 PM

JOB DESCRIPTION

Powerton CCR ABB/ASB

JOB NUMBER

500-233887-3

Eurofins Chicago
2417 Bond Street
University Park IL 60484

See page two for job notes and contact information.

my EOL

Eurofins Chicago

Job Notes

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Authorization



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Authorized for release by
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(219)252-7570

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR ABB/ASB

Laboratory Job ID: 500-233887-3

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Case Narrative

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR ABB/ASB

Job ID: 500-233887-3

Job ID: 500-233887-3

Laboratory: Eurofins Chicago

Narrative

Job Narrative
500-233887-3

Receipt
The samples were received on 5/17/2023 10:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were -2.0º C, 0.1º C and 5.3º C.

Metals
Methods 6020A, 6020B: The initial low level and continuing calibration verification (ICVL/CCVL) associated with batch 500-715021 recovered above the upper control limit for Beryllium. The samples associated with this CCV were non-detects for the affected analyte; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR ABB/ASB

Job ID: 500-233887-3

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	EET CHI
7470A	Mercury (CVAA)	SW846	EET CHI
SM 2540C	Solids, Total Dissolved (TDS)	SM	EET CHI
SM 4500 Cl- E	Chloride, Total	SM	EET CHI
SM 4500 F C	Fluoride	SM	EET CHI
SM 4500 SO4 E	Sulfate, Total	SM	EET CHI
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET CHI
7470A	Preparation, Mercury	SW846	EET CHI

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Sample Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR ABB/ASB

Job ID: 500-233887-3

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-233887-7	MW-17	Water	05/18/23 13:37	05/19/23 10:00
500-233887-8	MW-18	Water	05/18/23 12:34	05/19/23 10:00
500-233887-9	MW-19	Water	05/18/23 14:41	05/19/23 10:00
500-233887-10	Duplicate	Water	05/18/23 00:00	05/19/23 10:00

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR ABB/ASB

Job ID: 500-233887-3

Client Sample ID: MW-17

Date Collected: 05/18/23 13:37
Date Received: 05/19/23 10:00

Lab Sample ID: 500-233887-7

Matrix: Water

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		05/22/23 09:02	05/24/23 20:10	1
Arsenic	**0.0026**		0.0010		mg/L		05/22/23 09:02	05/23/23 23:05	1
Barium	**0.023**		0.0025		mg/L		05/22/23 09:02	05/23/23 23:05	1
Beryllium	<0.0010	^+ ^1+	0.0010		mg/L		05/22/23 09:02	05/23/23 23:05	1
Boron	**0.98**		0.050		mg/L		05/22/23 09:02	05/23/23 23:05	1
Cadmium	<0.00050		0.00050		mg/L		05/22/23 09:02	05/23/23 23:05	1
Calcium	**150**		0.20		mg/L		05/22/23 09:02	05/24/23 20:10	1
Chromium	<0.0050		0.0050		mg/L		05/22/23 09:02	05/23/23 23:05	1
Cobalt	<0.0010		0.0010		mg/L		05/22/23 09:02	05/23/23 23:05	1
Lead	<0.00050		0.00050		mg/L		05/22/23 09:02	05/23/23 23:05	1
Lithium	**0.011**		0.010		mg/L		05/22/23 09:02	05/25/23 16:43	1
Molybdenum	**0.058**		0.0050		mg/L		05/22/23 09:02	05/23/23 23:05	1
Selenium	<0.0025		0.0025		mg/L		05/22/23 09:02	05/23/23 23:05	1
Thallium	<0.0020		0.0020		mg/L		05/22/23 09:02	05/23/23 23:05	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/06/23 09:55	06/07/23 08:35	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**1400**		10		mg/L			05/22/23 01:10	1
Chloride (SM 4500 Cl- E)	**190**		20		mg/L			05/24/23 16:32	10
Fluoride (SM 4500 F C)	**0.65**		0.10		mg/L			05/24/23 08:35	1
Sulfate (SM 4500 SO4 E)	**460**		250		mg/L			05/26/23 14:10	50

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR ABB/ASB

Job ID: 500-233887-3

Client Sample ID: MW-18

Date Collected: 05/18/23 12:34
Date Received: 05/19/23 10:00

Lab Sample ID: 500-233887-8

Matrix: Water

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		05/22/23 09:02	05/24/23 20:14	1
Arsenic	<0.0010		0.0010		mg/L		05/22/23 09:02	05/23/23 23:09	1
Barium	**0.12**		0.0025		mg/L		05/22/23 09:02	05/23/23 23:09	1
Beryllium	<0.0010	^+ ^1+	0.0010		mg/L		05/22/23 09:02	05/23/23 23:09	1
Boron	**0.61**		0.050		mg/L		05/22/23 09:02	05/23/23 23:09	1
Cadmium	<0.00050		0.00050		mg/L		05/22/23 09:02	05/23/23 23:09	1
Calcium	**130**		0.20		mg/L		05/22/23 09:02	05/24/23 20:14	1
Chromium	<0.0050		0.0050		mg/L		05/22/23 09:02	05/23/23 23:09	1
Cobalt	<0.0010		0.0010		mg/L		05/22/23 09:02	05/23/23 23:09	1
Lead	<0.00050		0.00050		mg/L		05/22/23 09:02	05/23/23 23:09	1
Lithium	<0.010		0.010		mg/L		05/22/23 09:02	05/25/23 16:54	1
Molybdenum	**0.0060**		0.0050		mg/L		05/22/23 09:02	05/23/23 23:09	1
Selenium	<0.0025		0.0025		mg/L		05/22/23 09:02	05/23/23 23:09	1
Thallium	<0.0020		0.0020		mg/L		05/22/23 09:02	05/23/23 23:09	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/06/23 09:55	06/07/23 08:41	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**1000**		10		mg/L			05/22/23 01:13	1
Chloride (SM 4500 Cl- E)	**140**		10		mg/L			05/24/23 16:32	5
Fluoride (SM 4500 F C)	**0.52**		0.10		mg/L			05/24/23 08:35	1
Sulfate (SM 4500 SO4 E)	**120**		50		mg/L			05/26/23 14:24	10

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR ABB/ASB

Job ID: 500-233887-3

Client Sample ID: MW-19

Date Collected: 05/18/23 14:41
Date Received: 05/19/23 10:00

Lab Sample ID: 500-233887-9

Matrix: Water

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		05/22/23 09:02	05/24/23 20:17	1
Arsenic	<0.0010		0.0010		mg/L		05/22/23 09:02	05/23/23 23:12	1
Barium	**0.069**		0.0025		mg/L		05/22/23 09:02	05/23/23 23:12	1
Beryllium	<0.0010	^+ ^1+	0.0010		mg/L		05/22/23 09:02	05/23/23 23:12	1
Boron	**3.8**		0.050		mg/L		05/22/23 09:02	05/23/23 23:12	1
Cadmium	<0.00050		0.00050		mg/L		05/22/23 09:02	05/23/23 23:12	1
Calcium	**78**		0.20		mg/L		05/22/23 09:02	05/24/23 20:17	1
Chromium	<0.0050		0.0050		mg/L		05/22/23 09:02	05/23/23 23:12	1
Cobalt	<0.0010		0.0010		mg/L		05/22/23 09:02	05/23/23 23:12	1
Lead	<0.00050		0.00050		mg/L		05/22/23 09:02	05/23/23 23:12	1
Lithium	**0.010**		0.010		mg/L		05/22/23 09:02	05/25/23 16:57	1
Molybdenum	**0.030**		0.0050		mg/L		05/22/23 09:02	05/23/23 23:12	1
Selenium	**0.0035**		0.0025		mg/L		05/22/23 09:02	05/23/23 23:12	1
Thallium	<0.0020		0.0020		mg/L		05/22/23 09:02	05/23/23 23:12	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/06/23 09:55	06/07/23 08:43	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**580**		10		mg/L			05/22/23 01:15	1
Chloride (SM 4500 Cl- E)	**31**		2.0		mg/L			05/24/23 16:33	1
Fluoride (SM 4500 F C)	**0.13**		0.10		mg/L			05/24/23 08:35	1
Sulfate (SM 4500 SO4 E)	**150**		50		mg/L			05/26/23 14:24	10

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR ABB/ASB

Job ID: 500-233887-3

Client Sample ID: Duplicate

Date Collected: 05/18/23 00:00
Date Received: 05/19/23 10:00

Lab Sample ID: 500-233887-10

Matrix: Water

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		05/22/23 09:02	05/24/23 20:20	1
Arsenic	**0.0015**		0.0010		mg/L		05/22/23 09:02	05/23/23 23:16	1
Barium	**0.11**		0.0025		mg/L		05/22/23 09:02	05/23/23 23:16	1
Beryllium	<0.0010	^+ ^1+	0.0010		mg/L		05/22/23 09:02	05/23/23 23:16	1
Boron	**0.59**		0.050		mg/L		05/22/23 09:02	05/23/23 23:16	1
Cadmium	<0.00050		0.00050		mg/L		05/22/23 09:02	05/23/23 23:16	1
Calcium	**130**		0.20		mg/L		05/22/23 09:02	05/24/23 20:20	1
Chromium	<0.0050		0.0050		mg/L		05/22/23 09:02	05/23/23 23:16	1
Cobalt	<0.0010		0.0010		mg/L		05/22/23 09:02	05/23/23 23:16	1
Lead	<0.00050		0.00050		mg/L		05/22/23 09:02	05/23/23 23:16	1
Lithium	**0.011**		0.010		mg/L		05/22/23 09:02	06/08/23 13:11	1
Molybdenum	**0.0059**		0.0050		mg/L		05/22/23 09:02	05/23/23 23:16	1
Selenium	<0.0025		0.0025		mg/L		05/22/23 09:02	05/23/23 23:16	1
Thallium	<0.0020		0.0020		mg/L		05/22/23 09:02	05/23/23 23:16	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/06/23 09:55	06/07/23 08:52	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**1100**		10		mg/L			05/22/23 01:18	1
Chloride (SM 4500 Cl- E)	**150**		20		mg/L			05/24/23 16:33	10
Fluoride (SM 4500 F C)	**0.56**		0.10		mg/L			05/24/23 08:35	1
Sulfate (SM 4500 SO4 E)	**110**		50		mg/L			05/26/23 14:25	10

Definitions/Glossary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR ABB/ASB

Job ID: 500-233887-3

Qualifiers

Metals

Qualifier	Qualifier Description
^+	Continuing Calibration Verification (CCV) is outside acceptance limits, high biased.
^1+	Initial Calibration Verification (ICV) is outside acceptance limits, high biased.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

QC Association Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR ABB/ASB

Job ID: 500-233887-3

Metals

Prep Batch: 714515

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233887-7	MW-17	Total Recoverable	Water	3005A	
500-233887-8	MW-18	Total Recoverable	Water	3005A	
500-233887-9	MW-19	Total Recoverable	Water	3005A	
500-233887-10	Duplicate	Total Recoverable	Water	3005A	
MB 500-714515/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 500-714515/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 715021

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233887-7	MW-17	Total Recoverable	Water	6020A	714515
500-233887-8	MW-18	Total Recoverable	Water	6020A	714515
500-233887-9	MW-19	Total Recoverable	Water	6020A	714515
500-233887-10	Duplicate	Total Recoverable	Water	6020A	714515
MB 500-714515/1-A	Method Blank	Total Recoverable	Water	6020A	714515
LCS 500-714515/2-A	Lab Control Sample	Total Recoverable	Water	6020A	714515

Analysis Batch: 715273

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233887-7	MW-17	Total Recoverable	Water	6020A	714515
500-233887-8	MW-18	Total Recoverable	Water	6020A	714515
500-233887-9	MW-19	Total Recoverable	Water	6020A	714515
500-233887-10	Duplicate	Total Recoverable	Water	6020A	714515
MB 500-714515/1-A	Method Blank	Total Recoverable	Water	6020A	714515
LCS 500-714515/2-A	Lab Control Sample	Total Recoverable	Water	6020A	714515

Analysis Batch: 715492

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233887-7	MW-17	Total Recoverable	Water	6020A	714515
500-233887-8	MW-18	Total Recoverable	Water	6020A	714515
500-233887-9	MW-19	Total Recoverable	Water	6020A	714515
MB 500-714515/1-A	Method Blank	Total Recoverable	Water	6020A	714515
LCS 500-714515/2-A	Lab Control Sample	Total Recoverable	Water	6020A	714515

Prep Batch: 716983

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233887-7	MW-17	Total/NA	Water	7470A	
500-233887-8	MW-18	Total/NA	Water	7470A	
500-233887-9	MW-19	Total/NA	Water	7470A	
500-233887-10	Duplicate	Total/NA	Water	7470A	
MB 500-716983/12-A	Method Blank	Total/NA	Water	7470A	
LCS 500-716983/13-A	Lab Control Sample	Total/NA	Water	7470A	
500-233887-9 MS	MW-19	Total/NA	Water	7470A	
500-233887-9 MSD	MW-19	Total/NA	Water	7470A	
500-233887-9 DU	MW-19	Total/NA	Water	7470A	

Analysis Batch: 717281

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233887-7	MW-17	Total/NA	Water	7470A	716983
500-233887-8	MW-18	Total/NA	Water	7470A	716983
500-233887-9	MW-19	Total/NA	Water	7470A	716983
500-233887-10	Duplicate	Total/NA	Water	7470A	716983

QC Association Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR ABB/ASB

Job ID: 500-233887-3

Metals (Continued)

Analysis Batch: 717281 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 500-716983/12-A	Method Blank	Total/NA	Water	7470A	716983
LCS 500-716983/13-A	Lab Control Sample	Total/NA	Water	7470A	716983
500-233887-9 MS	MW-19	Total/NA	Water	7470A	716983
500-233887-9 MSD	MW-19	Total/NA	Water	7470A	716983
500-233887-9 DU	MW-19	Total/NA	Water	7470A	716983

Analysis Batch: 717605

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233887-10	Duplicate	Total Recoverable	Water	6020A	714515

General Chemistry

Analysis Batch: 714420

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233887-7	MW-17	Total/NA	Water	SM 2540C	
500-233887-8	MW-18	Total/NA	Water	SM 2540C	
500-233887-9	MW-19	Total/NA	Water	SM 2540C	
500-233887-10	Duplicate	Total/NA	Water	SM 2540C	
MB 500-714420/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 500-714420/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 715052

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233887-7	MW-17	Total/NA	Water	SM 4500 F C	
500-233887-8	MW-18	Total/NA	Water	SM 4500 F C	
500-233887-9	MW-19	Total/NA	Water	SM 4500 F C	
500-233887-10	Duplicate	Total/NA	Water	SM 4500 F C	
MB 500-715052/3	Method Blank	Total/NA	Water	SM 4500 F C	
LCS 500-715052/4	Lab Control Sample	Total/NA	Water	SM 4500 F C	

Analysis Batch: 715089

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233887-7	MW-17	Total/NA	Water	SM 4500 Cl- E	
500-233887-8	MW-18	Total/NA	Water	SM 4500 Cl- E	
500-233887-9	MW-19	Total/NA	Water	SM 4500 Cl- E	
500-233887-10	Duplicate	Total/NA	Water	SM 4500 Cl- E	
MB 500-715089/113	Method Blank	Total/NA	Water	SM 4500 Cl- E	
LCS 500-715089/114	Lab Control Sample	Total/NA	Water	SM 4500 Cl- E	

Analysis Batch: 715553

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233887-7	MW-17	Total/NA	Water	SM 4500 SO4 E	
500-233887-8	MW-18	Total/NA	Water	SM 4500 SO4 E	
500-233887-9	MW-19	Total/NA	Water	SM 4500 SO4 E	
500-233887-10	Duplicate	Total/NA	Water	SM 4500 SO4 E	
MB 500-715553/16	Method Blank	Total/NA	Water	SM 4500 SO4 E	
MB 500-715553/33	Method Blank	Total/NA	Water	SM 4500 SO4 E	
LCS 500-715553/17	Lab Control Sample	Total/NA	Water	SM 4500 SO4 E	
LCS 500-715553/35	Lab Control Sample	Total/NA	Water	SM 4500 SO4 E	

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR ABB/ASB

Job ID: 500-233887-3

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 500-714515/1-A
Matrix: Water
Analysis Batch: 715021

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 714515

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.0010		0.0010		mg/L		05/22/23 09:02	05/23/23 22:21	1
Barium	<0.0025		0.0025		mg/L		05/22/23 09:02	05/23/23 22:21	1
Beryllium	<0.0010	^+ ^1+	0.0010		mg/L		05/22/23 09:02	05/23/23 22:21	1
Boron	<0.050		0.050		mg/L		05/22/23 09:02	05/23/23 22:21	1
Cadmium	<0.00050		0.00050		mg/L		05/22/23 09:02	05/23/23 22:21	1
Chromium	<0.0050		0.0050		mg/L		05/22/23 09:02	05/23/23 22:21	1
Cobalt	<0.0010		0.0010		mg/L		05/22/23 09:02	05/23/23 22:21	1
Lead	<0.00050		0.00050		mg/L		05/22/23 09:02	05/23/23 22:21	1
Molybdenum	<0.0050		0.0050		mg/L		05/22/23 09:02	05/23/23 22:21	1
Selenium	<0.0025		0.0025		mg/L		05/22/23 09:02	05/23/23 22:21	1
Thallium	<0.0020		0.0020		mg/L		05/22/23 09:02	05/23/23 22:21	1

Lab Sample ID: MB 500-714515/1-A
Matrix: Water
Analysis Batch: 715273

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 714515

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		05/22/23 09:02	05/24/23 19:19	1
Calcium	<0.20		0.20		mg/L		05/22/23 09:02	05/24/23 19:19	1

Lab Sample ID: MB 500-714515/1-A
Matrix: Water
Analysis Batch: 715492

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 714515

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	<0.010		0.010		mg/L		05/22/23 09:02	05/25/23 16:13	1

Lab Sample ID: LCS 500-714515/2-A
Matrix: Water
Analysis Batch: 715021

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 714515

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	0.100	0.0987		mg/L		99	80 - 120
Barium	2.00	1.98		mg/L		99	80 - 120
Beryllium	0.0500	0.0541	^+ ^1+	mg/L		108	80 - 120
Boron	1.00	1.00		mg/L		100	80 - 120
Cadmium	0.0500	0.0485		mg/L		97	80 - 120
Chromium	0.200	0.192		mg/L		96	80 - 120
Cobalt	0.500	0.477		mg/L		95	80 - 120
Lead	0.100	0.101		mg/L		101	80 - 120
Molybdenum	1.00	0.885		mg/L		88	80 - 120
Selenium	0.100	0.0992		mg/L		99	80 - 120
Thallium	0.100	0.0978		mg/L		98	80 - 120

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR ABB/ASB

Job ID: 500-233887-3

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 500-714515/2-A
Matrix: Water
Analysis Batch: 715273

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 714515

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	0.500	0.485		mg/L		97	80 - 120
Calcium	10.0	8.73		mg/L		87	80 - 120

Lab Sample ID: LCS 500-714515/2-A
Matrix: Water
Analysis Batch: 715492

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 714515

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Lithium	0.500	0.486		mg/L		97	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 500-716983/12-A
Matrix: Water
Analysis Batch: 717281

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 716983

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/06/23 09:55	06/07/23 08:18	1

Lab Sample ID: LCS 500-716983/13-A
Matrix: Water
Analysis Batch: 717281

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 716983

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.00198	0.00202		mg/L		102	80 - 120

Lab Sample ID: 500-233887-9 MS
Matrix: Water
Analysis Batch: 717281

Client Sample ID: MW-19
Prep Type: Total/NA
Prep Batch: 716983

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	<0.00020		0.00100	0.00107		mg/L		107	75 - 125

Lab Sample ID: 500-233887-9 MSD
Matrix: Water
Analysis Batch: 717281

Client Sample ID: MW-19
Prep Type: Total/NA
Prep Batch: 716983

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	<0.00020		0.00100	0.00105		mg/L		105	75 - 125	2	20

Lab Sample ID: 500-233887-9 DU
Matrix: Water
Analysis Batch: 717281

Client Sample ID: MW-19
Prep Type: Total/NA
Prep Batch: 716983

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Mercury	<0.00020		<0.00020		mg/L		NC	20

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR ABB/ASB

Job ID: 500-233887-3

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 500-714420/1
Matrix: Water
Analysis Batch: 714420

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<10		10		mg/L			05/22/23 00:24	1

Lab Sample ID: LCS 500-714420/2
Matrix: Water
Analysis Batch: 714420

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	250	242		mg/L		97	80 - 120

Method: SM 4500 Cl- E - Chloride, Total

Lab Sample ID: MB 500-715089/113
Matrix: Water
Analysis Batch: 715089

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<2.0		2.0		mg/L			05/24/23 16:30	1

Lab Sample ID: LCS 500-715089/114
Matrix: Water
Analysis Batch: 715089

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	20.0	19.5		mg/L		98	85 - 115

Method: SM 4500 F C - Fluoride

Lab Sample ID: MB 500-715052/3
Matrix: Water
Analysis Batch: 715052

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<0.10		0.10		mg/L			05/24/23 08:35	1

Lab Sample ID: LCS 500-715052/4
Matrix: Water
Analysis Batch: 715052

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Fluoride	10.0	10.0		mg/L		100	90 - 119

Method: SM 4500 SO4 E - Sulfate, Total

Lab Sample ID: MB 500-715553/16
Matrix: Water
Analysis Batch: 715553

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	<5.0		5.0		mg/L			05/26/23 14:07	1

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR ABB/ASB

Job ID: 500-233887-3

Method: SM 4500 SO4 E - Sulfate, Total (Continued)

Lab Sample ID: MB 500-715553/33
Matrix: Water
Analysis Batch: 715553

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	<5.0		5.0		mg/L			05/26/23 14:15	1

Lab Sample ID: LCS 500-715553/17
Matrix: Water
Analysis Batch: 715553

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	20.0	20.2		mg/L		101	88 - 123

Lab Sample ID: LCS 500-715553/35
Matrix: Water
Analysis Batch: 715553

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	20.0	20.6		mg/L		103	88 - 123

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone (708) 534-5200 Phone (708) 534-5211

Chain of Custody Record

Environment Testing

500-233887 COC 1

Page 1 of 1

Job #: 500-233887

Client Information	Sampler: Kaelyn Sperle	Lab PM: Mockler Diana J	Carrier Tracking No(s):
Client Contact: Kaelyn Sperle	Phone: 262-278-1621	E-Mail: Diana Mockler@et.eurofinsus com	State of Origin: IL
Company: KPRG and Associates, Inc	PWSID:		
Address: 14665 West Lisbon Road, Suite 1A	Due Date Requested: Standard		
City: Brookfield	TAT Requested (days): Standard		
State, Zip: WI, 53005	Compliance Project: Δ Yes Δ No		
Phone: 262-781-0475(Tel)	PO #: 4502125100		
Email: kaelyns@kprginc com	WO #:		
Project Name: Powerton CCR Event Desc. Quarterly Powerton CCR Samplling	Project #: 50011612		
Site: Illinois	SSOW#:		

Analysis Requested

Preservation Codes

A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4-5
Y - Trizma
Z - other (specify)
Other:

	Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, 904.0	6020A, 7470A	2540C, 4500_F_C, SM4500_Cl_E	SM4500_SO4_E - Sulfate	Total Number of containers	Special Instructions/Note:
				Preservation Code				D	D	N	N		
	~~MW-01~~				Water								
	~~MW-08~~				Water								
1	MW-09	5/16/23	1518	G	Water	N	N	X	X	X	X		
2	MW-11	5/16/23	1401	↓	Water	N	N	X	X	X	X		
3	MW-12	5/16/23	1257	↓	Water	N	N	↓	↓	↓	↓		
	~~MW-15~~				Water								
	~~MW-17~~				Water								
	~~MW-18~~				Water								
	~~MW-19~~				Water								
					Water								
					Water								

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I, II, III, IV, Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by:	Date	Time	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time	Company
1	Kaelyn Sperle	5/16/23/1700	KPRG	FedEx	5/16/23/1700	FedEx
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 5/17/23 1000	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact. Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks: 5.4-5.3

Eurofins Chicago
2417 Bond Street
University Park IL 60484
Phone (708) 534-5200 Phone (708) 534-5211

Chain of Custody Record

Environment Testing

500-233887 COC

Client Information	Sampler: Kaelyn Sperle	Lab PM: Mockler, Diana J	Carrier Tracking No(s):
Client Contact: Kaelyn Sperle	Phone: 262-278-1621	E-Mail: Diana Mockler@et.eurofinsus.com	State of Origin: IL
Company: KPRG and Associates, Inc	PWSID:		Page 1 of 1
Address: 14665 West Lisbon Road, Suite 1A	Due Date Requested: Standard		Job #: 500-233887
City: Brookfield	TAT Requested (days): standard		
State, Zip: WI, 53005	Compliance Project: Δ Yes Δ No		
Phone: 262-781-0475(Tel)	PO #: 4502125100		
Email: kaelyns@kprginc com	WO #:		
Project Name: Powerton CCR Event Desc Quarterly Powerton CCR Samplling	Project #: 50011612		
Site: Illinois	SSOW#:		

Analysis Requested

Preservation Codes
A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4-5
Y - Trizma
Z - other (specify)
Other:

	Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, 904.0	6020A, 7470A	2540C, 4500_F_C, SM4500_Cl_E	SM4500_SO4_E - Sulfate	Total Number of containers	Special Instructions/Note:
				Preservation Code		X	X	D	D	N	N	X	
4	MW-01	5/17/23	1236	G	Water	N	N	X	X	X	X		
5	MW-08	5/17/23	1132	G	Water	N	N	X	X	X	X		
	~~MW-09~~				Water								
	~~MW-11~~				Water								
	~~MW-12~~				Water								
6	MW-15	5/17/23	1348	G	Water	N	N	X	X	X	X		
	~~MW-17~~				Water								
	~~MW-18~~				Water								
	~~MW-19~~				Water								
					Water								
					Water								

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II, III IV, Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by:	Date	Time	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time	Company
Kaelyn Sperle	5/17/23/1730	KPRG	FedEx	5/17/23/1730	FedEx
			[signature]	5/18/23 0940	

Custody Seals Intact: Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks.
		0.4 - 0.1

Ver: 01/16/2019

6/8/2023

Eurofins Chicago
2417 Bond Street
University Park IL 60484
Phone (708) 534-5200 Phone (708) 534-5211

Chain of Custody Record

eurofins | Environment Testing

500-233887 COC

Client Information	Sampler: Kaelyn Sperle	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	COC No: 500-112087-46458 1
Client Contact: Kaelyn Sperle	Phone: 262-278-1621	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: IL	Page: Page 1 of 1
Company: KPRG and Associates, Inc	PWSID:			Job #: 500-233887

Address: 14665 West Lisbon Road, Suite 1A	Due Date Requested: Standard
City: Brookfield	TAT Requested (days): Standard
State, Zip: WI, 53005	Compliance Project: Δ Yes Δ No
Phone: 262-781-0475(Tel)	PO #: 4502125100
Email: kaelyns@kprginc.com	WO #:
Project Name: Powerton CCR Event Desc. Quarterly Powerton CCR Sampling (ABBASB)	Project #: 50011612
Site: Illinois	SSOW#:

Analysis Requested

Preservation Codes

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, 904.0	6020A, 7470A	2540C, 4500_F_C, SM4500_Cl_E	SM4500_SO4_E - Sulfate	Total Number of containers	Special Instructions/Note:
			Preservation Code				D	D	N	N		
~~MW-01~~				Water								
~~MW-08~~				Water								
~~MW-09~~				Water								
~~MW-11~~				Water								
~~MW-12~~				Water								
~~MW-15~~	[illegible]			Water								
7 MW-17	5/18/23	1337	G	Water	N	N	X	X	X	X		
8 MW-18	5/18/23	1234	↓	Water	N	N	↓	↓	↓	↓		
9 MW-19	5/18/23	1441	↓	Water	N	N	↓	↓	↓	↓		
10 Duplicate	5/18/23	–	↓	Water	N	N	↓	↓	↓	↓		
				Water								

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I, II, III IV, Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment:

Relinquished by: Kaelyn Sperle	Date/Time: 5/18/23/1715	Company: KPRG	Received by: FedEx	Date/Time: 5/18/23/1715	Company: FedEx
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by: [signature]	Date/Time: 5/18/23 1000	Company

Custody Seals Intact. Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks: 2.4 - 2.0



ORIGIN ID:PIAA (262) 278-1621

KPRG AND ASSOCIATES
414 PLAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 16MAY23
ACTWGT: 58.00 LB
CAD: 6994779/SSFE2420
DIMS: 24x18x12 IN

BILL THIRD PARTY

TO SAMPLE RECEIVING
EUROFINS CHICAGO
2417 BOND ST

UNIVERSITY PARK IL 60

(000) 000-0000
INV:
PO

REF

500-233887 Waybi

DEPT.

ST TO

05 17

FedEx
Express

1 of 4

TRK# 0201 3983 9576 9626

MASTER

XN JOTA

WED - 17 MAY 10:30A
PRIORITY OVERNIGHT

60484
IL-US ORD

500-233887 Waybi



Do Not Lift Using This Tag

RT 519 ST 20

5 10:30 A 7203 05 19

IGIN ID:PIAA (000) 000-0000

RG AND ASSOCIATES
4 PLAZA DR STE 106

STMONT, IL 60559
NITED STATES US

E: 18MAY23
T: 43.00 LB
CAD: 6994779/SSFE2420
DIMS: 24x18x12 IN

BILL THIRD PARTY

Part # 156297-435 REV# EXP: 11/23

SAMPLE RECEIVING
EUROFINS CHICAGO
2417 BOND ST

UNIVERSITY PARK IL 60484

(000) 000-0000
INV:
PO:
REF:
DEPT:

FedEx Express

2 of 3

MPS# 3984 9766 7203
0263
Mstr# 3984 9766 7199
0201

FRI - 19 MAY 10:30A
PRIORITY OVERNIGHT

60484
IL-US ORD

XN JOTA

Do Not Lift Using This Tag

ORIGIN ID:PIAA (000) 000-0000

KPRG AND ASSOCIATES
414 PLAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 18MAY23
ACTWGT: 43.00 LB
CAD: 6994779/SSFE2420
DIMS: 24x18x12 IN

BILL THIRD P

TO SAMPLE RECEIVING
EUROFINS CHICAGO
2417 BOND ST

UNIVERSITY PARK I

RT 519 ST 20

5 10:30 A 7199 05 19

Part # 156297-435 REV# EXP: 11/23

(000) 000-0000
INV:
PO:
REF:
DEPT:

FedEx Express

1 of 3

TRK# 3984 9766 7199
0201
MASTER

FRI - 19 MAY 10:30A
PRIORITY OVERNIGHT

XN JOTA

60484
IL-US ORD

500-233887 Waybi

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-233887-3

Login Number: 233887
List Number: 1
Creator: James, Jeff A

List Source: Eurofins Chicago

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	5.3,0.1,-2.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR ABB/ASB

Job ID: 500-233887-3

Client Sample ID: MW-17

Lab Sample ID: 500-233887-7

Date Collected: 05/18/23 13:37

Matrix: Water

Date Received: 05/19/23 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			714515	BDE	EET CHI	05/22/23 09:02 - 05/22/23 09:32 [1]
Total Recoverable	Analysis	6020A		1	715021	FXG	EET CHI	05/23/23 23:05
Total Recoverable	Prep	3005A			714515	BDE	EET CHI	05/22/23 09:02 - 05/22/23 09:32 [1]
Total Recoverable	Analysis	6020A		1	715273	FXG	EET CHI	05/24/23 20:10
Total Recoverable	Prep	3005A			714515	BDE	EET CHI	05/22/23 09:02 - 05/22/23 09:32 [1]
Total Recoverable	Analysis	6020A		1	715492	FXG	EET CHI	05/25/23 16:43
Total/NA	Prep	7470A			716983	MJG	EET CHI	06/06/23 09:55 - 06/06/23 11:55 [1]
Total/NA	Analysis	7470A		1	717281	MJG	EET CHI	06/07/23 08:35
Total/NA	Analysis	SM 2540C		1	714420	CLB	EET CHI	05/22/23 01:10
Total/NA	Analysis	SM 4500 Cl- E		10	715089	MM	EET CHI	05/24/23 16:32
Total/NA	Analysis	SM 4500 F C		1	715052	EH	EET CHI	05/24/23 08:35
Total/NA	Analysis	SM 4500 SO4 E		50	715553	MM	EET CHI	05/26/23 14:10

Client Sample ID: MW-18

Lab Sample ID: 500-233887-8

Date Collected: 05/18/23 12:34

Matrix: Water

Date Received: 05/19/23 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			714515	BDE	EET CHI	05/22/23 09:02 - 05/22/23 09:32 [1]
Total Recoverable	Analysis	6020A		1	715021	FXG	EET CHI	05/23/23 23:09
Total Recoverable	Prep	3005A			714515	BDE	EET CHI	05/22/23 09:02 - 05/22/23 09:32 [1]
Total Recoverable	Analysis	6020A		1	715273	FXG	EET CHI	05/24/23 20:14
Total Recoverable	Prep	3005A			714515	BDE	EET CHI	05/22/23 09:02 - 05/22/23 09:32 [1]
Total Recoverable	Analysis	6020A		1	715492	FXG	EET CHI	05/25/23 16:54
Total/NA	Prep	7470A			716983	MJG	EET CHI	06/06/23 09:55 - 06/06/23 11:55 [1]
Total/NA	Analysis	7470A		1	717281	MJG	EET CHI	06/07/23 08:41
Total/NA	Analysis	SM 2540C		1	714420	CLB	EET CHI	05/22/23 01:13
Total/NA	Analysis	SM 4500 Cl- E		5	715089	MM	EET CHI	05/24/23 16:32
Total/NA	Analysis	SM 4500 F C		1	715052	EH	EET CHI	05/24/23 08:35
Total/NA	Analysis	SM 4500 SO4 E		10	715553	MM	EET CHI	05/26/23 14:24

Client Sample ID: MW-19

Lab Sample ID: 500-233887-9

Date Collected: 05/18/23 14:41

Matrix: Water

Date Received: 05/19/23 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			714515	BDE	EET CHI	05/22/23 09:02 - 05/22/23 09:32 [1]
Total Recoverable	Analysis	6020A		1	715021	FXG	EET CHI	05/23/23 23:12
Total Recoverable	Prep	3005A			714515	BDE	EET CHI	05/22/23 09:02 - 05/22/23 09:32 [1]
Total Recoverable	Analysis	6020A		1	715273	FXG	EET CHI	05/24/23 20:17
Total Recoverable	Prep	3005A			714515	BDE	EET CHI	05/22/23 09:02 - 05/22/23 09:32 [1]
Total Recoverable	Analysis	6020A		1	715492	FXG	EET CHI	05/25/23 16:57
Total/NA	Prep	7470A			716983	MJG	EET CHI	06/06/23 09:55 - 06/06/23 11:55 [1]
Total/NA	Analysis	7470A		1	717281	MJG	EET CHI	06/07/23 08:43

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR ABB/ASB

Job ID: 500-233887-3

Client Sample ID: MW-19

Lab Sample ID: 500-233887-9

Date Collected: 05/18/23 14:41

Matrix: Water

Date Received: 05/19/23 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	SM 2540C		1	714420	CLB	EET CHI	05/22/23 01:15
Total/NA	Analysis	SM 4500 Cl- E		1	715089	MM	EET CHI	05/24/23 16:33
Total/NA	Analysis	SM 4500 F C		1	715052	EH	EET CHI	05/24/23 08:35
Total/NA	Analysis	SM 4500 SO4 E		10	715553	MM	EET CHI	05/26/23 14:24

Client Sample ID: Duplicate

Lab Sample ID: 500-233887-10

Date Collected: 05/18/23 00:00

Matrix: Water

Date Received: 05/19/23 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			714515	BDE	EET CHI	05/22/23 09:02 - 05/22/23 09:32 [1]
Total Recoverable	Analysis	6020A		1	715021	FXG	EET CHI	05/23/23 23:16
Total Recoverable	Prep	3005A			714515	BDE	EET CHI	05/22/23 09:02 - 05/22/23 09:32 [1]
Total Recoverable	Analysis	6020A		1	715273	FXG	EET CHI	05/24/23 20:20
Total Recoverable	Prep	3005A			714515	BDE	EET CHI	05/22/23 09:02 - 05/22/23 09:32 [1]
Total Recoverable	Analysis	6020A		1	717605	FXG	EET CHI	06/08/23 13:11
Total/NA	Prep	7470A			716983	MJG	EET CHI	06/06/23 09:55 - 06/06/23 11:55 [1]
Total/NA	Analysis	7470A		1	717281	MJG	EET CHI	06/07/23 08:52
Total/NA	Analysis	SM 2540C		1	714420	CLB	EET CHI	05/22/23 01:18
Total/NA	Analysis	SM 4500 Cl- E		10	715089	MM	EET CHI	05/24/23 16:33
Total/NA	Analysis	SM 4500 F C		1	715052	EH	EET CHI	05/24/23 08:35
Total/NA	Analysis	SM 4500 SO4 E		10	715553	MM	EET CHI	05/26/23 14:25

[1] This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Accreditation/Certification Summary

Client: KPRG and Associates, Inc.
Job ID: 500-233887-3
Project/Site: Powerton CCR ABB/ASB

Laboratory: Eurofins Chicago

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Illinois	NELAP	IL00035	04-29-24

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Richard Gnat
KPRG and Associates, Inc.
14665 West Lisbon Road,
Suite 1A
Brookfield, Wisconsin 53005

Generated 6/21/2023 4:24:58 PM

JOB DESCRIPTION

Powerton CCR ABB/ASB (RAD)

JOB NUMBER

500-233887-4

Eurofins Chicago
2417 Bond Street
University Park IL 60484

See page two for job notes and contact information.

myEOL

Eurofins Chicago

Job Notes

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Authorization



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Case Narrative

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR ABB/ASB (RAD)

Job ID: 500-233887-4

Job ID: 500-233887-4

Laboratory: Eurofins Chicago

Narrative

Job Narrative
500-233887-4

Receipt
The samples were received on 5/17/2023 10:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were -2.0º C, 0.1º C and 5.3º C.

RAD
Methods 903.0, 9315: Radium-226 batch 613260
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
MW-17 (500-233887-7), MW-18 (500-233887-8), MW-19 (500-233887-9), Duplicate (500-233887-10), (LCS 160-613260/2-A), (MB 160-613260/1-A), (500-233887-E-4-A) and (500-233887-G-4-B DU)

Methods 904.0, 9320: Radium-228 batch 613360
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
MW-17 (500-233887-7), MW-18 (500-233887-8), MW-19 (500-233887-9), Duplicate (500-233887-10), (LCS 160-613360/2-A), (MB 160-613360/1-A), (500-233887-E-4-B) and (500-233887-G-4-C DU)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Method Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR ABB/ASB (RAD)

Job ID: 500-233887-4

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	EET SL
904.0	Radium-228 (GFPC)	EPA	EET SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	EET SL
PrecSep_0	Preparation, Precipitate Separation	None	EET SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	EET SL

Protocol References:

EPA = US Environmental Protection Agency

None = None

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR ABB/ASB (RAD)

Job ID: 500-233887-4

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-233887-7	MW-17	Water	05/18/23 13:37	05/19/23 10:00
500-233887-8	MW-18	Water	05/18/23 12:34	05/19/23 10:00
500-233887-9	MW-19	Water	05/18/23 14:41	05/19/23 10:00
500-233887-10	Duplicate	Water	05/18/23 00:00	05/19/23 10:00

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR ABB/ASB (RAD)

Job ID: 500-233887-4

Client Sample ID: MW-17

Date Collected: 05/18/23 13:37
Date Received: 05/19/23 10:00

Lab Sample ID: 500-233887-7

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0469	U	0.141	0.141	1.00	0.268	pCi/L	05/26/23 09:29	06/20/23 22:37	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.3*		*30 - 110*	*05/26/23 09:29*	*06/20/23 22:37*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.413	U	0.335	0.337	1.00	0.521	pCi/L	05/26/23 13:14	06/20/23 11:22	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.3*		*30 - 110*	*05/26/23 13:14*	*06/20/23 11:22*	*1*
Y Carrier	*85.6*		*30 - 110*	*05/26/23 13:14*	*06/20/23 11:22*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.460	U	0.363	0.365	5.00	0.521	pCi/L		06/21/23 15:27	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR ABB/ASB (RAD)

Job ID: 500-233887-4

Client Sample ID: MW-18

Date Collected: 05/18/23 12:34
Date Received: 05/19/23 10:00

Lab Sample ID: 500-233887-8

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.106	U	0.140	0.141	1.00	0.234	pCi/L	05/26/23 09:29	06/20/23 22:37	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95.1*		*30 - 110*	*05/26/23 09:29*	*06/20/23 22:37*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.241	U	0.266	0.267	1.00	0.433	pCi/L	05/26/23 13:14	06/20/23 11:22	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95.1*		*30 - 110*	*05/26/23 13:14*	*06/20/23 11:22*	*1*
Y Carrier	*87.1*		*30 - 110*	*05/26/23 13:14*	*06/20/23 11:22*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.347	U	0.301	0.302	5.00	0.433	pCi/L		06/21/23 15:27	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR ABB/ASB (RAD)

Job ID: 500-233887-4

Client Sample ID: MW-19

Date Collected: 05/18/23 14:41
Date Received: 05/19/23 10:00

Lab Sample ID: 500-233887-9

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0705	U	0.118	0.118	1.00	0.209	pCi/L	05/26/23 09:29	06/20/23 22:37	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95.9*		*30 - 110*	*05/26/23 09:29*	*06/20/23 22:37*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.533**		0.329	0.333	1.00	0.479	pCi/L	05/26/23 13:14	06/20/23 11:22	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95.9*		*30 - 110*	*05/26/23 13:14*	*06/20/23 11:22*	*1*
Y Carrier	*82.6*		*30 - 110*	*05/26/23 13:14*	*06/20/23 11:22*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.604**		0.350	0.353	5.00	0.479	pCi/L		06/21/23 15:27	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR ABB/ASB (RAD)

Job ID: 500-233887-4

Client Sample ID: Duplicate

Date Collected: 05/18/23 00:00
Date Received: 05/19/23 10:00

Lab Sample ID: 500-233887-10

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.193	U	0.164	0.165	1.00	0.238	pCi/L	05/26/23 09:29	06/20/23 22:37	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95.9*		*30 - 110*	*05/26/23 09:29*	*06/20/23 22:37*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.133	U	0.295	0.295	1.00	0.514	pCi/L	05/26/23 13:14	06/20/23 11:22	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95.9*		*30 - 110*	*05/26/23 13:14*	*06/20/23 11:22*	*1*
Y Carrier	*85.6*		*30 - 110*	*05/26/23 13:14*	*06/20/23 11:22*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.326	U	0.338	0.338	5.00	0.514	pCi/L		06/21/23 15:27	1

Definitions/Glossary

Client: KPRG and Associates, Inc.
Job ID: 500-233887-4
Project/Site: Powerton CCR ABB/ASB (RAD)

Qualifiers

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

QC Association Summary

Client: KPRG and Associates, Inc.
Job ID: 500-233887-4
Project/Site: Powerton CCR ABB/ASB (RAD)

Rad

Prep Batch: 613260

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233887-7	MW-17	Total/NA	Water	PrecSep-21	
500-233887-8	MW-18	Total/NA	Water	PrecSep-21	
500-233887-9	MW-19	Total/NA	Water	PrecSep-21	
500-233887-10	Duplicate	Total/NA	Water	PrecSep-21	
MB 160-613260/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-613260/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 613360

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233887-7	MW-17	Total/NA	Water	PrecSep_0	
500-233887-8	MW-18	Total/NA	Water	PrecSep_0	
500-233887-9	MW-19	Total/NA	Water	PrecSep_0	
500-233887-10	Duplicate	Total/NA	Water	PrecSep_0	
MB 160-613360/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-613360/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR ABB/ASB (RAD)

Job ID: 500-233887-4

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-613260/1-A
Matrix: Water
Analysis Batch: 616866

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 613260

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.03010	U	0.129	0.129	1.00	0.292	pCi/L	05/26/23 09:29	06/20/23 20:52	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*87.0*		*30 - 110*	*05/26/23 09:29*	*06/20/23 20:52*	*1*

Lab Sample ID: LCS 160-613260/2-A
Matrix: Water
Analysis Batch: 616866

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 613260

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			11.3	9.751		1.28	1.00	0.348	pCi/L	86	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*85.4*		*30 - 110*

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-613360/1-A
Matrix: Water
Analysis Batch: 616868

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 613360

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.1566	U	0.299	0.299	1.00	0.517	pCi/L	05/26/23 13:14	06/20/23 11:15	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*87.0*		*30 - 110*	*05/26/23 13:14*	*06/20/23 11:15*	*1*
Y Carrier	*86.4*		*30 - 110*	*05/26/23 13:14*	*06/20/23 11:15*	*1*

Lab Sample ID: LCS 160-613360/2-A
Matrix: Water
Analysis Batch: 616868

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 613360

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			8.10	8.095		1.15	1.00	0.499	pCi/L	100	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*85.4*		*30 - 110*
Y Carrier	*88.2*		*30 - 110*

Eurofins Chicago
2417 Bond Street
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Phone (708) 534-5200 Phone (708) 534-5211

Chain of Custody Record

Environment Testing

500-233887 COC 1

Page 1 of 1

Job #: 500-233887

Client Information	Sampler: Kaelyn Sperle	Lab PM: Mockler Diana J	Carrier Tracking No(s):
Client Contact: Kaelyn Sperle	Phone: 262-278-1621	E-Mail: Diana Mockler@et.eurofinsus com	State of Origin: IL
Company: KPRG and Associates, Inc	PWSID:		
Address: 14665 West Lisbon Road, Suite 1A	Due Date Requested: Standard		
City: Brookfield	TAT Requested (days): Standard		
State, Zip: WI, 53005	Compliance Project: Δ Yes Δ No		
Phone: 262-781-0475(Tel)	PO #: 4502125100		
Email: kaelyns@kprginc com	WO #:		
Project Name: Powerton CCR Event Desc. Quarterly Powerton CCR Samplling	Project #: 50011612		
Site: Illinois	SSOW#:		

Analysis Requested

Preservation Codes

A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4-5
Y - Trizma
Z - other (specify)
Other:

	Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, 904.0	6020A, 7470A	2540C, 4500_F_C, SM4500_Cl_E	SM4500_SO4_E - Sulfate	Total Number of containers	Special Instructions/Note:
				Preservation Code				D	D	N	N		
	~~MW-01~~				Water								
	~~MW-08~~				Water								
1	MW-09	5/16/23	1518	G	Water	N	N	X	X	X	X		
2	MW-11	5/16/23	1401	↓	Water	N	N	X	X	X	X		
3	MW-12	5/16/23	1257	↓	Water	N	N	↓	↓	↓	↓		
	~~MW-15~~				Water								
	~~MW-17~~				Water								
	~~MW-18~~				Water								
	~~MW-19~~				Water								
					Water								
					Water								

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I, II, III, IV, Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by:	Date	Time	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time	Company
1	Kaelyn Sperle	5/16/23/1700	KPRG	FedEx	5/16/23/1700	FedEx
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 5/17/23 1000	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact. Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks: 5.4-5.3

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University Park IL 60484
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Chain of Custody Record

Environment Testing

500-233887 COC

Page 1 of 1

Job #: 500-233887

Client Information	Sampler: Kaelyn Sperle	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	
Client Contact: Kaelyn Sperle	Phone: 262-278-1621	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: IL	
Company: KPRG and Associates, Inc	PWSID:			
Address: 14665 West Lisbon Road, Suite 1A	Due Date Requested: Standard			
City: Brookfield	TAT Requested (days): Standard			
State, Zip: WI, 53005	Compliance Project: Δ Yes Δ No			
Phone: 262-781-0475(Tel)	PO #: 4502125100			
Email: kaelyns@kprginc com	WO #:			
Project Name: Powerton CCR Event Desc Quarterly Powerton CCR Sampling	Project #: 50011612			
Site: Illinois	SSOW#:			

Analysis Requested

Preservation Codes

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify), Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, 904.0	6020A, 7470A	2540C, 4500_F_C, SM4500_Cl_E	SM4500_SO4_E - Sulfate	Total Number of containers	Special Instructions/Note:
			Preservation Code				D	D	N	N		
4 MW-01	5/17/23	1236	G	Water	N	N	X	X	X	X		
5 MW-08	5/17/23	1132	G	Water	N	N	X	X	X	X		
~~MW-09~~				Water								
~~MW-11~~				Water								
~~MW-12~~				Water								
6 MW-15	5/17/23	1348	G	Water	N	N	X	X	X	X		
~~MW-17~~				Water								
~~MW-18~~				Water								
~~MW-19~~				Water								
				Water								
				Water								

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II, III IV, Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by:	Date	Time	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	Kaelyn Sperle	5/17/23/1730	KPRG	FedEx	5/17/23/1730	FedEx
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 5/18/23 0840	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks: 0.4 - 0.1

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2417 Bond Street
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Chain of Custody Record

eurofins | Environment Testing

500-233887 COC

Client Information	Sampler: Kaelyn Sperle	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	COC No: 500-112087-46458 1
Client Contact: Kaelyn Sperle	Phone: 262-278-1621	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: IL	Page: Page 1 of 1
Company: KPRG and Associates, Inc	PWSID:			Job #: 500-233887

Address: 14665 West Lisbon Road, Suite 1A	Due Date Requested: Standard	Analysis Requested	Preservation Codes
City: Brookfield	TAT Requested (days): Standard		A - HCL; B - NaOH; C - Zn Acetate; D - Nitric Acid; E - NaHSO4; F - MeOH; G - Amchlor; H - Ascorbic Acid; I - Ice; J - DI Water; K - EDTA; L - EDA; M - Hexane; N - None; O - AsNaO2; P - Na2O4S; Q - Na2SO3; R - Na2S2O3; S - H2SO4; T - TSP Dodecahydrate; U - Acetone; V - MCAA; W - pH 4-5; Y - Trizma; Z - other (specify)
State, Zip: WI, 53005	Compliance Project: Δ Yes Δ No		
Phone: 262-781-0475(Tel)	PO #: 4502125100		
Email: kaelyns@kprginc.com	WO #:		Other:
Project Name: ABBASB Powerton CCR Event Desc. Quarterly Powerton CCR Sampling	Project #: 50011612		
Site: Illinois	SSOW#:		

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, 904.0	6020A, 7470A	2540C, 4500_F_C, SM4500_Cl_E	SM4500_SO4_E - Sulfate	Total Number of containers	Special Instructions/Note:
			Preservation Code				D	D	N	N		
~~MW-01~~				Water								
~~MW-08~~				Water								
~~MW-09~~				Water								
~~MW-11~~				Water								
~~MW-12~~				Water								
~~MW-15~~	X			Water								
7 MW-17	5/18/23	1337	G	Water	N	N	X	X	X	X		
8 MW-18	5/18/23	1234	↓	Water	N	N	↓	↓	↓	↓		
9 MW-19	5/18/23	1441	↓	Water	N	N	↓	↓	↓	↓		
10 Duplicate	5/18/23	–	↓	Water	N	N	↓	↓	↓	↓		
				Water								

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I, II, III IV, Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment:

Relinquished by: Kaelyn Sperle	Date/Time: 5/18/23/1715	Company: KPRG	Received by: FedEx	Date/Time: 5/18/23/1715	Company: FedEx
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 5/18/23 1000	Company

Custody Seals Intact. Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks: -2.4 -2.0


ORIGIN ID:PIAA (262) 278-1621
KPRG AND ASSOCIATES
414 PLAZA DR STE 106
WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 16MAY23
ACTWGT: 58.00 LB
CAD: 6994779/SSFE2420
DIMS: 24x18x12 IN
BILL THIRD PARTY

TO SAMPLE RECEIVING
EUROFINS CHICAGO
2417 BOND ST

UNIVERSITY PARK IL 60

(000) 000-0000
INV:
PO
REF
DEPT.

500-233887 Waybi

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FedEx
Express

1 of 4
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MASTER

XN JOTA

WED - 17 MAY 10:30A
PRIORITY OVERNIGHT

60484
IL-US ORD

500-233887 Waybi

ORIGIN ID:PIAA (262) 278-1621
KPRG AND ASSOCIATES
414 PLAZA DR STE 106
WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 17MAY23
ACTWGT: 50.00 LB
CAD: 6994779/SSFE2420
DIMS: 24x18x12 IN
BILL THIRD PARTY

Part # 156297-435 RRDB2 EXP 09/23

TO SAMPLE RECEIVING
EUROFINS
2417 BOND ST

UNIVERSITY PARK IL 60484
(000) 000-0000 REF:
INV:
PO: DEPT:

FedEx Express

4 of 5
MPS# 0263 3984 4873 0174
Mstr# 3984 4873 0141

THU - 18 MAY 10:30A
PRIORITY OVERNIGHT

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IL-US ORD

Do Not Lift Using This Tag

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RG AND ASSOCIATES
4 PLAZA DR STE 106
ESTMONT, IL 60559
NITED STATES US

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T: 43.00 LB
CAD: 6994779/SSFE2420
DIMS: 24x18x12 IN
BILL THIRD PARTY

Part # 156297-435 REV# EXP: 11/23

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EUROFINS CHICAGO
2417 BOND ST

UNIVERSITY PARK IL 60484

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REF:
DEPT:

FedEx Express

2 of 3
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Do Not Lift Using This Tag

ORIGIN ID:PIAA (000) 000-0000
KPRG AND ASSOCIATES
414 PLAZA DR STE 106
WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 18MAY23
ACTWGT: 43.00 LB
CAD: 6994779/SSFE2420
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BILL THIRD P

TO SAMPLE RECEIVING
EUROFINS CHICAGO
2417 BOND ST

UNIVERSITY PARK I

RT 519
ST 20

5 10:30 A 7199 05 19

Part # 156297-435 REV# EXP: 11/23

(000) 000-0000
INV:
PO:
REF:
DEPT:

FedEx Express

1 of 3
TRK# 3984 9766 7199
0201
MASTER

FRI - 19 MAY 10:30A
PRIORITY OVERNIGHT

XN JOTA

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IL-US ORD

500-233887 Waybi

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone: 708-534-5200 Fax: 708-534-5211

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	COC No: 500-174049.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: Illinois	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Illinois		Job #: 500-233887-2
Address: 13715 Rider Trail North, ,	Due Date Requested: 6/21/2023			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Powerton CCR (RAD)	Project #: 50011612			
Site: MWG - Powerton	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4-5
Y - Trizma
Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_21 Standard Target List	904.0/PrecSep_0 Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
MW-01 (500-233887-4)	5/17/23	12:36 Central		Water			X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
MW-08 (500-233887-5)	5/17/23	11:32 Central		Water			X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
MW-15 (500-233887-6)	5/17/23	13:48 Central		Water			X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
									9	

Note: Since laboratory accreditations are subject to change, Eurofins Chicago places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Chicago laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Chicago attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Chicago.

Possible Hazard Identification
Unconfirmed

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	5/19/23 1600		fedex		
fedex			Briana Sharkey-Gazalez	5/22/23 0805	EIASTL

Custody Seals Intact: Δ Yes Δ No

Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

6/21/2023

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone: 708-534-5200 Fax: 708-534-5211

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	COC No: 500-174049.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: Illinois	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Illinois		Job #: 500-233887-4
Address: 13715 Rider Trail North, ,	Due Date Requested: 6/21/2023			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Powerton CCR ABB/ASB (RAD)	Project #: 50011612			
Site: MWG - Powerton	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitnc Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_21 Standard Target List	904.0/PrecSep_0 Standard Target List	Ra226Ra228_GFPC	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
MW-17 (500-233887-7)	5/18/23	13:37 Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
MW-18 (500-233887-8)	5/18/23	12:34 Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
MW-19 (500-233887-9)	5/18/23	14:41 Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
Duplicate (500-233887-10)	5/18/23	Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
										(12)	30 Total

Note: Since laboratory accreditations are subject to change, Eurofins Chicago places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Chicago laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Chicago attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Chicago.

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	5/19/23 1600		fedex		
Relinquished by: fedex	Date/Time:	Company	Received by: Briana Starkey - Hayden	Date/Time: 5/22/23 0805	Company ETAS
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-233887-4

Login Number: 233887
List Number: 1
Creator: James, Jeff A

List Source: Eurofins Chicago

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	5.3,0.1,-2.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-233887-4

Login Number: 233887
List Number: 2
Creator: Farrell, Conor P

List Source: Eurofins St. Louis
List Creation: 05/18/23 01:47 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-233887-4

Login Number: 233887
List Number: 3
Creator: Sharkey-Gonzalez, Briana L

List Source: Eurofins St. Louis
List Creation: 05/22/23 06:02 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Lab Chronicle

Client: KPRG and Associates, Inc.
Job ID: 500-233887-4
Project/Site: Powerton CCR ABB/ASB (RAD)

Client Sample ID: MW-17
Lab Sample ID: 500-233887-7
Date Collected: 05/18/23 13:37
Matrix: Water
Date Received: 05/19/23 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			613260	KAC	EET SL	05/26/23 09:29
Total/NA	Analysis	903.0		1	616862	FLC	EET SL	06/20/23 22:37
Total/NA	Prep	PrecSep_0			613360	KAC	EET SL	05/26/23 13:14
Total/NA	Analysis	904.0		1	616863	FLC	EET SL	06/20/23 11:22
Total/NA	Analysis	Ra226_Ra228		1	617159	EMH	EET SL	06/21/23 15:27

Client Sample ID: MW-18
Lab Sample ID: 500-233887-8
Date Collected: 05/18/23 12:34
Matrix: Water
Date Received: 05/19/23 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			613260	KAC	EET SL	05/26/23 09:29
Total/NA	Analysis	903.0		1	616862	FLC	EET SL	06/20/23 22:37
Total/NA	Prep	PrecSep_0			613360	KAC	EET SL	05/26/23 13:14
Total/NA	Analysis	904.0		1	616863	FLC	EET SL	06/20/23 11:22
Total/NA	Analysis	Ra226_Ra228		1	617159	EMH	EET SL	06/21/23 15:27

Client Sample ID: MW-19
Lab Sample ID: 500-233887-9
Date Collected: 05/18/23 14:41
Matrix: Water
Date Received: 05/19/23 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			613260	KAC	EET SL	05/26/23 09:29
Total/NA	Analysis	903.0		1	616862	FLC	EET SL	06/20/23 22:37
Total/NA	Prep	PrecSep_0			613360	KAC	EET SL	05/26/23 13:14
Total/NA	Analysis	904.0		1	616863	FLC	EET SL	06/20/23 11:22
Total/NA	Analysis	Ra226_Ra228		1	617159	EMH	EET SL	06/21/23 15:27

Client Sample ID: Duplicate
Lab Sample ID: 500-233887-10
Date Collected: 05/18/23 00:00
Matrix: Water
Date Received: 05/19/23 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			613260	KAC	EET SL	05/26/23 09:29
Total/NA	Analysis	903.0		1	616862	FLC	EET SL	06/20/23 22:37
Total/NA	Prep	PrecSep_0			613360	KAC	EET SL	05/26/23 13:14
Total/NA	Analysis	904.0		1	616863	FLC	EET SL	06/20/23 11:22
Total/NA	Analysis	Ra226_Ra228		1	617159	EMH	EET SL	06/21/23 15:27

Laboratory References:
EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: KPRG and Associates, Inc.
Job ID: 500-233887-4
Project/Site: Powerton CCR ABB/ASB (RAD)

Laboratory: Eurofins St. Louis

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Illinois	NELAP	200023	11-30-23

Tracer/Carrier Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR ABB/ASB (RAD)

Job ID: 500-233887-4

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)
		Ba
Lab Sample ID	Client Sample ID	(30-110)
500-233887-7	MW-17	92.3
500-233887-8	MW-18	95.1
500-233887-9	MW-19	95.9
500-233887-10	Duplicate	95.9
LCS 160-613260/2-A	Lab Control Sample	85.4
MB 160-613260/1-A	Method Blank	87.0

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)	
		Ba	Y
Lab Sample ID	Client Sample ID	(30-110)	(30-110)
500-233887-7	MW-17	92.3	85.6
500-233887-8	MW-18	95.1	87.1
500-233887-9	MW-19	95.9	82.6
500-233887-10	Duplicate	95.9	85.6
LCS 160-613360/2-A	Lab Control Sample	85.4	88.2
MB 160-613360/1-A	Method Blank	87.0	86.4

Tracer/Carrier Legend

Ba = Ba Carrier

Y = Y Carrier

PROJECT NAME	NRG – POWERTON STATION – 12313.1		DATE	5/17/23
Sample Name	MW-01	Start Time	1218	
Condition of Well	good			
Water Level	23.91	Total Depth	—	
Well Diameter	PVC – 2 inch	Volume in Well	—	
Method of Purge	Low flow bladder	Purge Characteristics	clear	
Volume Removed	4 qts	W L at Sample Time	23.91	
Method of Sample	Low flow bladder	Sample Characteristics	clear	
Sample Analysis	CCA, CCR (FAB, ABBASB)	Sample Time	1236	
Water Quality Meter	YSI Pro Dss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1220	23.91	7.32	17.5	.728	8.77	21.9	6.65
1223	—	7.22	11.6	.625	8.81	30.7	5.05
1226	—	7.22	12.1	.624	8.54	31.5	4.41
1229	—	7.23	11.3	.616	8.42	32.6	4.36
1232	23.91	7.23	11.4	.612	8.26	33.3	4.33

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION – 12313.1		DATE	5/17/23
Sample Name	MW-08	Start Time	1117	
Condition of Well	good			
Water Level	25.42	Total Depth	–	
Well Diameter	PVC – 2 inch	Volume in Well	–	
Method of Purge	Low flow bladder	Purge Characteristics	cloudy, brown	
Volume Removed	5 gts	W L at Sample Time	25.42	
Method of Sample	Low flow bladder	Sample Characteristics	clear w/ yellow tint	
Sample Analysis	CCA, CCR(ABBASB)	Sample Time	1132	
Water Quality Meter	YSI Pro Dss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1119	25.42	7.55	14.9	1.058	6.55	-176.5	432.52
1122	–	7.62	15.0	.980	3.34	-203.3	96.31
1125	–	7.67	14.8	.976	2.60	-211.7	36.49
1128	25.42	7.68	14.9	.979	2.05	-221.7	17.75

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION – 12313.1		DATE	5/16/23
Sample Name	MW-09	Start Time	1449	
Condition of Well	good			
Water Level	25.89	Total Depth	–	
Well Diameter	PVC – 2 inch	Volume in Well	–	
Method of Purge	Low flow bladder	Purge Characteristics	Clear	
Volume Removed	3.5 gals	W L at Sample Time	25.89	
Method of Sample	Low flow bladder	Sample Characteristics	Clear	
Sample Analysis	CCA, CCR (ABBASB)	Sample Time	1518	
Water Quality Meter	YSI Pro Dss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1451	25.89	7.50	17.8	.695	9.00	28.8	17.21
1454	–	7.45	15.0	.667	5.35	-1.1	16.48
1457	–	7.46	15.2	.660	2.75	7.8	16.02
1500	25.89	7.46	15.0	.659	2.35	9.4	15.52

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION – 12313.1		DATE	5/16/23
Sample Name	MW-11	Start Time	1346	
Condition of Well	good			
Water Level	29.39	Total Depth	—	
Well Diameter	PVC – 2 inch	Volume in Well	—	
Method of Purge	Low flow bladder	Purge Characteristics	Clear	
Volume Removed	3 gals	W L at Sample Time	29.41	
Method of Sample	Low flow bladder	Sample Characteristics	Clear	
Sample Analysis	CCA, CCR (ABB/ASB)	Sample Time	1401	
Water Quality Meter	YSI Pro Dss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1348	29.39	7.25	16.2	.863	8.52	-47.8	4.02
1351	—	7.16	16.0	1.053	5.08	-115.3	31.20
1354	—	7.18	15.9	1.020	3.06	-128.5	16.87
1357	29.41	7.19	15.8	.999	2.28	-133.7	10.18

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION – 12313.1		DATE	5/16/23
Sample Name	MW-12	Start Time	1239	
Condition of Well	good			
Water Level	21.90	Total Depth	–	
Well Diameter	PVC – 2 inch	Volume in Well	–	
Method of Purge	Low flow bladder	Purge Characteristics	cloudy, orange	
Volume Removed	3 gts	W L at Sample Time	21.92	
Method of Sample	Low flow bladder	Sample Characteristics	clear	
Sample Analysis	CCA, CCR (ABB/ASB)	Sample Time	1257	
Water Quality Meter	YSI Pro Dss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1241	21.90	7.74	13.7	1.138	9.09	-41.8	13.75
1244	–	7.91	12.7	1.085	5.00	-168.8	597.57
1247	–	7.95	12.4	1.083	3.28	-198.0	457.18
1250	–	7.96	12.3	1.084	2.62	-203.9	52.04
1253	21.92	7.96	12.1	1.084	2.25	-203.9	21.37

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION – 12313.1		DATE	5/17/23
Sample Name	MW-15	Start Time	1333	
Condition of Well	good			
Water Level	24.67	Total Depth	~	
Well Diameter	PVC – 2 inch	Volume in Well	—	
Method of Purge	Low flow bladder	Purge Characteristics	cloudy, brown	
Volume Removed	6 gals	W L at Sample Time	24.71	
Method of Sample	Low flow bladder	Sample Characteristics	clear	
Sample Analysis	CCA, CCR(MCB, ABBASB)	Sample Time	1348	
Water Quality Meter	YSI Pro Dss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1335	24.67	7.04	16.3	1.659	8.20	18.9	10.08
1338	—	6.84	16.0	2.694	5.18	38.1	397.15
1341	—	6.83	15.9	2.693	3.61	29.4	2.692
1344	—	6.83	16.3	2.646	2.88	-1.0	39.90
1347	—	6.84	15.7	2.651	2.40	-20.8	20.76
1350	24.71	6.84	15.9	2.640	1.99	-33.7	13.90

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION – 12313.1		DATE	5/18/23
Sample Name	MW-17	Start Time	1320	
Condition of Well	good			
Water Level	19.62	Total Depth	—	
Well Diameter	PVC – 2 inch	Volume in Well	—	
Method of Purge	Low flow bladder	Purge Characteristics	cloudy, brown	
Volume Removed	5 gals	W L at Sample Time	20.88	
Method of Sample	Low flow bladder	Sample Characteristics	clear	
Sample Analysis	CCR (MCB, ABBAS3)	Sample Time	1337	
Water Quality Meter	YSI Pro Dss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1321	19.62	7.58	15.6	1.750	7.92	-87.3	106.60
1324	-	7.39	15.7	1.596	3.78	-53.2	135.88
1327	-	7.37	15.6	1.592	2.53	-41.6	30.70
1330	-	7.36	15.9	1.592	2.04	-36.3	13.18
1333	20.88	7.34	15.6	1.610	1.74	-31.8	9.92

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION – 12313.1		DATE	5/18/23
Sample Name	MW-18	Start Time	1217	
Condition of Well	good			
Water Level	26.35	Total Depth	–	
Well Diameter	PVC – 2 inch	Volume in Well	–	
Method of Purge	Low flow bladder	Purge Characteristics	clear w/ black specks	
Volume Removed	5 pts	W L at Sample Time	29.17	
Method of Sample	Low flow bladder	Sample Characteristics	clear	
Sample Analysis	CCR (ABBASB)	Sample Time	1234	
Water Quality Meter	YSI Pro Dss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1218	26.35	8.05	15.5	1.351	7.42	-121.9	8.79
1221	–	8.02	15.7	1.339	4.83	-139.5	7.29
1224	–	8.03	16.1	1.346	3.18	-153.2	4.49
1227	–	8.03	15.8	1.337	2.42	-164.4	3.60
1230	29.17	8.04	15.7	1.336	1.94	-172.7	3.04

SAMPLING NOTES:

ABBASB Duplicate

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION – 12313.1		DATE	5/18/23
Sample Name	MW-19	Start Time	1427	
Condition of Well	good			
Water Level	22.91	Total Depth	—	
Well Diameter	PVC – 2 inch	Volume in Well	—	
Method of Purge	Low flow bladder	Purge Characteristics	clear	
Volume Removed	4.5 qts	W L at Sample Time	22.91	
Method of Sample	Low flow bladder	Sample Characteristics	clear	
Sample Analysis	CCR (ABBASB)	Sample Time	1441	
Water Quality Meter	YSI Pro Dss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1428	22.91	7.41	16.5	.734	7.42	-83.5	2.28
1431	—	7.26	16.4	.726	4.02	-53.3	2.30
1434	—	7.25	16.4	.723	2.58	-37.3	2.12
1437	22.91	7.26	16.4	.724	1.91	-29.1	2.25

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates KLS

DATA SUMMARY POSTING

Station: Midwest Generation Powerton Generating Station

Regulated Unit(s): Former Ash Basin (IEPA ID No. W1798010008-05)

In accordance with the new Ill. Adm. Code Title 35, Part 845: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments (State CCR Rule) groundwater monitoring was completed during the 2nd quarter 2023 which includes the entire list of parameters specified under Section 845.600(a)(1) and (b). Table 1 is a summary table of all available CCR monitoring data to date including any data generated previously as part of the Federal CCR Rule monitoring. In addition, Table 2 provides a summary of turbidity data which was collected as part of State CCR Rule requirements which is a data parameter that was not required under the Federal CCR Rule.

No background statistics or proposed Groundwater Protection Standards are included on these tables. The background statistics and Proposed Groundwater Protection Standards were submitted to Illinois Environmental Protection Agency (EPA) as part of the Application for Initial Operating Permit submitted October 31, 2021. Upon Illinois EPA approval of the Operating Permit and Proposed Groundwater Protection Standards, the approved comparison values will be included on the tables for subsequent data comparisons/evaluations.

R000881

Table 1. Groundwater Analytical Results - Midwest Generation, LLC, Powerton Station, Pekin, IL. Former Ash Basin.

Well	Date	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Radium 226 + 228 Combined	Selenium	Thallium
MW-01 up-gradient	11/16/2015	1.0	98	44	0.17	7.07	93	530	< 0.003	< 0.001	0.057	^< 0.001	< 0.0005	< 0.005	< 0.001	*< 0.0005	< 0.01	< 0.0002	< 0.0050	0.744	< 0.0025	*< 0.002
	2/25/2016	0.2	110	42	0.16	7.23	54	460	< 0.003	0.0025	0.053	< 0.001	< 0.0005	< 0.005	0.0014	0.0019	< 0.01	< 0.0002	< 0.005	< 0.722	0.0029	< 0.002
	5/20/2016	0.34	100	44	0.17	6.95	65	430	< 0.003	0.0081	0.062	< 0.001	< 0.0005	0.007	0.0053	0.011	< 0.01	< 0.0002	< 0.005	< 0.953	< 0.0025	< 0.002
	8/17/2016	0.27	78	39	0.25	7.16	50	530	< 0.003	0.0014	0.048	< 0.001	< 0.0005	< 0.005	< 0.001	0.0014	< 0.01	< 0.0002	0.0057	< 0.491	< 0.0025	< 0.002
	11/16/2016	0.18	97	39	0.21	7.22	32	500	< 0.003	0.0051	0.056	< 0.001	< 0.0005	< 0.005	0.0044	0.0082	< 0.01	< 0.0002	0.0059	< 0.618	< 0.0025	< 0.002
	2/14/2017	0.18	120	55	0.17	7.30	60	550	< 0.003	0.0041	0.056	< 0.001	< 0.0005	< 0.005	0.0045	0.0076	< 0.01	< 0.0002	0.0056	< 0.837	< 0.0025	< 0.002
	5/3/2017	0.19	86	66	0.16	7.41	45	460	< 0.003	0.0015	0.045	< 0.001	< 0.0005	< 0.005	0.0033	0.0067	< 0.01	< 0.0002	< 0.005	0.574	< 0.0025	< 0.002
	6/21/2017	0.18	85	58	0.18	7.60	47	540	< 0.003	< 0.001	0.040	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0061	< 0.418	< 0.0025	< 0.002
	8/25/2017	0.56	86	41	0.18	7.41	63	490	< 0.003	< 0.001	0.049	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0059	0.775	< 0.0025	< 0.002
	11/8/2017	0.57	130	38	0.12	6.69	61	640	< 0.003	< 0.001	0.083	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.343	< 0.0025	< 0.002
	5/17/2018	0.15	88	50	0.12	6.70	48	540	< 0.003	< 0.001	0.045	< 0.001	< 0.0005	< 0.005	< 0.001	0.00068	< 0.01	< 0.0002	< 0.005	< 0.396	< 0.0025	< 0.002
	8/8/2018	0.14	86	48	0.13	6.80	43	430	< 0.003	< 0.001	0.051	^< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.579	< 0.0025	< 0.002
	4/30/2019	0.07	78	54	0.17	7.20	27	450	< 0.003	0.0014	0.039	< 0.001	< 0.0005	< 0.005	< 0.001	0.0017	< 0.01	< 0.0002	< 0.005	< 0.656	< 0.0025	< 0.002
	8/26/2019	0.57	100	39	0.13	7.15	71	550	< 0.003	< 0.001	0.053	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.802	< 0.0025	< 0.002
	2/24/2020	0.28	87	53	0.21	7.19	34	410	< 0.003	< 0.001	0.044	^< 0.001	< 0.0005	< 0.005	< 0.001	0.00057	< 0.01	< 0.0002	< 0.005	< 0.478	< 0.0025	< 0.002
	4/28/2020	0.33	110	46	0.19	7.17	41	470	NA	< 0.001	0.051	NA	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.628	< 0.0025	< 0.002
	12/7/2020	0.59	100	54	0.25	7.22	55	640	NA	< 0.001	0.058	NA	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0052	< 0.542	< 0.0025	< 0.002
	5/11/2021	0.21	85	51	0.21	7.52	37	450	< 0.003	< 0.001	0.043	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.01	0.521	< 0.0025	< 0.002
	8/24/2021	0.27	99	40	0.18	7.19	56	430	< 0.003	< 0.001	0.061	< 0.001	< 0.0005	< 0.005	< 0.001	0.00088	< 0.01	< 0.0002	0.007	< 0.463	< 0.0025	< 0.002
	11/30/2021	0.35	84	41	0.19	7.14	^- 28	410	< 0.003	< 0.001	0.06	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.005	< 0.0002	0.0072	< 0.434	0.0026	< 0.002
	2/9/2022	0.18	96	47	0.17	7.33	48	520	< 0.003	0.0017	0.052	< 0.001	< 0.0005	< 0.005	< 0.001	0.0012	0.003	< 0.0002	0.0074	< 0.527	< 0.0025	< 0.002
	6/7/2022	0.21	81	51	0.14	7.62	27	430	< 0.003	< 0.001	0.04	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0057	0.531	< 0.0025	< 0.002
	8/30/2022	0.59	92	44	0.15	7.10	66	810	< 0.003	< 0.001	0.073	^+< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	^+< 0.01	< 0.0002	< 0.005	< 0.441	< 0.0025	< 0.002
	11/15/2022	0.74	110	47	0.1	7.15	45	530	< 0.003	< 0.001	0.086	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.659	< 0.0025	< 0.002
	2/22/2023	0.46	110	52	0.14	7.51	92	500	< 0.0030	< 0.0010	0.082	< 0.0010	< 0.00050	< 0.0050	< 0.0010	< 0.00050	< 0.010	< 0.00020	< 0.0050	< 0.503	< 0.0025	< 0.0020
	5/17/2023	0.29	91	39	< 0.10	7.23	39	400	< 0.0030	< 0.0010	0.055	^+ ^]+< 0.0010	< 0.00050	< 0.0050	< 0.0010	< 0.00050	< 0.010	< 0.00020	< 0.0050	< 0.357	< 0.0025	< 0.0020
MW-10 up-gradient	6/22/2017	0.46	100	48	0.19	6.81	54	1.0	< 0.003	0.0023	0.250	< 0.001	< 0.0005	< 0.005	0.008	0.003	< 0.01	< 0.0002	< 0.005	0.408	0.0042	< 0.002
	8/24/2017	0.32	93	51	0.18	7.14	57	480	< 0.003	0.0020	0.220	< 0.001	< 0.0005	< 0.005	0.007	0.003	< 0.01	< 0.0002	< 0.005	0.564	0.0044	< 0.002
	11/9/2017	0.36	98	48	0.18	6.78	64	500	< 0.003	< 0.0010	0.220	< 0.001	< 0.0005	< 0.005	0.004	< 0.001	< 0.01	< 0.0002	< 0.005	1.020	0.0034	< 0.002
	5/16/2018	0.42	93	44	0.19	7.64	80	530	< 0.003	0.0010	0.220	< 0.001	< 0.0005	< 0.005	0.021	0.001	< 0.01	< 0.0002	< 0.005	1.550	0.0050	< 0.002
	8/8/2018	0.39	99	58	0.19	7.10	60	550	< 0.003	0.0012	0.220	<^ 0.001	< 0.0005	< 0.005	0.014	0.001	< 0.01	< 0.0002	< 0.005	< 0.551	0.0062	< 0.002
	10/30/2018	0.34	110	49	0.22	7.65	49	510	< 0.003	0.0110	0.410	< 0.001	0.0008	0.024	0.047	0.023	0.02	< 0.0002	< 0.005	3.00	0.0046	< 0.002
	2/26/2019	0.39	150	48	0.21	6.77	36	540	< 0.003	0.0220	0.590	< 0.005	0.0015	0.063	0.081	0.036	0.03	< 0.0002	0.007	4.130	0.0041	< 0.002
	5/1/2019	0.35	92	50	0.22	6.81	30	470	< 0.003	0.0023	0.270	< 0.001	< 0.0005	< 0.005	0.011	0.0028	< 0.01	< 0.0002	< 0.005	1.330	0.0037	< 0.002
	8/26/2019	0.30	84	48	0.19	7.09	30	410	< 0.003	0.0017	0.190	< 0.001	< 0.001	< 0.005	0.007	0.0016	< 0.01	< 0.0002	< 0.005	1.540	0.0050	< 0.002
	2/25/2020	1.40	110	45	0.23	6.82	59	500	< 0.003	0.0033	0.280	< ^ 0.001	< 0.0005	0.0086	0.011	0.0046	< 0.01	< 0.0002	< 0.005	1.07	0.0058	< 0.002
	4/28/2020	1.00	110	41	0.24	6.80	64	550	NA	0.0022	0.250	NA	NA	< 0.005	0.0065	0.0017	NA	NA	< 0.005	0.639	0.0054	NA
	12/8/2020	2.40	120	44	0.26	7.11	71	550	NA	0.0015	0.280	NA	NA	< 0.005	0.0089	0.0023	NA	< 0.0002	< 0.005	1.76	0.0031	NA
	5/11/2021	0.64	100	52	0.24	7.01	59	540	< 0.003	0.0011	0.260	< 0.001	< 0.0005	< 0.005	0.008	0.00085	< 0.01	< 0.0002	< 0.005	1.42	0.0049	< 0.002
	8/24/2021	0.42	98	53	0.21	6.87	46	420	< 0.003	0.0017	0.24	< 0.001	< 0.0005	< 0.005	0.0082	0.002	< 0.01	< 0.0002	< 0.005	0.638	0.0051	< 0.002
	11/30/2021	0.42	100	47	0.19	6.99	^- 36	530	< 0.003	0.0015	0.2	< 0.001	< 0.0005	< 0.005	0.0037	0.00051	0.0031	< 0.0002	< 0.005	1.39	< 0.0025	< 0.002
	2/9/2022	0.41	94	48	0.22	6.88	50	530	< 0.003	0.011	0.6	< 0.001	0.00064	0.026	0.054	0.021	0.011	< 0.0002	< 0.005	6.51	0.0045	< 0.002
	3/29/22 (R)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.811	NS	NS
	6/7/2022	0.43	85	44	0.21	7.09	38	390	< 0.003	0.0011	0.18	< 0.001	< 0.0005	< 0.005	0.0028	< 0.0005	< 0.01	< 0.0002	< 0.005	0.687	0.0049	< 0.002
	8/30/2022	0.38	92	45	0.22	6.83	38	590	< 0.003	0.0012	0.24	^+< 0.001	< 0.0005	< 0.005	0.0086	0.00074	^+< 0.01	< 0.0002	< 0.005	1.4	< 0.0025	< 0.002
	11/15/2022	0.44	99	49	0.28	7.03	48	470	< 0.003	< 0.001	0.2	< 0.001	< 0.0005	< 0.005	0.0052	< 0.0005	< 0.01	< 0.0002	< 0.005	0.909	< 0.0025	< 0.002
	2/22/2023	1.3	100	40	0.22	7.57	66	510	< 0.0030	0.0010	0.22	< 0.0010	< 0.00050	< 0.0050	0.0039	0.00057	< 0.010	< 0.00020	< 0.0050	0.753	0.0040	< 0.0020
	5/17/2023	1.8	130	34	0.25	7.07	84	610	< 0.0030	0.0017	0.32	^+ ^]+< 0.0010	< 0.00050	< 0.0050	0.012	0.0018	< 0.010	< 0.00020	< 0.0050	2.52	0.0047	< 0.0020
MW-02 down-gradient	6/20/2017	0.33	90	55	0.19	7.01	47	500	< 0.003	0.0012	0.075	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.341	< 0.0025	< 0.002
	8/23/2017	V 1.30	86	49	0.19	7.40	61	440	< 0.003	< 0.001	0.062	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.833	< 0.0025	< 0.002
	11/7/2017	3.70	98	46	0.17	7.10	88	550	< 0.003	0.0014	0.091	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.309	0.0027	< 0.002
	5/15/2018	0.22	80	45	0.23	7.71	54	500	< 0.003	0.0013	0.065	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	0.0004	< 0.005	< 0.408	< 0.0025	< 0.002
	8/7/2018	1.50	89	54	0.15	7.09	51	530	< 0.003	0.0016	0.067	<^ 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.622	< 0.0025	< 0.002
	10/30/2018	0.23	86	43	0.17	7.83	34	480	< 0.003	0.0015	0.067	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.564	< 0.0025	< 0.002
	2/26/2019	0.07	69	49	0.16	7.82	23	400	< 0.003	0.0026	0.041	< 0.001	< 0.0005	< 0.005	< 0.001	0.0013	< 0.01	< 0.0002	< 0.005	< 0.425	< 0.0025	< 0.002
	4/30/2019	0.12	79	48	0.16	7.60	30	440	< 0.003	0.0013	0.048	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.441	< 0.0025	< 0.002
	8/26/2019	0.51	86	50	0.18	7.13	32	400	< 0.003	0.0011	0.065	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	1.180	< 0.0025	< 0.002
	2/24/2020	0.33	89	53	0.20	7.43	37	410	< 0.003	0.0011	0.061	< ^ 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.485	< 0.0025	< 0.002
	4/28/2020	0.33	90	50	0.20	7.32	41	430	NA	0.0016	0.06	NA	NA	< 0.005	< 0.001	< 0.0005	NA	NA	< 0.005	< 0.54	< 0.0025	NA
	12/9/2020	0.66	100	41	0.15	7.78	64	430	NA	< 0.001	0.076	NA	NA	< 0.005	< 0.001	< 0.0005	NA	< 0.0002	0.0059	< 0.471	< 0.0025	NA
	5/11/2021	0.23	79	51	0.21	7.70	37	370	< 0.003	0.0015	0.057	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0095	< 0.528	< 0.0025	< 0.002
	8/24/2021	0.63	94	47	0.17	7.31	56	340	< 0.003	0.0014	0.073	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.47	< 0.0025	< 0.002
	11/30/2021	0.22	87	41	0.14	7.39	^- 36	380	< 0.003	0.0017	0.065	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.0045	< 0.0002	< 0.005	0.575	< 0.0025	< 0.002
	2/8/2022	0.27	95	47	0.2	7.69	49	550	< 0.003	0.0017	0.054	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.0025	< 0.0002	0.0076	0.554	< 0.0025	< 0.002
	6/7/2022	0.23	86	49	0.16	7.73	32	440	< 0.003	0.0016	0.064	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.0100	< 0.0002	0.0063	0.665	< 0.0025	< 0.002
	8/30/2022	1.1	95	45	0.15	7.22	75	690	< 0.003	< 0.001	0.073	^+< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	^+< 0.0100	< 0.0002	< 0.005	0.535	< 0.0025	< 0.002
	11/14/2022	1.6	96	49	0.21	7.14	63	480	< 0.003	< 0.001	0.083	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.0100	< 0.0002	< 0.005	< 0.587	< 0.0025	< 0.002
	2/21/2023	2.5	110	49	0.14	7.64	92	630	< 0.0030	< 0.0010	0.095	< 0.0010	< 0.00050	< 0.0050	< 0.0010	< 0.00050	< 0.010	< 0.00020	< 0.0050	< 0.563	< 0.0025	< 0.0020
	5/16/2023	0.53	83	47	0.15	7.48	33	400	< 0.0030	0.0011	0.065	^+ ^]+< 0.0010	< 0.00050	< 0.0050	< 0.0010	< 0.00050	< 0.010	< 0.00020	< 0.0050	< 0.519	< 0.0025	< 0.0020

Notes: All units are in mg/l except pH is in standard units.
V- Serial dilution exceeds control limits.
H- Sample was prepped or analyzed beyond specified holding time
F1 - MS and/or MSD Recovery outside of limits.
*_ LCS or LCSD is outside acceptance limits.
^_ Denotes instrument related QC exceeds the control limits
NA - Not Analyzed

R000882

Table 1. Groundwater Analytical Results - Midwest Generation, LLC, Powerton Station, Pekin, IL. Former Ash Basin.

Well	Date	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Radium 226 + 228 Combined	Selenium	Thallium
MW-03 down-gradient	6/20/2017	0.4	76	54	0.29	7.26	49	480	< 0.003	0.0013	0.066	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.325	< 0.0025	< 0.002
	8/23/2017	0.40	79	52	0.28	7.44	52	430	< 0.003	0.0010	0.066	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	1.200	< 0.0025	< 0.002
	11/7/2017	0.31	79	62	0.26	7.04	61	460	< 0.003	0.0013	0.068	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.588	< 0.0025	< 0.002
	5/15/2018	0.35	87	66	0.27	7.53	77	520	< 0.003	0.0010	0.059	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.489	< 0.0025	< 0.002
	8/7/2018	0.40	82	67	0.22	6.60	49	500	< 0.003	0.0015	0.067	^< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.341	< 0.0025	< 0.002
	10/30/2018	0.20	74	44	0.25	7.84	26	400	< 0.003	0.0014	0.056	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.354	< 0.0025	< 0.002
	2/26/2019	0.06	74	56	0.24	7.49	25	410	< 0.003	0.0013	0.054	< 0.001	< 0.0005	< 0.005	< 0.001	0.0007	< 0.01	< 0.0002	< 0.005	< 0.399	< 0.0025	< 0.002
	4/30/2019	0.28	74	49	0.22	7.17	38	390	< 0.003	< 0.001	0.060	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.668	< 0.0025	< 0.002
	8/26/2019	0.31	75	50	0.26	7.17	14	380	< 0.003	0.0014	0.069	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.444	< 0.0025	< 0.002
	2/24/2020	0.33	87	53	0.22	7.10	65	470	< 0.003	< 0.001	0.066	^< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.400	< 0.0025	< 0.002
	4/28/2020	0.24	86	46	0.22	7.03	79	410	NA	0.0013	0.066	NA	NA	< 0.005	< 0.001	< 0.0005	NA	NA	< 0.005	< 0.498	0.0036	NA
	12/9/2020	0.86	92	45	0.28	7.46	60	390	NA	< 0.001	0.086	NA	NA	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.432	< 0.0025	NA
	5/11/2021	0.22	75	49	0.21	7.33	38	390	< 0.003	< 0.001	0.07	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.519	< 0.0025	< 0.002
	8/24/2021	0.41	81	46	0.25	7.15	32	310	< 0.003	0.0012	0.072	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.444	< 0.0025	< 0.002
	11/30/2021	0.3	76	47	0.26	7.20	^- 23	350	< 0.003	0.0014	0.063	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.004	< 0.0002	< 0.005	< 0.436	< 0.0025	< 0.002
	2/8/2022	0.2	94	47	0.21	7.22	50	550	< 0.003	0.001	0.058	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.003	< 0.0002	< 0.005	0.593	< 0.0025	< 0.002
	6/7/2022	0.37	79	45	0.22	7.37	47	370	< 0.003	0.0012	0.064	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.851	< 0.0025	< 0.002
	8/30/2022	0.57	87	50	0.21	7.10	51	710	< 0.003	< 0.001	0.1	^+< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	^+< 0.01	< 0.0002	< 0.005	0.589	< 0.0025	< 0.002
	11/14/2022	0.42	81	49	0.28	7.23	44	430	< 0.003	< 0.001	0.11	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.54	< 0.0025	< 0.002
	2/21/2023	1.0	96	53	0.20	7.75	70	550	< 0.0030	< 0.0010	0.11	< 0.0010	< 0.00050	< 0.0050	< 0.0010	< 0.00050	< 0.010	< 0.00020	< 0.0050	< 0.493	< 0.0025	< 0.0020
	5/16/2023	0.15	80	69	0.21	7.42	31	420	< 0.0030	< 0.0010	0.068	^+^1+< 0.0010	< 0.00050	< 0.0050	< 0.0010	< 0.00050	< 0.010	< 0.00020	< 0.0050	0.993	0.0038	< 0.0020
MW-04 down-gradient	6/20/2017	0.5	77	55	0.29	7.45	53	480	< 0.003	< 0.001	0.0025	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.343	< 0.0025	< 0.002
	8/28/2017	V 0.73	90	89	0.33	7.13	110	680	< 0.003	< 0.001	0.028	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.013	< 0.246	< 0.0025	< 0.002
	11/7/2017	0.60	110	94	0.24	6.80	130	650	< 0.003	< 0.001	0.051	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.332	0.0092	< 0.002
	5/15/2018	0.68	87	66	0.27	7.63	100	630	< 0.003	< 0.001	0.037	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.661	< 0.0025	< 0.002
	8/7/2018	0.79	84	71	0.32	6.72	49	510	< 0.003	0.0011	0.031	<^ 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.006	< 0.334	< 0.0025	< 0.002
	10/30/2018	0.54	100	80	0.24	7.55	91	690	< 0.003	< 0.001	0.049	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.423	< 0.0025	< 0.002
	2/26/2019	0.38	79	55	0.25	7.18	52	490	< 0.003	0.0013	0.033	< 0.001	< 0.0005	< 0.005	0.001	0.0012	< 0.01	< 0.0002	< 0.005	0.366	< 0.0025	< 0.002
	4/30/2019	0.36	74	48	0.25	7.08	35	380	< 0.003	< 0.001	0.026	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.684	< 0.0025	< 0.002
	8/26/2019	0.64	91	60	0.24	7.08	14	490	< 0.003	< 0.001	0.032	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.008	1.090	< 0.0025	< 0.002
	2/24/2020	0.34	81	49	0.20	7.05	67	440	< 0.003	< 0.001	0.024	^< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.595	< 0.0025	< 0.002
	4/28/2020	0.55	76	52	0.27	7.03	47	380	NA	< 0.001	0.025	NA	NA	< 0.005	< 0.001	< 0.0005	NA	NA	< 0.005	< 0.465	< 0.0025	NA
	12/9/2020	0.57	92	88	0.32	7.10	94	580	NA	< 0.001	0.034	NA	NA	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0076	< 0.411	< 0.0025	NA
	5/11/2021	0.61	77	44	0.33	7.22	76	410	< 0.003	< 0.001	0.025	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.533	< 0.0025	< 0.002
	8/24/2021	0.72	78	48	0.34	7.12	15	100	< 0.003	< 0.001	0.024	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.014	< 0.427	< 0.0025	< 0.002
	11/30/2021	0.51	99	56	0.25	6.95	^- 62	560	< 0.003	0.0012	0.035	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.0035	< 0.0002	< 0.005	< 0.419	< 0.0025	< 0.002
	2/8/2022	0.47	88	59	0.29	7.15	52	580	< 0.003	< 0.001	0.03	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.0038	< 0.0002	0.006	0.818	< 0.0025	< 0.002
	6/7/2022	0.48	73	43	0.3	7.31	30	320	< 0.003	< 0.001	0.025	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0051	< 0.473	< 0.0025	< 0.002
	8/30/2022	0.67	94	61	0.21	6.80	67	720	< 0.003	< 0.001	0.034	^+< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	^+< 0.01	< 0.0002	< 0.005	< 0.546	< 0.0025	< 0.002
	11/14/2022	0.84	110	62	0.2	6.85	41	570	< 0.003	< 0.001	0.08	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.583	0.0074	< 0.002
	2/21/2023	0.75	89	54	0.22	7.58	54	540	< 0.0030	< 0.0010	0.035	< 0.0010	< 0.00050	< 0.0050	< 0.0010	< 0.00050	< 0.010	< 0.00020	< 0.0050	< 0.567	0.0037	< 0.0020
	5/16/2023	0.66	100	51	0.27	7.21	120	550	< 0.0030	< 0.0010	0.034	^+ ^1+< 0.0010	< 0.00050	< 0.0050	< 0.0010	< 0.00050	< 0.010	< 0.00020	< 0.0050	< 0.624	< 0.0025	< 0.0020
MW-05 down-gradient	5/17/2016	0.70	100	85	0.35	7.08	120	660	< 0.003	< 0.001	0.051	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.373	< 0.0025	< 0.002
	8/16/2016	0.69	110	97	0.30	6.85	150	830	< 0.003	< 0.001	0.060	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.452	< 0.0025	< 0.002
	11/15/2016	0.93	94	66	0.23	6.96	77	620	< 0.003	< 0.001	0.051	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.449	< 0.0025	< 0.002
	2/14/2017	0.79	100	100	0.25	7.25	170	760	< 0.003	< 0.001	0.062	< 0.001	< 0.0005	< 0.005	< 0.001	0.00091	< 0.01	< 0.0002	< 0.005	< 0.359	< 0.0025	< 0.002
	5/1/2017	0.70	100	92	0.28	7.60	170	710	< 0.003	< 0.001	0.059	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0066	< 0.439	< 0.0025	< 0.002
	6/20/2017	0.64	89	63	0.28	7.32	78	550	< 0.003	< 0.001	0.048	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0061	< 0.365	< 0.0025	< 0.002
	8/28/2017	0.62	110	120	0.33	7.05	210	870	< 0.003	< 0.001	0.064	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0085	0.381	< 0.0025	< 0.002
	11/7/2017	0.51	99	110	0.31	6.87	160	990	< 0.003	< 0.001	0.058	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.341	< 0.0025	< 0.002
	5/15/2018	0.61	130	89	0.29	7.70	210	910	< 0.003	< 0.001	0.062	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.390	< 0.0025	< 0.002
	8/7/2018	0.49	110	120	0.32	6.56	180	890	< 0.003	< 0.001	0.054	^< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0069	0.523	< 0.0025	< 0.002
	4/30/2019	0.56	84	73	0.36	6.96	120	590	< 0.003	< 0.001	0.041	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0061	< 0.709	< 0.0025	< 0.002
	8/26/2019	0.57	110	75	0.29	7.01	110	660	< 0.003	< 0.001	0.050	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0067	0.651	< 0.0025	< 0.002
	2/24/2020	0.54	110	70	0.36	6.90	120	H 700	< 0.003	< 0.001	0.057	^< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0061	0.506	< 0.0025	< 0.002
	4/28/2020	0.49	110	56	0.37	6.87	130	620	NA	0.001	0.052	NA	NA	< 0.005	< 0.001	< 0.0005	NA	NA	0.0074	0.508	< 0.0025	NA
	12/9/2020	0.53	98	78	0.31	6.91	110	670	NA	< 0.001	0.05	NA	NA	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0072	0.569	< 0.0025	NA
	5/11/2021	0.50	83	52	0.38	7.20	100	530	< 0.003	< 0.001	0.04	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0062	< 0.525	< 0.0025	< 0.002
	8/24/2021	0.55	88	69	0.32	6.84	99	500	< 0.003	< 0.001	0.041	< 0.001	< 0.0005	0.007	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0073	0.863	< 0.0025	< 0.002
	11/30/2021	0.68	99	67	0.3	6.92	^- 92	620	< 0.003	0.0011	0.048	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.0052	< 0.0002	0.0051	0.632	< 0.0025	< 0.002
	2/8/2022	0.56	88	68	0.36	6.95	91	650	< 0.003	< 0.001	0.043	< 0.001	0.00066	< 0.005	0.0023	0.0017	0.0051	< 0.0002	0.007	< 0.438	< 0.0025	< 0.002
	6/7/2022	0.59	110	58	0.27	7.15	120	650	< 0.003	< 0.001	0.052	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	0.00034	< 0.005	< 0.468	< 0.0025	< 0.002
	8/30/2022	0.69	79	73	0.38	6.94	86	720	< 0.003	< 0.001	0.029	^+< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	^+< 0.01	< 0.0002	0.0073	< 0.538	< 0.0025	< 0.002
	11/14/2022	1.1	96	64	0.29	6.87	93	600	< 0.003	< 0.001	0.072	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.0064	< 0.573	< 0.0025	< 0.002
	2/21/2023	0.68	100	93	0.29	7.34	97	760	< 0.0030	< 0.0010	0.052	< 0.0010	< 0.00050	< 0.0050	< 0.0010	< 0.00050	< 0.010	< 0.00020	< 0.0050	< 0.528	0.0031	< 0.0020
	5/16/2023	0.78	110	79	0.30	7.04	130	690	< 0.0030	< 0.0010	0.053	^+ ^1+< 0.0010	< 0.00050	< 0.0050	< 0.0010	< 0.00050	< 0.010	< 0.00020	< 0.0050	< 0.648	< 0.0025	< 0.0020

Notes: All units are in mg/l except pH is in standard units.
V- Serial dilution exceeds control limits.
H- Sample was prepped or analyzed beyond specified holding time
F1 - MS and/or MSD Recovery outside of limits.
*_ LCS or LCSD is outside acceptance limits.
^_ Denotes instrument related QC exceeds the control limits
NA - Not Analyzed

Table 2. Groundwater Turbidity - Midwest Generation, LLC, Powerton Station, Pekin, IL. Former Ash Basin.

Well	Date	Turbidity (NTU)
MW-01	2/23/2021	78.20
	4/9/2021	6.96
	5/10/2021	3.24
	6/2/2021	3.80
	6/28/2021	4.30
	7/19/2021	4.88
	8/24/2021	3.34
	9/30/2021	3.04
	11/30/2021	5.43
	2/9/2022	11.5
	6/7/2022	3.63
	8/30/2022	4.73
	11/15/2022	3.9
	2/22/2023	4.54
	5/17/2023	4.33
MW-10	2/23/2021	257.70
	4/9/2021	54.91
	5/11/2021	24.74
	6/2/2021	6.02
	6/28/2021	14.11
	7/19/2021	17.53
	8/24/2021	41.55
	9/30/2021	17.07
	11/30/2021	11.92
	2/9/2022	224.6
	6/7/2022	7.88
	8/30/2022	13.34
	11/15/2022	23.18
	2/22/2023	14.31
	5/17/2023	30.70
MW-02	2/22/2021	19.60
	4/8/2021	4.55
	5/11/2021	1.82
	6/2/2021	2.06
	6/28/2021	2.67
	7/19/2021	3.56
	8/24/2021	5.23
	10/1/2021	2.76
	11/30/2021	0.0
	2/8/2022	0.0
	6/7/2022	2.03
	8/30/2022	2.46
	11/14/2022	29.35
	2/21/2023	2.63
	5/16/2023	62.49
MW-03	2/22/2021	8.20
	4/8/2021	4.00
	5/11/2021	2.68
	6/2/2021	3.63
	6/28/2021	3.32
	7/19/2021	4.22
	8/24/2021	5.75
	10/1/2021	2.45
	11/30/2021	0.0
	2/8/2022	0.0
	6/7/2022	1.72
	8/30/2022	2.67
	11/14/2022	4.03
	2/21/2023	2.33
	5/16/2023	6.94
MW-04	2/22/2021	4.20
	4/8/2021	4.05
	5/11/2021	4.33
	6/2/2021	2.12
	6/28/2021	8.21
	7/19/2021	3.84
	8/24/2021	2.92
	10/1/2021	2.72
	11/30/2021	0.0
	2/8/2022	11.09
	6/7/2022	1.62
	8/30/2022	4.05
	11/14/2022	20.70
	2/21/2023	3.70
	5/16/2023	2.50

Table 2. Groundwater Turbidity - Midwest Generation, LLC, Powerton Station, Pekin, IL. Former Ash Basin.

MW-05	2/22/2021	1.72
	4/8/2021	4.00
	5/11/2021	1.82
	6/2/2021	1.88
	6/28/2021	3.49
	7/19/2021	8.39
	8/24/2021	3.20
	10/1/2021	3.12
	11/30/2021	0.0
	2/8/2022	0.0
	6/7/2022	2.33
	8/30/2022	2.70
	11/14/2022	2.05
	2/21/2023	2.16
	5/16/2023	2.55

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ANALYTICAL REPORT

PREPARED FOR

Attn: Richard Gnat
KPRG and Associates, Inc.
14665 West Lisbon Road,
Suite 1A
Brookfield, Wisconsin 53005

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JOB DESCRIPTION

Powerton CCR FAB

JOB NUMBER

500-233911-1

Eurofins Chicago
2417 Bond Street
University Park IL 60484

See page two for job notes and contact information.

my EOL

Eurofins Chicago

Job Notes

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Authorization



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Authorized for release by
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Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Laboratory Job ID: 500-233911-1

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Case Narrative

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-233911-1

Job ID: 500-233911-1

Laboratory: Eurofins Chicago

Narrative

Job Narrative
500-233911-1

Receipt
The samples were received on 5/17/2023 10:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.1º C and 4.5º C.

Metals
Method 6020A: The low level and continuing calibration verification (CCVL, CCV) associated with batch 500-715021 recovered above the upper control limit for Beryllium. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
For sample 500-233911-6 (MW-01), the plastic 1 liter unpreserved container was consumed during the TDS analysis, therefore, Chloride, Fluoride and Sulfate could not be analyzed. Per the client, they will re-sample for these parameters in mid-June

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-233911-1

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	EET CHI
7470A	Mercury (CVAA)	SW846	EET CHI
SM 2540C	Solids, Total Dissolved (TDS)	SM	EET CHI
SM 4500 Cl- E	Chloride, Total	SM	EET CHI
SM 4500 F C	Fluoride	SM	EET CHI
SM 4500 SO4 E	Sulfate, Total	SM	EET CHI
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET CHI
7470A	Preparation, Mercury	SW846	EET CHI

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Sample Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-233911-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-233911-1	MW-02	Water	05/16/23 09:06	05/17/23 10:00
500-233911-2	MW-03	Water	05/16/23 09:54	05/17/23 10:00
500-233911-3	MW-04	Water	05/16/23 10:48	05/17/23 10:00
500-233911-4	MW-05	Water	05/16/23 11:45	05/17/23 10:00
500-233911-5	MW-10	Water	05/17/23 09:08	05/18/23 09:40
500-233911-6	MW-01	Water	05/17/23 12:36	05/18/23 09:40
500-233911-7	Duplicate	Water	05/17/23 00:00	05/18/23 09:40

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-233911-1

Client Sample ID: MW-02

Date Collected: 05/16/23 09:06
Date Received: 05/17/23 10:00

Lab Sample ID: 500-233911-1

Matrix: Water

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		05/22/23 09:04	05/24/23 21:43	1
Arsenic	**0.0011**		0.0010		mg/L		05/22/23 09:04	05/23/23 23:53	1
Barium	**0.065**		0.0025		mg/L		05/22/23 09:04	05/24/23 21:43	1
Beryllium	<0.0010	^+ ^1+	0.0010		mg/L		05/22/23 09:04	05/23/23 23:53	1
Boron	**0.53**		0.050		mg/L		05/22/23 09:04	05/23/23 23:53	1
Cadmium	<0.00050		0.00050		mg/L		05/22/23 09:04	05/23/23 23:53	1
Calcium	**83**		0.20		mg/L		05/22/23 09:04	05/24/23 21:43	1
Chromium	<0.0050		0.0050		mg/L		05/22/23 09:04	05/23/23 23:53	1
Cobalt	<0.0010		0.0010		mg/L		05/22/23 09:04	05/23/23 23:53	1
Lead	<0.00050		0.00050		mg/L		05/22/23 09:04	05/23/23 23:53	1
Lithium	<0.010		0.010		mg/L		05/22/23 09:04	05/25/23 23:03	1
Molybdenum	<0.0050		0.0050		mg/L		05/22/23 09:04	05/23/23 23:53	1
Selenium	<0.0025		0.0025		mg/L		05/22/23 09:04	05/23/23 23:53	1
Thallium	<0.0020		0.0020		mg/L		05/22/23 09:04	05/23/23 23:53	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/05/23 11:05	06/06/23 10:02	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**400**		10		mg/L			05/18/23 00:33	1
Chloride (SM 4500 Cl- E)	**47**		4.0		mg/L			05/24/23 16:33	2
Fluoride (SM 4500 F C)	**0.15**		0.10		mg/L			05/21/23 10:10	1
Sulfate (SM 4500 SO4 E)	**33**		25		mg/L			05/26/23 14:25	5

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-233911-1

Client Sample ID: MW-03

Date Collected: 05/16/23 09:54
Date Received: 05/17/23 10:00

Lab Sample ID: 500-233911-2

Matrix: Water

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		05/22/23 09:04	05/24/23 21:46	1
Arsenic	<0.0010		0.0010		mg/L		05/22/23 09:04	05/23/23 23:57	1
Barium	**0.068**		0.0025		mg/L		05/22/23 09:04	05/24/23 21:46	1
Beryllium	<0.0010	^+ ^1+	0.0010		mg/L		05/22/23 09:04	05/23/23 23:57	1
Boron	**0.15**		0.050		mg/L		05/22/23 09:04	05/23/23 23:57	1
Cadmium	<0.00050		0.00050		mg/L		05/22/23 09:04	05/23/23 23:57	1
Calcium	**80**		0.20		mg/L		05/22/23 09:04	05/24/23 21:46	1
Chromium	<0.0050		0.0050		mg/L		05/22/23 09:04	05/23/23 23:57	1
Cobalt	<0.0010		0.0010		mg/L		05/22/23 09:04	05/23/23 23:57	1
Lead	<0.00050		0.00050		mg/L		05/22/23 09:04	05/23/23 23:57	1
Lithium	<0.010		0.010		mg/L		05/22/23 09:04	05/25/23 23:06	1
Molybdenum	<0.0050		0.0050		mg/L		05/22/23 09:04	05/23/23 23:57	1
Selenium	**0.0038**		0.0025		mg/L		05/22/23 09:04	05/23/23 23:57	1
Thallium	<0.0020		0.0020		mg/L		05/22/23 09:04	05/23/23 23:57	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/05/23 11:05	06/06/23 10:04	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**420**		10		mg/L			05/18/23 00:35	1
Chloride (SM 4500 Cl- E)	**69**		4.0		mg/L			05/24/23 16:34	2
Fluoride (SM 4500 F C)	**0.21**		0.10		mg/L			05/21/23 10:10	1
Sulfate (SM 4500 SO4 E)	**31**		10		mg/L			05/26/23 14:25	2

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-233911-1

Client Sample ID: MW-04

Date Collected: 05/16/23 10:48
Date Received: 05/17/23 10:00

Lab Sample ID: 500-233911-3

Matrix: Water

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		05/22/23 09:04	05/24/23 21:50	1
Arsenic	<0.0010		0.0010		mg/L		05/22/23 09:04	05/24/23 00:00	1
Barium	**0.034**		0.0025		mg/L		05/22/23 09:04	05/24/23 21:50	1
Beryllium	<0.0010	^+ ^1+	0.0010		mg/L		05/22/23 09:04	05/24/23 00:00	1
Boron	**0.66**		0.050		mg/L		05/22/23 09:04	05/24/23 00:00	1
Cadmium	<0.00050		0.00050		mg/L		05/22/23 09:04	05/24/23 00:00	1
Calcium	**100**		0.20		mg/L		05/22/23 09:04	05/24/23 21:50	1
Chromium	<0.0050		0.0050		mg/L		05/22/23 09:04	05/24/23 00:00	1
Cobalt	<0.0010		0.0010		mg/L		05/22/23 09:04	05/24/23 00:00	1
Lead	<0.00050		0.00050		mg/L		05/22/23 09:04	05/24/23 00:00	1
Lithium	<0.010		0.010		mg/L		05/22/23 09:04	05/25/23 23:10	1
Molybdenum	<0.0050		0.0050		mg/L		05/22/23 09:04	05/24/23 00:00	1
Selenium	<0.0025		0.0025		mg/L		05/22/23 09:04	05/24/23 00:00	1
Thallium	<0.0020		0.0020		mg/L		05/22/23 09:04	05/24/23 00:00	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/05/23 11:05	06/06/23 10:12	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**550**		10		mg/L			05/18/23 00:38	1
Chloride (SM 4500 Cl- E)	**51**		10		mg/L			05/24/23 16:34	5
Fluoride (SM 4500 F C)	**0.27**		0.10		mg/L			05/21/23 10:10	1
Sulfate (SM 4500 SO4 E)	**120**		50		mg/L			05/26/23 14:26	10

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-233911-1

Client Sample ID: MW-05

Date Collected: 05/16/23 11:45
Date Received: 05/17/23 10:00

Lab Sample ID: 500-233911-4

Matrix: Water

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		05/22/23 09:04	05/24/23 21:53	1
Arsenic	<0.0010		0.0010		mg/L		05/22/23 09:04	05/24/23 00:04	1
Barium	**0.053**		0.0025		mg/L		05/22/23 09:04	05/24/23 21:53	1
Beryllium	<0.0010	^+ ^1+	0.0010		mg/L		05/22/23 09:04	05/24/23 00:04	1
Boron	**0.78**		0.050		mg/L		05/22/23 09:04	05/24/23 00:04	1
Cadmium	<0.00050		0.00050		mg/L		05/22/23 09:04	05/24/23 00:04	1
Calcium	**110**		0.20		mg/L		05/22/23 09:04	05/24/23 21:53	1
Chromium	<0.0050		0.0050		mg/L		05/22/23 09:04	05/24/23 00:04	1
Cobalt	<0.0010		0.0010		mg/L		05/22/23 09:04	05/24/23 00:04	1
Lead	<0.00050		0.00050		mg/L		05/22/23 09:04	05/24/23 00:04	1
Lithium	<0.010		0.010		mg/L		05/22/23 09:04	05/25/23 23:13	1
Molybdenum	<0.0050		0.0050		mg/L		05/22/23 09:04	05/24/23 00:04	1
Selenium	<0.0025		0.0025		mg/L		05/22/23 09:04	05/24/23 00:04	1
Thallium	<0.0020		0.0020		mg/L		05/22/23 09:04	05/24/23 00:04	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/05/23 11:05	06/06/23 10:18	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**690**		10		mg/L			05/18/23 00:40	1
Chloride (SM 4500 Cl- E)	**79**		10		mg/L			05/24/23 16:35	5
Fluoride (SM 4500 F C)	**0.30**		0.10		mg/L			05/21/23 10:10	1
Sulfate (SM 4500 SO4 E)	**130**		25		mg/L			05/26/23 14:26	5

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-233911-1

Client Sample ID: MW-10

Date Collected: 05/17/23 09:08
Date Received: 05/18/23 09:40

Lab Sample ID: 500-233911-5

Matrix: Water

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		05/22/23 09:04	05/24/23 21:56	1
Arsenic	**0.0017**		0.0010		mg/L		05/22/23 09:04	05/24/23 00:07	1
Barium	**0.32**		0.0025		mg/L		05/22/23 09:04	05/24/23 21:56	1
Beryllium	<0.0010	^+ ^1+	0.0010		mg/L		05/22/23 09:04	05/24/23 00:07	1
Boron	**1.8**		0.050		mg/L		05/22/23 09:04	05/24/23 00:07	1
Cadmium	<0.00050		0.00050		mg/L		05/22/23 09:04	05/24/23 00:07	1
Calcium	**130**		0.20		mg/L		05/22/23 09:04	05/24/23 21:56	1
Chromium	<0.0050		0.0050		mg/L		05/22/23 09:04	05/24/23 00:07	1
Cobalt	**0.012**		0.0010		mg/L		05/22/23 09:04	05/24/23 00:07	1
Lead	**0.0018**		0.00050		mg/L		05/22/23 09:04	05/24/23 00:07	1
Lithium	<0.010		0.010		mg/L		05/22/23 09:04	05/25/23 23:16	1
Molybdenum	<0.0050		0.0050		mg/L		05/22/23 09:04	05/24/23 00:07	1
Selenium	**0.0047**		0.0025		mg/L		05/22/23 09:04	05/24/23 00:07	1
Thallium	<0.0020		0.0020		mg/L		05/22/23 09:04	05/24/23 00:07	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/05/23 11:05	06/06/23 10:21	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**610**		10		mg/L			05/22/23 01:20	1
Chloride (SM 4500 Cl- E)	**34**		4.0		mg/L			05/24/23 16:35	2
Fluoride (SM 4500 F C)	**0.25**		0.10		mg/L			05/24/23 08:35	1
Sulfate (SM 4500 SO4 E)	**84**		10		mg/L			05/26/23 14:26	2

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-233911-1

Client Sample ID: MW-01

Date Collected: 05/17/23 12:36
Date Received: 05/18/23 09:40

Lab Sample ID: 500-233911-6

Matrix: Water

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		05/22/23 09:04	05/24/23 22:07	1
Arsenic	<0.0010		0.0010		mg/L		05/22/23 09:04	05/24/23 00:10	1
Barium	**0.055**		0.0025		mg/L		05/22/23 09:04	05/24/23 22:07	1
Beryllium	<0.0010	^+ ^1+	0.0010		mg/L		05/22/23 09:04	05/24/23 00:10	1
Boron	**0.29**		0.050		mg/L		05/22/23 09:04	05/24/23 00:10	1
Cadmium	<0.00050		0.00050		mg/L		05/22/23 09:04	05/24/23 00:10	1
Calcium	**91**		0.20		mg/L		05/22/23 09:04	05/24/23 22:07	1
Chromium	<0.0050		0.0050		mg/L		05/22/23 09:04	05/24/23 00:10	1
Cobalt	<0.0010		0.0010		mg/L		05/22/23 09:04	05/24/23 00:10	1
Lead	<0.00050		0.00050		mg/L		05/22/23 09:04	05/24/23 00:10	1
Lithium	<0.010		0.010		mg/L		05/22/23 09:04	05/25/23 23:20	1
Molybdenum	<0.0050		0.0050		mg/L		05/22/23 09:04	05/24/23 00:10	1
Selenium	<0.0025		0.0025		mg/L		05/22/23 09:04	05/24/23 00:10	1
Thallium	<0.0020		0.0020		mg/L		05/22/23 09:04	05/24/23 00:10	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/05/23 11:05	06/06/23 10:23	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**400**		10		mg/L			05/22/23 01:23	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-233911-1

Client Sample ID: Duplicate

Date Collected: 05/17/23 00:00
Date Received: 05/18/23 09:40

Lab Sample ID: 500-233911-7

Matrix: Water

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		05/22/23 09:04	05/24/23 22:10	1
Arsenic	**0.0019**		0.0010		mg/L		05/22/23 09:04	05/24/23 00:21	1
Barium	**0.30**		0.0025		mg/L		05/22/23 09:04	05/24/23 22:10	1
Beryllium	<0.0010	^+ ^1+	0.0010		mg/L		05/22/23 09:04	05/24/23 00:21	1
Boron	**1.9**		0.050		mg/L		05/22/23 09:04	05/24/23 00:21	1
Cadmium	<0.00050		0.00050		mg/L		05/22/23 09:04	05/24/23 00:21	1
Calcium	**130**		0.20		mg/L		05/22/23 09:04	05/24/23 22:10	1
Chromium	<0.0050		0.0050		mg/L		05/22/23 09:04	05/24/23 00:21	1
Cobalt	**0.0052**		0.0010		mg/L		05/22/23 09:04	05/24/23 00:21	1
Lead	**0.0019**		0.00050		mg/L		05/22/23 09:04	05/24/23 00:21	1
Lithium	<0.010		0.010		mg/L		05/22/23 09:04	05/25/23 23:23	1
Molybdenum	<0.0050		0.0050		mg/L		05/22/23 09:04	05/24/23 00:21	1
Selenium	**0.0052**		0.0025		mg/L		05/22/23 09:04	05/24/23 00:21	1
Thallium	<0.0020		0.0020		mg/L		05/22/23 09:04	05/24/23 00:21	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/05/23 11:05	06/06/23 10:25	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**650**		10		mg/L			05/22/23 01:58	1
Chloride (SM 4500 Cl- E)	**34**		2.0		mg/L			05/24/23 16:34	1
Fluoride (SM 4500 F C)	**0.25**		0.10		mg/L			05/24/23 08:35	1
Sulfate (SM 4500 SO4 E)	**79**		50		mg/L			05/26/23 14:26	10

Definitions/Glossary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-233911-1

Qualifiers

Metals

Qualifier	Qualifier Description
^+	Continuing Calibration Verification (CCV) is outside acceptance limits, high biased.
^1+	Initial Calibration Verification (ICV) is outside acceptance limits, high biased.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

QC Association Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-233911-1

Metals

Prep Batch: 714516

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233911-1	MW-02	Total Recoverable	Water	3005A	
500-233911-2	MW-03	Total Recoverable	Water	3005A	
500-233911-3	MW-04	Total Recoverable	Water	3005A	
500-233911-4	MW-05	Total Recoverable	Water	3005A	
500-233911-5	MW-10	Total Recoverable	Water	3005A	
500-233911-6	MW-01	Total Recoverable	Water	3005A	
500-233911-7	Duplicate	Total Recoverable	Water	3005A	
MB 500-714516/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 500-714516/22-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCS 500-714516/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 715021

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233911-1	MW-02	Total Recoverable	Water	6020A	714516
500-233911-2	MW-03	Total Recoverable	Water	6020A	714516
500-233911-3	MW-04	Total Recoverable	Water	6020A	714516
500-233911-4	MW-05	Total Recoverable	Water	6020A	714516
500-233911-5	MW-10	Total Recoverable	Water	6020A	714516
500-233911-6	MW-01	Total Recoverable	Water	6020A	714516
500-233911-7	Duplicate	Total Recoverable	Water	6020A	714516
MB 500-714516/1-A	Method Blank	Total Recoverable	Water	6020A	714516
LCS 500-714516/2-A	Lab Control Sample	Total Recoverable	Water	6020A	714516

Analysis Batch: 715273

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233911-1	MW-02	Total Recoverable	Water	6020A	714516
500-233911-2	MW-03	Total Recoverable	Water	6020A	714516
500-233911-3	MW-04	Total Recoverable	Water	6020A	714516
500-233911-4	MW-05	Total Recoverable	Water	6020A	714516
500-233911-5	MW-10	Total Recoverable	Water	6020A	714516
500-233911-6	MW-01	Total Recoverable	Water	6020A	714516
500-233911-7	Duplicate	Total Recoverable	Water	6020A	714516
MB 500-714516/1-A	Method Blank	Total Recoverable	Water	6020A	714516
LCS 500-714516/22-A	Lab Control Sample	Total Recoverable	Water	6020A	714516

Analysis Batch: 715492

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233911-1	MW-02	Total Recoverable	Water	6020A	714516
500-233911-2	MW-03	Total Recoverable	Water	6020A	714516
500-233911-3	MW-04	Total Recoverable	Water	6020A	714516
500-233911-4	MW-05	Total Recoverable	Water	6020A	714516
500-233911-5	MW-10	Total Recoverable	Water	6020A	714516
500-233911-6	MW-01	Total Recoverable	Water	6020A	714516
500-233911-7	Duplicate	Total Recoverable	Water	6020A	714516
MB 500-714516/1-A	Method Blank	Total Recoverable	Water	6020A	714516
LCS 500-714516/22-A	Lab Control Sample	Total Recoverable	Water	6020A	714516

Prep Batch: 716804

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233911-1	MW-02	Total/NA	Water	7470A	
500-233911-2	MW-03	Total/NA	Water	7470A	

QC Association Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-233911-1

Metals (Continued)

Prep Batch: 716804 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233911-3	MW-04	Total/NA	Water	7470A	
500-233911-4	MW-05	Total/NA	Water	7470A	
500-233911-5	MW-10	Total/NA	Water	7470A	
500-233911-6	MW-01	Total/NA	Water	7470A	
500-233911-7	Duplicate	Total/NA	Water	7470A	
MB 500-716804/12-A	Method Blank	Total/NA	Water	7470A	
LCS 500-716804/13-A	Lab Control Sample	Total/NA	Water	7470A	
500-233911-2 MS	MW-03	Total/NA	Water	7470A	
500-233911-2 MSD	MW-03	Total/NA	Water	7470A	
500-233911-2 DU	MW-03	Total/NA	Water	7470A	

Analysis Batch: 717019

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233911-1	MW-02	Total/NA	Water	7470A	716804
500-233911-2	MW-03	Total/NA	Water	7470A	716804
500-233911-3	MW-04	Total/NA	Water	7470A	716804
500-233911-4	MW-05	Total/NA	Water	7470A	716804
500-233911-5	MW-10	Total/NA	Water	7470A	716804
500-233911-6	MW-01	Total/NA	Water	7470A	716804
500-233911-7	Duplicate	Total/NA	Water	7470A	716804
MB 500-716804/12-A	Method Blank	Total/NA	Water	7470A	716804
LCS 500-716804/13-A	Lab Control Sample	Total/NA	Water	7470A	716804
500-233911-2 MS	MW-03	Total/NA	Water	7470A	716804
500-233911-2 MSD	MW-03	Total/NA	Water	7470A	716804
500-233911-2 DU	MW-03	Total/NA	Water	7470A	716804

General Chemistry

Analysis Batch: 713901

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233911-1	MW-02	Total/NA	Water	SM 2540C	
500-233911-2	MW-03	Total/NA	Water	SM 2540C	
500-233911-3	MW-04	Total/NA	Water	SM 2540C	
500-233911-4	MW-05	Total/NA	Water	SM 2540C	
MB 500-713901/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 500-713901/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 714420

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233911-5	MW-10	Total/NA	Water	SM 2540C	
500-233911-6	MW-01	Total/NA	Water	SM 2540C	
MB 500-714420/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 500-714420/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 714421

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233911-7	Duplicate	Total/NA	Water	SM 2540C	
MB 500-714421/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 500-714421/2	Lab Control Sample	Total/NA	Water	SM 2540C	
500-233911-7 MS	Duplicate	Total/NA	Water	SM 2540C	
500-233911-7 DU	Duplicate	Total/NA	Water	SM 2540C	

QC Association Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-233911-1

General Chemistry

Analysis Batch: 714514

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233911-1	MW-02	Total/NA	Water	SM 4500 F C	
500-233911-2	MW-03	Total/NA	Water	SM 4500 F C	
500-233911-3	MW-04	Total/NA	Water	SM 4500 F C	
500-233911-4	MW-05	Total/NA	Water	SM 4500 F C	
MB 500-714514/31	Method Blank	Total/NA	Water	SM 4500 F C	
LCS 500-714514/32	Lab Control Sample	Total/NA	Water	SM 4500 F C	

Analysis Batch: 715052

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233911-5	MW-10	Total/NA	Water	SM 4500 F C	
500-233911-7	Duplicate	Total/NA	Water	SM 4500 F C	
MB 500-715052/3	Method Blank	Total/NA	Water	SM 4500 F C	
MB 500-715052/31	Method Blank	Total/NA	Water	SM 4500 F C	
LCS 500-715052/32	Lab Control Sample	Total/NA	Water	SM 4500 F C	
LCS 500-715052/4	Lab Control Sample	Total/NA	Water	SM 4500 F C	

Analysis Batch: 715089

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233911-1	MW-02	Total/NA	Water	SM 4500 Cl- E	
500-233911-2	MW-03	Total/NA	Water	SM 4500 Cl- E	
500-233911-3	MW-04	Total/NA	Water	SM 4500 Cl- E	
500-233911-4	MW-05	Total/NA	Water	SM 4500 Cl- E	
500-233911-5	MW-10	Total/NA	Water	SM 4500 Cl- E	
500-233911-7	Duplicate	Total/NA	Water	SM 4500 Cl- E	
MB 500-715089/113	Method Blank	Total/NA	Water	SM 4500 Cl- E	
LCS 500-715089/114	Lab Control Sample	Total/NA	Water	SM 4500 Cl- E	
500-233911-7 MS	Duplicate	Total/NA	Water	SM 4500 Cl- E	
500-233911-7 MSD	Duplicate	Total/NA	Water	SM 4500 Cl- E	

Analysis Batch: 715553

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233911-1	MW-02	Total/NA	Water	SM 4500 SO4 E	
500-233911-2	MW-03	Total/NA	Water	SM 4500 SO4 E	
500-233911-3	MW-04	Total/NA	Water	SM 4500 SO4 E	
500-233911-4	MW-05	Total/NA	Water	SM 4500 SO4 E	
500-233911-5	MW-10	Total/NA	Water	SM 4500 SO4 E	
500-233911-7	Duplicate	Total/NA	Water	SM 4500 SO4 E	
MB 500-715553/33	Method Blank	Total/NA	Water	SM 4500 SO4 E	
LCS 500-715553/35	Lab Control Sample	Total/NA	Water	SM 4500 SO4 E	

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-233911-1

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 500-714516/1-A
Matrix: Water
Analysis Batch: 715021

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 714516

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.0010		0.0010		mg/L		05/22/23 09:04	05/23/23 23:19	1
Barium	<0.0025		0.0025		mg/L		05/22/23 09:04	05/23/23 23:19	1
Beryllium	<0.0010	^+ ^1+	0.0010		mg/L		05/22/23 09:04	05/23/23 23:19	1
Boron	<0.050		0.050		mg/L		05/22/23 09:04	05/23/23 23:19	1
Cadmium	<0.00050		0.00050		mg/L		05/22/23 09:04	05/23/23 23:19	1
Calcium	<0.20		0.20		mg/L		05/22/23 09:04	05/23/23 23:19	1
Chromium	<0.0050		0.0050		mg/L		05/22/23 09:04	05/23/23 23:19	1
Cobalt	<0.0010		0.0010		mg/L		05/22/23 09:04	05/23/23 23:19	1
Lead	<0.00050		0.00050		mg/L		05/22/23 09:04	05/23/23 23:19	1
Molybdenum	<0.0050		0.0050		mg/L		05/22/23 09:04	05/23/23 23:19	1
Selenium	<0.0025		0.0025		mg/L		05/22/23 09:04	05/23/23 23:19	1
Thallium	<0.0020		0.0020		mg/L		05/22/23 09:04	05/23/23 23:19	1

Lab Sample ID: MB 500-714516/1-A
Matrix: Water
Analysis Batch: 715273

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 714516

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		05/22/23 09:04	05/24/23 21:36	1
Barium	<0.0025		0.0025		mg/L		05/22/23 09:04	05/24/23 21:36	1
Calcium	<0.20		0.20		mg/L		05/22/23 09:04	05/24/23 21:36	1

Lab Sample ID: MB 500-714516/1-A
Matrix: Water
Analysis Batch: 715492

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 714516

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	<0.010		0.010		mg/L		05/22/23 09:04	05/25/23 22:56	1

Lab Sample ID: LCS 500-714516/22-A
Matrix: Water
Analysis Batch: 715273

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 714516

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	0.500	0.515		mg/L		103	80 - 120
Barium	2.00	1.93		mg/L		97	80 - 120
Calcium	10.0	8.99		mg/L		90	80 - 120

Lab Sample ID: LCS 500-714516/22-A
Matrix: Water
Analysis Batch: 715492

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 714516

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Lithium	0.500	0.473		mg/L		95	80 - 120

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-233911-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 500-714516/2-A
Matrix: Water
Analysis Batch: 715021

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 714516

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Arsenic			0.100	0.0988		mg/L		99	80 - 120		
Beryllium			0.0500	0.0549	^+ ^1+	mg/L		110	80 - 120		
Boron			1.00	1.07		mg/L		107	80 - 120		
Cadmium			0.0500	0.0513		mg/L		103	80 - 120		
Chromium			0.200	0.208		mg/L		104	80 - 120		
Cobalt			0.500	0.522		mg/L		104	80 - 120		
Lead			0.100	0.104		mg/L		104	80 - 120		
Molybdenum			1.00	0.935		mg/L		94	80 - 120		
Selenium			0.100	0.101		mg/L		101	80 - 120		
Thallium			0.100	0.100		mg/L		100	80 - 120		

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 500-716804/12-A
Matrix: Water
Analysis Batch: 717019

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 716804

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/05/23 11:05	06/06/23 09:26	1

Lab Sample ID: LCS 500-716804/13-A
Matrix: Water
Analysis Batch: 717019

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 716804

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Mercury			0.00198	0.00208		mg/L		105	80 - 120		

Lab Sample ID: 500-233911-2 MS
Matrix: Water
Analysis Batch: 717019

Client Sample ID: MW-03
Prep Type: Total/NA
Prep Batch: 716804

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Mercury	<0.00020		0.00100	0.00106		mg/L		106	75 - 125		

Lab Sample ID: 500-233911-2 MSD
Matrix: Water
Analysis Batch: 717019

Client Sample ID: MW-03
Prep Type: Total/NA
Prep Batch: 716804

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	<0.00020		0.00100	0.00107		mg/L		107	75 - 125	1	20

Lab Sample ID: 500-233911-2 DU
Matrix: Water
Analysis Batch: 717019

Client Sample ID: MW-03
Prep Type: Total/NA
Prep Batch: 716804

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Mercury	<0.00020		<0.00020		mg/L		NC	20

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-233911-1

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 500-713901/1
Matrix: Water
Analysis Batch: 713901

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<10		10		mg/L			05/17/23 23:57	1

Lab Sample ID: LCS 500-713901/2
Matrix: Water
Analysis Batch: 713901

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	250	240		mg/L		96	80 - 120

Lab Sample ID: MB 500-714420/1
Matrix: Water
Analysis Batch: 714420

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<10		10		mg/L			05/22/23 00:24	1

Lab Sample ID: LCS 500-714420/2
Matrix: Water
Analysis Batch: 714420

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	250	242		mg/L		97	80 - 120

Lab Sample ID: MB 500-714421/1
Matrix: Water
Analysis Batch: 714421

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<10		10		mg/L			05/22/23 01:53	1

Lab Sample ID: LCS 500-714421/2
Matrix: Water
Analysis Batch: 714421

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	250	244		mg/L		98	80 - 120

Lab Sample ID: 500-233911-7 MS
Matrix: Water
Analysis Batch: 714421

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	650		250	942		mg/L		115	75 - 125

Lab Sample ID: 500-233911-7 DU
Matrix: Water
Analysis Batch: 714421

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	650		662		mg/L		1	5

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-233911-1

Method: SM 4500 Cl- E - Chloride, Total

Lab Sample ID: MB 500-715089/113
Matrix: Water
Analysis Batch: 715089

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<2.0		2.0		mg/L			05/24/23 16:30	1

Lab Sample ID: LCS 500-715089/114
Matrix: Water
Analysis Batch: 715089

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	20.0	19.5		mg/L		98	85 - 115

Lab Sample ID: 500-233911-7 MS
Matrix: Water
Analysis Batch: 715089

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	34		20.0	57.3		mg/L		116	75 - 125

Lab Sample ID: 500-233911-7 MSD
Matrix: Water
Analysis Batch: 715089

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	34		20.0	56.6		mg/L		112	75 - 125	1	20

Method: SM 4500 F C - Fluoride

Lab Sample ID: MB 500-714514/31
Matrix: Water
Analysis Batch: 714514

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<0.10		0.10		mg/L			05/21/23 10:10	1

Lab Sample ID: LCS 500-714514/32
Matrix: Water
Analysis Batch: 714514

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Fluoride	10.0	9.96		mg/L		100	90 - 119

Lab Sample ID: MB 500-715052/3
Matrix: Water
Analysis Batch: 715052

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<0.10		0.10		mg/L			05/24/23 08:35	1

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-233911-1

Method: SM 4500 F C - Fluoride (Continued)

Lab Sample ID: MB 500-715052/31
Matrix: Water
Analysis Batch: 715052

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<0.10		0.10		mg/L			05/24/23 08:35	1

Lab Sample ID: LCS 500-715052/32
Matrix: Water
Analysis Batch: 715052

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Fluoride	10.0	10.1		mg/L		101	90 - 119

Lab Sample ID: LCS 500-715052/4
Matrix: Water
Analysis Batch: 715052

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Fluoride	10.0	10.0		mg/L		100	90 - 119

Method: SM 4500 SO4 E - Sulfate, Total

Lab Sample ID: MB 500-715553/33
Matrix: Water
Analysis Batch: 715553

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	<5.0		5.0		mg/L			05/26/23 14:15	1

Lab Sample ID: LCS 500-715553/35
Matrix: Water
Analysis Batch: 715553

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	20.0	20.6		mg/L		103	88 - 123

Eurofins Chicago
2417 Bond Street
University Park IL 60484
Phone (708) 534-5200 Phone (708) 534-5211

Chain of Custody Record

Environment Testing

500-233911 COC

Page 1 of 1

Job #: 500-233911

Client Information	Sampler: Kaelyn Sperle	Lab PM: Mockler, Diana J	Carrier Tracking No(s):
Client Contact: Kaelyn Sperle	Phone: 262-278-1621	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: IL
Company: KPRG and Associates Inc	PWSID:		
Address: 14665 West Lisbon Road, Suite 1A	Due Date Requested: Standard		
City: Brookfield	TAT Requested (days): Standard		
State, Zip: WI, 53005	Compliance Project: Δ Yes Δ No		
Phone: 262-781-0475(Tel)	PO #: 4502125100		
Email: kaelyns@kprginc.com	WO #:		
Project Name: Powerton CCR FAB	Project #: 50011612		
Site: Illinois	SSOW#:		

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0 - Standard Target List	Ra226Ra228_GFPC - Local Method	904.0 - Standard Target List	6020A, 7470A	2540C, 4500_F_C, SM4500_Cl_E, SM4500_SO4_E	Total Number of containers	Special Instructions/Note
			Preservation Code:				D	D	D	D	N		
MW-02	5/16/23	0906	G	Water	N	N	X	X	X	X	X		
MW-03	5/16/23	0954	↓	Water	N	N	↓	↓	↓	↓	↓		
MW-04	5/16/23	1048	↓	Water	N	N	↓	↓	↓	↓	↓		
MW-05	5/16/23	1145	↓	Water	N	N	↓	↓	↓	↓	↓		
				Water									
				Water									
				Water									
				Water									

Preservation Codes

A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4-5
Y - Trizma
Z - other (specify)

Other:

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	Kaelyn Sperle	5/16/23/1700	KPRG	FedEx	5/16/23/1700	FedEx
2						
3					5/17/23 1000	

Custody Seals Intact. Δ Yes Δ No

Custody Seal No

Cooler Temperature(s) °C and Other Remarks 4.6 - 4.5

Ver: 01/16/2019

6/6/2023

R000908

Eurofins Chicago
2417 Bond Street
University Park IL 60484
Phone (708) 534-5200 Phone (708) 534-5211

Chain of Custody Record

Environment Testing

500-233911 COC

Page 1 of 1

Client Information	Sampler: Kaelyn Sperle	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	
Client Contact: Kaelyn Sperle	Phone: 262-278-1621	E-Mail: Diana Mockler@et eurofinsus com	State of Origin: IL	
Company: KPRG and Associates, Inc	PWSID:			Job #:
Address: 14665 West Lisbon Road, Suite 1A	Due Date Requested: standard			
City: Brookfield	TAT Requested (days): standard			
State, Zip: WI, 53005	Compliance Project: Δ Yes Δ No			
Phone: 262-781-0475(Tel)	PO #: 4502125100			
Email: kaelyns@kprginc com	WO #:			
Project Name: Powerton CCR FAB	Project #: 50011612			
Site: Illinois	SSOW#:			

Analysis Requested

Preservation Codes

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)

Other:

	Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0 - Standard Target List	Ra226Ra228_GFPC - Local Method	904.0 - Standard Target List	6020A, 7470A	2540C, 4500_F_C, SM4500_Cl_E, SM4500_SO4_E	Total Number of containers	Special Instructions/Note:
				Preservation Code.		X	X	D	D	D	D	N	X	
5	MW-10	5/17/23	0908	G	Water	N	N	X	X	X	X	X		
6	MW-01	5/17/23	1236	↓	Water	N	N	↓	↓	↓	↓	↓		
7	Duplicate	5/17/23	—	↓	Water	N	N	↓	↓	↓	↓	↓		
					Water									
					Water									
					Water									
					Water									
					Water									

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II, III, IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	Kaelyn Sperle	5/17/23/1730	KPRG	FedEX	5/17/23/1730	FedEX
2	Relinquished by:	Date/Time:	Company	Received by	5/18/23 0940	Company
3	Relinquished by	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact. Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks
		0.4 - 0.1

Ver: 01/16/2019

RT 519 10 30 9659 17

ST 18

ORIGIN ID:PIAA (262) 278-1621

KPRG AND ASSOCIATES
414 PLAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 16MAY23
ACTWGT: 58.00 LB
CAD: 6994779/SSFE2420
DIMS: 24x18x12 IN

BILL THIRD PARTY

Part # 156297-435 HRDB EXP 11/23

TO **SAMPLE RECEIVING**
EUROFINS CHICAGO
2417 BOND ST

UNIVERSITY PARK IL 60484

(000) 000-0000 REF:
INV:
PO: DEPT:

FedEx Express

E

J232023040501 uv

4 of 4

MPS# 0263 3983 9576 9659

Mstr# 3983 9576 9626 0201

WED - 17 MAY 10:30A
PRIORITY OVERNIGHT

XN JOTA

60484
IL-US ORD

500-233911 Waybi



ORIGIN ID:PIAA (262) 278-1621

KPRG AND ASSOCIATES
414 PLAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 17MAY23
ACTWGT: 50.00 LB
CAD: 6994779/SSFE2420
DIMS: 24x18x12 IN

BILL THIRD PARTY

Part # 156297-435 RRDB2 EXP 09/23

583J3/2BC3/FE2D

TO **SAMPLE RECEIVING**
EUROFINS
2417 BOND ST

UNIVERSITY PARK IL 60484

(000) 000-0000 REF:
INV:
PO: DEPT:

FedEx Express

E

J232023040501uv

500-233911 Waybi

3 of 5

MPS# 0263 3984 4873 0163

Mstr# 3984 4873 0141 0201

THU - 18 MAY 10:30A
PRIORITY OVERNIGHT

XN JOTA

60484
IL-US ORD

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-233911-1

Login Number: 233911
List Number: 1
Creator: James, Jeff A

List Source: Eurofins Chicago

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	4.5
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-233911-1

Client Sample ID: MW-02
Date Collected: 05/16/23 09:06
Date Received: 05/17/23 10:00

Lab Sample ID: 500-233911-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			714516	BDE	EET CHI	05/22/23 09:04 - 05/22/23 09:34 [1]
Total Recoverable	Analysis	6020A		1	715021	FXG	EET CHI	05/23/23 23:53
Total Recoverable	Prep	3005A			714516	BDE	EET CHI	05/22/23 09:04 - 05/22/23 09:34 [1]
Total Recoverable	Analysis	6020A		1	715273	FXG	EET CHI	05/24/23 21:43
Total Recoverable	Prep	3005A			714516	BDE	EET CHI	05/22/23 09:04 - 05/22/23 09:34 [1]
Total Recoverable	Analysis	6020A		1	715492	FXG	EET CHI	05/25/23 23:03
Total/NA	Prep	7470A			716804	MJG	EET CHI	06/05/23 11:05 - 06/05/23 13:05 [1]
Total/NA	Analysis	7470A		1	717019	MJG	EET CHI	06/06/23 10:02
Total/NA	Analysis	SM 2540C		1	713901	CLB	EET CHI	05/18/23 00:33
Total/NA	Analysis	SM 4500 Cl- E		2	715089	MM	EET CHI	05/24/23 16:33
Total/NA	Analysis	SM 4500 F C		1	714514	EH	EET CHI	05/21/23 10:10
Total/NA	Analysis	SM 4500 SO4 E		5	715553	MM	EET CHI	05/26/23 14:25

Client Sample ID: MW-03
Date Collected: 05/16/23 09:54
Date Received: 05/17/23 10:00

Lab Sample ID: 500-233911-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			714516	BDE	EET CHI	05/22/23 09:04 - 05/22/23 09:34 [1]
Total Recoverable	Analysis	6020A		1	715021	FXG	EET CHI	05/23/23 23:57
Total Recoverable	Prep	3005A			714516	BDE	EET CHI	05/22/23 09:04 - 05/22/23 09:34 [1]
Total Recoverable	Analysis	6020A		1	715273	FXG	EET CHI	05/24/23 21:46
Total Recoverable	Prep	3005A			714516	BDE	EET CHI	05/22/23 09:04 - 05/22/23 09:34 [1]
Total Recoverable	Analysis	6020A		1	715492	FXG	EET CHI	05/25/23 23:06
Total/NA	Prep	7470A			716804	MJG	EET CHI	06/05/23 11:05 - 06/05/23 13:05 [1]
Total/NA	Analysis	7470A		1	717019	MJG	EET CHI	06/06/23 10:04
Total/NA	Analysis	SM 2540C		1	713901	CLB	EET CHI	05/18/23 00:35
Total/NA	Analysis	SM 4500 Cl- E		2	715089	MM	EET CHI	05/24/23 16:34
Total/NA	Analysis	SM 4500 F C		1	714514	EH	EET CHI	05/21/23 10:10
Total/NA	Analysis	SM 4500 SO4 E		2	715553	MM	EET CHI	05/26/23 14:25

Client Sample ID: MW-04
Date Collected: 05/16/23 10:48
Date Received: 05/17/23 10:00

Lab Sample ID: 500-233911-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			714516	BDE	EET CHI	05/22/23 09:04 - 05/22/23 09:34 [1]
Total Recoverable	Analysis	6020A		1	715021	FXG	EET CHI	05/24/23 00:00
Total Recoverable	Prep	3005A			714516	BDE	EET CHI	05/22/23 09:04 - 05/22/23 09:34 [1]
Total Recoverable	Analysis	6020A		1	715273	FXG	EET CHI	05/24/23 21:50
Total Recoverable	Prep	3005A			714516	BDE	EET CHI	05/22/23 09:04 - 05/22/23 09:34 [1]
Total Recoverable	Analysis	6020A		1	715492	FXG	EET CHI	05/25/23 23:10
Total/NA	Prep	7470A			716804	MJG	EET CHI	06/05/23 11:05 - 06/05/23 13:05 [1]
Total/NA	Analysis	7470A		1	717019	MJG	EET CHI	06/06/23 10:12

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-233911-1

Client Sample ID: MW-04

Date Collected: 05/16/23 10:48
Date Received: 05/17/23 10:00

Lab Sample ID: 500-233911-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	SM 2540C		1	713901	CLB	EET CHI	05/18/23 00:38
Total/NA	Analysis	SM 4500 Cl- E		5	715089	MM	EET CHI	05/24/23 16:34
Total/NA	Analysis	SM 4500 F C		1	714514	EH	EET CHI	05/21/23 10:10
Total/NA	Analysis	SM 4500 SO4 E		10	715553	MM	EET CHI	05/26/23 14:26

Client Sample ID: MW-05

Date Collected: 05/16/23 11:45
Date Received: 05/17/23 10:00

Lab Sample ID: 500-233911-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			714516	BDE	EET CHI	05/22/23 09:04 - 05/22/23 09:34 [1]
Total Recoverable	Analysis	6020A		1	715021	FXG	EET CHI	05/24/23 00:04
Total Recoverable	Prep	3005A			714516	BDE	EET CHI	05/22/23 09:04 - 05/22/23 09:34 [1]
Total Recoverable	Analysis	6020A		1	715273	FXG	EET CHI	05/24/23 21:53
Total Recoverable	Prep	3005A			714516	BDE	EET CHI	05/22/23 09:04 - 05/22/23 09:34 [1]
Total Recoverable	Analysis	6020A		1	715492	FXG	EET CHI	05/25/23 23:13
Total/NA	Prep	7470A			716804	MJG	EET CHI	06/05/23 11:05 - 06/05/23 13:05 [1]
Total/NA	Analysis	7470A		1	717019	MJG	EET CHI	06/06/23 10:18
Total/NA	Analysis	SM 2540C		1	713901	CLB	EET CHI	05/18/23 00:40
Total/NA	Analysis	SM 4500 Cl- E		5	715089	MM	EET CHI	05/24/23 16:35
Total/NA	Analysis	SM 4500 F C		1	714514	EH	EET CHI	05/21/23 10:10
Total/NA	Analysis	SM 4500 SO4 E		5	715553	MM	EET CHI	05/26/23 14:26

Client Sample ID: MW-10

Date Collected: 05/17/23 09:08
Date Received: 05/18/23 09:40

Lab Sample ID: 500-233911-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			714516	BDE	EET CHI	05/22/23 09:04 - 05/22/23 09:34 [1]
Total Recoverable	Analysis	6020A		1	715021	FXG	EET CHI	05/24/23 00:07
Total Recoverable	Prep	3005A			714516	BDE	EET CHI	05/22/23 09:04 - 05/22/23 09:34 [1]
Total Recoverable	Analysis	6020A		1	715273	FXG	EET CHI	05/24/23 21:56
Total Recoverable	Prep	3005A			714516	BDE	EET CHI	05/22/23 09:04 - 05/22/23 09:34 [1]
Total Recoverable	Analysis	6020A		1	715492	FXG	EET CHI	05/25/23 23:16
Total/NA	Prep	7470A			716804	MJG	EET CHI	06/05/23 11:05 - 06/05/23 13:05 [1]
Total/NA	Analysis	7470A		1	717019	MJG	EET CHI	06/06/23 10:21
Total/NA	Analysis	SM 2540C		1	714420	CLB	EET CHI	05/22/23 01:20
Total/NA	Analysis	SM 4500 Cl- E		2	715089	MM	EET CHI	05/24/23 16:35
Total/NA	Analysis	SM 4500 F C		1	715052	EH	EET CHI	05/24/23 08:35
Total/NA	Analysis	SM 4500 SO4 E		2	715553	MM	EET CHI	05/26/23 14:26

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-233911-1

Client Sample ID: MW-01

Lab Sample ID: 500-233911-6

Date Collected: 05/17/23 12:36

Matrix: Water

Date Received: 05/18/23 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			714516	BDE	EET CHI	05/22/23 09:04 - 05/22/23 09:34 [1]
Total Recoverable	Analysis	6020A		1	715021	FXG	EET CHI	05/24/23 00:10
Total Recoverable	Prep	3005A			714516	BDE	EET CHI	05/22/23 09:04 - 05/22/23 09:34 [1]
Total Recoverable	Analysis	6020A		1	715273	FXG	EET CHI	05/24/23 22:07
Total Recoverable	Prep	3005A			714516	BDE	EET CHI	05/22/23 09:04 - 05/22/23 09:34 [1]
Total Recoverable	Analysis	6020A		1	715492	FXG	EET CHI	05/25/23 23:20
Total/NA	Prep	7470A			716804	MJG	EET CHI	06/05/23 11:05 - 06/05/23 13:05 [1]
Total/NA	Analysis	7470A		1	717019	MJG	EET CHI	06/06/23 10:23
Total/NA	Analysis	SM 2540C		1	714420	CLB	EET CHI	05/22/23 01:23

Client Sample ID: Duplicate

Lab Sample ID: 500-233911-7

Date Collected: 05/17/23 00:00

Matrix: Water

Date Received: 05/18/23 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			714516	BDE	EET CHI	05/22/23 09:04 - 05/22/23 09:34 [1]
Total Recoverable	Analysis	6020A		1	715021	FXG	EET CHI	05/24/23 00:21
Total Recoverable	Prep	3005A			714516	BDE	EET CHI	05/22/23 09:04 - 05/22/23 09:34 [1]
Total Recoverable	Analysis	6020A		1	715273	FXG	EET CHI	05/24/23 22:10
Total Recoverable	Prep	3005A			714516	BDE	EET CHI	05/22/23 09:04 - 05/22/23 09:34 [1]
Total Recoverable	Analysis	6020A		1	715492	FXG	EET CHI	05/25/23 23:23
Total/NA	Prep	7470A			716804	MJG	EET CHI	06/05/23 11:05 - 06/05/23 13:05 [1]
Total/NA	Analysis	7470A		1	717019	MJG	EET CHI	06/06/23 10:25
Total/NA	Analysis	SM 2540C		1	714421	CLB	EET CHI	05/22/23 01:58
Total/NA	Analysis	SM 4500 Cl- E		1	715089	MM	EET CHI	05/24/23 16:34
Total/NA	Analysis	SM 4500 F C		1	715052	EH	EET CHI	05/24/23 08:35
Total/NA	Analysis	SM 4500 SO4 E		10	715553	MM	EET CHI	05/26/23 14:26

[1] This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Accreditation/Certification Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB

Job ID: 500-233911-1

Laboratory: Eurofins Chicago

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Illinois	NELAP	IL00035	04-29-24

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Richard Gnat
KPRG and Associates, Inc.
14665 West Lisbon Road,
Suite 1A
Brookfield, Wisconsin 53005

Generated 6/21/2023 4:29:27 PM

JOB DESCRIPTION

Powerton CCR FAB (RAD)

JOB NUMBER

500-233911-2

Eurofins Chicago
2417 Bond Street
University Park IL 60484

See page two for job notes and contact information.

my EOL

Eurofins Chicago

Job Notes

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Authorization



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Authorized for release by
Diana Mockler, Project Manager I
Diana.Mockler@et.eurofinsus.com
(219)252-7570

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Laboratory Job ID: 500-233911-2

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Case Narrative

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-233911-2

Job ID: 500-233911-2

Laboratory: Eurofins Chicago

Narrative

Job Narrative
500-233911-2

Receipt
The samples were received on 5/17/2023 10:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.1º C and 4.5º C.

RAD
Methods 903.0, 9315: Radium-226 batch 613264
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
MW-02 (500-233911-1), MW-03 (500-233911-2), (LCS 160-613264/2-A), (LCSD 160-613264/3-A) and (MB 160-613264/1-A)

Method 903.0: Radium-226 batch 613094
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
MW-04 (500-233911-3), MW-05 (500-233911-4), (LCS 160-613094/2-A), (MB 160-613094/1-A), (500-233887-G-3-A) and (500-233887-F-3-A DU)

Methods 903.0, 9315: Radium-226 batch 613260
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
MW-10 (500-233911-5), MW-01 (500-233911-6), Duplicate (500-233911-7), (LCS 160-613260/2-A), (MB 160-613260/1-A), (500-233887-E-4-A) and (500-233887-G-4-B DU)

Method 904.0: Radium-228 batch 613098
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

MW-04 (500-233911-3), MW-05 (500-233911-4), (LCS 160-613098/2-A), (MB 160-613098/1-A), (500-233887-G-3-B) and (500-233887-F-3-B DU)

Methods 904.0, 9320: Radium-228 batch 613351
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
MW-02 (500-233911-1), MW-03 (500-233911-2), (LCS 160-613351/2-A), (LCSD 160-613351/3-A) and (MB 160-613351/1-A)

Methods 904.0, 9320: Radium-228 batch 613360
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
MW-10 (500-233911-5), MW-01 (500-233911-6), Duplicate (500-233911-7), (LCS 160-613360/2-A), (MB 160-613360/1-A), (500-233887-E-4-B) and (500-233887-G-4-C DU)

Method PrecSep_0:

Method PrecSep_0:

Method PrecSep_0:

Case Narrative

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-233911-2

Job ID: 500-233911-2 (Continued)

Laboratory: Eurofins Chicago (Continued)

Method PrecSep-21:

Method PrecSep-21:

Method PrecSep-21:

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Method Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-233911-2

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	EET SL
904.0	Radium-228 (GFPC)	EPA	EET SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	EET SL
PrecSep_0	Preparation, Precipitate Separation	None	EET SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	EET SL

Protocol References:

EPA = US Environmental Protection Agency

None = None

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-233911-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-233911-1	MW-02	Water	05/16/23 09:06	05/17/23 10:00
500-233911-2	MW-03	Water	05/16/23 09:54	05/17/23 10:00
500-233911-3	MW-04	Water	05/16/23 10:48	05/17/23 10:00
500-233911-4	MW-05	Water	05/16/23 11:45	05/17/23 10:00
500-233911-5	MW-10	Water	05/17/23 09:08	05/18/23 09:40
500-233911-6	MW-01	Water	05/17/23 12:36	05/18/23 09:40
500-233911-7	Duplicate	Water	05/17/23 00:00	05/18/23 09:40

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-233911-2

Client Sample ID: MW-02

Date Collected: 05/16/23 09:06
Date Received: 05/17/23 10:00

Lab Sample ID: 500-233911-1

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0395	U	0.194	0.195	1.00	0.371	pCi/L	05/26/23 11:20	06/20/23 20:50	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.4*		*30 - 110*	*05/26/23 11:20*	*06/20/23 20:50*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.108	U	0.291	0.291	1.00	0.519	pCi/L	05/26/23 11:25	06/20/23 11:43	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.4*		*30 - 110*	*05/26/23 11:25*	*06/20/23 11:43*	*1*
Y Carrier	*79.3*		*30 - 110*	*05/26/23 11:25*	*06/20/23 11:43*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.147	U	0.350	0.350	5.00	0.519	pCi/L		06/21/23 09:44	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-233911-2

Client Sample ID: MW-03

Date Collected: 05/16/23 09:54
Date Received: 05/17/23 10:00

Lab Sample ID: 500-233911-2

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0720	U	0.164	0.165	1.00	0.301	pCi/L	05/26/23 11:20	06/20/23 20:50	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*86.4*		*30 - 110*	*05/26/23 11:20*	*06/20/23 20:50*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.921**		0.487	0.494	1.00	0.713	pCi/L	05/26/23 11:25	06/20/23 11:43	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*86.4*		*30 - 110*	*05/26/23 11:25*	*06/20/23 11:43*	*1*
Y Carrier	*87.5*		*30 - 110*	*05/26/23 11:25*	*06/20/23 11:43*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.993**		0.514	0.521	5.00	0.713	pCi/L		06/21/23 09:44	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-233911-2

Client Sample ID: MW-04

Date Collected: 05/16/23 10:48
Date Received: 05/17/23 10:00

Lab Sample ID: 500-233911-3

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0143	U	0.154	0.154	1.00	0.308	pCi/L	05/25/23 10:10	06/20/23 08:22	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*79.8*		*30 - 110*	*05/25/23 10:10*	*06/20/23 08:22*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.212	U	0.362	0.363	1.00	0.624	pCi/L	05/25/23 10:14	06/19/23 14:39	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*79.8*		*30 - 110*	*05/25/23 10:14*	*06/19/23 14:39*	*1*
Y Carrier	*81.1*		*30 - 110*	*05/25/23 10:14*	*06/19/23 14:39*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.226	U	0.393	0.394	5.00	0.624	pCi/L		06/21/23 11:14	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-233911-2

Client Sample ID: MW-05

Date Collected: 05/16/23 11:45
Date Received: 05/17/23 10:00

Lab Sample ID: 500-233911-4

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0459	U	0.174	0.174	1.00	0.330	pCi/L	05/25/23 10:10	06/20/23 08:22	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*78.5*		*30 - 110*	*05/25/23 10:10*	*06/20/23 08:22*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0863	U	0.356	0.356	1.00	0.648	pCi/L	05/25/23 10:14	06/19/23 14:39	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*78.5*		*30 - 110*	*05/25/23 10:14*	*06/19/23 14:39*	*1*
Y Carrier	*80.0*		*30 - 110*	*05/25/23 10:14*	*06/19/23 14:39*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.132	U	0.396	0.396	5.00	0.648	pCi/L		06/21/23 11:14	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-233911-2

Client Sample ID: MW-10

Date Collected: 05/17/23 09:08
Date Received: 05/18/23 09:40

Lab Sample ID: 500-233911-5

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.05		0.477	0.486	1.00	0.554	pCi/L	05/26/23 09:29	06/20/23 22:37	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*101*		*30 - 110*	*05/26/23 09:29*	*06/20/23 22:37*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.47		0.676	0.690	1.00	0.931	pCi/L	05/26/23 13:14	06/20/23 11:22	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*101*		*30 - 110*	*05/26/23 13:14*	*06/20/23 11:22*	*1*
Y Carrier	*89.0*		*30 - 110*	*05/26/23 13:14*	*06/20/23 11:22*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	2.52		0.827	0.844	5.00	0.931	pCi/L		06/21/23 15:27	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-233911-2

Client Sample ID: MW-01

Date Collected: 05/17/23 12:36
Date Received: 05/18/23 09:40

Lab Sample ID: 500-233911-6

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0694	U	0.114	0.114	1.00	0.278	pCi/L	05/26/23 09:29	06/20/23 22:37	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*98.2*		*30 - 110*	*05/26/23 09:29*	*06/20/23 22:37*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.128	U	0.207	0.208	1.00	0.357	pCi/L	05/26/23 13:14	06/20/23 11:22	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*98.2*		*30 - 110*	*05/26/23 13:14*	*06/20/23 11:22*	*1*
Y Carrier	*89.0*		*30 - 110*	*05/26/23 13:14*	*06/20/23 11:22*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.0586	U	0.236	0.237	5.00	0.357	pCi/L		06/21/23 15:27	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-233911-2

Client Sample ID: Duplicate

Date Collected: 05/17/23 00:00
Date Received: 05/18/23 09:40

Lab Sample ID: 500-233911-7

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.01		0.355	0.367	1.00	0.336	pCi/L	05/26/23 09:29	06/20/23 22:37	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*101*		*30 - 110*	*05/26/23 09:29*	*06/20/23 22:37*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.900		0.442	0.450	1.00	0.605	pCi/L	05/26/23 13:14	06/20/23 11:23	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*101*		*30 - 110*	*05/26/23 13:14*	*06/20/23 11:23*	*1*
Y Carrier	*86.7*		*30 - 110*	*05/26/23 13:14*	*06/20/23 11:23*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.91		0.567	0.581	5.00	0.605	pCi/L		06/21/23 15:27	1

Definitions/Glossary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-233911-2

Qualifiers

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

QC Association Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-233911-2

Rad

Prep Batch: 613094

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233911-3	MW-04	Total/NA	Water	PrecSep-21	
500-233911-4	MW-05	Total/NA	Water	PrecSep-21	
MB 160-613094/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-613094/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 613098

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233911-3	MW-04	Total/NA	Water	PrecSep_0	
500-233911-4	MW-05	Total/NA	Water	PrecSep_0	
MB 160-613098/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-613098/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Prep Batch: 613260

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233911-5	MW-10	Total/NA	Water	PrecSep-21	
500-233911-6	MW-01	Total/NA	Water	PrecSep-21	
500-233911-7	Duplicate	Total/NA	Water	PrecSep-21	
MB 160-613260/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-613260/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 613264

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233911-1	MW-02	Total/NA	Water	PrecSep-21	
500-233911-2	MW-03	Total/NA	Water	PrecSep-21	
MB 160-613264/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-613264/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-613264/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 613351

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233911-1	MW-02	Total/NA	Water	PrecSep_0	
500-233911-2	MW-03	Total/NA	Water	PrecSep_0	
MB 160-613351/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-613351/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-613351/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Prep Batch: 613360

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-233911-5	MW-10	Total/NA	Water	PrecSep_0	
500-233911-6	MW-01	Total/NA	Water	PrecSep_0	
500-233911-7	Duplicate	Total/NA	Water	PrecSep_0	
MB 160-613360/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-613360/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-233911-2

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-613094/1-A
Matrix: Water
Analysis Batch: 616862

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 613094

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.003634	U	0.101	0.101	1.00	0.218	pCi/L	05/25/23 10:10	06/20/23 08:13	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.5*		*30 - 110*	*05/25/23 10:10*	*06/20/23 08:13*	*1*

Lab Sample ID: LCS 160-613094/2-A
Matrix: Water
Analysis Batch: 616862

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 613094

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			11.3	9.528		1.19	1.00	0.208	pCi/L	84	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*93.4*		*30 - 110*

Lab Sample ID: MB 160-613260/1-A
Matrix: Water
Analysis Batch: 616866

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 613260

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.03010	U	0.129	0.129	1.00	0.292	pCi/L	05/26/23 09:29	06/20/23 20:52	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*87.0*		*30 - 110*	*05/26/23 09:29*	*06/20/23 20:52*	*1*

Lab Sample ID: LCS 160-613260/2-A
Matrix: Water
Analysis Batch: 616866

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 613260

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			11.3	9.751		1.28	1.00	0.348	pCi/L	86	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*85.4*		*30 - 110*

Lab Sample ID: MB 160-613264/1-A
Matrix: Water
Analysis Batch: 616863

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 613264

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.07447	U	0.182	0.182	1.00	0.331	pCi/L	05/26/23 09:45	06/20/23 19:05	1

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-233911-2

Method: 903.0 - Radium-226 (GFPC) (Continued)

Lab Sample ID: MB 160-613264/1-A
Matrix: Water
Analysis Batch: 616863

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 613264

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	95.7		30 - 110	05/26/23 09:45	06/20/23 19:05	1

Lab Sample ID: LCS 160-613264/2-A
Matrix: Water
Analysis Batch: 616863

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 613264

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			11.3	9.719		1.27	1.00	0.364	pCi/L	86	75 - 125		

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	87.7		30 - 110

Lab Sample ID: LCSD 160-613264/3-A
Matrix: Water
Analysis Batch: 616863

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 613264

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-226			11.3	10.66		1.36	1.00	0.368	pCi/L	94	75 - 125	0.36	1

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Ba Carrier	89.8		30 - 110

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-613098/1-A
Matrix: Water
Analysis Batch: 616572

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 613098

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.4105	U	0.369	0.370	1.00	0.584	pCi/L	05/25/23 10:14	06/19/23 14:27	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	90.5		30 - 110	05/25/23 10:14	06/19/23 14:27	1
Y Carrier	84.1		30 - 110	05/25/23 10:14	06/19/23 14:27	1

Lab Sample ID: LCS 160-613098/2-A
Matrix: Water
Analysis Batch: 616572

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 613098

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			8.11	9.727		1.35	1.00	0.644	pCi/L	120	75 - 125		

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-233911-2

Method: 904.0 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-613098/2-A
Matrix: Water
Analysis Batch: 616572

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 613098

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	93.4		30 - 110
Y Carrier	82.2		30 - 110

Lab Sample ID: MB 160-613351/1-A
Matrix: Water
Analysis Batch: 616862

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 613351

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.4522	U	0.318	0.320	1.00	0.472	pCi/L	05/26/23 11:25	06/20/23 11:35	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	95.7		30 - 110	05/26/23 11:25	06/20/23 11:35	1
Y Carrier	81.5		30 - 110	05/26/23 11:25	06/20/23 11:35	1

Lab Sample ID: LCS 160-613351/2-A
Matrix: Water
Analysis Batch: 616862

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 613351

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			8.10	8.190		1.19	1.00	0.554	pCi/L	101	75 - 125		

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	87.7		30 - 110
Y Carrier	82.6		30 - 110

Lab Sample ID: LCSD 160-613351/3-A
Matrix: Water
Analysis Batch: 616862

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 613351

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-228			8.10	9.900		1.37	1.00	0.544	pCi/L	122	75 - 125	0.67	1

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Ba Carrier	89.8		30 - 110
Y Carrier	78.5		30 - 110

Lab Sample ID: MB 160-613360/1-A
Matrix: Water
Analysis Batch: 616868

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 613360

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.1566	U	0.299	0.299	1.00	0.517	pCi/L	05/26/23 13:14	06/20/23 11:15	1

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-233911-2

Method: 904.0 - Radium-228 (GFPC) (Continued)

Lab Sample ID: MB 160-613360/1-A
Matrix: Water
Analysis Batch: 616868

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 613360

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	87.0		30 - 110	05/26/23 13:14	06/20/23 11:15	1
Y Carrier	86.4		30 - 110	05/26/23 13:14	06/20/23 11:15	1

Lab Sample ID: LCS 160-613360/2-A
Matrix: Water
Analysis Batch: 616868

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 613360

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			8.10	8.095		1.15	1.00	0.499	pCi/L	100	75 - 125		

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	85.4		30 - 110
Y Carrier	88.2		30 - 110

Eurofins Chicago
2417 Bond Street
University Park IL 60484
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Chain of Custody Record

Environment Testing

500-233911 COC

Page 1 of 1

Job #: 500-233911

Client Information	Sampler: Kaelyn Sperle	Lab PM: Mockler, Diana J	Carrier Tracking No(s):
Client Contact: Kaelyn Sperle	Phone: 262-278-1621	E-Mail: Diana Mockler@et.eurofinsus com	State of Origin: IL
Company: KPRG and Associates Inc	PWSID:		
Address: 14665 West Lisbon Road, Suite 1A	Due Date Requested: Standard		
City: Brookfield	TAT Requested (days): Standard		
State Zip: WI, 53005	Compliance Project: Δ Yes Δ No		
Phone: 262-781-0475(Tel)	PO #: 4502125100		
Email: kaelyns@kprginc com	WO #:		
Project Name: Powerton CCR FAB	Project #: 50011612		
Site: Illinois	SSOW#:		

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water S=solid O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0 - Standard Target List	Ra226Ra228_GFPC - Local Method	904.0 - Standard Target List	6020A, 7470A	2540C, 4500_F_C, SM4500_Cl_E, SM4500_SO4_E	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D	D	D	N		
MW-02	5/16/23	0906	G	Water	N	N	X	X	X	X	X		
MW-03	5/16/23	0954	↓	Water	N	N	↓	↓	↓	↓	↓		
MW-04	5/16/23	1048	↓	Water	N	N							
MW-05	5/16/23	1145	↓	Water	N	N							
				Water									
				Water									
				Water									
				Water									

Preservation Codes

A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4-5
Y - Trizma
Z - other (specify)

Other:

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by:	Date	Time	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Kaelyn Sperle	5/16/23/1700	KPRG	FedEx	5/16/23/1700	FedEx
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	5/17/23 1000	Company

Custody Seals Intact. Δ Yes Δ No | Custody Seal No

Cooler Temperature(s) °C and Other Remarks 4.6 - 4.5

R000937

Eurofins Chicago
2417 Bond Street
University Park IL 60484
Phone (708) 534-5200 Phone (708) 534-5211

Chain of Custody Record

Environment Testing

500-233911 COC

Page 1 of 1

Client Information	Sampler: Kaelyn Sperle	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	Job #:
Client Contact: Kaelyn Sperle	Phone: 262-278-1621	E-Mail: Diana Mockler@et eurofinsus com	State of Origin: IL	
Company: KPRG and Associates, Inc	PWSID:			
Address: 14665 West Lisbon Road, Suite 1A	Due Date Requested: standard			
City: Brookfield	TAT Requested (days): standard			
State, Zip: WI, 53005	Compliance Project: Δ Yes Δ No			
Phone: 262-781-0475(Tel)	PO #: 4502125100			
Email: kaelyns@kprginc com	WO #:			
Project Name: Powerton CCR FAB	Project #: 50011612			
Site: Illinois	SSOW#:			

Analysis Requested

Preservation Codes

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)

Other:

	Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0 - Standard Target List	Ra226Ra228_GFPC - Local Method	904.0 - Standard Target List	6020A, 7470A	2540C, 4500_F_C, SM4500_Cl_E, SM4500_SO4_E	Total Number of containers	Special Instructions/Note:
				Preservation Code.				D	D	D	D	N		
5	MW-10	5/17/23	0908	G	Water	N	N	X	X	X	X	X		
6	MW-01	5/17/23	1236	↓	Water	N	N	↓	↓	↓	↓	↓		
7	Duplicate	5/17/23	—	↓	Water	N	N	↓	↓	↓	↓	↓		
					Water									
					Water									
					Water									
					Water									
					Water									

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II, III, IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by:	Date	Time	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	Kaelyn Sperle	5/17/23/1730	KPRG	FedEX	5/17/23/1730	FedEX
2	Relinquished by:	Date/Time:	Company	Received by:	5/18/23 0940	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact. Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks
		0.4 - 0.1

Ver: 01/16/2019

RT 519 10 30 9659 17

ST 18

ORIGIN ID:PIAA (262) 278-1621

KPRG AND ASSOCIATES
414 PLAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 16MAY23
ACTWGT: 58.00 LB
CAD: 6994779/SSFE2420
DIMS: 24x18x12 IN

BILL THIRD PARTY

Part # 156297-435 HRDB EXP 11/23

TO **SAMPLE RECEIVING**
EUROFINS CHICAGO
2417 BOND ST

UNIVERSITY PARK IL 60484

(000) 000-0000 REF:
INV:
PO: DEPT:

FedEx Express

E

J232023040501 ttv

4 of 4

MPS# 0263 3983 9576 9659

Mstr# 3983 9576 9626 0201

WED - 17 MAY 10:30A
PRIORITY OVERNIGHT

XN JOTA

60484
IL-US ORD

500-233911 Waybi



ORIGIN ID:PIAA (262) 278-1621

KPRG AND ASSOCIATES
414 PLAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 17MAY23
ACTWGT: 50.00 LB
CAD: 6994779/SSFE2420
DIMS: 24x18x12 IN

BILL THIRD PARTY

Part # 156297-435 RRDB2 EXP 09/23

583J3/2BC3/FE2D

TO **SAMPLE RECEIVING**
EUROFINS
2417 BOND ST

UNIVERSITY PARK IL 60484

(000) 000-0000 REF:
INV:
PO: DEPT:

FedEx Express

E

J232023040501uv

500-233911 Waybi

3 of 5

MPS# 0263 3984 4873 0163

Mstr# 3984 4873 0141 0201

THU - 18 MAY 10:30A
PRIORITY OVERNIGHT

XN JOTA

60484
IL-US ORD

R000940

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone: 708-534-5200 Fax: 708-534-5211

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	COC No: 500-173986.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: Illinois	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Illinois		Job #: 500-233911-2
Address: 13715 Rider Trail North, ,	Due Date Requested: 6/7/2023			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Powerton CCR FAB (RAD)	Project #: 50011612			
Site: MWG - Powerton	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_21 Standard Target List	904.0/PrecSep_0 Standard Target List	Ra226Ra228_GFPC	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
MW-02 (500-233911-1)	5/16/23	09:06 Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
MW-03 (500-233911-2)	5/16/23	09:54 Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
MW-04 (500-233911-3)	5/16/23	10:48 Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
MW-05 (500-233911-4)	5/16/23	11:45 Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no

Note: Since laboratory accreditations are subject to change, Eurofins Chicago places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Chicago laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Chicago attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Chicago.

Possible Hazard Identification: Unconfirmed	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	Chris Scott	5/17/23 1510		FedEx		
2	FedEx			Courier FedEx	0840 MAY 18 2023	ETA STL
3						

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone: 708-534-5200 Fax: 708-534-5211

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	COC No: 500-174050.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: Illinois	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Illinois		Job #: 500-233911-2
Address: 13715 Rider Trail North, ,	Due Date Requested: 6/21/2023			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Powerton CCR FAB (RAD)	Project #: 50011612			
Site: MWG - Powerton	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_21 Standard Target List	904.0/PrecSep_0 Standard Target List	Ra226Ra228_GFPC	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
MW-10 (500-233911-5)	5/17/23	09:08 Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
MW-01 (500-233911-6)	5/17/23	12:36 Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
Duplicate (500-233911-7)	5/17/23	Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
										9	

Note: Since laboratory accreditations are subject to change, Eurofins Chicago places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Chicago laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Chicago attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Chicago.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	[signature] fedex	5/19/23 1600		fedex		
	Relinquished by: fedex	Date/Time:	Company	Received by: Brenda Sharkey-Gonzalez	Date/Time: 5/22/23 0805	Company ETASTL
	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-233911-2

Login Number: 233911
List Number: 1
Creator: James, Jeff A

List Source: Eurofins Chicago

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	4.5
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-233911-2

Login Number: 233911
List Number: 2
Creator: Farrell, Conor P

List Source: Eurofins St. Louis
List Creation: 05/18/23 01:30 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-233911-2

Login Number: 233911
List Number: 3
Creator: Sharkey-Gonzalez, Briana L

List Source: Eurofins St. Louis
List Creation: 05/22/23 05:45 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-233911-2

Client Sample ID: MW-02
Date Collected: 05/16/23 09:06
Date Received: 05/17/23 10:00

Lab Sample ID: 500-233911-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			613264	KAC	EET SL	05/26/23 11:20
Total/NA	Analysis	903.0		1	616866	FLC	EET SL	06/20/23 20:50
Total/NA	Prep	PrecSep_0			613351	KAC	EET SL	05/26/23 11:25
Total/NA	Analysis	904.0		1	616866	FLC	EET SL	06/20/23 11:43
Total/NA	Analysis	Ra226_Ra228		1	616966	SCB	EET SL	06/21/23 09:44

Client Sample ID: MW-03
Date Collected: 05/16/23 09:54
Date Received: 05/17/23 10:00

Lab Sample ID: 500-233911-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			613264	KAC	EET SL	05/26/23 11:20
Total/NA	Analysis	903.0		1	616866	FLC	EET SL	06/20/23 20:50
Total/NA	Prep	PrecSep_0			613351	KAC	EET SL	05/26/23 11:25
Total/NA	Analysis	904.0		1	616866	FLC	EET SL	06/20/23 11:43
Total/NA	Analysis	Ra226_Ra228		1	616966	SCB	EET SL	06/21/23 09:44

Client Sample ID: MW-04
Date Collected: 05/16/23 10:48
Date Received: 05/17/23 10:00

Lab Sample ID: 500-233911-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			613094	KAC	EET SL	05/25/23 10:10
Total/NA	Analysis	903.0		1	616866	FLC	EET SL	06/20/23 08:22
Total/NA	Prep	PrecSep_0			613098	KAC	EET SL	05/25/23 10:14
Total/NA	Analysis	904.0		1	616575	FLC	EET SL	06/19/23 14:39
Total/NA	Analysis	Ra226_Ra228		1	616996	SCB	EET SL	06/21/23 11:14

Client Sample ID: MW-05
Date Collected: 05/16/23 11:45
Date Received: 05/17/23 10:00

Lab Sample ID: 500-233911-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			613094	KAC	EET SL	05/25/23 10:10
Total/NA	Analysis	903.0		1	616866	FLC	EET SL	06/20/23 08:22
Total/NA	Prep	PrecSep_0			613098	KAC	EET SL	05/25/23 10:14
Total/NA	Analysis	904.0		1	616575	FLC	EET SL	06/19/23 14:39
Total/NA	Analysis	Ra226_Ra228		1	616996	SCB	EET SL	06/21/23 11:14

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-233911-2

Client Sample ID: MW-10
Date Collected: 05/17/23 09:08
Date Received: 05/18/23 09:40

Lab Sample ID: 500-233911-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			613260	KAC	EET SL	05/26/23 09:29
Total/NA	Analysis	903.0		1	616862	FLC	EET SL	06/20/23 22:37
Total/NA	Prep	PrecSep_0			613360	KAC	EET SL	05/26/23 13:14
Total/NA	Analysis	904.0		1	616863	FLC	EET SL	06/20/23 11:22
Total/NA	Analysis	Ra226_Ra228		1	617159	EMH	EET SL	06/21/23 15:27

Client Sample ID: MW-01
Date Collected: 05/17/23 12:36
Date Received: 05/18/23 09:40

Lab Sample ID: 500-233911-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			613260	KAC	EET SL	05/26/23 09:29
Total/NA	Analysis	903.0		1	616862	FLC	EET SL	06/20/23 22:37
Total/NA	Prep	PrecSep_0			613360	KAC	EET SL	05/26/23 13:14
Total/NA	Analysis	904.0		1	616863	FLC	EET SL	06/20/23 11:22
Total/NA	Analysis	Ra226_Ra228		1	617159	EMH	EET SL	06/21/23 15:27

Client Sample ID: Duplicate
Date Collected: 05/17/23 00:00
Date Received: 05/18/23 09:40

Lab Sample ID: 500-233911-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			613260	KAC	EET SL	05/26/23 09:29
Total/NA	Analysis	903.0		1	616862	FLC	EET SL	06/20/23 22:37
Total/NA	Prep	PrecSep_0			613360	KAC	EET SL	05/26/23 13:14
Total/NA	Analysis	904.0		1	616863	FLC	EET SL	06/20/23 11:23
Total/NA	Analysis	Ra226_Ra228		1	617159	EMH	EET SL	06/21/23 15:27

Laboratory References:
EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: KPRG and Associates, Inc.
Job ID: 500-233911-2
Project/Site: Powerton CCR FAB (RAD)

Laboratory: Eurofins St. Louis

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Illinois	NELAP	200023	11-30-23

Tracer/Carrier Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (RAD)

Job ID: 500-233911-2

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)
Lab Sample ID	Client Sample ID	Ba (30-110)
500-233911-1	MW-02	94.4
500-233911-2	MW-03	86.4
500-233911-3	MW-04	79.8
500-233911-4	MW-05	78.5
500-233911-5	MW-10	101
500-233911-6	MW-01	98.2
500-233911-7	Duplicate	101
LCS 160-613094/2-A	Lab Control Sample	93.4
LCS 160-613260/2-A	Lab Control Sample	85.4
LCS 160-613264/2-A	Lab Control Sample	87.7
LCSD 160-613264/3-A	Lab Control Sample Dup	89.8
MB 160-613094/1-A	Method Blank	90.5
MB 160-613260/1-A	Method Blank	87.0
MB 160-613264/1-A	Method Blank	95.7

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (30-110)	Y (30-110)
500-233911-1	MW-02	94.4	79.3
500-233911-2	MW-03	86.4	87.5
500-233911-3	MW-04	79.8	81.1
500-233911-4	MW-05	78.5	80.0
500-233911-5	MW-10	101	89.0
500-233911-6	MW-01	98.2	89.0
500-233911-7	Duplicate	101	86.7
LCS 160-613098/2-A	Lab Control Sample	93.4	82.2
LCS 160-613351/2-A	Lab Control Sample	87.7	82.6
LCS 160-613360/2-A	Lab Control Sample	85.4	88.2
LCSD 160-613351/3-A	Lab Control Sample Dup	89.8	78.5
MB 160-613098/1-A	Method Blank	90.5	84.1
MB 160-613351/1-A	Method Blank	95.7	81.5
MB 160-613360/1-A	Method Blank	87.0	86.4

Tracer/Carrier Legend

Ba = Ba Carrier

Y = Y Carrier

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ANALYTICAL REPORT

PREPARED FOR

Attn: Richard Gnat
KPRG and Associates, Inc.
14665 West Lisbon Road,
Suite 1A
Brookfield, Wisconsin 53005

Generated 6/30/2023 10:19:08 AM

JOB DESCRIPTION

Powerton CCR FAB (MW-01 - Cl, Fl, SO4)

JOB NUMBER

500-235818-1

Eurofins Chicago
2417 Bond Street
University Park IL 60484

See page two for job notes and contact information.

my EOL

Eurofins Chicago

Job Notes

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Authorization



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6/30/2023 10:19:08 AM

Authorized for release by
Diana Mockler, Project Manager I
Diana.Mockler@et.eurofinsus.com
(219)252-7570

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (MW-01 - Cl, Fl, SO4)

Laboratory Job ID: 500-235818-1

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Case Narrative

Client: KPRG and Associates, Inc.
Job ID: 500-235818-1
Project/Site: Powerton CCR FAB (MW-01 - Cl, Fl, SO4)

Job ID: 500-235818-1

Laboratory: Eurofins Chicago

Narrative

Job Narrative
500-235818-1

Receipt
The sample was received on 6/27/2023 10:00 AM. Unless otherwise noted below, the sample arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 4.8º C.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: KPRG and Associates, Inc.
Job ID: 500-235818-1
Project/Site: Powerton CCR FAB (MW-01 - Cl, Fl, SO4)

Method	Method Description	Protocol	Laboratory
SM 4500 Cl- E	Chloride, Total	SM	EET CHI
SM 4500 F C	Fluoride	SM	EET CHI
SM 4500 SO4 E	Sulfate, Total	SM	EET CHI

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater"

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Sample Summary

Client: KPRG and Associates, Inc.
Job ID: 500-235818-1
Project/Site: Powerton CCR FAB (MW-01 - Cl, Fl, SO4)

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-235818-1	MW-01	Water	06/26/23 13:44	06/27/23 10:00

Client Sample Results

Client: KPRG and Associates, Inc.
Job ID: 500-235818-1
Project/Site: Powerton CCR FAB (MW-01 - Cl, Fl, SO4)

Client Sample ID: MW-01
Lab Sample ID: 500-235818-1
Date Collected: 06/26/23 13:44
Matrix: Water
Date Received: 06/27/23 10:00

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SM 4500 Cl- E)	**39**		4.0		mg/L			06/28/23 13:51	2
Fluoride (SM 4500 F C)	<0.10		0.10		mg/L			06/28/23 18:12	1
Sulfate (SM 4500 SO4 E)	**39**		10		mg/L			06/29/23 09:12	2

Definitions/Glossary

Client: KPRG and Associates, Inc. Job ID: 500-235818-1
Project/Site: Powerton CCR FAB (MW-01 - Cl, Fl, SO4)

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

QC Association Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (MW-01 - Cl, Fl, SO4)

Job ID: 500-235818-1

General Chemistry

Analysis Batch: 720896

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-235818-1	MW-01	Total/NA	Water	SM 4500 Cl- E	
MB 500-720896/112	Method Blank	Total/NA	Water	SM 4500 Cl- E	
LCS 500-720896/113	Lab Control Sample	Total/NA	Water	SM 4500 Cl- E	

Analysis Batch: 720973

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-235818-1	MW-01	Total/NA	Water	SM 4500 F C	
MB 500-720973/31	Method Blank	Total/NA	Water	SM 4500 F C	
LCS 500-720973/32	Lab Control Sample	Total/NA	Water	SM 4500 F C	

Analysis Batch: 721056

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-235818-1	MW-01	Total/NA	Water	SM 4500 SO4 E	
MB 500-721056/43	Method Blank	Total/NA	Water	SM 4500 SO4 E	
LCS 500-721056/44	Lab Control Sample	Total/NA	Water	SM 4500 SO4 E	

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR FAB (MW-01 - Cl, Fl, SO4)

Job ID: 500-235818-1

Method: SM 4500 Cl- E - Chloride, Total

Lab Sample ID: MB 500-720896/112
Matrix: Water
Analysis Batch: 720896

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<2.0		2.0		mg/L			06/28/23 13:49	1

Lab Sample ID: LCS 500-720896/113
Matrix: Water
Analysis Batch: 720896

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	20.0	19.9		mg/L		100	85 - 115

Method: SM 4500 F C - Fluoride

Lab Sample ID: MB 500-720973/31
Matrix: Water
Analysis Batch: 720973

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<0.10		0.10		mg/L			06/28/23 17:22	1

Lab Sample ID: LCS 500-720973/32
Matrix: Water
Analysis Batch: 720973

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Fluoride	10.0	10.6		mg/L		106	90 - 119

Method: SM 4500 SO4 E - Sulfate, Total

Lab Sample ID: MB 500-721056/43
Matrix: Water
Analysis Batch: 721056

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	<5.0		5.0		mg/L			06/29/23 09:09	1

Lab Sample ID: LCS 500-721056/44
Matrix: Water
Analysis Batch: 721056

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	20.0	20.3		mg/L		101	88 - 123

Eurofins Chicago
2417 Bond Street
University Park IL 60484
Phone 708-534-5200 Fax 708-534-5211

Chain of Custody Record

MKE 232 eurofins

Client Information	Sampler: Kaelyn Sperle	Lab PM: Mockler Diana J	Carrier Tracking No(s):	COC No: 500-104268-44025 1
Client Contact: ~~Mitchel Dolan~~ Kaelyn Sperle	Phone: 262-278-1621	E-Mail: Diana Mockler@et.eurofinsus.com	State of Origin: IL	Page: Page 1 of 1
Company: KPRG and Associates Inc.	PWSID:			Job #: 500-235818
Address: 14665 West Lisbon Road Suite 1A	Due Date Requested: Standard			
City: Brookfield	TAT Requested (days): Standard			
State Zip: WI 53005	Compliance Project: Δ Yes Δ No			
Phone: 262-781-0475(Tel)	PO #: 4502081030			
Email: ~~mitchell@kprginc.com~~ kaelyns@kprginc.com	WO #:			
Project Name: Powerton CCR FAB	Project #: 50011612			
Site: Illinois	SSOW#:			

500-235818 COC

Analysis Requested

Preservation Codes: A HCL, B NaOH, C Zn Acetate, D Nitric Acid, E NaHSO4, F MeOH, G Amchlor, H Ascorbic Acid, I Ice, J DI Water, K EDTA, L EDA, M Hexane, N None, O AsNaO2, P Na2O4S, Q Na2SO3, R Na2S2O3, S H2SO4, T TSP Dodecahydrate, U Acetone, V MCAA, W pH 4-5 Trizma, Z other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0 - Standard Target List	Ra226Ra228_GFPC - Local Method	904.0 - Standard Target List	6020A, 7470A	~~2540C~~, 4500_F_C SM4500_Cl_E, SM4500_SO4_E	Total Number of containers	Special Instructions/Note
				Preservation Code:			D	D	D	D	N		
1 MW-01	6/26/23	1344	G	Water	N	N					X	1	chloride, fluoride, & sulfate only
				Water									
				Water									
				Water									
				Water									
				Water									
				Water									
				Water									

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by:	Date	Time	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Kaelyn Sperle	6/26/23/1730	KPRG	FedEx	6/26/23/1730	FedEx
			Shri Scott	6/27/23 1000	EETA

Custody Seals Intact: Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks
		5.2 → 4.8

Ver 06 08/2 6/30/2023

500-235818 Waybi

ORIGIN ID:PIAA (262) 278-1621
KPRG AND ASSOCIATES
414 PLAZA DR STE 106
WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 26JUN23
ACTWGT: 41.75 LB
CAD: 6994780/SSFE2422
DIMS: 23x14x15 IN

BILL THIRD PARTY

TO EUROFINS

2417 BOND ST.

UNIVERSITY PARK IL 60484

(555) 555-5555 REF:
INV:
PO: DEPT:

FedEx Express

TRK# 0201 7803 8130 7994

TUE - 27 JUN 10:30A
PRIORITY OVERNIGHT
AHS
60484
IL-US ORD

XN JOTA

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-235818-1

Login Number: 235818
List Number: 1
Creator: Scott, Sherri L

List Source: Eurofins Chicago

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	4.8
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Lab Chronicle

Client: KPRG and Associates, Inc.
Job ID: 500-235818-1
Project/Site: Powerton CCR FAB (MW-01 - Cl, Fl, SO4)

Client Sample ID: MW-01
Lab Sample ID: 500-235818-1

Date Collected: 06/26/23 13:44
Matrix: Water

Date Received: 06/27/23 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	SM 4500 Cl- E		2	720896	MM	EET CHI	06/28/23 13:51
Total/NA	Analysis	SM 4500 F C		1	720973	EH	EET CHI	06/28/23 18:12
Total/NA	Analysis	SM 4500 SO4 E		2	721056	MM	EET CHI	06/29/23 09:12

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Accreditation/Certification Summary

Client: KPRG and Associates, Inc.
Job ID: 500-235818-1
Project/Site: Powerton CCR FAB (MW-01 - Cl, Fl, SO4)

Laboratory: Eurofins Chicago

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Illinois	NELAP	IL00035	04-29-24

PROJECT NAME	NRG – POWERTON STATION – 12313.1		DATE	5/17/23
Sample Name	MW-01	Start Time	1218	
Condition of Well	good			
Water Level	23.91	Total Depth	—	
Well Diameter	PVC – 2 inch	Volume in Well	—	
Method of Purge	Low flow bladder	Purge Characteristics	clear	
Volume Removed	4 gals	W L at Sample Time	23.91	
Method of Sample	Low flow bladder	Sample Characteristics	clear	
Sample Analysis	CCA, CCR (FAB, ABBASB)	Sample Time	1236	
Water Quality Meter	YSI Pro Dss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1220	23.91	7.32	17.5	.728	8.77	21.9	6.65
1223	—	7.22	11.6	.625	8.81	30.7	5.05
1226	—	7.22	12.1	.624	8.54	31.5	4.41
1229	—	7.23	11.3	.616	8.42	32.6	4.36
1232	23.91	7.23	11.4	.612	8.26	33.3	4.33

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION – 12313.1		DATE	5/16/23
Sample Name	MW-02	Start Time	0851	
Condition of Well	good			
Water Level	24.55	Total Depth	–	
Well Diameter	PVC – 2 inch	Volume in Well	–	
Method of Purge	Low flow bladder	Purge Characteristics	clear	
Volume Removed	4 gts	W L at Sample Time	24.55	
Method of Sample	Low flow bladder	Sample Characteristics	clear	
Sample Analysis	CCA, CCR(FAB)	Sample Time	0906	
Water Quality Meter	YSI Pro Dss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
0853	24.55	7.72	10.7	.738	10.18	15.7	61.73
0856	–	7.49	10.5	.578	6.82	17.5	71.83
0859	–	7.48	10.5	.576	5.44	19.4	65.89
0902	24.55	7.48	10.5	.576	4.66	21.1	62.49

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION – 12313.1		DATE	5/16/23
Sample Name	MW-03	Start Time	0939	
Condition of Well	good			
Water Level	23.62	Total Depth	–	
Well Diameter	PVC – 2 inch	Volume in Well	–	
Method of Purge	Low flow bladder	Purge Characteristics	clear	
Volume Removed	3.5 gals	W L at Sample Time	23.62	
Method of Sample	Low flow bladder	Sample Characteristics	clear	
Sample Analysis	CCA, CCR (FAB)	Sample Time	0954	
Water Quality Meter	YSI Pro Dss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
0941	23.62	7.74	9.9	.647	10.86	39.5	6.26
0944	-	7.45	9.4	.588	10.92	41.0	7.03
0947	-	7.42	9.2	.586	10.94	41.7	6.90
0950	23.62	7.42	9.3	.585	10.89	41.9	6.94

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION – 12313.1		DATE	5/16/23
Sample Name	MW-04	Start Time	1031	
Condition of Well	good			
Water Level	24.76	Total Depth	–	
Well Diameter	PVC – 2 inch	Volume in Well	–	
Method of Purge	Low flow bladder	Purge Characteristics	clear	
Volume Removed	3.5 qts	W L at Sample Time	24.76	
Method of Sample	Low flow bladder	Sample Characteristics	clear	
Sample Analysis	CCA, CCR(FAB)	Sample Time	1048	
Water Quality Meter	YSI Pro Dss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1034	24.76	7.26	14.7	.658	8.52	53.7	6.76
1037	–	7.20	14.6	.696	5.82	48.1	4.80
1040	–	7.21	14.6	.696	5.07	46.9	2.67
1043	24.76	7.21	14.6	.696	4.70	46.7	2.50

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION – 12313.1		DATE	5/16/23
Sample Name	MW-05	Start Time	1129	
Condition of Well	good			
Water Level	22.05	Total Depth	—	
Well Diameter	PVC – 2 inch	Volume in Well	—	
Method of Purge	Low flow bladder	Purge Characteristics	clear	
Volume Removed	3.0 qts	W L at Sample Time	22.07	
Method of Sample	Low flow bladder	Sample Characteristics	clear	
Sample Analysis	CCA, CCR(FAB)	Sample Time	1145	
Water Quality Meter	YSI Pro Dss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1131	22.05	7.47	14.6	.894	9.17	51.3	2.61
1134	—	7.05	13.8	.894	4.77	55.1	3.02
1137	—	7.04	13.7	.894	3.58	54.6	2.54
1140	22.07	7.04	13.7	.892	2.53	53.5	2.55

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION – 12313.1		DATE	5/17/23
Sample Name	MW-10	Start Time	0848	
Condition of Well	good			
Water Level	15.91	Total Depth	—	
Well Diameter	PVC – 2 inch	Volume in Well	—	
Method of Purge	Low flow bladder	Purge Characteristics	sl. cloudy, gray	
Volume Removed	5.5 gals	W L at Sample Time	15.91	
Method of Sample	Low flow bladder	Sample Characteristics	sl. cloudy, gray	
Sample Analysis	CCA, CCR (FAB)	Sample Time	0908	
Water Quality Meter	YSI Pro Dss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
0852	15.91	7.33	13.0	.634	9.62	-45.0	6.92
0855	-	7.05	13.5	.748	5.90	-24.4	113.14
0858	-	7.05	13.4	.753	3.88	-13.7	64.92
0901	—	7.06	13.4	.756	3.01	-9.4	42.85
0904	15.91	7.07	13.4	.758	2.30	-5.9	30.70

SAMPLING NOTES:

FAB duplicate

Sampler Name and Company: KPRG and Associates KLS

DATA SUMMARY POSTING

Station: Midwest Generation Powerton Generating Station

Regulated Unit(s): Metal Cleaning Basin (IEPA ID No. W1798010008-03)

In accordance with the new Ill. Adm. Code Title 35, Part 845: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments (State CCR Rule) groundwater monitoring was completed during the 2nd quarter 2023 which includes the entire list of parameters specified under Section 845.600(a)(1) and (b). Table 1 is a summary table of all available CCR monitoring data to date including any data generated previously as part of the Federal CCR Rule monitoring. Table 2 provides a summary of turbidity data which was collected as part of State CCR Rule requirements which is a data parameter that was not required under the Federal CCR Rule.

No background statistics or proposed Groundwater Protection Standards are included on these tables. The background statistics and proposed Groundwater Protection Standards were submitted to Illinois Environmental Protection Agency (EPA) as part of the Application for Initial Operating Permit for the Metal Cleaning Basin dated March 31, 2022. Upon Illinois EPA approval of the Operating Permit and Proposed Groundwater Protection Standards, the approved comparison values will be included on the tables for subsequent data comparisons/evaluations.

It is noted that MW-20 was not sampled with the other wells during the week of May 15, 2023 due to a damaged pump. The pump was repaired and the well was sampled on June 26, 2023. At the time of writing this report, the data is not yet available for MW-20 and an updated submittal will be provided upon receipt of that data.

R000971

Table 1. Groundwater Analytical Results - Midwest Generation, LLC, Powerton Station, Pekin, IL. Menids Cleaning Basin.

Well	Date	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Radium 226 + 228	Selenium	Thallium
MW-13 (S) up-gradient	4/8/2021	2.6	380	130	0.4	8.08	1500	2700	< 0.003	0.021	0.21	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.025	0.77	< 0.0025	< 0.002
	5/13/2021	2.6	340	130	0.39	7.86	1400	2500	< 0.003	0.023	0.23	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.022	0.84	< 0.0025	< 0.002
	6/3/2021	3.2	370	150	0.41	7.63	1500	2600	< 0.003	0.025	0.22	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.026	0.79	< 0.0025	< 0.002
	8/23/2021	3.0	340	110	0.36	7.72	980	2000	< 0.003	0.021	0.19	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.022	0.9	< 0.0025	< 0.002
	10/1/2021	2.8	320	120	0.36	7.78	1300	2500	< 0.003	0.025	0.25	< 0.001	< 0.0005	< 0.005	< 0.001	0.00065	^1=< 0.01	< 0.0002	0.023	< 0.577	< 0.0025	< 0.002
	11/30/2021	3.1	330	120	0.36	7.79	^- 1000	2100	< 0.003	0.024	0.19	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.021	0.635	< 0.0025	< 0.002
	1/6/2022	3.1	280	120	0.4	7.77	950	2000	< 0.003	0.028	0.25	< 0.001	< 0.0005	< 0.005	< 0.001	0.00053	< 0.0002	< 0.0002	0.022	1.57	< 0.0025	< 0.002
	2/9/2022	2.8	310	120	0.41	7.67	1000	2200	< 0.003	0.026	0.25	< 0.001	< 0.0005	< 0.005	< 0.001	0.00061	< 0.002	< 0.0002	0.02	1.34	< 0.0025	< 0.002
	6/8/2022	3.2	240	100	0.37	7.96	860	1800	< 0.003	0.021	0.17	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.002	< 0.0002	0.021	< 0.502	< 0.0025	< 0.002
	8/31/2022	2.9	B 250	110	0.39	7.64	F1 790	1900	< 0.003	0.022	0.19	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.019	0.819	< 0.0025	< 0.002
	11/16/2022	2.6	250	120	0.83	7.97	910	1800	< 0.003	0.029	0.21	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	0.018	3.04	< 0.0025	< 0.002
	2/23/2023	3.1	220	130	0.42	8.38	660	1700	< 0.0010	0.028	0.22	^1= >=< 0.0010	< 0.0005	< 0.0050	< 0.0010	< 0.0005	< 0.010	0.00033	0.020	1.15	< 0.0025	< 0.0020
	5/17/2023	3.0	200	130	0.41	7.88	640	1700	< 0.0010	0.022	0.13	^1= >=< 0.0010	< 0.00050	< 0.0050	< 0.0010	< 0.00050	< 0.010	< 0.00020	0.017	< 0.447	< 0.0025	< 0.0020
MW-15 (CL) down-gradient	11/18/2015	1.5	270	H 210	0.53	6.55	H 1400	H 2400	< 0.003	0.03	0.096	^- < 0.001	0.00061	0.005	< 0.001	< 0.0005	0.042	H < 0.0002	0.023	< 0.599	0.0065	< 0.002
	2/25/2016	2.0	240	110	0.61	6.84	640	1700	< 0.003	0.025	0.083	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.041	< 0.0002	0.035	0.870	0.045	< 0.002
	5/19/2016	2.7	320	340	0.53	6.83	1200	2800	< 0.003	0.04	0.097	< 0.001	0.00098	< 0.005	< 0.001	< 0.0005	0.044	< 0.0002	0.041	< 0.420	0.0067	< 0.002
	8/18/2016	1.5	200	F1 170	0.54	6.96	660	1900	< 0.003	0.13	0.11	< 0.001	0.0041	< 0.005	< 0.001	< 0.0005	0.028	< 0.0002	0.027	< 0.672	0.0061	< 0.002
	11/17/2016	1.3	120	180	0.47	6.91	560	1900	< 0.003	0.0033	0.031	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.016	< 0.0002	0.018	< 0.570	0.0078	< 0.002
	2/17/2017	1.9	200	190	0.43	7.24	670	1700	< 0.003	0.02	0.036	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.025	< 0.0002	0.027	< 0.392	0.0032	< 0.002
	5/4/2017	1.5	180	190	0.57	7.35	670	1700	< 0.003	0.011	0.049	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.023	< 0.0002	0.023	< 0.456	0.0014	< 0.002
	6/21/2017	1.6	180	200	0.56	7.30	510	1600	< 0.003	0.0093	0.054	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.027	< 0.0002	0.03	< 0.347	0.019	< 0.002
	8/29/2017	2.2	190	200	0.53	6.87	540	1800	< 0.003	0.0018	0.044	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.023	< 0.0002	0.032	0.377	0.0092	< 0.002
	11/10/2017	1.6	170	180	0.63	7.09	530	1500	< 0.003	0.0063	0.046	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.025	< 0.0002	0.02	< 0.313	0.016	< 0.002
	5/17/2018	2.3	200	160	0.5	6.75	680	1800	< 0.003	0.0081	0.05	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.029	< 0.0002	0.03	0.397	0.077	< 0.002
	8/9/2018	2.3	200	200	0.48	7.06	520	1700	< 0.003	0.0083	0.048	<^ 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.026	< 0.0002	0.033	0.566	0.06	< 0.002
	5/2/2019	1.5	180	200	0.52	6.89	420	1500	< 0.003	0.0045	0.052	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.027	< 0.0002	0.023	< 0.424	< 0.0025	< 0.002
	11/14/2019	1.8	170	170	0.5	7.24	260	1100	< 0.003	0.0044	0.053	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.029	< 0.0002	0.025	< 0.475	< 0.0025	< 0.002
	4/29/2020	1.2	160	200	0.58	6.90	370	1300	NA	0.0016	0.06	NA	< 0.0005	NA	< 0.0010	< 0.0005	0.027	< 0.0002	0.023	0.578	< 0.0025	< 0.002
	12/8/2020	1.5	170	200	0.55	7.04	540	1400	NA	0.02	0.10	NA	0.00039	NA	0.0012	< 0.0005	0.035	< 0.0002	0.02	0.626	0.012	< 0.002
	5/12/2021	1.3	180	180	0.54	6.97	520	1500	< 0.003	0.0048	0.065	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.026	< 0.0002	0.014	< 0.648	0.0071	< 0.002
	7/20/2021	1.5	190	180	0.49	6.80	440	1500	< 0.003	0.0027	0.057	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.028	< 0.0002	0.02	< 0.398	< 0.0025	< 0.002
	8/23/2021	1.6	200	180	0.52	6.76	440	1500	< 0.003	0.0019	0.052	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.026	< 0.0002	0.024	< 0.794	0.012	< 0.002
	10/1/2021	1.2	180	180	0.53	6.97	430	1400	< 0.003	0.0087	0.065	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	^1= 0.028	< 0.0002	0.018	< 0.511	0.009	< 0.002
	11/29/2021	1.9	230	240	0.5	6.71	^- 450	1700	< 0.003	0.0081	0.074	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.024	< 0.0002	0.016	< 0.353	0.055	< 0.002
	2/9/2022	0.84	140	160	0.58	6.91	320	1200	< 0.003	0.0075	0.054	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.023	< 0.0002	0.014	< 0.51	0.0025	< 0.002
	6/8/2022	2.0	310	230	0.43	6.87	970	2600	< 0.003	0.004	0.09	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.027	< 0.0002	0.019	< 0.6612	0.12	< 0.002
	8/31/2022	B 2.0	270	0.5	6.80	550	1900	< 0.003	0.0054	0.057	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.03	< 0.0002	0.022	0.548	0.008	< 0.002	
	11/16/2022	1.3	210	220	0.81	7.26	400	1500	< 0.003	0.012	0.068	< 0.001	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.026	< 0.0002	0.05	0.851	< 0.0025	< 0.002
	2/23/2023	1.3	190	210	0.37	7.32	370	1400	< 0.0030	0.0049	0.055	^1= >=< 0.0010	0.00087	< 0.0050	0.0089	< 0.0005	0.024	< 0.0002	0.086	0.723	0.028	0.0029
	5/17/2023	2.1	280	330	0.42	6.84	860	2700	< 0.0030	0.0032	0.071	^1= >=< 0.0010	0.00052	< 0.0030	0.0015	< 0.00050	0.023	< 0.00020	0.040	0.547	0.17	< 0.0020
MW-17 (CL) up-gradient	11/19/2015	1.6	210	H 230	H 0.43	7.11	H 850	H 1800	< 0.003	0.0028	0.14	<^ 0.001	< 0.0005	< 0.005	0.0012	0.0012	0.019	H < 0.0002	0.035	< 0.790	< 0.0025	< 0.002
	2/22/2016	1.8	290	280	0.55	7.19	960	2100	< 0.003	0.021	0.051	< 0.001	< 0.0005	< 0.005	0.0012	< 0.0005	0.038	< 0.0002	0.093	1.07	< 0.0025	< 0.002
	5/18/2016	1.4	220	230	0.64	7.02	700	1800	< 0.003	0.32	0.12	< 0.001	0.001	< 0.005	0.0015	< 0.0005	0.026	< 0.0002	0.12	8.27	< 0.0025	0.0028
	8/15/2016	1.1	220	220	0.60	7.08	860	2100	< 0.003	0.34	0.12	< 0.001	0.001	< 0.005	0.0016	< 0.0005	0.022	< 0.0002	0.1	0.606	< 0.0025	0.0031
	11/14/2016	1.5	200	210	0.56	7.26	560	2000	< 0.003	0.19	0.073	< 0.001	0.00051	< 0.005	0.0012	< 0.0005	0.022	< 0.0002	0.042	3.76	< 0.0025	0.0021
	2/13/2017	1.6	190	230	0.56	6.84	770	1600	< 0.003	0.35	0.16	< 0.001	0.00093	< 0.005	0.0014	0.00079	0.019	< 0.0002	0.088	2.08	< 0.0025	0.0023
	5/4/2017	1.2	170	210	0.61	7.29	720	1500	< 0.003	0.24	0.39	0.0013	0.0023	< 0.005	0.0023	0.00066	0.016	< 0.0002	0.036	1.91	< 0.0025	0.0065
	6/22/2017	0.95	150	210	0.72	7.38	580	1600	< 0.003	0.41	0.13	< 0.001	0.0007	< 0.005	0.0012	0.0011	0.022	< 0.0002	0.11	1.21	< 0.0025	0.0022
	8/29/2017	1.4	190	230	0.64	7.19	640	1900	< 0.003	0.34	0.092	< 0.001	< 0.0005	< 0.005	< 0.001	0.00058	0.021	< 0.0002	0.13	3.32	< 0.0025	0.0023
	11/6/2017	1.7	190	240	0.62	7.27	840	1800	< 0.003	0.17	0.38	< 0.001	0.0022	< 0.005	0.0015	< 0.0005	< 0.01	< 0.0002	0.019	2.54	< 0.0025	0.0075
	5/14/2018	1.6	170	220	0.6	7.79	800	1700	< 0.003	0.42	0.17	< 0.001	0.002	< 0.005	0.0029	0.0021	0.015	< 0.0002	0.13	2.03	< 0.0025	0.0068
	8/6/2018	1.3	170	230	0.6	7.12	620	1600	< 0.003	0.087	0.055	<^ 0.001	0.00094	< 0.005	0.0013	< 0.0005	0.019	< 0.0002	0.084	1.34	< 0.0025	0.0023
	4/29/2019	0.98	150	190	0.66	7.25	660	1500	< 0.003	0.042	0.04	< 0.001	0.00052	< 0.005	0.001	0.00069	0.015	< 0.0002	0.06	0.517	< 0.0025	< 0.002
	11/13/2019	1.9	230	600	0.55	7.16	730	2100	< 0.003	0.088	0.10	< 0.001	0.0015	< 0.005	0.0011	0.00093	0.021	< 0.0002	0.058	0.643	< 0.0025	0.0029
	4/27/2020	1.2	150	170	0.79	7.27	520	1300	NA	0.026	0.036	NA	< 0.0005	NA	< 0.001	0.00081	0.021	< 0.0002	0.075	0.498	< 0.0025	< 0.002
	12/7/2020	1.3	140	160	0.8	7.22	410	1100	NA	0.08	0.05	NA	0.001	NA	< 0.001	0.0011	0.022	< 0.0002	0.056	< 0.438	< 0.0025	< 0.002
	4/8/2021	1.1	140	160	0.71	7.75	480	1200	< 0.003	0.0061	0.028	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.019	< 0.0002	0.057	< 0.485	< 0.0025	< 0.002
	5/12/2021	1.1	130	160	0.75	7.52	470	1100	< 0.003	0.0042	0.027	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.051	< 0.398	< 0.0025	< 0.002
	6/3/2021	0.4	150	96	0.74	7.27	500	1300	< 0.003	0.011	0.029	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.055	< 0.463	< 0.0025	< 0.002
	6/28/2021	B 1.1	150	120	0.69	7.34	500	1200	^= < 0.003	0.018	0.034	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.018	< 0.0002	0.050	1.20	< 0.0025	< 0.002
	7/20/2021	0.94	180	150	0.67	7.31	450	1200	< 0.003	0.0074	0.035	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.029	< 0.0002	0.028	< 0.43	0.051	0.0031
	8/23/2021	0.93	140	150	0.7	7.37	470	1300	< 0.003	0.0083	0.029	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.043	< 0.55	< 0.0025	< 0.002
	10/1/2021	0.85	130	140	0.7	7.26	430	1100	< 0.003	0.0082	0.028	< 0.001	< 0.0005	< 0.005	< 0.001	0.00056	^1= 0.022	< 0.0002	0.028	< 0.44	< 0.0025	< 0.002
	11/29/2021	0.97	140	150	0.72	7.30	^- 400	1100	< 0.003	0.0065	0.025	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.038	< 0.39	< 0.0025	< 0.002
	2/7/2022	0.99	140	160	0.78	7.27	450	1300	< 0.003	0.0079	0.027	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.016	< 0.0002	0.037	0.53	< 0.0025	< 0.002
	6/8/2022	1.3	190	190	0.69	7.51	820	1900	< 0.003	0.0071	0.038	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.053	< 0.42	< 0.0025	< 0.002
	8/31/2022	0.89	B 140	170	0.71	7.12	440	1300	< 0.003	0.0042	0.029	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.017	< 0.0002	0.022	0.71	< 0.0025	< 0.002
	11/16/2022	1.1	160	170	1.2	7.56	600	1500	< 0.003	0.0031	0.031	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.013	< 0.0002	0.026	1.00	< 0.0025	< 0.002
	2/23/2023	1.5	170	210	0.65	7.87	710	1700	< 0.0030	0.0041	0.028	^1= >=< 0.0010	< 0.0005	< 0.0050	< 0.0010	< 0.0005	0.015	< 0.0002	0.044	< 0.547	< 0.0025	0.0021
	5/18/2023	1.3	130	F1 200	0.64	7.34	470	1400	< 0.0030	0.0033	0.022	^1= >=< 0.0010	< 0.00050	0.0050	< 0.0010	< 0.00050	0.010	< 0.00020	0.035	< 0.488	< 0.0025	< 0.0020
MW-14 (CL) down-gradient	4/8/2021	2.1	200	98	1.1	7.33	630	1600	< 0.003	0.0028	0.036	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.028	< 0.0002	0.035	< 0.605	0.029	0.0022
	5/12/2021	2.6	210	100	1.1	7.13	640	1700	< 0.003	0.0047	0.038	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.028	< 0.0002	0.034	< 0.43	0.0039	0.0028
	6/3/2021	2.1	200	26	1.0	6.79	590	1600	< 0.003	0.0025	0.036	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.025	< 0.0002	0.028	< 0.357	0.004	0.0025
	6/28/2021	B 2.0	210	93	0.99	6.90	570	1700	^= < 0.003	0.0014	0.034	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.028	< 0.0002	0.03	0.758	0.034	0.0023
	7/20/2021	2.0	190	81	0.89	6.88	500	1700	< 0.003	0.0025	0.057	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.027	< 0.0002	0.021	< 0.434	< 0.0025	< 0.002
	8/23/2021	2.1	210	91	0.96	6.91	560	1800	< 0.003	0.0022	0.035	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.03	< 0.0002	0.031	0.515	0.01	0.0021
	10/1/2021	1.9	200	100	0.95	7.06	640	1700	< 0.003	0.0045	0.039	< 0.001	0.0005	< 0.005	< 0.001	0.00065	^1= 0.034	< 0.0002	0.037	< 0.581	< 0.0025	0.002
	11/29/2021	2.0	180	94	1.10	7.01	^- 480	1400	< 0.003	0.0025	0.032	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.026	< 0.0002	0.033	< 0.442	0.01	< 0.002
	2/9/2022	1.9	180	67	1.10	6.91	430	1500	< 0.003	0.0013	0.046	< 0.001	0.00056	< 0.005	< 0.001	< 0.0005	0.026	< 0.0002	0.03	0.724	< 0.0025	0.0022
	6/8/2022	2.2	230	87	0.96	7.12	810	2100	< 0.003	0.0041	0.057	< 0.001	0.00056	< 0.005	< 0.001	< 0.0005	0.022	< 0.0002	0.038	< 0.429	0.01	0.0023
	8/31/2022	2.2	B 200	120	0.86	6.74	610	1800	< 0.003	0.004	0.056	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.027	< 0.0002	0.024	0.743	< 0.0025	< 0.002
	11/17/2022	NS	NS	NS	NS	6.93	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/22/2023	2.2	190	120	0.76	7.40	600	1700	< 0.0030	0.0015	0.067	^1= >=< 0.0010	0.00085	0.0050	< 0.0010	0.0015	0.021	< 0.00022	0.023	< 0.552	0.024	0.0020
	5/17/2023	2.3	280	300	1.0	7.02	1100	2600	< 0.0030	0.0016	0.054	^1= >=< 0.0010	< 0.00050	< 0.0050	< 0.0010	< 0.00050	0.021	< 0.00020	0.044	< 0.712	0.090	0.0027
MW-20 (CL) down-gradient	4/8/2021	2.2	310	150	0.20	7.18	850	2200	< 0.003	0.0027	0.19	< 0.001	< 0.0005	< 0.005	0.0013	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.673	< 0.0025	< 0.002
	5/12/2021	0.43	130	150	0.19	6.90	850	2200	< 0.003	0.019	0.21	< 0.001	< 0.0005	< 0.005	0.0039	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.79	< 0.0025	< 0.002
	6/3/2021	1.5	260	26	0.12	6.35	500	1500	< 0.003	< 0.001	0.085	< 0.001	< 0.0005	< 0.005	0.0039	< 0.0005	< 0.01	< 0.0002	< 0.005	0.708	< 0.0025	< 0.002
	6/28/2021	B 1.8	270	96	0.14	6.49	570	1800	^= < 0.003	0.002	0.13	< 0.001	< 0.0005	< 0.005	0.0025	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.453	< 0.0025	< 0.002
	7/20/2021	1.5	230	64	0.13	6.41	440	1600	< 0.003	0.0025	0.1	< 0.001	< 0.0005	< 0.005	0.0022	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.484	< 0.0025	< 0.002
	8/23/2021	1.5	230	54	0.12	6.66	170	1400	< 0.003	0.0014	0.12	< 0.001	< 0.0005	< 0.005	0.0017	< 0.0005	< 0.01	< 0.0002	< 0.005	0.792	< 0.0025	< 0.002
	10/1/2021	1.7	210	80	0.13	6.74	180	1600	< 0.003	0.0029	0.13	< 0.001	< 0.0005	< 0.005	0.0016	< 0.0005	^1=< 0.01	< 0.0002	< 0.005	0.763	< 0.0025	< 0.002
	11/29/2021	1.7	250	120	0.16	6.73	^- 550	1900	< 0.003	0.0071	0.16	< 0.001	< 0.0005	< 0.005	0.0019	0.0024	< 0.01	< 0.0002	< 0.005	< 0.639	< 0.0025	< 0.002
	2/8/2022	1.9	230	110	0.17	6.67	440	1700	< 0.003	0.0098	0.16	< 0.001	< 0.0005	< 0.005	0.0013	0.00085	< 0.002	< 0.0002	< 0.005	< 0.605	< 0.0025	< 0.002
	6/9/2022	1.5	230	65	0.13	6.73	400	1600	< 0.003	0.0024	0.1	< 0.001	< 0.0005	< 0.005	0.0018	< 0.0005	< 0.01	< 0.0002	< 0.005	0.636	< 0.0025	< 0.002
	9/1/2022	2.0	B 230	110	0.15	6.28	370	2100	< 0.003	0.0013	0.12	< 0.001	< 0.0005	< 0.005	0.0012	< 0.0005	< 0.01	< 0.0002	< 0.005	0.596	< 0.0025	< 0.002
	11/17/2022	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/22/2023	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	6/26/2023	DNYA	DNYA	DNYA	DNYA	6.79	DNYA	DNYA	DNYA	DNYA	DNYA	DNYA	DNYA	DNYA	DNYA	DNYA	DNYA	DNYA	DNYA	DNYA	DNYA	DNYA
MW-21 (CL) down-gradient	4/8/2021	0.48	140	34	0.25	7.08	26	770	< 0.003	0.025	0.34	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	0.0042	< 0.0002	< 0.005	1.18	< 0.0025	< 0.002
	5/13/2021	0.42	66	22	0.16	6.72	57	680	< 0.003	0.0023	0.19	< 0.001	< 0.0005	< 0.005	< 0.001	< 0.0005	< 0.01	< 0.0002	< 0.005	0.708	< 0.0025	< 0.002
	6/3/2021	0.39	130	23	0.17	6.58	41	690	< 0.003	0.0069	0.25	< 0.001	< 0.0005	< 0.005	0.002	< 0.0005	< 0.01	< 0.0002	< 0.005	1.01	< 0.0025	< 0.002
	6/28/2021	0.60	140	17	0.16	6.35	6.9	660	^= < 0.003	0.025	0.35	< 0.001	< 0.0005	< 0.005	0.002	< 0.0005	< 0.01	< 0.0002	< 0.005	0.487	< 0.0025	< 0.002
	7/20/2021	0.38	130	28	0.15	6.49	32	650	< 0.003	0.017	0.35	< 0.001	< 0.0005	< 0.005	0.0083	0.001	< 0.01	< 0.0002	< 0.005	0.97	< 0.0025	< 0.002
	8/23/2021	0.66	130	29	0.17	6.66	< 5	550	< 0.003	0.022	0.32	< 0.001	< 0.0005	< 0.005	0.0016	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.588	< 0.0025	< 0.002
	10/8/2021	0.35	160	38	0.19	6.72	< 5	810	< 0.003	0.036	0.45	< 0.001	< 0.0005	0.0072	0.0072	0.0026	^1=< 0.01	< 0.0002	< 0.005	< 1.08	< 0.0025	< 0.002
	11/29/2021	0.66	130	30	0.18	6.55	^- < 5	660	< 0.003	0.031	0.37	< 0.001	< 0.0005	< 0.005	0.0015	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.747	< 0.0025	< 0.002
	3/1/2022	0.21	210	43	0.24	6.71	< 5	900	< 0.003	0.063	0.48	< 0.001	< 0.0005	< 0.005	0.0085	< 0.0005	< 0.002	< 0.0002	< 0.005	1.2	< 0.0025	< 0.002
	6/9/2022	0.45	130	24	0.16	6.91	12	660	< 0.003	0.028	0.4	< 0.001	< 0.0005	< 0.005	0.0028	< 0.0005	< 0.01	< 0.0002	< 0.005	0.953	< 0.0025	< 0.002
	9/1/2022	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	11/17/2022	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	N

Table 2. Groundwater Turbidity - Midwest Generation, LLC, Powerton Station, Pekin, IL. Metal Cleaning Basin.

Well	Date	Turbidity (NTU)
MW-13	2/24/2021	8.90
	4/8/2021	6.50
	5/13/2021	2.17
	6/3/2021	2.81
	6/29/2021	4.00
	8/23/2021	3.99
	10/1/2021	4.82
	11/30/2021	5.51
	1/6/2022	16.87
	2/9/2022	1.99
	6/8/2022	30.66
	8/31/2022	16.22
	11/16/2022	4.82
	2/23/2023	23.89
	5/17/2023	10.09
MW-15	2/24/2021	64.90
	4/9/2021	16.80
	5/12/2021	16.45
	6/3/2021	7.85
	6/29/2021	6.58
	7/20/2021	5.82
	8/23/2021	4.28
	10/1/2021	13.13
	11/29/2021	12.35
	2/7/2022	9.38
	6/8/2022	10.32
	8/31/2022	28.7
	11/16/2022	55.82
	2/23/2023	21.36
	5/17/2023	13.90
MW-17	2/24/2021	42.00
	4/8/2021	17.10
	5/12/2021	10.90
	6/3/2021	38.15
	6/28/2021	29.15
	7/20/2021	16.38
	8/23/2021	26.51
	10/1/2021	21.26
	11/30/2021	8.86
	2/9/2022	11.19
	6/8/2022	41.49
	8/31/2022	22.58
	11/16/2022	116.69
	2/23/2023	20.65
	5/18/2023	9.92
MW-14	2/24/2021	13.90
	4/8/2021	5.39
	5/12/2021	1.22
	6/3/2021	2.63
	6/28/2021	3.74
	7/20/2021	4.34
	8/23/2021	4.26
	10/1/2021	10.27
	11/29/2021	12.29
	2/9/2022	8.66
	6/8/2022	19.54
	8/31/2022	40.75
	11/17/2022	31.69
	2/21/2023	7.33
	5/17/2023	7.08
MW-20	3/12/2021	343.30
	4/8/2021	14.45
	5/12/2021	3.89
	6/3/2021	6.01
	6/28/2021	8.28
	7/20/2021	9.16
	8/23/2021	27.31
	10/1/2021	8.27
	11/29/2021	8.35
	2/8/2022	76.4
	6/9/2022	19.31
	9/1/2022	63.5
	11/17/2022	NM
	2/21/2023	NM
	6/26/2023	48.01
MW-21	3/12/2021	49.20
	4/8/2021	5.88
	5/12/2021	26.09
	6/3/2021	17.61
	6/28/2021	6.33
	7/20/2021	44.93
	8/23/2021	19.43
	10/8/2021	94.82
	11/29/2021	20.2
	3/1/2022	7.64
	6/9/2022	7.56
	9/1/2022	NM
	11/17/2022	NM
	2/20/2023	25.99
	5/18/2023	7.50

NM - Not Measured due to insufficient water volume.

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ANALYTICAL REPORT

PREPARED FOR

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Suite 1A
Brookfield, Wisconsin 53005

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JOB DESCRIPTION

Powerton CCR MCB

JOB NUMBER

500-234016-1

Eurofins Chicago
2417 Bond Street
University Park IL 60484

See page two for job notes and contact information.

myEOL

Eurofins Chicago

Job Notes

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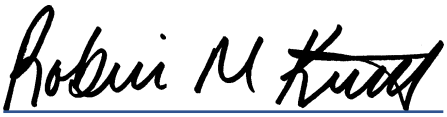

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Case Narrative

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-234016-1

Job ID: 500-234016-1

Laboratory: Eurofins Chicago

Narrative

Job Narrative
500-234016-1

Receipt
The samples were received on 5/18/2023 9:40 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.7º C and 5.2º C.

Metals
Method 6020A: The initial and continuing low level continuing calibration verification (ICVL/CCVL) associated with batch 716022 recovered above the upper control limit for Be. The samples associated with this CCV were all below the reporting limit for the affected analytes; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
Method SM 4500 SO4 E: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for analytical batch 500-715553 were outside control limits for sulfate. See QC Sample Results for detail. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery is within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Method Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-234016-1

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	EET CHI
7470A	Mercury (CVAA)	SW846	EET CHI
SM 2540C	Solids, Total Dissolved (TDS)	SM	EET CHI
SM 4500 Cl- E	Chloride, Total	SM	EET CHI
SM 4500 F C	Fluoride	SM	EET CHI
SM 4500 SO4 E	Sulfate, Total	SM	EET CHI
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET CHI
7470A	Preparation, Mercury	SW846	EET CHI

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Sample Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-234016-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-234016-1	MW-15	Water	05/17/23 13:48	05/18/23 09:40
500-234016-2	MW-14	Water	05/17/23 10:27	05/18/23 09:40
500-234016-3	Duplicate	Water	05/17/23 00:00	05/18/23 09:40
500-234016-4	MW-13	Water	05/17/23 15:15	05/18/23 09:40
500-234016-5	MW-17	Water	05/18/23 13:37	05/19/23 10:00
500-234016-6	MW-21	Water	05/18/23 09:45	05/19/23 10:00

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-234016-1

Client Sample ID: MW-15

Date Collected: 05/17/23 13:48
Date Received: 05/18/23 09:40

Lab Sample ID: 500-234016-1

Matrix: Water

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		05/24/23 08:52	05/25/23 01:28	1
Arsenic	**0.0032**		0.0010		mg/L		05/24/23 08:52	05/25/23 01:28	1
Barium	**0.071**		0.0025		mg/L		05/24/23 08:52	05/25/23 01:28	1
Beryllium	<0.0010	^1+ ^+	0.0010		mg/L		05/24/23 08:52	05/26/23 20:21	1
Boron	**2.1**		0.25		mg/L		05/24/23 08:52	05/26/23 19:50	5
Cadmium	**0.00052**		0.00050		mg/L		05/24/23 08:52	05/25/23 01:28	1
Calcium	**280**		1.0		mg/L		05/24/23 08:52	05/26/23 19:50	5
Chromium	<0.0050		0.0050		mg/L		05/24/23 08:52	05/25/23 01:28	1
Cobalt	**0.0015**		0.0010		mg/L		05/24/23 08:52	05/25/23 01:28	1
Lead	<0.00050		0.00050		mg/L		05/24/23 08:52	05/25/23 01:28	1
Lithium	**0.023**		0.010		mg/L		05/24/23 08:52	05/25/23 01:28	1
Molybdenum	**0.045**		0.0050		mg/L		05/24/23 08:52	05/25/23 01:28	1
Selenium	**0.17**		0.0025		mg/L		05/24/23 08:52	05/25/23 01:28	1
Thallium	<0.0020		0.0020		mg/L		05/24/23 08:52	05/25/23 01:28	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/08/23 15:05	06/09/23 09:03	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**2700**		10		mg/L			05/22/23 02:29	1
Chloride (SM 4500 Cl- E)	**330**		20		mg/L			05/31/23 15:40	10
Fluoride (SM 4500 F C)	**0.42**		0.10		mg/L			05/24/23 08:35	1
Sulfate (SM 4500 SO4 E)	**860**		100		mg/L			05/26/23 14:27	20

Client Sample ID: MW-14

Date Collected: 05/17/23 10:27
Date Received: 05/18/23 09:40

Lab Sample ID: 500-234016-2

Matrix: Water

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		05/24/23 08:52	05/25/23 01:32	1
Arsenic	**0.0016**		0.0010		mg/L		05/24/23 08:52	05/25/23 01:32	1
Barium	**0.054**		0.0025		mg/L		05/24/23 08:52	05/25/23 01:32	1
Beryllium	<0.0010	^1+ ^+	0.0010		mg/L		05/24/23 08:52	05/26/23 20:24	1
Boron	**2.3**		0.25		mg/L		05/24/23 08:52	05/26/23 19:54	5
Cadmium	<0.00050		0.00050		mg/L		05/24/23 08:52	05/25/23 01:32	1
Calcium	**280**		1.0		mg/L		05/24/23 08:52	05/26/23 19:54	5
Chromium	<0.0050		0.0050		mg/L		05/24/23 08:52	05/25/23 01:32	1
Cobalt	<0.0010		0.0010		mg/L		05/24/23 08:52	05/25/23 01:32	1
Lead	<0.00050		0.00050		mg/L		05/24/23 08:52	05/25/23 01:32	1
Lithium	**0.021**		0.010		mg/L		05/24/23 08:52	05/25/23 01:32	1
Molybdenum	**0.044**		0.0050		mg/L		05/24/23 08:52	05/25/23 01:32	1
Selenium	**0.090**		0.0025		mg/L		05/24/23 08:52	05/25/23 01:32	1
Thallium	**0.0027**		0.0020		mg/L		05/24/23 08:52	05/25/23 01:32	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/08/23 15:05	06/09/23 09:05	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-234016-1

Client Sample ID: MW-14

Lab Sample ID: 500-234016-2
Matrix: Water
Date Collected: 05/17/23 10:27
Date Received: 05/18/23 09:40

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	2600		10		mg/L			05/22/23 02:31	1
Chloride (SM 4500 Cl- E)	100		20		mg/L			05/31/23 15:40	10
Fluoride (SM 4500 F C)	1.0		0.10		mg/L			05/24/23 08:35	1
Sulfate (SM 4500 SO4 E)	1100		500		mg/L			05/26/23 14:28	100

Client Sample ID: Duplicate

Lab Sample ID: 500-234016-3
Matrix: Water
Date Collected: 05/17/23 00:00
Date Received: 05/18/23 09:40

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		05/24/23 08:52	05/25/23 01:35	1
Arsenic	0.021		0.0010		mg/L		05/24/23 08:52	05/25/23 01:35	1
Barium	0.12		0.0025		mg/L		05/24/23 08:52	05/25/23 01:35	1
Beryllium	<0.0010	^1+ ^+	0.0010		mg/L		05/24/23 08:52	05/26/23 20:28	1
Boron	2.8		0.50		mg/L		05/24/23 08:52	05/26/23 19:57	10
Cadmium	<0.00050		0.00050		mg/L		05/24/23 08:52	05/25/23 01:35	1
Calcium	190		0.20		mg/L		05/24/23 08:52	05/25/23 01:35	1
Chromium	<0.0050		0.0050		mg/L		05/24/23 08:52	05/25/23 01:35	1
Cobalt	<0.0010		0.0010		mg/L		05/24/23 08:52	05/25/23 01:35	1
Lead	<0.00050		0.00050		mg/L		05/24/23 08:52	05/25/23 01:35	1
Lithium	<0.010		0.010		mg/L		05/24/23 08:52	05/25/23 01:35	1
Molybdenum	0.018		0.0050		mg/L		05/24/23 08:52	05/25/23 01:35	1
Selenium	<0.0025		0.0025		mg/L		05/24/23 08:52	05/25/23 01:35	1
Thallium	<0.0020		0.0020		mg/L		05/24/23 08:52	05/25/23 01:35	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/08/23 15:05	06/09/23 09:08	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	1600		10		mg/L			05/22/23 02:34	1
Chloride (SM 4500 Cl- E)	130		20		mg/L			05/31/23 15:41	10
Fluoride (SM 4500 F C)	0.40		0.10		mg/L			05/24/23 08:35	1
Sulfate (SM 4500 SO4 E)	590		250		mg/L			05/26/23 14:15	50

Client Sample ID: MW-13

Lab Sample ID: 500-234016-4
Matrix: Water
Date Collected: 05/17/23 15:15
Date Received: 05/18/23 09:40

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		05/24/23 08:52	05/25/23 01:39	1
Arsenic	0.022		0.0010		mg/L		05/24/23 08:52	05/25/23 01:39	1
Barium	0.13		0.0025		mg/L		05/24/23 08:52	05/25/23 01:39	1
Beryllium	<0.0010	^1+ ^+	0.0010		mg/L		05/24/23 08:52	05/26/23 20:31	1
Boron	3.0		0.50		mg/L		05/24/23 08:52	05/26/23 20:00	10
Cadmium	<0.00050		0.00050		mg/L		05/24/23 08:52	05/25/23 01:39	1
Calcium	200		0.20		mg/L		05/24/23 08:52	05/25/23 01:39	1
Chromium	<0.0050		0.0050		mg/L		05/24/23 08:52	05/25/23 01:39	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-234016-1

Client Sample ID: MW-13

Lab Sample ID: 500-234016-4
Matrix: Water
Date Collected: 05/17/23 15:15
Date Received: 05/18/23 09:40

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	<0.0010		0.0010		mg/L		05/24/23 08:52	05/25/23 01:39	1
Lead	<0.00050		0.00050		mg/L		05/24/23 08:52	05/25/23 01:39	1
Lithium	<0.010		0.010		mg/L		05/24/23 08:52	05/25/23 01:39	1
Molybdenum	**0.017**		0.0050		mg/L		05/24/23 08:52	05/25/23 01:39	1
Selenium	<0.0025		0.0025		mg/L		05/24/23 08:52	05/25/23 01:39	1
Thallium	<0.0020		0.0020		mg/L		05/24/23 08:52	05/25/23 01:39	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/08/23 15:05	06/09/23 09:10	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**1700**		10		mg/L			05/22/23 02:36	1
Chloride (SM 4500 Cl- E)	**130**		20		mg/L			05/31/23 15:41	10
Fluoride (SM 4500 F C)	**0.41**		0.10		mg/L			05/24/23 08:35	1
Sulfate (SM 4500 SO4 E)	**640**		250		mg/L			05/26/23 14:16	50

Client Sample ID: MW-17

Lab Sample ID: 500-234016-5
Matrix: Water
Date Collected: 05/18/23 13:37
Date Received: 05/19/23 10:00

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		05/24/23 08:52	05/25/23 01:42	1
Arsenic	**0.0033**		0.0010		mg/L		05/24/23 08:52	05/25/23 01:42	1
Barium	**0.022**		0.0025		mg/L		05/24/23 08:52	05/25/23 01:42	1
Beryllium	<0.0010	^1+ ^+	0.0010		mg/L		05/24/23 08:52	05/26/23 20:35	1
Boron	**1.3**		0.25		mg/L		05/24/23 08:52	05/26/23 20:04	5
Cadmium	<0.00050		0.00050		mg/L		05/24/23 08:52	05/25/23 01:42	1
Calcium	**130**		0.20		mg/L		05/24/23 08:52	05/25/23 01:42	1
Chromium	<0.0050		0.0050		mg/L		05/24/23 08:52	05/25/23 01:42	1
Cobalt	<0.0010		0.0010		mg/L		05/24/23 08:52	05/25/23 01:42	1
Lead	<0.00050		0.00050		mg/L		05/24/23 08:52	05/25/23 01:42	1
Lithium	**0.010**		0.010		mg/L		05/24/23 08:52	05/25/23 01:42	1
Molybdenum	**0.055**		0.0050		mg/L		05/24/23 08:52	05/25/23 01:42	1
Selenium	<0.0025		0.0025		mg/L		05/24/23 08:52	05/25/23 01:42	1
Thallium	<0.0020		0.0020		mg/L		05/24/23 08:52	05/25/23 01:42	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/08/23 15:05	06/09/23 09:12	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**1400**		10		mg/L			05/23/23 22:32	1
Chloride (SM 4500 Cl- E)	**200**	**F1**	20		mg/L			05/31/23 15:42	10
Fluoride (SM 4500 F C)	**0.64**		0.10		mg/L			05/24/23 08:35	1
Sulfate (SM 4500 SO4 E)	**470**		250		mg/L			05/26/23 14:17	50

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-234016-1

Client Sample ID: MW-21

Date Collected: 05/18/23 09:45
Date Received: 05/19/23 10:00

Lab Sample ID: 500-234016-6

Matrix: Water

Method: SW846 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		05/24/23 08:52	05/25/23 01:46	1
Arsenic	**0.038**		0.0010		mg/L		05/24/23 08:52	05/25/23 01:46	1
Barium	**0.39**		0.0025		mg/L		05/24/23 08:52	05/25/23 01:46	1
Beryllium	<0.0010	^1+ ^+	0.0010		mg/L		05/24/23 08:52	05/26/23 20:07	1
Boron	**0.63**		0.050		mg/L		05/24/23 08:52	05/26/23 20:07	1
Cadmium	<0.00050		0.00050		mg/L		05/24/23 08:52	05/25/23 01:46	1
Calcium	**130**		0.20		mg/L		05/24/23 08:52	05/25/23 01:46	1
Chromium	<0.0050		0.0050		mg/L		05/24/23 08:52	05/25/23 01:46	1
Cobalt	**0.0023**		0.0010		mg/L		05/24/23 08:52	05/25/23 01:46	1
Lead	<0.00050		0.00050		mg/L		05/24/23 08:52	05/25/23 01:46	1
Lithium	<0.010		0.010		mg/L		05/24/23 08:52	05/25/23 01:46	1
Molybdenum	<0.0050		0.0050		mg/L		05/24/23 08:52	05/25/23 01:46	1
Selenium	<0.0025		0.0025		mg/L		05/24/23 08:52	05/25/23 01:46	1
Thallium	<0.0020		0.0020		mg/L		05/24/23 08:52	05/25/23 01:46	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/08/23 15:05	06/09/23 09:14	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**630**		10		mg/L			05/23/23 22:40	1
Chloride (SM 4500 Cl- E)	**24**		2.0		mg/L			05/31/23 16:50	1
Fluoride (SM 4500 F C)	**0.15**		0.10		mg/L			05/25/23 09:19	1
Sulfate (SM 4500 SO4 E)	<5.0		5.0		mg/L			05/26/23 14:16	1

Definitions/Glossary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-234016-1

Qualifiers

Metals

Qualifier	Qualifier Description
^+	Continuing Calibration Verification (CCV) is outside acceptance limits, high biased.
^1+	Initial Calibration Verification (ICV) is outside acceptance limits, high biased.

General Chemistry

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
F1	MS and/or MSD recovery exceeds control limits.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

QC Association Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-234016-1

Metals

Prep Batch: 714956

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-234016-1	MW-15	Total Recoverable	Water	3005A	
500-234016-2	MW-14	Total Recoverable	Water	3005A	
500-234016-3	Duplicate	Total Recoverable	Water	3005A	
500-234016-4	MW-13	Total Recoverable	Water	3005A	
500-234016-5	MW-17	Total Recoverable	Water	3005A	
500-234016-6	MW-21	Total Recoverable	Water	3005A	
MB 500-714956/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 500-714956/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 715273

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-234016-1	MW-15	Total Recoverable	Water	6020A	714956
500-234016-2	MW-14	Total Recoverable	Water	6020A	714956
500-234016-3	Duplicate	Total Recoverable	Water	6020A	714956
500-234016-4	MW-13	Total Recoverable	Water	6020A	714956
500-234016-5	MW-17	Total Recoverable	Water	6020A	714956
500-234016-6	MW-21	Total Recoverable	Water	6020A	714956
MB 500-714956/1-A	Method Blank	Total Recoverable	Water	6020A	714956
LCS 500-714956/2-A	Lab Control Sample	Total Recoverable	Water	6020A	714956

Analysis Batch: 716022

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-234016-1	MW-15	Total Recoverable	Water	6020A	714956
500-234016-1	MW-15	Total Recoverable	Water	6020A	714956
500-234016-2	MW-14	Total Recoverable	Water	6020A	714956
500-234016-2	MW-14	Total Recoverable	Water	6020A	714956
500-234016-3	Duplicate	Total Recoverable	Water	6020A	714956
500-234016-3	Duplicate	Total Recoverable	Water	6020A	714956
500-234016-4	MW-13	Total Recoverable	Water	6020A	714956
500-234016-4	MW-13	Total Recoverable	Water	6020A	714956
500-234016-5	MW-17	Total Recoverable	Water	6020A	714956
500-234016-5	MW-17	Total Recoverable	Water	6020A	714956
500-234016-6	MW-21	Total Recoverable	Water	6020A	714956
MB 500-714956/1-A	Method Blank	Total Recoverable	Water	6020A	714956
LCS 500-714956/2-A	Lab Control Sample	Total Recoverable	Water	6020A	714956

Prep Batch: 717594

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-234016-1	MW-15	Total/NA	Water	7470A	
500-234016-2	MW-14	Total/NA	Water	7470A	
500-234016-3	Duplicate	Total/NA	Water	7470A	
500-234016-4	MW-13	Total/NA	Water	7470A	
500-234016-5	MW-17	Total/NA	Water	7470A	
500-234016-6	MW-21	Total/NA	Water	7470A	
MB 500-717594/12-A	Method Blank	Total/NA	Water	7470A	
LCS 500-717594/13-A	Lab Control Sample	Total/NA	Water	7470A	
500-234016-6 MS	MW-21	Total/NA	Water	7470A	
500-234016-6 MSD	MW-21	Total/NA	Water	7470A	
500-234016-6 DU	MW-21	Total/NA	Water	7470A	

QC Association Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-234016-1

Metals

Analysis Batch: 717824

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-234016-1	MW-15	Total/NA	Water	7470A	717594
500-234016-2	MW-14	Total/NA	Water	7470A	717594
500-234016-3	Duplicate	Total/NA	Water	7470A	717594
500-234016-4	MW-13	Total/NA	Water	7470A	717594
500-234016-5	MW-17	Total/NA	Water	7470A	717594
500-234016-6	MW-21	Total/NA	Water	7470A	717594
MB 500-717594/12-A	Method Blank	Total/NA	Water	7470A	717594
LCS 500-717594/13-A	Lab Control Sample	Total/NA	Water	7470A	717594
500-234016-6 MS	MW-21	Total/NA	Water	7470A	717594
500-234016-6 MSD	MW-21	Total/NA	Water	7470A	717594
500-234016-6 DU	MW-21	Total/NA	Water	7470A	717594

General Chemistry

Analysis Batch: 714421

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-234016-1	MW-15	Total/NA	Water	SM 2540C	
500-234016-2	MW-14	Total/NA	Water	SM 2540C	
500-234016-3	Duplicate	Total/NA	Water	SM 2540C	
500-234016-4	MW-13	Total/NA	Water	SM 2540C	
MB 500-714421/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 500-714421/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 714883

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-234016-5	MW-17	Total/NA	Water	SM 2540C	
500-234016-6	MW-21	Total/NA	Water	SM 2540C	
MB 500-714883/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 500-714883/2	Lab Control Sample	Total/NA	Water	SM 2540C	
500-234016-5 MS	MW-17	Total/NA	Water	SM 2540C	
500-234016-5 DU	MW-17	Total/NA	Water	SM 2540C	
500-234016-6 DU	MW-21	Total/NA	Water	SM 2540C	

Analysis Batch: 715052

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-234016-1	MW-15	Total/NA	Water	SM 4500 F C	
500-234016-2	MW-14	Total/NA	Water	SM 4500 F C	
500-234016-3	Duplicate	Total/NA	Water	SM 4500 F C	
500-234016-4	MW-13	Total/NA	Water	SM 4500 F C	
500-234016-5	MW-17	Total/NA	Water	SM 4500 F C	
MB 500-715052/3	Method Blank	Total/NA	Water	SM 4500 F C	
LCS 500-715052/4	Lab Control Sample	Total/NA	Water	SM 4500 F C	

Analysis Batch: 715327

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-234016-6	MW-21	Total/NA	Water	SM 4500 F C	
MB 500-715327/31	Method Blank	Total/NA	Water	SM 4500 F C	
LCS 500-715327/32	Lab Control Sample	Total/NA	Water	SM 4500 F C	
500-234016-6 MS	MW-21	Total/NA	Water	SM 4500 F C	
500-234016-6 MSD	MW-21	Total/NA	Water	SM 4500 F C	

QC Association Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-234016-1

General Chemistry

Analysis Batch: 715553

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-234016-1	MW-15	Total/NA	Water	SM 4500 SO4 E	
500-234016-2	MW-14	Total/NA	Water	SM 4500 SO4 E	
500-234016-3	Duplicate	Total/NA	Water	SM 4500 SO4 E	
500-234016-4	MW-13	Total/NA	Water	SM 4500 SO4 E	
500-234016-5	MW-17	Total/NA	Water	SM 4500 SO4 E	
500-234016-6	MW-21	Total/NA	Water	SM 4500 SO4 E	
MB 500-715553/16	Method Blank	Total/NA	Water	SM 4500 SO4 E	
MB 500-715553/33	Method Blank	Total/NA	Water	SM 4500 SO4 E	
LCS 500-715553/17	Lab Control Sample	Total/NA	Water	SM 4500 SO4 E	
LCS 500-715553/35	Lab Control Sample	Total/NA	Water	SM 4500 SO4 E	
500-234016-3 MS	Duplicate	Total/NA	Water	SM 4500 SO4 E	
500-234016-3 MSD	Duplicate	Total/NA	Water	SM 4500 SO4 E	
500-234016-6 MS	MW-21	Total/NA	Water	SM 4500 SO4 E	
500-234016-6 MSD	MW-21	Total/NA	Water	SM 4500 SO4 E	

Analysis Batch: 716123

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-234016-1	MW-15	Total/NA	Water	SM 4500 Cl- E	
500-234016-2	MW-14	Total/NA	Water	SM 4500 Cl- E	
500-234016-3	Duplicate	Total/NA	Water	SM 4500 Cl- E	
500-234016-4	MW-13	Total/NA	Water	SM 4500 Cl- E	
500-234016-5	MW-17	Total/NA	Water	SM 4500 Cl- E	
500-234016-6	MW-21	Total/NA	Water	SM 4500 Cl- E	
MB 500-716123/145	Method Blank	Total/NA	Water	SM 4500 Cl- E	
MB 500-716123/196	Method Blank	Total/NA	Water	SM 4500 Cl- E	
LCS 500-716123/146	Lab Control Sample	Total/NA	Water	SM 4500 Cl- E	
LCS 500-716123/197	Lab Control Sample	Total/NA	Water	SM 4500 Cl- E	
500-234016-5 MS	MW-17	Total/NA	Water	SM 4500 Cl- E	
500-234016-5 MSD	MW-17	Total/NA	Water	SM 4500 Cl- E	

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-234016-1

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 500-714956/1-A
Matrix: Water
Analysis Batch: 715273

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 714956

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030		mg/L		05/24/23 08:52	05/25/23 00:00	1
Arsenic	<0.0010		0.0010		mg/L		05/24/23 08:52	05/25/23 00:00	1
Barium	<0.0025		0.0025		mg/L		05/24/23 08:52	05/25/23 00:00	1
Cadmium	<0.00050		0.00050		mg/L		05/24/23 08:52	05/25/23 00:00	1
Calcium	<0.20		0.20		mg/L		05/24/23 08:52	05/25/23 00:00	1
Chromium	<0.0050		0.0050		mg/L		05/24/23 08:52	05/25/23 00:00	1
Cobalt	<0.0010		0.0010		mg/L		05/24/23 08:52	05/25/23 00:00	1
Lead	<0.00050		0.00050		mg/L		05/24/23 08:52	05/25/23 00:00	1
Lithium	<0.010		0.010		mg/L		05/24/23 08:52	05/25/23 00:00	1
Molybdenum	<0.0050		0.0050		mg/L		05/24/23 08:52	05/25/23 00:00	1
Selenium	<0.0025		0.0025		mg/L		05/24/23 08:52	05/25/23 00:00	1
Thallium	<0.0020		0.0020		mg/L		05/24/23 08:52	05/25/23 00:00	1

Lab Sample ID: MB 500-714956/1-A
Matrix: Water
Analysis Batch: 716022

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 714956

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	<0.0010	^1+ ^+	0.0010		mg/L		05/24/23 08:52	05/26/23 19:43	1
Boron	<0.050		0.050		mg/L		05/24/23 08:52	05/26/23 19:43	1

Lab Sample ID: LCS 500-714956/2-A
Matrix: Water
Analysis Batch: 715273

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 714956

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	0.500	0.486		mg/L		97	80 - 120
Arsenic	0.100	0.101		mg/L		101	80 - 120
Barium	2.00	1.89		mg/L		95	80 - 120
Cadmium	0.0500	0.0481		mg/L		96	80 - 120
Calcium	10.0	8.98		mg/L		90	80 - 120
Chromium	0.200	0.200		mg/L		100	80 - 120
Cobalt	0.500	0.507		mg/L		101	80 - 120
Lead	0.100	0.107		mg/L		107	80 - 120
Lithium	0.500	0.551		mg/L		110	80 - 120
Molybdenum	1.00	0.956		mg/L		96	80 - 120
Selenium	0.100	0.0943		mg/L		94	80 - 120
Thallium	0.100	0.108		mg/L		108	80 - 120

Lab Sample ID: LCS 500-714956/2-A
Matrix: Water
Analysis Batch: 716022

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 714956

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Beryllium	0.0500	0.0484	^1+ ^+	mg/L		97	80 - 120
Boron	1.00	1.04		mg/L		104	80 - 120

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-234016-1

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 500-717594/12-A
Matrix: Water
Analysis Batch: 717824

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 717594

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020		mg/L		06/08/23 15:05	06/09/23 07:36	1

Lab Sample ID: LCS 500-717594/13-A
Matrix: Water
Analysis Batch: 717824

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 717594

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.00198	0.00191		mg/L		96	80 - 120

Lab Sample ID: 500-234016-6 MS
Matrix: Water
Analysis Batch: 717824

Client Sample ID: MW-21
Prep Type: Total/NA
Prep Batch: 717594

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	<0.00020		0.00100	0.000986		mg/L		99	75 - 125

Lab Sample ID: 500-234016-6 MSD
Matrix: Water
Analysis Batch: 717824

Client Sample ID: MW-21
Prep Type: Total/NA
Prep Batch: 717594

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	<0.00020		0.00100	0.000995		mg/L		100	75 - 125	1	20

Lab Sample ID: 500-234016-6 DU
Matrix: Water
Analysis Batch: 717824

Client Sample ID: MW-21
Prep Type: Total/NA
Prep Batch: 717594

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Mercury	<0.00020		<0.00020		mg/L		NC	20

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 500-714421/1
Matrix: Water
Analysis Batch: 714421

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<10		10		mg/L			05/22/23 01:53	1

Lab Sample ID: LCS 500-714421/2
Matrix: Water
Analysis Batch: 714421

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	250	244		mg/L		98	80 - 120

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-234016-1

Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: MB 500-714883/1
Matrix: Water
Analysis Batch: 714883

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<10		10		mg/L			05/23/23 22:25	1

Lab Sample ID: LCS 500-714883/2
Matrix: Water
Analysis Batch: 714883

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Dissolved Solids			250	286		mg/L		114	80 - 120		

Lab Sample ID: 500-234016-5 MS
Matrix: Water
Analysis Batch: 714883

Client Sample ID: MW-17
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Dissolved Solids	1400		250	1630	4	mg/L		85	75 - 125		

Lab Sample ID: 500-234016-5 DU
Matrix: Water
Analysis Batch: 714883

Client Sample ID: MW-17
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	1400			1380		mg/L				2	5

Lab Sample ID: 500-234016-6 DU
Matrix: Water
Analysis Batch: 714883

Client Sample ID: MW-21
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	630			632		mg/L				0.3	5

Method: SM 4500 Cl- E - Chloride, Total

Lab Sample ID: MB 500-716123/145
Matrix: Water
Analysis Batch: 716123

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<2.0		2.0		mg/L			05/31/23 15:36	1

Lab Sample ID: MB 500-716123/196
Matrix: Water
Analysis Batch: 716123

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<2.0		2.0		mg/L			05/31/23 16:45	1

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-234016-1

Method: SM 4500 Cl- E - Chloride, Total (Continued)

Lab Sample ID: LCS 500-716123/146
Matrix: Water
Analysis Batch: 716123

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	20.0	20.0		mg/L		100	85 - 115

Lab Sample ID: LCS 500-716123/197
Matrix: Water
Analysis Batch: 716123

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	20.0	20.2		mg/L		101	85 - 115

Lab Sample ID: 500-234016-5 MS
Matrix: Water
Analysis Batch: 716123

Client Sample ID: MW-17
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	200	F1	20.0	215	4	mg/L		80	75 - 125

Lab Sample ID: 500-234016-5 MSD
Matrix: Water
Analysis Batch: 716123

Client Sample ID: MW-17
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	200	F1	20.0	217	4	mg/L		90	75 - 125	1	20

Method: SM 4500 F C - Fluoride

Lab Sample ID: MB 500-715052/3
Matrix: Water
Analysis Batch: 715052

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<0.10		0.10		mg/L			05/24/23 08:35	1

Lab Sample ID: LCS 500-715052/4
Matrix: Water
Analysis Batch: 715052

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Fluoride	10.0	10.0		mg/L		100	90 - 119

Lab Sample ID: MB 500-715327/31
Matrix: Water
Analysis Batch: 715327

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<0.10		0.10		mg/L			05/25/23 09:19	1

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-234016-1

Method: SM 4500 F C - Fluoride (Continued)

Lab Sample ID: LCS 500-715327/32
Matrix: Water
Analysis Batch: 715327

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Fluoride			10.0	10.0		mg/L		100	90 - 119		

Lab Sample ID: 500-234016-6 MS
Matrix: Water
Analysis Batch: 715327

Client Sample ID: MW-21
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Fluoride	0.15		5.00	5.37		mg/L		104	75 - 125		

Lab Sample ID: 500-234016-6 MSD
Matrix: Water
Analysis Batch: 715327

Client Sample ID: MW-21
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Fluoride	0.15		5.00	5.00		mg/L		97	75 - 125	7	20

Method: SM 4500 SO4 E - Sulfate, Total

Lab Sample ID: MB 500-715553/16
Matrix: Water
Analysis Batch: 715553

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	<5.0		5.0		mg/L			05/26/23 14:07	1

Lab Sample ID: MB 500-715553/33
Matrix: Water
Analysis Batch: 715553

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	<5.0		5.0		mg/L			05/26/23 14:15	1

Lab Sample ID: LCS 500-715553/17
Matrix: Water
Analysis Batch: 715553

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Sulfate			20.0	20.2		mg/L		101	88 - 123		

Lab Sample ID: LCS 500-715553/35
Matrix: Water
Analysis Batch: 715553

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Sulfate			20.0	20.6		mg/L		103	88 - 123		

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-234016-1

Method: SM 4500 SO4 E - Sulfate, Total (Continued)

Lab Sample ID: 500-234016-3 MS
Matrix: Water
Analysis Batch: 715553

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	590		20.0	593	4	mg/L		-1	75 - 125

Lab Sample ID: 500-234016-3 MSD
Matrix: Water
Analysis Batch: 715553

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Sulfate	590		20.0	605	4	mg/L		59	75 - 125	2	20

Lab Sample ID: 500-234016-6 MS
Matrix: Water
Analysis Batch: 715553

Client Sample ID: MW-21
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	<5.0		20.0	19.8		mg/L		99	75 - 125

Lab Sample ID: 500-234016-6 MSD
Matrix: Water
Analysis Batch: 715553

Client Sample ID: MW-21
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Sulfate	<5.0		20.0	19.9		mg/L		100	75 - 125	1	20

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone (708) 534-5200 Phone (708) 534-5211

Chain of Custody Record

Environment Testing

Client Information	Sampler: Kaelyn Sperle	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	500-234016 COC
Client Contact: ~~Mitchel Dolan~~ Kaelyn Sperle	Phone: 262-278-1621	E-Mail: Diana Mockler@et.eurofinsus com	State of Origin: IL	Page 1 of 1
Company: KPRG and Associates, Inc	PWSID:			Job #: 500-234016

Address: 414 Plaza Drive Suite 106	Due Date Requested: Standard	
City: Westmont	TAT Requested (days): Standard	
State, Zip: IL 60559	Compliance Project. Δ Yes Δ No	
Phone: 262-781-0475(Tel)	PO #: 4502125100	
Email: ~~mitchell@kprginc.com~~ kaelyns@kprginc.com	WO #:	
Project Name: Powerton CCR MCB	Project #: 50018578	
Site:	SSOW#:	

Analysis Requested

Preservation Codes.

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)

Other:

	Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2540C, 4500_F_C, SM4500_Cl_E, SM4500_SO4_E	903.0 - Radium 226	904.0 - Radium 228	Ra226Ra228_GFPC - Rad Combined	6010C, 6020A, 7470A	Total Number of containers	Special Instructions/Note:
				Preservation Code				N	D	D	D	D		
1	MW-15	5/17/23	1348	G	Water	N	N	X	X	X	X	X		
2	MW-14	5/17/23	1027	G	Water	N	N	X	X	X	X	X		
	~~MW-17~~				Water									
	~~MW-20~~				Water									
	~~MW-21~~				Water									
3	Duplicate	5/17/23	—	G	Water	N	N	X	X	X	X	X		
4	MW-13	5/17/23	1515	G	Water	N	N	X	X	X	X	X		
					Water									

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II, III, IV, Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment:

	Date/Time	Company		Date/Time	Company
Relinquished by: Kaelyn Sperle	5/17/23/1730	KPRG	Received by: FedEx	5/17/23/1730	FedEx
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 5/18/23 0940	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact. Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks. 5.3 - 5.2

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone (708) 534-5200 Phone (708) 534-5211

Chain of Custody Record

urofins | Environment Testing

500-234016 COC

2089-46460 1

of 1

Client Information

Client Contact: ~~Mitchel Dolan~~ Kaelyn Sperle	Sampler: Kaelyn Sperle
Company: KPRG and Associates, Inc	Phone: 262-278-1621
Address: 414 Plaza Drive Suite 106	PWSID:
City: Westmont	Due Date Requested: Standard
State, Zip: IL, 60559	TAT Requested (days): Standard
Phone: 262-781-0475(Tel)	Compliance Project: Δ Yes Δ No
Email: ~~mitchell@kprginc.com~~ kaelyns@kprginc.com	PO #: 4502125100
Project Name: Powerton CCR MCB	WO #:
Site:	Project #: 50018578
	SSOW#:

Lab PM: Mockler, Diana J
E-Mail: Diana.Mockler@et.eurofinsus.com
Carrier Trac
State of Orig

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify), Other

500-234016

Special Instructions/Note:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2540C, 4500_F_C, SM4500_Cl_E, SM4500_SO4_E	903.0 - Radium 226	904.0 - Radium 228	Ra226Ra228_GFPC - Rad Combined	6010C, 6020A, 7470A	Total Number of containers
			Preservation Code:		X	X	N	D	D	D	D	
~~MW-15~~				Water								
~~MW-14~~				Water								
MW-17	5/18/23	1337	G	Water	N	N	X	X	X	X	X	
~~MW-20~~				Water								
MW-21	5/18/23	0945	G	Water	N	N	X	X	X	X	X	
~~Duplicate~~				Water								
~~MW-13~~				Water								
				Water								

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements.

Empty Kit Relinquished by:		Date		Time		Method of Shipment:	
Relinquished by: Kaelyn Sperle	Date/Time: 5/18/23/1715	Company: KPRG	Received by: FedEx	Date/Time: 5/18/23/1715	Company: FedEx		
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company		
Relinquished by:	Date/Time:	Company	Received by: [signature]	Date/Time: 5/19/23 1000	Company		

Custody Seals Intact: Δ Yes Δ No | Custody Seal No

Cooler Temperature(s) °C and Other Remarks: 0.7

Ver: 01/16/2019

ORIGIN ID:PIAA (262) 278-1621

KPRG AND ASSOCIATES
414 PLAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 17MAY23
ACTWGT: 50.00 LB
CAD: 6994779/SSFE2420
DIMS: 24x18x12 IN

BILL THIRD PARTY

TO SAMPLE RECEIVING
EUROFINS
2417 BOND ST

UNIVERSITY PARK IL 60484

(000) 000-0000
INV:
PO:
REF:
DEPT:

FedEx Express

1 of 5

TRK# 0201 3984 4873 0141

MASTER

XN JOTA

THU - 18 MAY 10:30A
PRIORITY OVERNIGHT

60484
IL-US ORD

500-234016 Waybi

Do Not Lift Using This Tag

ORIGIN ID:PIAA (000) 000-0000

KPRG AND ASSOCIATES
414 PLAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 18MAY23
ACTWGT: 43.00 LB
CAD: 6994779/SSFE2420
DIMS: 24x18x12 IN

BILL THIRD PARTY

Part # 156297-435 FRPP EXP 11/23

TO **SAMPLE RECEIVING**
EUROFINS CHICAGO
2417 BOND ST

UNIVERSITY PARK IL 60484

(000) 000-0000 REF:
INV:
PO: DEPT:

RT 519
ST 20

5
10:30

A
7214
05 19

J232023040501

3 of 3

MPS# 0263 **3984 9766 7214**

Mstr# 3984 9766 7199 0201

FRI – 19 MAY 10:30A
PRIORITY OVERNIGHT

XN JOTA

60484
IL-US **ORD**

500-234016 Waybi

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-234016-1

Login Number: 234016
List Number: 1
Creator: James, Jeff A

List Source: Eurofins Chicago

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	5.2, 0.7
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-234016-1

Client Sample ID: MW-15
Date Collected: 05/17/23 13:48
Date Received: 05/18/23 09:40

Lab Sample ID: 500-234016-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			714956	BDE	EET CHI	05/24/23 08:52 - 05/24/23 09:22 [1]
Total Recoverable	Analysis	6020A		1	715273	FXG	EET CHI	05/25/23 01:28
Total Recoverable	Prep	3005A			714956	BDE	EET CHI	05/24/23 08:52 - 05/24/23 09:22 [1]
Total Recoverable	Analysis	6020A		5	716022	FXG	EET CHI	05/26/23 19:50
Total Recoverable	Prep	3005A			714956	BDE	EET CHI	05/24/23 08:52 - 05/24/23 09:22 [1]
Total Recoverable	Analysis	6020A		1	716022	FXG	EET CHI	05/26/23 20:21
Total/NA	Prep	7470A			717594	MJG	EET CHI	06/08/23 15:05 - 06/08/23 17:05 [1]
Total/NA	Analysis	7470A		1	717824	MJG	EET CHI	06/09/23 09:03
Total/NA	Analysis	SM 2540C		1	714421	CLB	EET CHI	05/22/23 02:29
Total/NA	Analysis	SM 4500 Cl- E		10	716123	MM	EET CHI	05/31/23 15:40
Total/NA	Analysis	SM 4500 F C		1	715052	EH	EET CHI	05/24/23 08:35
Total/NA	Analysis	SM 4500 SO4 E		20	715553	MM	EET CHI	05/26/23 14:27

Client Sample ID: MW-14
Date Collected: 05/17/23 10:27
Date Received: 05/18/23 09:40

Lab Sample ID: 500-234016-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			714956	BDE	EET CHI	05/24/23 08:52 - 05/24/23 09:22 [1]
Total Recoverable	Analysis	6020A		1	715273	FXG	EET CHI	05/25/23 01:32
Total Recoverable	Prep	3005A			714956	BDE	EET CHI	05/24/23 08:52 - 05/24/23 09:22 [1]
Total Recoverable	Analysis	6020A		5	716022	FXG	EET CHI	05/26/23 19:54
Total Recoverable	Prep	3005A			714956	BDE	EET CHI	05/24/23 08:52 - 05/24/23 09:22 [1]
Total Recoverable	Analysis	6020A		1	716022	FXG	EET CHI	05/26/23 20:24
Total/NA	Prep	7470A			717594	MJG	EET CHI	06/08/23 15:05 - 06/08/23 17:05 [1]
Total/NA	Analysis	7470A		1	717824	MJG	EET CHI	06/09/23 09:05
Total/NA	Analysis	SM 2540C		1	714421	CLB	EET CHI	05/22/23 02:31
Total/NA	Analysis	SM 4500 Cl- E		10	716123	MM	EET CHI	05/31/23 15:40
Total/NA	Analysis	SM 4500 F C		1	715052	EH	EET CHI	05/24/23 08:35
Total/NA	Analysis	SM 4500 SO4 E		100	715553	MM	EET CHI	05/26/23 14:28

Client Sample ID: Duplicate
Date Collected: 05/17/23 00:00
Date Received: 05/18/23 09:40

Lab Sample ID: 500-234016-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			714956	BDE	EET CHI	05/24/23 08:52 - 05/24/23 09:22 [1]
Total Recoverable	Analysis	6020A		1	715273	FXG	EET CHI	05/25/23 01:35
Total Recoverable	Prep	3005A			714956	BDE	EET CHI	05/24/23 08:52 - 05/24/23 09:22 [1]
Total Recoverable	Analysis	6020A		10	716022	FXG	EET CHI	05/26/23 19:57
Total Recoverable	Prep	3005A			714956	BDE	EET CHI	05/24/23 08:52 - 05/24/23 09:22 [1]
Total Recoverable	Analysis	6020A		1	716022	FXG	EET CHI	05/26/23 20:28
Total/NA	Prep	7470A			717594	MJG	EET CHI	06/08/23 15:05 - 06/08/23 17:05 [1]
Total/NA	Analysis	7470A		1	717824	MJG	EET CHI	06/09/23 09:08

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-234016-1

Client Sample ID: Duplicate

Lab Sample ID: 500-234016-3
Matrix: Water
Date Collected: 05/17/23 00:00
Date Received: 05/18/23 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	SM 2540C		1	714421	CLB	EET CHI	05/22/23 02:34
Total/NA	Analysis	SM 4500 Cl- E		10	716123	MM	EET CHI	05/31/23 15:41
Total/NA	Analysis	SM 4500 F C		1	715052	EH	EET CHI	05/24/23 08:35
Total/NA	Analysis	SM 4500 SO4 E		50	715553	MM	EET CHI	05/26/23 14:15

Client Sample ID: MW-13

Lab Sample ID: 500-234016-4
Matrix: Water
Date Collected: 05/17/23 15:15
Date Received: 05/18/23 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			714956	BDE	EET CHI	05/24/23 08:52 - 05/24/23 09:22 [1]
Total Recoverable	Analysis	6020A		1	715273	FXG	EET CHI	05/25/23 01:39
Total Recoverable	Prep	3005A			714956	BDE	EET CHI	05/24/23 08:52 - 05/24/23 09:22 [1]
Total Recoverable	Analysis	6020A		10	716022	FXG	EET CHI	05/26/23 20:00
Total Recoverable	Prep	3005A			714956	BDE	EET CHI	05/24/23 08:52 - 05/24/23 09:22 [1]
Total Recoverable	Analysis	6020A		1	716022	FXG	EET CHI	05/26/23 20:31
Total/NA	Prep	7470A			717594	MJG	EET CHI	06/08/23 15:05 - 06/08/23 17:05 [1]
Total/NA	Analysis	7470A		1	717824	MJG	EET CHI	06/09/23 09:10
Total/NA	Analysis	SM 2540C		1	714421	CLB	EET CHI	05/22/23 02:36
Total/NA	Analysis	SM 4500 Cl- E		10	716123	MM	EET CHI	05/31/23 15:41
Total/NA	Analysis	SM 4500 F C		1	715052	EH	EET CHI	05/24/23 08:35
Total/NA	Analysis	SM 4500 SO4 E		50	715553	MM	EET CHI	05/26/23 14:16

Client Sample ID: MW-17

Lab Sample ID: 500-234016-5
Matrix: Water
Date Collected: 05/18/23 13:37
Date Received: 05/19/23 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			714956	BDE	EET CHI	05/24/23 08:52 - 05/24/23 09:22 [1]
Total Recoverable	Analysis	6020A		1	715273	FXG	EET CHI	05/25/23 01:42
Total Recoverable	Prep	3005A			714956	BDE	EET CHI	05/24/23 08:52 - 05/24/23 09:22 [1]
Total Recoverable	Analysis	6020A		5	716022	FXG	EET CHI	05/26/23 20:04
Total Recoverable	Prep	3005A			714956	BDE	EET CHI	05/24/23 08:52 - 05/24/23 09:22 [1]
Total Recoverable	Analysis	6020A		1	716022	FXG	EET CHI	05/26/23 20:35
Total/NA	Prep	7470A			717594	MJG	EET CHI	06/08/23 15:05 - 06/08/23 17:05 [1]
Total/NA	Analysis	7470A		1	717824	MJG	EET CHI	06/09/23 09:12
Total/NA	Analysis	SM 2540C		1	714883	CLB	EET CHI	05/23/23 22:32
Total/NA	Analysis	SM 4500 Cl- E		10	716123	MM	EET CHI	05/31/23 15:42
Total/NA	Analysis	SM 4500 F C		1	715052	EH	EET CHI	05/24/23 08:35
Total/NA	Analysis	SM 4500 SO4 E		50	715553	MM	EET CHI	05/26/23 14:17

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-234016-1

Client Sample ID: MW-21

Date Collected: 05/18/23 09:45
Date Received: 05/19/23 10:00

Lab Sample ID: 500-234016-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			714956	BDE	EET CHI	05/24/23 08:52 - 05/24/23 09:22 [1]
Total Recoverable	Analysis	6020A		1	715273	FXG	EET CHI	05/25/23 01:46
Total Recoverable	Prep	3005A			714956	BDE	EET CHI	05/24/23 08:52 - 05/24/23 09:22 [1]
Total Recoverable	Analysis	6020A		1	716022	FXG	EET CHI	05/26/23 20:07
Total/NA	Prep	7470A			717594	MJG	EET CHI	06/08/23 15:05 - 06/08/23 17:05 [1]
Total/NA	Analysis	7470A		1	717824	MJG	EET CHI	06/09/23 09:14
Total/NA	Analysis	SM 2540C		1	714883	CLB	EET CHI	05/23/23 22:40
Total/NA	Analysis	SM 4500 Cl- E		1	716123	MM	EET CHI	05/31/23 16:50
Total/NA	Analysis	SM 4500 F C		1	715327	EH	EET CHI	05/25/23 09:19
Total/NA	Analysis	SM 4500 SO4 E		1	715553	MM	EET CHI	05/26/23 14:16

[1] This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Accreditation/Certification Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB

Job ID: 500-234016-1

Laboratory: Eurofins Chicago

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Illinois	NELAP	IL00035	04-29-24

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Richard Gnat
KPRG and Associates, Inc.
14665 West Lisbon Road,
Suite 1A
Brookfield, Wisconsin 53005

Generated 6/21/2023 12:04:22 PM

JOB DESCRIPTION

Powerton CCR MCB (RAD)

JOB NUMBER

500-234016-2

Eurofins Chicago
2417 Bond Street
University Park IL 60484

See page two for job notes and contact information.

my EOL

Eurofins Chicago

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Chicago Project Manager.

Authorization



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Authorized for release by
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Case Narrative

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB (RAD)

Job ID: 500-234016-2

Job ID: 500-234016-2

Laboratory: Eurofins Chicago

Narrative

Job Narrative
500-234016-2

Receipt
The samples were received on 5/18/2023 9:40 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.7º C and 5.2º C.

RAD
Methods 903.0, 9315: Radium-226 batch 613262
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
MW-15 (500-234016-1), MW-14 (500-234016-2), Duplicate (500-234016-3), MW-13 (500-234016-4), MW-17 (500-234016-5), MW-21 (500-234016-6), (LCS 160-613262/2-A), (MB 160-613262/1-A), (480-208976-C-2-A), (480-208976-C-2-B MS) and (480-208976-D-2-A MSD)

Methods 904.0, 9320: Radium-228 batch 613362
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date
MW-15 (500-234016-1), MW-14 (500-234016-2), Duplicate (500-234016-3), MW-13 (500-234016-4), MW-17 (500-234016-5), MW-21 (500-234016-6), (LCS 160-613362/2-A), (MB 160-613362/1-A), (480-208976-C-2-C), (480-208976-C-2-D MS) and (480-208976-D-2-B MSD)

Method PrecSep_0:

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Method Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB (RAD)

Job ID: 500-234016-2

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	EET SL
904.0	Radium-228 (GFPC)	EPA	EET SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	EET SL
PrecSep_0	Preparation, Precipitate Separation	None	EET SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	EET SL

Protocol References:

EPA = US Environmental Protection Agency

None = None

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB (RAD)

Job ID: 500-234016-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-234016-1	MW-15	Water	05/17/23 13:48	05/18/23 09:40
500-234016-2	MW-14	Water	05/17/23 10:27	05/18/23 09:40
500-234016-3	Duplicate	Water	05/17/23 00:00	05/18/23 09:40
500-234016-4	MW-13	Water	05/17/23 15:15	05/18/23 09:40
500-234016-5	MW-17	Water	05/18/23 13:37	05/19/23 10:00
500-234016-6	MW-21	Water	05/18/23 09:45	05/19/23 10:00

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB (RAD)

Job ID: 500-234016-2

Client Sample ID: MW-15

Date Collected: 05/17/23 13:48
Date Received: 05/18/23 09:40

Lab Sample ID: 500-234016-1

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.245	U	0.159	0.160	1.00	0.245	pCi/L	05/26/23 09:33	06/20/23 18:59	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.6*		*30 - 110*	*05/26/23 09:33*	*06/20/23 18:59*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.491	U	0.314	0.316	1.00	0.491	pCi/L	05/26/23 13:35	06/19/23 11:24	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.6*		*30 - 110*	*05/26/23 13:35*	*06/19/23 11:24*	*1*
Y Carrier	*83.0*		*30 - 110*	*05/26/23 13:35*	*06/19/23 11:24*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.547**		0.352	0.354	5.00	0.491	pCi/L		06/21/23 11:13	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB (RAD)

Job ID: 500-234016-2

Client Sample ID: MW-14

Date Collected: 05/17/23 10:27
Date Received: 05/18/23 09:40

Lab Sample ID: 500-234016-2

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.338		0.210	0.212	1.00	0.288	pCi/L	05/26/23 09:33	06/20/23 19:00	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*89.5*		*30 - 110*	*05/26/23 09:33*	*06/20/23 19:00*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.712	U	0.369	0.370	1.00	0.712	pCi/L	05/26/23 13:35	06/19/23 11:24	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*89.5*		*30 - 110*	*05/26/23 13:35*	*06/19/23 11:24*	*1*
Y Carrier	*75.9*		*30 - 110*	*05/26/23 13:35*	*06/19/23 11:24*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	<0.712	U	0.425	0.426	5.00	0.712	pCi/L		06/21/23 11:13	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB (RAD)

Job ID: 500-234016-2

Client Sample ID: Duplicate

Date Collected: 05/17/23 00:00
Date Received: 05/18/23 09:40

Lab Sample ID: 500-234016-3

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.372**		0.183	0.186	1.00	0.217	pCi/L	05/26/23 09:33	06/20/23 19:00	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*89.5*		*30 - 110*	*05/26/23 09:33*	*06/20/23 19:00*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.539	U	0.313	0.313	1.00	0.539	pCi/L	05/26/23 13:35	06/19/23 11:24	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*89.5*		*30 - 110*	*05/26/23 13:35*	*06/19/23 11:24*	*1*
Y Carrier	*80.7*		*30 - 110*	*05/26/23 13:35*	*06/19/23 11:24*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.549**		0.363	0.364	5.00	0.539	pCi/L		06/21/23 11:13	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB (RAD)

Job ID: 500-234016-2

Client Sample ID: MW-13

Date Collected: 05/17/23 15:15
Date Received: 05/18/23 09:40

Lab Sample ID: 500-234016-4

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.205	U	0.121	0.121	1.00	0.205	pCi/L	05/26/23 09:33	06/20/23 19:00	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.7*		*30 - 110*	*05/26/23 09:33*	*06/20/23 19:00*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.447	U	0.282	0.283	1.00	0.447	pCi/L	05/26/23 13:35	06/19/23 11:24	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.7*		*30 - 110*	*05/26/23 13:35*	*06/19/23 11:24*	*1*
Y Carrier	*81.5*		*30 - 110*	*05/26/23 13:35*	*06/19/23 11:24*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	<0.447	U	0.307	0.308	5.00	0.447	pCi/L		06/21/23 11:13	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB (RAD)

Job ID: 500-234016-2

Client Sample ID: MW-17

Date Collected: 05/18/23 13:37
Date Received: 05/19/23 10:00

Lab Sample ID: 500-234016-5

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.251	U	0.142	0.142	1.00	0.251	pCi/L	05/26/23 09:33	06/20/23 19:00	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.8*		*30 - 110*	*05/26/23 09:33*	*06/20/23 19:00*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.488	U	0.285	0.285	1.00	0.488	pCi/L	05/26/23 13:35	06/19/23 11:25	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.8*		*30 - 110*	*05/26/23 13:35*	*06/19/23 11:25*	*1*
Y Carrier	*83.0*		*30 - 110*	*05/26/23 13:35*	*06/19/23 11:25*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	<0.488	U	0.318	0.318	5.00	0.488	pCi/L		06/21/23 11:13	1

Client Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB (RAD)

Job ID: 500-234016-2

Client Sample ID: MW-21

Date Collected: 05/18/23 09:45
Date Received: 05/19/23 10:00

Lab Sample ID: 500-234016-6

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.571**		0.296	0.301	1.00	0.397	pCi/L	05/26/23 09:33	06/20/23 19:00	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.6*		*30 - 110*	*05/26/23 09:33*	*06/20/23 19:00*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.702	U	0.403	0.404	1.00	0.702	pCi/L	05/26/23 13:35	06/19/23 11:25	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.6*		*30 - 110*	*05/26/23 13:35*	*06/19/23 11:25*	*1*
Y Carrier	*84.5*		*30 - 110*	*05/26/23 13:35*	*06/19/23 11:25*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.761**		0.500	0.504	5.00	0.702	pCi/L		06/21/23 11:13	1

Definitions/Glossary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB (RAD)

Job ID: 500-234016-2

Qualifiers

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

QC Association Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB (RAD)

Job ID: 500-234016-2

Rad

Prep Batch: 613262

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-234016-1	MW-15	Total/NA	Water	PrecSep-21	
500-234016-2	MW-14	Total/NA	Water	PrecSep-21	
500-234016-3	Duplicate	Total/NA	Water	PrecSep-21	
500-234016-4	MW-13	Total/NA	Water	PrecSep-21	
500-234016-5	MW-17	Total/NA	Water	PrecSep-21	
500-234016-6	MW-21	Total/NA	Water	PrecSep-21	
MB 160-613262/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-613262/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 613362

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-234016-1	MW-15	Total/NA	Water	PrecSep_0	
500-234016-2	MW-14	Total/NA	Water	PrecSep_0	
500-234016-3	Duplicate	Total/NA	Water	PrecSep_0	
500-234016-4	MW-13	Total/NA	Water	PrecSep_0	
500-234016-5	MW-17	Total/NA	Water	PrecSep_0	
500-234016-6	MW-21	Total/NA	Water	PrecSep_0	
MB 160-613362/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-613362/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

QC Sample Results

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB (RAD)

Job ID: 500-234016-2

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-613262/1-A
Matrix: Water
Analysis Batch: 616862

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 613262

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.325	U	0.193	0.193	1.00	0.325	pCi/L	05/26/23 09:33	06/20/23 18:44	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*77.0*		*30 - 110*	*05/26/23 09:33*	*06/20/23 18:44*	*1*

Lab Sample ID: LCS 160-613262/2-A
Matrix: Water
Analysis Batch: 616862

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 613262

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			11.3	11.32		1.36	1.00	0.207	pCi/L	100	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*96.2*		*30 - 110*

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-613362/1-A
Matrix: Water
Analysis Batch: 616573

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 613362

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.8965		0.483	0.490	1.00	0.682	pCi/L	05/26/23 13:35	06/19/23 11:16	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*77.0*		*30 - 110*	*05/26/23 13:35*	*06/19/23 11:16*	*1*
Y Carrier	*73.6*		*30 - 110*	*05/26/23 13:35*	*06/19/23 11:16*	*1*

Lab Sample ID: LCS 160-613362/2-A
Matrix: Water
Analysis Batch: 616573

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 613362

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			8.11	8.380		1.15	1.00	0.502	pCi/L	103	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*96.2*		*30 - 110*
Y Carrier	*84.5*		*30 - 110*

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone (708) 534-5200 Phone (708) 534-5211

Chain of Custody Record

Environment Testing

Client Information	Sampler: Kaelyn Sperle	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	500-234016 COC
Client Contact: ~~Mitchel Dolan~~ Kaelyn Sperle	Phone: 262-278-1621	E-Mail: Diana Mockler@et.eurofinsus com	State of Origin: IL	Page 1 of 1
Company: KPRG and Associates, Inc	PWSID:			Job #: 500-234016

Address: 414 Plaza Drive Suite 106	Due Date Requested: Standard	
City: Westmont	TAT Requested (days): Standard	
State, Zip: IL 60559	Compliance Project. Δ Yes Δ No	
Phone: 262-781-0475(Tel)	PO #: 4502125100	
Email: ~~mitchell@kprginc.com~~ kaelyns@kprginc.com	WO #:	
Project Name: Powerton CCR MCB	Project #: 50018578	
Site:	SSOW#:	

Analysis Requested

Preservation Codes.

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Y - Trizma
	Z - other (specify)

Other:

	Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2540C, 4500_F_C, SM4500_Cl_E, SM4500_SO4_E	903.0 - Radium 226	904.0 - Radium 228	Ra226Ra228_GFPC - Rad Combined	6010C, 6020A, 7470A	Total Number of containers	Special Instructions/Note:
				Preservation Code				N	D	D	D	D		
1	MW-15	5/17/23	1348	G	Water	N	N	X	X	X	X	X		
2	MW-14	5/17/23	1027	G	Water	N	N	X	X	X	X	X		
	~~MW-17~~				Water									
	~~MW-20~~				Water									
	~~MW-21~~				Water									
3	Duplicate	5/17/23	—	G	Water	N	N	X	X	X	X	X		
4	MW-13	5/17/23	1515	G	Water	N	N	X	X	X	X	X		
					Water									

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II, III, IV, Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment:

	Date/Time	Company	Received by	Date/Time	Company
Relinquished by: Kaelyn Sperle	5/17/23/1730	KPRG	FedEx	5/17/23/1730	FedEx
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 5/18/23 0940	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact. Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks. 5.3 - 5.2

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone (708) 534-5200 Phone (708) 534-5211

Chain of Custody Record

urofins | Environment Testing

500-234016 COC

2089-46460 1

of 1

Client Information	Sampler: Kaelyn Sperle	Lab PM: Mockler, Diana J	Carrier Trac
Client Contact: ~~Mitchel Dolan~~ Kaelyn Sperle	Phone: 262-278-1621	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Orig
Company: KPRG and Associates, Inc	PWSID:		
Address: 414 Plaza Drive Suite 106	Due Date Requested: Standard		
City: Westmont	TAT Requested (days): Standard		
State, Zip: IL, 60559	Compliance Project: Δ Yes Δ No		
Phone: 262-781-0475(Tel)	PO #: 4502125100		
Email: ~~mitchell@kprginc.com~~ kaelyns@kprginc.com	WO #:		
Project Name: Powerton CCR MCB	Project #: 50018578		
Site:	SSOW#:		

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify), Other

500-234016

Special Instructions/Note:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2540C, 4500_F_C, SM4500_Cl_E, SM4500_SO4_E	903.0 - Radium 226	904.0 - Radium 228	Ra226Ra228_GFPC - Rad Combined	6010C, 6020A, 7470A	Total Number of containers
			Preservation Code:		X	X	N	D	D	D	D	
~~MW-15~~				Water								
~~MW-14~~				Water								
MW-17	5/18/23	1337	G	Water	N	N	X	X	X	X	X	
~~MW-20~~				Water								
MW-21	5/18/23	0945	G	Water	N	N	X	X	X	X	X	
~~Duplicate~~				Water								
~~MW-13~~				Water								
				Water								

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For ____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements.

Empty Kit Relinquished by:	Date	Time	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	Kaelyn Sperle	5/18/23/1715	KPRG	FedEx	5/18/23/1715	FedEx
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 5/19/23 1000	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No

Cooler Temperature(s) °C and Other Remarks: 0.7

Ver: 01/16/2019

ORIGIN ID:PIAA (262) 278-1621

KPRG AND ASSOCIATES
414 PLAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 17MAY23
ACTWGT: 50.00 LB
CAD: 6994779/SSFE2420
DIMS: 24x18x12 IN

BILL THIRD PARTY

TO SAMPLE RECEIVING
EUROFINS
2417 BOND ST

UNIVERSITY PARK IL 60484

(000) 000-0000
INV:
PO:
REF:
DEPT:

FedEx Express

1 of 5

TRK# 0201 3984 4873 0141

MASTER

XN JOTA

THU - 18 MAY 10:30A
PRIORITY OVERNIGHT

60484
IL-US ORD

500-234016 Waybi

Do Not Lift Using This Tag

ORIGIN ID:PIAA (000) 000-0000

KPRG AND ASSOCIATES
414 PLAZA DR STE 106

WESTMONT, IL 60559
UNITED STATES US

SHIP DATE: 18MAY23
ACTWGT: 43.00 LB
CAD: 6994779/SSFE2420
DIMS: 24x18x12 IN

BILL THIRD PARTY

Part # 156297-435 FRPP EXP 11/23

TO **SAMPLE RECEIVING**
EUROFINS CHICAGO
2417 BOND ST

UNIVERSITY PARK IL 60484

(000) 000-0000 REF:
INV:
PO: DEPT:

RT 519
ST 20

5
10:30

A
7214
05 19

J232023040501

3 of 3

MPS# 0263 **3984 9766 7214**

Mstr# 3984 9766 7199 0201

FRI – 19 MAY 10:30A
PRIORITY OVERNIGHT

XN JOTA

60484
IL-US **ORD**

500-234016 Waybi

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Phone: 708-534-5200 Fax: 708-534-5211

Chain of Custody Record

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Client Information (Sub Contract Lab)	Sampler:	Lab PM: Mockler, Diana J	Carrier Tracking No(s):	COC No: 500-174051.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Diana.Mockler@et.eurofinsus.com	State of Origin: Illinois	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Illinois		Job #: 500-234016-2
Address: 13715 Rider Trail North, ,	Due Date Requested: 6/22/2023			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Powerton CCR MCB (RAD)	Project #: 50018578			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_21 Standard Target List	904.0/PrecSep_0 Standard Target List	Ra226Ra228_GFPC	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X				X	
MW-15 (500-234016-1)	5/17/23	13:48 Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
MW-14 (500-234016-2)	5/17/23	10:27 Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
Duplicate (500-234016-3)	5/17/23	Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
MW-13 (500-234016-4)	5/17/23	15:15 Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
MW-17 (500-234016-5)	5/18/23	13:37 Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
MW-21 (500-234016-6)	5/18/23	09:45 Central		Water			X	X	X	3	Full QC needed (dups, etc) Batch QC must be performed (dup, spikes, etc) - no
											(16) to STL (18)

Note: Since laboratory accreditations are subject to change, Eurofins Chicago places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Chicago laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Chicago attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Chicago.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:				
Relinquished by:	Date/Time: 5/19/23 16:00	Company	Received by: fedex	Date/Time:	Company
Relinquished by: fedex	Date/Time:	Company	Received by: Briana Sharkey - Hazgate	Date/Time: 5/24/23 0805	Company ETASTL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-234016-2

Login Number: 234016
List Number: 1
Creator: James, Jeff A

List Source: Eurofins Chicago

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	5.2, 0.7
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: KPRG and Associates, Inc.

Job Number: 500-234016-2

Login Number: 234016
List Number: 2
Creator: Sharkey-Gonzalez, Briana L

List Source: Eurofins St. Louis
List Creation: 05/22/23 05:42 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB (RAD)

Job ID: 500-234016-2

Client Sample ID: MW-15
Date Collected: 05/17/23 13:48
Date Received: 05/18/23 09:40

Lab Sample ID: 500-234016-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			613262	KAC	EET SL	05/26/23 09:33
Total/NA	Analysis	903.0		1	616866	FLC	EET SL	06/20/23 18:59
Total/NA	Prep	PrecSep_0			613362	KAC	EET SL	05/26/23 13:35
Total/NA	Analysis	904.0		1	616575	FLC	EET SL	06/19/23 11:24
Total/NA	Analysis	Ra226_Ra228		1	616994	SCB	EET SL	06/21/23 11:13

Client Sample ID: MW-14
Date Collected: 05/17/23 10:27
Date Received: 05/18/23 09:40

Lab Sample ID: 500-234016-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			613262	KAC	EET SL	05/26/23 09:33
Total/NA	Analysis	903.0		1	616866	FLC	EET SL	06/20/23 19:00
Total/NA	Prep	PrecSep_0			613362	KAC	EET SL	05/26/23 13:35
Total/NA	Analysis	904.0		1	616575	FLC	EET SL	06/19/23 11:24
Total/NA	Analysis	Ra226_Ra228		1	616994	SCB	EET SL	06/21/23 11:13

Client Sample ID: Duplicate
Date Collected: 05/17/23 00:00
Date Received: 05/18/23 09:40

Lab Sample ID: 500-234016-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			613262	KAC	EET SL	05/26/23 09:33
Total/NA	Analysis	903.0		1	616866	FLC	EET SL	06/20/23 19:00
Total/NA	Prep	PrecSep_0			613362	KAC	EET SL	05/26/23 13:35
Total/NA	Analysis	904.0		1	616575	FLC	EET SL	06/19/23 11:24
Total/NA	Analysis	Ra226_Ra228		1	616994	SCB	EET SL	06/21/23 11:13

Client Sample ID: MW-13
Date Collected: 05/17/23 15:15
Date Received: 05/18/23 09:40

Lab Sample ID: 500-234016-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			613262	KAC	EET SL	05/26/23 09:33
Total/NA	Analysis	903.0		1	616866	FLC	EET SL	06/20/23 19:00
Total/NA	Prep	PrecSep_0			613362	KAC	EET SL	05/26/23 13:35
Total/NA	Analysis	904.0		1	616575	FLC	EET SL	06/19/23 11:24
Total/NA	Analysis	Ra226_Ra228		1	616994	SCB	EET SL	06/21/23 11:13

Lab Chronicle

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB (RAD)

Job ID: 500-234016-2

Client Sample ID: MW-17

Lab Sample ID: 500-234016-5

Date Collected: 05/18/23 13:37
Date Received: 05/19/23 10:00

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			613262	KAC	EET SL	05/26/23 09:33
Total/NA	Analysis	903.0		1	616866	FLC	EET SL	06/20/23 19:00
Total/NA	Prep	PrecSep_0			613362	KAC	EET SL	05/26/23 13:35
Total/NA	Analysis	904.0		1	616575	FLC	EET SL	06/19/23 11:25
Total/NA	Analysis	Ra226_Ra228		1	616994	SCB	EET SL	06/21/23 11:13

Client Sample ID: MW-21

Lab Sample ID: 500-234016-6

Date Collected: 05/18/23 09:45
Date Received: 05/19/23 10:00

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep-21			613262	KAC	EET SL	05/26/23 09:33
Total/NA	Analysis	903.0		1	616866	FLC	EET SL	06/20/23 19:00
Total/NA	Prep	PrecSep_0			613362	KAC	EET SL	05/26/23 13:35
Total/NA	Analysis	904.0		1	616575	FLC	EET SL	06/19/23 11:25
Total/NA	Analysis	Ra226_Ra228		1	616994	SCB	EET SL	06/21/23 11:13

Laboratory References:

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: KPRG and Associates, Inc.
Job ID: 500-234016-2
Project/Site: Powerton CCR MCB (RAD)

Laboratory: Eurofins St. Louis

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Illinois	NELAP	200023	11-30-23

Tracer/Carrier Summary

Client: KPRG and Associates, Inc.
Project/Site: Powerton CCR MCB (RAD)

Job ID: 500-234016-2

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water — **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)
Lab Sample ID	Client Sample ID	Ba (30-110)
500-234016-1	MW-15	94.6
500-234016-2	MW-14	89.5
500-234016-3	Duplicate	89.5
500-234016-4	MW-13	96.7
500-234016-5	MW-17	92.8
500-234016-6	MW-21	94.6
LCS 160-613262/2-A	Lab Control Sample	96.2
MB 160-613262/1-A	Method Blank	77.0

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water — **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (30-110)	Y (30-110)
500-234016-1	MW-15	94.6	83.0
500-234016-2	MW-14	89.5	75.9
500-234016-3	Duplicate	89.5	80.7
500-234016-4	MW-13	96.7	81.5
500-234016-5	MW-17	92.8	83.0
500-234016-6	MW-21	94.6	84.5
LCS 160-613362/2-A	Lab Control Sample	96.2	84.5
MB 160-613362/1-A	Method Blank	77.0	73.6

Tracer/Carrier Legend

Ba = Ba Carrier
Y = Y Carrier

PROJECT NAME	NRG – POWERTON STATION – 12313.1		DATE	5/17/23
Sample Name	MW-13	Start Time	1458	
Condition of Well	good			
Water Level	30.45	Total Depth	-	
Well Diameter	PVC – 2 inch	Volume in Well	-	
Method of Purge	Low flow bladder	Purge Characteristics	sl. cloudy black, visible black specks	
Volume Removed	4 qts	W L at Sample Time	30.95	
Method of Sample	Low flow bladder	Sample Characteristics	clear, gray tint	
Sample Analysis	CCA, CCR (MCB)	Sample Time	1515	
Water Quality Meter	YSI Pro Dss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1500	30.45	7.85	15.6	1.689	8.85	-22.7	16.66
1503	-	7.87	15.6	1.796	5.09	-158.2	16.35
1506	-	7.90	15.5	1.791	3.06	-194.8	11.70
1509	-	7.89	15.6	1.776	2.27	-203.7	10.71
1512	30.95	7.88	15.5	1.770	2.20	-206.7	10.09

SAMPLING NOTES:

MCB Duplicate

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION – 12313.1		DATE	5/17/23
Sample Name	MW-14	Start Time	1002	
Condition of Well	good			
Water Level	24.41	Total Depth	–	
Well Diameter	PVC – 2 inch	Volume in Well	–	
Method of Purge	Low flow bladder	Purge Characteristics	clear	
Volume Removed	5.5 gals	W L at Sample Time	25.51	
Method of Sample	Low flow bladder	Sample Characteristics	clear	
Sample Analysis	CCA, CCR (MCB)	Sample Time	1027	
Water Quality Meter	YSI Pro Dss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1006	24.41	7.04	14.7	2.570	6.39	41.1	21.59
1009	–	7.01	14.7	2.619	4.25	37.0	11.94
1017	–	7.01	14.4	2.668	2.63	30.9	9.25
1020	–	7.01	14.6	2.630	2.54	30.7	7.99
1023	25.51	7.02	14.8	2.633	2.27	30.2	7.08

SAMPLING NOTES:
- paused water quality readings to take phone call; resumed w/ no change in set up

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION – 12313.1		DATE	5/17/23
Sample Name	MW-15	Start Time	1333	
Condition of Well	good			
Water Level	24.67	Total Depth	~	
Well Diameter	PVC – 2 inch	Volume in Well	—	
Method of Purge	Low flow bladder	Purge Characteristics	cloudy, brown	
Volume Removed	6 gals	W L at Sample Time	24.71	
Method of Sample	Low flow bladder	Sample Characteristics	clear	
Sample Analysis	CCA, CCR(MCB, ABBASB)	Sample Time	1348	
Water Quality Meter	YSI Pro Dss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1335	24.67	7.04	16.3	1.659	8.20	18.9	10.08
1338	—	6.84	16.0	2.694	5.18	38.1	397.15
1341	—	6.83	15.9	2.693	3.61	29.4	2.692
1344	—	6.83	16.3	2.646	2.88	-1.0	39.90
1347	—	6.84	15.7	2.651	2.40	-20.8	20.76
1350	24.71	6.84	15.9	2.640	1.99	-33.7	13.90

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION – 12313.1		DATE	5/18/23
Sample Name	MW-17	Start Time	1320	
Condition of Well	good			
Water Level	19.62	Total Depth	—	
Well Diameter	PVC – 2 inch	Volume in Well	—	
Method of Purge	Low flow bladder	Purge Characteristics	cloudy, brown	
Volume Removed	5 gals	W L at Sample Time	20.88	
Method of Sample	Low flow bladder	Sample Characteristics	clear	
Sample Analysis	CCR (MCB, ABBA53)	Sample Time	1337	
Water Quality Meter	YSI Pro Dss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1321	19.62	7.58	15.6	1.750	7.92	-87.3	106.60
1324	—	7.39	15.7	1.596	3.78	-53.2	135.88
1327	—	7.37	15.6	1.592	2.53	-41.6	30.70
1330	-	7.36	15.9	1.592	2.04	-36.3	13.18
1333	20.88	7.34	15.6	1.610	1.74	-31.8	9.92

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION – 12313.1		DATE	6/26/23
Sample Name	MW-20	Start Time	1420	
Condition of Well	good			
Water Level	31.24	Total Depth	—	
Well Diameter	PVC – 2 inch	Volume in Well	—	
Method of Purge	Low flow bladder	Purge Characteristics	sl. cloudy	
Volume Removed	0.5 gals	W L at Sample Time	31.24	
Method of Sample	Low flow bladder	Sample Characteristics	sl. cloudy	
Sample Analysis	CCR(MCB)	Sample Time	1444	
Water Quality Meter	YSI Pro Dss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
1428	31.24	6.86	21.2	2.477	5.33	-117.9	81.10
1431	—	6.84	21.4	2.443	4.22	-113.7	74.03
1434	—	6.83	21.3	2.387	3.45	-109.6	69.33
1437	—	6.80	21.9	2.370	2.94	-108.2	65.04
1440	31.24	6.79	21.7	2.300	2.60	-108.8	48.01

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates KLS

PROJECT NAME	NRG – POWERTON STATION – 12313.1		DATE	5/18/23
Sample Name	MW-21	Start Time	0925	
Condition of Well	good			
Water Level	29.15	Total Depth	–	
Well Diameter	PVC – 2 inch	Volume in Well	–	
Method of Purge	Low flow bladder	Purge Characteristics	clear	
Volume Removed	1.5 qts	W L at Sample Time	29.86	
Method of Sample	Low flow bladder	Sample Characteristics	clear	
Sample Analysis	CCR (MCB)	Sample Time	0945	
Water Quality Meter	YSI Pro Dss			

Time	Depth to Water (ft)	ph (SU)	Temp (°C)	Spec. Cond (mS/cm).	DO (mg/L)	ORP (mV)	Turbidity (NTU)
0929	29.15	6.75	15.9	1.081	6.71	-111.7	17.36
0932	–	6.77	15.9	1.039	4.67	-144.6	13.21
0935	–	6.77	15.9	1.024	3.51	-155.7	8.15
0938	–	6.78	15.8	1.020	2.90	-161.9	8.97
0941	29.86	6.78	15.7	1.023	2.45	-164.1	7.50

SAMPLING NOTES:

Sampler Name and Company: KPRG and Associates KLS

error, please notify the sender immediately by return e-mail and destroy this communication and all copies thereof, including all attachments. Receipt by an unintended recipient does not waive attorney-client privilege, attorney work product privilege, or any other exemption from disclosure.

DOCUMENT 17

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 · (217) 782-3397
JB PRITZKER, GOVERNOR JOHN J. KIM, DIRECTOR

217/782-0610

February 22, 2024

Dale Green
Midwest Generation, LLC
804 Carnegie Center
Princeton, NJ

Re: Powerton Generating Station
Log No. 2021-100029
Bureau ID # W1798010008
Construction Permit to Retrofit Bypass Basin
Review Letter

Mr. Green:

Illinois EPA received your Application for a Construction Permit to retrofit Powerton's Bypass Basin and the supporting documents concerning the above project on July 22, 2022. The application and supporting information, as submitted, are undergoing review by the Illinois EPA, and based upon that review, the following items are offered for your consideration and appropriate action:

General Comments:

- Retrofit construction permit application must include a groundwater monitoring program pursuant to all applicable subsections of 35 Ill. Admin. Code 845.630, 845.640, 845.650.

- MWG must provide the preliminary written closure plan and the initial post-closure care plan as part of the construction permit application for the retrofit of the By-pass Basin. The construction permit application for the retrofit of the By-pass Basin does not constitute approval of either the final written closure plan or the final written post-closure care plan.

- As a condition of leaving the existing synthetic liner in place under Section 845.770(a), the retrofit construction plan must include cover to prevent plume migration from the retrofit embankments that are filled with CCR and the embankments of the original By-pass Basin to the extent they remain in place during operation of the retrofit Bypass Basin. PS-GT-8, drilled and logged in 2005 in the Bypass Basin embankments, according to the Geotechnical Summary Letter dated 2005 contains bottom ash and slag. The CCR in the embankments of the retrofit By-pass Basin must include a final cover system that isolates the embankment materials that include CCR from stormwater infiltration.

- The Safety Plan, Emergency Action Plan and Fugitive Dust Control Plan must be updated for construction activities for the Construction Permit application in accordance with 35 IAC 845.530(c)(2), 845.500(b), and 845.520(b).

- Section 1.5: Because this is a construction permit application and the embankments of the Bypass Basin are confirmed to have been constructed of CCR at least in part (KPRG, 2005), the stormwater runoff from the construction must be addressed as a part of the permit application.

- Section 1.5: This section does not adequately address what happens when flooding breaches the elevation of the embankments and does not provide an elevation of the embankment for the Agency's review.

- Section 1.6 and Attachments to Permit Application: The History of Construction prepared by Geosyntec in 2016 must be provided in the Construction Permit Application for review of congruency by the Agency.

- Section 1.6.1: The KPRG report dated October 13, 2005 exhibits that CCR comprises the majority of the fill materials for the embankments. The nature of the origin of the fill material is required to be discussed, due to the requirement of removal of contaminated subsoils pursuant to 35 Ill. Admin. Code 845.770(a). A closure construction permit application with a closure alternatives analysis will be required to complete closure at the end of the active life of the retrofit By-pass Basin.

- Sections 1.7 and 1.7.1: Sections describing the engineering properties of the embankment fill do not provide known descriptions of the embankment fill which includes slag and bottom ash to a depth of at least 15 feet. (KPRG, 2005).

- Section1.7.1: Construction methods must take into consideration that CCR was used to construct the embankments of the Bypass Basin (KPRG, 2005).

- Section 2.0 and 8.2: Retrofitting of the CCRSI under Section 845.770 is not the same process or part of the process as closure by removal under Section 845.740. Corrective action is also a different process and may be required in conjunction with either Section 845.740 or Section 845.770.

- Section 2.1, Table 2.1-1 and Section 2.2: The CCR characterization does not have adequate explanation of how one or two samples for the entirety of the Bypass Basin CCR is sufficient to comply with Chapter 9 of the SW846 Compendium incorporated by reference under Section 845.150.

- Section 2.5: The onsite transportation plan should comply with 35 Ill. Admin. Code 845.740(c)(1)(B)(ii), (iii) noise and entry to Manito Road, (iv) dust suppression measures reference, (v), (vi), and (vii).

- Section 5.2: Any structural fill removed from the embankments that is CCR or mixed CCR must be characterized and appropriately disposed . Structural fill placed between the existing synthetic liner and the composite liner must not contain CCR.

- Section 7.1.1: The bottom of the Ash Surge Basin seems to extend to at least elevation 452-feet amsl and the Bypass Basin bottom seems to be above elevation 460 feet. However, the basis for this depiction is not provided in the documents that MWG has submitted for the permit application. The bottom of the Ash Surge Basin and the Bypass Basin must be provided. The bottom of the Former Ash Basin intersects the groundwater table and it has surface water standing in it most of the time. The clay seam at Powerton is not continuous and does not provide a confining unit between the sand fill and the sand and gravel underlying the sand fill and/or clay seam. The potentiometric surface and surface water levels in the Illinois River have risen to 452-feet amsl multiple times in the last 10 years at Powerton Station. The potentiometric surface maps must be updated and be consistent between flow maps. Additionally, according to the FEMA Flood Insurance maps, the flood zone that encompasses the Former Ash Basin is elevation 456.9-feet amsl. Currently flow maps are segregated and inconsistent with each other between the figures presented depending on basin.
- Section 7.1.2: The US Fish and Wildlife Service Wetlands Mapper shows Freshwater Forested/Shrub Wetlands and Freshwater Emergent Wetlands in an around the CCRSIs at the Powerton Generating Station. This section of the Permit Application must be updated to appropriately address the wetlands that exist here.
- Section 7.1.2: The Former Ash Basin lies within a US Fish and Wildlife Service mapped wetland. However, there are no supporting documents to ensure that 35 Ill.. Adm. Code 845. 230(d)(2)(D)(ii) is adhered to.
-

- Section 7.0: The Bypass Basin bottom is not provided in a manner that is verifiable. The bottom of the Bypass Basin must be demonstrated to be at the depth that is depicted on cross sections. The potentiometric surface and surface water levels in the Illinois River have risen to 452-feet amsl multiple times in the last 10 years at Powerton Station. MWG must adequately demonstrate that the bottom of the Bypass Basin complies with Section 845.300. If the Bypass Basin cannot meet the requirements of Section 845.300 it cannot be retrofit under Section 845.770.

- Section 8: Under Section 845.230(d)(2) (j) and (k) the preliminary written closure plan and the initial written post-closure care plan, respectively, must be submitted as part of the retrofit construction permit application. Closure under 845 Subpart G is subject to a separate construction permit application and is not approved under a retrofit construction permit application.
-

- Section 8.3: Retrofitting of a CCRSI pursuant to 35 Ill. Admin. Code 845.770 does not equate to closure by removal in accordance with 35 Ill. Admin. Code 845.740 .

- Section 9.1, 9.2 and 9.3 and Attachment 9-2: MWG must monitor the hydrostratigraphic units and evaluate the multiunit groundwater monitoring system to determine impacts of flooding from the Illinois River. The Agency reviews the boring logs and well construction in Attachment 9-2 and determined the following wells are associated with the following units:

    - Fill: MW-8 (cross gradient), MW-18 (cross gradient) and possibly MW-19 (upgradient, may have overlying CCR above screen, so not acceptable as an upgradient/background well).

    - Clay/silty clay unit: MW-6 (downgradient), MW-10 (cross gradient), MW-12 (cross gradient), MW-14 (cross gradient), MW-15 (cross gradient), and MW-17 (cross gradient)

    - Sand and gravel unit: MW-01 (cross gradient), MW-2 (downgradient), MW-3 (downgradient), MW-4 (downgradient), MW-5 (downgradient), MW-7 (cross gradient), MW-9 (upgradient, but has surficial CCR proximate to the well), MW-10 (cross gradient), MW-13 (cross gradient), and MW-16 (upgradient)

- Given the aforementioned wells and associated lithologic units, MWG must install and monitor additional wells as follows:

    - Fill unit: Upgradient well. Must be installed upgradient of all CCR operations present and past (see comment on background/upgradient wells below). Two downgradient wells must be installed downgradient of the FAB to gauge groundwater fluctuations due to temporal and seasonal changes including Illinois River elevation surges.

    - Clay/silty clay unit: Upgradient well. Must be installed upgradient of all CCR operations present and past (see comment on background/upgradient wells below).

    - Sand and gravel unit: Upgradient well. Must be installed upgradient of all CCR operations present and past (see comment on background/upgradient wells below).

    - Vertical gradient and extent of contamination investigation: At least one location of vertical gradient nested wells must be installed to determine the vertical extent of the groundwater contamination. The vertical gradient wells must be installed north of the Ash Surge Basin. Drilling of initial borehole must include soil classification to a depth of 100-feet pursuant to 35 Ill. Admin. Code 845.620(b)(13).

    - Well installation must be conducted pursuant to 77 Ill. Admin. Code 920.170. isolation casing must be installed where appropriate to prevent cross contamination during drilling and well installation.

- The upgradient or background monitoring wells chosen for each CCRSI must comply with Section 845.630(a). The upgradient or background monitoring wells must be as close to the upgradient side of the CCRSI that the background well is meant to monitor with the following conditions:
    - Must not be in CCR.
    - Must be as close to the CCRSI and as far away from similar source material to adequately characterize the Section 845.600(a) constituents that are already present prior to entering the CCRSI groundwater.
    - If the background monitoring well is not hydraulically connected, the geochemical conditions must be similar to those onsite to ensure similar monitoring conditions.

- Section 9.1.1: Because MWG is proposing design and construction of retrofit, it would be better suited to discuss the geology of the soils as it pertains to geotechnical engineering applications. In other words, instead of citing USDA sources, MWG must discuss where the glacial till, if any, begins. Glacial till has specific foundational and load bearing capacities that lend to apply to the design. This section is conflicting in that the source for soils is the USDA from 1996. However, according to the Handbook of Illinois Stratigraphy (1975) and the second paragraph there are clays/silty clays/silts that are organic, which is consistent with alluvial silts and clays. Due to the proximity to the Illinois River, the geologic maps of the Handbook of Illinois Stratigraphy showing alluvium along the area that encompasses Powerton correlate with the borings that have been collected at Powerton. Additionally, the known geomorphologic processes that occur around the Illinois River will cause more alluvial processes over time thus confirming that alluvium deposits and erosion will occur in the future. MWG must provide discussion of these facts in relation to the Bypass Basin.

- Section 9.1.2 and Table 9-2: The Agency is unable to review hydraulic conductivities provided by MWG. MWG must provide the data inputs and software outputs/calculations for the values presented in Section 9.1.2 and Table 9-2.

- Section 9.1.2: MWG states that there is an ELUC for the Ash Basin, Bypass Basin and Former Ash Basin provided on Figure 9-19. An ELUC cannot be issued by Bureau of Water and any environmental covenant is only one factor to be considered under Section 845.660. An ELUC does not alter the requirements of Part 845.

- Section 9.2: See previous comments on downgradient and upgradient well designations and the groundwater monitoring system.

- Section 9.3.2: Field parameters must include dissolved oxygen and oxidation reduction potential. Please update to be consistent with the Groundwater Monitoring Plan Addendum and Agency review Attachment comments.

- Section 9.3.7: Field and laboratory QA/QC must differentiate between QA measures and QC measures. QA measures refer to using a separate laboratory to ensure that the laboratory results are accurate. QC measures are internal measures such as duplicates, equipment blanks, field blanks, etc. MWG must specify the number or percentage of each type of QC samples that will be collected during each sample event. MWG must also specify the number or percentage of QA samples that will be collected and analyzed during each event.

- Attachment 2-3: , Any removal action of CCR from any CCRSI must be addressed in the Fugitive Dust Control Plan, Emergency Action Plan, and Safety Plan pursuant to 35 Ill. Admin. Code 845.500(b), 845.520 and 845.530. See Comment for Section 2.5 regarding a site transportation plan. Specifics of how a release of CCR will be averted, controlled and managed are required under the Emergency Action Plan and Safety Plan. Specifics included in one or more of these documents must comprise of the following:

    - Dust control measures applied to equipment moving CCR anywhere within the facility property boundaries (i.e. covers for trucks moving materials, staging areas for placing covers over the truck, methods and equipment to be used to cover trucks, etc.)

    - Dust control measures including how often and when spraying will occur every day. (i.e. when

    - Dust control measures including when and what materials will be used to cover temporary storage piles.

    - Dust monitoring, analyses, turn-around times for actions taken in response to air born dust.

    - Emergency action planning must include truck roll overs, excavator roll overs, extreme weather events, flooding of the flood plain including the Bypass Basin during construction activities.

    - The current EAP, included in the initial operating permit application, does not identify any potential safety emergencies that could occur during operations of the CCRSI and construction of the retrofit. Potential emergencies identified in the EAP Section 1.0 are passive incidents and do not include movement of CCR during operations or after conclusion of operations.

    - The current EAP, Section 2.2, does not identify facility specific corrective actions to be taken in an emergency. The corrective action required at the time of the discovery of any physical spill of CCR solids outside of the CCRSI must be collection, containment and disposal consistent with Part 845. Corrective action for spills involving fluids from the operation of vehicles or equipment inside the CCRSI and outside the CCRSI must also be addressed specifically pursuant to 29 Ill. Admin. Code 430.

- Safety plans for construction projects must be updated for construction activities for the Construction Permit application in accordance with 35 IAC 845.530(c)(2), 845.500(b), and 845.520(b). Hazards must be identified. Identification of hazard mitigation is required. The safety plan must include engineering controls, institutional controls and PPE for the work to be completed.

- Safety plans must include a summary of constituents in the CCR that are hazardous to human health, acute and chronic symptoms of exposure, action levels, institutional controls, engineering controls and other safety measures that are currently in place and when other measures are to be implemented.

- Please note that silica is an air born carcinogen and must be characterized for the purpose of an SDS or in the safety plan/emergency action plan and is not reported in Attachment 2-1 or anywhere else within the retrofit permit application submittal.

- whiConstruction permits must have separate emergency action plans and safety plans to adequately meet safety regulations and training requirements for construction activities. For the purpose of permitting the activity, MWG must provide details required by 35 Ill. Admin. Code 845.500, 845.520 and 845.530 which require adherence to 29 CFR 1926.

- Attachment 5-1: CQA reports for the construction must include all applicable items listed in 35 IAC 845.290. MWG must specify, in the text of the Permit Application, the methods, materials and operations that are being implemented to meet the design specifications. MWG must provide the specific QA and QC methods, including ASTM methods, will be utilized for the construction quality assurance program during the retrofit construction. During construction, MWG must document and provide weekly CQA reports in accordance with 35 IAC 845.290.

- Attachment 8-2: Please see third General Comment.

- Attachment 8-2, Section 3.0: All CCR surface impoundments closing by removal are subject to 35 Ill. Admin. Code 845.740. This construction permit application is for the retrofit of the Bypass Basin under Section 845.770. The construction permit application for retrofitting a CCR surface impoundment requires the inclusion of the preliminary written closure plan, but approval of a retrofit construction permit does not approve closure as presented in the preliminary written closure plan.

- Attachment 8-2, Section 3.0: The Preliminary Closure Plan must include an outline of means and methods to demonstrate that contaminated subsoils have been removed.

- Attachment 8-2, Section 3.0: MWG must change the requirements for transportation of the CCR to comply with 35 Ill. Admin. Code 845.740(c) instead of 35 Ill. Admin. Code 809.201. The Transportation Plan must be submitted with the Retrofit construction permit application. Also see Comment Attachment 2-3.

- Attachment 8-2, Section 4.0: Estimate of maximum inventory of CCR must include CCR underlying the liner. MWG may either use the existing borings with CCR described in the boring logs from the KPRG Geotechnical Summary Letter dated October 13, 2005 or collect analytical data to determine the estimated bottom of CCR contaminated soils at the Bypass Basin.

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- General Comment, Attachment 9-1, 9-2, 9-3, 9-4, 9-5 and 9-0: field monitoring parameters and field procedures must be conducted in accordance with EQASOP-GW4, Low Stress Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells and all inorganic constituents collected must be collected as total recoverable metals pursuant to 35 Ill. Admin. Code 845.640(i).

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Should you have any questions or comments regarding the above, please contact Mark E. Liska at 217/524-3262 or at the above address.

As Illinois EPA completes our technical review of the construction retrofit permit application, we will communicate any further concerns that we identify with you.

Sincerely,

Darin E. LeCrone, P.E.
Manager, Permit Section
Division of Water Pollution Control

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cc: Hydrogeologic Compliance Unit/Groundwater Section
Peoria Region
Records Unit

DOCUMENT

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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 · (217) 782-3397
JB PRITZKER, GOVERNOR JOHN J. KIM, DIRECTOR

217/782-0610

February 22, 2024

Dale Green
Midwest Generation, LLC
804 Carnegie Center
Princeton, NJ 08540

Re: Powerton Generating Station
Log No. 2021-100029
Bureau ID # W1798010008
Construction Permit to Retrofit Bypass Basin
Review Letter

Mr. Green:

Illinois EPA received your Application for a Construction Permit to retrofit Powerton's Bypass Basin and the supporting documents concerning the above project on July 22, 2022. The application and supporting information, as submitted, are undergoing review by the Illinois EPA, and based upon that review, the following items are offered for your consideration and appropriate action:

General Comments:

- Retrofit construction permit application must include a groundwater monitoring program pursuant to all applicable subsections of 35 Ill. Admin. Code 845.630, 845.640, 845.650.

- MWG must provide the preliminary written closure plan and the initial post-closure care plan as part of the construction permit application for the retrofit of the By-pass Basin. The construction permit application for the retrofit of the By-pass Basin does not constitute approval of either the final written closure plan or the final written post-closure care plan.

- As a condition of leaving the existing synthetic liner in place under Section 845.770(a), the retrofit construction plan must include cover to prevent plume migration from the retrofit embankments that are filled with CCR and the embankments of the original By-pass Basin to the extent they remain in place during operation of the retrofit Bypass Basin. PS-GT-8, drilled and logged in 2005 in the Bypass Basin embankments, according to the Geotechnical Summary Letter dated 2005 contains bottom ash and slag. The CCR in the embankments of the retrofit By-pass Basin must include a final cover system that isolates the embankment materials that include CCR from stormwater infiltration.

- The Safety Plan, Emergency Action Plan and Fugitive Dust Control Plan must be updated for construction activities for the Construction Permit application in accordance with 35 IAC 845.530(c)(2), 845.500(b), and 845.520(b).

- Section 1.5: Because this is a construction permit application and the embankments of the Bypass Basin are confirmed to have been constructed of CCR at least in part (KPRG, 2005), the stormwater runoff from the construction must be addressed as a part of the permit application.

- Section 1.5: This section does not adequately address what happens when flooding breaches the elevation of the embankments and does not provide an elevation of the embankment for the Agency's review.

- Section 1.6 and Attachments to Permit Application: The History of Construction prepared by Geosyntec in 2016 must be provided in the Construction Permit Application for review of congruency by the Agency.

- Section 1.6.1: The KPRG report dated October 13, 2005 exhibits that CCR comprises the majority of the fill materials for the embankments. The nature of the origin of the fill material is required to be discussed, due to the requirement of removal of contaminated subsoils pursuant to 35 Ill. Admin. Code 845.770(a). A closure construction permit application with a closure alternatives analysis will be required to complete closure at the end of the active life of the retrofit By-pass Basin.

- Sections 1.7 and 1.7.1: Sections describing the engineering properties of the embankment fill do not provide known descriptions of the embankment fill which includes slag and bottom ash to a depth of at least 15 feet. (KPRG, 2005).

- Section1.7.1: Construction methods must take into consideration that CCR was used to construct the embankments of the Bypass Basin (KPRG, 2005).

- Section 2.0 and 8.2: Retrofitting of the CCRSI under Section 845.770 is not the same process or part of the process as closure by removal under Section 845.740. Corrective action is also a different process and may be required in conjunction with either Section 845.740 or Section 845.770.

- Section 2.1, Table 2.1-1 and Section 2.2: The CCR characterization does not have adequate explanation of how one or two samples for the entirety of the Bypass Basin CCR is sufficient to comply with Chapter 9 of the SW846 Compendium incorporated by reference under Section 845.150.

- Section 2.5: The onsite transportation plan should comply with 35 Ill. Admin. Code 845.740(c)(1)(B)(ii), (iii) noise and entry to Manito Road, (iv) dust suppression measures reference, (v), (vi), and (vii).

- Section 5.2: Any structural fill removed from the embankments that is CCR or mixed CCR must be characterized and appropriately disposed . Structural fill placed between the existing synthetic liner and the composite liner must not contain CCR.

- Section 7.1.1: The bottom of the Ash Surge Basin seems to extend to at least elevation 452-feet amsl and the Bypass Basin bottom seems to be above elevation 460 feet. However, the basis for this depiction is not provided in the documents that MWG has submitted for the permit application. The bottom of the Ash Surge Basin and the Bypass Basin must be provided. The bottom of the Former Ash Basin intersects the groundwater table and it has surface water standing in it most of the time. The clay seam at Powerton is not continuous and does not provide a confining unit between the sand fill and the sand and gravel underlying the sand fill and/or clay seam. The potentiometric surface and surface water levels in the Illinois River have risen to 452-feet amsl multiple times in the last 10 years at Powerton Station. The potentiometric surface maps must be updated and be consistent between flow maps. Additionally, according to the FEMA Flood Insurance maps, the flood zone that encompasses the Former Ash Basin is elevation 456.9-feet amsl. Currently flow maps are segregated and inconsistent with each other between the figures presented depending on basin.
- Section 7.1.2: The US Fish and Wildlife Service Wetlands Mapper shows Freshwater Forested/Shrub Wetlands and Freshwater Emergent Wetlands in an around the CCRSIs at the Powerton Generating Station. This section of the Permit Application must be updated to appropriately address the wetlands that exist here.
- Section 7.1.2: The Former Ash Basin lies within a US Fish and Wildlife Service mapped wetland. However, there are no supporting documents to ensure that 35 Ill.. Adm. Code 845. 230(d)(2)(D)(ii) is adhered to.
-

- Section 7.0: The Bypass Basin bottom is not provided in a manner that is verifiable. The bottom of the Bypass Basin must be demonstrated to be at the depth that is depicted on cross sections. The potentiometric surface and surface water levels in the Illinois River have risen to 452-feet amsl multiple times in the last 10 years at Powerton Station. MWG must adequately demonstrate that the bottom of the Bypass Basin complies with Section 845.300. If the Bypass Basin cannot meet the requirements of Section 845.300 it cannot be retrofit under Section 845.770.

- Section 8: Under Section 845.230(d)(2) (j) and (k) the preliminary written closure plan and the initial written post-closure care plan, respectively, must be submitted as part of the retrofit construction permit application. Closure under 845 Subpart G is subject to a separate construction permit application and is not approved under a retrofit construction permit application.
-

- Section 8.3: Retrofitting of a CCRSI pursuant to 35 Ill. Admin. Code 845.770 does not equate to closure by removal in accordance with 35 Ill. Admin. Code 845.740 .

- Section 9.1, 9.2 and 9.3 and Attachment 9-2: MWG must monitor the hydrostratigraphic units and evaluate the multiunit groundwater monitoring system to determine impacts of flooding from the Illinois River. The Agency reviews the boring logs and well construction in Attachment 9-2 and determined the following wells are associated with the following units:

    - Fill: MW-8 (cross gradient), MW-18 (cross gradient) and possibly MW-19 (upgradient, may have overlying CCR above screen, so not acceptable as an upgradient/background well).

    - Clay/silty clay unit: MW-6 (downgradient), MW-10 (cross gradient), MW-12 (cross gradient), MW-14 (cross gradient), MW-15 (cross gradient), and MW-17 (cross gradient)

    - Sand and gravel unit: MW-01 (cross gradient), MW-2 (downgradient), MW-3 (downgradient), MW-4 (downgradient), MW-5 (downgradient), MW-7 (cross gradient), MW-9 (upgradient, but has surficial CCR proximate to the well), MW-10 (cross gradient), MW-13 (cross gradient), and MW-16 (upgradient)

- Given the aforementioned wells and associated lithologic units, MWG must install and monitor additional wells as follows:

    - Fill unit: Upgradient well. Must be installed upgradient of all CCR operations present and past (see comment on background/upgradient wells below). Two downgradient wells must be installed downgradient of the FAB to gauge groundwater fluctuations due to temporal and seasonal changes including Illinois River elevation surges.

    - Clay/silty clay unit: Upgradient well. Must be installed upgradient of all CCR operations present and past (see comment on background/upgradient wells below).

    - Sand and gravel unit: Upgradient well. Must be installed upgradient of all CCR operations present and past (see comment on background/upgradient wells below).

    - Vertical gradient and extent of contamination investigation: At least one location of vertical gradient nested wells must be installed to determine the vertical extent of the groundwater contamination. The vertical gradient wells must be installed north of the Ash Surge Basin. Drilling of initial borehole must include soil classification to a depth of 100-feet pursuant to 35 Ill. Admin. Code 845.620(b)(13).

    - Well installation must be conducted pursuant to 77 Ill. Admin. Code 920.170. isolation casing must be installed where appropriate to prevent cross contamination during drilling and well installation.

- The upgradient or background monitoring wells chosen for each CCRSI must comply with Section 845.630(a). The upgradient or background monitoring wells must be as close to the upgradient side of the CCRSI that the background well is meant to monitor with the following conditions:
    - Must not be in CCR.
    - Must be as close to the CCRSI and as far away from similar source material to adequately characterize the Section 845.600(a) constituents that are already present prior to entering the CCRSI groundwater.
    - If the background monitoring well is not hydraulically connected, the geochemical conditions must be similar to those onsite to ensure similar monitoring conditions.

- Section 9.1.1: Because MWG is proposing design and construction of retrofit, it would be better suited to discuss the geology of the soils as it pertains to geotechnical engineering applications. In other words, instead of citing USDA sources, MWG must discuss where the glacial till, if any, begins. Glacial till has specific foundational and load bearing capacities that lend to apply to the design. This section is conflicting in that the source for soils is the USDA from 1996. However, according to the Handbook of Illinois Stratigraphy (1975) and the second paragraph there are clays/silty clays/silts that are organic, which is consistent with alluvial silts and clays. Due to the proximity to the Illinois River, the geologic maps of the Handbook of Illinois Stratigraphy showing alluvium along the area that encompasses Powerton correlate with the borings that have been collected at Powerton. Additionally, the known geomorphologic processes that occur around the Illinois River will cause more alluvial processes over time thus confirming that alluvium deposits and erosion will occur in the future. MWG must provide discussion of these facts in relation to the Bypass Basin.

- Section 9.1.2 and Table 9-2: The Agency is unable to review hydraulic conductivities provided by MWG. MWG must provide the data inputs and software outputs/calculations for the values presented in Section 9.1.2 and Table 9-2.

- Section 9.1.2: MWG states that there is an ELUC for the Ash Basin, Bypass Basin and Former Ash Basin provided on Figure 9-19. An ELUC cannot be issued by Bureau of Water and any environmental covenant is only one factor to be considered under Section 845.660. An ELUC does not alter the requirements of Part 845.

- Section 9.2: See previous comments on downgradient and upgradient well designations and the groundwater monitoring system.

- Section 9.3.2: Field parameters must include dissolved oxygen and oxidation reduction potential. Please update to be consistent with the Groundwater Monitoring Plan Addendum and Agency review Attachment comments.

- Section 9.3.7: Field and laboratory QA/QC must differentiate between QA measures and QC measures. QA measures refer to using a separate laboratory to ensure that the laboratory results are accurate. QC measures are internal measures such as duplicates, equipment blanks, field blanks, etc. MWG must specify the number or percentage of each type of QC samples that will be collected during each sample event. MWG must also specify the number or percentage of QA samples that will be collected and analyzed during each event.

- Attachment 2-3: , Any removal action of CCR from any CCRSI must be addressed in the Fugitive Dust Control Plan, Emergency Action Plan, and Safety Plan pursuant to 35 Ill. Admin. Code 845.500(b), 845.520 and 845.530. See Comment for Section 2.5 regarding a site transportation plan. Specifics of how a release of CCR will be averted, controlled and managed are required under the Emergency Action Plan and Safety Plan. Specifics included in one or more of these documents must comprise of the following:

    - Dust control measures applied to equipment moving CCR anywhere within the facility property boundaries (i.e. covers for trucks moving materials, staging areas for placing covers over the truck, methods and equipment to be used to cover trucks, etc.)

    - Dust control measures including how often and when spraying will occur every day. (i.e. when

    - Dust control measures including when and what materials will be used to cover temporary storage piles.

    - Dust monitoring, analyses, turn-around times for actions taken in response to air born dust.

    - Emergency action planning must include truck roll overs, excavator roll overs, extreme weather events, flooding of the flood plain including the Bypass Basin during construction activities.

    - The current EAP, included in the initial operating permit application, does not identify any potential safety emergencies that could occur during operations of the CCRSI and construction of the retrofit. Potential emergencies identified in the EAP Section 1.0 are passive incidents and do not include movement of CCR during operations or after conclusion of operations.

    - The current EAP, Section 2.2, does not identify facility specific corrective actions to be taken in an emergency. The corrective action required at the time of the discovery of any physical spill of CCR solids outside of the CCRSI must be collection, containment and disposal consistent with Part 845. Corrective action for spills involving fluids from the operation of vehicles or equipment inside the CCRSI and outside the CCRSI must also be addressed specifically pursuant to 29 Ill. Admin. Code 430.

- Safety plans for construction projects must be updated for construction activities for the Construction Permit application in accordance with 35 IAC 845.530(c)(2), 845.500(b), and 845.520(b). Hazards must be identified. Identification of hazard mitigation is required. The safety plan must include engineering controls, institutional controls and PPE for the work to be completed.

- Safety plans must include a summary of constituents in the CCR that are hazardous to human health, acute and chronic symptoms of exposure, action levels, institutional controls, engineering controls and other safety measures that are currently in place and when other measures are to be implemented.

- Please note that silica is an air born carcinogen and must be characterized for the purpose of an SDS or in the safety plan/emergency action plan and is not reported in Attachment 2-1 or anywhere else within the retrofit permit application submittal.

- whiConstruction permits must have separate emergency action plans and safety plans to adequately meet safety regulations and training requirements for construction activities. For the purpose of permitting the activity, MWG must provide details required by 35 Ill. Admin. Code 845.500, 845.520 and 845.530 which require adherence to 29 CFR 1926.

- Attachment 5-1: CQA reports for the construction must include all applicable items listed in 35 IAC 845.290. MWG must specify, in the text of the Permit Application, the methods, materials and operations that are being implemented to meet the design specifications. MWG must provide the specific QA and QC methods, including ASTM methods, will be utilized for the construction quality assurance program during the retrofit construction. During construction, MWG must document and provide weekly CQA reports in accordance with 35 IAC 845.290.

- Attachment 8-2: Please see third General Comment.

- Attachment 8-2, Section 3.0: All CCR surface impoundments closing by removal are subject to 35 Ill. Admin. Code 845.740. This construction permit application is for the retrofit of the Bypass Basin under Section 845.770. The construction permit application for retrofitting a CCR surface impoundment requires the inclusion of the preliminary written closure plan, but approval of a retrofit construction permit does not approve closure as presented in the preliminary written closure plan.

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Should you have any questions or comments regarding the above, please contact Mark E. Liska at 217/524-3262 or at the above address.

As Illinois EPA completes our technical review of the construction retrofit permit application, we will communicate any further concerns that we identify with you.

Sincerely,

Darin E. LeCrone, P.E.
Manager, Permit Section
Division of Water Pollution Control

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cc: Hydrogeologic Compliance Unit/Groundwater Section
Peoria Region
Records Unit

DOCUMENT 19

MWG
Midwest Generation, LLC
Powerton Generation Station
13082 E. Manito Rd.
Pekin, IL 61554

February 26, 2024

Via electronic mail and hand delivery

Mr. Mark Liska
Illinois EPA, Bureau of Water
1021 North Grand Avenue East
Springfield, IL 62702

Re: Powerton Generation Station
Log No. 2021-100029
Bureau ID# W1798010008
MWG Response to Construction Permit to Retrofit Bypass Basin Review Letter

Dear Mr. Liska:

Midwest Generation, LLC ("MWG") received the subject letter, dated February 22, 2024, from the Illinois Environmental Protection Agency ("IEPA" or the "Agency") via email on February 22, 2024. While MWG provided response to the Agency's Permit to Operate a Coal Combustion Residual Impoundment Review Letter dated October 11, 2023 on February 5, 2024 (the "February 5, 2024 Response"), the Agency repeated comments or questions in its February 22, 2024 letter. MWG does not repeat previously provided responses here but instead incorporates the February 5, 2024 Response by reference.

MWG reiterates its request that correspondence regarding Powerton Generating Station ("Powerton Station" or "Powerton") be addressed to:

Powerton Generating Station
Attn: Plant Manager
13082 E. Manito Road
Pekin, IL 61544

The current Plant Manager of Powerton Station is Todd Mundorf.

As we go through the below responses and MWG's February 5, 2024 Response, it is important to note that the Bypass Basin is incredibly small – a single acre. Moreover, retrofitting the Bypass Basin is not the final action at the pond. Rather, pursuant to the Climate and Equitable Jobs Act ("CEJA") Powerton Station must cease generating electricity with coal (and thus will cease generating coal combustion residuals ("CCR")) by January 1, 2030. Separately, yet as important, MWG notified the Agency that Powerton Station will comply with federal Effluent Limit Guidelines given at 40 CFR 423 by ceasing burning of coal at the electric generating units no later than December 31, 2028. Once the generation of CCR ceases, the basin will be closed pursuant to Part 845. During the time between retrofitting the Bypass Basin and closure of the Bypass Basin, the Agency and MWG can continue to work through the Agency's issues that are related to long-term closure of the pond.

Like the February 5, 2024 Response, for ease of review, MWG numbered the Agency's comments, and the numbered IEPA letter is presented as Attachment 1. Numbers given in responses below correspond to the numbers in Attachment 1. These responses may be updated as needed after our meeting in February 2024. Please add this Response with the Attachments to the Ash Surge Basin ("ASB"), Ash Bypass Basin ("Bypass Basin" or "ABB") and Former Ash Basin ("FAB") operating permit application record and the Bypass Basin Application for Retrofit Construction Permit application record.

MWG looks forward to discussing CCRSI permitting for Powerton Station with the Agency. If you have any questions or need additional information, please contact me at sharene.shealey@nrg.com.

Sincerely,



Sharene Shealey
Director, Environmental

Cc *(via electronic mail)*:

David Bacher
Jill Buckley
Todd Mundorf
Walter Stone
Cecilia DeRobertis, USEPA
Lauren Hunt, IEPA
Darin LeCrone, IEPA
EPA.CCR.Part845.Coordinator@Illinois.gov

MIDWEST GENERATION LLC'S RESPONSES

1) Section 9.0 of the Bypass Basin Application for Retrofit Construction Permit ("Application") submitted on July 15, 2022, which is a reproduction of Section 9.0 of the ASB, ABB and FAB Application for Initial Operating Permit submitted on October 30, 2021, presents in detail the information requested in this comment. Section 9.0 references specific regulatory citations as provided in Section 845.220(a)(7) regarding what needs to be included in this part of the Application. Section 9.1 provides a detailed description of the site geology and hydrogeology as required under Section 845.220(a)(7)(A), which in turn references Section 845.620. Section 9.2 presents the groundwater monitoring system design and construction plans as required under Section 845.220(a)(7)(B), which in turn references Section 845.630. Section 9.3 presents a groundwater sampling and analysis program as required under Section 845.220(a)(7)(C), which in turn references Section 845.640. It is noted that in Section 9.3.8 a proposed statistical evaluation plan as required under Section 845.640(f) is specified as Attachment 9-5 of the Application submittal.

2) As referenced in Section 8.2 of the Application, Attachment 8-2 of the Application provides the preliminary written closure plan for the retrofitted Bypass Basin as required by 845.220(b)(4) for retrofit construction permit applications. Per the preliminary written closure plan, MWG currently intends to close the retrofitted Bypass Basin by removal of CCR in accordance with Section 845.740(a). Therefore, as stated in Section 8.3 of the Application, the post-closure care requirements promulgated by Section 845.780 are not applicable to the retrofitted Bypass Basin. Thus, a post-closure care plan need not be, and was not, submitted with the Application.

3) First, no CCR material will be used in any part of the retrofit construction. Second, Section 845.770(a) does not require a final cover system. A final cover system is only required when closing a CCR surface impoundment by leaving CCR in-place under Section 845.750. The Application is for retrofitting an existing CCR surface impoundment under Section 845.770.

Section 845.770(a)(1) does require all CCR and contaminated soils and sediments from the CCR surface impoundment to be removed. Indeed, Note 3.A on Drawing POW-BBR-CSK-004 in Attachment 5-1 of the Application requires all material above the Bypass Basin's existing liner to be removed. This includes any remaining CCR and the Bypass Basin's existing granular protective layers, which are assumed to be contaminated with CCR. Moreover, Note 3.B.III on Drawing POW-BBR-CSK-004 requires the contractor to inspect the exposed soils below all areas of the existing liner that are found to be damaged, if any, to determine whether CCR from the basin has been released into, and has therefore, contaminated the underlying soils. This same note instructs the contractor to remove all such contaminated soil.

Section 845.770(a)(1) does ***not*** require CCR that was intentionally placed for the purposes of forming the embankments of a CCR surface impoundment and/or for providing the foundation for a CCR surface impoundment be removed. In any case, these CCR materials are not CCRs that were sent to the impoundment for storage, treatment, and/or disposal, and are not contaminated soils or sediments impacted by releases from the CCR surface impoundment. Because the Bypass Basin has always had a liner (Hypalon from 1980 to 2010 and HDPE geomembrane since 2010), it is possible to distinguish between the CCR that was used to construct the Bypass Basin and the CCR disposed in the basin when it was last in service. The Bypass Basin's existing HDPE geomembrane liner represents the waste boundary for the basin, thereby distinguishing where CCR has been

historically placed within the basin from where CCR was used to construct the basin's embankments and/or build up the area.

As stated in MWG's February 5, 2024 Response, the CCR required to be removed under Section 845.770(a)(1) during retrofit construction only pertains to CCR that was placed within the Bypass Basin (*i.e.*, within the lined area). CCR within the structural fill used to construct the basin's embankments and CCR within the foundation soils supporting the basin are not part of the impoundment area, regardless of whether the CCR qualifies as beneficial use of CCR under Section 3.135 of the Act and Section 845.150. Therefore, the CCR in the Bypass Basin's embankments and in the basin's foundation soils is not regulated under the Illinois CCR Rule.

As explained in MWG's February 5, 2024 Response, defining a CCR surface impoundment as the area bounded by the dikes (but excluding those structures) is logical, because the definition is contingent upon the ability to accumulate liquid. As U.S. EPA explained when it first promulgated Part 257 Subpart D, on which the Illinois CCR Rule is based, the risks associated with CCR surface impoundments are from the hydraulic head created by the water impounded with the CCR that promotes leaching of contaminants. 80 Fed. Reg. at 21328, 21342, 21357. In its May 2023 Proposed Rule for legacy CCR surface impoundments and CCR management units, U.S. EPA again emphasized the importance of the accumulation of liquid to the definition of a CCR surface impoundment, stating: "Units that contain liquid present different risks than those that do not, and the applicable requirements should differentiate among them accordingly on that basis." Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Legacy CCR Surface Impoundments, 88 Fed. Reg. 31982 ("Legacy Rule"), p. 31993 (May 18, 2023). U.S. EPA repeats that the key is that impounded water creates a "hydraulic head" in an operating impoundment that "allows for continual leaching of contaminants from the CCR and drives the resulting leachate…potentially into the underlying aquifer." Id. at 32011. Conversely, in its May 2023 proposal to regulate CCR management units ("CCRMUs"), U.S. EPA specifically distinguishes CCRMUs from CCRSIs by stating that "CCRMUs do not contain sufficient liquids to create a hydraulic head or to otherwise cause the conditions that might lead to a structural failure…" Id. at 32017. Because of the absence of the risk from a hydraulic head, U.S. EPA concluded that many of the existing requirements in Part 257 Subpart D applicable to CCRSIs are not necessary for CCRMUs. Id.

U.S. EPA's decision in its May 2023 proposal to distinguish CCRMUs from CCRSIs – and therefore regulate them differently – further supports that the dikes are not a part of the CCRSI definition. U.S. EPA proposed to define a CCRMU as "any area of land on which any non-containerized accumulation of CCR is received, placed, or otherwise managed at any time, that is not a CCR unit." Id. at 32034. U.S. EPA also excluded CCRMUs from the definition of "CCR unit" in its proposal, further creating a distinction between CCR surface impoundments (that accumulate liquids) and CCRMUs (that do not accumulate liquids). Id. Under this proposed definition, U.S. EPA explained that CCRMUs would include "…areas where the solid waste management of CCR on the ground has occurred, such as structural fill sites, [and] CCR placed below currently regulated CCR units." Id at 32018. Finally, U.S. EPA stated that CCRMUs "remain exempt under existing federal CCR regulations," demonstrating that the agency considered CCRSIs and CCRMUs as separate features. Id. at 32013. Therefore, in the context of the Bypass Basin, the boundary where the CCRMU ends (currently not regulated) and a CCRSI begins (currently regulated) is the existing HDPE geomembrane liner. Accordingly, the dikes (*i.e.*, structural fill sites) in which the Bypass

Basin sits and the CCR in the foundation soils below the basin's liner are CCRMUs and are not part of the regulated CCRSIs.

Finally, it would be inappropriate for MWG to preemptively install a final cover system over any CCRMU area before U.S. EPA finalizes its May 2023 proposal for CCRMUs. It is possible that U.S. EPA's Final Rule will impose different closure standards for CCRMUs than currently specified for CCRSIs. Per the 2016 Water Infrastructure Improvements for the Nation (WIIN) Act, the Station will continue to be subject to both the Illinois and Federal CCR Rules until the Illinois EPA submits its CCR permit program to U.S. EPA for approval and the latter approves the permit program. Given that the Station continues to be subject to both federal and state regulations for the foreseeable future, and given the possibility that the Federal CCR Rule's closure standards for CCRMUs may be different from the Illinois CCR Rule's closure standards for CCRSIs, it would not be prudent for MWG to close a CCRMU in accordance with the Illinois CCR Rule's standards for closing a CCRSI prior to U.S. EPA's Final Rule for CCRMUs becoming effective.

4) Refer to MWG's February 5, 2024 Response, Item 5. Also note that on Drawing POW-BBR-CSK-004, Note 3.D, the construction contractor is required to develop and implement fugitive dust controls during CCR material removal in accordance with 35 Ill. Adm. Code 845.740(c)(2).

5) Specification P-1400, which is provided in Attachment 5-1 of the Application, and which provides the material and installation requirements for the General Work ("GW") Contractor performing the retrofit work, addresses stormwater management during construction. Per Spec. P-1400, Sect. 011100, Par. 103.2d, the GW Contractor is responsible for "dewatering of all areas that collect storm water or groundwater in the area controlled by the [contractor] and redirecting any surface water as a result of rainfall or water generated by the [retrofit work]." Because the Bypass Basin is diked on all sides, stormwater accumulation during construction will be limited to direct rainfall into the basin. Per the subject paragraph of Spec. P-1400, the GW Contractor will be responsible for disposing of all such stormwater in accordance with the Station's NPDES permit. Moreover, Note 3.E on Drawing POW-BBR-CSK-004 requires the GW Contractor to develop and implement measures to prevent contamination of surface water, groundwater, soil, and sediments during excavation of CCR and the existing granular protective layers from the Bypass Basin in accordance with Section 845.740(c)(4).

6) The purpose of Section 1.5 is to provide the name and size of the watershed in which the Bypass Basin is located, as required by Section 845.220(a)(1)(C) for all construction permit applications. Section 845.220(a)(1)(C) does not require an evaluation of a CCR surface impoundment's proximity to a floodplain. Instead, this comparison is required by Section 845.340(c), which is addressed in Section 7.1.6 and Attachment 7-2 of the Application. As stated in Section 7.1.6, and as shown in Attachment 7-2, the Bypass Basin is not located in a floodplain according to National Flood Hazard Layer FIRMette Map No. 17179C0175E prepared by the Federal Emergency Management Agency. Therefore, MWG does not need to address the potential for flood waters overtopping the Bypass Basin's embankments.

7) The 2016 History of Construction prepared by Geosyntec is provided as Attachment 2.

8) MWG will revise Section 1.6.1 of the Application as expeditiously as practical to indicate the materials identified in the borings in the report referenced in this comment. However, while Section 845.770(a) does require removal of contaminated subsoils, the CCR that was intentionally placed for the purposes of forming the Bypass Basin's embankments and/or building up the area do not

constitute contamination from the Bypass Basin and, therefore, do not need to be removed as a part of the proposed retrofit construction. These structural fill areas are CCRMUs as defined in U.S. EPA's May 2023 Proposed Rule and are not currently regulated by the Federal CCR Rule or the Illinois CCR Rule. Refer to MWG's Response No. 3, above, for additional discussion on this matter.

9) MWG will revise Section 1.7.1 of the Application as expeditiously as practical to indicate the materials identified in the borings in the report referenced in this comment.

10) Although the Agency references Section 1.7.1 of this comment, the context of the comment indicates the Agency meant to reference Section 1.7.2, "Construction Methods." If so, MWG disagrees with this comment. Section 1.7.2 does not need to take into consideration what materials were used to construct the Bypass Basin's embankments because Section 1.7.1 already addresses that topic. Instead, Section 1.7.2 describes how the construction materials referenced in Section 1.7.1 were placed, compacted, and graded to form the Bypass Basin's embankments.

11) MWG requests clarification from the Agency on this comment. First, it is not clear why Section 2.0 of the Application is referenced in this comment when Section 2.0 does not discuss the comment's subject matter (retrofit construction, closure construction, or corrective action). Second, MWG is not suggesting that retrofitting a CCRSI under Section 845.770 is the same process or part of the process as closure by removal under Section 845.740. Section 8.2 and Attachment 8-2 of the Application provide the preliminary written closure plan for the ***retrofitted*** Bypass Basin as required by Section 845.220(b)(4) for all retrofit construction permit applications.

12) Please refer to the February 5, 2024 Response, Item 14.

13) Section 845.220(a)(2)(E) does not require the on-site transportation plan to address roads outside of the facility's property. The plan only needs to include "all existing and planned roads ***in the facility*** that will be used during the operation of the CCR surface impoundment." (Emphasis added.) Therefore, Section 2.5 of the Application does not need to address noise and entry to Manito Road or dust suppression measures.

However, MWG does address the Agency's comment in Section 5.1 of the Application, in the Design Drawings (*see* Attachment 5-1 of the Application), and in the written retrofit plan for the Bypass Basin (*see* Attachment 8-1 of the Application). Because CCR and CCR-mixed soils (*i.e.*, the Bypass Basin's existing granular protective layers) will be removed and transported off-site for disposal, MWG is requiring the contractor transporting these materials off-site to handle and haul the material in accordance with Section 845.740(c). Per Notes 3.D, 3.E, and 3.F on Drawing POW-BBR-CSK-004 in Attachment 5-1 of the Application, the GW Contractor must 1) develop and implement fugitive dust controls during material removal from the Bypass Basin area in accordance with Section 845.740(c)(2); 2) develop and implement measures to prevent contamination of surface water, groundwater, soil, and sediments during material removal from the Bypass Basin area in accordance with Section 845.740(c)(4); and 3) prepare a report at the end of each month documenting the contractor's progress in removing CCR and CCR-mixed soils from the area in accordance with Section 845.740(d). These requirements are summarized in Section 5.1 of the Application and in the written retrofit plan provided in Attachment 8-1 of the Application.

14) Section 5.2 does not state structural fill will be removed from the Bypass Basin's embankments. The Design Drawings in Attachment 5-1 of the Application show that placement of structural fill for retrofit construction will be limited to the existing impoundment area (*i.e.*, within the existing liner area). Removing structural fill from this area would compromise the basin's existing HDPE

geomembrane liner, which MWG is proposing to re-use as part of retrofitting the Bypass Basin in accordance with Section 845.770(a)(4).

CCR is not specified to be used as, and will not be permitted to be used as, any fill material shown on the Design Drawings or specified in Specification P-1400 for retrofitting the Bypass Basin. *See* Attachment 5-1 of the Application, specifically Spec. P-1400, Sect. 319005 and the Design Drawings.

15) The basis for establishing the bottom of the Bypass Basin at elevation 457 feet amsl is provided in Attachment 1-2 of the Application. This attachment provides the as-built construction plan for the work performed in 2010 to replace the basin's original Hypalon liner with its current HDPE geomembrane liner. *See* Dwg. D1965C020-02 ("Liner Subgrade Preparation") in Attachment 1-2.

MWG requests clarification from the Agency regarding why the Ash Surge Basin and Former Ash Basin are discussed in this comment. The entire Application, including Section 7.1.1, addresses only the proposed retrofit construction for the Bypass Basin. The Ash Surge Basin and Former Ash Basin are not subjects of the retrofit construction proposed in the Application.

16) Section 7.1.2 of the Application, "Wetlands," accurately states that the Bypass Basin is not located within wetlands and that the basin meets the location restriction standard. Moreover, because no lateral expansions are planned as part of retrofitting the basin, the retrofitted Bypass Basin will continue to meet the location restriction standard. Thus, no demonstration is required for this basin pursuant to Section 845.310(a).

17) MWG requests clarification from the Agency on this comment. The Former Ash Basin is not the subject of the Application, which is for a retrofit construction permit for the Bypass Basin. No proposed construction related to the Former Ash Basin is discussed in the Application. This comment is addressed in MWG's February 5, 2024 Response, Item 20.

18) See MWG Response No. 15, above, regarding the basis used to establish the bottom of the Bypass Basin at elevation 457 feet amsl. As stated in Section 7.1.1 of the Application, "Placement Above the Uppermost Aquifer," MWG demonstrated the Bypass Basin is separated from the upper limit of the uppermost aquifer by at least five feet in accordance with Section 845.300(a) in the ASB, ABB and FAB Application for Initial Operating Permit submitted on October 30, 2021. Therefore, the Bypass Basin can be retrofitted under Section 845.770.

19) MWG requests clarification from the Agency on this comment. Sections 845.230(d)(2)(J) and (K) are requirements for ***initial operating*** permit applications. The Application is for a ***retrofit construction*** permit. Presuming this is a typographical error and the Agency meant to reference Sections 845.220(b)(4) and (5), refer to Response No. 2.

20) Section 8.3 does not equate retrofitting a CCR surface impoundment under Section 845.770 to closure by removal under Section 845.740. Section 8.3 states that a post-closure care plan is not being submitted for the *retrofitted* Bypass Basin under Section 845.220(b)(5) because MWG's preliminary written closure plan for the *retrofitted* Bypass Basin (*see* Attachment 8-2 of the Application) calls for closing the basin by removing CCR and CCR-mixed materials in accordance with Section 845.740(a). Therefore, as stated in Section 8.3, the post-closure care requirements promulgated by Section 845.780 are not applicable to the *retrofitted* Bypass Basin.

21) Please refer to the February 5, 2024 Response, Item 26.

22) Please refer to the February 5, 2024 Response, Item 26.

23) The opening paragraph of Application Section 9.1.1 is a very general discussion of the physiography and near surface soils in the general vicinity of the site. This information was obtained from the Soil Survey of Tazewell County, Illinois which is a publication of the US Department of Agriculture (USDA), hence the near surface soil descriptions are based on the USDA categorization. Using this reference in such general introductory discussions for overall local surficial physical conditions is common practice. Subsequent discussion in this section goes on to include specific descriptions from the on-site monitoring well boring logs which use Unified Soil Classification System (USCS) terminology.

Relative to the use of this information for engineering design considerations, discussions with the project engineers indicate that the information provided on the site-specific borings logs was sufficient and was used in the various design and loading calculations for the retrofit design work. The need for additional information will be further discussed with the Agency during the upcoming meeting.

Relative to the last portion of this comment regarding alluvial processes of deposition and erosion and their consideration in retrofit design evaluation, this will be discussed with the Agency during the upcoming meeting to obtain clarification from the Agency.

24) Please refer to the February 5, 2024 Response, Item 40.

25) Please refer to the February 5, 2024 Response, Item 25.

26) Please refer to the February 5, 2024 Response, Item 26 (also see response to items 21 and 22 above).

27) Part 845 does not contain any requirement within the groundwater monitoring requirements that requires collecting dissolved oxygen (DO) and oxidation reduction potential (ORP). These are not routinely required for CCR monitoring. The need and use of this data for this monitoring program is not clear and will be further discussed during the upcoming meeting.

28) Please refer to the February 5, 2024 Response, Item 27.

29) The Powerton Station currently has a facility wide Emergency Action Plan ("EAP") that addresses weather/natural disaster emergencies, flooding emergencies, a fire emergency, a spill/release emergency, medical emergency, active shooter, water rescue, an explosion, and the OSHA requirements, including those contained within 29 CFR 1910.38. MWG's EAPs for the ASB, ABB, and FAB attached to its Initial Operating Permit Application comply with Section 845.520, including 845.520(b)(1). However, in response to the Agency's previous comments, MWG updated the EAP for the ASB and ABB to include weather emergencies that could occur during the operation and maintenance of the CCRSIs. Any other instance not covered in the CCRSIs Emergency Action Plan would be dealt with in accordance with the station's existing Emergency Plan.

The existing fugitive dust control plan addresses the removal of CCR as part of typical cleaning that occurs resulting from normal operations of the CCRSI. This includes minimizing the stockpile height, spraying with water, and covering any stockpiles. Spraying CCR with water would occur on an as needed basis depending on the frequency of precipitation during operating and retrofitting

activities. Any of covering stockpiles would be done using plastic sheeting and held down with sandbags or other heavy objects.

As stated in Response No. 4 above, the contractor selected to perform the retrofit work will be required to develop and implement fugitive dust controls. These controls may include covering each load of CCR removed from the site using tarps built-in to the dump truck, spraying CCR when it becomes dry and fugitive dust is visible, and covering any stockpiles with plastic sheeting and held down using heavy objects, such as sandbags. The contractor will be expected to have fugitive dust control measures readily on hand for implementation upon immediate direction by MWG.

In addition, the contractor will be required to develop a health and safety plan that addresses emergencies and accidents that may occur during the retrofit construction. Activities that will occur during the retrofit construction are not typical operating activities for the CCRSI and the development of any safety and emergency measures are best performed by the selected contractor, who is intimately knowledgeable about the means and methods that will be employed for executing the retrofit. In general, any spilled CCR will be collected, contained, and disposed of in the same manner as the CCR material removed as part of the retrofit construction.

As part of the pre-construction meeting, the dangers associated with CCR will be discussed with the construction crew along with providing a CCR SDS. MWG updated the Safety and Health Plan to include a CCR SDS and the updated plan was included as Attachment 4 to the February 5, 2024 Response. The revised Safety and Health Plan includes in its training program the requirement for contractors and employees to be informed of chemical hazards and hazardous materials, including CCR, which may be present. Specifically, Section 4.0(B)(6) identifies that "CCR may be present in water or as respirable dust" and "CCR may contain heavy metals, such as arsenic, barium, cadmium, chromium, lead, mercury, and selenium". Section 4.0(B)(7) identifies the use of engineering controls, administrative controls, and required PPE.

As stated previously, the contractor executing the retrofit construction will create the necessary Emergency Plan and Safety & Health Plan specific to the means and methods of construction they will employ. The Emergency Action Plan and Safety & Health Plan revised to address comments from IEPA's Initial Operating Permit Application review letter address the applicable portions of 29 CFR 1926 related to the operation of the ABB and the presence of CCR. MWG neglected to include the revised Emergency Action Plan in its February 5, 2024 Response; it is included as Attachment 3 to this response.

30) MWG specifies the methods, materials, and operations that will be implemented to meet the retrofit design specifications in the text of the Application. These specifications are principally stated in Attachment 5-2 of the Application, which is Construction Quality Assurance (CQA) specification for the project (Spec. P-1401). This specification "covers the field and laboratory activities for a [CQA] Contractor to provide assurance and documentation that the Bypass Basin at the Powerton Generating Station is retrofitted in accordance with the General Work (GW) Specification (P-1400), the Design Drawings, and permit requirements." Spec. P-1401, Sect. 011100, Par. 103.1. The CQA Contractor's scope of work includes visual inspections, field tests, and laboratory tests on the various materials to be used in the retrofit project. *See* Spec. P-1401, Sect. 014362 for detailed CQA

specifications and ASTM test methods to be used, including Tables 014362-1 through 014362-7 at the end of that section.

In addition to the CQA scope of work discussed above, additional QA/QC methods and tests are specified in GW Spec. P-1400 provided in Attachment 5-1 of the Application. For example, each material supplier is required to submit material certificates and test reports indicating that the provided materials meet specification requirements. The ASTM test methods to be performed by the material suppliers are also specified. *See* Spec. P-1400, Sect. 319005, Par. 104.3b1 (Structural Fill). *See* Spec. P-1400, Sect. 319005, Par. 104.3c1 (crushed stone surfacing). *See* Spec. P-1400, Sect. 319020, Par. 104.3b5 (HDPE geomembrane). *See* Spec. P-1400, Sect. 319020, Par. 104.3c4 (drainage geocomposite). *See* Spec. P-1400, Sect. 319025, Par. 104.2b2 (geosynthetic clay liner). *See* Spec. P-1400, Sect. 319050, Par. 104.3a1 (Coarse Aggregate Bedding Material). *See* Spec. P-1400, Sect. 319050, Par. 104.3b1 (Sand Filter Layer Material). *See* Spec. P-1400, Sect. 319050, Par. 104.3c1 (Protective Warning Layer Material). *See* Spec. P-1400, Sect. 319050, Par. 104.3d1 (Riprap Bedding Layer Material). *See* Spec. P-1400, Sect. 319050, Par. 104.3e1 (Riprap).

CQA Specification P-1401 ensures that the CQA reports required by Section 845.290 will be prepared for the retrofitted Bypass Basin:

a. Per Sect. 011100, Par. 104.1f1, the CQA Contractor that MWG hires will include a CQA Officer, who will be a professional engineer licensed in the State of Illinois and who will be responsible for implementation of the construction quality assurance work. This complies with Section 845.290(b)(1).

b. Per Sect. 014362, Par. 104.2b2.1, the CQA Officer will be required to prepare a Weekly Summary Report at the end of each week until construction is complete. Per Sect. 014362, Par. 104.2b2.2, the Weekly Summary Report will contain descriptions of the weather, locations where construction occurred during the previous week, materials used, results of testing, inspection reports, and procedures used to perform inspections. MWG will place each Weekly Summary Report in the facility's operating record. This complies with Section 845.290(b)(2).

c. Per Sect. 014362, Par. 104.2b3.1, the CQA Officer will prepare a Retrofit Completion Report that demonstrates the Bypass Basin was retrofitted in conformance with Project Specifications, the Design Drawings, and permit requirements. This report will include certifications that 1) pipe bedding material contains no undesirable objects (complies with Section 845.290(b)(3)(A)); 2) the anchor trench and backfill are constructed to prevent damage to a geosynthetic membrane (complies with Section 845.290(b)(3)(C)); 3) all tears, rips, punctures, and other damage to geosynthetic materials are repaired (complies with Section 845.290(b)(3)(D)); 4) all geomembrane seams are properly constructed and tested in accordance with the manufacturer's specifications (complies with Section 845.290(b)(3)(E)); 5) proper filter material consisting of uniform granular fill, to avoid clogging, is used in construction (complies with Section 845.290(b)(3)(I)); and 6) the filter material, as placed, possesses structural strength adequate to support the maximum loads imposed by the overlying materials and equipment used at the facility (complies with Section 845.290(b)(3)(J)).

d. Per Sect. 011100, Par. 104.1f2, the CQA Officer will supervise and be responsible for all inspections, testing, and other activities required to be implemented as part of the CQA scope of work for the project. This complies with Section 845.290(b)(4).

e. Per Sect. 011100, Par. 104.1f3, the CQA Officer will be present to provide supervision and assume responsibility for performing all inspections of 1) compaction of subgrade materials and 2) installation of the new composite liner system. This complies with Section 845.290(b)(5).

f. Per Sect. 011100, Par. 104.1.f4, if the CQA Officer is unable to be present during specified inspections, the CQA Officer will provided, in writing, 1) the reasons for the CQA Officer's absence; 2) a designation of a person who must exercise professional judgment in carrying out the duties of the CQA Officer-in-Absentia; and 3) a signed statement that the CQA Officer assumes full responsibility for all inspections performed and reports prepared by the designated CQA Officer-in-Absentia during the absence of the CQA Officer. This complies with Section 845.290(b)(6).

g. As a whole, the Design Drawings and Project Specifications (Spec. P-1400 and Spec. P-1401) for retrofitting the Bypass Basin include a comprehensive CQA scope of work to ensure, at a minimum, that construction materials and operations meet design specifications and permit requirements. This complies with Section 845.290(b)(7).

31) See Response No. 3, above.

32) See Response No. 2, above.

33) The preliminary written closure plan for the retrofitted Bypass Basin provided in Attachment 8-2 of the Application was prepared in accordance with Section 845.720(a). Sections 845.720(a)(1)(A) through (F) do not require the preliminary written closure plan to "include an outline of means and methods ***to demonstrate*** that contaminated subsoils have been removed." (Emphasis added.) Section 845.720(a)(1)(B) only requires "a description of the procedures to remove the CCR and decontaminate the CCR surface impoundment in accordance with Section 845.740." In other words, the preliminary written closure plan only needs to describe how the impoundment will be closed, not how decontamination will be verified. For details on the procedures MWG currently plans to use to close the retrofitted Bypass Basin in accordance with Section 845.740, refer to Section 3.0 of the preliminary written closure plan provided in Attachment 8-2 of the Application.

34) 35 Ill. Adm. Code 809 was referenced with respect to the manifest requirements cited in Section 845.740(c)(1)(A)(i). Moreover, Section 3.0 of the preliminary written closure plan for the retrofitted Bypass Basin provided in Attachment 8-2 of the Application does require transportation of CCR to comply with Section 845.740(c):

> "Trucks transporting the CCR materials off-site will carry manifests pursuant to ***35 Ill. Adm. Code 845.740(c)(1)(A)*** and as specified in 35 Ill. Adm. Code 809. In addition, a CCR transportation plan will be prepared in accordance with ***35 Ill. Adm. Code 845.740(c)(1)(B)***…Pursuant to ***35 Ill. Adm. Code 845.740(c)(2)(A)***, [on-site fugitive] dust control measures will include water spray, commercial dust suppressant, or a combination of these.

> Prior to the removal of CCR materials from the retrofitted Bypass Basin, signage will be posted at the Station's entrance warning of the hazards of CCR dust inhalation in accordance with ***35 Ill. Adm. Code 845.740(c)(3)(A)***. Pursuant to ***35 Ill. Adm. Code 845.740(c)(3)(B)***, a written notice will be issued to each of the local governments through which the CCR materials will be transported." (Emphasis added.) Attachment 8-2 of the Application at 3 to 4.

Because the Application is for a retrofit construction permit, the Agency's comment regarding a transportation plan related to MWG's preliminary written closure plan for the retrofitted Bypass Basin is not applicable. Moreover, the only transportation plan that needs to be submitted with a construction permit application is the on-site transportation plan showing "all existing and planned roads in the facility that will be used during the operation of the CCR surface impoundment." Section 845.220(a)(2)(E). The on-site transportation plan for the Bypass Basin is provided in Section 2.5 and shown on Figure 2 in Attachment 2-3 of the Application.

35) MWG disagrees with this comment. The "estimate of the maximum inventory of CCR ever on-site over the active life of the CCR surface impoundment" required by Section 845.720(a)(1)(D) refers to CCR ***stored within*** the CCR surface impoundment and does not include CCR materials used to construct an impoundment's embankments or foundation. Those CCR materials are CCRMUs as defined by U.S. EPA's May 2023 Proposed Rule and are not currently regulated by the Federal CCR Rule or the Illinois CCR Rule.

36) MWG will correct this typographical error for the title of Section 7.0 in the written retrofit plan for the Bypass Basin. The section will be renamed "Amendments to Retrofit Plan."

37) Please refer to the February 5, 2024 Response, Item 9.

38) Please refer to the February 5, 2024 Response, Item 9.

39) Please refer to the February 5, 2024 Response, Item 47.

40) Please refer to the February 5, 2024 Response, Item 48.

41) Please refer to the February 5, 2024 Response, Item 23.

42) Please refer to the February 5, 2024 Response, Item 23.

43) Please refer to the February 5, 2024 Response, Item 51.

44) Please refer to the February 5, 2024 Response, Item 23.

45) Please refer to the February 5, 2024 Response, Item 50.

46) Updates to the noted tables will be made as appropriate.

47) Please refer to the February 5, 2024 Response, Item 54.

48) Please refer to the February 5, 2024 Response, Item 55.

49) Please refer to the February 5, 2024 Response, Items 9 and 56.

50) Please refer to the February 5, 2024 Response, Item 57.

51) Please refer to the February 5, 2024 Response, Item 58.

52) Please refer to the February 5, 2024 Response, Item 59.

List of Attachments

Attachment No.	Description
1	Numbered IEPA Permit Bypass Basin Retrofit Application Review Letter
2	2016 History of Construction
3	Revised Emergency Action Plan, January 2024

Attachment 1

Numbered IEPA Bypass Basin Retrofit Permit Application Review Letter

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397
JB PRITZKER, GOVERNOR JOHN J. KIM, DIRECTOR

217/782-0610

February 22, 2024

Dale Green
Midwest Generation, LLC
804 Carnegie Center
Princeton, NJ

Re: Powerton Generating Stat 3) 2) 1)
Log No. 2021-100029
Bureau ID # W1798010008
Construction Permit to Retrofit Bypass Basin
Review Letter

Mr. Green:

Illinois EPA received your Application for a Construction Permit to retrofit Powerton's Bypass Basin and the supporting documents concerning the above project on July 22, 2022. The application and supporting information, as submitted, are undergoing review by the Illinois EPA, and based upon that review, the following items are offered for your consideration and appropriate action:

General Comments:

- Retrofit construction permit application must include a groundwater monitoring program pursuant to all applicable subsections of 35 Ill. Admin. Code 845.630, 845.640, 845.650.

- MWG must provide the preliminary written closure plan and the initial post-closure care plan as part of the construction permit application for the retrofit of the By-pass Basin. The construction permit application for the retrofit of the By-pass Basin does not constitute approval of either the final written closure plan or the final written post-closure care plan.

- As a condition of leaving the existing synthetic liner in place under Section 845.770(a), the retrofit construction plan must include cover to prevent plume migration from the retrofit embankments that are filled with CCR and the embankments of the original By-pass Basin to the extent they remain in place during operation of the retrofit Bypass Basin. PS-GT-8, drilled and logged in 2005 in the Bypass Basin embankments, according to the Geotechnical Summary Letter dated 2005 contains bottom ash and slag. The CCR in the embankments of the retrofit By-pass Basin must include a final cover system that isolates the embankment materials that include CCR from stormwater infiltration.

- The Safety Plan, Emergency Action Plan and Fugitive Dust Control Plan must be updated for construction activities for the Construction Permit application in accordance with 35 IAC 845.530(c)(2), 845.500(b), and 845.520(b).

- Section 1.5: Because this is a construction permit application and the embankments of the Bypass Basin are confirmed to have been constructed of CCR at least in part (KPRG, 2005), the stormwater runoff from the construction must be addressed as a part of the permit application.

- Section 1.5: This section does not adequately address what happens when flooding breaches the elevation of the embankments and does not provide an elevation of the embankment for the Agency's review.

12) 11) 10) 9) 8) 7) 6)

- Section 1.6 and Attachments to Permit Application: The History of Construction prepared by Geosyntec in 2016 must be provided in the Construction Permit Application for review of congruency by the Agency.

- Section 1.6.1: The KPRG report dated October 13, 2005 exhibits that CCR comprises the majority of the fill materials for the embankments. The nature of the origin of the fill material is required to be discussed, due to the requirement of removal of contaminated subsoils pursuant to 35 Ill. Admin. Code 845.770(a). A closure construction permit application with a closure alternatives analysis will be required to complete closure at the end of the active life of the retrofit By-pass Basin.

- Sections 1.7 and 1.7.1: Sections describing the engineering properties of the embankment fill do not provide known descriptions of the embankment fill which includes slag and bottom ash to a depth of at least 15 feet. (KPRG, 2005).

- Section1.7.1: Construction methods must take into consideration that CCR was used to construct the embankments of the Bypass Basin (KPRG, 2005).

- Section 2.0 and 8.2: Retrofitting of the CCRSI under Section 845.770 is not the same process or part of the process as closure by removal under Section 845.740. Corrective action is also a different process and may be required in conjunction with either Section 845.740 or Section 845.770.

- Section 2.1, Table 2.1-1 and Section 2.2: The CCR characterization does not have adequate explanation of how one or two samples for the entirety of the Bypass Basin CCR is sufficient to comply with Chapter 9 of the SW846 Compendium incorporated by reference under Section 845.150.

- Section 2.5: The onsite transportation plan should comply with 35 Ill. Admin. Code 845.740(c)(1)(B)(ii), (iii) noise and entry to Manito Road, (iv) dust suppression measures reference, (v), (vi), and (vii).

- Section 5.2: Any structural fill removed from the embankments that is CCR or mixed CCR must be characterized and appropriately disposed . Structural fill placed between the existing synthetic liner and the composite liner must not contain CCR.

- Section 7.1.1: The bottom of the Ash Surge Basin seems to extend to at least elevation 452-feet amsl and the Bypass Basin bottom seems to be above elevation 460 feet. However, the basis for this depiction is not provided in the documents that MWG has submitted for the permit application. The bottom of the Ash Surge Basin and the Bypass Basin must be provided. The bottom of the Former Ash Basin intersects the groundwater table and it has surface water standing in it most of the time. The clay seam at Powerton is not continuous and does not provide a confining unit between the sand fill and the sand and gravel underlying the sand fill and/or clay seam. The potentiometric surface and surface water levels in the Illinois River have risen to 452-feet amsl multiple times in the last 10 years at Powerton Station. The potentiometric surface maps must be updated and be consistent between flow maps. Additionally, according to the FEMA Flood Insurance maps, the flood zone that encompasses the Former Ash Basin is elevation 456.9-feet amsl. Currently flow maps are segregated and inconsistent with each other between the figures presented depending on basin.
- Section 7.1.2: The US Fish and Wildlife Service Wetlands Mapper shows Freshwater Forested/Shrub Wetlands and Freshwater Emergent Wetlands in an around the CCRSIs at the Powerton Generating Station. This section of the Permit Application must be updated to appropriately address the wetlands that exist here.
- Section 7.1.2: The Former Ash Basin lies within a US Fish and Wildlife Service mapped wetland. However, there are no supporting documents to ensure that 35 Ill.. Adm. Code 845. 230(d)(2)(D)(ii) is adhered to.
-

- Section 7.0: The Bypass Basin bottom is not provided in a manner that is verifiable. The bottom of the Bypass Basin must be demonstrated to be at the depth that is depicted on cross sections. The potentiometric surface and surface water levels in the Illinois River have risen to 452-feet amsl multiple times in the last 10 years at Powerton Station. MWG must adequately demonstrate that the bottom of the Bypass Basin complies with Section 845.300. If the Bypass Basin cannot meet the requirements of Section 845.300 it cannot be retrofit under Section 845.770.

- Section 8: Under Section 845.230(d)(2) (j) and (k) the preliminary written closure plan and the initial written post-closure care plan, respectively, must be submitted as part of the retrofit construction permit application. Closure under 845 Subpart G is subject to a separate construction permit application and is not approved under a retrofit construction permit application.
-

- Section 8.3: Retrofitting of a CCRSI pursuant to 35 Ill. Admin. Code 845.770 does not equate to closure by removal in accordance with 35 Ill. Admin. Code 845.740 .

- Section 9.1, 9.2 and 9.3 and Attachment 9-2: MWG must monitor the hydrostratigraphic units and evaluate the multiunit groundwater monitoring system to determine impacts of flooding from the Illinois River. The Agency reviews the boring logs and well construction in Attachment 9-2 and determined the following wells are associated with the following units:

    - Fill: MW-8 (cross gradient), MW-18 (cross gradient) and possibly MW-19 (upgradient, may have overlying CCR above screen, so not acceptable as an upgradient/background well).

    - Clay/silty clay unit: MW-6 (downgradient), MW-10 (cross gradient), MW-12 (cross gradient), MW-14 (cross gradient), MW-15 (cross gradient), and MW-17 (cross gradient)

    - Sand and gravel unit: MW-01 (cross gradient), MW-2 (downgradient), MW-3 (downgradient), MW-4 (downgradient), MW-5 (downgradient), MW-7 (cross gradient), MW-9 (upgradient, but has surficial CCR proximate to the well), MW-10 (cross gradient), MW-13 (cross gradient), and MW-16 (upgradient)

- Given the aforementioned wells and associated lithologic units, MWG must install and monitor additional wells as follows:

    - Fill unit: Upgradient well. Must be installed upgradient of all CCR operations present and past (see comment on background/upgradient wells below). Two downgradient wells must be installed downgradient of the FAB to gauge groundwater fluctuations due to temporal and seasonal changes including Illinois River elevation surges.

    - Clay/silty clay unit: Upgradient well. Must be installed upgradient of all CCR operations present and past (see comment on background/upgradient wells below).

    - Sand and gravel unit: Upgradient well. Must be installed upgradient of all CCR operations present and past (see comment on background/upgradient wells below).

    - Vertical gradient and extent of contamination investigation: At least one location of vertical gradient nested wells must be installed to determine the vertical extent of the groundwater contamination. The vertical gradient wells must be installed north of the Ash Surge Basin. Drilling of initial borehole must include soil classification to a depth of 100-feet pursuant to 35 Ill. Admin. Code 845.620(b)(13).

    - Well installation must be conducted pursuant to 77 Ill. Admin. Code 920.170. isolation casing must be installed where appropriate to prevent cross contamination during drilling and well installation.

- The upgradient or background monitoring wells chosen for each CCRSI must comply with Section 845.630(a). The upgradient or background monitoring wells must be as close to the upgradient side of the CCRSI that the background well is meant to monitor with the following conditions:
  - Must not be in CCR.
  - Must be as close to the CCRSI and as far away from similar source material to adequately characterize the Section 845.600(a) constituents that are already present prior to entering the CCRSI groundwater.

27) 26) 25) 24) 23)

  - If the background monitoring well is not hydraulically connected, the geochemical conditions must be similar to those onsite to ensure similar monitoring conditions.

- Section 9.1.1: Because MWG is proposing design and construction of retrofit, it would be better suited to discuss the geology of the soils as it pertains to geotechnical engineering applications. In other words, instead of citing USDA sources, MWG must discuss where the glacial till, if any, begins. Glacial till has specific foundational and load bearing capacities that lend to apply to the design. This section is conflicting in that the source for soils is the USDA from 1996. However, according to the Handbook of Illinois Stratigraphy (1975) and the second paragraph there are clays/silty clays/silts that are organic, which is consistent with alluvial silts and clays. Due to the proximity to the Illinois River, the geologic maps of the Handbook of Illinois Stratigraphy showing alluvium along the area that encompasses Powerton correlate with the borings that have been collected at Powerton. Additionally, the known geomorphologic processes that occur around the Illinois River will cause more alluvial processes over time thus confirming that alluvium deposits and erosion will occur in the future. MWG must provide discussion of these facts in relation to the Bypass Basin.

- Section 9.1.2 and Table 9-2: The Agency is unable to review hydraulic conductivities provided by MWG. MWG must provide the data inputs and software outputs/calculations for the values presented in Section 9.1.2 and Table 9-2.

- Section 9.1.2: MWG states that there is an ELUC for the Ash Basin, Bypass Basin and Former Ash Basin provided on Figure 9-19. An ELUC cannot be issued by Bureau of Water and any environmental covenant is only one factor to be considered under Section 845.660. An ELUC does not alter the requirements of Part 845.

- Section 9.2: See previous comments on downgradient and upgradient well designations and the groundwater monitoring system.

- Section 9.3.2: Field parameters must include dissolved oxygen and oxidation reduction potential. Please update to be consistent with the Groundwater Monitoring Plan Addendum and Agency review Attachment comments.

- Section 9.3.7: Field and laboratory QA/QC must differentiate between QA measures and QC measures. QA measures refer to using a separate laboratory to ensure that the laboratory results are accurate. QC measures are internal measures such as duplicates, equipment blanks, field blanks, etc. MWG must specify the number or percentage of each type of QC samples that will be collected during each sample event. MWG must also specify the number or percentage of QA samples that will be collected and analyzed during each event.

- Attachment 2-3: , Any removal action of CCR from any CCRSI must be addressed in the Fugitive Dust Control Plan, Emergency Action Plan, and Safety Plan pursuant to 35 Ill. Admin. Code 845.500(b), 845.520 and 845.530. See Comment for Section 2.5 regarding a site transportation plan. Specifics of how a release of CCR will be averted, controlled and managed are required under the Emergency Action Plan and Safety Plan. Specifics included in one or more of these documents must comprise of the following:

    - Dust control measures applied to equipment moving CCR anywhere within the facility property boundaries (i.e. covers for trucks moving materials, staging areas for placing covers over the truck, methods and equipment to be used to cover trucks, etc.)

    - Dust control measures including how often and when spraying will occur every day. (i.e. when

    - Dust control measures including when and what materials will be used to cover temporary storage piles.

    - Dust monitoring, analyses, turn-around times for actions taken in response to air born dust.

    - Emergency action planning must include truck roll overs, excavator roll overs, extreme weather events, flooding of the flood plain including the Bypass Basin during construction activities.

    - The current EAP, included in the initial operating permit application, does not identify any potential safety emergencies that could occur during operations of the CCRSI and construction of the retrofit. Potential emergencies identified in the EAP Section 1.0 are passive incidents and do not include movement of CCR during operations or after conclusion of operations.

    - The current EAP, Section 2.2, does not identify facility specific corrective actions to be taken in an emergency. The corrective action required at the time of the discovery of any physical spill of CCR solids outside of the CCRSI must be collection, containment and disposal consistent with Part 845. Corrective action for spills involving fluids from the operation of vehicles or equipment inside the CCRSI and outside the CCRSI must also be addressed specifically pursuant to 29 Ill. Admin. Code 430.

- Safety plans for construction projects must be updated for construction activities for the Construction Permit application in accordance with 35 IAC 845.530(c)(2), 845.500(b), and 845.520(b). Hazards must be identified. Identification of hazard mitigation is required. The safety plan must include engineering controls, institutional controls and PPE for the work to be completed.

- Safety plans must include a summary of constituents in the CCR that are hazardous to human health, acute and chronic symptoms of exposure, action levels, institutional controls, engineering controls and other safety measures that are currently in place and when other measures are to be implemented.

- Ple(34) note th(33) ilica is an air b(32) rc(31) gen and must be (30) racterized for the purpose of an SDS or in the safety plan/emergency action plan and is not reported in Attachment 2-1 or anywhere else within the retrofit permit application submittal.

- whiConstruction permits must have separate emergency action plans and safety plans to adequately meet safety regulations and training requirements for construction activities. For the purpose of permitting the activity, MWG must provide details required by 35 Ill. Admin. Code 845.500, 845.520 and 845.530 which require adherence to 29 CFR 1926.

- Attachment 5-1: CQA reports for the construction must include all applicable items listed in 35 IAC 845.290. MWG must specify, in the text of the Permit Application, the methods, materials and operations that are being implemented to meet the design specifications. MWG must provide the specific QA and QC methods, including ASTM methods, will be utilized for the construction quality assurance program during the retrofit construction. During construction, MWG must document and provide weekly CQA reports in accordance with 35 IAC 845.290.

- Attachment 8-2: Please see third General Comment.

- Attachment 8-2, Section 3.0: All CCR surface impoundments closing by removal are subject to 35 Ill. Admin. Code 845.740. This construction permit application is for the retrofit of the Bypass Basin under Section 845.770. The construction permit application for retrofitting a CCR surface impoundment requires the inclusion of the preliminary written closure plan, but approval of a retrofit construction permit does not approve closure as presented in the preliminary written closure plan.

- Attachment 8-2, Section 3.0: The Preliminary Closure Plan must include an outline of means and methods to demonstrate that contaminated subsoils have been removed.

- Attachment 8-2, Section 3.0: MWG must change the requirements for transportation of the CCR to comply with 35 Ill. Admin. Code 845.740(c) instead of 35 Ill. Admin. Code 809.201. The Transportation Plan must be submitted with the Retrofit construction permit application. Also see Comment Attachment 2-3.

- Attachment 8-2, Section 4.0: Estimate of maximum inventory of CCR must include CCR underlying the liner. MWG may either use the existing borings with CCR described in the boring logs from the KPRG Geotechnical Summary Letter dated October 13, 2005 or collect analytical data to determine the estimated bottom of CCR contaminated soils at the Bypass Basin.

- Attachment 8-1 and 8-2: Attachment 8-1 Section 7.0 is incorrect. Changes to the retrofit plan do not change a closure plan. The Section must be renamed "Amendments to Retrofit Plan". Closure plans must be amended under Section 845.720(a) as described in Attachment 8-2.

- General Comment, Attachment 9-1, 9-2, 9-3, 9-4, 9-5 and 9-0: Description of any structures that may or may not impede groundwater flow between the Illinois River and tributaries and the CCRSIs. Description of any structures that impede groundwater flow at any other location onsite to an offsite location. (37) (38) (39) (40) (41) (42) (43)

- General Comment, Attachment 9-1, 9-2, 9-3, 9-4, 9-5 and 9-0: field monitoring parameters and field procedures must be conducted in accordance with EQASOP-GW4, Low Stress Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells and all inorganic constituents collected must be collected as total recoverable metals pursuant to 35 Ill. Admin. Code 845.640(i).

- Attachment 9-0, Figure 9-1, 9-10 to 9-17: MWG must update the Monitoring well map with designations of wells installed in separate units or provide multiple maps for the monitoring well network in each unit.

- Attachment 9-0, Figure 9-8: MWG must update the hydrograph of groundwater elevations to discern between the hydrostratigraphic units in accordance with the aforementioned comments on the multi-unit groundwater monitoring system.

- Attachment 9-0 , Figures 9-10, 9-11, 9-12, 9-13, 9-14, 9-15, 9-16, and 9-17: Surface water elevations in Lost Creek along the east side of the CCRSIs must be monitored during sampling events at the site. A staff gage must be installed in the western drainage ditch.

- Attachment 9-0, Figures 9-10, 9-11, 9-12, 9-13, 9-14, 9-15, 9-16, and 9-17: Surface water elevation data from the Illinois River must be accounted for and interpreted on potentiometric surface maps for the purpose of depicting the surface water groundwater interaction and potential for releases of groundwater directly to surface water.

- Attachment 9-0, Figure 9-18: Constituents remaining from the previously approved GMZ under Part 620 must be addressed as part of the request to terminate post-closure care under Section 845.780(e).

- Attachment 9-0, Tables: MWG must add a table or graph exhibiting the USGS staff gage data for the preceding 3 years. The USGS staff gage USGS 05568500 Kingston Mines, Illinois is closest to the facility.

- Attachment 9-0, Table 9-2: MWG must update groundwater flow for temporary directional changes due to Illinois River flooding.

- Attachment 9-0, Table 9-4 and 9-5: MWG must update for well designations and new wells installed in accordance with previous comments on the multi-unit groundwater monitoring system.

52) 51) 50) 49) 48) 47) 46)

- Attachment 9-1: Well location map must be provided and any available elevation data associated with the specific wells presented must be provided for review of Attachment 9-1.

- Attachment 9-2: Boring log and well location map must be provided and any available elevation data must be included for review to be conducted.

- Attachment 9-3: Groundwater analytical data must be determined using laboratory reports and chains of custody to be of total recoverable metals and not filtered at any point during the field collection and laboratory analysis.

- Attachment 9-5: MWG must revise the GWPS to adhere to the 35 Ill. Admin. Code 845.640(f)(1). Trend or prediction limits cannot be used when Statistically Significant Increases (SSIs) are being calculated for each specific constituent. MWG must choose SSIs and a mean or median value for the background wells/35 Ill. Admin. Code 845.600(a)(1) GWPS or trend/prediction limit and comparison of each individual constituent value from each sampling event must be compared to the trend/prediction limit/35 Ill. Admin. Code 845.600(a)(1) GWPS, whichever is higher.

    - Attachment 9-5, Section 2.1: Outlier analysis cannot be performed on any data set that has less than 32 samples that have been verified as sampled pursuant to 35 Ill. Admin. Code 845.640 criteria and groundwater flow direction in the same direction for all samples being analyzed.

    - Attachment 9-5: MWG must revise the GWPS to adhere to the additional guidance provided to MWG on background wells and verify that the GWPS statistics were conducted in accordance with EPA QA/G-9S, Data Quality Assessment: Statistical Methods for Practitioners.

Should you have any questions or comments regarding the above, please contact Mark E. Liska at 217/524-3262 or at the above address.

As Illinois EPA completes our technical review of the construction retrofit permit application, we will communicate any further concerns that we identify with you.

Sincerely,

Darin E. LeCrone, P.E.
Manager, Permit Section
Division of Water Pollution Control

DEL:MEL:2021-100029 Bypass Retrofit Review.docx

cc: Hydrogeologic Compliance Unit/Groundwater Section
Peoria Region
Records Unit

Attachment 2

2016 History of Construction

Geosyntec consultants

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San Diego, CA 92127
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HISTORY OF CONSTRUCTION
ASH SURGE BASIN AND BYPASS BASIN
POWERTON STATION
OCTOBER 2016

Geosyntec Consultants (Geosyntec) prepared this history of construction report for the Ash Surge Basin and Bypass Basin located at the Powerton Station (Site) in Pekin, Illinois, which is owned and operated by Midwest Generation LLC (Midwest Generation). This history of construction report addresses the requirements of the Coal Combustion Residuals (CCR) Rule codified in the Code of Federal Regulations Title 40, Part 257, Subpart D. These regulations were published in the Federal Register on 17 April 2015 and became effective on 19 October 2015. This report identifies and addresses the specific requirements of §257.73(c) of the CCR Rule regarding preparing a history of construction report for CCR surface impoundments. Specifically, this report provides the history of construction through 17 October 2016 for the Ash Surge Basin and Bypass Basin.

This report was prepared under the direction of Ms. Jane Soule, P.E., and was reviewed in accordance with Geosyntec's internal review policy by Mr. Robert White of Geosyntec.

1. CCR Rule Requirements for History of Construction

History of construction requirements for existing CCR surface impoundments are included in the structural integrity criteria presented in §257.73 of the CCR Rule. The preamble of the CCR Rule (Page 21380) states that the history of construction for an existing CCR impoundment (in this case, the Ash Surge Basin and Bypass Basin) is required to include information only to the extent available and that only factual documentation, not anecdotal or speculative information, is to be included. Additionally, the preamble states that no new information should be generated to satisfy the requirements of §257.73(c).

2. History of Construction

2.1 Owner and Unit Identification - §257.73 (c)(1)(i)

Owner and unit identification for the Ash Surge Basin and Bypass Basin are presented in Table 1 below.

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Table 1: Owner and Unit Identification

UNIT NAME	OWNER/OPERATOR	IDENTIFICATION NUMBER
Ash Surge Basin	Midwest Generation 804 Carnegie Center Princeton, NJ 08540	IL0002232-001
Bypass Basin	Midwest Generation 804 Carnegie Center Princeton, NJ 08540	IL0002232-001

2.2 Unit Location on USGS Map – §257.73 (c)(1)(ii)

The Site is located south of the Illinois River in the Pekin, Illinois. Figure 1 presents the location of the Ash Surge Basin and Bypass Basin on a 7.5-minute United States Geological Survey (USGS) topographic quadrangle map.

2.3 Purpose of the CCR Units – §257.73 (c)(1)(iii)

2.3.1 Ash Surge Basin

The Ash Surge Basin serves as a settling pond for sluiced CCR and other process waters related to electrical power generation at the Site.

2.3.2 Bypass Basin

The Bypass Basin serves as a settling pond for sluiced CCR and other process waters related to electrical power generation at the Site when the Ash Surge Basin is temporarily out of service for maintenance.

2.4 Name and Size of the Watershed – §257.73 (c)(1)(iv)

The Ash Surge Basin and the Bypass Basin are located in the Pekin Lake – Illinois River subwatershed (HUC12 071300030304), which is approximately 28,847 acres in size (USGS, 2015). However, surface water run-on to the basins is limited to the area within the embankment crests because the basins are constructed with elevated embankments surrounding them.

2.5 Description of Foundation– §257.73 (c)(1)(v)

The Ash Surge Basin and the Bypass Basin were constructed with fill embankments on all sides. Because no formational materials provide lateral structural support for the embankments, the

basins do not contain abutments. The remainder of this section addresses the foundation materials for the basins' embankments.

Information regarding the foundation materials at the Site is derived from geotechnical and hydrogeological investigations and engineering analyses (KPRG, 2005, Patrick Engineering, 2011, Geosyntec, 2016).

2.5.1 Properties of Foundation Materials

Foundation materials in the vicinity of the Ash Surge Basin and Bypass Basin generally consist of an interlayering of sandy and clayey units (KPRG, 2005). Publically available geologic information shows that the Site is underlain by approximately 100 to 125 feet of alluvial sands and gravels with some minor clay (Patrick Engineering, 2011). Logs from wells installed in the embankments of the Ash Surge Basin, as well as borings and cone penetration test (CPT) soundings in the vicinity of the basins, indicate silt and clay layers under the embankment fill (Patrick Engineering, 2011; Geosyntec, 2016). Well logs, boring logs, and CPT soundings show the thickness of the silt and clay layers ranging from 16 to 20 feet with approximately 34 to 43 feet of medium dense poorly graded sand and gravel below (Patrick Engineering 2011, Geosyntec, 2016). One boring and one CPT located east of the Ash Surge Basin indicated the presence of a layer of very hard lean clay below the poorly graded sand and gravel (Geosyntec, 2016).

2.5.2 Engineering Properties of Foundation

For engineering analyses, the foundation materials for the Ash Surge Basin and Bypass Basin were considered to either be clay or sand. Table 2 presents engineering properties for the clay and sand materials at the Site developed for the periodic structural stability and safety factor assessments (Geosyntec, 2016). These engineering properties are based on investigations performed at the Site, published correlations, and laboratory testing of samples collected from foundation soils during the Site investigations. Engineering properties were not developed for the very hard lean clay layer due to its relative depth below the ground surface and negligible contribution to the slope stability analyses.

Table 2: Foundation Material Engineering Properties

MATERIAL	UNIT WEIGHT (PCF)	DRAINED FRICTION ANGLE (DEGREES)	EFFECTIVE COHESION (PSF)	UNDRAINED SHEAR STRENGTH (PSF)
Clay	115	32	25	600
Sand	125	32	0	--

2.6 Description of the Materials, Methods, and Dates of Construction - §257.73 (c)(1)(vi)

The following sections describe the type, size, range, and physical and engineering properties of the materials used in constructing each zone or stage of the Ash Surge Basin and Bypass Basin, the method of site preparation and construction of each zone of the unit, and the approximate dates of construction of each successive stage of construction of the unit to the extent the information is available.

Information presented in the following sections is based on available construction drawings (NUS, 1978 and NUS, 1980) and subsequent investigations at the site. No as-built construction drawings or construction completion reports detailing the actual materials and methods used for the original construction of the basins were available for this report.

2.6.1 Ash Surge Basin

Based on the available construction drawings (NUS, 1978), embankments for the Ash Surge Basin were designed to be constructed using compacted fill. Additional detail of the compacted fill is included in prior investigations at the site (Patrick, 2011 and Geosyntec, 2016). The top of the embankment was designed to be 20 feet wide and have a gravel surfaced access road (NUS, 1978). The maximum height of the embankment is approximately 26 feet (measured from crest to downstream toe) in the northeast corner of the basin.

Interior embankments were designed at an inclination of 3H:1V (horizontal:vertical) and were originally lined with a geomembrane (Hypalon) liner (NUS, 1978). However, as-built subgrade topography from liner replacement construction in 2013 show interior slopes are inclined at approximately 4H:1V (NRT, 2014). The impoundment floor and portions of the slopes, including the southern slope below the inlet distribution trough, were lined with a Poz-O-Pac™ liner system to be installed in two 6-inch lifts (NUS, 1978). A description of the Poz-O-Pac™ liner system is not included in the Construction Drawings for the Ash Surge Basin, but is included in information provided from the available construction drawings for the Bypass Basin (NUS, 1980). In 2013, the membrane liner (and limited portions of the Poz-O-Pac liner near the outlet weir) were removed and replaced with a high-density polyethylene (HDPE) geomembrane liner (NRT, 2014). Exterior slopes were designed at 3H:1V or flatter.

2.6.2 Bypass Basin

A description of the embankment fill that was specified for the Bypass Basin is included in the available construction drawings for the Bypass Basin (NUS, 1980). Fill was specified to be placed and compacted in loose lifts not to exceed 9 inches and compacted to 95 percent relative compaction when compared to a maximum dry density obtained from a Modified Proctor test (NUS, 1980). Embankment construction for the Bypass Basin involved building the southern and

eastern embankments because the northern and western embankments are shared with previously constructed surface impoundments (CCR and non-CCR). The design width for the top of the embankment ranged from 12 to 18 feet and the maximum slope height is approximately 24 feet on the west side of the basin where the embankment is shared by the East Roof and Runoff Basin.

Interior embankments for the Bypass Basin were designed at an inclination of 3H:1V and were originally lined with a membrane (Hypalon) liner. The impoundment floor was lined with a Poz-O-Pac™ liner system (as described previously). In 2010, the original liner was removed and replaced with an HDPE geomembrane liner (NRT, 2011). Exterior slopes were designed at 2.5H:1V or flatter (NUS, 1980).

2.6.3 Engineering Properties

Engineering properties for the Embankment Fill used for the design and construction of the Ash Surge Basin and Bypass Basin embankment materials were not available at the time of this report. However, engineering properties were estimated for the Embankment Fill for use in the factor of safety assessment performed for the basins in accordance with the CCR Rule. The estimated engineering properties were based on investigations performed at the Site, published correlations, and laboratory testing of embankment materials and are presented in Geosyntec (2016) and reproduced in Table 3.

Table 3: Embankment Fill Engineering Properties

MATERIAL	UNIT WEIGHT (PCF)	DRAINED FRICTION ANGLE (DEGREES)	EFFECTIVE COHESION (PSF)
Embankment Fill	125	35	25

2.6.4 Construction Dates

Exact dates for construction of the Ash Surge Basin embankments, original liner system, and appurtenant structures are unknown; however, construction drawings were approved for construction in December 1978 (NUS, 1978). Replacement of the original liner system for the Ash Surge Basin was completed in 2013 (NRT, 2014).

Exact dates for construction of the Bypass Basin embankments, original liner system, and appurtenant structures are also unknown; however, construction drawings were approved for construction in June 1980 (NUS, 1980) and indicate that construction of the Ash Surge Basin was complete prior to design of the Bypass Basin. Replacement of the original liner system for the Bypass Basin was completed in 2010 (NRT, 2011).

2.7 Drawings - §257.73 (c)(1)(vii)

Available construction drawings relevant to the design, construction, operation, and maintenance of the Ash Surge Basin and the Bypass Basin are included in Appendix A and Appendix B, respectively. Appendix A-1 includes the available construction drawings for the Ash Surge Basin (NUS, 1978) and Appendix A-2 includes the construction record drawings for the liner replacement activities conducted in 2013 (NRT, 2014). Appendix B-1 includes the available construction drawings for the Bypass Basin (NUS, 1978) and Appendix B-2 includes the construction record drawings for the liner replacement activities conducted in 2010 (NRT, 2011).

2.8 Instrumentation - §257.73 (c)(1)(viii)

Instrumentation monitored for operation of the Ash Surge Basin and Bypass Basin includes a water level monitoring system. The water level monitoring system includes an ultrasonic level detector located in the pump house sump north of the Ash Surge Basin which is connected to contactors that control the pumps to maintain operational water levels in the basins.

2.9 Area-Capacity Curve - §257.73 (c)(1)(ix)

Area-capacity curves for the Ash Surge Basin and the Bypass Basin are included as Figure 2.

2.10 Spillway Description and Calculations - §257.73 (c)(1)(x)

A concrete spillway is located along the eastern perimeter of the Ash Surge Basin. The spillway is constructed of two 4.5-foot wide concrete box culverts beneath the perimeter access road (NUS, 1978). A concrete apron is located east of the box culvert and rip rap is located downstream of the apron. Calculations for the original design of the Ash Surge Basin spillway were not available at the time of this report.

The Bypass Basin includes a corrugated metal overflow pipe located along the northern interior slope of the basin that extends approximately 40 feet northward beneath the access road into the Ash Surge Basin. This overflow pipe includes a 5-foot diameter corrugated metal pipe vertical riser which connects to a 30-inch diameter concrete pipe that extends northward within the embankment between the Bypass and Ash Surge Basins and discharges onto the concrete apron on the southern slope of the Ash Surge Basin. Calculations for the original design of the Bypass Basin overflow pipe were not available at the time of this report.

2.11 Construction Specifications and Provisions for Surveillance, Maintenance and Repair - §257.73 (c)(1)(xi)

The only construction specifications available for this report are the HDPE geomembrane specifications for the liner replacement projects performed in 2010 and 2013 for the Bypass Basin and Ash Surge Basin, respectively. Generally, the HDPE geomembrane specifications identify that an HDPE, white, 60-mil, textured geomembrane be used for the projects. They also identify deployment and seaming requirements, quality control procedures, and requirements for materials placed above the geomembrane. The geomembrane specifications are included in Appendices C and D for the Ash Surge Basin and Bypass Basin, respectively.

As part of the 2010 and 2013 liner replacement projects, warning posts were installed at the toe of interior basin slopes above the geomembrane liner system. These posts are utilized as a visual guide to identify the toe of slope during CCR removal operations to limit potential damage to the liner system.

2.12 Record of Any Structural Instability - §257.73 (c)(1)(xii)

Based on our discussions with Site staff and review of the construction documentation provided herein, there are no records or knowledge of structural instability for the Ash Surge Basin and the Bypass Basin.

3. References

Geosyntec, 2016. Soil Properties Calculation, Ash Surge Basin and Bypass Basin, Powerton Station. October.

KPRG and Associates, Inc., 2005. Geotechnical Analysis of Soil Surrounding Settling Basins/Ponds, KPRG Project No. 15805, October.

Natural Resource Technology (NRT), 2011. Construction Documentation Transmittal – Metal Cleaning Basin and Bypass Basin Liner Replacement, dated 27 June 2011.

NRT, 2014. Construction Documentation Transmittal – Ash Surge Basin Liner Replacement, Midwest Generation Powerton Generation Station, dated 18 July 2014.

NUS Corporation (NUS), 1978. Waste Water Treatment Facility Drawings:

Detail Plan, Ash Surge Basin, Sheet No. 3B-0-2071, redrawn from NUS Dwg. #5080 C 5007 1 of 1, 1978.

Ash Surge Basin, Sections & Details, Sheet No. 3B-0-2075, redrawn from NUS Dwg. # 5080 C 5012 1 of 1, 1978.

Miscellaneous Sections & Details, NUS Dwg. # 5080 C 5015 1 of 2, Rev 2, 1978.
Sludge Weirs, Sections & Details, Sheet No. 3B-0-2089, redrawn from NUW Dwg. #C 5080 C 5506, 1 of 1, 1978.
Ramps & Ash Surge Basin, Overflow Structure, Sheet No. 3B-0-2090, redrawn from NUW Dwg. #5080 C 5507 1 of 1, 1978.
Ash Surge Basin and Limestone Basin Dist. Troughs – Sections, Sheet No. 3B-0-2092, redrawn from NUS Dwg. #5080 C 5509 1 of 1, 1978.
Ash Surge Basin, Wing Wall – Sheet No. 3B-0-2093, redrawn from NUS Dwg dated 1978.
Dewatering Bin Overflow Channel, Sections & Details, Sheet No. 3B-0-2094, redrawn from NUS Dwg # 5080 C 5511 1 of 1, 1978.
Ash Surge Basin, Sump – Soil Profile, Sheet No. 3B-0-2106, redrawn from NUS Dwg # 5080 C 5586 1 of 1, 1978.
Site Plan, East Roof & Yard Runoff Basin, Sheet No. 3B-0-2067, redrawn from NUS Dwg. #5080 C 5002 1 of 1, 1978.

NUS, 1980. Waste Water Treatment Facilities Powerton:
Ash Surge Basin By Pass Plan and Profile, Sheet No. 5295 C 5001.
Ash Surge Basin By Pass Sections and Ramp Profiles, Sheet No. 5295 C 5002.
Ash Surge Basin By Pass Miscellaneous Details, Sheet No. 5295 C 5003.
Ash Surge Basin By Pass Basin Inlet Structure, Sheet No. 5295 C 5501.
Ash Surge Basin By Pass Basin Outlet Structure, Sheet No. 5295 C 5502.
Ash Surge Basin By Pass Basin Miscellaneous Slide Gates, Sheet No. 5295 C 5503.

Patrick Engineering, 2011. Hydrogeological Assessment Report, Powerton Generating Station, Pekin, Illinois, Patrick Project No. 21053.070, February.

USGS (2015). "Watershed Boundary Dataset," accessed via The National Map, http://viewer.nationalmap.gov/viewer/nhd.html?p=nhd, accessed 1 February 2016.

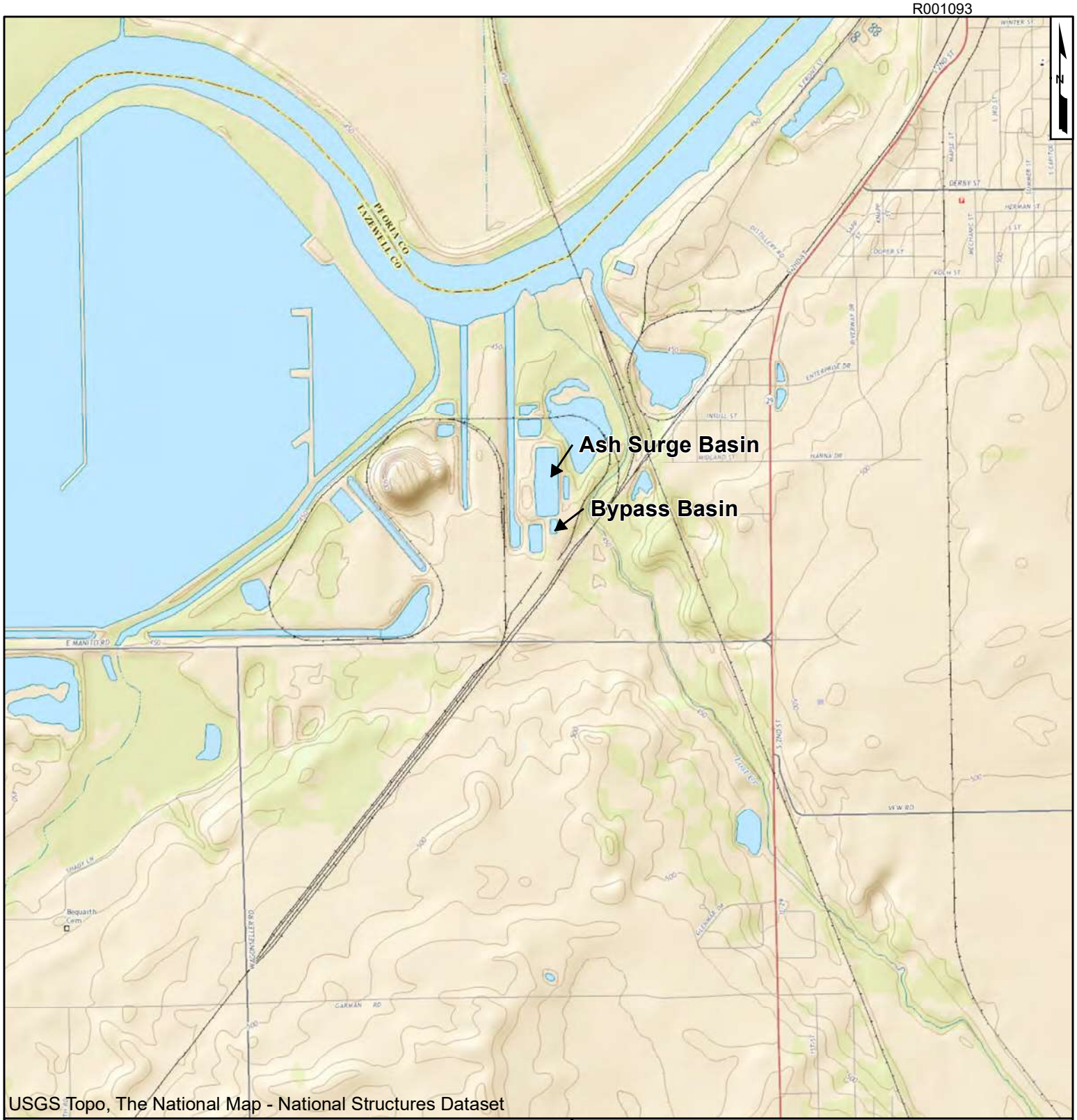
Attachments

Figure 1 – Site Location
Figure 2 – Area-Capacity Curves
Appendix A – Ash Surge Basin Construction Drawings
Appendix A-1 NUS Construction Drawings
Appendix A-2 Liner Replacement Drawings
Appendix B – Ash Surge Basin Construction Drawings

Appendix B-1 NUS Construction Drawings
Appendix B-2 Liner Replacement Drawings
Appendix C – Ash Surge Basin Liner Replacement Specifications
Appendix D – Bypass Basin Liner Replacement Specifications

engineers | scientists | innovators

R001093





2,000 1,000 0 2,000 Feet

Site Location

Ash Surge and Bypass Basins
Powerton Station
Pekin, Illinois

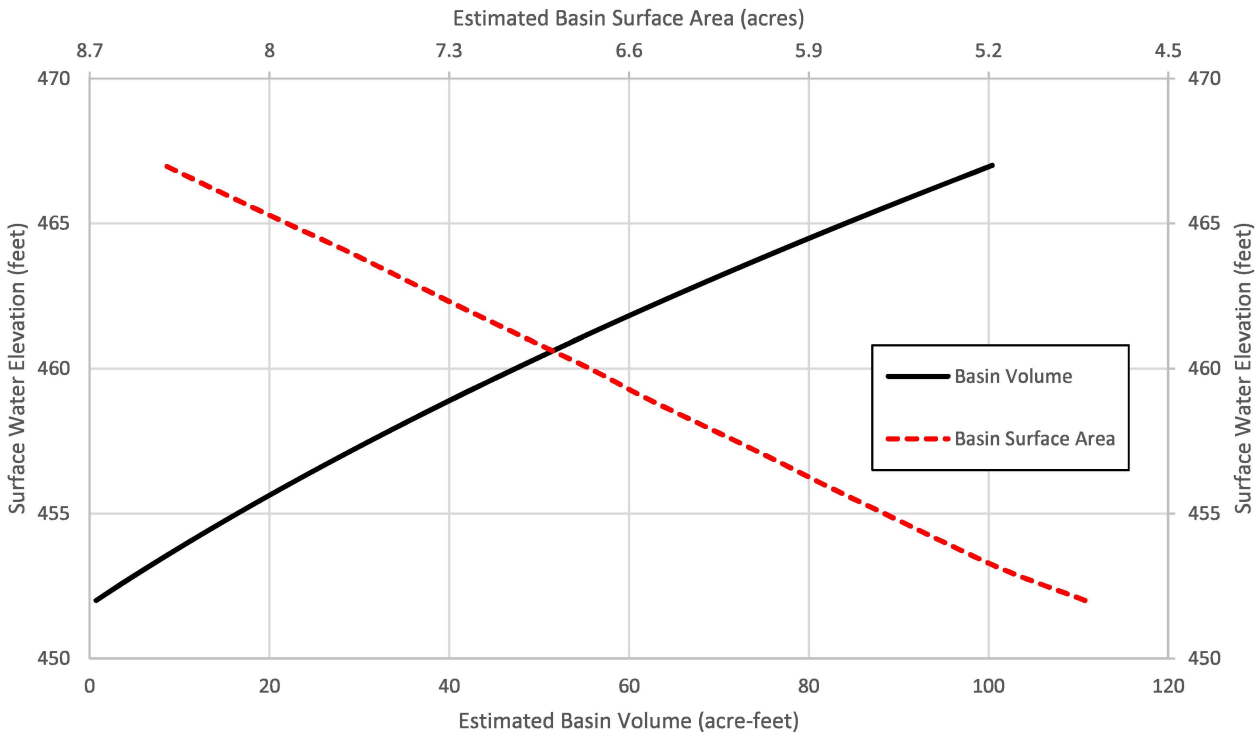
Geosyntec consultants

San Diego | October 2016

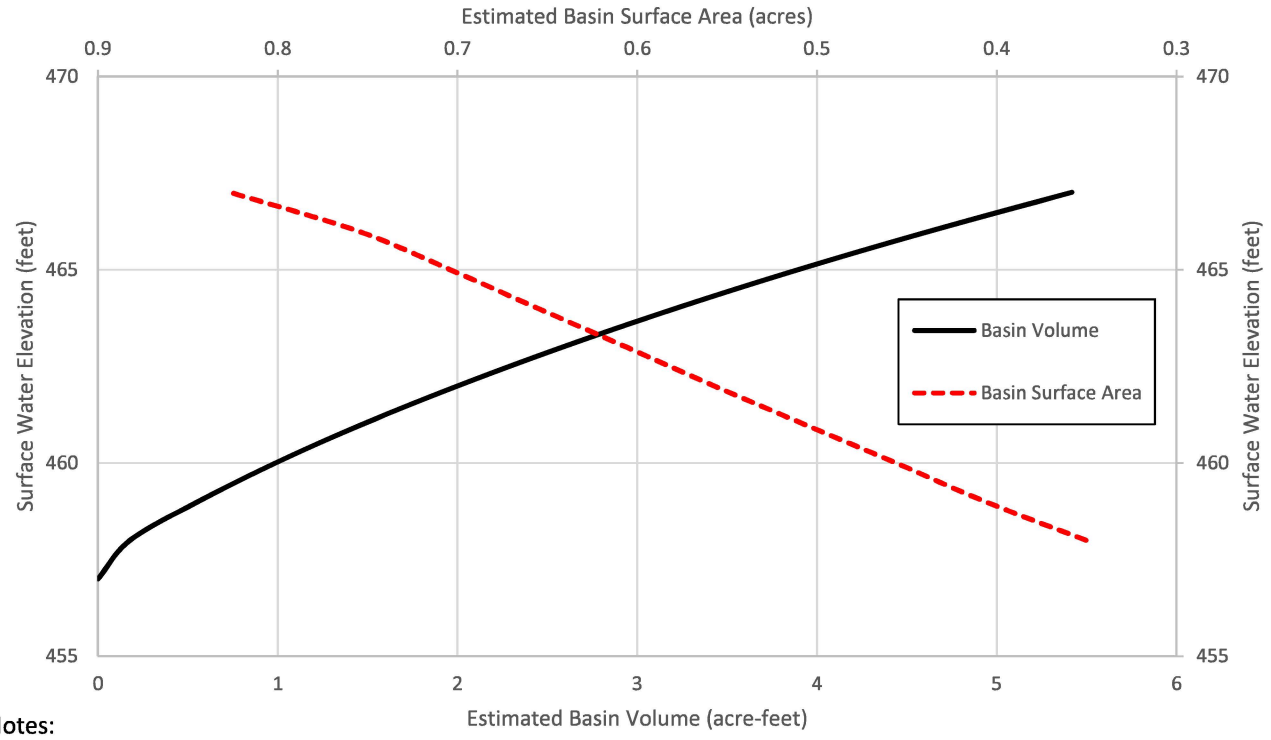
Figure 1

K:\GIS\PowertonSiteLocation.mxd Name

Ash Surge Basin



Bypass Basin



Notes:
(1) Surface water elevations are NAD83.
(2) Basin volumes are estimated based on as-built information and 2008 site topography.

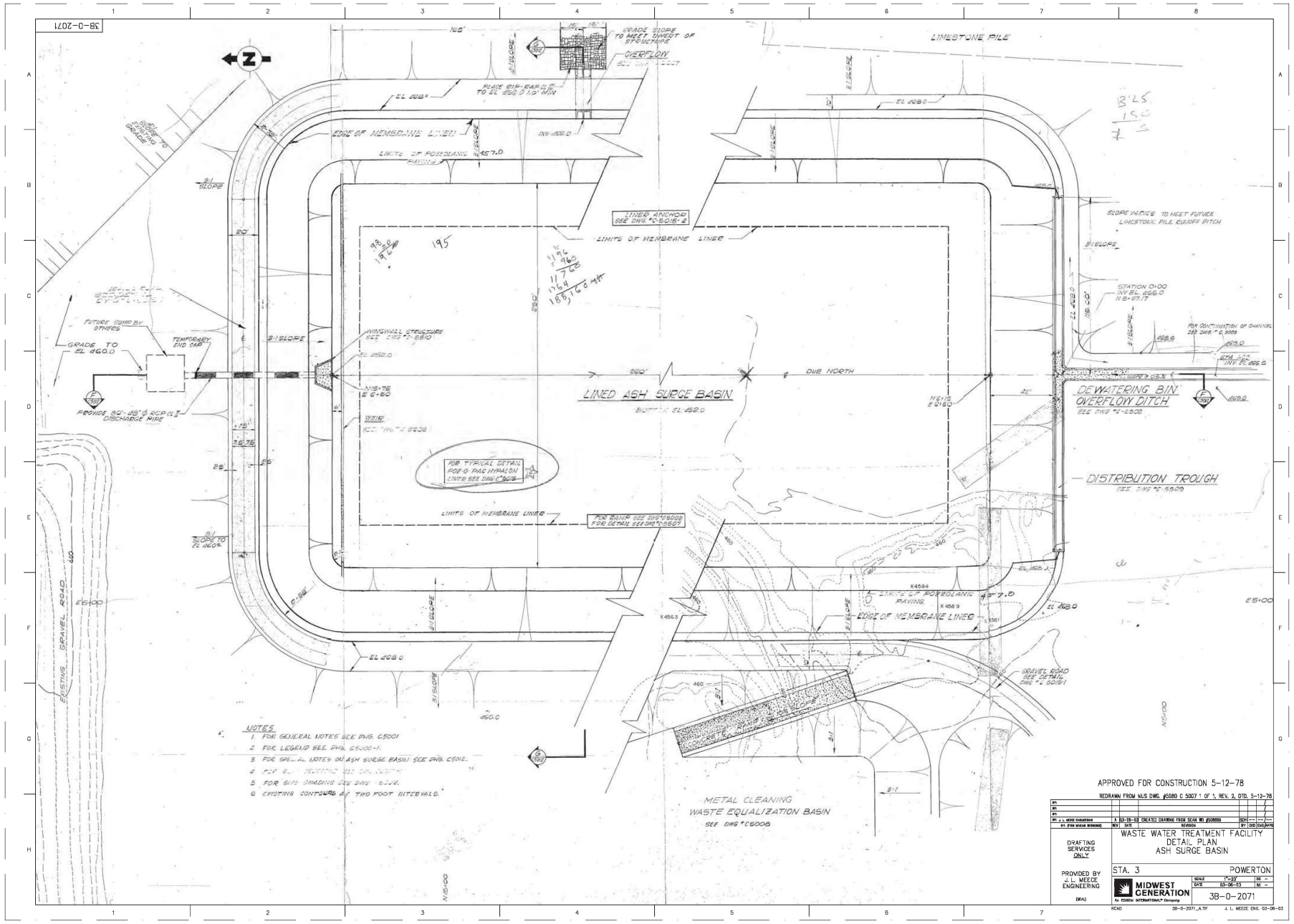
Geosyntec consultants OCTOBER 2016 SW0251-07	AREA-CAPACITY CURVES ASH SURGE & BYPASS BASINS POWERTON STATION PEKIN, ILLINOIS	**FIGURE 2**

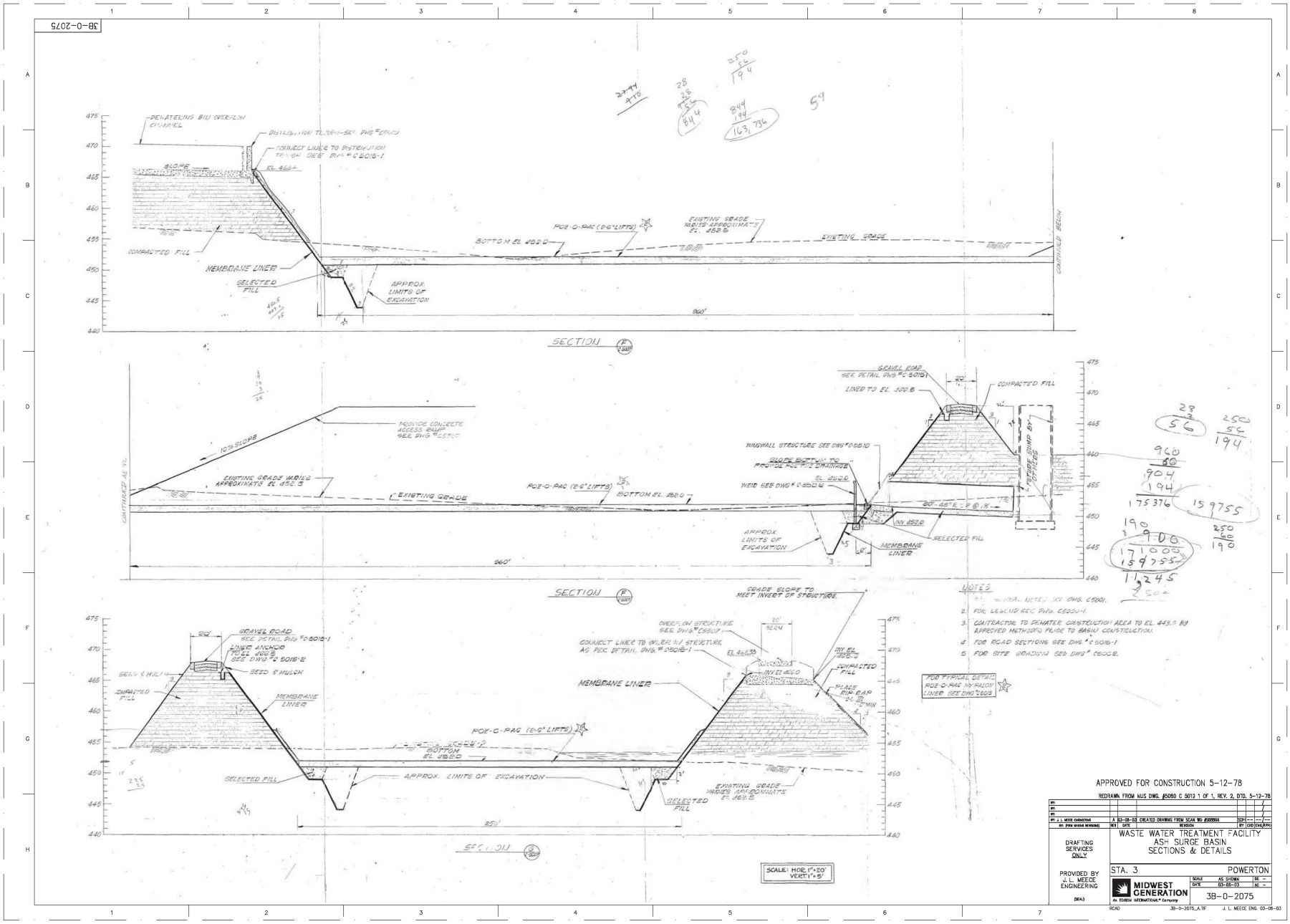
APPENDIX A

Ash Surge Basin Construction Drawing

APPENDIX A-1

NUS Construction Drawings


3B-0-2071
LIMESTONE PILE
GRADE SLOPE TO MEET INVERT OF STRUCTURE
OVERFLOW
EDGE OF MEMBRANE LINER
LIMITS OF POZZOLANIC PAVING
LINER ANCHOR SEE DWG. #C-5015-2
LIMITS OF MEMBRANE LINER
SLOPE VARIES TO MEET FUTURE LIMESTONE PILE RUNOFF DITCH
STATION 0+00 INV EL. 466.0 N 8+67.17
FOR CONTINUATION OF CHANNEL SEE DWG. #C-5005
FUTURE SUMP BY OTHERS
TEMPORARY END CAP
GRADE TO EL 460.0
PROVIDE 80'-48" Ø RCP CL II DISCHARGE PIPE
WINGWALL STRUCTURE SEE DWG #C-5810
DUE NORTH
LINED ASH SURGE BASIN
BOTTOM EL 452.0
DEWATERING BIN OVERFLOW DITCH
SEE DWG #C-5508
WEIR
FOR TYPICAL DETAIL POZ-O-PAC HYPALON LINER SEE DWG C-5015
DISTRIBUTION TROUGH
SEE DWG #C-5509
LIMITS OF MEMBRANE LINER
FOR RAMP SEE DWG #C5002 FOR DETAIL SEE DWG #C-5507
LIMITS OF POZZOLANIC PAVING
EDGE OF MEMBRANE LINER
GRAVEL ROAD SEE DETAIL DWG #C-5015-1
EXISTING GRAVEL ROAD
CONCRETE RAMP
METAL CLEANING WASTE EQUALIZATION BASIN
SEE DWG #C5008
NOTES
1. FOR GENERAL NOTES SEE DWG. C5001
2. FOR LEGEND SEE DWG. C5000-1.
3. FOR SPECIAL NOTES ON ASH SURGE BASIN SEE DWG. C5012.
5. FOR SITE GRADING SEE DWG. C5002.
6. EXISTING CONTOURS AT TWO FOOT INTERVALS.
APPROVED FOR CONSTRUCTION 5-12-78
REDRAWN FROM NUS DWG. #5080 C 5007 1 OF 1, REV. 2, DTD. 5-12-78
A 03-06-03 CREATED DRAWING FROM SCAN WO #5008886
REV DATE REVISION BY DSD CHK APPR
DRAFTING SERVICES ONLY
PROVIDED BY J. L. MEECE ENGINEERING (SEAL)
WASTE WATER TREATMENT FACILITY
DETAIL PLAN
ASH SURGE BASIN
STA. 3
POWERTON
MIDWEST GENERATION
An EDISON INTERNATIONAL Company
SCALE 1"=20'
DATE 03-06-03
3B-0-2071
RCAD 3B-0-2071_A.TIF
J. L. MEECE ENG. 03-06-03



3B-0-2075
DEWATERING BIN OVERFLOW CHANNEL
DISTRIBUTION TRENCH-SEE DWG # C5010
CONNECT LINER TO DISTRIBUTION TRENCH SEE DWG # C5015-1
SLOPE
EL. 462.4
COMPACTED FILL
MEMBRANE LINER
SELECTED FILL
APPROX. LIMITS OF EXCAVATION
POZ-O-PAC (2-6" LIFTS)
BOTTOM EL. 452.0
EXISTING GRADE VARIES APPROXIMATE EL. 452.5
EXISTING GRADE
CONTINUED BELOW
960'
SECTION F
PROVIDE CONCRETE ACCESS RAMP SEE DWG # C5510
10% SLOPE
EXISTING GRADE VARIES APPROXIMATE EL. 452.5
EXISTING GRADE
POZ-O-PAC (2-6" LIFTS)
BOTTOM EL. 452.0
WINGWALL STRUCTURE SEE DWG # C5510
SLOPE BOTTOM TO PROVIDE POSITIVE DRAINAGE
EL. 452.0
WEIR SEE DWG # C5510
GRAVEL ROAD SEE DETAIL DWG # C5015-1
LINER TO EL. 462.5
COMPACTED FILL
FUTURE SUMP BY OTHERS
INV. 452.0
SELECTED FILL
MEMBRANE LINER
APPROX. LIMITS OF EXCAVATION
960'
SECTION F
GRADE SLOPE TO MEET INVERT OF STRUCTURE.
GRAVEL ROAD SEE DETAIL DWG # C5015-1
LINER ANCHOR TO EL. 462.5 SEE DWG # C5015-2
SEED & MULCH
COMPACTED FILL
MEMBRANE LINER
POZ-O-PAC (2-6" LIFTS)
BOTTOM EL. 452.0
SELECTED FILL
APPROX. LIMITS OF EXCAVATION
OVERFLOW STRUCTURE SEE DWG # C5507
CONNECT LINER TO OVERFLOW STRUCTURE AS PER DETAIL DWG # C5015-1
EL. 462.50
INV. EL. 462.0
COMPACTED FILL
PLACE RIP-RAP
EXISTING GRADE VARIES APPROXIMATE EL. 452.5
SELECTED FILL
250'
SECTION G
SCALE: HOR. 1"=20' VERT. 1"=5'
NOTES
1. FOR GENERAL NOTES SEE DWG. C5001.
2. FOR LEGEND SEE DWG. C5000-1.
3. CONTRACTOR TO DEWATER CONSTRUCTION AREA TO EL. 443.0 BY APPROVED METHOD(S) PRIOR TO BASIN CONSTRUCTION.
4. FOR ROAD SECTIONS SEE DWG. # C5015-1
5. FOR SITE GRADING SEE DWG # C5008.
FOR TYPICAL DETAIL POZ-O-PAC MY PALON LINER SEE DWG # C5013
APPROVED FOR CONSTRUCTION 5-12-78
REDRAWN FROM NUS DWG. #5080 C 5012 1 OF 1, REV. 2, DTD. 5-12-78
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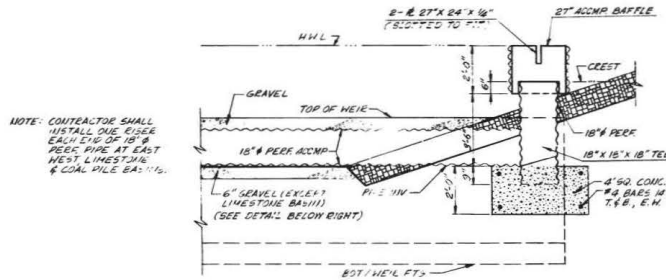
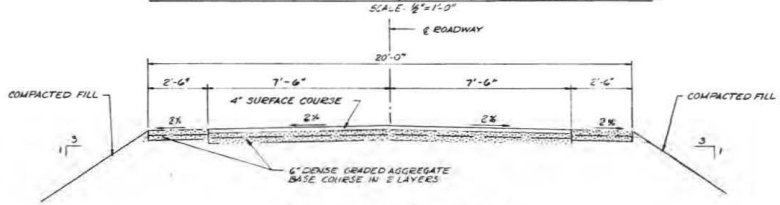
WASTE WATER TREATMENT FACILITY
ASH SURGE BASIN
SECTIONS & DETAILS
DRAFTING SERVICES ONLY
PROVIDED BY J. L. MEECE ENGINEERING
STA. 3
POWERTON
MIDWEST GENERATION
An EDISON INTERNATIONAL Company
SCALE AS SHOWN
DATE 03-06-03
3B-0-2075
RCAD 3B-0-2075_A.TIF
J. L. MEECE ENG. 03-06-03

R001098



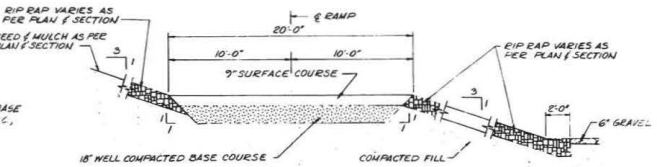
☆ TYP. SECTION-RISER & BAFFLE FOR PERF PIPE

SCALE: 1/2"=1'-0"



TYPICAL ROAD SECTION

SCALE: HOR. 1"=2' VERT. 1"=1'



TYPICAL SECTION GRAVEL RAMP

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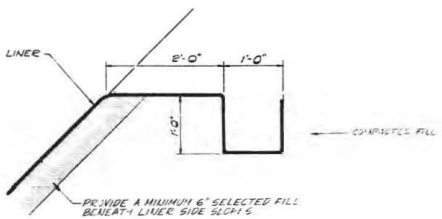
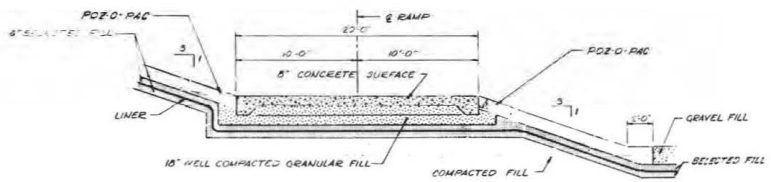
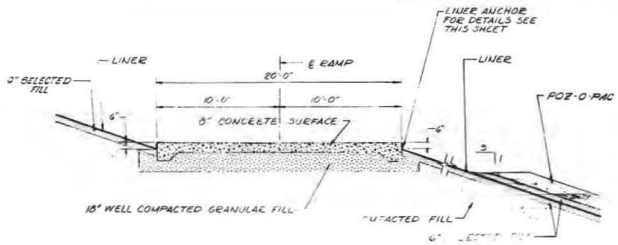




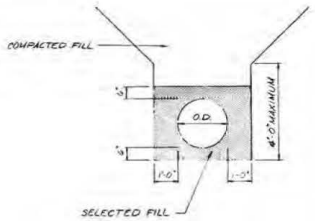
TYPICAL CONCRETE RAMP SECTION LINER BELOW RAMP



TYPICAL CONCRETE RAMP SECTION LINER ON GRADE

SCALE 1"=4'

FOR TYPICAL SECTION SEE DWG. 5055



PIPE BEDDING DETAIL

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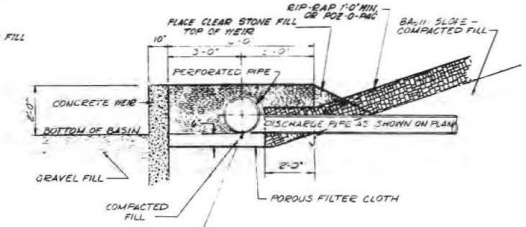

PERFORATED PIPE BEDDING DETAIL

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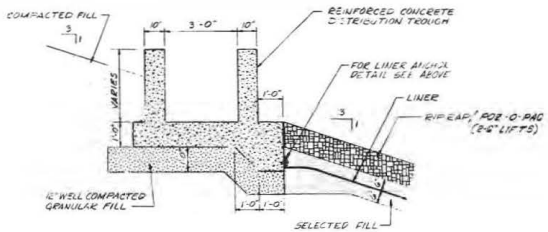


LINER ANCHOR DETAILS

NO SCALE

LINER ANCHORAGE FOR DISTRIBUTION TROUGH

SCALE: 1"=2'

NOTES:

1. FOR GENERAL NOTES SEE DWG. 2-5001
2. FOR LEGEND SEE DWG. 2-5000-1

GRAPHIC SCALE

Sudhakar P. Verma 51178

DRAWING STATUS

APPROVED FOR CONSTRUCTION

Date 12/19/78

DESIGN	A. Tzou	11/77	
CHECKED			
CIVIL ENGINEER			
DESIGN GROUP APPR.			
APPROVAL			
APPROVAL FROM			
APPROVAL CLIENT			

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES
POWERTON

MISCELLANEOUS SECTIONS & DETAILS

CECO CONTRACT: 802467

CECO DWG. NO.

DRAWING NO. 5080 C 5015

NUS CORPORATION ROCKVILLE, MD.

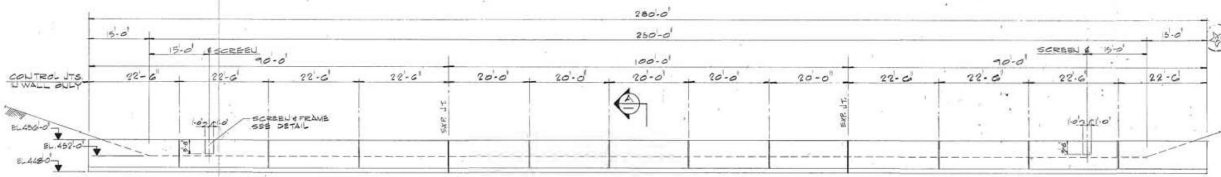
SCALE: AS SHOWN

SHEET 1 OF 2

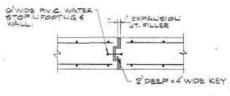
3	CONSTRUCTION	12-19-78	AW
2	ADDED RISER BAFFLE DETAIL	7-7-78	AW
1	ISSUED WITH 5 DWGS ON NO. 6-3837-3	6-23-78	AW

38-0-2089

REFERENCE DRAWINGS	
WEIR LOCATION	CIVIL DWG. NO.
ASH SURGE BASIN	5080 C 5007
METAL CLEANING	5080 C 5008
LIMESTONE BASIN	5080 C 5008
WEST YARD BASIN	5080 C 5015
EAST ROOF & YARD BASIN	5080 C 5005
COAL PILE	5080 C 5006



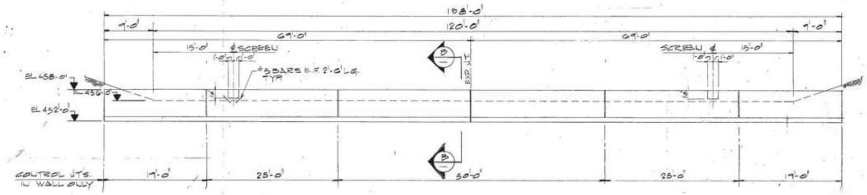
ASH SURGE BASIN WEIR
SCALE: 1/8" = 1'-0"



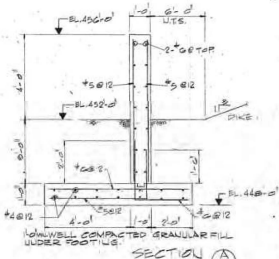
EXPANSION JOINT
(IN WALL & FOOTING)



CONTROL JOINT

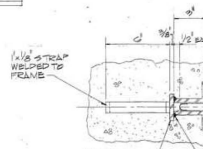


METAL CLEANING EQUALIZATION BASIN WEIR
SCALE: 1/8" = 1'-0"

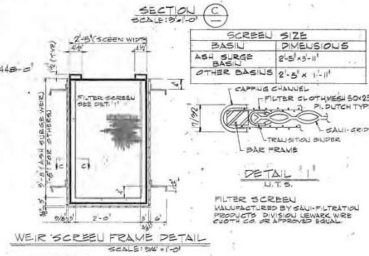


SECTION
SCALE: 1/2" = 1'-0"

ASH SURGE BASIN WEIR
BASIN CONSTRUCTION AS PER DWG. 5080 C 5012 & SPECS.



NOTE: ALL EXPOSED STEEL TO BE GALVANIZED



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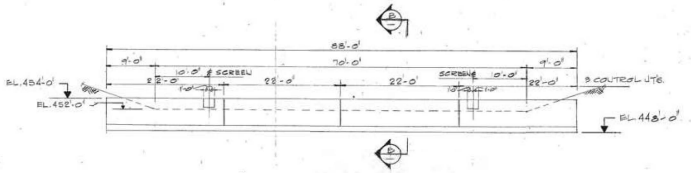
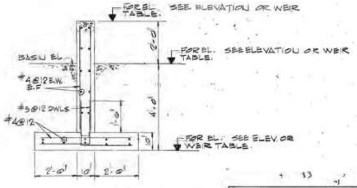
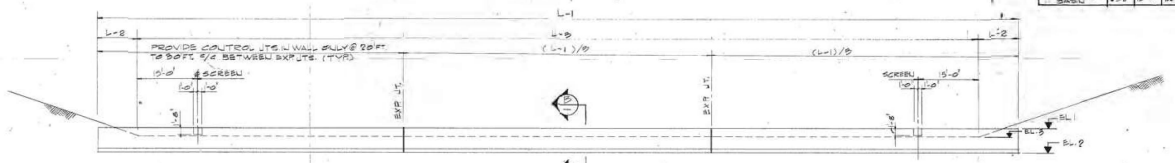


LIMESTONE RUNOFF BASIN WEIR
SCALE: 1/8" = 1'-0"



SECTION
SCALE: 1/2" = 1'-0"

WEIR TABLE						
LIMIT OF BASIN	L-1	L-2	L-3	EL. 1	EL. 2	EL. 3
WEST YARD BASIN	268'	9'-0"	250'	460'	449'	447'
EAST YARD BASIN	198'	7'-0"	180'	447'	441'	445'
COAL PILE BASIN	292'	13'-0"	806'	445'	434'	449'



TYPICAL WEIR FOR
WEST YARD BASIN
EAST ROOF & YARD BASIN
COAL PILE BASIN
SCALE: 1/32" = 1'-0"

DRAWING STATUS
APPROVED FOR CONSTRUCTION
4/1/03 Date

REDRAWN FROM NUS DWG. #5080 C 5506 1 OF 1, REV. 2, DTD. 8-7-78

BY	DATE	REVISION	BY	CKD	ENG. APPR.
BY J. L. MEECE ENGINEERING	3-28-03	CREATED DRAWING FROM SCAN NO. #5005506	SCH	--	--

DRAFTING SERVICES ONLY

PROVIDED BY J. L. MEECE ENGINEERING

DEAL

WASTE WATER TREATMENT FACILITY
SLUDGE WEIRS
SECTIONS & DETAILS

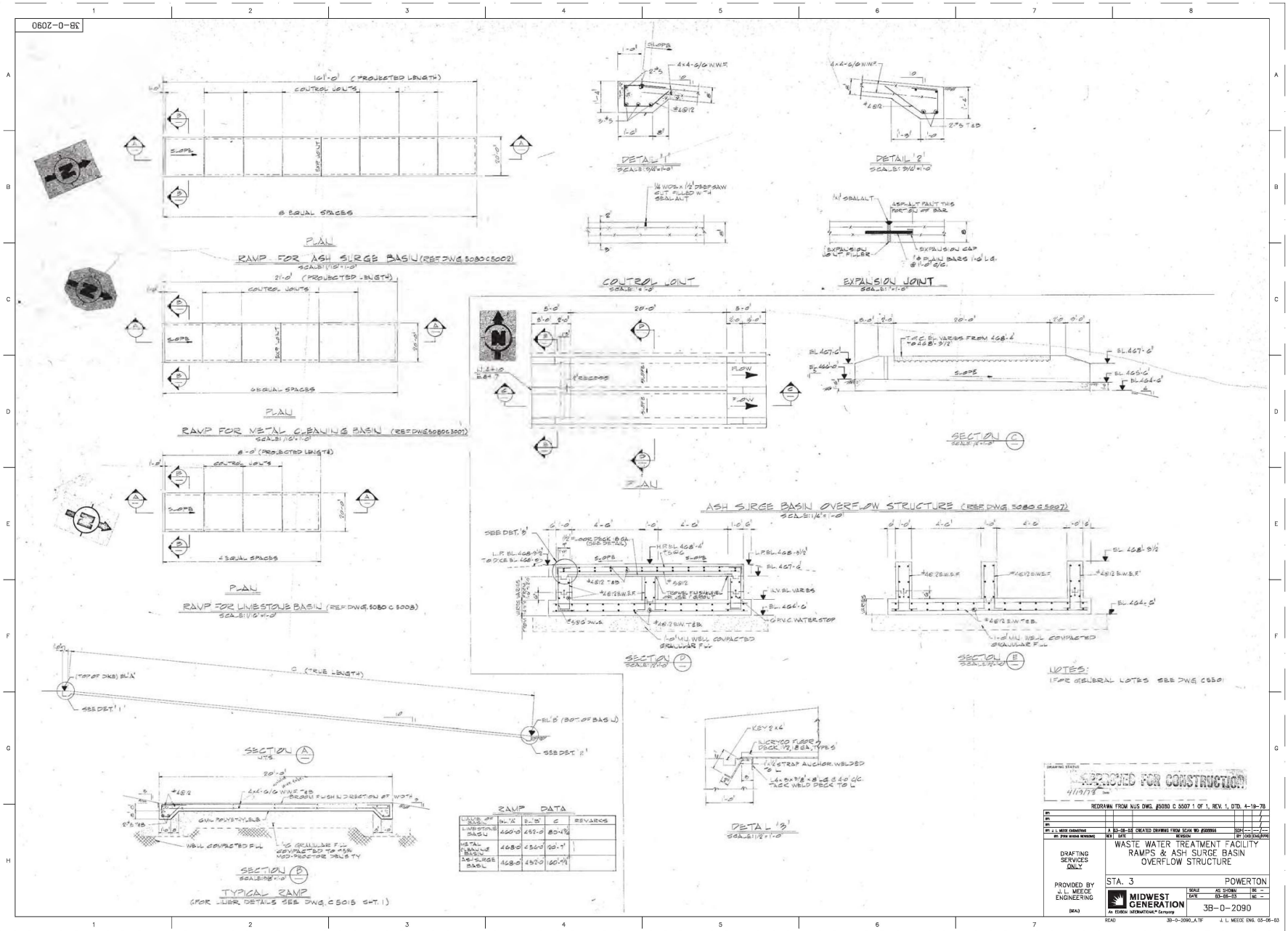
STA. 3 POWERTON

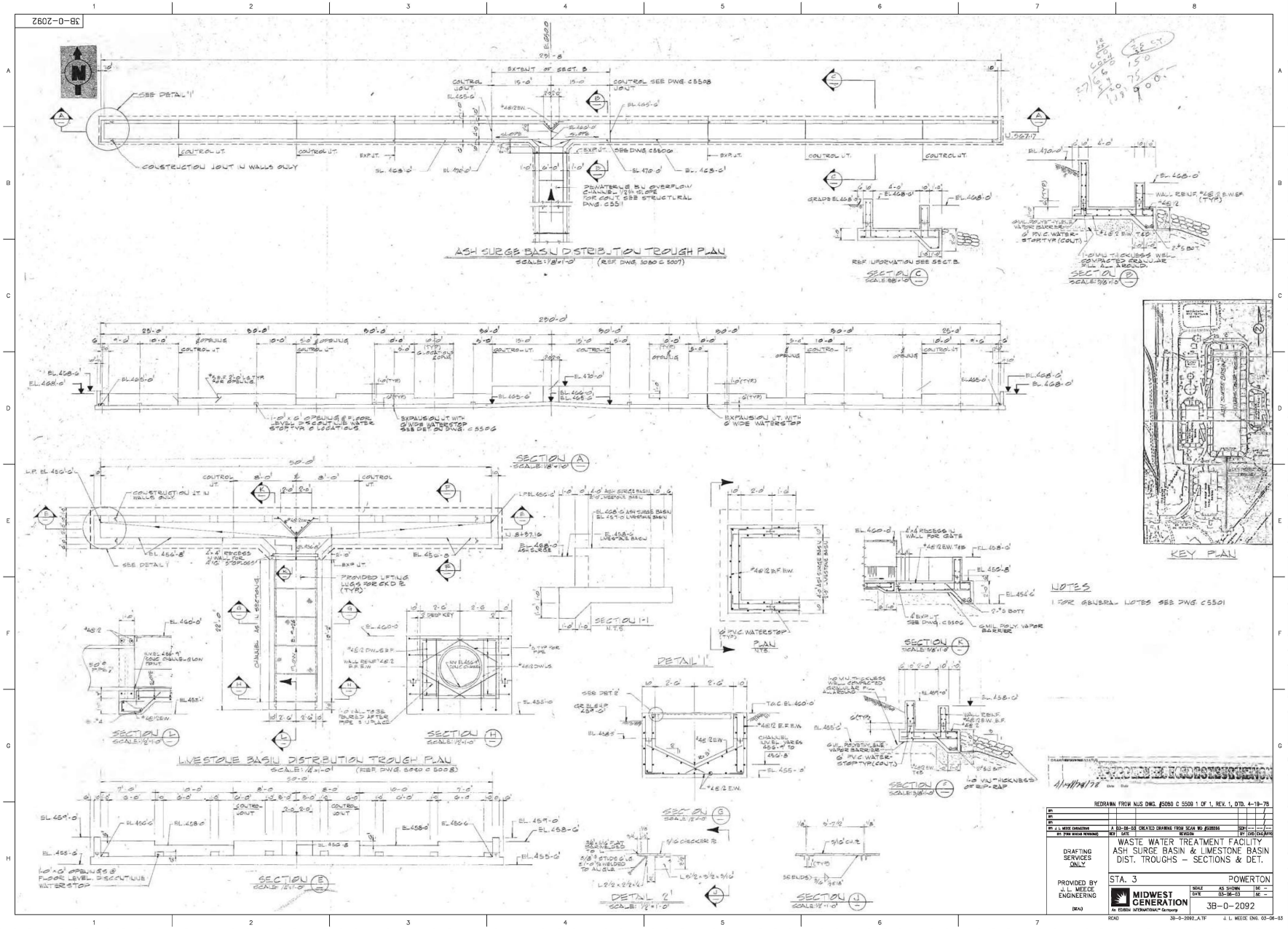
MIDWEST GENERATION
An EDISON INTERNATIONAL Company

SCALE AS SHOWN DC --
DATE 03-28-03 EC --

38-0-2089

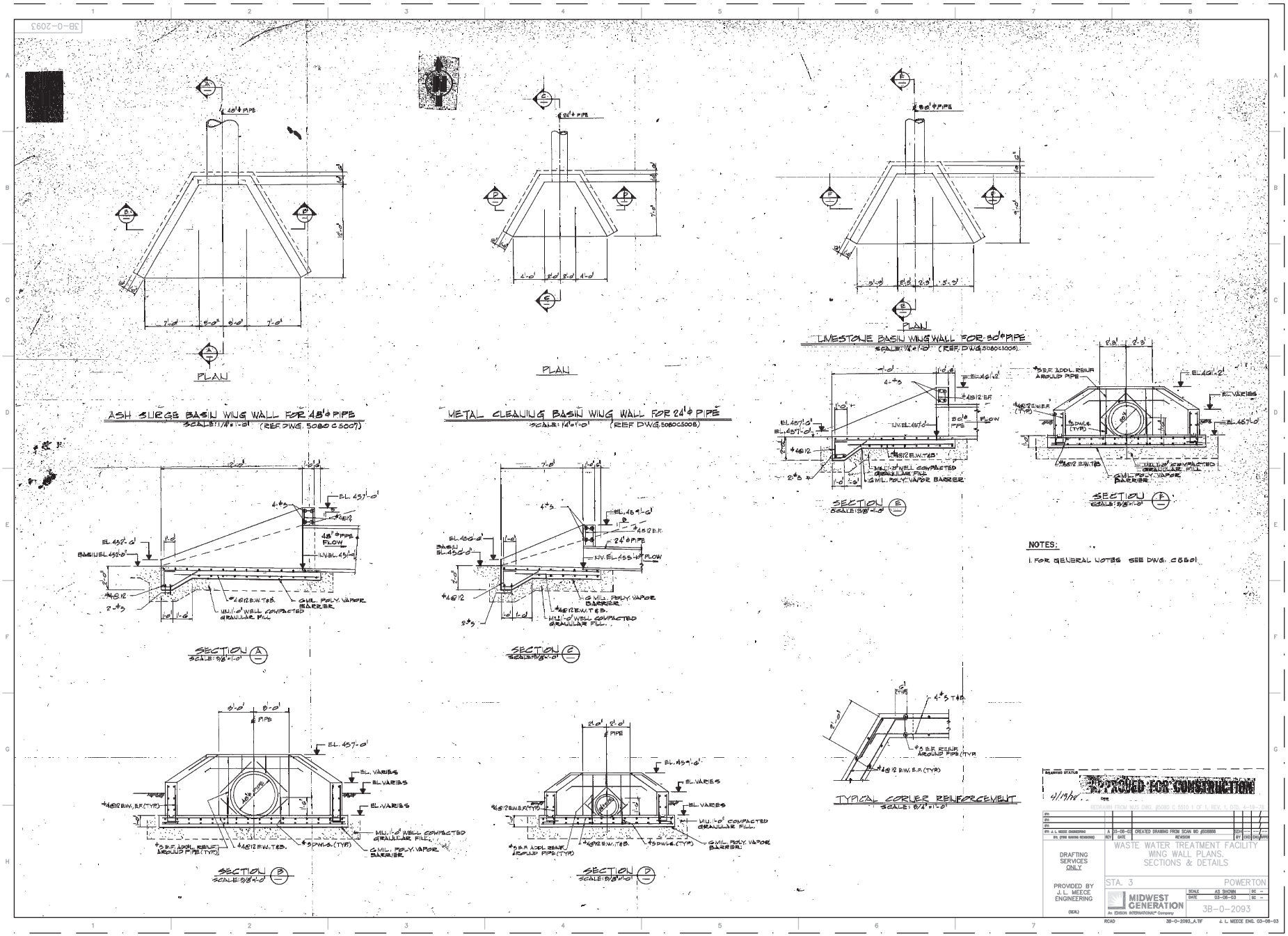
READ 38-0-2089_A.TIF J. L. MEECE ENG. 03-28-03


3B-0-2090
PLAN
RAMP FOR ASH SURGE BASIN (REF DWG 5080 C 5002)
SCALE: 1/16" = 1'-0"
161'-0" (PROJECTED LENGTH)
CONTROL JOINTS
8 EQUAL SPACES
PLAN
RAMP FOR METAL CLEANING BASIN (REF DWG 5080 C 5007)
SCALE: 1/16" = 1'-0"
21'-0" (PROJECTED LENGTH)
6 EQUAL SPACES
PLAN
RAMP FOR LIMESTONE BASIN (REF DWG 5080 C 5008)
SCALE: 1/16" = 1'-0"
8'-0" (PROJECTED LENGTH)
4 EQUAL SPACES
DETAIL '1'
SCALE: 3/4" = 1'-0"
DETAIL '2'
SCALE: 3/4" = 1'-0"
CONTROL JOINT
SCALE: 1" = 1'-0"
EXPANSION JOINT
SCALE: 1" = 1'-0"
ASH SURGE BASIN OVERFLOW STRUCTURE (REF DWG 5080 C 5007)
SCALE: 1/4" = 1'-0"
PLAN
SECTION C
SECTION D
SECTION E
SECTION A
SECTION B
TYPICAL RAMP
(FOR LINER DETAILS SEE DWG C 5015 SHT. 1)
DETAIL '3'
SCALE: 1 1/2" = 1'-0"
NOTES:
1 FOR GENERAL NOTES SEE DWG C 5501
RAMP DATA
LIMESTONE BASIN | 460'-0" | 452'-0" | 80'-4 3/4"
METAL CLEANING BASIN | 468'-0" | 456'-0" | 120'-7"
ASH SURGE BASIN | 468'-0" | 452'-0" | 160'-4 3/4"
APPROVED FOR CONSTRUCTION
4/19/78
REDRAWN FROM NUS DWG. #5080 C 5507 1 OF 1, REV. 1, DTD. 4-19-78
A 03-08-03 CREATED DRAWING FROM SCAN WO #G00995
DRAFTING SERVICES ONLY
PROVIDED BY J. L. MEECE ENGINEERING
WASTE WATER TREATMENT FACILITY
RAMPS & ASH SURGE BASIN
OVERFLOW STRUCTURE
STA. 3
POWERTON
MIDWEST GENERATION
An EDISON INTERNATIONAL® Company
3B-0-2090
J. L. MEECE ENG. 03-06-03



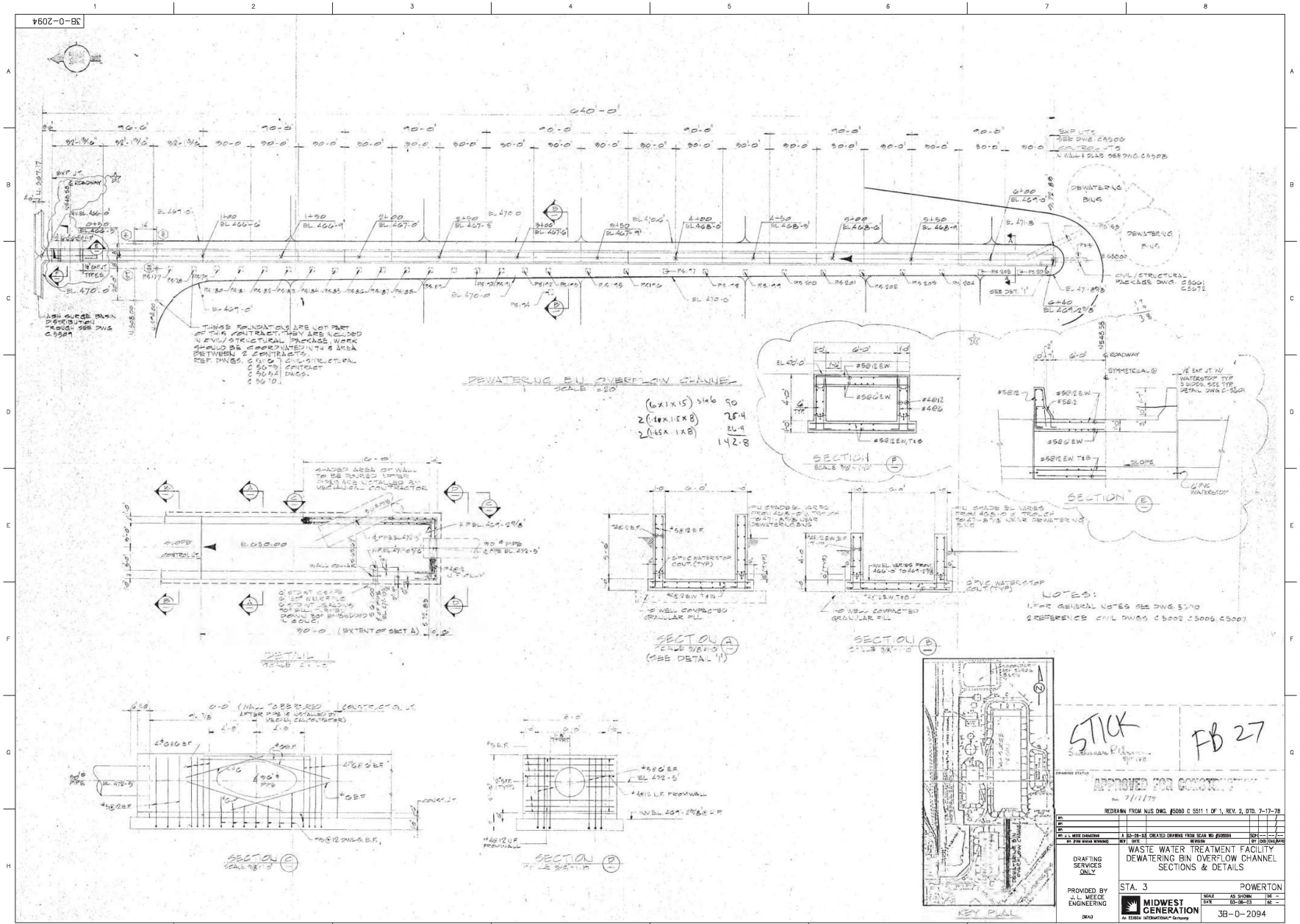
ASH SURGE BASIN DISTRIBUTION TROUGH PLAN
SCALE: 1/8"=1'-0" (REF. DWG. 5080 C 5007)
SECTION A
SCALE: 1/8"=1'-0"
SECTION B
SCALE: 3/8"=1'-0"
SECTION C
SCALE: 3/8"=1'-0"
SECTION 1-1
N.T.S.
LIMESTONE BASIN DISTRIBUTION TROUGH PLAN
SCALE: 1/4"=1'-0" (REF. DWG. 5080 C 5008)
SECTION E
SCALE: 1/4"=1'-0"
SECTION F
SCALE: 3/8"=1'-0"
SECTION G
SCALE: 1/2"=1'-0"
SECTION H
SCALE: 1/2"=1'-0"
SECTION J
SCALE: 1/2"=1'-0"
SECTION K
SCALE: 3/8"=1'-0"
SECTION L
SCALE: 1/2"=1'-0"
DETAIL 1'
DETAIL 2'
PLAN
N.T.S.
KEY PLAN
NOTES
1. FOR GENERAL NOTES SEE DWG. C5501
REDRAWN FROM NUS DWG. #5080 C 5509 1 OF 1, REV. 1, DTD. 4-19-78
A 03-06-03 CREATED DRAWING FROM SCAN NO #5080B56
WASTE WATER TREATMENT FACILITY
ASH SURGE BASIN & LIMESTONE BASIN
DIST. TROUGHS – SECTIONS & DET.
DRAFTING SERVICES ONLY
PROVIDED BY J. L. MEECE ENGINEERING
STA. 3
POWERTON
MIDWEST GENERATION
An EDISON INTERNATIONAL® Company
SCALE AS SHOWN
DATE 03-06-03
3B-0-2092
RCAD
3B-0-2092_A.TIF
J. L. MEECE ENG. 03-06-03

R001102



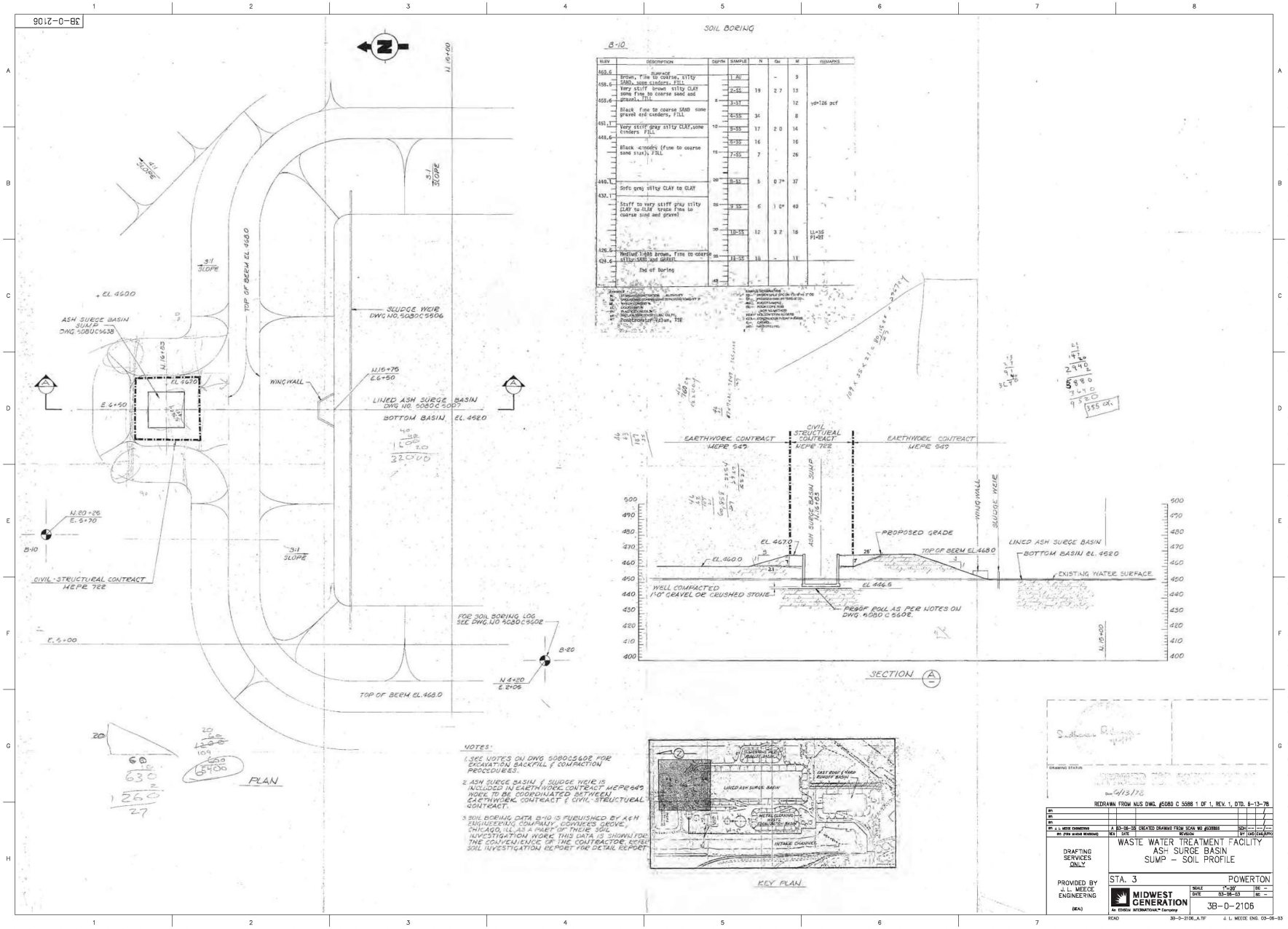
ASH SURGE BASIN WING WALL FOR 48"ϕ PIPE
SCALE: 1/4"=1'-0" (REF DWG. 5080 C5007)
PLAN
METAL CLEANING BASIN WING WALL FOR 24"ϕ PIPE
SCALE: 1/4"=1'-0" (REF DWG. 5080C5008)
PLAN
LIMESTONE BASIN WING WALL FOR 30"ϕ PIPE
SCALE: 1/4"=1'-0" (REF. DWG. 5080C5008)
PLAN
SECTION A
SCALE: 3/8"=1'-0"
SECTION B
SCALE: 3/8"=1'-0"
SECTION C
SCALE: 3/8"=1'-0"
SECTION D
SCALE: 3/8"=1'-0"
SECTION E
SCALE: 3/8"=1'-0"
SECTION F
SCALE: 3/8"=1'-0"
TYPICAL CORNER REINFORCEMENT
SCALE: 3/4"=1'-0"
NOTES:
1. FOR GENERAL NOTES SEE DWG. C5501
DRAWING STATUS
APPROVED FOR CONSTRUCTION
4/19/78
REDRAWN FROM NUS DWG. #5080 C 5510 1 OF 1, REV. 1, DTD. 4-19-78
A 03-06-03 CREATED DRAWING FROM SCAN NO #508868
REV DATE REVISION BY CKD DWG APPR
DRAFTING SERVICES ONLY
PROVIDED BY J. L. MEECE ENGINEERING
WASTE WATER TREATMENT FACILITY
WING WALL PLANS.
SECTIONS & DETAILS
STA. 3
POWERTON
MIDWEST GENERATION
An EDISON INTERNATIONAL Company
SCALE AS SHOWN
DATE 03-06-03
3B-0-2093
RCAD
3B-0-2093_A.TIF
J. L. MEECE ENG. 03-06-03

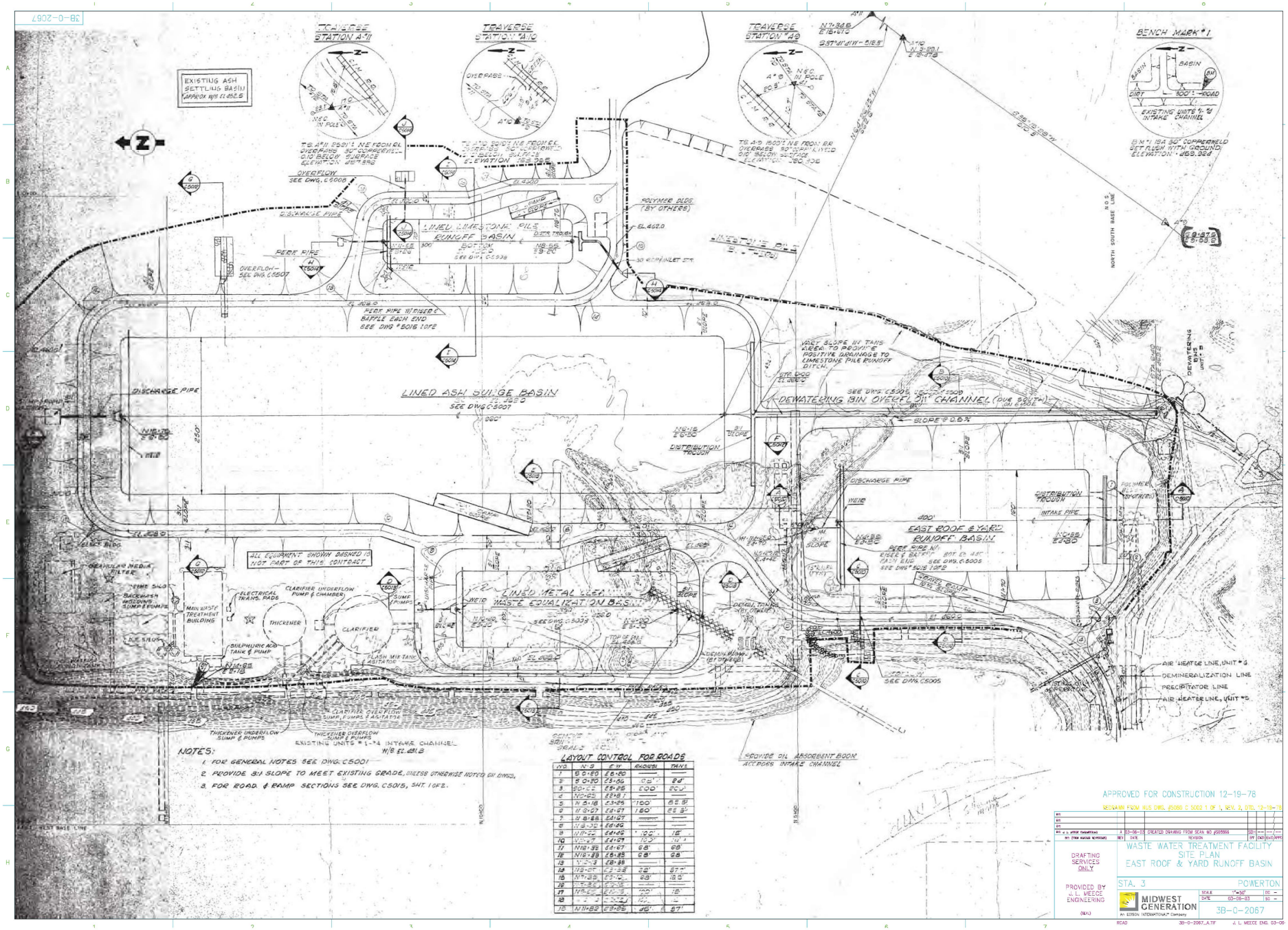
R001103



3B-0-2094
DEWATERING BIN OVERFLOW CHANNEL
SCALE 1"=20'
SECTION F
SECTION E
SECTION A
(SEE DETAIL '1')
SECTION B
SECTION C
SECTION D
DETAIL 1
NOTES:
1. FOR GENERAL NOTES SEE DWG. 5300
2. REFERENCE CIVIL DWGS C5002, C5005, C5007
KEY PLAN
STICK
FB 27
APPROVED FOR CONSTRUCTION
REDRAWN FROM NUS DWG. #5080 C 5511 1 OF 1, REV. 2, DTD. 7-17-78
WASTE WATER TREATMENT FACILITY
DEWATERING BIN OVERFLOW CHANNEL
SECTIONS & DETAILS
DRAFTING SERVICES ONLY
PROVIDED BY J. L. MEECE ENGINEERING
STA. 3
POWERTON
MIDWEST GENERATION
An EDISON INTERNATIONAL Company
3B-0-2094

R001104


3B-0-2106
SOIL BORING
B-10
ELEV | DESCRIPTION | DEPTH | SAMPLE | N | Qu | M | REMARKS
460.6 | SURFACE
Brown, fine to coarse, silty SAND, some cinders, FILL | 1 AU | - | 9
458.6 | Very stiff brown silty CLAY some fine to coarse sand and gravel, FILL | 2-SS | 19 | 2.7 | 13
455.6 | Black fine to coarse SAND some gravel and cinders, FILL | 3-ST | 12 | yd=126 pcf
451.1 | Very stiff gray silty CLAY, some cinders FILL | 4-SS | 34 | 8
448.6 | Black cinders (fine to coarse sand size), FILL | 5-SS | 17 | 2.0 | 14
6-SS | 16 | 16
7-SS | 7 | 26
440.1 | Soft gray silty CLAY to CLAY | 8-SS | 5 | 0.7* | 37
437.1 | Stiff to very stiff gray silty CLAY to CLAY trace fine to coarse sand and gravel | 9-SS | 5 | 1.0* | 40
10-SS | 12 | 3.2 | 16 | LL=35 PI=21
426.6 | Medium light brown, fine to coarse silty SAND and GRAVEL | 11-SS | 18 | - | 11
424.6 | End of Boring
N.15+00
4:1 SLOPE
3:1 SLOPE
TOP OF BERM EL 468.0
EL 460.0
ASH SURGE BASIN SUMP DWG. 5080C5638
SLUDGE WEIR DWG NO. 5080C5506
WING WALL
N.15+75 E.6+50
LINED ASH SURGE BASIN DWG NO. 5080C5007
BOTTOM BASIN EL. 452.0
E.6+50
N.20+25 E.5+70
B-10
CIVIL-STRUCTURAL CONTRACT MEPR 722
FOR SOIL BORING LOG SEE DWG. NO 5080C5602
E.5+00
B-20
N.4+20 E.2+05
TOP OF BERM EL. 468.0
PLAN
EARTHWORK CONTRACT MEPR 549
CIVIL STRUCTURAL CONTRACT MEPR 722
EARTHWORK CONTRACT MEPR 549
ASH SURGE BASIN SUMP N.16+83
WING WALL
SLUDGE WEIR
PROPOSED GRADE
EL 467.0
EL 460.0
TOP OF BERM EL 468.0
LINED ASH SURGE BASIN
BOTTOM BASIN EL. 452.0
EXISTING WATER SURFACE
WELL COMPACTED 1'-0" GRAVEL OR CRUSHED STONE
EL 446.5
PROOF ROLL AS PER NOTES ON DWG. 5080 C 5602.
N.15+00
SECTION A
NOTES:
1. SEE NOTES ON DWG 5080C5602 FOR EXCAVATION BACKFILL & COMPACTION PROCEDURES.
2. ASH SURGE BASIN & SLUDGE WEIR IS INCLUDED IN EARTHWORK CONTRACT MEPR 549 WORK TO BE COORDINATED BETWEEN EARTHWORK CONTRACT & CIVIL-STRUCTURAL CONTRACT.
3. SOIL BORING DATA B-10 IS FURNISHED BY A&H ENGINEERING COMPANY, DOWNERS GROVE, CHICAGO, ILL. AS A PART OF THEIR SOIL INVESTIGATION WORK THIS DATA IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR. REFER SOIL INVESTIGATION REPORT FOR DETAIL REPORT
LINED ASH SURGE BASIN
INTAKE CHANNEL
KEY PLAN
DRAWING STATUS
6/13/78
REDRAWN FROM NUS DWG. #5080 C 5588 1 OF 1, REV. 1, DTD. 6-13-78
A 03-06-03 CREATED DRAWING FROM SCAN NO #005885
REV DATE REVISION BY CKD ENG APPR
DRAFTING SERVICES ONLY
PROVIDED BY J. L. MEECE ENGINEERING (SEAL)
WASTE WATER TREATMENT FACILITY
ASH SURGE BASIN
SUMP – SOIL PROFILE
STA. 3
POWERTON
MIDWEST GENERATION
An EDISON INTERNATIONAL® Company
SCALE 1"=20'
DATE 03-06-03
3B-0-2106
RCAD
3B-0-2106_A.TIF
J. L. MEECE ENG. 03-06-03



NOTES:

1. FOR GENERAL NOTES SEE DWG. C5001
2. PROVIDE 3:1 SLOPE TO MEET EXISTING GRADE, UNLESS OTHERWISE NOTED ON DWGS.
3. FOR ROAD & RAMP SECTIONS SEE DWG. C5015, SHT. 1 OF 2.

LAYOUT CONTROL FOR ROADS

NO.	N-S	E-W	RADIUS	TANG
1	S 0-20	E3-20	—	—
2	S 0-20	E3-26	68'	24'
3	S0-22	E3-25	200'	20'
4	N0-25	E2-8	—	—
5	N 5-18	E3-25	150'	82.8'
6	N 6-07	E4-67	150'	82.8'
7	N 8-28	E4-67	—	—
8	N 8-30	E4-46	—	—
9	N11-22	E4-46	100'	15'
10	N11-27	E4-67	100'	15'
11	N12-32	E4-67	68'	68'
12	N12-38	E5-38	68'	68'
13	N12-43	E5-38	—	—
14	N13-07	E5-38	68'	87'
15	N7-35	E5-12	68'	12.5'
16	N7-35	E5-12	—	—
17	N8-25	E10-15	100'	15'
18	[illegible]	[illegible]	100'	[illegible]
19	N11-82	E8-35	45'	87'

APPROVED FOR CONSTRUCTION 12-19-78

REDRAWN FROM HUS DWG. #5080 C 5002 1 OF 1, REV. 2, DTD. 12-19-78

REV	DATE	REVISION	BY	CKD	ENG	APPD
A	03-06-03	CREATED DRAWING FROM SCAN NO #5085866	SD			

DRAFTING SERVICES ONLY

PROVIDED BY J. L. MEECE ENGINEERING (SEAL)

WASTE WATER TREATMENT FACILITY
SITE PLAN
EAST ROOF & YARD RUNOFF BASIN

STA. 3 POWERTON

MIDWEST GENERATION
An EDISON INTERNATIONAL Company

SCALE 1"=50' DC –
DATE 03-06-03 SC –

3B-0-2067

ROAD 3B-0-2067_A.TIF J. L. MEECE ENG. 03-06

R001106

APPENDIX A-2

Liner Replacement Drawings

ASH SURGE BASIN LINER REPLACEMENT
MIDWEST GENERATION
POWERTON GENERATING STATION
PEKIN, ILLINOIS

LIST OF DRAWINGS

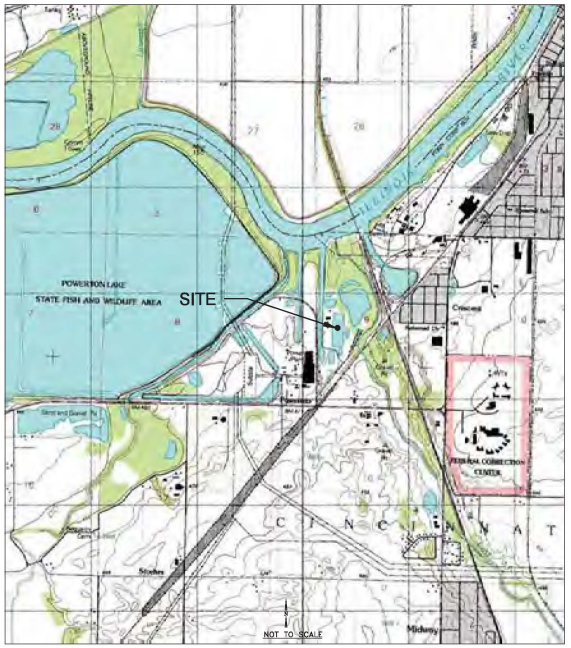
SHEET NO.	TITLE	DRAWING NO.
TS	TITLE SHEET	D21132TS-03
C010	PRE-CONSTRUCTION SITE CONDITIONS	D21132C010-03
C020	LINER SUBGRADE PREPARATION	D21132C020-03
C021	GEOMEMBRANE PANEL LAYOUT	D21132C021-00
C030	WARNING LAYER PLAN	D21132C030-03
C031	DETAILS AND SECTIONS	D21132C031-03
C032	DETAILS AND SECTIONS	D21132C032-03

RECORD DRAWING LEGEND

~~PROPOSED~~	CROSSED OUT TEXT INDICATES CHANGES FROM THE FINAL DESIGN TO RECORD CONSTRUCTION
PRE-CONSTRUCTION	UNDERLINED TEXT INDICATES ADDED NOTES OR COMMENTS, AND DOCUMENTS CHANGES FROM THE FINAL DESIGN TO RECORD CONSTRUCTION
	"CLOUDS" DOCUMENT ADDITIONS AND/OR CHANGES FROM THE FINAL DESIGN TO RECORD CONSTRUCTION
	"CROSS OUTS" DOCUMENT OBJECTS REMOVED FROM THE FINAL DESIGN TO RECORD CONSTRUCTION



ILLINOIS



SITE LOCATION

PREPARED FOR:
MIDWEST GENERATION, LLC
13082 EAST MANITO RAOD
PEKIN, IL 61554

JULY 2014

TITLE SHEET
ASH SURGE BASIN LINER REPLACEMENT DOCUMENTATION
MIDWEST GENERATION
POWERTON GENERATING STATION
PEKIN, ILLINOIS

SHEET NO. TS

PROJECT NO. 2113.2/POWER/BID
DRAWN BY: RLH 01/14/13
CHECKED BY: HMS 01/14/13
APPROVED BY: HMS 01/15/13
DRAWING NO: D21132TS-03
REFERENCE:

NATURAL RESOURCE TECHNOLOGY

REVISION:	DATE:	APP'D BY:
6.		
5.		
4.		
3. ISSUED FOR RECORD DOCUMENTATION	07/02/14	EJT
2. ISSUED FOR CONSTRUCTION	06/25/13	HMS
1. ISSUED FOR BID	03/26/13	EJT
0. ISSUED FOR PERMIT	01/15/13	HMS

Jul 17, 2014 12:56pm PLOTTED BY: ddudo SAVED BY: ddudo
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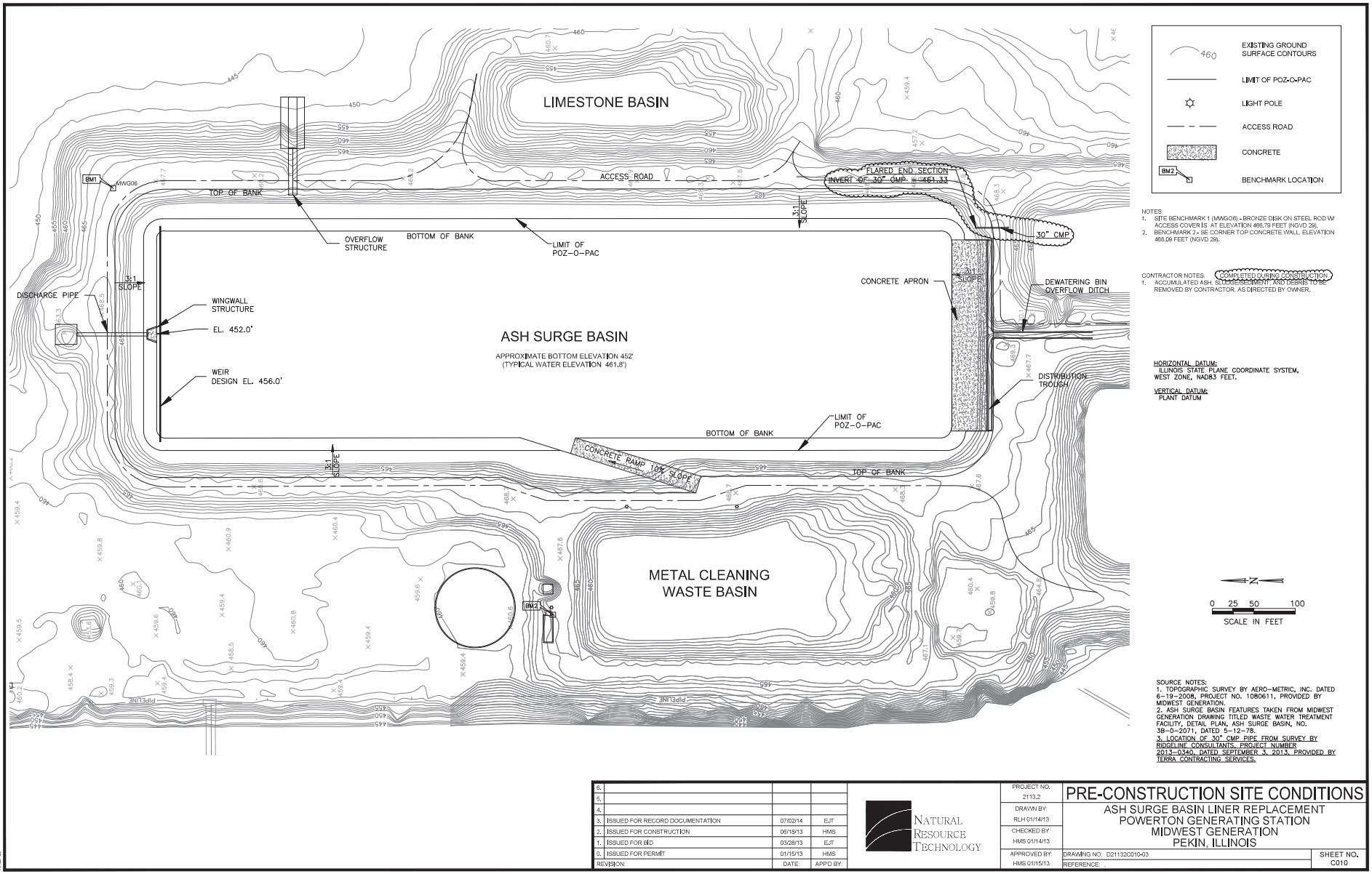
R001109



NOTES:
1. SITE BENCHMARK 1 (MWG06) - BRONZE DISK ON STEEL ROD W/ ACCESS COVER IS AT ELEVATION 466.79 FEET (NGVD 29).
2. BENCHMARK 2 - SE CORNER TOP CONCRETE WALL, ELEVATION 468.09 FEET (NGVD 29).

CONTRACTOR NOTES: (COMPLETED DURING CONSTRUCTION)
1. ACCUMULATED ASH, SLUDGE/SEDIMENT, AND DEBRIS TO BE REMOVED BY CONTRACTOR, AS DIRECTED BY OWNER.

HORIZONTAL DATUM:
ILLINOIS STATE PLANE COORDINATE SYSTEM, WEST ZONE, NAD83 FEET.

VERTICAL DATUM:
PLANT DATUM

SOURCE NOTES:
1. TOPOGRAPHIC SURVEY BY AERO-METRIC, INC. DATED 6-19-2008, PROJECT NO. 1080611, PROVIDED BY MIDWEST GENERATION.
2. ASH SURGE BASIN FEATURES TAKEN FROM MIDWEST GENERATION DRAWING TITLED WASTE WATER TREATMENT FACILITY, DETAIL PLAN, ASH SURGE BASIN, NO. 3B-0-2071, DATED 5-12-78.
3. LOCATION OF 30" CMP PIPE FROM SURVEY BY RIDGELINE CONSULTANTS, PROJECT NUMBER 2013-0340, DATED SEPTEMBER 3, 2013, PROVIDED BY TERRA CONTRACTING SERVICES.

REVISION:	DATE:	APPD BY:
6.		
5.		
4.		
3. ISSUED FOR RECORD DOCUMENTATION	07/02/14	EJT
2. ISSUED FOR CONSTRUCTION	06/18/13	HMS
1. ISSUED FOR BID	03/28/13	EJT
0. ISSUED FOR PERMIT	01/15/13	HMS

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.	2113.2
DRAWN BY:	RLH 01/14/13
CHECKED BY:	HMS 01/14/13
APPROVED BY:	HMS 01/15/13

PRE-CONSTRUCTION SITE CONDITIONS

ASH SURGE BASIN LINER REPLACEMENT
POWERTON GENERATING STATION
MIDWEST GENERATION
PEKIN, ILLINOIS

DRAWING NO: D2113200010-03
REFERENCE: .

SHEET NO. C010

Jul 17, 2014 - 12:57pm PLOTTED BY: ddubb SAVED BY: ddubb
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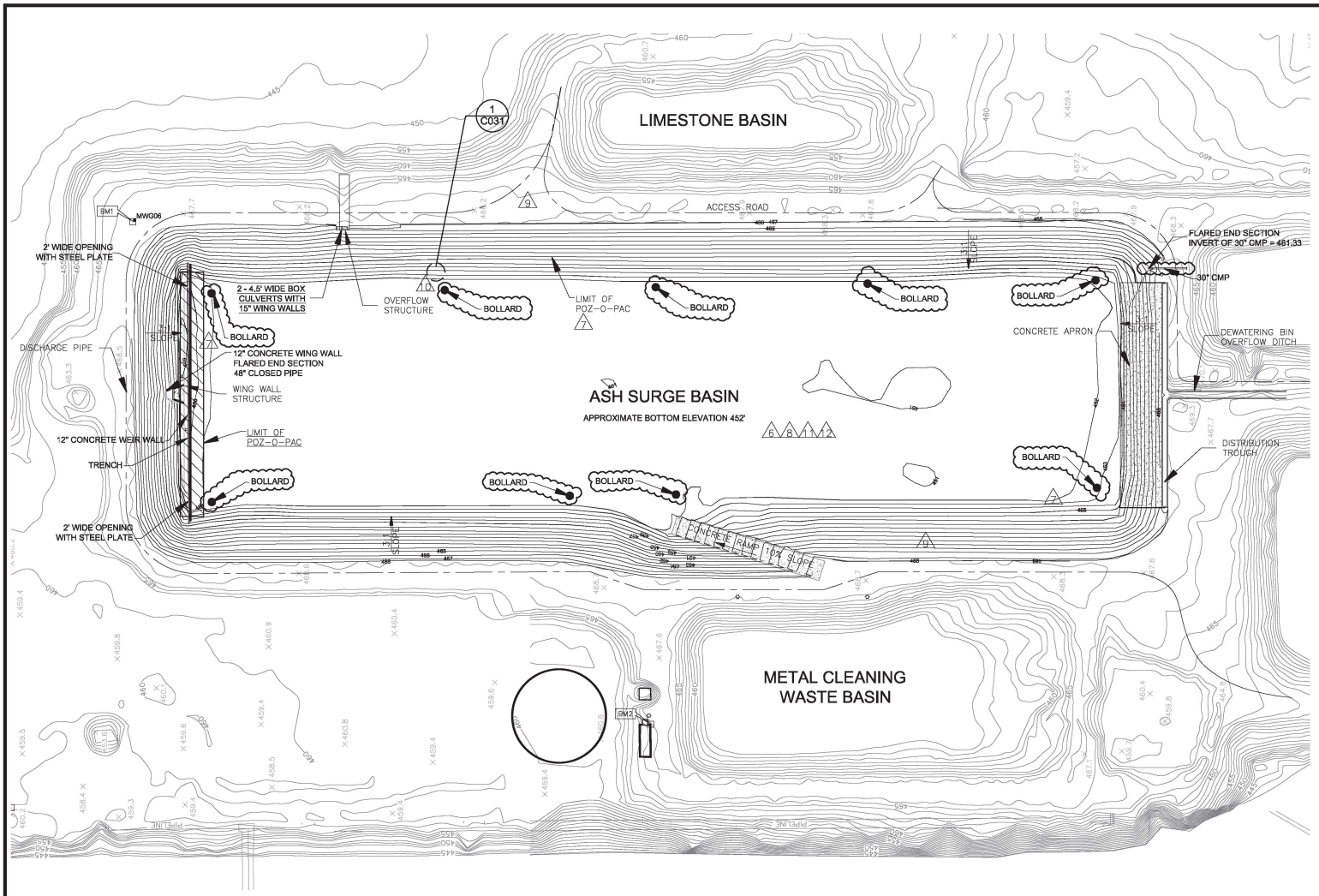
XREFS:
IMAGES:



EXISTING PREVIOUS GROUND SURFACE CONTOURS
SUBGRADE SURFACE CONTOUR
LIMIT OF POZ-O-PAC
LIGHT POLE
ACCESS ROAD
MARKER POST LOCATION
POZ-O-PAC REMOVAL AREA
CONCRETE
BENCHMARK LOCATION

NOTES:
1. SITE BENCHMARK 1 (MW306) - BRONZE DISK ON STEEL ROD W/ ACCESS COVER IS AT ELEVATION 466.79 FEET (NGVD 29).
2. BENCHMARK 2 - SE CORNER TOP CONCRETE WALL, ELEVATION 468.09 FEET (NGVD 29).

CONTRACTOR NOTES: COMPLETED DURING CONSTRUCTION
1. CONTRACTOR SHALL FIELD VERIFY LOCATION OF UNDERGROUND PIPES WITH ASSISTANCE OF OWNER'S UTILITY LOCATOR.
2. CONTRACTOR SHALL FIELD VERIFY LOCATION OF CONCRETE APRON, CONCRETE STRUCTURES, AND ABOVE GROUND PIPING.
3. CLEAR AND GRUB ALL BRUSH ALONG TOP OF SLOPE OF BASIN.
4. CONTRACTOR SHALL STORE ALL GEOSYNTHETICS AND SUBGRADE MATERIALS IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
5. CONTRACTOR SHALL STORE AND STAGE EQUIPMENT AT LOCATION APPROVED BY OWNER.
6. PROTECT ALL CONCRETE AND UTILITY STRUCTURES THROUGHOUT PROJECT DURATION.
7. REMOVE EXISTING 12-INCH POZ-O-PAC LAYER ALONG SIDE SLOPES. POZ-O-PAC LAYER AT BASE OF BASIN TO REMAIN IN PLACE, EXCEPT NORTH OF WEIR AND 20 FOOT SECTION SOUTH OF WEIR, AS SHOWN. CONTRACTOR SHALL REMOVE AN ADDITIONAL 6 INCHES OF SUBGRADE MATERIAL LOCATED BETWEEN THE WEIR AND THE WING WALL STRUCTURE ALONG THE NORTH TOE OF SLOPE, AS SHOWN ON SHEET C032. REMOVE AT LEAST 18 INCHES OF POZ-O-PAC LAYER AND SUBGRADE MATERIAL AT BASE OF WEIR TO THE SOUTH AND GRADE AT A 1% 7.5% SLOPE. REFER TO SHEET C032.
8. CONTRACTOR SHALL REMOVE ALL VEGETATION, ROCKS, AND OTHER DEBRIS FROM EXISTING LINER AND DISPOSE OF IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
9. CONTRACTOR SHALL RESHAPE SIDE SLOPES AS NECESSARY TO MAINTAIN 3:1 SIDE SLOPES, AND REMOVE "SOFT" SUBGRADE MATERIAL AS DIRECTED BY OWNER AND/OR ENGINEER. BACKFILL AREAS WITH FILL IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS. EXISTING HYPALON GEOMEMBRANE MAY REMAIN IN PLACE ALONG THE SIDE SLOPES, EXCEPT IN SOFT OR LOW/HIGH (RELATIVE TO GEOMEMBRANE SUBGRADE) AREAS, AS DIRECTED BY ENGINEER AND/OR OWNER.
10. CONTRACTOR SHALL INSTALL MARKER POSTS ALONG THE TOE OF SLOPE AS SHOWN AND IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS AND DETAIL 1 ON SHEET C031.
11. SUBGRADE MUST BE APPROVED BY OWNER AND/OR ENGINEER PRIOR TO INSTALLATION OF GEOMEMBRANE.
12. CONTRACTOR SHALL PROVIDE MEANS TO PROTECT SUBGRADE LAYER FROM EROSION, STORM WATER, AND HEAVY EQUIPMENT TRAFFIC. DAMAGE TO SUBGRADE LAYER SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

HORIZONTAL DATUM:
ILLINOIS STATE PLANE COORDINATE SYSTEM, WEST ZONE, NAD83 FEET.

VERTICAL DATUM:
PLANT DATUM

N

0 25 50 100
SCALE IN FEET

SOURCE NOTES:
1. TOPOGRAPHIC SURVEY BY AERO-METRIC, INC. DATED 6-19-2008, PROJECT NO. 1080611, PROVIDED BY MIDWEST GENERATION.
2. ASH SURGE BASIN FEATURES TAKEN FROM MIDWEST GENERATION DRAWING TITLED WASTE WATER TREATMENT FACILITY, DETAIL PLAN, ASH SURGE BASIN, NO. 3B-0-2071, DATED 5-12-78.
3. SUBGRADE CONTOURS AND FEATURE LOCATIONS FROM SURVEY BY RIDGELINE CONSULTANTS, PROJECT NUMBER 2013-0340, DATED SEPTEMBER 3, 2013, PROVIDED BY TERRA CONTRACTING SERVICES.

REVISION:	DATE:	APP'D BY:
6.		
5.		
4.		
3. ISSUED FOR RECORD DOCUMENTATION	07/16/14	EJT
2. ISSUED FOR CONSTRUCTION	06/18/13	HMS
1. ISSUED FOR BID	03/26/13	EJT
0. ISSUED FOR PERMIT	01/15/13	HMS

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 2113.2
DRAWN BY: RLH 01/14/13
CHECKED BY: HMS 01/14/13
APPROVED BY: HMS 01/15/13

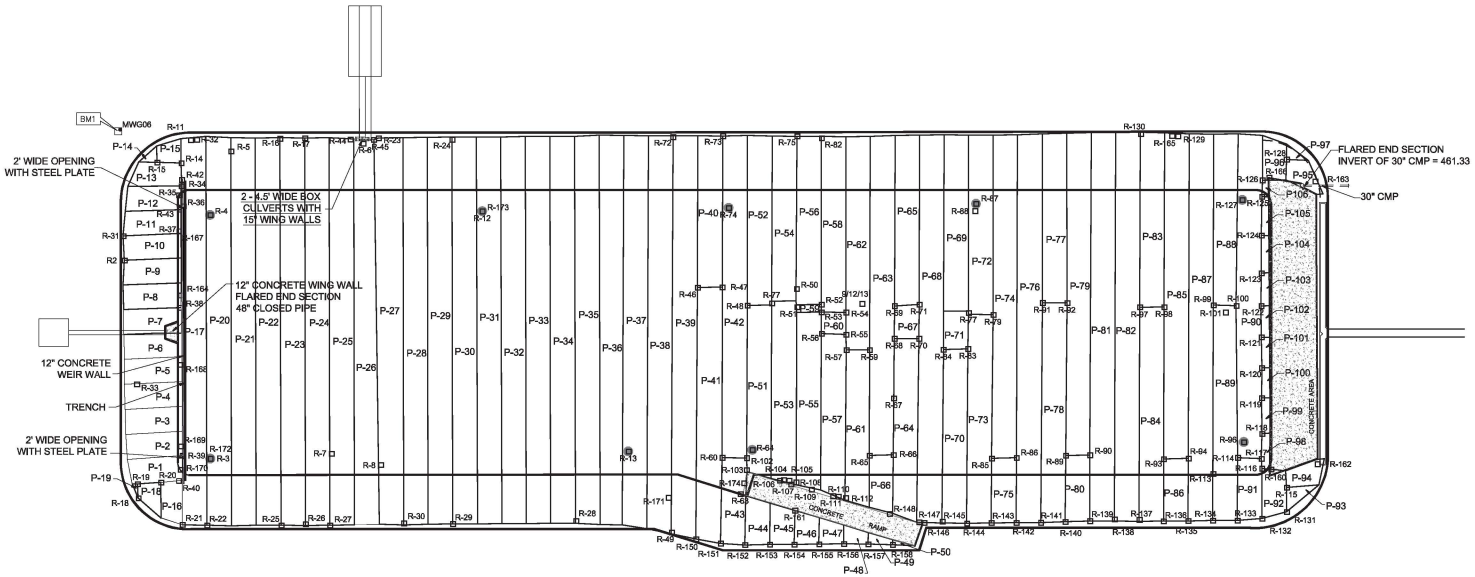
LINER SUBGRADE PREPARATION

ASH SURGE BASIN LINER REPLACEMENT
POWERTON GENERATING STATION
MIDWEST GENERATION
PEKIN, ILLINOIS

DRAWING NO: D2113ZC020-03
REFERENCE: .

SHEET NO. C020

Jul 18, 2014 - 12:21pm PLOTTED BY: ddubb SAVED BY: ddubb
Y:\ACADdata\Projects\21\2113\2132_Powerton\ASH SURGE BASIN\RECORD DWGS\Record 070214\D2113ZC020-03.dwg C020
IMAGES:
XREFS:



GEOMEMBRANE PANEL SEAM

P23 GEOMEMBRANE PANEL AND PANEL NUMBER

R87 GEOMEMBRANE REPAIR LOCATION (NOT TO SCALE)

BM2 BENCHMARK LOCATION

MARKER POST LOCATION

NOTES:
1. SITE BENCHMARK 1 (MWG06) - BRONZE DISK ON STEEL ROD W/ ACCESS COVER IS AT ELEVATION 466.76 FEET (NGVD 29).
2. BENCHMARK 2 - SE CORNER TOP CONCRETE WALL, ELEVATION 468.09 FEET (NGVD 29).

N

0 25 50 100

SCALE IN FEET

HORIZONTAL DATUM:
ILLINOIS STATE PLANE COORDINATE SYSTEM, WEST ZONE, NAD83 FEET.

VERTICAL DATUM:
PLANT DATUM

SOURCE NOTES:

1. THIS DRAWING WAS DEVELOPED FROM SURVEY DATA BY RIDGELINE CONSULTANTS, PROJECT NUMBER 2013-0340, DATED SEPTEMBER 3, 2013, PROVIDED BY TERRA CONTRACTING SERVICES.

6.			
5.			
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0.	ISSUED FOR RECORD DOCUMENTATION	07/17/14	EJT
REVISION:		DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.	2113.2
DRAWN BY:	RLH 03/06/14
CHECKED BY:	JRR 03/06/14
APPROVED BY:	EJT 07/17/14
DRAWING NO:	D21132C021-00
REFERENCE:	.

GEOMEMBRANE PANEL LAYOUT

ASH SURGE BASIN LINER REPLACEMENT
POWERTON GENERATING STATION
MIDWEST GENERATION
PEKIN, ILLINOIS

SHEET NO. C021

Jul 18, 2014 - 12:16pm PLOTTED BY: ddutch SAVED BY: ddutch
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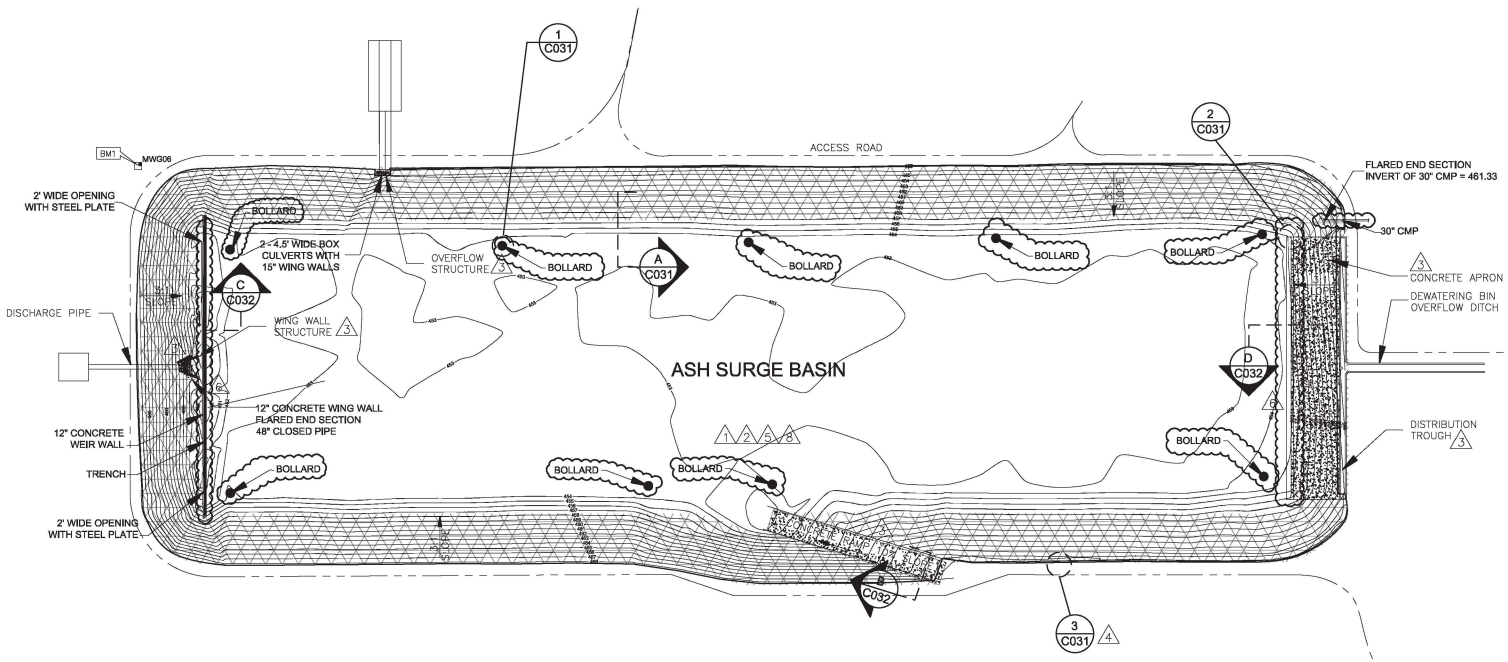

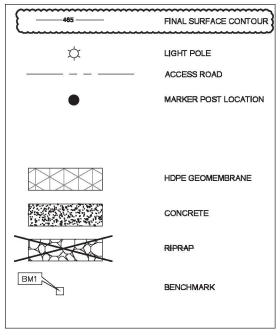

CONTRACTOR NOTES: △ COMPLETED DURING CONSTRUCTION

1. CONTRACTOR SHALL PLACE 16-OZ. NON-WOVEN GEOTEXTILE OVER THE SUBGRADE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
2. CONTRACTOR SHALL INSTALL 60 MIL HDPE, WHITE, TEXTURED GEOMEMBRANE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION PRIOR TO PLACEMENT OF THE WARNING LAYER, CONTRACTOR SHALL PROVIDE AND FOLLOW AN APPROVED GEOMEMBRANE LAYOUT PLAN.
3. CONTRACTOR SHALL ATTACH GEOMEMBRANE TO STRUCTURES, CONCRETE RAMP, AND APRON, IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION AND DETAILS ON SHEET C031 AND C032.
4. GEOMEMBRANE SHALL BE ANCHORED INTO 2.5 FEET DEEP TRENCHES ALONG TOP OF BANK, AS SHOWN IN DETAIL 3 ON SHEET C031. CONTRACTOR SHALL ADVISE OWNER AND/OR ENGINEER IF PROPOSED LOCATION FOR ANCHOR TRENCH IS NOT FEASIBLE.
5. CONTRACTOR SHALL PLACE 16-OZ. NON-WOVEN GEOTEXTILE, CUSHION MATERIAL AND WARNING LAYER MATERIAL OVER THE GEOMEMBRANE AT BASE AND 4 FEET ON SIDE SLOPES (SEE SECTION A, SHEET C031), FOLLOWING ENGINEER APPROVAL AND PASSING QUALITY CONTROL RESULTS IN ACCORDANCE WITH TECHNICAL SPECIFICATIONS.
6. CONTRACTOR SHALL PLACE AN 18-INCH LAYER OF ~~4 TO 12-INCH~~ DIAMETER RIPRAP WARNING LAYER MATERIAL BETWEEN WEIR AND WING WALL STRUCTURE ALONG THE NORTH TOE OF SLOPE AND AT TOE OF CONCRETE APRON AS DIRECTED BY ENGINEER. REFER TO DETAILS ON SHEET C032.
7. CONTRACTOR SHALL PROVIDE SURVEY DOCUMENTATION OF THE ITEMS LISTED IN THE TECHNICAL SPECIFICATIONS.
8. CONTRACTOR SHALL PERFORM A LEAK LOCATION SURVEY IN ACCORDANCE WITH TECHNICAL SPECIFICATIONS.
9. RESTORE AREAS DISTURBED BY EQUIPMENT AND MATERIAL LAYDOWN.

HORIZONTAL DATUM:
ILLINOIS STATE PLANE COORDINATE SYSTEM, WEST ZONE, NAD83 FEET.

VERTICAL DATUM:
PLANT DATUM

0 25 50 100
SCALE IN FEET

SOURCE NOTES:
1. TOPOGRAPHIC SURVEY BY AERO-METRIC, INC. DATED 6-19-2008, PROJECT NO. 1080811, PROVIDED BY MIDWEST GENERATION.
2. ASH SURGE BASIN FEATURES TAKEN FROM MIDWEST GENERATION DRAWING TITLED WASTE WATER TREATMENT FACILITY, DETAIL PLAN, ASH SURGE BASIN, NO. 36-0-2071, DATED 5-12-78.
3. FINAL SURFACE CONTOURS AND FEATURE LOCATIONS FROM SURVEY BY RIDGELINE CONSULTANTS, PROJECT NUMBER 2013-0340, DATED OCTOBER 8, 2013, PROVIDED BY TERRA CONTRACTING SERVICES.

REVISION:	DATE:	APP'D BY:
3. ISSUED FOR RECORD DOCUMENTATION	07/16/14	EJT
2. ISSUED FOR CONSTRUCTION	06/18/13	HMS
1. ISSUED FOR BID	03/26/13	EJT
0. ISSUED FOR PERMIT	01/15/13	HMS

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.	2113.2/POWER/CON
DRAWN BY:	RLH 01/15/13
CHECKED BY:	HMS 01/15/13
APPROVED BY:	HMS 01/16/13

WARNING LAYER PLAN

ASH SURGE BASIN LINER REPLACEMENT
POWERTON GENERATING STATION
MIDWEST GENERATION
PEKIN, ILLINOIS

DRAWING NO: D2113 2C030-03
REFERENCE: .

SHEET NO. C030

Jul 18, 2014 - 12:35pm PLOTTED BY: ddubb SAVED BY: ddubb
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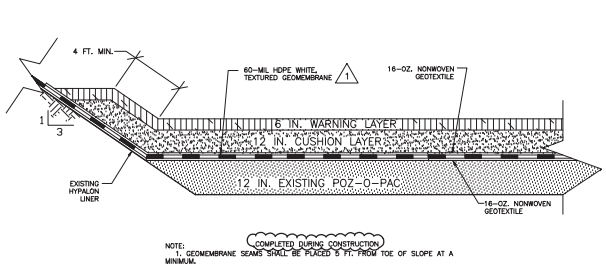
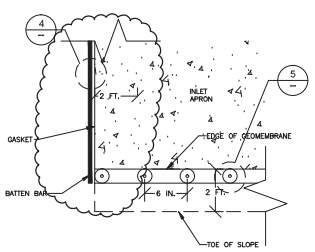
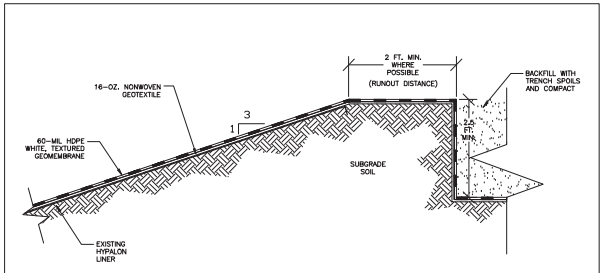


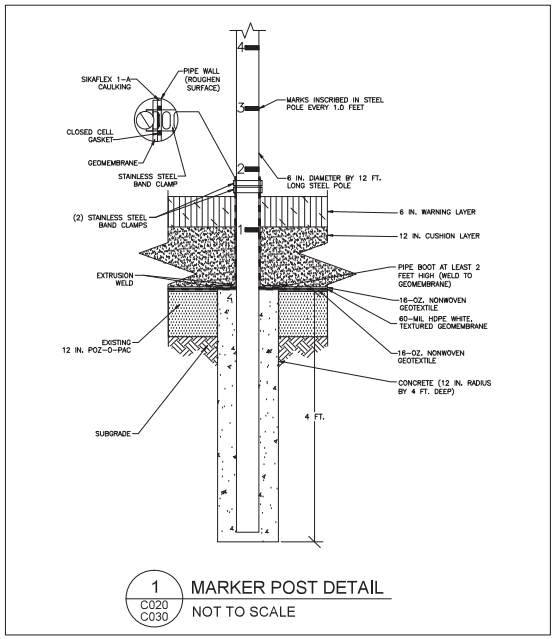
A / C030 SLOPE TRANSITION SECTION
NOT TO SCALE



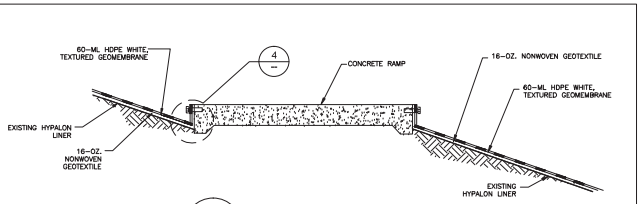
2 / C030 INLET APRON DETAIL PLAN
NOT TO SCALE



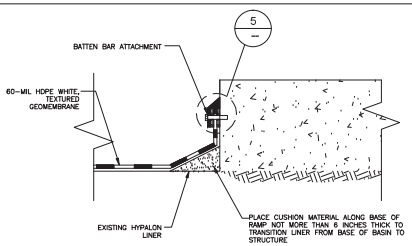
3 / C030 ANCHOR TRENCH DETAIL
NOT TO SCALE



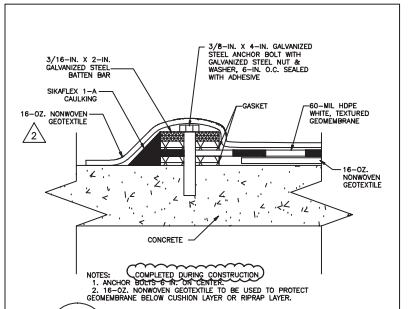
1 / C020 C030 MARKER POST DETAIL
NOT TO SCALE



B / C030 CONCRETE RAMP SECTION
NOT TO SCALE



4 / -- VERTICAL CONNECTION DETAIL
NOT TO SCALE



5 / --- BATTEN BAR ATTACHMENT
NOT TO SCALE

6.			
5.			
4.			
3.	ISSUED FOR RECORD DOCUMENTATION	07/17/14	EJT
2.	ISSUED FOR CONSTRUCTION	06/25/13	HMS
1.	ISSUED FOR BID	03/28/13	EJT
0.	ISSUED FOR PERMIT	01/15/13	HMS
REVISION:		DATE:	APPD BY:

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.	2113.2/POWER/CON
DRAWN BY:	RLH 01/14/13
CHECKED BY:	HMS 01/14/13
APPROVED BY:	HMS 01/15/13

DETAILS AND SECTIONS

ASH SURGE BASIN LINER REPLACEMENT
POWERTON GENERATING STATION
MIDWEST GENERATION
PEKIN, ILLINOIS

DRAWING NO: D21132C031-03
REFERENCE: .

SHEET NO. C031

Jul 17, 2014 - 1:13pm PLOTTED BY: ddode SAVED BY: ddode
Y:\ACADdata\Projects\21\2113\21132_Powerton\ASH SURGE BASIN\RECORD DWGS\Record 070214\D21132C031-03.dwg C031
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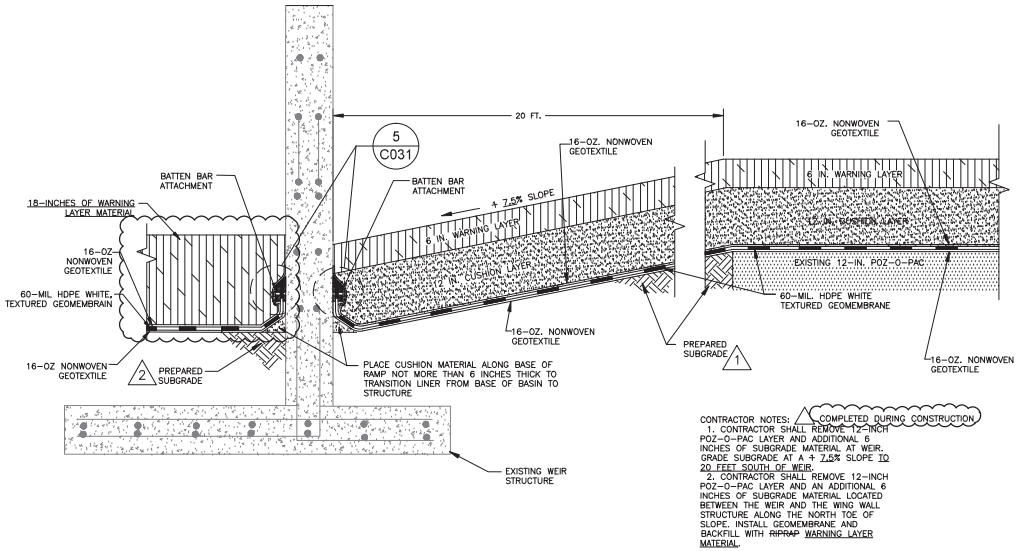
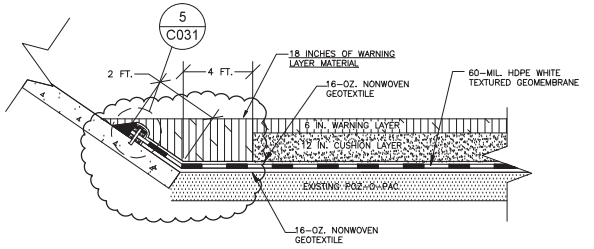


C / C030 CONCRETE WEIR SECTION
NOT TO SCALE



D / C030 INLET APRON SECTION
NOT TO SCALE

6.			
5.			
4.			
3.	ISSUED FOR RECORD DOCUMENTATION	07/17/14	EJT
2.	ISSUED FOR CONSTRUCTION	06/25/13	HMS
1.	ISSUED FOR BID	03/28/13	EJT
0.	ISSUED FOR PERMIT	01/15/13	HMS
REVISION:		DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.	2113.2/POWER/CON
DRAWN BY:	RLH 01/14/13
CHECKED BY:	HMS 01/14/13
APPROVED BY:	HMS 01/15/13

DETAILS AND SECTIONS

ASH SURGE BASIN LINER REPLACEMENT
POWERTON GENERATING STATION
MIDWEST GENERATION
PEKIN, ILLINOIS

DRAWING NO: D21132C032-04
REFERENCE: .

SHEET NO. C032

Jul 17, 2014 1:15pm PLOTTED BY: ddode SAVED BY: ddode
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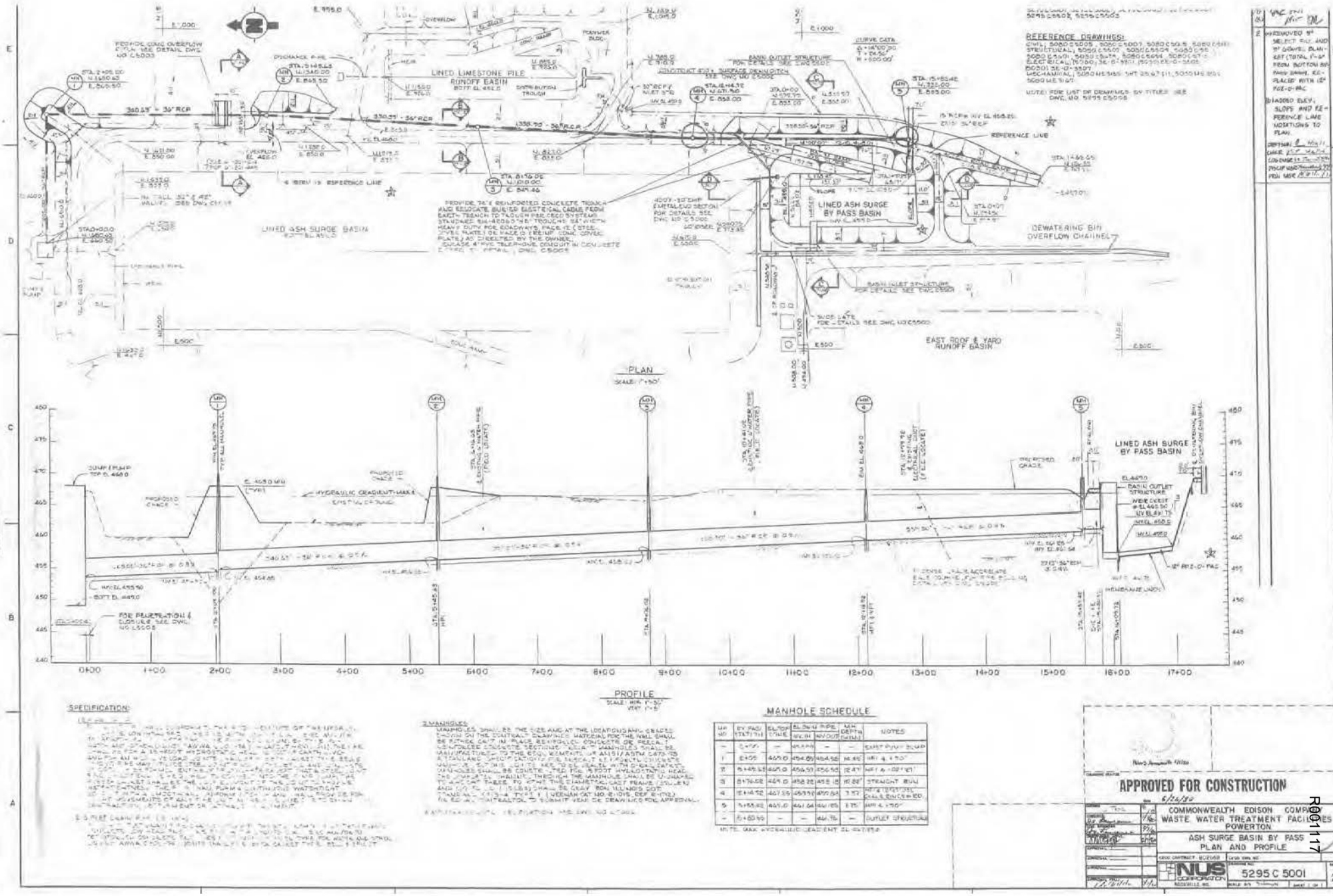
IMAGES:

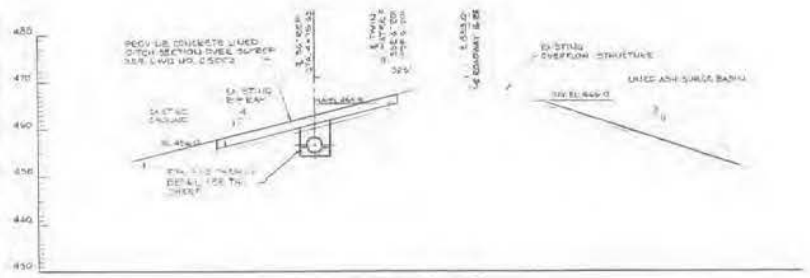
APPENDIX B

Ash Surge Basin Construction Drawings

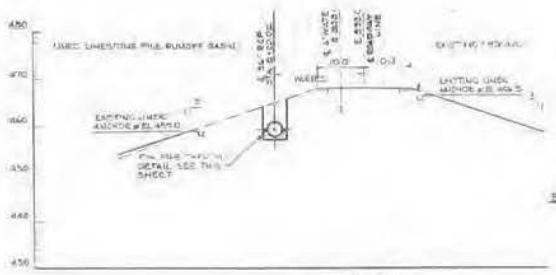
APPENDIX B-1

NUS Construction Drawings


LINED LIMESTONE FILE RUNOFF BASIN
LINED ASH SURGE BASIN
LINED ASH SURGE BY PASS BASIN
DEWATERING BIN OVERFLOW CHANNEL
EAST ROOF & YARD RUNOFF BASIN
REFERENCE DRAWINGS:
PLAN
PROFILE
SPECIFICATION:
MANHOLE SCHEDULE
APPROVED FOR CONSTRUCTION
COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES
POWERTON
ASH SURGE BASIN BY PASS
PLAN AND PROFILE
NUS CORPORATION
5295 C 5001



SECTION A



SECTION B

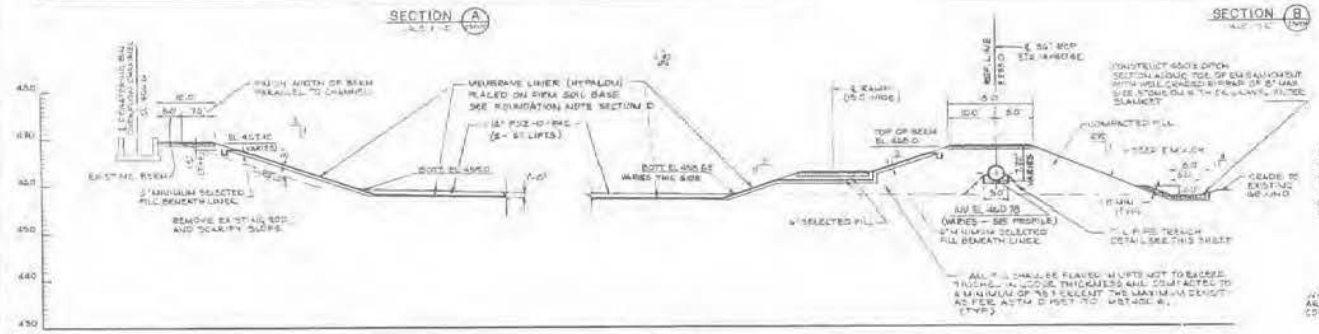
CONTRACT DRAWINGS:
[illegible]

REFERENCE DRAWINGS:
[illegible]

SPECIFICATION (CONTINUED FROM C 5002)

6. MEMBRANE LINER
THE LINER MATERIAL SHALL BE SYNTHETIC ELASTOMERIC SHEETING MANUFACTURED FROM A SYNTHETIC ELASTOMERIC COMPOUND CONTAINING NOT LESS THAN 65% (BY WEIGHT) OF CURED HYPALON AS THE PRIMARY ELASTOMER AND THE FOR EGOING SHEETING AND FORMULATED IN ACCORDANCE WITH THE RECOMMENDATIONS OF E.I. DUPONT ELASTOMER CHEMICALS DEPARTMENT.
INSTALLATION, SEAMING, ANCHORAGE, ETC.
THE LINER MATERIAL SHALL BE TWO-PLY CONSISTING OF TWO PLIES THICKNESS OF HYPALON (MINIMUM) OF SCRIM SHEET LAMINATED TO ONE LAYER OF NYLON CAL. [illegible] TEN. RE-UPHOLSTERY FABRIC FOR A TOTAL MINIMUM THICKNESS OF [illegible]
THE MATERIAL SHALL BE FURNISHED IN SUCH SIZES AS WILL MINIMIZE FIELD SEAMING. ALL SEAMS SHALL BE LAP SEAMS AND SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE MANUFACTURER OF THE LINER MATERIAL. INSTALLATION SHALL BE COMPLETED BY PERSONNEL EXPERIENCED IN THE INSTALLATION OF SIMILAR MATERIALS. [illegible] SHALL BE STAINLESS STEEL BATTEN BARS AND STAINLESS STEEL SCREWS OR STAINLESS STEEL STUDDING.

8. POZ-O-PAC
POZZOLANIC BASE IS TO BE PLACED AT THE BASIN BOTTOM ON TOP OF THE MEMBRANE LINER. THE PRODUCT MIXTURE SHALL BE FIELD DETERMINED BUT SHALL BE COMPOSED OF HYDRATED LIME (ATT. #1, #2 OR #3) FLY ASH (#1 OR #2) AND BOILER SLAG AGGREGATE (#6 OR #7) WITH ABOUT 10% MOISTURE ADDED (COMPACTION TO THE REQUIRED DENSITY SHALL BE IN 6-INCH LAYERS AND THE FINISHED THICKNESS IS OBTAINED. POZ-O-PAC BASE SHALL BE CONSTRUCTED WHEN THE TEMPERATURE IS ABOVE 40°F DURING MAY 15TH TO SEPT 15TH.



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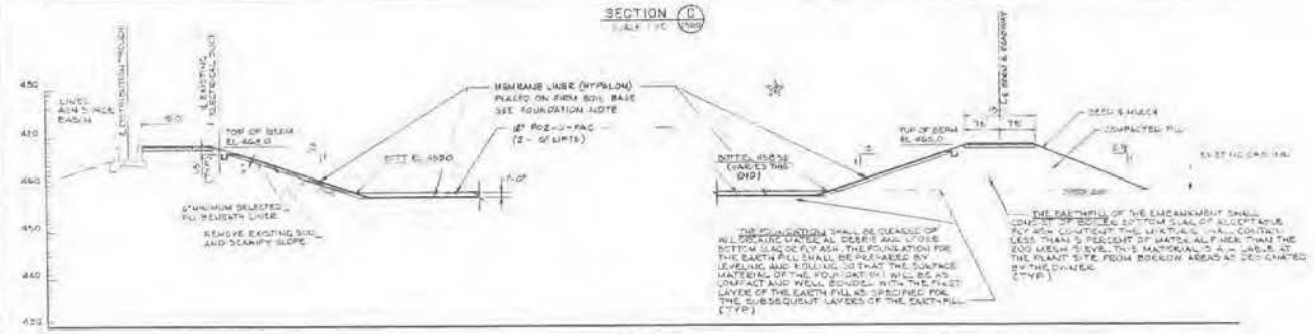

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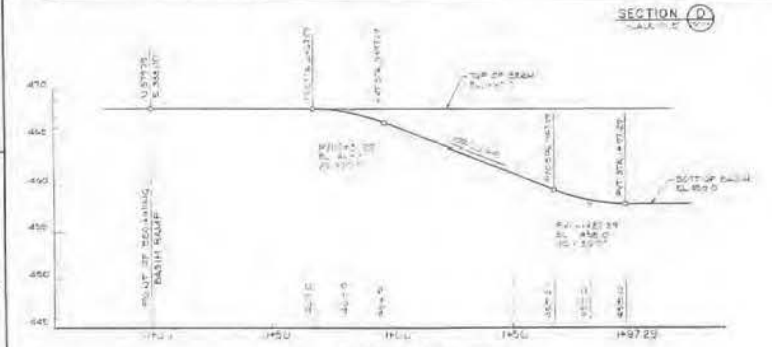
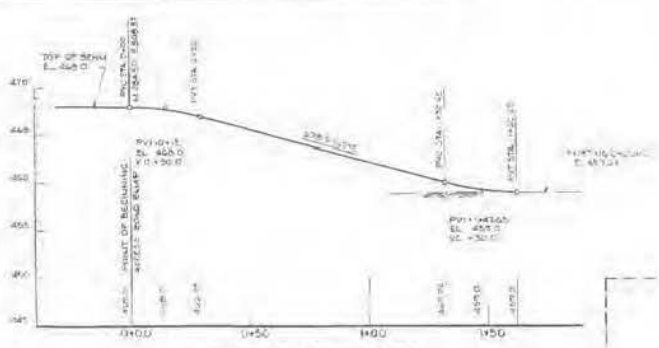
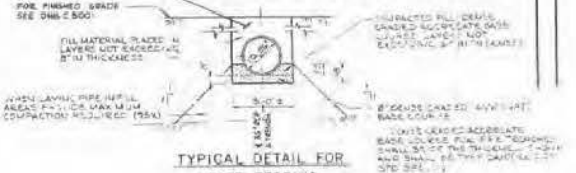


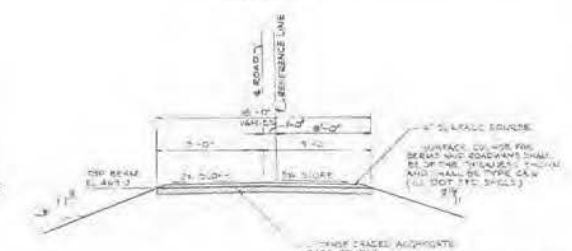
BASIN RAMP PROFILE



ACCESS ROAD RAMP PROFILE



TYPICAL DETAIL FOR PIPE BEDDING



TYPICAL ROAD SECTION

APPROVED FOR CONSTRUCTION
5/5/82

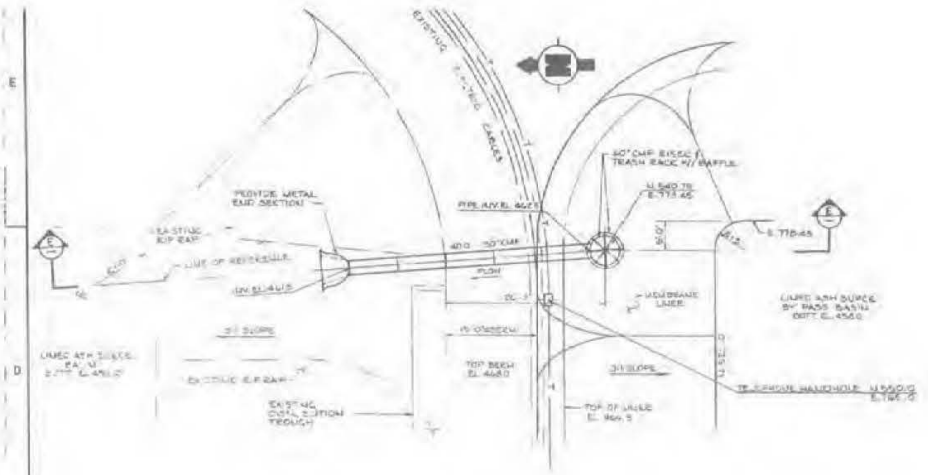
COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES
POWERTON

ASH SURGE BASIN BY PASS
SECTIONS AND RAMP PROFILES

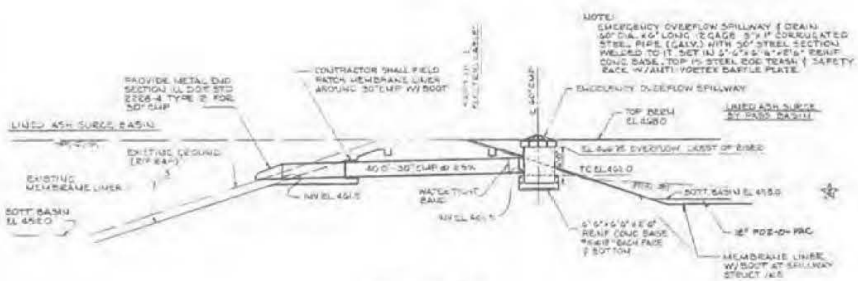
NUS CORPORATION
ROCKVILLE, MD

5295 C 5002

R001118



PLAN



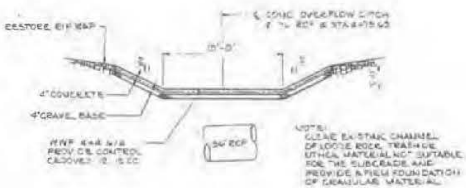
SECTION (E)

EMERGENCY OVERFLOW SPILLWAY

SCALE: 1/8"=1'-0"

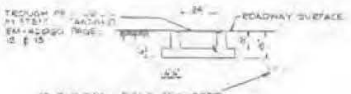
CONTRACT DRAWINGS		
DRAWING NO.	REV.	DRAWING TITLES
5295 C 5001	1	PLAN & PROFILE
5295 C 5002	1	DETAILS & SECTIONS
5295 C 5003	1	MISCELLANEOUS DETAILS
5295 C 5501	1	INLET STRUCTURE
5295 C 5502	1	OUTLET STRUCTURE
5295 C 5503	1	MISCELLANEOUS GATES
REFERENCE DRAWINGS		
5080 C 5006	2	DETAIL PLAN - EAST ROOF & YARD RUNOFF BASIN
5080 C 5007	2	DETAIL PLAN ASH SURGE BASIN
5080 C 5018	2	MISCELLANEOUS SECTIONS AND DETAILS, SHTS 1&2
5080 C 5181	1	BASIN SWD. SECTION
5080 C 5501	1	RAMPS & ASH SURGE BASIN OVERFLOW STRUCTURE
5080 C 5502	1	ASH SURGE BASIN & LIMESTONE BASIN DISTRIBUTION TROUGH SECT (A) & DETAILS
5080 C 5511	2	DEWATERING BIN OVERFLOW CHANNEL SECTIONS & DETAILS
5080 C 5601	2	STANDARD DETAILS
5080 C 5688	3	ASH SURGE BASIN SUMP - ELASTIFIEL OVERFLOW SUMP
5080 C 5698	1	PIPE SUPPORTS PERIMETER PLAN & SECTIONS (COL LINE "A" TO "E")
5080 C 5712	1	ASH SURGE BASIN SUMP PLAT PIPE SECTIONS & DETAILS
(5080) 3E-0-5501	2	ELECTRICAL AREA LAYOUT EAST RUNOFF BASIN - NORTH
(5080) 3E-0-5505	3	ELECTRICAL AREA LAYOUT LIMESTONE PILE RUNOFF BASIN
(5080) 3E-0-5507	2	ELECTRICAL AREA LAYOUT ASH SURGE BASIN AREA
5080 ME 3151 SHT 1	4	PIPING ARRANGEMENT - YARD AREA
SHT 2	3	
SHT 6	3	
SHT 7	3	
SHT 11	3	
5050 ME 3156 SHT 1	3	PIPING ARRANGEMENT YARD DETAIL EAST ROOF & YARD RUNOFF BASIN
5050 ME 3149 SHT 1	1	PIPING ARRANGEMENT YARD DETAIL LIMESTONE PILE RUNOFF BASIN AND ASH SURGE BASIN SUMPS

NOTE:
FOR ELECTRICAL CABLE TROUGH SEE C&CO SYSTEMS STANDARD SK-42066 "HB" TROUGH 24" WIDTH HEAVY DUTY FOR ROADWAYS PAGE 12 (3/8" STEEL COVER PLATE) ON PAGE 13 (REINFORCED CONCRETE 3/16" PLATE).



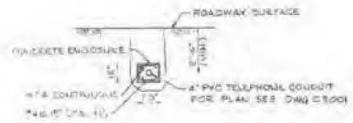
TYPICAL DETAIL
CONCRETE OVERFLOW DITCH

SCALE: 1/4"=1'-0"



DETAIL
ELECTRICAL CABLE TROUGH

SCALE: 3/8"=1'-0"



DETAIL
CONCRETE ENCLOSURE FOR
TELEPHONE CONDUIT

SCALE: 3/8"=1'-0"

NO.	BY	DATE
2	MW	11/8/83

2 MW REMOVED CONCRETE WEIGHT AND ADDED BLANKET FROM BOTTOM OF BASIN AND ADDED 18" RCP OUTFALL PIPE
1 CHANGED BOTTOM EL 458.0 TO 459.0

APPROVED FOR CONSTRUCTION

6/24/83

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES
POWERTON

ASH SURGE BASIN BY PASS
MISCELLANEOUS DETAILS

DESIGNED	DRAWN	CHECKED	APPROVED
1-83	1-83	1-83	1-83
8-26	8-26	8-26	8-26
8-29	8-29	8-29	8-29

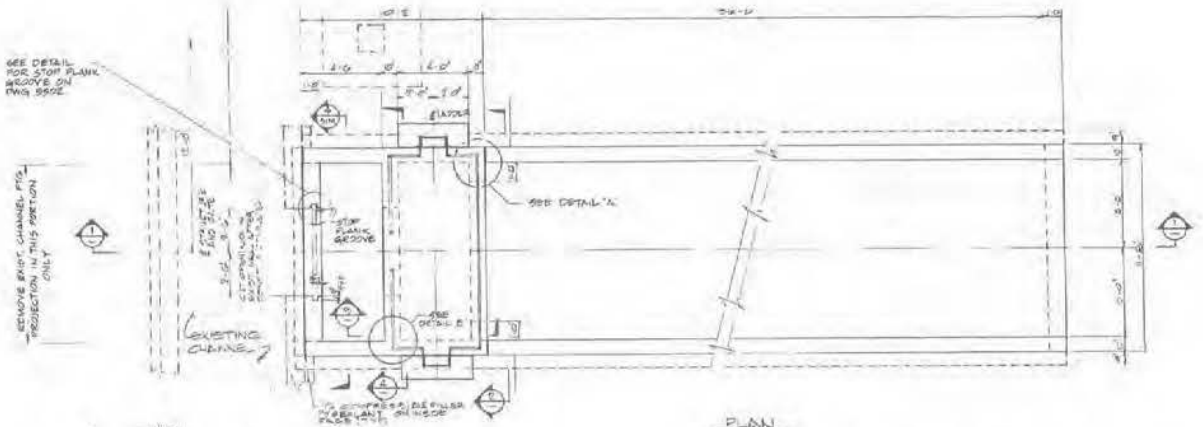
C&CO CONTRACT-502 C&CO | C&CO DWG. NO.

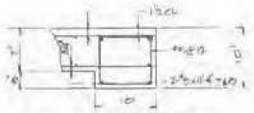
NUS CORPORATION ROCKVILLE, MD.

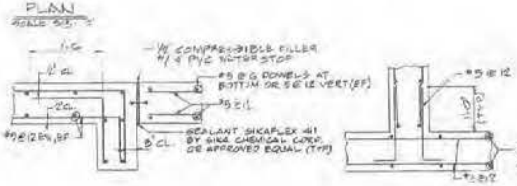
5295 C 5003

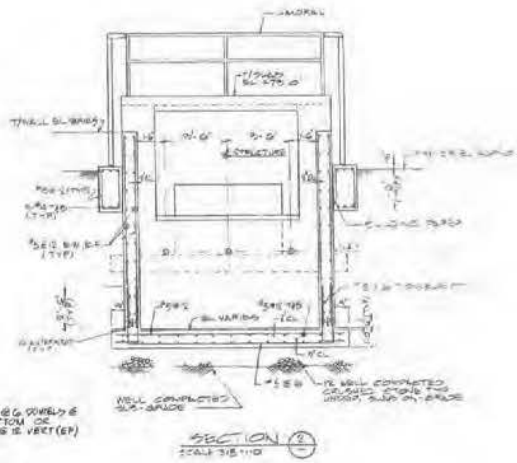
SCALE: 1/2"=1'-0" | SHT. 2 OF 2

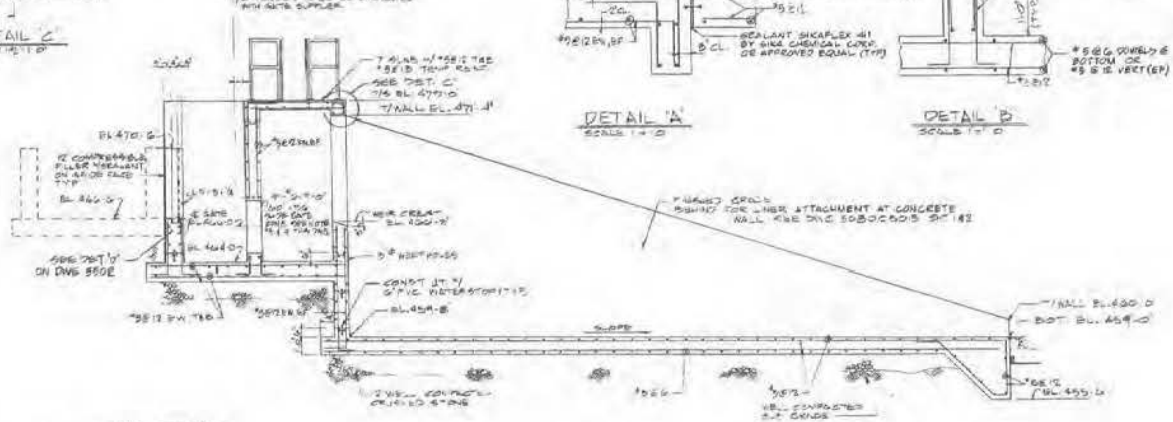
R001119

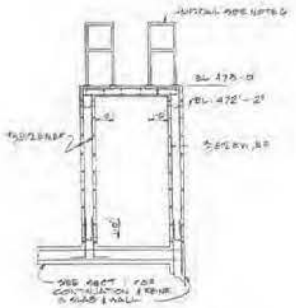


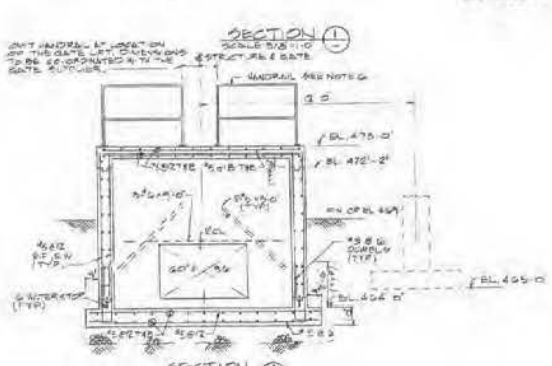












NOTES:

1. CONCRETE: f'c = 5000 PSI AT 28 DAYS
2. REINFORCING = ASTM A 615 GRADE 60
3. CONTRACTOR SHALL FURNISH AND INSTALL R&D STEEL GATE AND ACCESS DOOR AS MANUFACTURED BY ARMCO STEEL CORP. CONFORMING TO THE FOLLOWING SPECS OR APPROVED EQUAL.
   a. GATE: MODEL W-00
      QUANTITY REQUIRED = 1
      OPENING SIZE = 60"Wx60"H
      FRAME TYPE = FLAT BACK, STD BOTTOM
      MATERIAL COMBINATION = #2
      STEM DIA. = 1 1/2"ø
   b. ACCESSORIES:
      TYPE OF LIFT = CPS 2
      LIFT SUPPORT = WALL BRACKET TO MATCH CPS 2 STEM SUPPORT = ADJUSTABLE STEM GUIDES AT SPACING RECOMMENDED BY MANUFACTURER.
4. CONTRACTOR SHALL COORDINATE WITH THE GATE SUPPLIER FOR THE NUMBER, SIZE AND LOCATION OF ANCHOR BOLTS REQUIRED TO ATTACH THE GATE, WALL BRACKET AND STEM GUIDES TO THE SUPPORTING WALL.
5. WORK THIS DWG WITH CIVIL DWGS 5295 C 5001 AND 5002.
6. FOR HANDRAIL & LADDER DETAILS SEE REF DWG 5080 C 5601.
7. FOR STOP PLANKS SEE DWG 5295 C 5502 NOTE 4

CONTRACT DRAWINGS:
5295 C 5001, 5002, 5003, 5501, 5502, 5503.

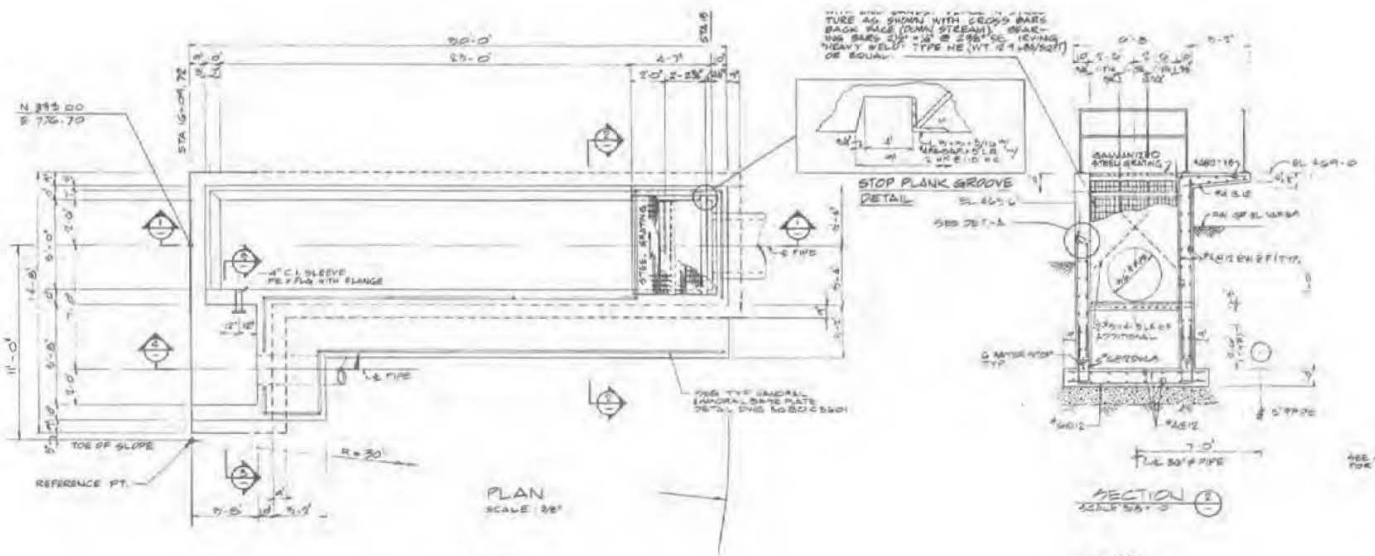
REFERENCE DRAWINGS:
CIVIL: 5080 C 5005, 5007, 5015, 5121
STRUCTURAL: 5080 C 5507, 3507, 3511, 5601, 3638, 3654, 5715
ELECTRICAL: (5080) 3E-0-3301, 3305, 3307
MECHANICAL: 5080 M&V 3155 SHT 2, 5, 6, 7 & 11, 3165, 3169

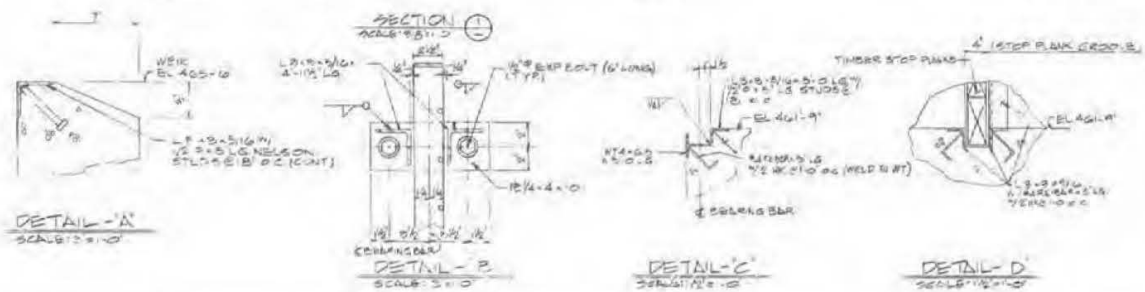
NOTE: FOR LIST OF DRAWINGS BY TITLES SEE DWG NO. 4249 C 5003

APPROVED FOR CONSTRUCTION
6/1/80

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES
POWERTON
ASH SURGE BASIN BY PASS
BASIN INLET STRUCTURE
NUS CORPORATION
5295 C 5501

R001120





NOTES:

1. SEE NOTE NOS 1, 2, 4, 5 AND 6 ON DWG 5301.
2. CONTRACTOR SHALL FURNISH & INSTALL MEDIUM DUTY SLUICE GATE & ACCESSORIES AS MANUFACTURED BY ARMCO STEEL CORP. OR APPROVED EQUAL, CONFORMING TO FOLLOWING SPECS:
   a. GATE
      MODEL 20-10C
      QUANTITY REQD = 1
      OPENING SIZE = 15" DIA.
      FRAME TYPE = FLAT BACK
      MATERIAL COMBINATION = #2
      STEM DIA. = 3/8"
   b. ACCESSORIES
      TYPE OF LIFT = HT-10
      FRAME HT = 12'-4½" MINIMUM
3. STEEL GRATING TO BE IRVING WELDED RECTANGULAR DESIGN TYPE IHB-2 WITH 1½" x ¼" MAIN BARS, AS MANUFACTURED BY IKG INDUSTRIES OR APPROVED EQUAL (GALVANIZED)
4. STOP PLANKS TO BE DOUGLAS FIR COMMERCIAL GRADE NO. 2 (WEST COAST)

   PROVIDE ONE SET OF 7 PLANKS 4" x 8" x 5'-5" LONG (DRESSED SIZE 3½ x 7½ x 5'-5")

   STOP PLANKS ARE INTERCHANGEABLE AT THREE LOCATIONS — SEE ALSO DWGS C5501 & C5503 (ONLY ONE SET REQUIRED UNLESS DIRECTED OTHERWISE BY OWNER)

CONTRACT DRAWINGS:

5295 C 5001, 5002, 5003, 5501, 5502, 5503.

REFERENCE DRAWINGS:

CIVIL: 5080 C 5005, 5007, 5015, 5121
STRUCTURAL: 5080 C 5507, 5509, 5511, 5601, 5635, 5654, 5713
ELECTRICAL: (FORM 3E-0-3301, 5305, 5307
MECHANICAL: F 180 ME 5155 SHT 2, 5, 6, 7 & 11, 5 62, 5169

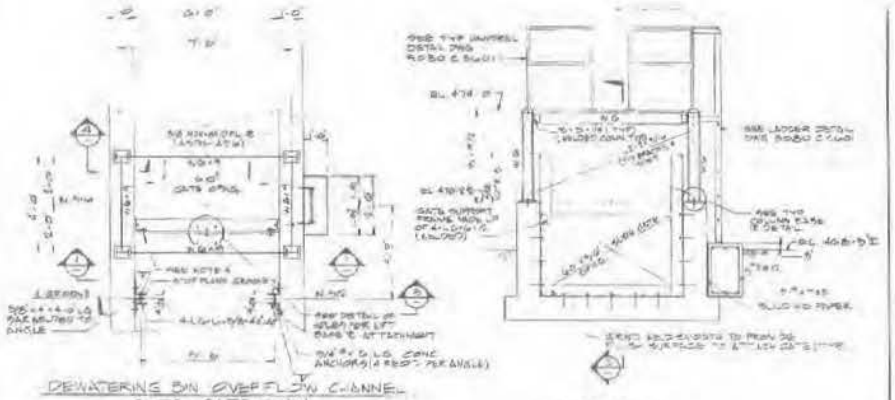
NOTE: FOR LIST OF DRAWINGS BY TITLES SEE DWG NO. 5295 C 5009.

APPROVED FOR CONSTRUCTION

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES
POWERTON
ASH SURGE BASIN BY PASS
BASIN OUTLET STRUCTURE

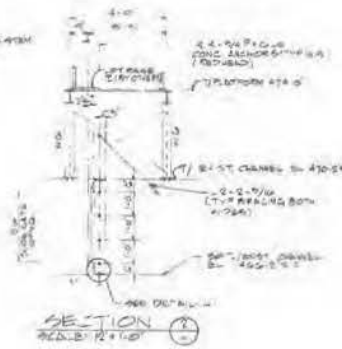
NUS CORPORATION
5295 C 5502

R001121

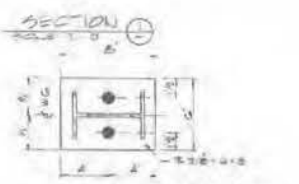


DEWATERING BIN OVERFLOW CHANNEL SLIDE GATE ELEVATION

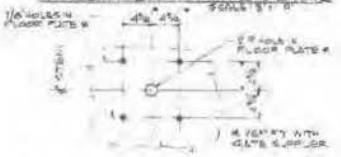
SECTION



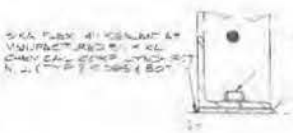
SECTION



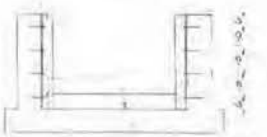
COLUMN BASE PLATE DETAIL



HOLE ARRANGEMENT FOR LIFT BASE PLATE ATTACHMENT



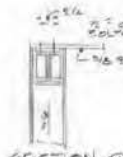
DETAIL - A



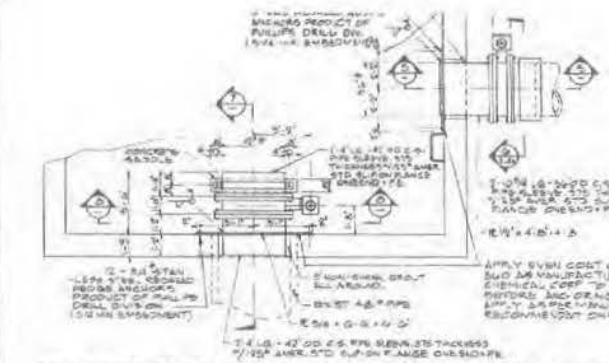
SECTION

NOTES:

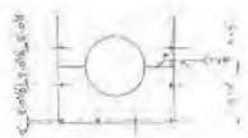
1. ALL STRUCTURAL STEEL: ASTM A-36
2. WELDING ELECTRODES: E70-XX
3. GATE TO BE LAMILOID FIBERGLASS STEEL SLIDE GATE MODEL SLOG VERTICAL LIFTING TYPE WITH STAINLESS STEEL SEATING OR APPROVED EQUAL.
4. GATE TO BE ATTACHED TO SUPPORT MEMBER FRAME WITH BOLTS AS RECOMMENDED BY GATE MANUFACTURER.
5. VERTICAL SIDE LEGS OF GATE FRAME SHALL TO BE EXTENDED FOR SLIDE GATE SUPPORT BRACKETS AND SIDE GUIDES OF GATE. THESE DIMENSIONS SHALL BE COORDINATED WITH THE SITE SUPPLIER.
6. STRUCTURAL STEEL TO RECEIVE ONE SHOP COAT OF NORCHEM 2210.



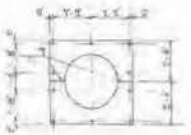
SECTION



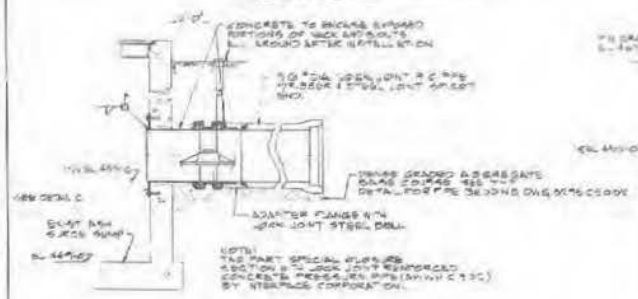
ASU SURGE BASIN SUMP BYPASS PIPE PENETRATION PLAN AT DRIVE INSTALLATIONS



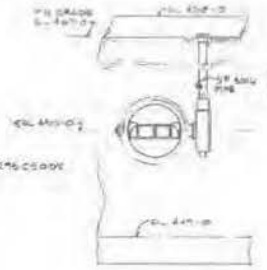
DETAIL - B



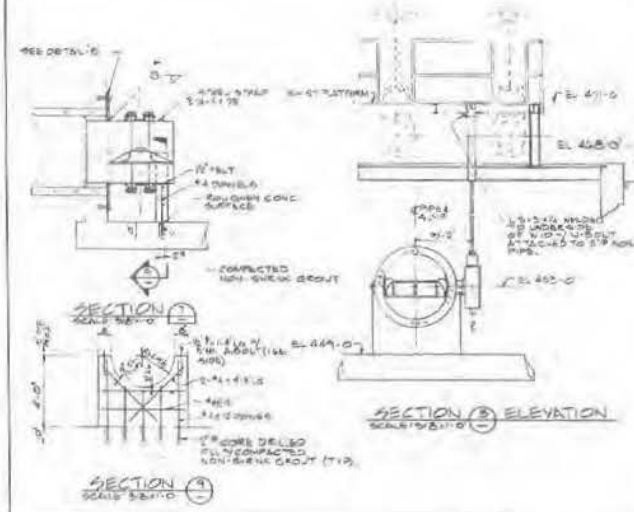
DETAIL - C



SECTION



SECTION ELEVATION



SECTION ELEVATION

NOTES:

1. PROVIDE ONE(1) 36" DIA. AND ONE(1) 42" DIA. RUBBER SEATED BUTTERFLY VALVES WHICH COMPLY WITH AWWA STANDARD C504 (LATEST REVISION). BODY SHALL BE CAST IRON, WAFER END FOR FLANGES. SERVICE IS FOR AWWA PRESSURE CLASS 150B. OPERATOR SHALL BE BURIED SERVICE/SUBMERSION PRESSURE (OPS1) WITH 2" STD AWWA NUT AND EXTENSION STEMS AS SHOWN. VALVES SHALL BE PECTON X-R-70, MANUFACTURED BY HENRY PRATT COMPANY, AURORA, IL. OR APPROVED EQUAL.
2. MISCELLANEOUS STEEL EXPOSED SHALL BE GALVANIZED.

CONTRACT DRAWINGS:

5295 C 5001, 5002, 5003 (CIVIL) 5295 C 5501, 5502, 5503 (STRUCT.)

REFERENCE DRAWINGS:

CIVIL: 5080 C 5005, 5007, 5013, 5121
STRUCTURAL: 5080 C 5507, 5509, 5511, 5610, 5638, 5654, 5713
ELECTRICAL: 5080-5610, 5330, 5505, 5507
MECHANICAL: 5080 M 5150 SHT 7 & 9, 5111, 5162, 5169.
NOTE: FOR LIST OF DRAWINGS BY TITLES SEE DWG NO. 5295 C 5003.

APPROVED FOR CONSTRUCTION

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES
POWERTON

MISCELLANEOUS SLIDE GATES

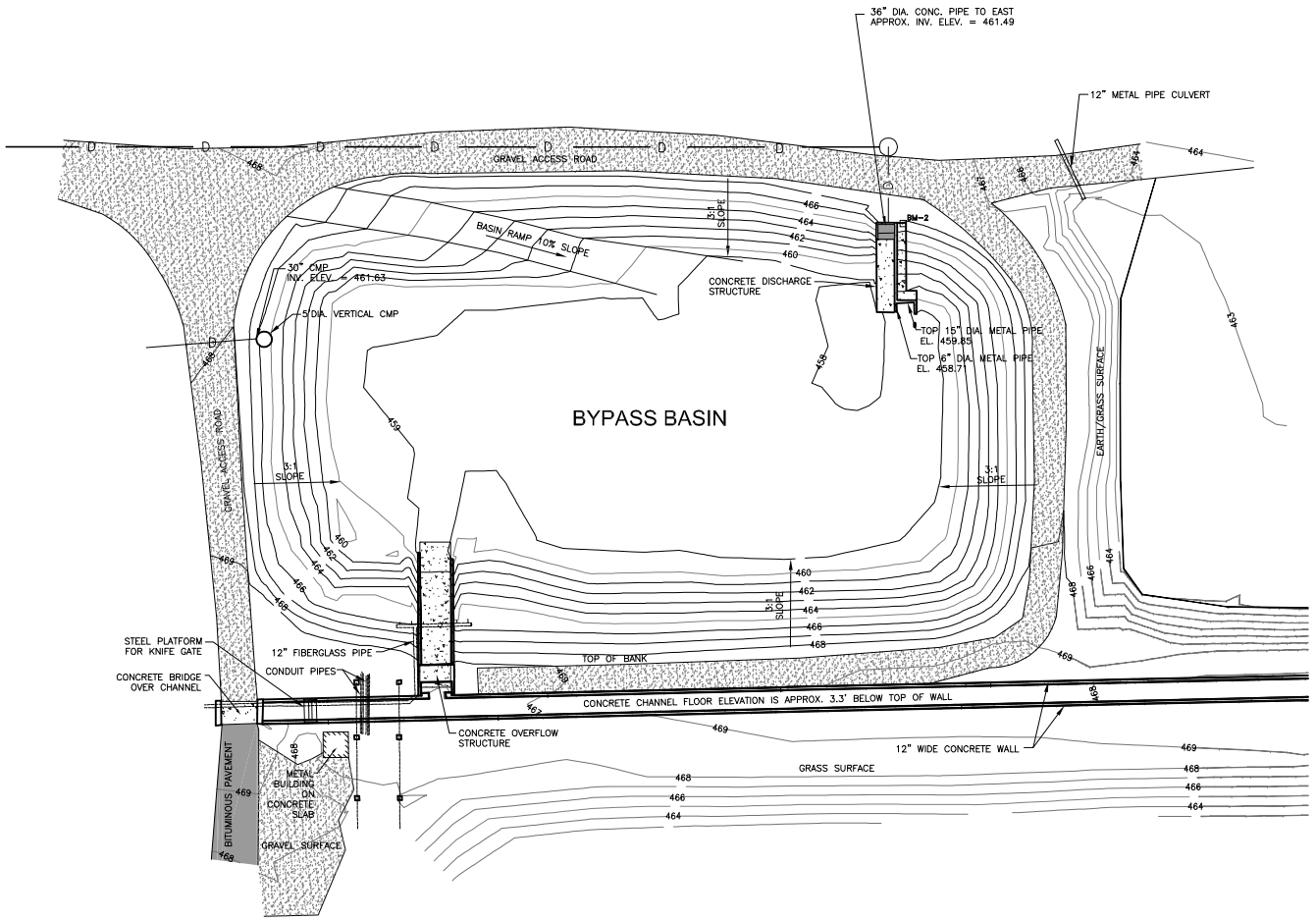
NUS CORPORATION

5295 C 5503

R0011122

APPENDIX B-2

Liner Replacement Construction Drawings



LEGEND

- D — UNDERGROUND DISCHARGE PIPE
- ABOVEGROUND INTAKE PIPE
- 460 — GROUND SURFACE CONTOUR
- BM-2 — BENCHMARK 2

HORIZONTAL DATUM:
ILLINOIS STATE PLANE COORDINATE SYSTEM, WEST ZONE, NAD83.

VERTICAL DATUM:
LOCAL PLANT DATUM

BENCHMARK 2:
NORTHEAST CORNER OF CONCRETE DISCHARGE STRUCTURE. CHISELED "+" IN CONCRETE ELEVATION 468.75 FT.

SOURCE NOTES:
THIS DRAWING WAS DEVELOPED FROM A SURVEY MAURER STUTZ, INC. DATED SEPTEMBER 7, 2010, DRAWING NO. 23210023.
LOCATION OF BASIN AND ACCESS RAMP TAKEN FROM MIDWEST GENERATION DRAWING NO. 5295 C5001-2, DATED 6-26-1980.

N

0 10 20 40
SCALE IN FEET

6.			
5.			
4.			
3.			
2.	RECORD DOCUMENTATION	06/08/11	HMS
1.	ISSUED FOR BID	10/06/10	HMS
0.	ISSUED FOR PERMIT	06/30/10	HMS
REVISION:		DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

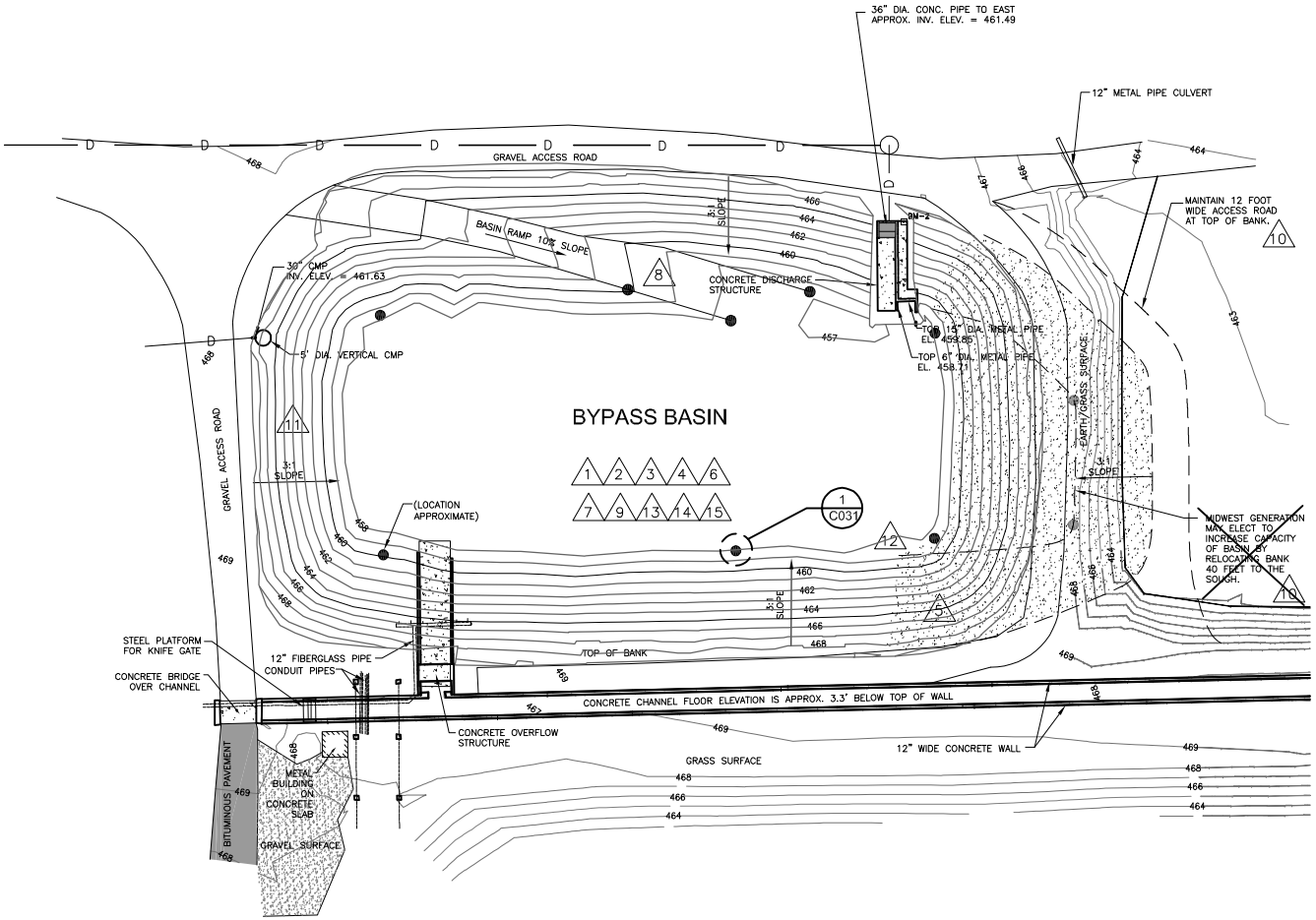
PROJECT NO. 1965.5/5.4
DRAWN BY: KNW 06/30/10
CHECKED BY: RJG 06/30/10
APPROVED BY: HMS 06/130/10

PRE-CONSTRUCTION CONDITIONS

BYPASS BASIN LINER REPLACEMENT
MIDWEST GENERATION
POWERTON POWER STATION
PEKIN, ILLINOIS

DRAWING NO: D1965C010-02
REFERENCE: .

SHEET NO. C010



LEGEND

- UNDERGROUND DISCHARGE PIPE
- ABOVEGROUND INTAKE PIPE
- PREPARED SUBGRADE SURFACE CONTOUR
- 12 OZ. NON-WOVEN GEOTEXTILE
- MARKER POST LOCATION
- ADDITIONAL MARKER POST LOCATION IF BANK IS RELOCATED.
- BANK/AREA FOR POSSIBLE RELOCATION
- BENCHMARK 2

CONTRACTOR NOTES:

1. CONTRACTOR SHALL FIELD VERIFY LOCATION OF UNDERGROUND PIPES WITH ASSISTANCE OF OWNER'S UTILITY LOCATOR.
2. CONTRACTOR SHALL FIELD VERIFY LOCATION OF CONCRETE STRUCTURES AND ABOVE GROUND PIPING.
3. CONTRACTOR SHALL STORE ALL GEOSYNTHETICS AND SUBGRADE MATERIALS IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
4. CONTRACTOR SHALL STORE AND STAGE EQUIPMENT AT LOCATION APPROVED BY OWNER.
5. CLEAR AND GRUB ALL BRUSH ALONG TOP OF SLOPE OF BASIN.
6. PROTECT ALL CONCRETE AND UTILITY STRUCTURES THROUGHOUT PROJECT DURATION.
7. CONTRACTOR SHALL REMOVE ALL VEGETATION, ROCKS, AND OTHER DEBRIS FROM EXISTING LINER AND DISPOSE OF IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
8. CONTRACTOR SHALL CLEAN OFF THE RAMP SURFACE TO THE EXTENT PRACTICAL TO REMOVE ROCKS THAT MAY POSE A HAZARD TO GEOMEMBRANE, AS APPROVED BY GEOMEMBRANE INSTALLER, ENGINEER AND/OR OWNER.
9. CONTRACTOR SHALL REMOVE 12-INCH LAYER OF POZ-O-PAC AND 6-INCHES OF POZ-O-PAC SUBGRADE FROM THE BASE OF BASIN.
~~10. CONTRACTOR SHALL RELOCATE SOUTHERN BANK 40 FEET TO THE SOUTH, AS DIRECTED BY OWNER. SEGREGATE GRAVEL ACCESS ROAD MATERIAL TO BE REUSED AS BASE SOURCE MATERIAL. MATERIAL REMOVED FROM THE EXISTING BANK MAY BE USED TO RECONSTRUCT NEW SOUTHERN BANK IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.~~
11. CONTRACTOR SHALL REMOVE "SOFT" SUBGRADE MATERIAL BENEATH EXISTING HYPALON LINER, AS DIRECTED BY OWNER AND/OR ENGINEER. BACK FILL AREAS WITH FILL IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS. CUT HYPALON AS NEEDED TO REPAIR THE "SOFT" SUBGRADE AREAS.
12. CONTRACTOR SHALL INSTALL MARKER POSTS ALONG THE TOE OF SLOPE AS SHOWN AND IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS AND DETAIL 1 ON SHEET C031.
13. CONTRACTOR SHALL PLACE 16 OZ. NONWOVEN GEOTEXTILE AT BASE OF BASIN AND WHERE HYPALON LINER DOES NOT EXIST OR WAS REMOVED OF THE PREPARED SUBGRADE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
14. SUBGRADE SHALL BE APPROVED BY OWNER AND/OR ENGINEER PRIOR TO INSTALLATION OF GEOMEMBRANE.
15. CONTRACTOR SHALL PROVIDE MEANS TO PROTECT SUBGRADE FROM EROSION, STORM WATER, AND HEAVY EQUIPMENT TRAFFIC. DAMAGE TO SUBGRADE SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

HORIZONTAL DATUM:
ILLINOIS STATE PLANE COORDINATE SYSTEM, WEST ZONE, NAD83.

VERTICAL DATUM:
LOCAL PLANT DATUM

BENCHMARK 2:
NORTHEAST CORNER OF CONCRETE DISCHARGE STRUCTURE. CHISELED "+" IN CONCRETE ELEVATION 468.75 FT.

SOURCE NOTES:
THIS DRAWING WAS DEVELOPED FROM A SURVEY MAURER STUTZ, INC. DATED SEPTEMBER 7, 2010, DRAWING NO. 23210023.
LOCATION OF BASIN AND ACCESS RAMP TAKEN FROM MIDWEST GENERATION DRAWING NO. 5295 C5001-2, DATED 6-26-1980.
BASIN SUBGRADE AND SITE IMPROVEMENTS FROM A SURVEY PROVIDED BY MILLENNIA PROFESSIONAL SERVICES, MARCH 2011.

0 10 20 40
SCALE IN FEET

	REVISION:	DATE:	APP'D BY:
6.			
5.			
4.			
3.			
2.	RECORD DOCUMENTATION	06/08/11	HMS
1.	ISSUED FOR BID	10/06/10	HMS
0.	ISSUED FOR PERMIT	06/30/10	HMS

NATURAL RESOURCE TECHNOLOGY

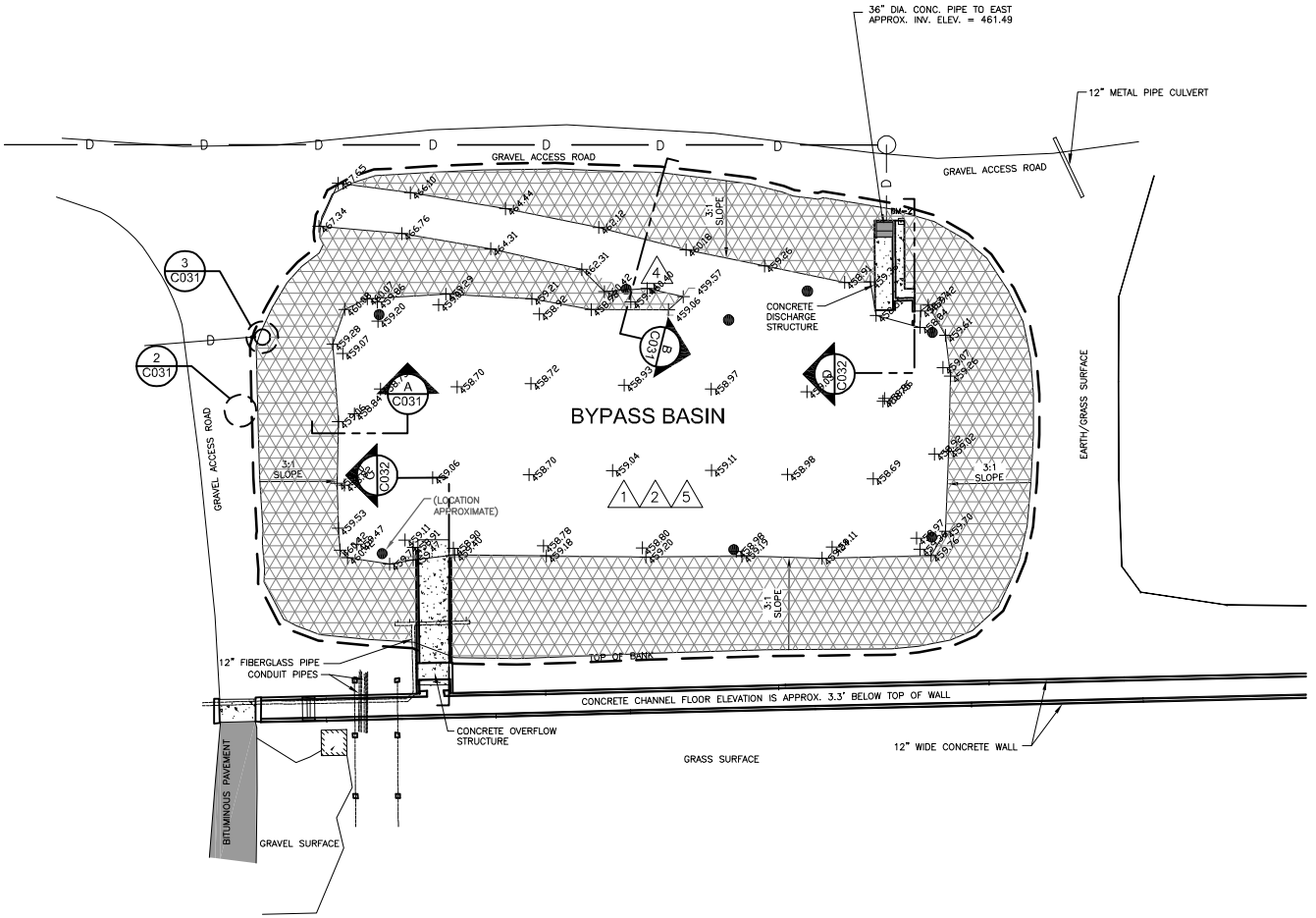
PROJECT NO.	1965/5.4
DRAWN BY:	KNW 06/30/10
CHECKED BY:	RJG 06/30/10
APPROVED BY:	HMS 06/30/10

LINER SUBGRADE PREPARATION

BYPASS BASIN LINER REPLACEMENT
MIDWEST GENERATION
POWERTON POWER STATION
PEKIN, ILLINOIS

DRAWING NO: D1965C020-02
REFERENCE: .

SHEET NO. C020



LEGEND

- D — UNDERGROUND DISCHARGE PIPE
- ABOVEGROUND INTAKE PIPE
- ANCHOR TRENCH
- × 459.11 — TOP OF WARNING LAYER (ELEVATION, FT.)
- MARKER POST LOCATION
- BM-2 — BENCHMARK 2
- HDPE GEOMEMBRANE

HORIZONTAL DATUM:
ILLINOIS STATE PLANE COORDINATE SYSTEM, WEST ZONE, NAD83.

VERTICAL DATUM:
LOCAL PLANT DATUM

BENCHMARK 2:
NORTHEAST CORNER OF CONCRETE DISCHARGE STRUCTURE. CHISELED "+" IN CONCRETE ELEVATION 468.75 FT.

CONTRACTOR NOTES: △

1. CONTRACTOR SHALL INSTALL 60 MIL HDPE, WHITE, TEXTURED GEOMEMBRANE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION PRIOR TO PLACEMENT OF THE WARNING LAYER. CONTRACTOR SHALL PROVIDE AND FOLLOW AN APPROVED GEOMEMBRANE LAYOUT PLAN.
2. GEOMEMBRANE SHALL BE ANCHORED INTO 2.5 FEET DEEP TRENCHES ALONG TOP OF BASIN BANK, AS SHOWN ON SHEET C031. CONTRACTOR SHALL ADVISE OWNER AND/OR ENGINEER IF PROPOSED LOCATION FOR ANCHOR TRENCH IS NOT POSSIBLE.
3. CONTRACTOR SHALL PLACE 12-OZ. NON-WOVEN GEOTEXTILE, CUSHION MATERIAL AND WARNING LAYER MATERIAL OVER THE GEOMEMBRANE AT BASE AND 4 FEET ON SIDE SLOPES FOLLOWING ENGINEER APPROVAL AND PASSING QUALITY CONTROL RESULTS IN ACCORDANCE WITH TECHNICAL SPECIFICATIONS (SEE SHEET C031).
4. CONTRACTOR SHALL PLACE 2 LAYERS OF 12-OZ. NONWOVEN GEOTEXTILE, CUSHION AND WARNING LAYER MATERIALS OVER THE GEOMEMBRANE ON THE RAMP, AS SHOWN ON SHEET C031.
5. RESTORE AREAS DISTURBED BY EQUIPMENT AND MATERIAL LAYDOWN.
6. CONTRACTOR SHALL PROVIDE SURVEY DOCUMENTATION OF THE ITEMS LISTED IN THE TECHNICAL SPECIFICATIONS.
7. CONTRACTOR SHALL PERFORM A LEAK LOCATION SURVEY IN ACCORDANCE WITH TECHNICAL SPECIFICATIONS.

SOURCE NOTES:
THIS DRAWING WAS DEVELOPED FROM A SURVEY MAURER STUTZ, INC. DATED SEPTEMBER 7, 2010, DRAWING NO. 23210023.
LOCATION OF BASIN AND ACCESS RAMP TAKEN FROM MIDWEST GENERATION DRAWING NO. 5295 C5001-2, DATED 6-26-1980.
BASIN SUBGRADE AND SITE IMPROVEMENTS FROM A SURVEY PROVIDED BY MILLENNIA PROFESSIONAL SERVICE, MARCH 2011.

N

0 10 20 40
SCALE IN FEET

	REVISION:	DATE:	APP'D BY:
6.			
5.			
4.			
3.			
2.	RECORD DOCUMENTATION	06/08/11	HMS
1.	ISSUED FOR BID	10/06/10	HMS
0.	ISSUED FOR PERMIT	06/30/10	HMS

NATURAL RESOURCE TECHNOLOGY

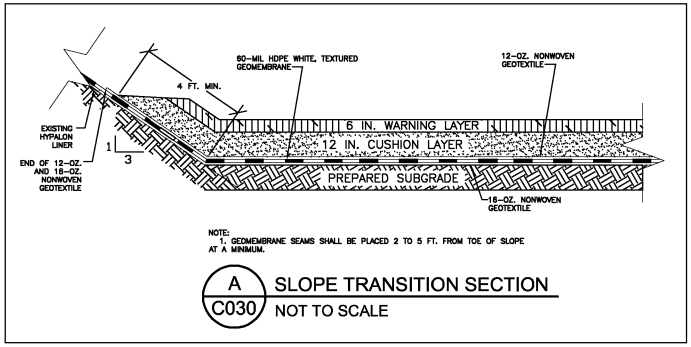
PROJECT NO. 1965.5/5.4
DRAWN BY: KNW 06/30/10
CHECKED BY: RJG 06/30/10
APPROVED BY: HMS 06/30/10

WARNING LAYER PLAN

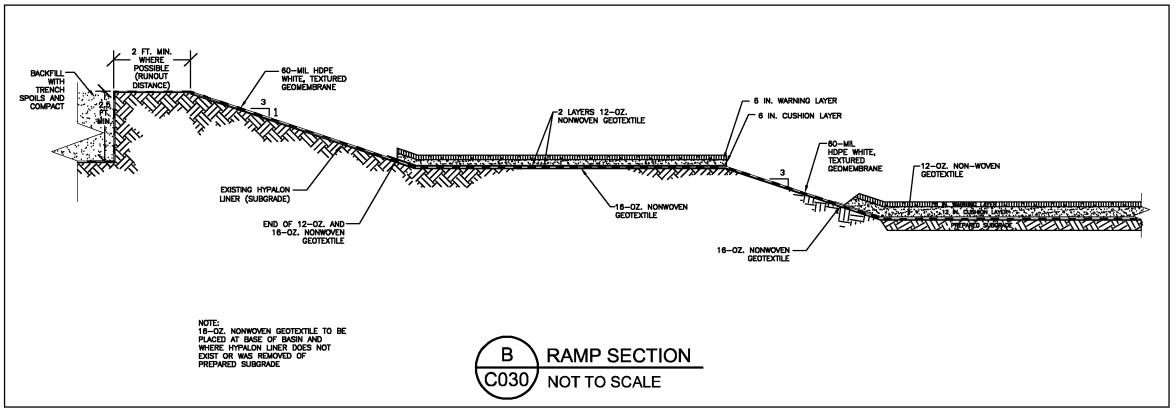
BYPASS BASIN LINER REPLACEMENT
MIDWEST GENERATION
POWERTON POWER STATION
PEKIN, ILLINOIS

DRAWING NO: D1965C030-02
REFERENCE: .

SHEET NO. C030



A / C030 SLOPE TRANSITION SECTION
NOT TO SCALE



B / C030 RAMP SECTION
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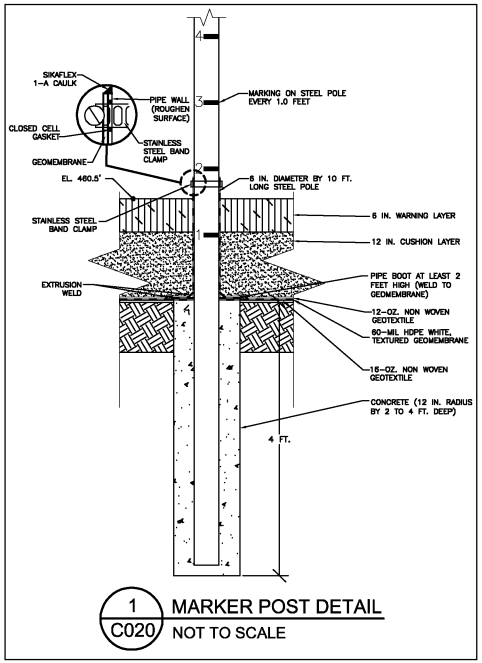

1 / C020 MARKER POST DETAIL
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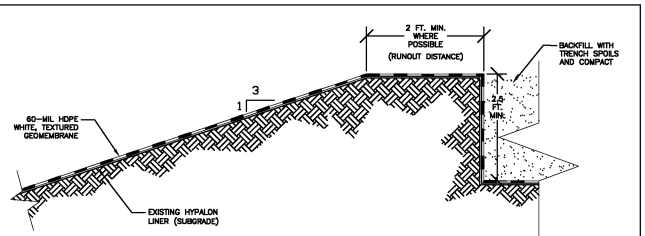
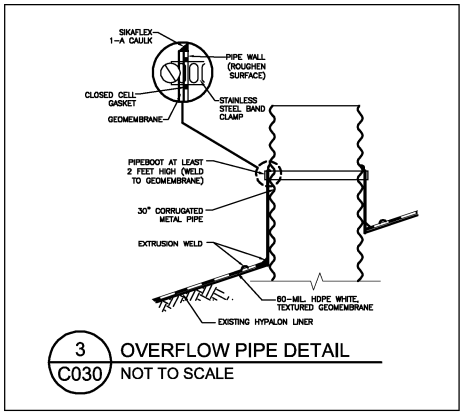


2 / C030 ANCHOR TRENCH DETAIL
NOT TO SCALE



3 / C030 OVERFLOW PIPE DETAIL
NOT TO SCALE

NOT FOR CONSTRUCTION

6.			
5.			
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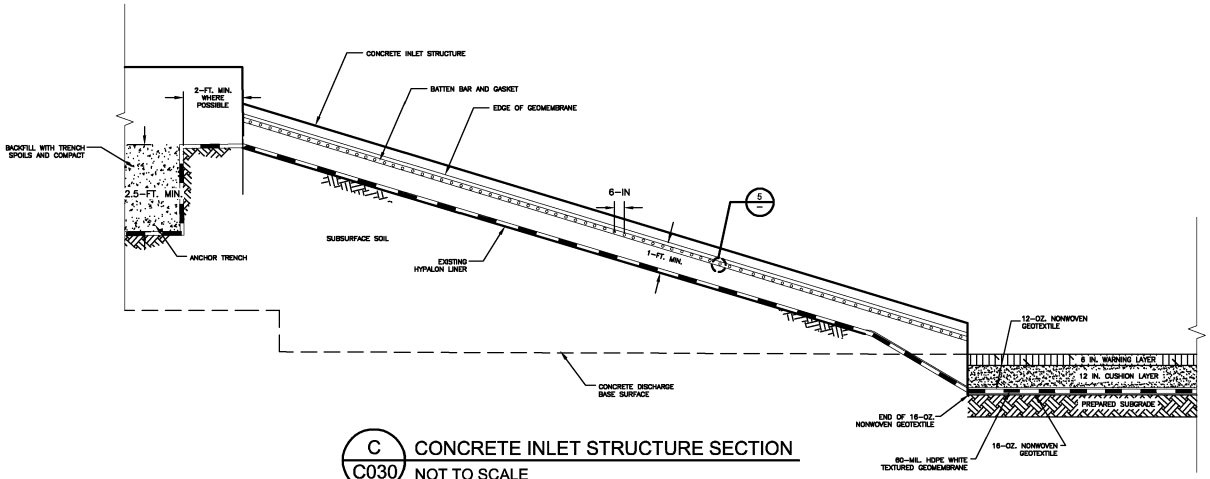
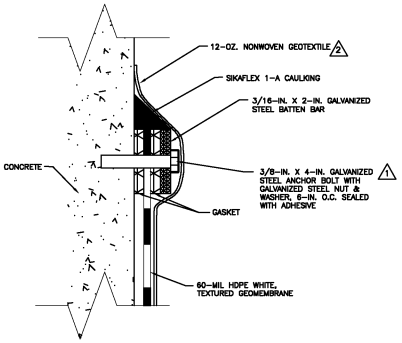
2.	RECORD DOCUMENTATION	06/16/11	HMS
1.	ISSUED FOR BID	10/08/10	HMS
0.	ISSUED FOR PERMIT	06/30/10	HMS
REVISION:		DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1965/5.4	DETAILS AND SECTIONS
DRAWN BY: KNW 06/30/10	BYPASS BASIN LINER REPLACEMENT MIDWEST GENERATION POWERTON POWER STATION PEKIN, ILLINOIS
CHECKED BY: RJG 06/30/10	
APPROVED BY: HMS 06/30/10	DRAWING NO: D1965C031-02
	REFERENCE:
	SHEET NO. C031

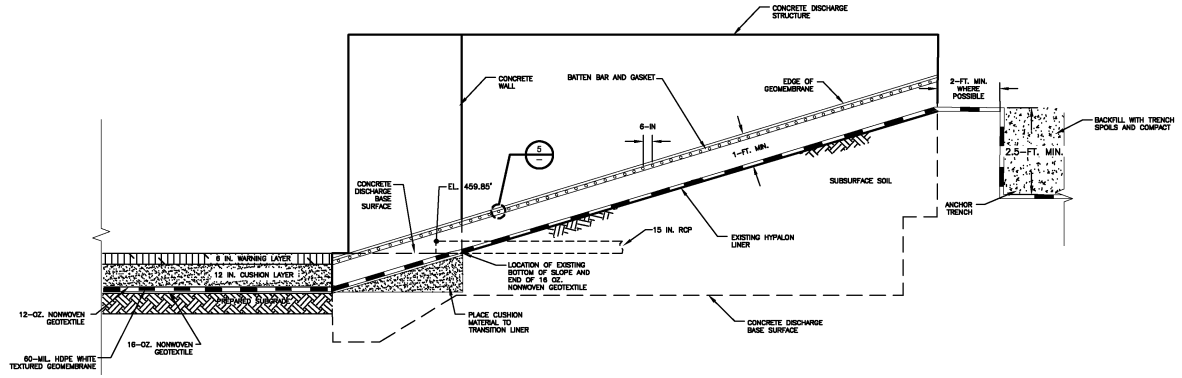


C / C030 CONCRETE INLET STRUCTURE SECTION
NOT TO SCALE



NOTE: △
1. ANCHOR BOLTS 6 IN. ON CENTER.
2. 12-OZ. NONWOVEN GEOTEXTILE TO BE USED TO PROTECT GEOMEMBRANE BELOW CUSHION/WARNING LAYERS.

5 / -- BATTEN BAR ATTACHMENT
NOT TO SCALE



D / - CONCRETE DISCHARGE STRUCTURE SECTION
NOT TO SCALE

NOT FOR CONSTRUCTION

6.			
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3.			
2.	RECORD DOCUMENTATION	06/16/11	HMS
1.	ISSUED FOR BID	10/08/10	HMS
0.	ISSUED FOR PERMIT	06/30/10	HMS
REVISION:		DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1965/5.4	DETAILS AND SECTIONS
DRAWN BY: KNW 06/30/10	BYPASS BASIN LINER REPLACEMENT MIDWEST GENERATION POWERTON POWER STATION PEKIN, ILLINOIS
CHECKED BY: RJG 06/30/10	
APPROVED BY: HMS 06/30/10	DRAWING NO: D1965C032-02 / REFERENCE:
	SHEET NO. C032

APPENDIX C

Ash Surge Basin Liner Replacement Specifications

SECTION 02600
HIGH DENSITY POLYETHYLENE (HDPE) GEOMEMBRANE

PART 1 - GENERAL

1.01 WORK INCLUDES

A. Furnish all labor, materials, tools, supervision, transportation, and installation equipment necessary for installation of 60-mil High Density Polyethylene (HDPE) geomembrane, as specified herein, and as shown on Contract Drawings.

1.02 REFERENCE STANDARDS

A. ASTM D5641 – Standard Practice for Geomembrane Seam Evaluation by Vacuum Chamber

B. ASTM D5820 – Standard Practice for Pressurized Air Channel Evaluation of Dual Seamed Geomembranes

C. ASTM D6392 –Test Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods.

D. ASTM D7007 Standard Practice for Locating Leaks in Geomembranes Covered with Water or Earthen Materials.

E. GRI Test Method, GM 13 - Test Methods, Test Properties and Testing Frequency for High Density Polyethylene (HDPE) Smooth and Textured Geomembranes

F. GRI Test Method, GM 14 – Selecting Variable Intervals for Taking Geomembrane Destructive Seam Samples Using the Method of Attributes.

G. GRI Test Method, GM 19 – Seam Strength and Related Properties of Thermally Bonded Polyolefin Geomembranes.

1.03 DEFINITIONS

A. Geomembrane Installer: hired by Contractor responsible for field handling, transporting, storing, deploying, seaming and testing of the geomembrane seams.

B. Geomembrane Manufacturer: hired by Geomembrane Installer to provide HDPE geomembrane.

C. Leak Location Contractor: hired by Contractor and responsible for locating potential holes in the installed geomembrane using electrical methods.

D. Geosynthetic Quality Assurance Laboratory (Testing Laboratory): Laboratory, independent from the Owner, Manufacturer and Installer, responsible for conducting laboratory tests on samples of geosynthetics obtained at the site or during manufacturing, usually under the direction of the Owner.

E. Lot: A quantity of resin (usually the capacity of one rail car) used in the manufacture of geomembranes. Finished roll will be identified by a roll number traceable to the resin lot used.

F. Resin Supplier: selected by Geomembrane Manufacturer to provide resin used in manufacturing geomembrane.

G. Panel: Unit area of a geomembrane that will be seamed in the field that is larger than $100ft^2$.

H. Patch: Unit area of a geomembrane that will be seamed in the field that is less than $100ft^2$.

I. Subgrade Surface: Soil Layer surface which immediately underlies the geosynthetic material(s).

1.04 QUALITY ASSURANCE

A. Qualifications:

1. Geomembrane Manufacturer shall have a minimum of 5 years of continuous experience manufacturing HDPE geomembrane totaling 1,000,000 square feet.

2. Geomembrane Installer:

a. 5 years of continuous experience in installation of HDPE geomembrane.

b. Experience totaling a minimum of 5,000,000 square feet of installed HDPE geomembrane on some combination of at least 10 completed facilities.

c. Personnel performing seaming operations qualified by experience or by successfully passing seaming tests. Master seamer shall have experience seaming a minimum of 3,000,000 square feet of geomembrane using same type of seaming apparatus to be used on this project.

d. Geomembrane Installers that are qualified and approved by Engineer are listed below:

i. Clean Air and Water Systems
Dousman, WI
Brain McKeown
262-965-4366

3. Leak Location Contractor:

a. 3 years of continuous experience in performing leak location surveys using electrical methods.

b. Experience totaling a minimum of 2,000,000 square feet of geomembrane leak location surveys on some combination of at least 5 completed facilities.

c. Personnel performing survey qualified by experience with at least 2 years of geomembrane testing experience using the leak location survey electrical method.

d. Leak Location Contractors that are qualified and approved by Engineer are listed below:

i. Leak Location Services, Inc.
San Antonio, TX
210-408-1241

ii. Or other approved by Owner and/or Engineer.

B. Quality Assurance Program:

1. Geomembrane Manufacturer/Installer shall conform with requirements of these Technical Specifications.

2. The Owner and/or Engineer may document geomembrane installation including panel placement, seaming, pre-qualification seam testing, non-destructive seam and repair testing, repair size and locations, and weather conditions.

3. The Owner may engage and pay for the services of Engineer and QA Laboratory to monitor geomembrane installation.

1.05 SUBMITTALS

A. Prior to project start, submit the following to Owner and/or Engineer in accordance with Section 01300, Submittals:

1. Raw Materials:

a. Name of Resin Supplier, location of supplier's production plant(s), resin brand name and product number.

b. Source and nature of plasticizers, fillers, carbon black and any other additives along with their percent addition to geomembrane material.

c. Test results documenting conformance with the "index properties" of GRI Test Method, GM 13.

2. Geomembrane Manufacturer's Certification:

a. Written certification that Geomembrane Manufacturer's Quality Control Plan was fully implemented during production of geomembrane material supplied for this project. (Submittal shall be made within 5 working days of delivery to site).

3. Geomembrane Manufacturer Production Information:

   a. Corporate background information indicating compliance with qualification requirements.

   b. Quality control plan for manufacturing.

   c. Copy of quality control certificates demonstrating compliance with the quality control plan for manufacturing and the test property requirements of GRI Test method, GM 13 (i.e., mill certificates).

4. Contractor shall provide the Engineer a certificate stating the name of the geotextile manufacturer, product name, chemical composition of the filaments and other pertinent information to fully describe the geotextile.

5. Geomembrane Installer's Seaming Personnel

   a. Training completed by personnel.

   b. Seaming experience for each personnel.

6. Geomembrane Installer's Information:

   a. Corporate background information indicating compliance with qualification requirements.

   b. List of completed facilities, totaling 5,000,000 square feet minimum for which Geomembrane Installer has completed installation of a HDPE geomembrane. Include name and purpose of facility, location, date of installation, and quantity installed.

   c. Resumes of personnel performing field seaming operation, along with pertinent experience information. Include documentation regarding which seamers are qualified to use thermal fusion welding apparatus.

   d. Installation quality control plan.

7. Installation panel layout diagram identifying placement of geomembrane panels, seams, and any variance or additional details which deviate from Contract Drawings or Technical Specifications. Layout shall be drawn to scale and shall be adequate for use as a construction plan. Layout shall include dimensions and pertinent seam and anchorage details.

B. With bid, submit the following to Owner and/or Engineer in accordance with Section 01300, Submittals

   1. Leak Location Contractor's Work Plan:

a. Corporate background information indicating compliance with qualification requirements.

b. List of completed facilities, totaling 2,000,000 square feet minimum of geomembrane leak location surveys on some combination of at least 5 completed facilities. Include name and purpose of facility, location, date of survey, survey method, and quantity surveyed.

c. Resumes of personnel performing leak location survey, along with pertinent experience information.

d. Leak Location Contractor quality control plan including description of the proposed survey methods and procedures, and field calibration procedures.

e. Leak Location Contractor's required site preparations to be completed to perform the proposed leak location survey, and estimated duration to complete the survey.

f. An example of a final report (per ASTM D 7007) provided by the Leak Location Contractor following the completion of the survey.

C. During installation, submit the following to the Owner and/or Engineer:

1. Daily records/logs prepared by Geomembrane Installer documenting work performed, personnel involved, general working conditions, and any problems encountered or anticipated on project. Submit on a weekly basis.

2. Copy of subgrade acceptance signed by Geomembrane Installer for areas to be covered with geomembrane each day.

D. Within 10 days of geomembrane installation completion, submit the following to Owner and/or Engineer:

1. Geomembrane installation certification that Work was performed under Geomembrane Installer's approved quality control plan and in substantial compliance with Technical Specifications and Contract Drawings.

2. As-built panel diagram identifying placement of geomembrane panels, seams, repairs, and destructive seam sample locations.

3. Copy of warranty for material (including factory seams) and installation covering both for a period of 2 years from the date of substantial completion.

E. The Owner and/or Engineer will review and inspect geomembrane installation upon completion of all Work specified in this Section. Deficiencies noted shall be corrected at no additional cost to the Owner.

F. The Owner and/or Engineer will provide written final acceptance of the geomembrane installation after completion of the leak location survey. Written conditional

geomembrane installation acceptance can be provided to the Contractor prior to completion of the leak location survey when the following conditions are satisfied, if necessary, and requested by the Contractor:

1. The entire geomembrane installation is completed or any pre-determined subsection if the project is phased.

2. All installation quality assurance/control documentation has been completed and submitted to the Owner and/or Engineer.

3. Verification of the adequacy of all field seams, repairs and associated testing is complete.

G. Within 14 days of completion of the leak location survey, submit final written report (per ASTM D 7007) of the leak location survey provided by Leak Location Contractor.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Transportation:

1. Geomembrane rolls shall be transported, unloaded and handled at the job site in accordance with manufacturer recommendations. Damaged material may be rejected by the Owner and/or Engineer.

B. On-site Storage:

1. Geomembrane rolls which have been delivered to job site shall be unloaded and stored in original, unopened packaging in a secure location, determined by Owner and/or Engineer.

2. Store geomembrane rolls to ensure adequate protection against exposure to the following:

a. Equipment;

b. Strong oxidizing chemicals, acids, or bases;

c. Flames, including welding sparks;

d. Temperatures in excess of 160 deg. F;

e. Dust;

f. Ultraviolet radiation (i.e. sunlight); and

g. Inclement weather.

3. Whenever possible, provide a 6-inch minimum air space between rolls.

4. Containers/rolls shall not be stacked.

C. On-Site Handling:

1. Handle rolls per Geomembrane Manufacturer's recommendations and as necessary to prevent damage.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Geotextile to be used for cushioning between subgrade and geomembrane shall be polyester or polypropylene, non-woven needlepunched fabric and shall conform to the following requirements:

GEOTEXTILE PROPERTIES

Property	Units	Value	Test	Criterion
Mass Per Unit Area	oz/yd^2	16	ASTM D5261	MARV
Puncture Strength	lb	170	ASTM D4833	MARV
Trapezoid Tear	lb	145	ASTM D4533	MARV
Grab Tensile Strength	lb	370	ASTM D4632	MARV
Grab Elongation	%	50	ASTM D4632	MARV
UV Resistance @500 hours	% retained	70	ASTM D4355	Minimum

B. Geotextile to be used for separation between geomembrane and cushion material shall be polyester or polypropylene, non-woven needlepunched fabric and shall conform to the following requirements:

GEOTEXTILE PROPERTIES

Property	Units	Value	Test	Criterion
Mass Per Unit Area	oz/yd^2	12	ASTM D5261	MARV
Apparent Opening Size	US Sieve	100	ASTM D4751	MARV
Puncture Strength	lb	210	ASTM D4833	MARV
Trapezoid Tear	lb	125	ASTM D4533	MARV
Grab Tensile Strength	lb	320	ASTM D4632	MARV
Grab Elongation	%	50	ASTM D4632	MARV
UV Resistance @500 hours	% retained	70	ASTM D4355	Minimum

C. High Density Polyethylene (HDPE) White Textured Geomembrane

1. HDPE geomembrane shall be white, textured (both sides), 60-mil product approved by the Owner and/or Engineer.

2. The Contractor shall submit, with the bid, written certification from the proposed Geomembrane Manufacturer that geomembrane products proposed in the bid satisfy the following requirements:

a. The proposed HDPE compound shall be comprised entirely of virgin materials. Compliance with this specification shall be documented in accordance with Geomembrane Manufacturer's quality control program

and submitted to the Owner and/or Engineer with the written conformance certification.

b. The proposed Geomembrane Manufacturer shall certify that any plasticizers, fillers and additives incorporated into the manufacturing process for the proposed HDPE geomembrane have demonstrated acceptable performance on past projects.

c. The proposed geomembrane shall meet the requirements of Geosynthetic Research Institute's test method GM 13.

d. The nominal thickness of proposed geomembrane shall be 60 mil., or as approved by the Owner and/or Engineer.

e. Geomembrane Manufacturer that are qualified and approved by Engineer are listed below:

i. GSE
Houston, TX
800 435 2008

3. Geomembrane sheets shall be visually consistent in appearance and shall contain no holes, blisters, undisbursed raw materials or other signs of contamination by foreign material. Geomembrane must have no striations, roughness or bubbles on the surface.

D. Seaming Apparatus

1. Thermal fusion welding machines used for joining geomembrane surfaces may be either extrusion or hot wedge. These machines shall include sufficient temperature and rate-of-travel monitoring devices to allow continuous monitoring of operating conditions.

2. One spare, operable thermal fusion seaming device shall be maintained on site at all times.

E. Field Test Equipment

1. Field Tensiometer: the field tensiometer shall be calibrated within three months prior to project start date over the range of field test values.

2. Air Channel Test Equipment: air channel test equipment shall consist of hoses, fittings, valves and pressure gauge(s) needed to deliver and monitor the pressure of compressed air through an approved pressure feed device.

3. Air Compressor: the air compressor utilized for field testing shall be capable of producing and maintaining an operating pressure of at least 50 psi.

4. Vacuum Box: the vacuum box shall consist of a vacuum gage, valve, and a gasket around the edge of the open bottom needed to apply vacuum to a surface.

2.02. CONFORMANCE TESTING REQUIREMENTS

A. Geomembrane shipped to site shall undergo conformance testing. Manufacturer's roll certificates may be used for conformance evaluation at the option of the Owner and/or Engineer. Nonconforming material shall either be retested at the direction of the Owner and/or Engineer or removed from site and replaced at Contractor's expense.

B. Conformance Test Methods

1. Samples will be located and collected by the Owner and/or Engineer at a rate of one sample per 100,000 square feet of geomembrane delivered to site.

2. One sample will be obtained from each geomembrane production batch delivered to the site.

3 Samples shall be cut by Geomembrane Installer and be at least 45 square feet in size.

4. Samples shall be tested in accordance with Table 1 (Smooth) or Table 2 (Textured) specified in GRI Test Method GM13.

5. Geomembrane thickness shall be measured a minimum of three times per panel during deployment to verify conformance with GRI Test Method GM13.

C. Role of Testing Laboratories

1. The Owner and/or Engineer will be responsible for acquiring samples of the geomembrane for conformance testing. The Owner or Engineer will retain an independent, third party laboratory to perform conformance testing on samples of geomembrane.

2. Retesting of geomembrane panels by the Geomembrane Installer because of failure to meet any of the conformance specifications can only be authorized by the Owner and/or Engineer.

3. The Geomembrane Manufacturer and/or Geomembrane Installer may perform independent tests in accordance with methods and procedures specified in GRI GM 13. Results shall not be substituted for quality assurance testing described herein.

D. Procedures for Determining Conformance Test Failures

1. If conformance test results fail to meet specifications, the roll and/or batch may be retested using specimens from either the original roll sample or from another sample collected by the Owner and/or Engineer. Two additional tests (retests)

shall be performed for each failed test procedure. Each retest shall consist of multiple specimen tests if multiple specimens are specified in the test procedure. If the results of both retests meet specifications, the roll and batch will be considered to have passed conformance testing.

2. Failure of any retest shall be cause for rejection of the entire roll or batch depending on the type of failing test. The Owner and/or Engineer reserves the right to collect samples from other rolls of a particular batch for further conformance testing. The Owner and/or Engineer may choose to accept only a portion of the batch on the basis of the results of conformance testing of samples collected from other rolls.

3. If retesting does not result in conformance with the specifications as defined in preceding paragraph, or if there are any other nonconformities with the material specifications, the Contractor shall remove the rolls from use in the project. The Contractor shall also be responsible for removal of rejected geomembrane from the site and replacement with acceptable geomembrane at no additional cost to the Owner.

PART 3 - EXECUTION

3.01 PRE-CONSTRUCTION MEETING

A. A Pre-Construction Meeting shall be held at the site to discuss and plan the details of geomembrane installation. This meeting shall be attended by the Geomembrane Installer, Owner, Engineer and the Contractor.

B. The following topics relating to geomembrane installation shall be addressed:

1. Responsibilities of each party.

2. Lines of authority and communication.

3. Methods for documenting, reporting and distributing documents and reports.

4. Procedures for packaging and storing archive samples.

5. Review of the schedule for all installation and quality assurance testing, including third-party testing turnaround times.

6. Review of panel layout, access and numbering systems for panels and seams including details for marking on the HDPE geomembrane.

7. Procedures and responsibilities for preparation and submittal of as-built drawings.

8. Temperature and weather limitations, installation procedures for adverse weather conditions and defining acceptable subgrade or ambient moisture and temperature conditions for working during liner installation.

9. Subgrade conditions, dewatering responsibilities and subgrade maintenance plan.

10. Deployment techniques including allowable subgrade for geomembrane.

11. Procedures for covering of the geomembrane to prevent damage.

12. Plan for minimizing wrinkles in the geomembrane.

13. Measurement and payment schedules.

14. Site health and safety procedures/protocols.

3.02 SUBGRADE INSPECTION AND REPAIR

A. The Geomembrane Installer shall visually inspect the subgrade immediately prior to geomembrane deployment. Inspection shall verify that there are no potentially harmful foreign objects present, such as sharp rocks and other deleterious debris. Any foreign objects encountered shall be removed by Geomembrane Installer or Contractor. All subgrade damaged by construction equipment and deemed unsuitable for geomembrane deployment shall be repaired prior to geomembrane deployment. All repairs shall be approved by the Owner and/or Engineer and Geomembrane Installer. The responsibility for preparation, repairs, and maintenance of the subgrade shall be defined in the preconstruction meeting. The Geomembrane Installer shall provide the Owner and/or Engineer with written acceptance of subgrade surface over which 16 oz non woven geotextile and geomembrane is deployed (Part 1.05C*)* for each day of deployment.

3.03 GEOMEMBRANE LINER DEPLOYMENT

A. Geomembrane Installer shall deploy 16-oz non woven geotextile following applicable certifications/quality control certificates listed in Subsection 1.05 of this section and approved by the Owner and/or Engineer. Any 16-oz non woven geotextile placed prior to approval by the Owner and/or Engineer shall be at the sole risk of the Contractor. If geotextile installed prior to approval by the Owner and/or Engineer does not meet the requirements of this specification, it shall be removed from the site at no additional cost to the Owner.

B. 60 mil HDPE geomembrane will be deployed following installation of 16-oz non woven geotextile and applicable certifications/quality control certificates listed in Subsection 1.05 of this section according to submitted panel layout drawing as approved by the Owner and/or Engineer. The Owner and/or Engineer is to be notified of and approve any revisions or modifications to the approved panel layout drawing prior to deploying geomembrane in the area of review.

C. Adequate temporary anchoring (sand bags, tires, etc.) that will not damage the geomembrane shall be placed on a deployed panel to prevent uplift by wind.

D. Geomembrane shall not be deployed if:

1. Ambient temperatures are below 41 degrees F (5 degrees C) or above 104 degrees F (40 degrees C) measured six inches above geomembrane surface unless approved by the Owner and/or Engineer.

2. Precipitation is expected or in the presence of excessive moisture or ponded water on the subgrade surface.

3. Winds are excessive as determined by Geomembrane Installer in agreement with the Owner and/or Engineer.

4. The Owner and/or Engineer will have the authority to suspend work during such conditions.

E. The Geomembrane Installer shall be responsible for conformance with the following requirements:

1. Equipment utilized for installation/quality assurance testing does not damage geomembrane. Such equipment shall have rubber tires and a ground pressure not exceeding 8 psi . Only equipment necessary for installation and quality assurance testing is allowed on the deployed geomembrane.

2. Personnel working on geomembrane do not damage geomembrane (activities such as smoking or wearing damaging clothing shall not be allowed).

3. Method of deployment does not damage geomembrane.

4. Method of deployment minimizes wrinkles.

5. Temporary loading or anchoring does not damage geomembrane.

6. Direct contact with geomembrane is minimized.

F. Geomembrane Installer shall place 16-oz non woven geotextile on the geomembrane at the base of the basin and at least 4 feet up side slopes, as indicated on Contract Drawings. Geomembrane Installer shall cover the batten bar attachments with the 16-oz non woven geotextile.

G. No vehicles shall be allowed on deployed geomembrane under any circumstances.

3.04 FIELD SEAMS

A. Seam Layout

1. In general, seams shall be oriented parallel to the line of the maximum slope. In corners and at other odd-shaped geometric intersections, number of seams should be minimized. If at all possible, seams shall not be located at low points in the subgrade unless geometry requires seaming to be done at these locations.

2. A seam numbering system compatible with the panel numbering system shall be agreed upon at the Pre-Construction Meeting.

B. Seaming Processes/Equipment

1. Approved processes for field seaming (panel to panel) are extrusion or hot wedge fusion-type seam methods. No other processes can be used without prior written authorization from the Owner and/or Engineer. Only equipment which has been specifically approved by make and model shall be used, if applicable.

2. The Geomembrane Installer will meet the following requirements regarding use, availability, and cleaning of welding equipment at job site:

   a. Intersecting hot wedge seams shall be patched using extrusion welding process.

   b. Electric generator for equipment shall be placed on a smooth base such that no damage occurs to geomembrane. A smooth insulating plate or fabric shall be placed beneath hot equipment after usage.

3. The Geomembrane Installer shall keep records for performance and testing of all seams.

C. Seaming Requirements/Procedures

1. Weather Conditions - Range of weather conditions under which geomembrane seaming can be performed are as follows:

   a. Unless otherwise authorized in writing by Owner and/or Engineer, no seaming shall be attempted or performed at an ambient temperature below 41 degrees F (5 degrees C) or above 104 degrees F (40 degrees C).

   b. Between ambient temperatures of 32 degrees F (0 degrees C) and 41 degrees F (5 degrees C), seaming shall follow GRI GM9 cold weather seaming guidelines. Pre-qualification seams shall be produced to determine appropriate seaming parameters and for Engineer's approval.

   c. Above 41 degrees F (5 degrees C), no special conditions will be required.

   d. Geomembrane shall be dry and protected from wind.

   e. Seaming shall not be performed during any precipitation event.

   f. Seaming shall not be performed in areas where ponded water has collected below surface of geomembrane.

2. If the Geomembrane Installer chooses to use methods which may allow seaming at ambient temperatures below 41 degrees F or above 104 degrees F, the Geomembrane Installer shall demonstrate and submit certification to Owner and/or Engineer that methods and techniques used to perform seaming produce seams that are equivalent to seams produced at temperatures above 41 degrees F and below 104 degrees F. The Owner and/or Engineer may deny approval for use of the proposed technique regardless of demonstration results.

3. Overlapping - Geomembrane panels shall have finished overlap as follows:

   a. Minimum of 6 inches for thermal fusion welding.

b. Insufficient overlap will be considered a failed seam.

4. Pre-qualification tests for geomembrane fusion welding shall be conducted by a minimum of 2 pre-qualification seams conducted per day per welding machine by each seaming technician performing welding with that machine. At least one test shall be performed at the start of each work day, with tests at intervals of no greater than 5 hours and additional pre-qualification tests following work interruptions, weather changes, changes to machine settings, or as directed by the Owner and/or Engineer. Pre-qualification seams shall be made under the same conditions as the actual seams.

   a. Pre-qualification seam samples shall be 5 feet long by 1-foot wide (minimum) after seaming, with seam centered along its length. Each pre-qualification seam shall be labeled with the date, geomembrane temperature, seaming unit identifier, seam number or test location, technician performing the test seam and description of testing results.

   b. Seam overlap shall be in accordance with Subsection 3.04(C)(3).

   c. Pre-qualification seams shall be inspected for proper squeeze-out, footprint pressure, and general appearance.

   d. Four specimens, each 1-inch in length, shall be cut from opposite ends of the pre-qualification seam sample by the Geomembrane Installer. The remainder of pre-qualification seam shall be retained by the Owner and/or Engineer and may be submitted for laboratory testing.

   e. The Geomembrane Installer shall complete two shear tests and two peel tests in accordance with GRI GM 19.

   f. Pre-qualification seams failed by inspection or testing may be retested at request of the Geomembrane Installer. If the second pre-qualification seam fails, then the seaming apparatus or seaming technique shall be disqualified from use until two consecutive, satisfactory pre-qualification seams are obtained.

5. Seam Preparation

   a. Prior to seaming, seam area shall be clean and free of moisture, dust, dirt, debris of any kind, and foreign material.

   b. Seams shall be aligned so as to minimize number of wrinkles and fishmouths.

6. General Seaming Procedures

a. Fishmouths or wrinkles at seam overlaps shall be cut along ridge of the wrinkle to achieve a flat overlap. Cut fishmouths or wrinkles shall be repaired, and/or patched in accordance with Part 3.07.

b. Seaming shall extend to the outside edge of geomembrane panels including material placed in anchor trenches.

c. The intersecting thermal fusion seams shall be patched using the extrusion welding process.

3.05 NON-DESTRUCTIVE TESTING

A. Each field seam shall be non-destructively tested over its entire length by the Installer. Testing shall be conducted as field seaming progresses, not at completion of all seams, unless specifically agreed to by the Owner and/or Engineer in writing.

B. Vacuum Testing – shall be performed in accordance with ASTM D5641.

C. Air Pressure Testing – shall be performed in accordance with ASTM D5820, and GRI GM 6, Pressurized Air Channel Test for Dual Seamed Geomembranes.

D. Each seam tested non-destructively shall be marked with the date of the test, name of the testing technician, length of the seam, test method and results. The same shall also be recorded by the Owner and/or Engineer on the appropriate CQA documentation.

E. Non-Destructive Seam Test Failures

1. Seams failing non-destructive testing shall be repaired by the Geomembrane Installer according to Part 3.07. Seams shall be non-destructively retested. If the seam defect cannot be located, the entire section of seam affected shall be repaired and retested.

3.06 ELECTRONIC LEAK LOCATION SURVEY

A. Leak Location Contractor shall identify actions required by Contractor to prepare the site for the leak location survey.

B. Contractor shall ensure that the cushion and warning layers, and 12 oz non woven geotextile above and 16 oz non woven geotextile below the geomembrane contains sufficient moisture to conduct a leak location survey. Typically, a moisture content of earth materials of 1% to 2% by weight is sufficient to conduct the survey. If the moisture content of the cushion layer, warning layer and subgrade is not sufficient per the requirements of the Leak Location Contractor, Contractor shall add moisture to the layers, as required.

C. Contractor shall provide electrical isolation of the metal marker posts, batten bars, and concrete structures, as requested by Leak Location Contractor.

D. Leak Location Contractor shall inspect the site prior to commencing the survey to ensure all site preparations are completed and the site conditions are appropriate for conducting the leak location survey.

E. Any discrepancy in the required site preparation detailed in the Leak Location Contractor's Work Plan or site conditions shall be reported to the Contractor for corrective or appropriate action.

F. After the warning layer is placed, conduct a leak location survey on the warning layer material using the procedures for surveys with earth materials covering the Geomembrane as described in ASTM D 7007.

G. A leak detection sensitivity test using an artificial leak shall be conducted on the geomembrane for each set of equipment used before the equipment is used on for the leak location survey, as described in ASTM D 7007 to determine the detection distance for the survey.

H. The leak location survey shall be taken on survey lines or on a grid spaced no farther apart than twice the leak detection distance as determined in the leak detection sensitivity test.

I. The Leak Location Contractor shall inform the Owner and/or Engineer and mark the locations of all identified or indicated leaks with a flag or spray paint. The Geomembrane Installer shall repair the defect/hole as detailed in Part 3.07 of this Section.

3.07 DEFECTS AND REPAIRS

A. The geomembrane shall be examined by the Geomembrane Installer and the Owner and/or Engineer for defects, holes, blisters, undispersed raw materials, and any signs of contamination by foreign matter. The geomembrane surface shall be swept and/or washed by the Geomembrane Installer if the amount of dust or mud inhibits examination. The Contractor shall provide a water truck, an operator, clean water and hoses as reasonably necessary to assist the Geomembrane Installer in this activity.

B. Portions of geomembrane exhibiting flaws, or failing a non-destructive or destructive (if conducted) test, shall be repaired or replaced by the Geomembrane Installer. Repair procedures available include:

1. Patching - used to repair large holes, tears, undispersed raw materials, contamination by foreign matter, holes resulting from destructive sampling (if conducted), and locations where seam overlap is insufficient;

2. Capping - used to repair large lengths of failed seams; and

3. Additional Procedures - used upon recommendation of the Geomembrane Installer if agreed to by the Owner and/or Engineer.

C. Patches or caps.

1. Extend patch or cap 6 inches (minimum) beyond the edge of the defect.

2. Round corners of patch and/or cap (suggest 3-inch radius).

3. Repair procedures, equipment, materials, and techniques will be approved by the Owner and/or Engineer prior to repair.

4. Geomembrane below large caps shall be appropriately cut to avoid water or gas collection between two sheets.

D. The Geomembrane Installer shall mark on the geomembrane (using a non-puncturing writing utensil), repair date, time, and personnel involved.

E. Each repair shall be non-destructively tested in accordance with Part 3.05. Large caps may require destructive test sampling in accordance with Part 3.06 at the discretion of the Owner and/or Engineer.

F. Repairs which fail testing shall be redone and retested until a passing result is obtained. The Geomembrane Installer will perform non-destructive testing on repairs and will document retesting of repairs.

G. The Owner and/or Engineer will document repairs, repair testing, and retesting results.

H. The Geomembrane Installer shall cut and seam wrinkles which may adversely affect long-term integrity of the geomembrane, hinder subsequent construction of overlying layers, or impede drainage off of the geomembrane after it is covered by soil. Seaming shall be done in accordance with procedures described in Parts 3.04(B) and 3.04(C), and it shall be subject to test provisions of Parts 3.05 (non-destructive testing) and 3.06 (destructive testing – if conducted).

3.08 PROTRUSIONS AND CONNECTIONS TO GEOMEMBRANE

A. If required, the Geomembrane Installer shall install geomembrane around utility poles, guy wires, and other structures according to the Contract Drawings and the following requirements:

1. Use minimum 2-ft long geomembrane pipe boots and steel clamps to seal the geomembrane around pole or structure.

2. Use standard welding procedures to seam the geomembrane boot or weld strip to the geomembrane.

3. Seaming performed on and around penetrations, and other appurtenances shall be non-destructively tested using the vacuum testing method.

3.09 SURVEY DOCUMENTATION

A. Prior to covering the geomembrane, the Geomembrane Installer shall provide the Contractor , Owner and/or Engineer with 24-hour notification to conduct a survey. The Contractor shall survey the location of all seams (panel corners acceptable), and repairs. The Contractor shall provide survey data to the Owner and/or Engineer within two

working day of survey completion and in accordance with Section 01050, Field Engineering and Survey.

3.10 DAILY FIELD INSTALLATION REPORTS

A. At the beginning of each day, the Geomembrane Installer shall provide the Owner and/or Engineer with a report for all work completed the previous day.

B. The Daily Field Installation Report shall include the following:

1. The total amount and location of geomembrane placed.

2. The total length and location of seams completed, technician name and welding unit numbers.

3. A drawing or sketch depicting the geomembrane installed the previous day including the panel number, seam number and locations of non-destructive and destructive testing (if conducted).

4. Results of pre-qualification test seams, if available.

5. Results of non-destructive testing.

C. Destructive test results (if conducted) shall be reported within 48 hours or prior to covering the geomembrane, whichever is practical.

END OF SECTION

APPENDIX D

Bypass Liner Replacement Specifications

SECTION 02600
HIGH DENSITY POLYETHYLENE (HDPE) GEOMEMBRANE

PART 1 - GENERAL

1.01 WORK INCLUDES

A. Furnish all labor, materials, tools, supervision, transportation, and installation equipment necessary for installation of 60-mil High Density Polyethylene (HDPE) geomembrane, as specified herein, and as shown on Contract Drawings.

1.02 REFERENCE STANDARDS

A. ASTM D6392 –Test Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods.

B. ASTM D7007 Standard Practice for Locating Leaks in Geomembranes Covered with Water or Earthen Materials.

C. GRI Test Method, GM 13 - Test Methods, Test Properties and Testing Frequency for High Density Polyethylene (HDPE) Smooth and Textured Geomembranes

D. GRI Test Method, GM 14 – Selecting Variable Intervals for Taking Geomembrane Destructive Seam Samples Using the Method of Attributes.

E. GRI Test Method, GM 19 – Seam Strength and Related Properties of Thermally Bonded Polyolefin Geomembranes.

1.03 DEFINITIONS

A. Geomembrane Installer: hired by Contractor or Owner responsible for field handling, transporting, storing, deploying, seaming and testing of the geomembrane seams.

B. Geomembrane Manufacturer: hired by Geomembrane Installer, Contractor, or Owner to provide HDPE geomembrane.

C. Leak Location Contractor: hired by Contractor or Owner and responsible for locating potential holes in the installed geomembrane using electrical methods.

D. Geosynthetic Quality Assurance Consultant: Consultant, independent from the Manufacturer, and Installer, responsible for field oversight of geosynthetics installation, and related testing, usually under the direction of the Owner.

D. Geosynthetic Quality Assurance Laboratory (Testing Laboratory): Laboratory, independent from the Manufacturer and Installer, responsible for conducting laboratory tests on samples of geosynthetics obtained at the site or during manufacturing, usually under the direction of the Owner.

D. Lot: A quantity of resin (usually the capacity of one rail car) used in the manufacture of geomembranes. Finished roll will be identified by a roll number traceable to the resin lot used.

E. Resin Supplier: selected by Geomembrane Manufacturer to provide resin used in manufacturing geomembrane.

F. Panel: Unit area of a geomembrane that will be seamed in the field that is larger than $100ft^2$.

G. Patch: Unit area of a geomembrane that will be seamed in the field that is less than $100ft^2$.

H. Subgrade Surface: Soil Layer surface which immediately underlies the geosynthetic material(s).

1.04 QUALITY ASSURANCE

A. Qualifications:

1. Geomembrane Manufacturer shall have a minimum of 5 years of continuous experience manufacturing HDPE geomembrane totaling 1,000,000 square feet.

2. Geomembrane Installer:

a. 5 years of continuous experience in installation of HDPE geomembrane.

b. Experience totaling a minimum of 5,000,000 square feet of installed HDPE geomembrane on some combination of at least 10 completed facilities.

c. Personnel performing seaming operations qualified by experience or by successfully passing seaming tests. Master seamer shall have experience seaming a minimum of 3,000,000 square feet of geomembrane using same type of seaming apparatus to be used on this project.

3. Leak Location Contractor:

d. 3 years of continuous experience in performing leak location surveys using electrical methods.

e. Experience totaling a minimum of 2,000,000 square feet of geomembrane leak location surveys on some combination of at least 5 completed facilities.

f. Personnel performing survey qualified by experience with at least 2 years of geomembrane testing experience using the leak location survey electrical method.

B. Quality Assurance Program:

1. Geomembrane Manufacturer/Installer shall conform with requirements of these Technical Specifications.

2. The Owner or Contractor will engage and pay for the services of a Geosynthetic Quality Assurance Consultant and Laboratory to monitor geomembrane installation.

1.05 SUBMITTALS

A. Prior to project start, submit the following to Geosynthetic Quality Assurance Consultant in accordance with Section 01300, Submittals:

1. Raw Materials:

a. Name of Resin Supplier, location of supplier's production plant(s), resin brand name and product number.

b. Source and nature of plasticizers, fillers, carbon black and any other additives along with their percent addition to geomembrane material.

c. Test results documenting conformance with the "index properties" of GRI Test Method, GM 13.

2. Geomembrane Manufacturer's Certification:

a. Written certification that Geomembrane Manufacturer's Quality Control Plan was fully implemented during production of geomembrane material supplied for this project. (Submittal shall be made within 5 working days of delivery to site).

3. Geomembrane Installer's Seaming Personnel

a. Training completed by personnel.

b. Seaming experience for each personnel.

4. Geomembrane Manufacturer Production Information:

a. Corporate background information indicating compliance with qualification requirements.

b. Quality control plan for manufacturing.

c. Copy of quality control certificates demonstrating compliance with the quality control plan for manufacturing and the test property requirements of GRI Test method, GM 13 (i.e. mill certificates).

5. Geomembrane Installer's Information:

a. Corporate background information indicating compliance with qualification requirements.

b. List of completed facilities, totaling 5,000,000 square feet minimum for which Geomembrane Installer has completed installation of a HDPE geomembrane. Include name and purpose of facility, location, date of installation, and quantity installed.

c. Resumes of personnel performing field seaming operation, along with pertinent experience information. Include documentation regarding which seamers are qualified to use thermal fusion welding apparatus.

d. Installation quality control plan.

6. Installation panel layout diagram identifying placement of geomembrane panels, seams, and any variance or additional details which deviate from Contract Drawings or Technical Specifications. Layout shall be drawn to scale and shall be adequate for use as a construction plan. Layout shall include dimensions and pertinent seam and anchorage details.

7. Installation Sequence and Schedule shall be included as part of Construction Progress Schedule.

8. Description of seaming apparatus to be used.

B. With bid, submit the following to Owner and/or Engineer in accordance with Section 01300, Submittals

1. Leak Location Contractor's Work Plan:

a. Corporate background information indicating compliance with qualification requirements.

b. List of completed facilities, totaling 2,000,000 square feet minimum of geomembrane leak location surveys on some combination of at least 5 completed facilities. Include name and purpose of facility, location, date of survey, survey method, and quantity surveyed.

c. Resumes of personnel performing leak location survey, along with pertinent experience information.

d. Leak Location Contractor quality control plan including description of the proposed survey methods and procedures, and field calibration procedures.

e. Leak Location Contractor's required site preparations to be completed to perform the proposed leak location survey, and estimated duration to complete the survey.

f. An example of a final report (per ASTM D 7007) provided by the Leak Location Contractor following the completion of the survey.

C. During installation, submit the following to the Geosynthetic Quality Assurance Consultant:

1. Daily records/logs prepared by Geomembrane Installer documenting work performed, personnel involved, general working conditions, and any problems encountered or anticipated on project. Submit on a weekly basis.

2. Copy of subgrade acceptance signed by Geomembrane Installer for areas to be covered with geomembrane each day.

D. Within 10 days of geomembrane installation completion, submit the following to Geosynthetic Quality Assurance Consultant:

1. Geomembrane installation certification that Work was performed under Geomembrane Installer's approved quality control plan and in substantial compliance with Technical Specifications and Contract Drawings.

2. As-built panel diagram identifying placement of geomembrane panels, seams, repairs, and destructive seam sample locations.

3. Copy of warranty for material (including factory seams) and installation covering both for a period of 2 years from the date of substantial completion.

E. The Geosynthetic Quality Assurance Consultant will review and inspect HDPE geomembrane installation upon completion of all Work specified in this Section. Deficiencies noted shall be corrected at no additional cost to the Owner.

F. The Geosynthetic Quality Assurance Consultant will provide written final acceptance of the geomembrane installation after completion of material placement above geomembrane. Written conditional geomembrane installation acceptance can be provided to the Contractor prior to completion of material placement above geomembrane when the following conditions are satisfied, if necessary, and requested by the Contractor:

1. The entire geomembrane installation is completed or any pre-determined subsection if the project is phased.

2. All installation quality assurance/control documentation has been completed and submitted to the Geosynthetic Quality Assurance Consultant or Owner.

3. Verification of the adequacy of all field seams, repairs and associated testing is complete.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Transportation:

1. Geomembrane rolls shall be transported, unloaded and handled at the job site in accordance with manufacturer recommendations. Damaged material may be rejected by the Geosynthetic Quality Assurance Consultant.

B. On-site Storage:

1. Geomembrane rolls which have been delivered to job site shall be unloaded and stored in original, unopened packaging in a secure location, determined by Owner and/or Geosynthetic Quality Assurance Consultant.

2. Store geomembrane rolls to ensure adequate protection against exposure to the following:

a. Equipment;

b. Strong oxidizing chemicals, acids, or bases;

c. Flames, including welding sparks;

d. Temperatures in excess of 160 deg. F;

e. Dust;

f. Ultraviolet radiation (i.e. sunlight); and

g. Inclement weather.

3. Whenever possible, provide a 6-inch minimum air space between rolls.

4. Containers/rolls shall not be stacked.

C. On-Site Handling:

1. Handle rolls per Geomembrane Manufacturer's recommendations and as necessary to prevent damage.

PART 2 - PRODUCTS

2.01 MATERIALS

A. High Density Polyethylene (HDPE) White Textured Geomembrane.

1. HDPE geomembrane shall be white, textured, 60-mil product approved by the Engineer and/or Geosynthetic Quality Assurance Consultant.

2. The Contractor shall submit, with the bid, written certification from the proposed Geomembrane Manufacturer that geomembrane products proposed in the bid satisfy the following requirements:

a. The proposed HDPE compound shall be comprised entirely of virgin materials. Compliance with this specification shall be documented in accordance with Geomembrane Manufacturer's quality control program and submitted to the Geosynthetic Quality Assurance Consultant with the written conformance certification.

b. The proposed Geomembrane Manufacturer shall certify that any plasticizers, fillers and additives incorporated into the manufacturing process for the proposed HDPE geomembrane have demonstrated acceptable performance on past projects.

c. The proposed geomembrane shall meet the requirements of Geosynthetic Research Institute's test method GM 13.

d. The nominal thickness of proposed geomembrane shall be 60 mil., or as approved by the Engineer and/or Geosynthetic Quality Assurance Consultant.

3. Geomembrane sheets shall be visually consistent in appearance and shall contain no holes, blisters, undisbursed raw materials or other signs of contamination by foreign material. Geomembrane must have no striations, roughness or bubbles on the surface.

B. Seaming Apparatus

1. Thermal fusion welding machines used for joining geomembrane surfaces may be either extrusion or hot wedge. These machines shall include sufficient temperature and rate-of-travel monitoring devices to allow continuous monitoring of operating conditions.

2. One spare, operable thermal fusion seaming device shall be maintained on site at all times.

C. Field Test Equipment

1. Field Tensiometer: the field tensiometer shall be calibrated within three months prior to project start date over the range of field test values.

2. Air Channel Test Equipment: air channel test equipment shall consist of hoses, fittings, valves and pressure gauge(s) needed to deliver and monitor the pressure of compressed air through an approved pressure feed device.

3. Air Compressor: the air compressor utilized for field testing shall be capable of producing and maintaining an operating pressure of at least 50 psi.

4. Vacuum Box: the vacuum box shall consist of a vacuum gage, valve, and a gasket around the edge of the open bottom needed to apply vacuum to a surface.

2.02. CONFORMANCE TESTING REQUIREMENTS

A. Geomembrane shipped to site shall undergo conformance testing. Manufacturer's roll certificates may be used for conformance evaluation at the option of the Geosynthetic Assurance Consultant. Nonconforming material shall either be retested at the direction of the Geosynthetic Quality Assurance Consultant or removed from site and replaced at Contractor's expense.

B. Conformance Test Methods

1. Samples will be located and collected by the Geosynthetic Quality Assurance Consultant at a rate of one sample per 100,000 square feet of geomembrane delivered to site.

2. One sample will be obtained from each geomembrane production batch delivered to the site.

3 Samples shall be cut by Geomembrane Installer and be at least 45 square feet in size.

4. Samples shall be tested in accordance with Table 1 (Smooth) or Table 2 (Textured) specified in GRI Test Method GM13.

5. Geomembrane thickness shall be measured a minimum of three times per panel during deployment to verify conformance with GRI Test Method GM13.

C. Role of Testing Laboratories

1. The Geosynthetic Quality Assurance Consultant will be responsible for acquiring samples of the geomembrane for conformance testing. The Owner or Geosynthetic Quality Assurance Consultant will retain an independent, third party laboratory to perform conformance testing on samples of geomembrane.

2. Retesting of geomembrane panels by the Geomembrane Installer because of failure to meet any of the conformance specifications can only be authorized by the Geosynthetic Quality Assurance Consultant. Non-conforming panels may be retested in accordance with Subsection 2.02(B) and 2.02(D) under authorization of the Geosynthetic Quality Assurance Consultant only.

3. The Geomembrane Manufacturer and/or Geomembrane Installer may perform independent tests in accordance with methods and procedures specified in Subsection 2.02(B). Results shall not be substituted for quality assurance testing described herein.

D. Procedures for Determining Conformance Test Failures

1. If conformance test results fail to meet specifications, the roll and/or batch may be retested using specimens from either the original roll sample or from another sample collected by the Geosynthetic Quality Assurance Consultant. Two additional tests (retests) shall be performed for each failed test procedure. Each retest shall consist of multiple specimen tests if multiple specimens are specified in the test procedure. If the results of both retests meet specifications, the roll and batch will be considered to have passed conformance testing.

2. Failure of any retest shall be cause for rejection of the entire roll or batch depending on the type of failing test. The Geosynthetic Quality Assurance Consultant reserves the right to collect samples from other rolls of a particular batch for further conformance testing. The Geosynthetic Quality Assurance Consultant may choose to accept only a portion of the batch on the basis of the results of conformance testing of samples collected from other rolls.

3. If retesting does not result in conformance with the specifications as defined in preceding paragraph, or if there are any other nonconformities with the material specifications, the Contractor shall remove the rolls from use in the project. The Contractor shall also be responsible for removal of rejected geomembrane from the site and replacement with acceptable geomembrane at no additional cost to the Owner.

PART 3 - EXECUTION

3.01 PRE-CONSTRUCTION MEETING

A. A Pre-Construction Meeting shall be held at the site to discuss and plan the details of geomembrane installation. This meeting shall be attended by the Geomembrane Installer, Owner, Engineer and the Contractor.

B. The following topics relating to geomembrane installation shall be addressed:

1. Responsibilities of each party.

2. Lines of authority and communication.

3. Methods for documenting, reporting and distributing documents and reports.

4. Procedures for packaging and storing archive samples.

5. Review of the schedule for all installation and quality assurance testing, including third-party testing turnaround times.

6. Review of panel layout, access and numbering systems for panels and seams including details for marking on the HDPE geomembrane.

7. Procedures and responsibilities for preparation and submittal of as-built drawings.

8. Temperature and weather limitations, installation procedures for adverse weather conditions and defining acceptable subgrade or ambient moisture and temperature conditions for working during liner installation.

9. Subgrade conditions, dewatering responsibilities and subgrade maintenance plan.

10. Deployment techniques including allowable subgrade for geomembrane.

11. Procedures for covering of the geomembrane to prevent damage.

12. Plan for minimizing wrinkles in the geomembrane.

13. Measurement and payment schedules.

14. Site health and safety procedures/protocols.

3.02 SUBGRADE PREPARATION

A. Contractor shall prepare a subgrade surface in accordance with Section 02300, Earthwork.

B. The Contractor shall not excavate more than the amount of anchor trench required for one day of geosynthetics deployment, unless otherwise specified by the Geosynthetic Quality Assurance Consultant. Rounded corners shall be provided in the trenches where the geosynthetics enter the trench to allow them to be uniformly supported by the subgrade and to avoid sharp bends. The geosynthetics shall not be supported by loose soils in anchor trenches.

C. The Geomembrane Installer shall visually inspect the subgrade immediately prior to geomembrane deployment. Inspection shall verify that there are no potentially harmful foreign objects present, such as sharp rocks and other deleterious debris. Any foreign objects encountered shall be removed by Geomembrane Installer or Contractor. All subgrade damaged by construction equipment and deemed unsuitable for geomembrane deployment shall be repaired prior to geomembrane deployment. All repairs shall be approved by the Geosynthetic Quality Assurance Consultant and Geomembrane Installer. The responsibility for preparation, repairs, and maintenance of the subgrade shall be defined in the preconstruction meeting. The Geomembrane Installer shall provide the Geosynthetic Quality Assurance Consultant with written acceptance of subgrade surface over which geomembrane is deployed (Part 1 .05C) for each day of deployment.

3.03 GEOMEMBRANE DEPLOYMENT

A. Geomembrane shall not be deployed until all applicable certifications/quality control certificates listed in Subsection 1.05 of this section and conformance testing listed in Subsection 2.02 of this section are submitted and approved by the Geosynthetic Quality Assurance Consultant. Any geomembrane deployed prior to approval by the Geosynthetic Quality Assurance Consultant shall be at the sole risk of the Geomembrane Installer and/or Contractor. If material installed prior to approval by the Geosynthetic Quality Assurance Consultant does not meet the requirements of this specification, it shall be removed from the site at no additional cost to the Owner.

B. Geomembrane will be deployed according to submitted panel layout drawing as approved by the Geosynthetic Quality Assurance Consultant. The Geosynthetic Quality Assurance Consultant is to be notified of and approve any revisions or modifications to the approved panel layout drawing prior to deploying geomembrane in the area of review.

C. Adequate temporary anchoring (sand bags, tires, etc.) that will not damage the geomembrane shall be placed on a deployed panel to prevent uplift by wind.

D. Geomembrane shall not be deployed if:

1. Ambient temperatures are below 41 degrees F (5 degrees C) or above 104 degrees F (40 degrees C) measured six inches above geomembrane surface unless approved by the Geosynthetic Quality Assurance Consultant.

2. Precipitation is expected or in the presence of excessive moisture or ponded water on the subgrade surface.

3. Winds are excessive as determined by Geomembrane Installer in agreement with the Geosynthetic Quality Assurance Consultant.

4. The Geosynthetic Quality Assurance Consultant will have the authority to suspend work during such conditions.

E. The Geomembrane Installer shall be responsible for conformance with the following requirements:

1. Equipment utilized for installation/quality assurance testing does not damage geomembrane. Such equipment shall have rubber tires and a ground pressure not exceeding 5 psi or total weight exceeding 750 lbs. Only equipment necessary for installation and quality assurance testing is allowed on the deployed geomembrane.

2. Personnel working on geomembrane do not damage geomembrane (activities such as smoking or wearing damaging clothing shall not be allowed).

3. Method of deployment does not damage geomembrane.

4. Method of deployment minimizes wrinkles.

5. Temporary loading or anchoring does not damage geomembrane.

6. Direct contact with geomembrane is minimized.

F. No vehicles shall be allowed on deployed geomembrane under any circumstances.

3.04 FIELD SEAMS

A. Seam Layout

1. In general, seams shall be oriented parallel to the line of the maximum slope. In corners and at other odd-shaped geometric intersections, number of seams should be minimized. If at all possible, seams shall not be located at low points in the subgrade unless geometry requires seaming to be done at these locations.

2. A seam numbering system compatible with the panel numbering system shall be agreed upon at the Pre-Construction Meeting.

C. Field Test Methods

1. Ten 1-inch-wide samples described above under Part 3.06(B)(3) shall be field tested for peel (5 samples) and shear (5 samples) in accordance with GRI GM 19.

2. One seam sample shall be field tested for peel and shear at the end of each continuous field seam 100 feet or greater in length.

3. Testing shall be performed in accordance with ASTM D6392 using a field tensiometer or equivalent device to qualitatively and quantitatively determine mode of failure.

4. Seam shall be considered passing if failure in both peel and shear meet criteria listed in GRI GM 19.

5. The procedures specified in Subsection 3.06(D) shall be implemented when sample passes field tensiometer test.

D. Laboratory Test Methods

1. Laboratory testing of seam samples shall be conducted by the Geosynthetic Quality Assurance Laboratory under contract with the Geosynthetic Quality Assurance Consultant or Owner. Five specimens shall be tested in shear and five in peel.

2. Laboratory testing shall be conducted in accordance with GRI GM 19.

3. For both seam shear and peel tension tests, an indication will be given for each specimen tested which defines locus of failure.

4. For shear tests, the following values, along with the mean and standard deviation where appropriate, will be reported for each specimen tested:

   a. Maximum tension in pounds per square inch.

   b. Elongation at break (up to a tested maximum of 100 percent).

   c. Locus of failure using ASTM D6392 designations.

5. For peel tests, the following values, along with the mean and standard deviation where appropriate, will be reported for each specimen tested:

   a. Maximum tension in pounds per square inch.

   b. Seam separation (expressed as percent of original seam area).

c. Locus of failure.

6. Retesting of seams due to nonconformance with specifications may be performed at the discretion of the Geosynthetic Quality Assurance Consultant.

E. Destructive Seam Test Failure

1. Shear and peel test results derived from testing described in Parts 3.06(C) and 3.06(D) shall comply with GRI GM 19 for seam to be considered acceptable.

2. The Geomembrane Installer has two options in determining the repair boundary whenever a seam has failed destructive testing:

   a. The seam can be reconstructed between the two previously tested and passed destructive sample locations; or,

   b. The Geomembrane Installer can trace the welding path to an intermediate location at least ten feet from point of failed test in each direction and obtain destructive test samples collected from these locations. If destructive tests on these samples are acceptable, then the seam shall be reconstructed between the intermediate locations. If either sample fails, the process may be repeated until an acceptable seam test has been performed on both sides of the original failed sample. If a passing sample is not realized on one (or both) side of the original failed sample, then seam repair must extend to the end(s) of the seam. Retesting of seams according to this procedure shall utilize the sampling methodology described in Part 3.06(B). The Owner reserves the right to terminate this process, at the discretion of the Geosynthetic Quality Assurance Consultant, after the second retesting. An additional sample taken from the reconstructed zone must pass destructive seam testing if destructive sample failure(s) causes reconstruction.

3. The Geosynthetic Quality Assurance Consultant shall be responsible for documenting all actions taken in repairing seams. The Geomembrane Installer will be responsible for keeping the Geosynthetic Quality Assurance Consultant informed of seaming progress.

4. Additional fees for destructive seam test failures shall be assessed to the Contractor and deducted from payment. This fee shall be assessed only if the failing sample is a laboratory sample.

3.07 ELECTRONIC LEAK LOCATION SURVEY

A. The Owner shall have the option to conduct an electronic leak location survey. Leak location survey shall be performed by the Leak Location Contractor under the observation of the Geosynthetic Quality Assurance Consultant.

B. Leak Location Contractor shall identify actions required by Contractor to prepare the site for the leak location survey.

C. Contractor shall ensure that the layers above and below the geomembrane contains sufficient moisture to conduct a leak location survey. Typically, a moisture content of earth materials of 1% to 2% by weight is sufficient to conduct the survey. If the moisture content of layers above and/or below the geomembrane is not sufficient per the requirements of the Leak Location Contractor, Contractor shall add moisture to the layers, as required.

D. Contractor shall provide electrical isolation of the metal marker posts, batten bars, and concrete structures, as requested by Leak Location Contractor.

E. Leak Location Contractor shall inspect the site prior to commencing the survey to ensure all site preparations are completed and the site conditions are appropriate for conducting the leak location survey.

F. Any discrepancy in the required site preparation detailed in the Leak Location Contractor's Work Plan or site conditions shall be reported to the Contractor for corrective or appropriate action.

G. After the final layer is placed above the geomembrane, conduct a leak location survey on the final layer material using the procedures for surveys with earth materials covering the Geomembrane as described in ASTM D 7007.

H. A leak detection sensitivity test using an artificial leak shall be conducted on the geomembrane for each set of equipment used before the equipment is used on for the leak location survey, as described in ASTM D 7007 to determine the detection distance for the survey.

I. The leak location survey shall be taken on survey lines or on a grid spaced no farther apart than twice the leak detection distance as determined in the leak detection sensitivity test.

J. The Leak Location Contractor shall inform the Owner and/or Engineer and mark the locations of all identified or indicated leaks with a flag or spray paint. The Geomembrane Installer shall repair the defect/hole as detailed in Part 3.08 of this Section.

3.08 DEFECTS AND REPAIRS

A. The geomembrane shall be examined by the Geomembrane Installer and the Engineer for defects, holes, blisters, undispersed raw materials, and any signs of contamination by foreign matter. The geomembrane surface shall be swept and/or washed by the Geomembrane Installer if the amount of dust or mud inhibits examination. The

Contractor shall provide a water truck, an operator, clean water and hoses as reasonably necessary to assist the Geomembrane Installer in this activity.

B. Portions of geomembrane exhibiting flaws, or failing a non-destructive or destructive (if conducted) test, shall be repaired or replaced by the Geomembrane Installer. Repair procedures available include:

1. Patching - used to repair large holes, tears, undispersed raw materials, contamination by foreign matter, holes resulting from destructive sampling (if conducted), and locations where seam overlap is insufficient;

2. Capping - used to repair large lengths of failed seams; and

3. Additional Procedures - used upon recommendation of the Geomembrane Installer if agreed to by the Engineer.

C. Patches or caps.

1. Extend patch or cap 6 inches (minimum) beyond the edge of the defect.

2. Round corners of patch and/or cap (suggest 3-inch radius).

3. Repair procedures, equipment, materials, and techniques will be approved by the Geosynthetic Quality Assurance Consultant prior to repair.

4. Geomembrane below large caps shall be appropriately cut to avoid water or gas collection between two sheets.

D. The Geomembrane Installer shall mark on the geomembrane (using a non-puncturing writing utensil), repair date, time, and personnel involved.

E. Each repair shall be non-destructively tested in accordance with Part 3.05. Large caps may require destructive test sampling in accordance with Part 3.06 at the discretion of the Geosynthetic Quality Assurance Consultant.

F. Repairs which fail testing shall be redone and retested until a passing result is obtained. The Geomembrane Installer will perform non-destructive testing on repairs and will document retesting of repairs.

G. The Geosynthetic Quality Assurance Consultant will document repairs, repair testing, and retesting results.

H. The Geomembrane Installer shall cut and seam wrinkles which may adversely affect long-term integrity of the geomembrane, hinder subsequent construction of overlying layers, or impede drainage off of the geomembrane after it is covered by soil. Seaming shall be done in accordance with procedures described in Parts 3.04(B) and 3.04(C), and it shall be subject to test provisions of Parts 3.05 (non-destructive testing) and 3.06 (destructive testing – if conducted).

3.09 PROTRUSIONS AND CONNECTIONS TO GEOMEMBRANE

A. If required, the Geomembrane Installer shall install geomembrane around utility poles, guy wires, and other structures according to the Contract Drawings and the following requirements:

1. Use minimum 1-ft long geomembrane pipe boots and steel clamps to seal the geomembrane around pole or structure.

2. Use standard welding procedures to seam the geomembrane boot to the geomembrane.

3. Seaming performed on and around penetrations, and other appurtenances shall be non-destructively tested using the vacuum testing method.

3.10 SURVEY DOCUMENTATION

A. The Geomembrane Installer shall survey the completed geomembrane prior to covering and provide the Geosynthetic Quality Assurance Consultant with 24-hour notification of survey. The Contractor shall document the location of all seams (panel corners acceptable), destructive test samples (if conducted) and repairs. The Contractor shall provide survey data to the Geosynthetic Quality Assurance Consultant within two working day of survey completion.

3.11 DAILY FIELD INSTALLATION REPORTS

A. At the beginning of each day, the Geomembrane Installer shall provide the Geosynthetic Quality Assurance Consultant with a report for all work completed the previous day.

B. The Daily Field Installation Report shall include the following:

1. The total amount and location of geomembrane placed.

2. The total length and location of seams completed, technician name and welding unit numbers.

3. A drawing or sketch depicting the geomembrane installed the previous day including the panel number, seam number and locations of non-destructive and destructive testing (if conducted).

4. Results of pre-qualification test seams, if available.

5. Results of non-destructive testing.

C. Destructive test results (if conducted) shall be reported within 48 hours or prior to covering the geomembrane, whichever is practical.

3.12 MATERIAL ABOVE GEOMEMBRANE

A. The Geosynthetic Quality Assurance Consultant and Geomembrane Installer shall verify the area of geomembrane completion prior to placement of material over the geomembrane.

B. Soils - Apply following general criteria for covering of the geomembrane:

1. Do not place soils on the geomembrane at an ambient temperature below 32 degrees F, (0 degrees C) nor above 104 degrees F (40 degrees C), unless otherwise specified.

2. Do not drive equipment used for placing soil directly on the geomembrane.

3. A minimum thickness of 1 foot of soil is specified between a low ground pressure dozer (maximum contact pressure of 5 lb/sq. inch) and the geomembrane.

4. A minimum thickness of 2 feet of soil is required between rubber-tired vehicles and the geomembrane.

5. Do not compact soils placed directly on geomembrane.

6. Damage to the geomembrane resulting from placement of cover soils shall be repaired in accordance with Part 3.08 by the Geomembrane Installer at the Contractor's expense.

7. Do not push soil downslope. Soil shall be placed over the geomembrane starting from base of the slope, up to top of the slope.

END OF SECTION

Attachment 3

Revised Emergency Action Plan

January 2024

EMERGENCY ACTION PLAN
ASH SURGE BASIN, BYPASS BASIN, and METAL CLEANING BASIN
POWERTON STATION
JANUARY 2024

The Emergency Action Plan (EAP) was initially prepared by Civil & Environmental Consultants, Inc. (CEC) pursuant to 40 CFR 257.73(a)(3) for the Ash Surge Basin and Bypass Basin at the Midwest Generation, LLC (MWG) Powerton Station (Station) in Pekin, Illinois. This EAP has been revised to comply with 35 Ill. Adm. Code Part 845, Subpart E, §845.520 by revising the code references and including the Metal Cleaning Basin as well as to address comments by the Illinois Environmental Protection Agency (IEPA). Previous assessments performed in accordance with §257.73(a)(2) identified the Ash Surge Basin and the Ash Bypass Basin as significant hazard potential Coal Combustion Residual (CCR) surface impoundments, and as a result, this written EAP has been prepared to address a potential failure of the Ash Surge Basin and Bypass Basin along with the Metal Cleaning Basin. The Metal Cleaning Basin was not originally included in the hazard potential assessment, but the relative location of the Metal Cleaning Basin allows for the failures and the result of the failures for the Ash Surge Basin and Bypass Basin to be applied to the Metal Cleaning Basin. The EAP is presented as follows:

Section 1.0: §845.520(b)(1) Definition of the events or circumstances involving the CCR unit(s) that represent a safety emergency, along with a description of the procedures that will be followed to detect a safety emergency in a timely manner;

Section 2.0: §845.520(b)(2); Definition of the responsible persons, their respective responsibilities, and notification procedures in the event of a safety emergency involving the CCR unit(s);

Section 3.0: §845.520(b)(3); Contact information of emergency responders;

Section 4.0: §845.520(b)(4); Provide Site Maps, which delineate the downstream areas which would be affected in the event of the Basins failure and a physical description of the CCR Units;

Section 5.0: §845.520(b)(5); Include provisions for an annual face-to-face meeting or exercise between representatives of the Powerton Station and the local emergency responders; and

Section 6.0: §845.520(e); The owner or operator of the CCR unit(s) must obtain a certification from a qualified professional engineer stating that the written EAP, and any subsequent amendment of the EAP, meets the requirements of 845.520.

1.0 DEFINITION OF THE EVENTS THAT REPRESENT A SAFETY EMERGENCY

In accordance with Section 845.520(b)(1), the attached tables define the events and/or circumstances involving the Basin$_s$ that represent a structural safety emergency, along with a description of the procedures that will be followed to detect a safety emergency in a timely manner.

The information provided in the Tables 1 through 4 provide a listing of problems which may occur at the Basin$_s$, how to make a rapid evaluation of the problem, and what action should be taken in response to the problem. This section presents only generalized information to aid in first response to a given problem. Suspected problems should be reported as soon as possible, as discussed in Section 2.0, and assistance from a qualified engineer should be obtained if necessary.

The problems outlined in the tables are related to above grade, earthen type embankment dams similar in construction to the Ash Surge Basin, Ash Bypass Basin, and the Metal Cleaning Basin. The problems discussed herein include:

- Table 1: Seepage
- Table 2: Sliding
- Table 3: Cracking
- Table 4: Animal Burrows and Holes

For each problem, the indicators are discussed followed by evaluation techniques and then by action items for each problem.

An additional safety emergency may also be caused by severe weather. The Basins exist outdoors and are exposed to elements where a weather emergency may occur. The following is the station's procedure for weather emergencies:

1.0 Upon receipt of a severe weather warning from a weather radio, internet, community siren, or by visual observation, the following precautions will be taken.

2.0 The Shift Supervisor will use radios and P.A. to notify each department. Pay attention to workers outside the main building and permanent structures.

3.0 Inform critical operating personnel that they should remain on the job in a secure location until notified to do otherwise by the Shift Supervisor.

4.0 Notify Administration Manager, Projects Manager, or Contract Administrators on site that severe weather is imminent.

5.0 Notify Security.

6.0 Notify all Contractor supervisors, managers and foremen. Instruct them to evacuate all personnel from trailers and temporary structures and to take shelter in the main power block between Units 5 and 6. This area is known as the old maintenance shop and store room window area.

7.0 All personnel, except Fuel Handling will be instructed to return to the main building and seek shelter in the following locations for a head count.

7.1 **Electrical Maintenance Shop** – Electrical Maintenance, Instrument Maintenance and Mechanical Maintenance, Operating, Storeroom.
7.2 **Electrical Maintenance Office** – Administration, Specialist, Planners.
7.3 **Outside Storeroom Window** – Visitors, Janitors, Security, Contractors.
7.4 **Lower level of Car Dumper; C-1 or C-2 Tunnels** – Fuel Handling

8.0 When the warning is lifted, all employees, visitors, and contractors shall report to their supervisors for a head count.

9.0 Inspect the plant facilities for damage.

9.1 If the plant is damaged:

9.1.1 Secure damaged areas to prevent access.

9.1.2 Make notifications as necessary (Refer to 13.4.2).

2.0 RESPONSIBLE PERSONS, RESPECTIVE RESPONSIBILITIES, AND NOTIFICATION PROCEDURES

The EAP must be implemented once events or circumstances involving the CCR unit that represent a safety emergency are detected, including conditions identified during periodic structural stability assessments, annual inspections, and inspections by a qualified person. In accordance with §845.520(b)(2), the following sections define responsible persons, their respective responsibilities, and notification procedures in the event of a safety emergency involving the Ash Surge Basin, Bypass Basin, and/or the Metal Cleaning Basin. Contact information is provided in Table 5, attached.

2.1 Responsible Persons and Responsibilities

Appropriate parties will be notified based on the nature and severity of the incident as determined by the Station Environmental Specialist or Chemical Specialist. If failure is

imminent or has occurred, notification and mitigation procedures are a top priority, particularly for a potentially hazardous situation. The Station Environmental Specialist or Chemical Specialist, in conjunction with the Station Director, is responsible for this determination.

2.2 Notification Sequence

The following notification procedures shall be used by employees in the event of a safety emergency with the Ash Surge Basin, Bypass Basin, and/or the Metal Cleaning Basin.

(1) Notify the Shift Supervisor and Environmental Specialist, Chemical Specialist, or alternate.

(2) If unsafe conditions exist, the employee should evacuate the area.

(3) Only the Environmental Specialist, Chemical Specialist, Corporate Environmental or designated alternate shall have any official communication with non-employees or regulatory agencies, and only the Communications Director shall have any contact with the media.

The Environmental Specialist, Chemical Specialist, or designated alternate should follow these procedures in the event of a safety emergency involving the Ash Surge Basin and/or Bypass Basin:

(1) Organize appropriately trained Station personnel and/or other employees or contractors as necessary to assist with the safety emergency.

(2) After consultation with appropriately trained Station personnel, contact the proper civil authorities (e.g., fire, police, etc.) if necessary. Notify the appropriate agencies where there has been a reportable release of material(s) into the environment. See Table 5, attached for contact information. Notify MWG Corporate via the Intelex online notification system within 24 hours in the event of a reportable release. A reportable release is a Material Release defined as a spill or leak that materialized in the waterway. A Non-Material Release is a spill or leak that did not come into contact with the waterway.

(3) Be prepared to evacuate the inundation area at any time during the safety emergency response.

(4) If the emergency is beyond the Facility’s response capabilities, contact one or more emergency response contractors as necessary.

(5) Corrective actions should only be performed by properly trained individuals.

2.3 Emergency Responders Contact Information

In accordance with §845.520(b)(3), Table 5, attached, provides contact information of emergency responders. The Station Environmental Specialist, Chemical Specialist, or alternate will determine who to notify, including any affected residents and/or businesses, in the case of an imminent or actual CCR surface impoundment dam failure. The Station Environmental Specialist, Chemical Specialist, or alternate will ensure proper notifications are made.

Appropriate contractors will be utilized to assist the Station Environmental Specialist, Chemical Specialist or alternate with mitigated actions being undertaken in order to minimize the impact of an event that has occurred. Contact information for contractors and consultants are provided in Table 5.

3.0 SITE MAP AND A SITE MAP DELINEATING THE DOWNSTREAM AREA

In accordance with §845.520(b)(4), the following section provides a physical description of the Ash Surge Basin, Bypass Basin, and the Metal Cleaning Basin. A Site Vicinity Map is provided as Figure 1, a Site Plan for the Ash Surge Basin, Bypass Basin, and the Metal Cleaning Basin is provided as Figure 2. Drawings depicting the locations of, and the downstream areas affected by, a potential failure of the Ash Surge Basin and Bypass Basin were prepared by Geosyntec in October 16, 2016 and are provided in Appendix A.

3.1 Basin Locations and Descriptions

The Ash Surge Basin, Bypass Basin and Metal Cleaning Basin are located in the eastern portion of Powerton Station (see Figure 1) northeast of the Main Power Block Building situated between the Old Intake Channel and the Former Ash Basin. The Bypass Basin is immediately southeast of the Ash Surge Basin. The Metal Cleaning Basin is immediately west of the Ash Surge Basin.

From CEC's observations and review of construction and engineering documentation provided by MWG, the Basins were constructed with elevated earthen berms or embankments. Run-on is limited to precipitation contained within the earthen berm. Physical characteristics of the Ash Surge Basin, Bypass Basin, and the Metal Cleaning Basin are provided in Table 6.

3.2 Delineation of Downstream Areas

The potential impacts from failure of the Ash Surge Basin and Bypass Basin were evaluated and reported by Geosyntec in the Hazard Potential Classification Assessment (HPCA), dated October 2016. A copy of the HPCA is contained on the CCR Rule Compliance Data and Information web site (http://www.nrg.com/legal/coalcombustion-residuals/).

Results of the HPCA indicate that both the Ash Surge Basin and Bypass Basin are classified as significant hazard potential CCR surface impoundments. The evaluation reports no loss of life resulting from failure of the Basin embankments is probable because no occupied buildings are located within the anticipated inundation areas. However, potential failure during flood conditions could result in offsite economic or environmental impacts. Inundation Maps are provided in Appendix A.

Reviewing the location of the Metal Cleaning Basin, it is reasonable to conclude that no loss of life would occur resulting from a failure of the Metal Cleaning Basin embankments because no occupied buildings are located downstream.

4.0 ANNUAL FACE-TO-FACE MEETING

In accordance with §845.520(b)(5), a face-to-face meeting or an exercise between representatives of the Powerton Station and the local emergency responders shall be offered and, if accepted, held on an annual basis. The purpose of the annual meeting is to review the EAP to assure that contacts, addresses, telephone numbers, etc. are current. The annual meeting will be held whether or not an incident occurred in the previous year. In the event an incident occurs, the annual meeting date may be moved up in order to discuss the incident closer to the date of occurrence. If no incidents have occurred, the annual meeting will be held to inform local emergency responders on the contents of the EAP and changes from the previous year. Documentation of the annual face to face meeting will be recorded and placed in the operating record for the Station.

5.0 LIMITATIONS AND CERTIFICATION

This EAP was prepared to initially meet the requirements of 257.73(a)(3) and was previously prepared by CEC in April 2017 to address the Ash Surge Basin and the Bypass Basin. This EAP has been updated to include the Metal Cleaning Basin, comments from IEPA, and the remainder was reviewed by KPRG for compliance with 35 Ill. Adm. Code 845.520(b). KPRG's review of the EAP is based solely on the observations of the conditions observed by KPRG personnel and information provided to KPRG by Midwest Generation. This review neither accepts nor rejects the safety emergencies identified by CEC. The structural safety emergencies identified along with the responses are the product of CEC. KPRG has not altered the structural safety emergencies or the responses associated with each emergency. As such, the Emergency Action Plan complies with 35 Ill. Adm. Code 845.520(b).

Signature:

Name: Joshua D. Davenport, P.E.



Date of Certification: 1/26/2024

Illinois Professional Engineer No. 062.061945

License Expires: 11/30/2025

FIGURES



W:\projects\midwest generation\operating permit\powerton\figures\eap map.dwg

ENVIRONMENTAL CONSULTATION & REMEDIATION

K P R G

KPRG and Associates, inc.

414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

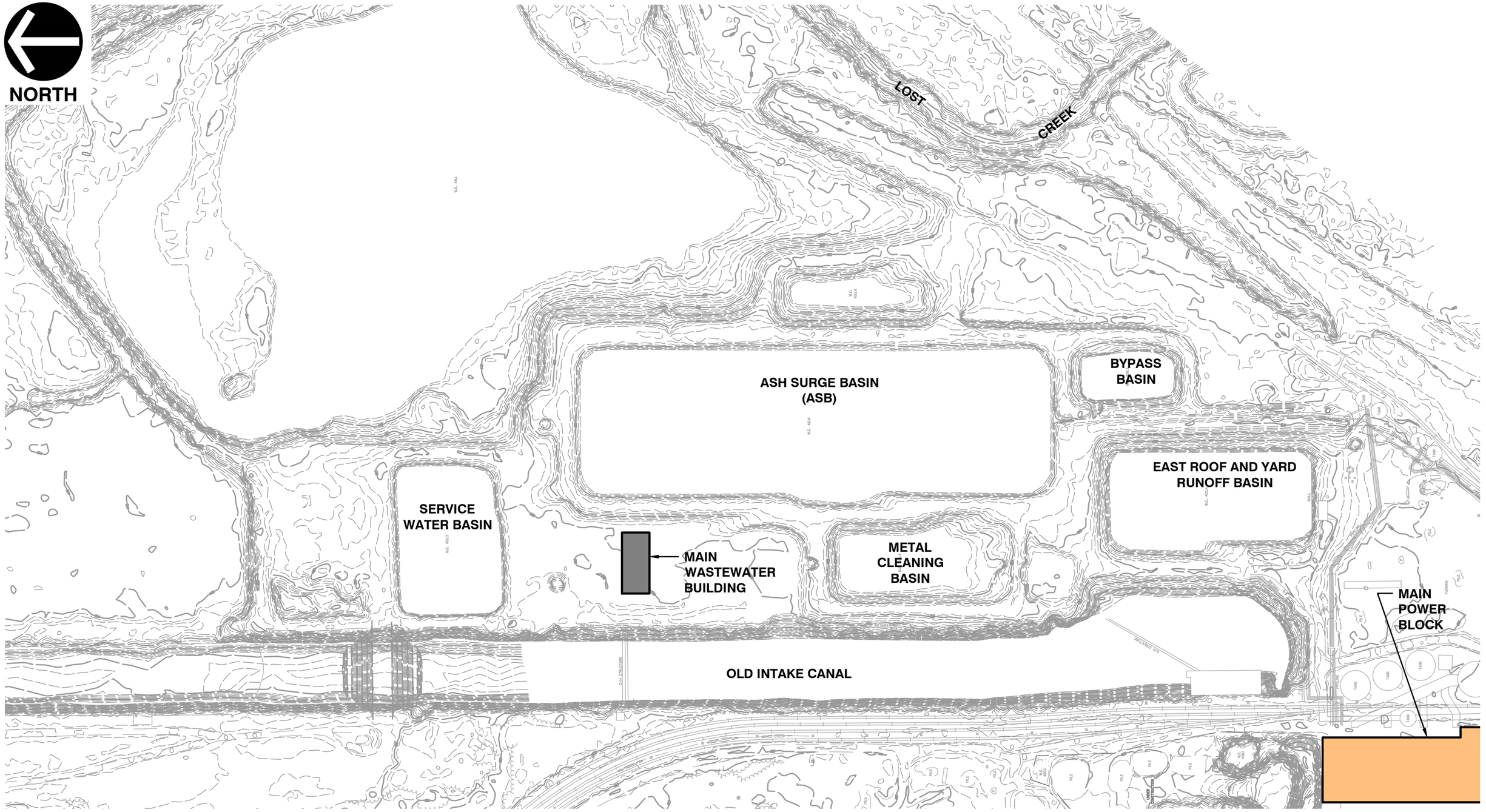
14665 West Lisbon Road, Suite 1A Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478

SITE MAP

POWERTON GENERATING STATION
PEKIN, ILLINOIS

Scale: 1" = 550' | Date: October 20, 2021

KPRG Project No. 19520 | FIGURE 1



REFERENCE

1. TOPOGRAPHIC INFORMATION SOUTH OF SECONDARY ASH SETTLING BASIN AND FAB IS BASED ON AERIAL SURVEY PERFORMED BY AEROMETRIC, INC. DATED JUNE 19, 2008. TOPOGRAPHY NORTH OF ASH SURGE BASIN IS BASED ON SURVEY BY RIDGELINE CONSULTANTS PERFORMED IN FEBRUARY AND MARCH 2016.

LEGEND

- OCCUPIED STRUCTURE
- UNOCCUPIED STRUCTURE
- TOPOGRAPHY (1-FOOT INTERVAL)

*HAND SIGNATURE ON FILE

SCALE IN FEET

0 200 400

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www.cecinc.com

POWERTON STATION
ASH SURGE BASIN - BYPASS BASIN
PEKIN, ILLINOIS

SITE PLAN

DRAWN BY:	MSK	CHECKED BY:	MDJ	APPROVED BY:	MDJ*	FIGURE NO.:	2
DATE:	04/05/2017	DWG SCALE:	1"=200'	PROJECT NO:	163-469.0100		

P:\2016\163-469\-CADD\Dwg\CV01-Powerton Station\163469-CV01-C102-Site Plan.dwg[LAYOUT1] LS:(3/9/2017 - ccase) - LP: 4/5/2017 1:26 PM

TABLES

Table 1: Ash Surge Basin, Ash Bypass Basin, and Metal Cleaning Basin
Event Definition, Evaluation and Action: Seepage

Definition	Evaluation	Action
1A: Wet area on downstream embankment slope or other area downstream of the embankment, with very little or no surface water or very minor seeps.	1B: Condition may be caused by infiltration of rain water, which is not serious; or may be the start of a serious seepage problem, which would be indicated by a quick change to one of the conditions below.	1C: No immediate action required. Note the location for future comparison.
2A: Same wet area as above, with moderate seeps of clear or relatively clear water and the rate of flow not increasing.	2B: Measure the flow periodically and note changes in clarity.	2C: No immediate action required. Note the location, flow rate, and clarity for future comparison. During reservoir flood stages, the seepage area should be watched for changes.
3A: Same wet area as above, with moderate seeps of clear or relatively clear water and rate of flow increasing.	3B: Measure the flow periodically and note changes in clarity. Inspect downstream area for new seeps.	3C: Contact a qualified engineer for immediate inspection (see Table 5). Observe the condition constantly for further changes in flow rate or clarity, unless notified otherwise by the engineer.
4A: Piping (seepage with the removal of materials from the foundation or embankment), moderate to active flows of cloudy to muddy water.	If the water is cloudy to muddy, and the rate of flow is increasing, this condition could lead to failure of the dam. If, along the piping, there is an upstream swirl (whirlpool) caused by water entering through the abutments of embankment, failure is imminent.	4C: Immediate action is necessary. Notify the appropriate agencies (see Table 5).
5A: Boils (soil particles deposited around a water exit forming a cone, varying from a few inches in diameter spaced 2 to 3 feet apart to isolated locations several feet in diameter in the floodplain downstream of the dam) may show the types of flow as noted above.	5B: Evaluation of the problem is the same as noted above for the various flow conditions, i.e., clear and constant, clear and increasing, and cloudy or muddy and increasing.	5C: Actions to be taken are essentially the same as those noted above.

Table 2: Ash Surge Basin, Ash Bypass Basin, and Metal Cleaning Basin
Event Definition, Evaluation and Action: Sliding

Definition	Evaluation	Action
1A: Movement of a portion of the embankment, either the upstream or downstream slope, toward the toe of the dam.	1B: Various degrees of severity of a slide require different responses. The first condition is that the slide does not pass through the crest and does not extend into the embankment for more than 5 ft., measured perpendicular to the slope	1C: For this condition, a qualified engineer (see Table 5) should be consulted before repairs are initiated to determine the cause of the slide and to recommend modifications to prevent future slides. The downstream side of the dam should be watched for the emergence of water, either through the slide or opposite the slide. If water is noted discharging, the area should be treated as a seepage location and monitored as noted above.
2A: Slide passes is the second condition.	2B: In this condition, the slide passes through the crest and that the reservoir elevation is more than 10 ft. below the lowered crest.	2C: Use the same actions as noted above, and notify the appropriate MWG personnel (see Table 5) of the situation so they may be prepared to act if the condition worsens.
3A: Slide passes is also the third condition.	3B: In this condition, the slide passes through the crest and that the reservoir elevation is less than 10 ft. below the lowered crest.	3C: This condition is critical, and failure of the dam should be considered imminent. Notify the appropriate agencies (see Table 5).

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Table 3: Ash Surge Basin, Ash Bypass Basin, and Metal Cleaning Basin
Event Definition, Evaluation and Action: Cracking

Definition	Evaluation	Action
1A: Cracks in the embankment can occur either in the longitudinal (along the length of the dam) or transverse (across the dam from upstream to downstream directions).	1B: Some cracking of the surface soils may occur when they become dry. This cracking is to be expected, and no further action is required.	1C: No further action is required.
2A: Longitudinal cracking can indicate the beginning of a slide or be an uneven settlement of the embankment.	2B: Monitor the crack for future changes, and contact a qualified engineer for assistance in the evaluation of the crack and recommended repairs.	2C: Contact a qualified engineer for assistance and recommendations (see Table 5).
3A: Transverse cracking can indicate uneven settlement or the loss of support below the crack. Such cracks usually occur over an outlet conduit, near the abutments, or in the taller portion of the embankment.	3B: Monitor the crack for future changes, and contact a qualified engineer for assistance in the evaluation of the crack and recommended repairs.	3C: Contact a qualified engineer for assistance and recommendations (see Table 5).

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Table 4: Ash Surge Basin, Ash Bypass Basin, and Metal Cleaning Basin
Event Definition, Evaluation and Action: Animal Burrows and Holes

Definition	Evaluation	Action
1A: Holes in the embankment, varying in size from about one inch in diameter to one foot in diameter caused by animals.	1B: If the holes do not penetrate through the embankment, the situation is usually not serious. Some animal holes will have soil pushed out around the hole in a circular fashion, which may look like a boil (crayfish or crawdad). Watch for the movement of water and soil particles from these holes to determine whether they are boils.	1C: Backfill as deeply as possible with impervious material. If rodents become a nuisance, an effective rodent control program, as approved by the Illinois Department of Natural Resources District Wildlife Biologist, should be implemented.

Table 5: Midwest Generation Powerton Generating Station
CCR EAP Notification List – Updated September 2021

Plant Contacts:

Name	Title	Contact Info
Joseph Kotas	Environmental Specialist	(O) 309-477-5216 (C) 815-901-6549
Dale Green	Plant Manager	(O) 309-477-5212 (C) 309-620-3908
Todd Mundorf	Operations Manager	(O) 309-477-5215 (C) 847-456-4642
Mark Vannaken	Maintenance Manager	(O) 309-477-5221 (C) 309-824-5686
Sunish Shah	Engineering Manager	(O) 309-477-5243 (C) 773-410-3225
Bill Gaynor	Class K WWT Operator	(O) 309-477-5437 (C) 309-824-2999
Station Control Room	24-Hour, 7-day	309-477-5299

Corporate Support:

Name	Title	Contact Info
Sharene Shealey	Director, Environmental	(C) 724-255-3220
Jill Buckley	Environmental Manager	(C) 724-448-9732
Tony Shea	Sr. Director, Environmental	(O) 609-524-4923 (C) 609-651-6478
Dave Schrader	Sr. Manager, Communications (public point of contact)	(O) 267-295-5768 (C) 267-294-2860

Emergency Response Agencies:

Agency	Address	Contact Info
National Response Center (NRC) – US Army Corp of Engineers	Peoria Lock and Dam 1139 Wesley Rd, Creve Coeur, IL 61610	800-424-8802 (309) 699-6111 (local)
Illinois Department of Natural Resources, Office of Water Resources	One Natural Resources Way, 2nd Floor Springfield, IL 62702-1271	8:30 a.m.-5:00 p.m. 217-782-4427
Illinois Emergency Management Agency (IEMA)	2200 Dirksen Parkway Springfield, IL 62703	800-782-7860
Illinois Environmental Protection Agency (IEPA)	Bureau of Water 1021 North Grand Avenue East Springfield, IL 62794	217-782-3637
Tazewell County Emergency Management Agency Operations Center	21304 IL State Rt. 9 Tremont, IL 61568	Phone: 309-925-2271 24-hour: 309-477-2234
Tazewell County TC3: Dispatches to Fire, Police and Emergency Medical services	101 S Capitol Street Pekin, IL 61554	Emergency: 9-1-1 Non-Emergency: 309-478-5796
Pekin Police Department	111 S Capitol St #100 Pekin, IL 61554	Emergency: 9-1-1 Non-Emergency: 309-346-3132 Front Desk: 309-478-5330
Pekin Fire Department	3232 Court Street Pekin, IL 61554	Emergency: 9-1-1 Non-Emergency: 309-477-2388

Environmental Response Contractors/Consultants:

Contractor/Consultant	Address	Contact Info
Civil & Environmental Consultants, Inc.	555 Butterfield Road, Suite 300 Lombard, IL 60148	630-963-6026
Iron Hustler Excavating	1604 West Detweiller Drive Peoria, IL61615	309 691-9894
SET Environmental	450 Sumac Road Wheeling, IL 60090	847 850-1056 877-437-7455 (24-hr)
Heritage Environmental Services	15330 Canal Bank Road Lemont, IL 62095	630-739-1151

R001184

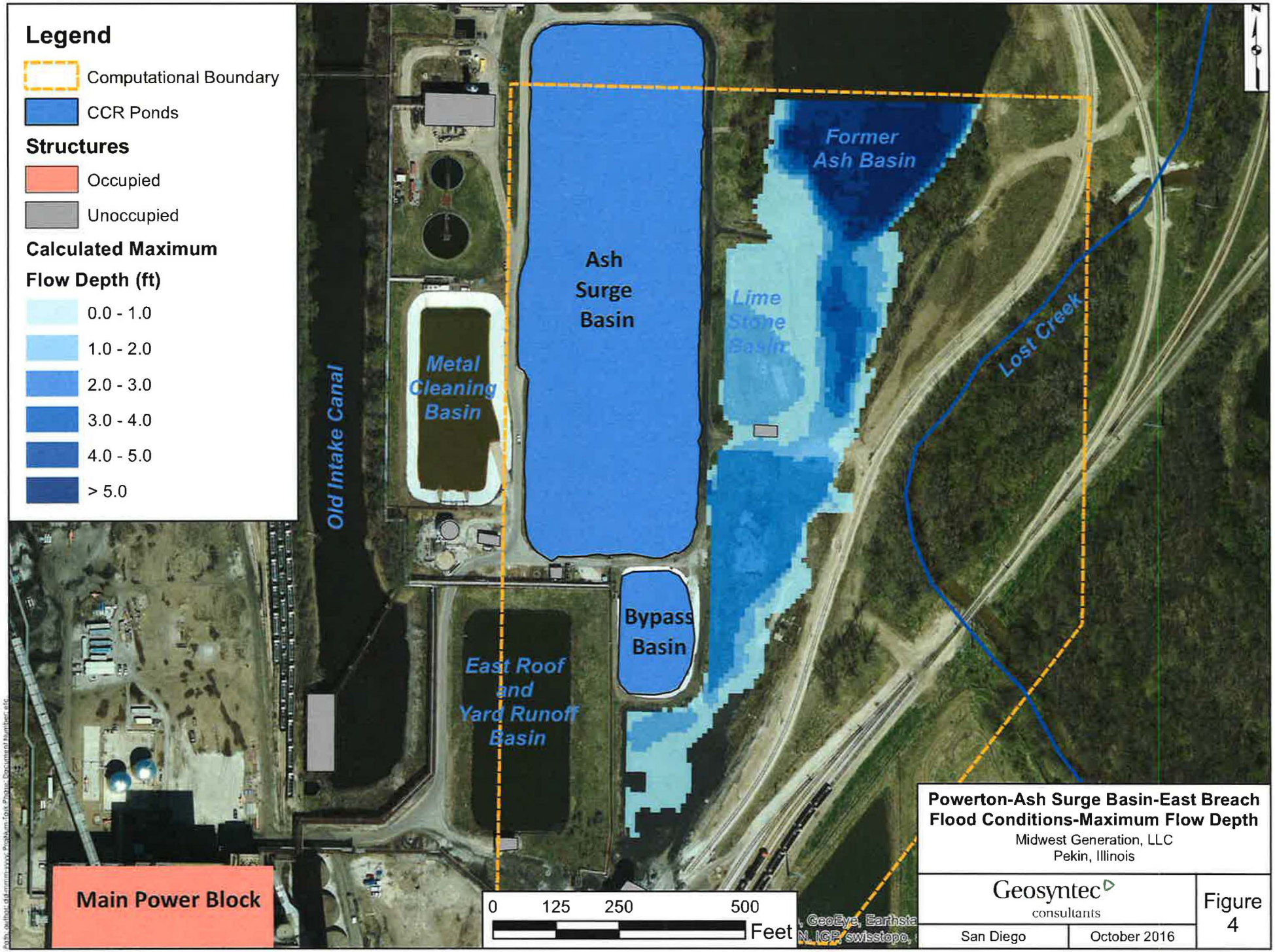
Table 6: Basin Characteristics

	Ash Surge Basin	Bypass Basin	Metal Cleaning Basin
Estimated Capacity (acre-feet)	92.1	5.1	14.0
Estimated Maximum Basin Depth (feet)	16	10	10
Elevation - Maximum Crest (ft msl.)	467.6	467.6	467.6

APPENDIX A

GEOSYNTEC HPCA INUNDATION MAPS

R001186



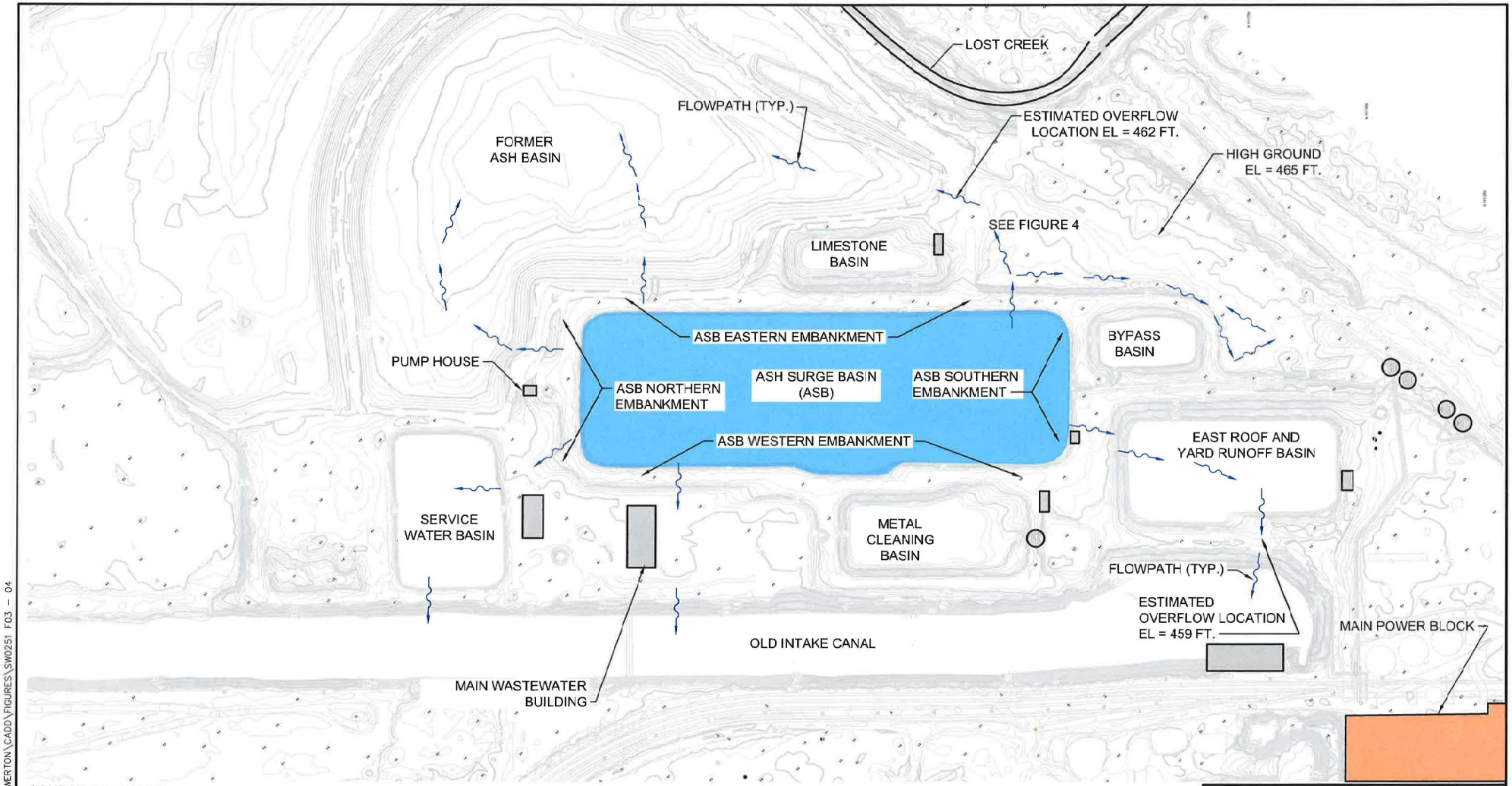
Powerton-Ash Surge Basin-East Breach Flood Conditions-Maximum Flow Depth

Midwest Generation, LLC
Pekin, Illinois

Geosyntec consultants

San Diego | October 2016

Figure 4



SOURCE OF SURVEY:

TOPOGRAPHY SOUTH OF SECONDARY ASH SETTLING BASIN AND FAB IS BASED ON AERIAL SURVEY PERFORMED BY AEROMETRIC, INC. DATED JUNE 19, 2008. TOPOGRAPHY NORTH OF ASH SURGE BASIN IS BASED ON SURVEY BY RIDGELINE CONSULTANTS PERFORMED IN FEBRUARY AND MARCH 2016.

NOTE:

1. TOPOGRAPHY SHOWN DOES NOT REFLECT MINOR REGRADING OF THE SLOPE EAST OF THE BYPASS BASIN PERFORMED IN FALL 2016.

LEGEND

STRUCTURES

OCCUPIED

UNOCCUPIED

N

0 200' 400'

SCALE IN FEET

ASH SURGE BASIN
POTENTIAL BREACH FLOWPATHS

POWERTON STATION
PEKIN, ILLINOIS

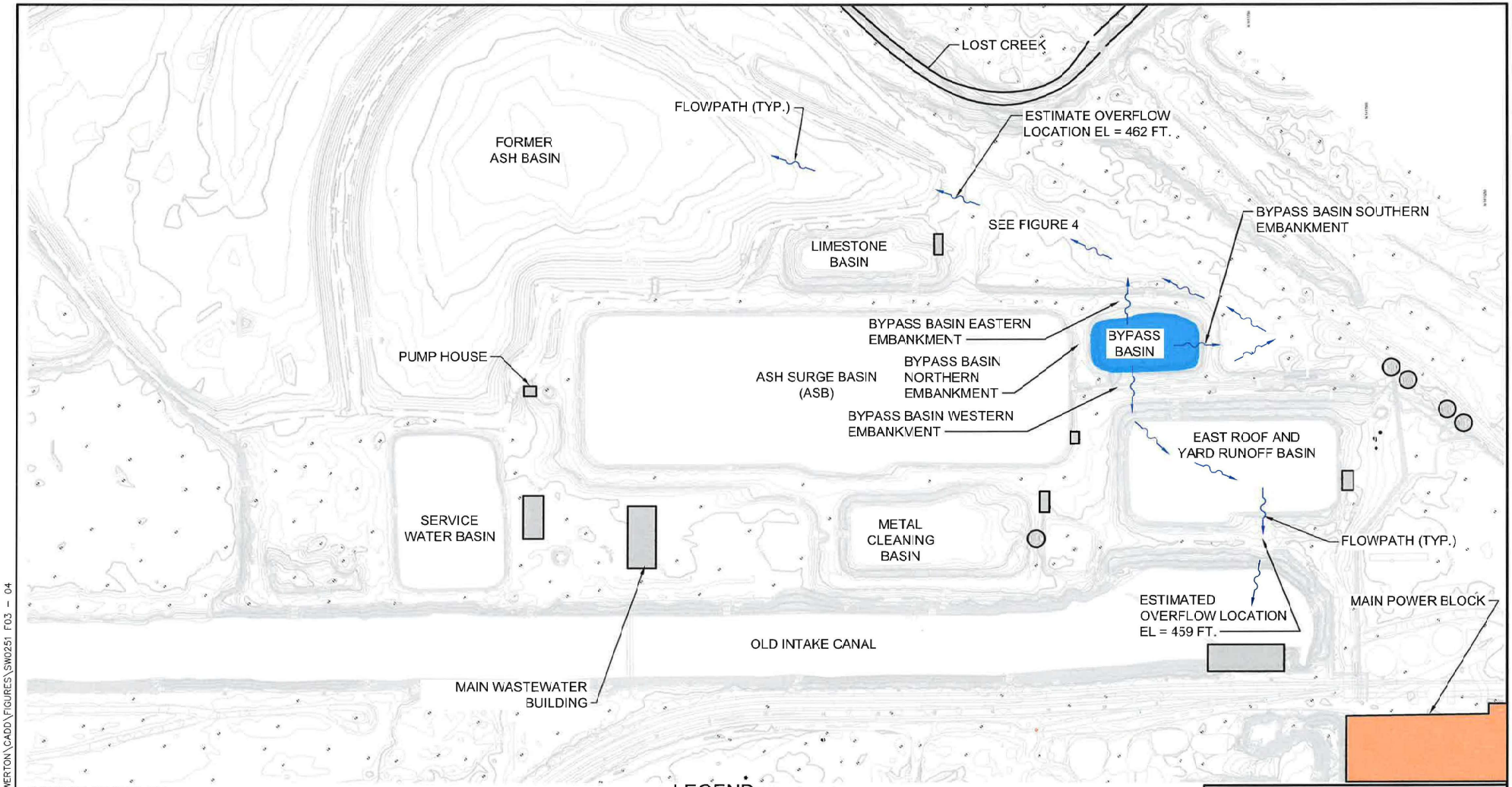
Geosyntec consultants

PROJECT NO: SWC251 | OCTOBER 2016

FIGURE 3

R001187

\\SANDIEGO-01\SW0251$\07 POWERTON\CADD\FIGURES\SW0251 F03 - 04



SOURCE OF SURVEY:

TOPOGRAPHY SOUTH OF SECONDARY ASH SETTLING BASIN AND FAB IS BASED ON AERIAL SURVEY PERFORMED BY AEROMETRIC, INC. DATED JUNE 19, 2008. TOPOGRAPHY NORTH OF ASH SURGE BASIN IS BASED ON SURVEY BY RIDGELINE CONSULTANTS PERFORMED IN FEBRUARY AND MARCH 2016.

NOTE:

1. TOPOGRAPHY SHOWN DOES NOT REFLECT MINOR REGRADING OF THE SLOPE EAST OF THE BYPASS BASIN PERFORMED IN FALL 2016.

LEGEND

STRUCTURES

OCCUPIED

UNOCCUPIED

N

0 200' 400'

SCALE IN FEET

BYPASS BASIN
POTENTIAL BREACH FLOWPATHS

POWERTON STATION
PEKIN, ILLINOIS

Geosyntec consultants

PROJECT NO SW0251 | OCTOBER 2016

FIGURE 5

R001188

\\SANDIEGO-01\SW0251$\07 POWERTON\CADD\FIGURES\SW0251 F03 - 04

DOCUMENT 20

From: Shealey, Sharene <Sharene.Shealey@nrg.com>
Sent: Monday, February 26, 2024 3:25 PM
To: Liska, Mark; EPA.CCR.Part845.Coordinator@Illinois.gov
Cc: LeCrone, Darin; Hunt, Lauren; Bierwagen, Justin; Bacher, David; Buckley, Jill; Mundorf, Todd; Stone, Walter; DeRobertis, Cecilia
Subject: [External] MWG Response to Powerton Bypass Basin Retrofit Letter
Attachments: Powerton IEPA ABB Retrofit Permit Review Response 02-26-24.pdf

Importance: High

Greetings,

Please find attached an electronic copy of Midwest Generation's response to Illinois EPA's Construction Permit to retrofit Powerton's Bypass Basin Review Letter, dated February 22, 2024. A hardcopy of this submittal will be hand delivered to the Agency. For Agency reference, this refers to Log No. 2021-100029, Bureau ID W1798010008.

Thank you,
Sharene

From: Hunt, Lauren <Lauren.Hunt@Illinois.gov>
Sent: Thursday, February 22, 2024 3:37 PM
To: Shealey, Sharene <Sharene.Shealey@nrg.com>
Cc: LeCrone, Darin <Darin.LeCrone@Illinois.gov>; Liska, Mark <Mark.Liska@Illinois.gov>; Bierwagen, Justin <Justin.Bierwagen@Illinois.gov>
Subject: Powerton Bypass Basin Retrofit Letter

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Sharene.
Please see attached. The hard copy will go out in the mail tomorrow.
Thanks,
Lauren

Lauren I. Hunt, M.S. (she/they/he)
Environmental Protection Geologist III
Illinois Environmental Protection Agency
Bureau of Water
Groundwater Section
1021 N. Grand Avenue
PO Box 13
Springfield, IL 62702
D: 217-524-9048
C: 309-361-0037
Lauren.hunt@illinois.gov
Hours: 7 am to 5 pm Tuesday through Thursday
7 am to 4:30 pm Fridays (remote)
Mondays off.

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DOCUMENT 21

MWG
Midwest Generation, LLC

Powerton Generating Station

Bypass Basin Retrofit Plan

Revision 1

March 5, 2024

Issue Purpose: Use

Project No.: 12661-181

55 East Monroe Street
Chicago, IL 60603-5780 USA
312-269-2000
www.sargentlundy.com

Sargent & Lundy

LEGAL NOTICE

This report was prepared by Sargent & Lundy (S&L) expressly for the sole use of Midwest Generation, LLC (Client) in accordance with the contract agreement between S&L and Client. This report was prepared using the degree of skill and care ordinarily exercised by engineers practicing under similar circumstances. Client acknowledges: (1) S&L prepared this report subject to the particular scope limitations, budgetary and time constraints, and business objectives of Client; (2) information and data provided by others, including Client, may not have been independently verified by S&L; and (3) the information and data contained in this report are time-sensitive and changes in the data, applicable codes, standards, and acceptable engineering practices may invalidate the findings of this report. Any use or reliance upon this report by third parties shall be at their sole risk.

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1.0 PURPOSE & SCOPE

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.770(c)
Federal CCR Rule Reference: 40 CFR 257.102(k)(2)

1.1 PURPOSE

Midwest Generation, LLC (MWG) plans to retrofit the Bypass Basin at the Powerton Generating Station ("Powerton" or "Station") in Pekin, Illinois with a new composite liner system and a new leachate collection and removal system. The Bypass Basin is an existing coal combustion residual (CCR) surface impoundment that was historically used by the Station as a settling pond for bottom ash transport water discharged from the Station's dewatering bins (which initially treat the Station's CCR sluice water) and for other process waste streams related to electric power-generating operations when the Station's Ash Surge Basin was being cleaned. However, the Bypass Basin has not been in service since early October 2020 when the Station started cleaning out the basin in accordance with historical cleaning practices. The Bypass Basin is lined with a 60-mil high-density polyethylene (HDPE) geomembrane liner, has a surface area of approximately 0.83 acre, and has a storage capacity of approximately 9,000 cubic yards.

As a CCR surface impoundment, the Bypass Basin is regulated by both the Illinois Pollution Control Board's "Standards for the Disposal of Coal Combustion Residuals in CCR Surface Impoundments," which are codified in Title 35, Part 845 to the Illinois Administrative Code (35 Ill. Adm. Code 845), and the U.S. Environmental Protection Agency's (EPA) "Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments," which are codified in 40 CFR Part 257 Subpart D. These state and federal CCR regulations are referred to herein as the Illinois CCR Rule and the Federal CCR Rule, respectively. Pursuant to 35 Ill. Adm. Code 845.770(c) and 40 CFR 257.102(k)(2), this document provides MWG's written retrofit plan for the Bypass Basin.

Revision 1 of this document represents the first amendment to the initial written retrofit plan for Powerton's Bypass Basin, which was included with the retrofit construction permit application submitted to Illinois EPA for the basin on July 15, 2022. This amended written retrofit plan addresses changes to the sequencing and schedule of activities necessary to satisfy the retrofit criteria in 35 Ill. Adm. Code 845.770 and 40 CFR 257.102(k). These schedule changes are based in part on input MWG received from Illinois EPA during an in-person meeting on February 27, 2024.

1.2 SCOPE

Per the 2016 Water Infrastructure Improvements for the Nation (WIIN) Act, the Bypass Basin will continue to be subject to both the Illinois and Federal CCR Rules until the U.S. EPA approves the Illinois EPA's CCR permit program. The Illinois EPA has yet to publish a timeline for submitting its proposed CCR permit

program to the U.S. EPA for approval, and so this written retrofit plan has been prepared pursuant to both sets of regulations.

2.0 RETROFIT PLAN NARRATIVE DESCRIPTION

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.770(c)(1)(A)
Federal CCR Rule Reference: 40 CFR 257.102(k)(2)(i)(A)

MWG will retrofit the Bypass Basin in two phases: (1) decontaminating and verifying the integrity of the basin's existing geomembrane liner and (2) installing structural fill, a new composite liner system, and a new leachate collection and removal system within the basin.

MWG plans to re-use the Bypass Basin's existing HDPE geomembrane liner as a supplemental liner in the retrofitted basin. Phase 1 of retrofitting the Bypass Basin covers the activities necessary for MWG to submit the visual inspection and analytical test data Illinois EPA requires to approve re-using the existing liner in accordance with 35 Ill. Adm. Code 845.770(a)(4). MWG will execute Phase 1 by performing the following sequential steps:

1. Remove the gravel warning and sand cushion layers over the existing geomembrane liner from the basin and transport the soil materials to a permitted disposal facility.
2. Decontaminate the basin's existing geomembrane liner and appurtenant structures (*e.g.*, inlet and outlet structures, piping).
3. Visually inspect the geomembrane liner for CCR and for damage (i.e., tears, holes, etc.) and repair any observed damage.
4. Submit samples of the basin's existing geomembrane liner to a certified laboratory for analytical testing to confirm the liner is no longer contaminated with CCR constituents.
5. Perform an electrical leak location survey to verify the basin's existing geomembrane liner is competent and repair any identified damage.
6. Submit the visual inspection, laboratory test, and electrical leak location survey results to Illinois EPA for review.
7. Illinois EPA approves re-use of the Bypass Basin's existing geomembrane liner as a supplemental liner under the basin's new composite liner.

Phase 2 of retrofitting the Bypass Basin covers the activities necessary to install a new composite liner system and a new leachate collection and removal system within the basin. MWG will execute Phase 2 by performing the following sequential steps:

1. Obtain a construction permit from the Illinois EPA.
2. Procure the materials for the basin's new composite liner system and new leachate collection and removal system.

3. Procure a General Work Contractor to retrofit the basin and a Construction Quality Assurance (CQA) Contractor to verify the basin is retrofitted in accordance with specified requirements.
4. Place structural fill within the basin floor to establish the slopes for the new leachate collection and removal system and to support the new composite liner (see Section 2.1).
5. Install an alternative composite liner system in accordance with 35 Ill. Adm. Code 845.410 and 40 CFR 257.72 (see Section 2.2).
6. Install a leachate collection and removal system in accordance with 35 Ill. Adm. Code 845.420 (see Section 2.3).
7. Submit to the Illinois EPA:
    a. A retrofit completion report (see Section 8.0), and
    b. A certification from a qualified professional engineer licensed in the State of Illinois that the Bypass Basin has been retrofitted in accordance with the activities outlined in this retrofit plan (or subsequent amendment of this retrofit plan), the requirements stipulated in 35 Ill. Adm. Code Part 845, and the requirements of 40 CFR 257.102(k).

2.1 STRUCTURAL FILL

Pursuant to 35 Ill. Adm. Code 845.420(a)(3), the retrofitted Bypass Basin will have a new leachate collection and removal system that slopes towards a collection pipe at a minimum slope of three percent. Because the existing basin floor is approximately flat, MWG will place, compact, and grade structural fill along the basin floor to establish the lines and grades for the new leachate collection and removal system. The structural fill will be placed over the Bypass Basin's existing HDPE geomembrane liner, which MWG plans to leave in-place as a supplemental liner under the basin's new composite liner. All earthwork activities associated with placing, compacting, and grading structural fill along the basin floor will be done in a manner to prevent tearing, ripping, or otherwise damaging the Bypass Basin's existing HDPE geomembrane liner.

2.2 COMPOSITE LINER

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.410(a) & 845.400(c)
Federal CCR Rule Reference: 40 CFR 257.72(a) & 257.70(c)

MWG will retrofit the Bypass Basin with an alternative composite liner system that meets the requirements of 35 Ill. Adm. Code 845.400(c) and 40 CFR 257.70(c). The composite liner will consist of a 60-mil HDPE geomembrane over a geosynthetic clay liner (GCL). Pursuant to 35 Ill. Adm. Code 845.400(c)(2) and 40 CFR 257.70(c)(1), the GCL component will have a hydraulic conductivity of no more than 1×10^{-9} cm/sec to ensure that the liquid flow rate through the GCL is less than the liquid flow rate through two feet of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec.

2.3 LEACHATE COLLECTION & REMOVAL SYSTEM

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.420(a)

In addition to installing a new composite liner in the basin, MWG will install a new leachate collection and removal system (LCRS) in the Bypass Basin pursuant to 35 Ill. Adm. Code 845.420. This LCRS will be placed over the new composite liner and will be constructed of drainage geocomposite with a transmissivity of at least 6×10^{-4} m^2/sec in accordance with 35 Ill. Adm. Code 845.420(a)(4). The drainage geocomposite will consist of an HDPE geonet core with a non-woven geotextile layer heat-laminated to each side of the geonet core, and will be sloped towards a perforated collection pipe installed in a trench along the middle of the basin. As discussed in Section 2.1, the structural fill placed along the basin floor will ensure the drainage geocomposite slopes towards the collection pipe at a slope of at least three percent pursuant to 35 Ill. Adm. Code 845.420(a)(3). This collection pipe will then convey leachate to a sump pump at the southern end of the retrofitted Bypass Basin to ultimately be pumped out of the basin. This drainage geocomposite and collection pipe system will ensure leachate flows from all points within the basin to the sump, will be constructed in such a way as to prevent clogging of the LCRS during the active life and post-closure care period of the basin, and will be large enough to conduct periodic cleaning. The upper non-woven geotextile component of the drainage geocomposite will also prevent CCR and non-CCR sediments from intruding into, clogging, and impeding the flow of leachate through the HDPE geonet core.

In addition to the upper non-woven geotextile component of the drainage geocomposite, a sand filter layer will be installed above the retrofitted Bypass Basin's LCRS to prevent CCR and non-CCR sediments from clogging the LCRS. This sand filter layer will have a hydraulic conductivity of at least 1×10^{-5} cm/sec pursuant to 35 Ill. Adm. Code 845.420(a)(2). Meanwhile, the upper non-woven geotextile component of the drainage geocomposite will preclude the intrusion of sand particles from the filter layer into the HDPE geonet core's apertures, which would otherwise impede the flow of leachate through the geonet.

Finally, in accordance with 35 Ill. Adm. Code 845.420(a)(8), a protective warning layer will be installed over the sand filter layer to provide a means of deflecting the force of CCR pumped into the retrofitted Bypass Basin. Along the floor of the retrofitted Bypass Basin, this uppermost layer will be comprised of coarse aggregate materials to provide a working surface for operators removing CCR from the basin; it will also serve as a means of warning these operators that they have reached the basin floor and to stop excavating. Along the basin's side slopes, the protective warning layer will consist of riprap on a gravel bedding layer to protect the sand filter layer from erosion.

Prior to the removal of the granular protective layers covering the Bypass Basin's existing geomembrane liner, signage will be posted at the Station's entrance warning of the hazards of CCR dust inhalation in accordance with 35 Ill. Adm. Code 845.740(c)(3)(A). Pursuant to 35 Ill. Adm. Code 845.740(c)(3)(B), a written notice will be issued to each of the local governments through which the CCR-impacted material will be transported. This written notice will include an explanation of the hazards of CCR dust inhalation, the aforementioned CCR transportation plan, and a tentative transportation schedule.

After the granular protective layers in the basin have been removed, MWG will begin decontaminating the Bypass Basin's existing geomembrane liner. The basin's inlet and outlet structures, associated piping, *etc*. will also be decontaminated. At a minimum, decontamination procedures will include pressure washing of the geomembrane liner and pond appurtenances in a systematic manner to remove all CCR. Following decontamination, the existing geomembrane liner will be visually inspected, and an electrical leak location survey will be conducted to ensure the liner is competent. Any damage to the existing geomembrane liner observed during the visual inspection or identified by the electrical leak location survey will be repaired, and all repairs will be documented. MWG will also submit samples of the existing liner to a certified laboratory for analytical testing to confirm the liner is no longer contaminated with CCR constituents. The results from the visual inspection and analytical tests will then be submitted to the Illinois EPA to approve MWG's proposal to re-use the existing geomembrane liner as a supplemental liner under the new composite liner in the retrofitted Bypass Basin.

4.0 ESTIMATED MAXIMUM INVENTORY OF CCR TO BE REMOVED

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.770(c)(1)(C)
Federal CCR Rule Reference: 40 CFR 257.102(k)(2)(i)(C)

As previously stated, no appreciable volume of CCR remains in the Bypass Basin since Powerton cleaned the basin in accordance with the Station's ash pond maintenance practices. However, it is likely that CCR materials are present within the granular protective layers covering the Bypass Basin's existing geomembrane liner. For the purposes of this retrofit plan, the maximum amount of CCR that will be removed during the retrofit of the Bypass Basin is conservatively based on the volume of the granular protective layers that will be removed from the basin prior to the installation of the basin's new composite liner and new LCRS: approximately 1,000 cubic yards.

5.0 ESTIMATED LARGEST AREA TO BE RETROFITTED

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.770(c)(1)(D)
Federal CCR Rule Reference: 40 CFR 257.102(k)(2)(i)(D)

The estimated largest area of the Bypass Basin to be retrofitted is anticipated to be the basin's full surface area: 0.83 acre.

6.0 RETROFIT SCHEDULE

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.770(c)(1)(E)
Federal CCR Rule Reference: 40 CFR 257.102(k)(2)(i)(E)

MWG expects to complete the retrofit work for the Bypass Basin in 2024. Table 1 lists the major milestones necessary for retrofitting the Bypass Basin and the expected duration for completing each milestone.

Table 1 – Planning Level Schedule for Retrofitting the Bypass Basin

Activity	Estimated Duration
Prepare Retrofit Construction Design Documents	Complete
Submit Retrofit Construction Permit Application to Illinois EPA	Complete
Phase 1 – Existing Liner Decontamination and Integrity Verification	
Remove Protective Granular Layers Above Existing Liner	2 Months
Decontaminate Existing Liner and Basin Appurtenances	1 Week
Verify Decontamination and Liner Integrity (Including Laboratory Testing)	5 Weeks
Obtain Approval from Illinois EPA to Re-Use Existing Liner as Supplemental Liner	1 Month
Phase 2 – Retrofit Construction	
Purchase Composite Liner and LCRS Materials	4 Months
Hire General Work Contractor to Complete Retrofit Work	4 Months
Hire CQA Contractor to Inspect and Test Retrofit Work	3 Months
Obtain Retrofit Construction Permit from Illinois EPA	5 Months
Install Structural Fill	1 Week
Install Composite Liner System	1 Week

Activity	Estimated Duration
Phase 2 – Retrofit Construction (Continued)	
Install Leachate Collection and Removal System (Including Filter and Protective Layers)	2 Weeks
Submit Retrofit Completion Report and Certification to Illinois EPA	1 Week
Obtain Approval of Retrofit Completion Report and Certification from Illinois EPA	1 Month
Complete and Certify Retrofit of the Bypass Basin	--

7.0 AMENDMENTS TO RETROFIT PLAN

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.770(c)(3)
Federal CCR Rule Reference: 40 CFR 257.102(k)(2)(iii)

This retrofit plan will be amended in accordance with 35 Ill. Adm. Code 845.770(c)(3) and 40 CFR 257.102(k)(2)(iii) if a change in the operation of the Bypass Basin would substantially affect this retrofit plan or if an unanticipated event necessitates a revision to this retrofit plan. Any and all amendments to this retrofit plan will be certified by a qualified professional engineer licensed in the State of Illinois in accordance with 35 Ill. Adm. Code 845.770(c)(4) and 40 CFR 257.102(k)(2)(iv).

8.0 COMPLETION OF RETROFIT ACTIVITIES

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.770(g)
Federal CCR Rule Reference: 40 CFR 257.102(k)(4)

Upon completion of all retrofit activities required by 35 Ill. Adm. Code Part 845 and 40 CFR 257.102(k) and approved by the Illinois EPA in a construction permit, a retrofit completion report and certification will be submitted to the Illinois EPA. The retrofit completion report will include (1) the engineering and hydrogeology reports containing monitoring well completion reports, boring logs, all CQA reports, certifications, designations of CQA officers-in-absentia required by 35 Ill. Adm. Code 845.290; (2) photographs with time, date, and location information of the liner system and leachate collection system; (3) other photographs relied upon for documentation of construction activities; (4) a written summary of the retrofit requirements and completed activities as stated in the construction permit and 35 Ill. Adm. Code 845; and (5) any other information relied upon by the qualified professional engineer for the certification. Pursuant to 35 Ill. Adm. Code 845.770(g)(2) and 40 CFR 257.102(k)(4), the certification will be prepared by an independent, qualified professional engineer licensed in the State of Illinois and will verify that the Bypass Basin has been retrofitted in accordance with this retrofit plan (or subsequent amendment of this retrofit plan), the requirements of 35 Ill. Adm. Code Part 845, and the requirements of 40 CFR 257.102(k). Finally, within 30 days of the Illinois

EPA approving the retrofit completion report and certification, a notification of completion of retrofit activities will be prepared in accordance with 35 Ill. Adm. Code 845.770(h).

9.0 CERTIFICATION

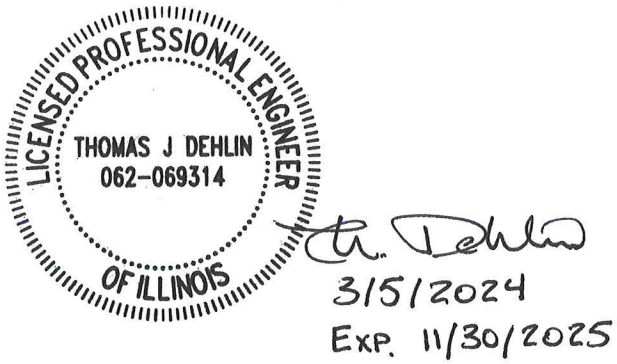
Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.770(c)(4)
Federal CCR Rule Reference: 40 CFR 257.102(k)(2)(iv)

I certify that:

- This written retrofit plan for the Bypass Basin was prepared by me or under my direct supervision.
- The work was conducted in accordance with the requirements of 35 Ill. Adm. Code 845.770 and with the requirements of 40 CFR 257.102(k).
- I am a registered professional engineer under the laws of the State of Illinois.

Certified By: Thomas J. Dehlin Date: March 5, 2024

Seal:



3.0 CCR REMOVAL & DECONTAMINATION PROCEDURES

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.770(c)(1)(B)
Federal CCR Rule Reference: 40 CFR 257.102(k)(2)(i)(B)

In early October 2020, Powerton took the Bypass Basin out of service for routine cleaning and began drawing down the surface water in the basin to dewater the basin and the CCR material stored therein. The Station then began removing the ash stored above the granular protective layers covering the basin's existing geomembrane liner in accordance with the Station's historical cleaning and maintenance practices for the Bypass Basin whereby ash is periodically removed from the basin to recover storage capacity. As of late October 2021, no CCR remains in the Bypass Basin. With the CCR removed from the basin, the retrofit work described in Section 2.0 will be performed in accordance with this retrofit plan (or subsequent amendment of this retrofit plan) and the construction permit issued by the Illinois EPA.

In order to submit the visual inspection and analytical test data Illinois EPA requires to approve re-using the Bypass Basin's existing HDPE geomembrane liner as a supplemental liner in accordance with 35 Ill. Adm. Code 845.770(a)(4), MWG will first remove the granular protective layers covering the existing liner: a 6-in.-thick gravel warning layer and a 12-in.-thick sand cushion layer. These soil materials will be loaded onto trucks and transported to a permitted disposal facility. Because these soil materials are likely to contain CCR materials, the trucks transporting the material off-site will carry manifests pursuant to 35 Ill. Adm. Code 845.740(c)(1)(A) and as specified in 35 Ill. Adm. Code 809. In addition, a CCR transportation plan will be prepared in accordance with 35 Ill. Adm. Code 845.740(c)(1)(B) which will include:

- Identification of the transportation method selected.
- The frequency, time of day, and routes of CCR transportation.
- Any measures to minimize noise, traffic, and safety concerns caused by the transportation of the CCR.
- Measures to limit fugitive dust from any transportation of CCR.
- Installation and use of a vehicle washing station.
- A means of covering the CCR for any mode of CCR transportation.
- A requirement that the CCR is transported by a permitted special waste hauler under 35 Ill. Adm. Code 809.201.

On-site fugitive dust control measures will also be implemented as necessary to minimize airborne CCR particulates while CCR-impacted material is being handled. Pursuant to 35 Ill. Adm. Code 845.740(c)(2)(A), these dust control measures will include a water spray, commercial dust suppressant, or a combination of these.

DOCUMENT 22

Thomas Dehlin, P.E.
Manager / Consultant (Licensed in IL, KY, and WY)
(312) 269-6373
tdehlin@sargentlundy.com

Letter No. 12661-181-SL-IEPA-0001
March 5, 2024
Project No. File No. 12661-181

Re: Amended Written Retrofit Plan for Powerton Bypass Basin (Rev. 1)

Mr. Mark Liska
Illinois EPA, Bureau of Water
1021 North Grand Avenue East
Springfield, IL 62702

Submitted via email to Mark.Liska@Illinois.gov

Dear Mr. Liska:

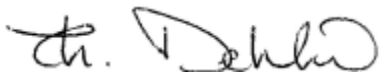
On behalf of Midwest Generation, LLC (MWG), Sargent & Lundy is submitting an amended written retrofit plan for the Bypass Basin at the Powerton Generating Station ("Powerton") in Pekin, IL. This revision, Rev. 1, addresses changes to the sequencing and schedule of activities necessary to retrofit the basin. These schedule changes are based in part on input MWG received from Illinois EPA ("IEPA" or the "Agency") during an in-person meeting on February 27, 2024, including removal of the protective warning layers over the basin's existing geomembrane liner to facilitate inspection and testing of the liner to verify decontamination and integrity under 35 Ill. Adm. Code 845.770(a)(4).

As discussed during our meeting on February 27, 2024, MWG's engineering team is updating the technical specifications and design drawings for the Bypass Basin retrofit project to address changes to MWG's procurement strategy (i.e., direct purchase of liner and leachate collection and removal system materials) and updated survey information. MWG plans to submit a permit modification application with the amended written retrofit plan and revised design document to IEPA by the end of March. However, we wanted to provide the amended written retrofit plan to the Agency as soon as possible so that you are informed of the modifications that MWG has made to the project schedule and sequencing to ensure that the Bypass Basin is retrofitted ahead of the state and federal deadline of October 15, 2024 (see 35 Ill. Adm. Code 845.700(d)(2)(D) and 40 CFR 257.103(f)(1)(vi), respectively).

We appreciate IEPA's feedback and support on the Bypass Basin retrofit project, and we look forward to continuing to work with the Agency on this matter.

Please do not hesitate to contact me directly at (312) 269-6373 or via email at tdehlin@sargentlundy.com if you have any questions on MWG's plans for retrofitting Powerton's Bypass Basin.

Best Regards,



Thomas Dehlin, P.E.
Manager / Consultant

Enclosure: Bypass Basin Retrofit Plan (Rev. 1)

Copies Furnished (via Email):

1. Lauren Hunt, IEPA
2. Darin LeCrone, IEPA
3. EPA.CCR.Part845.Coordinator@Illinois.gov
4. Sharene Shealey, MWG
5. Jill Buckley, MWG
6. Todd Mundorf, MWG

DOCUMENT 23

From: Dehlin, Thomas J <THOMAS.J.DEHLIN@sargentlundy.com>
Sent: Tuesday, March 5, 2024 11:21 AM
To: mark.liska@illinois.gov
Cc: lauren.hunt@illinois.gov; darin.lecrone@illinois.gov; EPA.CCR.Part845.Coordinator@illinois.gov; Shealey, Sharene; Buckley, Jill; Mundorf, Todd
Subject: [External] 12661-181-SL-IEPA-0001: Amended Written Retrofit Plan for Powerton Bypass Basin (Rev. 1)
Attachments: 12661-181-SL-IEPA-0001.pdf; MWG PT BB Retrofit Plan_1.pdf

Importance: High

Good morning Mark,

Please find attached an amended written retrofit plan for the Bypass Basin at Midwest Generation, LLC's Powerton Generating Station in Pekin, IL. This revision, Rev. 1, addresses changes to the sequencing and schedule of activities necessary to retrofit the basin. The schedule changes are based in part on input MWG received from Illinois EPA during our in-person meeting last week. Please refer to the attached cover letter for additional details. For Agency reference, this refers to Log No. 2021-100029, Bureau ID W1798010008.

We appreciate IEPA's feedback and support on the Bypass Basin retrofit project, and we look forward to continuing to work with the Agency on this matter.

Best regards,

Thomas (Tom) Dehlin, P.E.
Manager / Consultant
Sargent & Lundy
1-312-269-6373
Licensed in IL, KY, and WY
thomas.j.dehlin@sargentlundy.com
www.sargentlundy.com
55 E. Monroe | Chicago, IL 60603

DOCUMENT 24

From: Hunt, Lauren <Lauren.Hunt@Illinois.gov>
Sent: Tuesday, March 5, 2024 11:27 AM
To: Bierwagen, Justin
Subject: FW: 12661-181-SL-IEPA-0001: Amended Written Retrofit Plan for Powerton Bypass Basin (Rev. 1)
Attachments: 12661-181-SL-IEPA-0001.pdf; MWG PT BB Retrofit Plan_1.pdf

Importance: High

Please see attached. I also downloaded it to the N Drive in the permits folders. Thanks. Lauren

Lauren I. Hunt, M.S. (she/they/he)
Environmental Protection Geologist III
Illinois Environmental Protection Agency
Bureau of Water
Groundwater Section
1021 N. Grand Avenue
PO Box 13
Springfield, IL 62702
D: 217-524-9048
C: 309-361-0037
Lauren.hunt@illinois.gov
Hours: 7 am to 5 pm Tuesday through Thursday
7 am to 4:30 pm Fridays (remote)
Mondays off.

From: Dehlin, Thomas J <THOMAS.J.DEHLIN@sargentlundy.com>
Sent: Tuesday, March 5, 2024 11:21 AM
To: Liska, Mark <Mark.Liska@Illinois.gov>
Cc: Hunt, Lauren <Lauren.Hunt@Illinois.gov>; LeCrone, Darin <Darin.LeCrone@Illinois.gov>; EPA.CCR.Part845.Coordinator <EPA.CCR.Part845.Coordinator@Illinois.gov>; Shealey, Sharene <Sharene.Shealey@nrg.com>; Buckley, Jill <Jill.Buckley@nrg.com>; Mundorf, Todd <Todd.Mundorf@nrg.com>
Subject: [External] 12661-181-SL-IEPA-0001: Amended Written Retrofit Plan for Powerton Bypass Basin (Rev. 1)
Importance: High

Good morning Mark,

Please find attached an amended written retrofit plan for the Bypass Basin at Midwest Generation, LLC's Powerton Generating Station in Pekin, IL. This revision, Rev. 1, addresses changes to the sequencing and schedule of activities necessary to retrofit the basin. The schedule changes are based in part on input MWG received from Illinois EPA during our in-person meeting last week. Please refer to the attached cover letter for additional details. For Agency reference, this refers to Log No. 2021-100029, Bureau ID W1798010008.

We appreciate IEPA's feedback and support on the Bypass Basin retrofit project, and we look forward to continuing to work with the Agency on this matter.

Best regards,

Thomas (Tom) Dehlin, P.E.
Manager / Consultant
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DOCUMENT 25

From: Hunt, Lauren <Lauren.Hunt@Illinois.gov>
Sent: Tuesday, March 5, 2024 12:47 PM
To: Dehlin, Thomas J
Cc: Liska, Mark
Subject: RE: 12661-181-SL-IEPA-0001: Amended Written Retrofit Plan for Powerton Bypass Basin (Rev. 1)

Received. Thank you. Lauren

Lauren I. Hunt, M.S. (she/they/he)
Environmental Protection Geologist III
Illinois Environmental Protection Agency
Bureau of Water
Groundwater Section
1021 N. Grand Avenue
PO Box 13
Springfield, IL 62702
D: 217-524-9048
C: 309-361-0037
Lauren.hunt@illinois.gov
Hours: 7 am to 5 pm Tuesday through Thursday
7 am to 4:30 pm Fridays (remote)
Mondays off.

From: Dehlin, Thomas J <THOMAS.J.DEHLIN@sargentlundy.com>
Sent: Tuesday, March 5, 2024 11:21 AM
To: Liska, Mark <Mark.Liska@Illinois.gov>
Cc: Hunt, Lauren <Lauren.Hunt@Illinois.gov>; LeCrone, Darin <Darin.LeCrone@Illinois.gov>; EPA.CCR.Part845.Coordinator <EPA.CCR.Part845.Coordinator@Illinois.gov>; Shealey, Sharene <Sharene.Shealey@nrg.com>; Buckley, Jill <Jill.Buckley@nrg.com>; Mundorf, Todd <Todd.Mundorf@nrg.com>
Subject: [External] 12661-181-SL-IEPA-0001: Amended Written Retrofit Plan for Powerton Bypass Basin (Rev. 1)
Importance: High

Good morning Mark,

Please find attached an amended written retrofit plan for the Bypass Basin at Midwest Generation, LLC's Powerton Generating Station in Pekin, IL. This revision, Rev. 1, addresses changes to the sequencing and schedule of activities necessary to retrofit the basin. The schedule changes are based in part on input MWG received from Illinois EPA during our in-person meeting last week. Please refer to the attached cover letter for additional details. For Agency reference, this refers to Log No. 2021-100029, Bureau ID W1798010008.

We appreciate IEPA's feedback and support on the Bypass Basin retrofit project, and we look forward to continuing to work with the Agency on this matter.

Best regards,

Thomas (Tom) Dehlin, P.E.
Manager / Consultant
Sargent & Lundy
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DOCUMENT 26

From: Rompot, Derek <Derek.Rompot@Illinois.gov>
Sent: Friday, March 22, 2024 9:20 AM
To: MacDonna, Keegan; Liska, Mark; Azeem, Anwar; Rompot, Derek; Herrera, Francisco
Subject: Most recent draft permit
Attachments: 24022801 Powerton construct-operating.docx

Mark has been kicking butt and taking names. Attached is the first draft CCR that is going out to the company for the 10-day review period. While it is possible that the "Standardized" language may be changed in the future, this is the most recent/furthest along first permit.

Derek

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CCR Permit No. 2021-CO-100029
Notice No. MEL:24022801.docx

Public Notice Beginning Date:

Public Notice Ending Date:

Coal Combustion Residual Surface Impoundment
Permit Program

Draft Permit for Retrofit Construction and to Operate a Coal Combustion Residual Surface Impoundment.

Public Notice/Fact Sheet Issued By:

Illinois Environmental Protection Agency
Bureau of Water
Division of Water Pollution Control
Permit Section
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276
217/782-0610

Name and Address of Permittee:

Midwest Generation, LLC
13082 East Manito Rd.
Pekin, IL 61554

Name and Address of Facility:

Midwest Generation, LLC
Powerton Generating Station
13082 East Manito Rd.
Pekin, IL 61554
(Tazewell County)

The Illinois Environmental Protection Agency (IEPA) has made a tentative determination to issue a Permit to Operate a Coal Combustion Surface Impoundment pursuant to 35 Illinois Administrative Code Part 845 and has prepared a draft permit and associated fact sheet for the above named discharger. The Public Notice period will begin and end on the dates indicated in the heading of this Public Notice/Fact Sheet.

A public hearing on this draft permit will be held on May 8, 2024 at x:xx p.m. at xxxxx, in Pekin/Peoria.

Interested persons are invited to submit written comments on the draft permit to the IEPA at:

Hearing Officer Dean Studer, Office of Community Relations
Re: Midwest Generation, LLC – Powerton Generating Station
Illinois Environmental Protection Agency
1021 North Grand Avenue East, P. O. Box 19276
Springfield, IL 62794-9276

Comments may also be e-mailed to epa.publichearingcom@iilinois.gov and must specify either “Midwest Generation, LLC – Powerton Generating Station CCR” or “2021-CO-100029” in the subject line. E-mail comments originating on third party systems or servers intended for submittal of multiple emails of the same or nearly the same content will not be accepted without prior approval from the hearing officer.

The application, engineer's review notes including load limit calculations, Public Notice/Fact Sheet, draft permit, comments received, and other documents are available for inspection and may be copied at the IEPA between 9:30 a.m. and 3:30 p.m. Monday through Friday when scheduled by the interested person.

Response to comments will be provided in a responsiveness summary which will be available at the time a final decision is made in this matter.

For further information on the draft permit, please call Mark E. Liska at 217/782-0610.

The applicant has been operating a steam electric generating station (SIC 4911). The station operates four cyclone coal-fired wet bottom boilers to supply steam to two generating units, designated units #5 and #6 rated at 851 and 846 MW respectively.

CCR basins at the facility consist of the Ash Surge Basin, the Ash Bypass Basin, the Former Ash Basin, and the Metal Cleaning Basin. This permit will cover the retrofit construction of the Ash Bypass Basin and the operation of the Ash Bypass Basin, Ash Surge Basin, Former Ash Basin, and Metal Cleaning Basin.

The Ash Bypass Basin is a settling pond for sluiced CCR and other process waters related to power generation when the Ash Surge Basin is not currently in use due to maintenance. The Ash Bypass Basin has a surface area of 0.83 acres and a storage capacity of approximately 9,000 cubic yards. The Ash Bypass Basin has not been in use since April 11, 2021.

The Former Ash Basin has an unknown construction date and could possibly be old as from the plant first generated power in 1928. It is estimated that it stopped receiving ash sometime in the 1970s.

The Ash Surge Basin was constructed in 1978 and is currently in operation.

The Metal Cleaning Basin was constructed in 1978 and has been in continuous operation. It has been used to temporarily store fly ash and bottom ash which are both routinely removed after the time needed for temporary storage is complete. Bottom ash comes from street sweeping and cleanup activities.

Midwest Generation – Powerton Generating Station has an active NPDES Permit IL0002232 that regulates the discharges of wastewater from the property to waters of the United States.

The proposed Coal Combustion Residual Surface Impoundment Retrofit Construction and Operating Permit No. 2021-C0-100029 does not address the closure of the Ash Bypass Basin. Midwest Generation – Powerton Generating Station has submitted a separate Permit application to address the closure of the CCR basins.

Retrofit Construction of Ash Bypass Basin:

Midwest Generation – Powerton Generating Station must comply with the requirements of 35 Illinois Administrative Code Part 845. This proposed Coal Combustion Residual Surface Impoundment Retrofit Construction and Operating Permit (Permit No. 2021-CO-100029) is being issued to specify the operating conditions that must be followed to comply with 35 Illinois Administrative Code Part 845. In order for the permittee to use the Ash Bypass Basin for receiving CCR, it must be retrofitted with a new composite liner system and a new leachate collection and removal system in accordance with federal and state environmental regulations for CCR surface impoundments. It is therefore subject to the requirements of 35 IAC 845.220 for construction permits.

Midwest Generation, LLC – Powerton Station is (currently) a 1,785 MW coal-fired power plant located in Pekin, IL along the Illinois River. The facility has produced electricity since the 1928 utilizing four coal-fired boilers and two electric generating units, Units 5 and 6. The site is located within Pekin Lake-Illinois River watershed which is approximately 28,834 acres.

The basin historically has managed bottom ash since it was constructed in 1980 and was retrofitted in 2010. The chemical constituents of the CCR have been analyzed in mg/kg. The max capacity of the basin is 6,700 cubic yards. The basin is currently not receiving CCR, but will receive it after retrofit and will receive up to 20 MGD of dewatering effluent, slag tank overflow, basin overflow, etc. until December 31, 2028. The facility has secure, on-site roads for transportation of people and material.

The permittee submitted a construction permit containing the physical and engineering properties of the foundation and abutment materials, the type, size, range, and physical and engineering properties of the materials used in constructing each zone or stage of the CCR surface impoundment and the method of site preparation and construction of each zone of the CCR surface impoundment.

Site drawings show details to the design, construction, operation, and maintenance of the CCR surface impoundment, detailed dimensional drawings of the CCR surface impoundment, including a plan view and cross-sections of the length and width of the CCR surface impoundment, showing all zones, foundation improvements, drainage provisions, spillways, diversion ditches, outlets, instrument locations, and slope protection, in addition to the normal operating pool surface elevation and the maximum pool surface elevation following peak discharge from the inflow design flood, the expected maximum depth of CCR within the CCR surface impoundment, and any identifiable natural or manmade features that could adversely affect operation of the CCR surface impoundment due to malfunction or mis-operation.

Narrative Description of Proposed Construction:

The permittee's narrative of the construction is as follows: obtain the construction permit, remove the gravel warning and sand cushion layers or the existing liner, decontaminate the existing liner for re-use as a supplemental liner, decontaminate appurtenant structures,

place structural fill in the basin floor to establish slopes of the new leachate collection and removal system, install new composite liner, install new leachate collection system, install sand filter layer, and install protective warning layer.

Location Standards:

The permittee provided information and certification on the placement being above the aquifer, wetlands, fault areas, seismic impact zones, unstable areas, and floodplains.

Above the Uppermost Aquifer – October 2021 conclusion approved by Geosyntec that the bottom of the Ash Bypass Basin's existing liner is separated from the upper limit of the uppermost aquifer by at least five feet.

Wetlands - October 2021 conclusion approved by Geosyntec that the Ash Bypass Basin is not located in mapped wetlands.

Fault Areas - October 2021 conclusion approved by Geosyntec that the Ash Bypass Basin is not located within 200 feet of the outermost damage zone of a fault that has had displacement in Holocene time.

Seismic Impact Zones - October 2021 conclusion approved by Geosyntec that the Ash Bypass Basin is not located within a seismic impact zone.

Unstable Areas - October 2021 conclusion approved by Geosyntec that the Ash Bypass Basin is not located in an unstable area.

Floodplain - October 2021 conclusion approved by Geosyntec that The Ash Bypass Basin is not located in a floodplain according to the National Flood Hazard Layer FIRMeete Map No. 17179C0175E prepared by FEMA.

Meeting Design Criteria:

The plans meet these criteria in that it will have a liner that meets the criteria, it will have a new leachate collection system installed, and will have slope protection.

A. Liner requirements – 845.400(c)(1-4)

   The permittee has chosen to install an alternative composite liner that meets the requirements of 35 Ill. Adm. Code 845.400(c).

   The permittee submitted information and drawings showing that the composite liner will meet these specifications. The maximum hydraulic conductivity of the liner is between 1.0×10^{-7} and 1.0×10^{-9} cm/sec and has a liquid flow rate through the liner of 5.87×10^{-7} cm/sec. The information and drawings have been certified by Thomas J. Dehlin, an Illinois licensed P.E. An inspection of the drawings have shown no deficiencies in the basin and liner system.

   The composite liner also meets all requirements from 845.400(b) as is required in 845.400(c)(4). It is constructed of sufficient materials that are exposed to climatic conditions, installation stress, daily operation, shear resistance, and is on a base capable of supporting the basin and is installed to cover all surrounding earth likely to come into contact with CCR or leachate.

B. Leachate Collection System – 845.420

   The permittee submitted information and drawings showing that the composite liner will meet these specifications. This system is being placed above the retrofitted Ash Bypass Basin's new composite liner. It will have a sand filter layer having a hydraulic conductivity of at least 10×10^{-5} cm/sec. It has a bottom slope of 33%. For drainage material, they chose option B; it is a drainage geocomposite with a transmissivity of at least $6 * 10^{-4}$ m^2/sec. The drainage components are HDPE and natural soil components which are chemically resistant to CCR and non-CCR waste.

   The perforated leachate collection pipe will be surrounded by coarse aggregate bedding in order to prevent fines from clogging the piping. The piping itself is a 6-inch diameter perforated leachate collection pipe which is sloped towards a sump with a submersible pump and riser pipe to convey leachate out of the basin.

   The protective waring layer for the leachate collection system will be 6 inches of densely graded aggregate installed over the sand filter layer. Along the sides, riprap on a gravel bedding layer will protect the sand filter layer from erosion. The upper non-woven geotextile component of the drainage geocomposite will prevent CCR and non-CCR sediments from intruding into, clogging, and impeding the flow of leachate through the HDPE geonet core during the active life and post-closure care period of the retrofitted Ash Bypass Basin.

The information and drawings have been certified by Thomas J. Dehlin, an Illinois licensed P.E. An inspection of the drawings have shown no deficiencies in the leachate collection system.

C. CCR fugitive dust control plant (845.220(b)(3))

The application has a fugitive dust control plan for the construction of the Ash Bypass Basin which conforms to 845.500. A special condition has been added that they keep proper records as required in the regulations.

D. Preliminary written closure plan (845.220(b)(4))

The permittee will close the retrofitted Ash Bypass Basin by removing the CCR and other materials remaining in the basin after the plant has closed, then decontaminating the areas (closure by removal).

E. Initial post-closure care plan (845.220(b)(5))

After removal of all CCR material and this has been verified and certified, groundwater will be sampled to make sure that it is not exceeding the groundwater protection standards.

Operation of All Basins:

Midwest Generation, LLC – Powerton Station is (currently) a 1,785 MW coal-fired power plant located in Pekin, IL along the Illinois River.

The facility has produced electricity since the 1928 utilizing four coal-fired boilers and two electric generating units, Units 5 and 6.

The Ash Surge Basin was constructed in 1978 and is currently in operation.

The Ash Bypass Basin, was used as a bypass when the Ash Surge Basin required maintenance – decant water would divert to it instead of the Ash Surge Basin. The Ash Bypass Basin was taken out of service in 2020 and has not been used for managing CCR or non-CCR waste streams since 2020. The Ash Bypass Basin will be retrofitted with a new composite liner system and a new leachate collection and removal system.

The Former Ash Basin has an unknown construction date and could possibly be old as from the plant first generated power in 1928. It is estimated that it stopped receiving ash sometime in the 1970s.

The Metal Cleaning Basin was constructed in 1978 and has been in continuous operation. It has been used to temporarily store fly ash and bottom ash which are both routinely removed after the time needed for temporary storage is complete. Bottom ash comes from street sweeping and cleanup activities.

The basins described above must meet the requirements pursuant to 35 Ill. Adm. Code 845.230(d) for initial Operating Permits.

The Ash Surge Basin, Metal Cleaning Basin, and Ash Bypass Basin were constructed in 1978. The Former Ash Basin has an unknown construction date. The Ash Surge basin contains bottom ash. The Ash Bypass Basin contained bottom ash and economizer ash which have been removed. The Former Ash Basin does not have documentation of what was put in there. The Metal Cleaning Basin occasionally has both fly and bottom ash in it.

The permittee performed a Locations Restrictions Compliance Demonstration in October 2018. The basins are separated from the upper limit of the uppermost aquifer by a minimum distance of 5 feet which meets compliance with 845.300. They are not located in a wetlands according to the National Wetlands Inventory – Version 2 by the USFW. They are not located within a Holocene-aged fault or a seismic impact zone as mapped by the USGS. The are also not in an unstable area or floodplain according to the NFHL FIRMette Map.

Documentation and Maintenance of Slope Protection: The exterior north slope has erosion protection because of the Ash Surge Basin's geomembrane-lined interior slope. The exterior east and south slopes have erosion protection because of the established vegetation. The exterior west slope is covered with gravel that protects the slope from erosion. Photo documentation is included in the application.

The Ash Bypass Basin, like the Ash Surge Basin, is lined and has established vegetation.

The Former Ash Basin has fill embankments on the north, west and east sides and is incised on the south side. Heavy vegetation from decades on non-use provides additional protection.

The Metal Cleaning Basin has partial embankments on all sides with slopes lined with 60-mil high-density PE geomembrane.

The permittee submitted an Initial Emergency Action Plan and a Fugitive Dust Control Plan for all basins that meets the requirements and are certified.

The permittee has submitted a Groundwater Monitoring Plan which has been reviewed by the Groundwater Section and meets the requirements. The Groundwater Monitoring Plan's monitoring wells, limits, and other requirements are explained in the Special Conditions of the permit.

The permittee submitted a written closure plan in the application for all four basins in accordance with 845.740. For the Ash Surge Basin Ash Bypass Basin and Metal Cleaning Basin, the permittee remove all CCR material. For the Former Ash Basin, the permittee will close it in place.

The permittee submitted a written post-closure plan for all four basins in accordance with 845.780. Since the Ash Surge Basin and Ash Bypass Basin will be closed through removal of CCR, a post-closure plan is not required although groundwater monitoring will continue. The Former Ash Basin will have regular maintenance for the required 30 years.

Liner Certification: The liners for the Ash Surge Basin, Ash Bypass Basin, and Metal Cleaning Basin have 60-mil HDPE geomembrane liner, 12 inches of limestone screenings, and 6 inches of sand, but do not comply with the requirements of 35 Ill. Adm. Code 845.400 and are considered unlined. The construction of the Former Ash Basin is unknown and, based on its age, is believed to be unlined.

The permittee submitted a hazard potential classification assessment under 35 Ill. Adm. Code 845.440 and 40 CFR 257.73(a)(2) which was certified by an IL licensed professional engineer. The basins are considered Class 2 as an Illinois Hazard Potential Classification.

The permittee submitted a structural stability assessment which was certified by an IL licensed professional engineer. The assessment recommended mowing vegetation, removing woody vegetation, and making sure the basins' discharge pipes are in good, working order.

The permittee submitted an initial safety factor assessment which was certified by an IL licensed professional engineer. The assessment did not find any issues.

The permittee submitted an initial inflow design flood control system plan assessment which was certified by an IL licensed professional engineer. The assessment found that the basins met a 1,000 year flood event without water overflowing the basins' emergency spillway structures.

The permittee submitted a safety and health plan underlining safety requirements.

The permittee submitted notice of a bond showing financial assurance in accordance with 35 Ill. Adm. Code 845.230(d)(2)(N).

Special Conditions:

The following explains the conditions of the proposed permit:

The special conditions specify that various plans relating to the operation and maintenance of the basins must be maintained and kept up to date, that the permittee must operate and maintain the groundwater monitoring system, specifies the groundwater standards at the waste boundary, and specifies recordkeeping and reporting requirements.

1. Permittee must Comply with Air and Land Regulations
2. No construction for closure or corrective actions, only retrofit construction of the Ash Bypass Basin
3. Fugitive Dust Control Plan Requirements
4. Permanent Signage Requirements
5. Emergency Action Plan Requirements
6. Safety and Health Plan Requirements
7. Written Post-Closure Plan Requirements
8. Financial Assurance Requirements
9. Lateral expansions must be inspected
10. All impoundments must be inspected annually
11. Two additional down gradient wells in the silty clay silt unit, two piezometers must be added
12. Background wells for the 3 aquifer unit requirements
13. Downgradient wells for the three aquifer unit requirements
14. Surface water and groundwater interaction monitoring

15. Start groundwater sampling at all wells
16. Statistical methods for evaluating groundwater requirements
17. Groundwater monitoring program must be in compliance with 845
18. Within 240 days, must submit statistical calculations from Special Condition 16
19. Within 60 days, must provide analysis of CCR
20. Analysis of all waste streams in Ash Bypass Basin
21. Groundwater standards at the waste boundary for the Fill Unit approved
22. Groundwater standards for Silty Clay/Silt unit requirements
23. Groundwater standards for the Sand and Gravel unit requirements
24. Annual consolidated report requirements
25. Groundwater monitoring data submission requirements
26. Annual Groundwater Monitoring and Corrective Action Report requirements
27. Annual consolidated report requirements
28. Addresses to mail to
29. Construct according to plans approved by Agency
30. Notify Agency when construction is completed
31. Not released from prior liabilities
32. Sludges generated must be properly disposed of
33. Wastewater discharges governed by NPDES permit

Public Notice of Draft Permit

Public Notice Number MEL:24022801.docx is hereby given by Illinois EPA, Division of Water Pollution Control, Permit Section, 1021 North Grand Avenue East, Post Office Box 19276, Springfield, Illinois 62794-9276 (herein Agency) that a draft Coal Combustion Residual Surface Impoundment Retrofit Construction and Operating Permit (CCR) Permit Number 2021-CO-100029 has been prepared under 40 CFR 124.6(d) for Midwest Generation, LLC for discharge into Illinois River from the Powerton Generating Station, 13082 East Manito Rd., Pekin, IL 61554, (Tazewell County).

The application, draft permit and other documents are available for inspection and may be copied at the Agency between 9:30 A.M. and 3:30 P.M. Monday through Friday. A Fact Sheet containing more detailed information is available at no charge. For further information, call the Public Notice Clerk at 217/782-0610.

Interested persons are invited to submit written comments on the draft permit to the Agency at the above address. The NPDES Permit and Joint Public Notice numbers must appear on each comment page. All comments received by the Agency not later than 30 days from the date of this publication shall be considered in making the final decision regarding permit issuance.

Any interested person may submit written request for a public hearing on the draft permit, stating their name and address, the nature of the issues proposed to be raised and the evidence proposed to be presented with regards to these issues in the hearing. Such requests must be received by the Agency not later than 30 days from the date of this publication.

If written comments and/or requests indicate a significant degree of public interest in the draft permit, the permitting authority may, at its discretion, hold a public hearing. Public notice will be given 30 days before any public hearing.

Coal Combustion Residual Surface Impoundment Permit No. 2021-CO-100029

Illinois Environmental Protection Agency

Division of Water Pollution Control

1021 North Grand Avenue East

Post Office Box 19276

Springfield, Illinois 62794-9276

Coal Combustion Residual Surface Impoundment Retrofit Construction and Operating Permit

Expiration Date:

Issue Date:
Effective Date:

Name and Address of Permittee:

Midwest Generation, LLC
13082 East Manito Rd.
Pekin, IL 61554

Name and Address of Facility:

Midwest Generation, LLC
Powerton Generating Station
13082 East Manito Rd.
Pekin, IL 61554
(Tazewell County)

CCR Impoundment:

W1798010008-01 Ash Surge Basin
W1798010008-03 Metal Cleaning Basin
W1798010008-04 Ash Bypass Basin
W1798010008-05 Former Ash Basin

In compliance with the provisions of the Illinois Environmental Protection Act, Title 35 of Ill. Adm. Code, Subtitle C and/or Subtitle D, Chapter 1, and the Clean Water Act (CWA), the above-named permittee is hereby authorized to operate a coal combustion residual (CCR) surface impoundment, at the above location in accordance with the standard conditions and attachments herein.

Coal Combustion Residual Surface Impoundment Permit No. 2021-CO-100029 authorizes the retrofit construction of the Ash Bypass Basin in accordance with 35 Illinois Administrative Code Part 845 as described below.

Coal Combustion Residual Surface Impoundment Permit No. 2021-CO-100029 authorizes the operation of the Ash Surge Basin, the Metal Cleaning Basin, the Ash Bypass Basin, and the Former Ash Basin.

Coal Combustion Residual Surface Impoundment Permit No. 2021-CO-100029 does not authorize the closure of the Ash Bypass Basin, corrective action for the Ash Bypass Basin, or any construction activities associated with the closure of the Ash Bypass Basin.

Coal Combustion Residual Surface Impoundment Permit No. 2021-CO-100029 does not authorize the closure, corrective action, or any construction for the Ash Surge Basin, the Former Ash Basin, or the Metal Cleaning Basin.

Coal Combustion Residual Surface Impoundment Permit No. 2021-CO-100029 does not authorize the discharge of any wastewater to waters of the United States. NPDES Permit No. IL0002232 authorizes this facility to discharge wastewater to waters of the United States.

Coal combustion residuals, consisting of bottom ash discharged from the station's dewatering bins and other process waste streams related to electric power-generating operations when the Ash Surge Basin was being cleaned. The Ash Bypass Basin covers approximately 0.83 acres and has a storage capacity of approximately 9,000 cubic yards.

Permit is hereby granted to the above designated permittee(s) to construct facilities described as follows:

The retrofit construction of the Ash Bypass Basin including the removal of the gravel warning and sand cushion layers over the existing geomembrane liner, decontaminating the basin's existing geomembrane liner for re-use as a supplemental liner, decontaminating the basin's appurtenant structures, installing a new basin floor and slopes, installing a composite liner system consisting of a 60-mil HDPE geomembrane over a geosynthetic clay liner, installing a leachate collection and removal system consisting of a drainage geocomposite, leachate collection pipe, and submersible sump pump, installing a sand filter layer over the leachate collection and removal system, and installing a protective warning layer over the sand filter layer. Retrofit construction includes all pipes, pumps, and appurtenances as specified in the Application for Retrofit Construction Permit application dated July 15, 2022 and the Amended Written Retrofit Plan Revision 1 dated March 5, 2024.

Permittee is not authorized to operate after the above expiration date. In order to receive authorization to operate beyond the expiration date, the permittee shall submit the proper application as required by the Illinois Environmental Protection Agency (IEPA) not later than 180 days prior to the expiration date.

Darin E. LeCrone P.E.
Manager, Permit Section
Division of Water Pollution Control

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CCR Impoundment Permit No. 2021-CO-100029

Special Conditions

SPECIAL CONDITION 1: This permit does not relieve the Permittee of the responsibility of complying with the provisions of the State of Illinois Rules and Regulations, 35 Ill. Adm. Code Subtitle B, Air Pollution Control, Chapter 1 and 35 Ill. Adm. Code Subtitle G, Land Pollution Control, Chapter 1. The Permittee may be required to file reports and/or obtain applicable permits through the Illinois EPA's Bureau of Air (BOA) - Division of Air Pollution Control (DAPC) and/or Illinois EPA's Bureau of Land (BOL) – Division of Land Pollution Control (DLPC).

SPECIAL CONDTION 2: This construction permit is for Retrofitting of the Ash Bypass Basin and does not cover any closure construction or post-closure care of the Ash Bypass Basin. This permit does not authorize any construction activities necessary for closure and/or corrective action of the Ash Bypass Basin.

SPECIAL CONDITION 3: The operator shall implement methods for controlling dust, including the Fugitive Dust Control Plan included in Application Log No. 2021-100029, so as to prevent wind dispersal of particulate matter off-site.

SPECIAL CONDITION 4: A permanent sign shall be maintained at each CCR impoundment that contains the information required under 35 IAC, Section 845.130.

SPECIAL CONDITION 5: The written Emergency Action Plan (EAP), shall be maintained by the facility. The EAP and all amendments must be placed in the facility's operating record. Upon activation of the EAP, the facility must notify Illinois EPA in writing within 30 days of activation and place all corresponding documentation in the facility operating record. The permittee may amend the EAP at any time but must amend the EAP when there is a change in conditions that would substantially affect the EAP.

SPECIAL CONDITION 6: The Safety and Health Plan and accompanying certification has been submitted as part of Permit Application Log No. 2021-100029 and must be maintained by the facility. The plan must be updated annually and on an as needed basis. The Safety and Health Plan and all amendments must be placed in the facility operating record.

SPECIAL CONDITION 7: The permittee must maintain the written Post-Closure Care Plan for the site. The permittee may amend the written Post-Closure Care Plan at any time but must amend Post-Closure Care Plan when there is a change in operation of a CCR surface impoundment that would substantially affect the written Post-Closure Care Plan, and when before unanticipated events necessitate a revision. The Post-Closure Care Plan shall be amended at least 60 days before a planned change and within 60 days after an unanticipated event is required. If the Post-Closure Care Plan is revised after post-closure activities have started for a CCR impoundment, the permittee must submit a request to modify the operating permit within 30 days following the trigger event.

The Post-Closure Care Plan must be updated in the event of corrective action interim measures and/or corrective action implementation.

The post-closure care plan and post-closure care term of 30 years cannot begin while active groundwater corrective action is occurring. Active corrective action is defined as corrective actions that have to be maintained or powered to continue to be effective.

SPECIAL CONDITION 8: The permittee shall provide and maintain financial assurance in accordance with Part 845 Subpart I.

SPECIAL CONDITION 9: All CCR impoundments and any lateral expansion of a CCR surface impoundment must be inspected by a qualified person on a weekly basis and after each 25-year, 24-hour storm event. All CCR surface impoundment instrumentation must be inspected at least every 30 days. A report for each inspection shall be generated and placed into the facility operating record.

SPECIAL CONDITION 10: Each CCR Surface impoundment must be inspected on an annual basis by a qualified Professional Engineer, in accordance with 35 IAC 945.540. An inspection report must be completed and included with the Annual Consolidated Report, as specified in Special Condition 29.

SPECIAL CONDITION 11: Within 60 days of the effective date of this operating permit, the facility must install and begin to monitor at least two additional down gradient wells in the Silty Clay/Silt Unit, two piezometers in the fill unit, and two staff gages in the intermittent stream and standing water within the wetlands north of the service road splitting up the Former Ash Basin.

SPECIAL CONDTION 12: The background wells for the three aquifer units are as follows:

a. Fill Unit—locations to be reviewed and approved by the Agency once surface water/groundwater interaction after surface water/groundwater interaction has been evaluated in the fill.

b. Silty Clay/Silt Unit —MW-16

Commented [HL1]: EAPs for initial operating permits are subject to 845.520 and 29 CFR 1910.

EAPs for Construction permits are subject to 845.520 and 29 CFR 1926 which has much more extensive requirements for emergencies during construction.

Commented [HL2]: Safety Plans for construction have different training requirements for staff under 29 CFR 1926. therefore, under 834.530 the training requirements change because the federal training requirements change. Additionally SDS's under 845.530 will need updated for new equipment and activities on site.

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Commented [DL3]: Appears to be site-specific to J-9

Commented [HL4R3]: This is an initial operating permit and interim corrective action can happen at any of the CCRSIs at any facility under 35 IAC 845.680 prior to a construction permit. This is meant to be general and protect from any site closing with active corrective action in place.

Commented [HL5]: GWS additions

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Deleted: SPECIAL CONDITION 13: The permittee must have a groundwater monitoring system that is compliant with 35 IAC 845.630 and, at a minimum, include all of the following monitoring wells in the Lincoln Stone Quarry Groundwater monitoring system: Monitoring wells G20S, G30S, G41S, G44S, G45S, G46S, G47S, G48S, T03S, T11S, R08S, R32S, G45WT, G46WT, G47WT, G48WT, R08WT and R16WT.…¶
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CCR Impoundment Permit No. 2021-CO-100029

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c. Sand and Gravel Unit— MW16

SPECIAL CONDITION 13: The downgradient wells for the three aquifer units are as follows:

a. Fill Unit—locations to be reviewed and approved by the Agency once surface water/groundwater interaction after surface water/groundwater interaction has been evaluated in the fill.

b. Silty Clay/Silt Unit — Newly installed well (near MW-10 on west side of service road), Second newly installed well (between the Ash Surge Basin and the Former Ash Basin), MW-06, MW-14.

c. Sand and Gravel Unit— MW-01, MW02, MW03, MW04, MW05, MW-07, MW-10, New well installed co-located with MW-14 and screened in the Sand and Gravel unit.

SPECIAL CONDITION 14: Surface water and groundwater interaction monitoring and aquifer unit groundwater monitoring includes surface water elevations and groundwater elevations collected and reported in accordance with 35 IAC 845.610(e)(3)(C), 35 IAC 845.640(c)(1) and (3), and 35 IAC 845.650(b)(2). The groundwater and surface water elevation monitoring locations are as follows:

a. Surface water—the Illinois River USGS staff gage at Kingston Mines and two new staff gages, installed in intermittent stream(s) or standing water locations in the wetlands between the Illinois River and the service road that divides the Former Ash Basin.

b. Fill Unit—wells and/or piezometers to be reviewed and approved by the Agency once surface water/groundwater interaction has been evaluated in the fill. Initial evaluation locations includes three piezometers installed in the fill material, extending to the bottom of the fill unit, where accessible near the wetlands (near MW-10 on the east side of the service road, near MW-01 north of the service road, and between MW-06 and MW-05 north of the service road). After completion of the initial surface water/groundwater interaction and new fill unit wells are installed, new fill unit wells must be monitored for groundwater elevations.

c. Silty Clay/Silt Unit— MW-06, MW-12, MW-14, MW-15, MW-17, MW-18, Newly installed well (near MW-10 on west side of service road), Second newly installed well (between the Ash Surge Basin and the Former Ash Basin).

d. Sand and Gravel Unit—MW-01, MW02, MW03, MW04, MW05, MW-07, MW-09, MW-11, MW-16, MW-19, newly installed well co-located with MW-14.

MWG must install the silty clay/silt and sand and gravel unit groundwater monitoring wells, fill unit piezometers and staff gages within 60 days of the issuance of this permit.

MWG must provide proposed locations for Agency review and approval for the fill unit groundwater monitoring within 2 years of the issuance of this permit.

SPECIAL CONDITION 15: Within 30 days of the effective date of this operating permit, the facility must be performing groundwater sampling and analysis in accordance with 35 IAC Section 845.640 at every well. Compliance with Section 845.640(a) requires the collection and submission during annual reporting of laboratory reports, field documents and records of collection and analysis, and documentation of environmental data compliant with SW 846.

SPECIAL CONDITION 16: Within 30 days of the effective date of this permit, the permittee must select a statistical method for evaluating groundwater monitoring data, pursuant to Section 845.640(f)(1), and notify Illinois EPA of the chosen statistical method. The permittee must use the data from the groundwater monitoring program required by this permit to conduct the statistical analysis. Data to be provided or correction of Attachment 9-4 of the Initial Operating Permit Application is as follows:

a. Outlier analysis must be struck from Attachment 9-4 or revised to adhere to the following for any laboratory analyzed constituent listed in 35 IAC 845.600:

The Agency's position on outliers is that verified data from a NELAP certified laboratory is representative of the aquifer properties analyzed. Outliers cannot be evaluated for exclusion from any dataset without explicit data validation identifying discrepancies from the laboratory and/or field procedures that would qualify a data point to be considered an outlier. Midwest Generation must use the USEPA data validation procedures to determine when or if a data point is to be excluded from a data set. (EPA QA/G-8).

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b. All input data sets for each constituent must be provided in a table in accordance with SW-846 chapter 1, incorporated by reference in 35 IAC 845. Chapter 1 of SW846 states that regulatory decisions must be made with environmental data.

c. All data sets, used for statistical analysis of background, must be within the last eight consecutive quarterly sampling events in order to validate the statistical methods for recent activity (35 IAC 845.650(b)); Note: If an impoundment is considered closed by the Agency, the data sets must be used from the eight consecutive quarters after closure or most recent eight consecutive quarters. Non-parametric statistical analysis must be provided to the Agency for review and approval each time that a non-parametric data set occurs.

d. Non-parametric statistical analysis must be provided to the Agency for review and approval each time that a non-parametric data set occurs.

Commented [DL7]: The only issue I have with this Note is that none of the CCRSIs at Powerton are closed so it doesn't apply. Therefore, I would leave it out of this condition.

SPECIAL CONDITION 17: Within 30 days of the effective date of this permit, the groundwater monitoring program must be in compliance with 35 IAC 845.650 at all wells.

a. The permittee must analyze each sample for the constituents listed in 845.600(a), calcium and turbidity.

b. When analyzing groundwater quality, the permittee must measure total recoverable metals pursuant to Section 845.640(i).

c. The permittee must collect a minimum of eight independent samples from each background and downgradient well within 180 days of operating permit issuance.

d. After background groundwater monitoring has been completed, the permittee must conduct monitoring pursuant to Section 845.650(b).

SPECIAL CONDITION 18: Within 240 days of the effective date of this permit, the permittee must submit statistical calculations using the method selected in Special Condition 16. As part of this submittal, the applicant must provide a groundwater protection standard for each constituent, the statistical evaluations and calculations including the raw data used, and a description of any assumptions used when calculating the groundwater protection standards.

Commented [HL8]: Can we do this? MW-16 needs background established in totals.

SPECIAL CONDITION 19: Within 60 days of the effective date of the construction permit, the permittee must provide an analysis of the coal combustion residual located inside the Former Ash Basin, Ash Surge Basin, Metal Cleaning Basin, and Ash Bypass Basin, if any remains and in the embankments of the Former Ash Basin, Ash Surge Basin, Metal Cleaning Basin, and Ash Bypass Basin. The samples must be compliant with the sampling requirements of SW 846 pursuant to 845.230(d)(2)(B).

SPECIAL CONDITION 20: Within 60 days of the effective date of this permit, the permittee must provide an analysis of all waste streams entering or currently at the Former Ash Basin, Ash Surge Basin, Metal Cleaning Basin, and Ash Bypass Basin. Sources that have historically discharged in the Former Ash Basin, Ash Surge Basin, Metal Cleaning Basin, and Ash Bypass Basin include: coal pile runoff, gas side metal cleaning waste, plant drains, yard runoff, roof drains, road runoff. For each of these sources and any other sources not identified, the permittee must provide an analysis of the waste stream compliant with the sampling requirements of SW 846 pursuant to 845.230(d)(2)(C) or a statement that the identified source is no longer discharging and the approximate date of the last discharge.

Commented [HL9]: Not sure on waste streams from the CCRSIs. Please review if you want to keep or get rid of. Also that the waste streams are correct.

SPECIAL CONDITION 21: The groundwater standards at the waste boundary for the Fill unit will be established once a monitoring system has been approved.

If the statistical analysis performed as part of Special Condition 18 determines a groundwater protection standard that is higher than the currently permitted limits, the applicant may submit a permit application to modify the above standards. Chloride and pH will only be amended through statistical analysis during permit renewal.

After review and approval of initial background concentrations by the Agency, background concentrations for constituents listed in 35 IAC 845.600(a) will only be evaluated for changes during permit renewal and after implementation and completion of construction permits.

SPECIAL CONDITION 22: The groundwater standards at the waste boundary for the Silty Clay/Silt unit are:

Pollutant	Concentration
Antimony	0.006 mg/L
Arsenic	0.010 mg/L
Barium	2.0 mg/L
Beryllium	0.004 mg/L

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Boron	4.7 mg/L
Cadmium:	0.005 mg/L
Chloride:	200 mg/L
Chromium:	0.1 mg/L
Cobalt:	0.006 mg/L
Fluoride:	4.0 mg/L
Lead:	0.0075 mg/L
Lithium:	0.04 mg/L
Mercury:	0.002 mg/L
Molybdenum:	0.1 mg/L
pH:	6.5-9.0 units
Selenium:	0.05 mg/L
Sulfate:	400 mg/L
Thallium:	0.002 mg/L
Total Dissolved Solids:	1200 mg/L
Radium 226 and 228 combined:	5 pCi/L

If the statistical analysis performed as part of Special Condition 22 determines a groundwater protection standard that is higher than the currently permitted limits, the applicant may submit a permit application modification to modify the above standards. Chloride and pH will only be amended through statistical analysis during permit renewal.

After review and approval of initial background concentrations by the Agency, background concentrations for constituents listed in 35 IAC 845.600(a) will only be evaluated for changes during permit renewal and after implementation and completion of construction permits.

SPECIAL CONDITION 23: The groundwater standards at the waste boundary for the Sand and Gravel unit are:

Commented [HL10]: Permit application figure 9-10 shows MW-01 downgradient of the Bypass Basin. So boron is the only constituent evaluated upgradient of the Bypass Basin and still exceeding the numerical values.

Pollutant	Concentration
Antimony	0.006 mg/L
Arsenic	0.010 mg/L
Barium	2.0 mg/L
Beryllium	0.004 mg/L
Boron	4.7 mg/L
Cadmium:	0.005 mg/L
Chloride:	200 mg/L
Chromium:	0.1 mg/L
Cobalt:	0.006 mg/L
Fluoride:	4.0 mg/L
Lead:	0.0075 mg/L
Lithium:	0.04 mg/L
Mercury:	0.002 mg/L
Molybdenum:	0.1 mg/L
pH:	6.5-9.0 units
Selenium:	0.05 mg/L
Sulfate:	400 mg/L
Thallium:	0.002 mg/L
Total Dissolved Solids:	1200 mg/L
Radium 226 and 228 combined:	5 pCi/L

If the statistical analysis performed as part of Special Condition 22 determines a groundwater protection standard that is higher than the currently permitted limits, the applicant may submit a permit application modification to modify the above standards. Chloride and pH will only be amended through statistical analysis during permit renewal.

After review and approval of initial background concentrations by the Agency, background concentrations for constituents listed in 35 IAC 845.600(a) will only be evaluated for changes during permit renewal and after implementation and completion of construction permits.

SPECIAL CONDITION 24: Annual consolidated reports must contain the following items in accordance with Section 845.550, 845.500(c), 845.540(b)(3), and 845.610(e):

Fugitive Dust Control Report in accordance with Section 845.500(c);

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Annual Inspection Report in accordance with Section 845.540(b)(2);

Groundwater Monitoring and Corrective Action Report in accordance with Section 845.610(e)(3) and (e)(4); documentation in the report must satisfy Section 845.640(a), (b), (c),

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SPECIAL CONDITION 26: The permittee must maintain a written operating record at the facility. Each record must be retained for at least three years past the date the Agency approved the owner's or operator's request to terminate post-closure care, when closure is with a final cover system, or the completion of groundwater monitoring under Section 845.740(b), when closure is by removal. Records for each individual surface impoundment must be identified by name and identification number.

The permittee must place the following information, as it becomes available, in the facility's operating record:

e. Copies of all permit applications and permits;

f. Documentation recording the public meetings held under Section 845.240;

g. Weekly CQA reports under Section 845.290(b);

h. Hazard potential classification assessments for CCR surface impoundments (see Section 845.440(a)(3)(D));

i. Structural stability assessments for CCR surface impoundments (see Section 845.450(d)(4));

j. Safety factor assessments for CCR surface impoundments (see Section 845.460(c)(4));

k. The CCR fugitive dust control plan and any subsequent amendment of the plan (see Section 845.500(b)(6)), except that only the most recent fugitive dust control plan must be maintained in the facility's operating record, irrespective of the time requirement specified in subsection (b);

l. Inflow design flood control system plans for CCR surface impoundments (see Section 845.510(c)(4)(D));

i. Emergency Action Plan (see Section 845.520(a)), except that only the most recent EAP must be maintained in the facility's operating record irrespective of the time requirement specified in subsection (b);

j. Documentation prepared by the owner or operator recording all activations of the EAP (see Section 845.520(f));

k. Documentation prepared by the owner or operator recording the annual face-to-face meeting or exercise between representatives of the owner or operator of the CCR surface impoundment and the local emergency responders (see Section 845.520(g));

l. Safety and Health Plan (see Section 845.530(a));

m. Documentation recording the results of each inspection and instrumentation monitoring by a qualified person (see Section 845.540(a)(2));

n. Annual consolidated report (see Section 845.550), which contains the following:

1. The annual CCR fugitive dust control report (see Section 845.500(c));

2. The annual inspection report (see Section 845.540(b)(3)); and

3. The annual groundwater monitoring and corrective action report (see Section 845.610(e));

o. All groundwater monitoring data submitted to the Agency and any analysis performed (see Section 845.610(b)(3)(D) and 845.640(a), (b), and (c));

p. Within 30 days after detecting one or more monitored constituents above the groundwater protection standard, the notifications required by Section 845.650(d) and (e);

q. The semi-annual report describing the progress in selecting and designing the remedy (see Section 845.670(a));

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r. Within 30 days after completing implementation of the corrective action plan, the notification required by Section 845.680(e);

s. USEPA-approved or denied demonstration as required by Section 845.700(d)(2)(F);

t. The preliminary written closure plan and any amendment of the plan (see Section 845.720(a)) except that only the most recent closure plan must be maintained in the facility's operating record, irrespective of the time requirement specified in subsection (b);

u. The written demonstrations, including the certification required by Section 845.730(b)(3), for a time extension for initiating closure (see Section 845.730(b)(2)); 22) The notification of intent to close a CCR surface impoundment (see Section 845.730(d));

v. The monthly reports for closure by removal (see Section 845.740(d));

w. The closure report and certification (see Section 845.760(e)(3)), or the completion of groundwater monitoring report and certification (see Section 845.740(f)); completion of groundwater monitoring in accordance with Section 845.740 with concurrence of the Agency must be in the record;

x. The notification of completion of closure of a CCR surface impoundment (see Section 845.760(f));

y. The notification recording a notation on the deed (see Section 845.760(h));

z. The preliminary written retrofit plan for a CCR surface impoundment (see Section 845.770(a)(3));

aa. The notification of intent to initiate retrofit of a CCR surface impoundment (see Section 845.770(d));

bb. The retrofit completion report and certification (see Section 845.770(g)(3));

cc. The notification of completion of retrofit activities (see Section 845.770(h));

dd. The notification of completion of post-closure care period (see Section 845.780(f));

ee. The completion of CCR removal and decontamination report and certification (see Section 845.740(e)); and

ff. The most current cost estimates (see Section 845.940(d)).

SPECIAL CONDITION 25: All groundwater monitoring data and resulting analysis must be submitted to Illinois EPA within 60 days after completion of sampling and must be place into the facility operating record.

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SPECIAL CONDITION 26: The permittee shall prepare am Annual Groundwater Monitoring and Corrective Action Report each year. The Annual Groundwater Monitoring and Corrective Action Report shall be submitted to Illinois EPA as part of the Annual Consolidated Report required in Special Condition 24, and must be placed into the facility operating record. The annual report shall include at a minimum and to the extent available:

a. A map, aerial image, or diagram showing the CCR surface impoundment, all background (or upgradient) and downgradient monitoring wells, including the well identification numbers, that are part of the groundwater monitoring program for the CCR surface impoundment, and a visual delineation of any exceedances of the groundwater protection standards;

b. Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;

c. A potentiometric surface map of each monitored groundwater migration pathway unit (Fill Unit, Silty/Clay-Silt Unit and Sand and Gravel Unit) for each groundwater elevation sampling event required by Section 845.650(b)(2);

d. Monitoring data must include analytical results, documentation of field sampling procedures, and laboratory reports in accordance with 35 IAC 845.640(a).

e. An assessment of corrective measures, corrective action plans, interim corrective measures and any other corrective action measures conducted during the year must be summarized and/or documented in the submission of the annual

groundwater monitoring and corrective action report in accordance with 35 IAC 845.610(e) and 35 IAC 845.550(3).

f. In addition to all the monitoring data obtained in the year, a summary including the number of groundwater samples that were collected for analysis for each Illinois EPA approved background and downgradient well, and the dates the samples were collected;

g. In accordance with 35 IAC 845.610(e), a narrative discussion of any statistically significant increases over background levels for the constituents listed in Section 845.600. Any statistically significant increases over background concentrations for one or more constituents listed in 35 IAC 845.600 must be identified and summarized or documented in accordance with 35 IAC 845.610(e)(4). Corrective action assessments, planning, and actions must be documented in accordance with 35 IAC 845.610(e); and

h. All other information required to be included in the annual report as specified in 35 IAC 845 Subpart F.

SPECIAL CONDTION 27: The Annual Consolidated report each calendar year shall be submitted to the Illinois EPA by January 31 of the following year and placed into the facility operating record. The Annual Consolidated Report shall consist of the following:

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a. The Annual CCR fugitive dust control report.

b. The Annual Inspection Report, which may include:

1. Annual Hazard potential certification, if applicable.

2. Annual structural stability assessment certification, if applicable.

3. Annual Safety factor assessment certification, if applicable.

4. Inflow design flood control system certification, if applicable.

c. The Annual Groundwater Monitoring and Corrective Action Report.

SPECIAL CONDITION 28: All certifications, logs, reports, plan sheets, notices, and groundwater and leachate monitoring data required to be submitted to the Illinois EPA by the permittee shall be mailed to the following address:

Deleted: 27

Illinois Environmental Protection Agency
Compliance Assurance Section
Bureau of Water
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

Commented [BJ11]: Not the Part 845 mailing address?

Information submittals transmitted by FedEX or UPS shall be mailed to the following address:

Illinois Environmental Protection Agency
Compliance Assurance Section
Bureau of Water
1021 North Grand Avenue East
Springfield, Illinois 62702

Commented [BJ12]: Not the Part 845 mailing address?

Electronic groundwater and leachate monitoring data shall be emailed to Illinois EPA at the following email address: EPA.BOW.GWS.CCR@illinois.gov

Commented [BJ13]: Please clarify electronic groundwater and leachate monitoring data? Confirming Agency wants 3 hardcopies of quarterly GW monitoring data, for example?

Except for electronic groundwater and leachate monitoring data, the operator shall provide the Illinois EPA with the original and two (2) copies of all certifications, logs, reports, and plan sheets required by this permit.

Commented [BJ14]: Please clarify electronic groundwater and leachate monitoring data? Confirming Agency wants 3 hardcopies of quarterly GW monitoring data, for example?

SPECIAL CONDITION 29: The permittee will commence construction in accordance with the specifications listed in the Application for Retrofit Construction Permit application dated July 15, 2022 and the Amended Written Retrofit Plan Revision 1 dated March 5, 2024. Any changes made to the construction plans must be approved by the Agency.

SPECIAL CONDITION 30: The permittee shall notify the Agency when construction has been completed.

CCR Impoundment Permit No. 2021-CO-100029

Special Conditions

SPECIAL CONDITION 31: Issuance of this permit does not release the Permittees from any liability for prior violations of the Act or Rules and Regulations promulgated thereunder.

SPECIAL CONDITION 32: All sludges generated on site shall be disposed of at a site and in a manner acceptable to the Agency.

SPECIAL CONDITION 33: All discharges to a Water of the United States shall be governed by NPDES Permit No. IL0002232.

SPECIAL CONDITION 34: All certifications, logs, reports, plan sheets, notices, and groundwater and leachate monitoring data generated as a part of the construction quality program must be reported in the retrofit construction completion report in accordance with 35 IAC 845.770(g) and is required to be submitted to the Illinois EPA prior to termination of the retrofit construction permit by the permittee. The permittee shall mail the retrofit construction completion report to the following address:

Illinois Environmental Protection Agency
Compliance Assurance Section
Bureau of Water
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

Commented [DL15]: I don't understand what we want MWG to do here, unless you're saying the retrofit completion report must be included in the closure construction permit? In the future when closure happens

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 · (217) 782-3397
JB PRITZKER, GOVERNOR **JOHN J. KIM**, DIRECTOR

217/782-0610

March 22, 2024

Midwest Generation, LLC
13082 East Manito Road
Pekin, Illinois 61554

Re: Midwest Generation, LLC
Powerton Generating Station
Coal Combustion Residual Surface Impoundment Retrofit Construction and Operating Permit
No. 2021-CO-100029
Bureau ID: W1798010008
Draft Permit

Dear Permittee:

Attached to this letter is a copy of the draft Permit, Public Notice/Fact Sheet for your facility. The Agency proposes to issue the Coal Combustion Residual Surface Impoundment Permit for your facility as shown in the draft Permit.

Fifteen days from the date of this letter, the Agency proposes to distribute the attached Public Notice/Fact Sheet statewide. If you have objections to the content of the Public Notice/Fact Sheet, a written statement must be received by the Agency at the indicated address, attention: CCR PN Clerk within 10 days.

The Agency will receive comments regarding the Permit for a period of 45 days after the Public Notice is issued. If you wish to comment or object to any of the terms and conditions of the Permit, you must state the objections in writing prior to the end of the public notice. The Agency may or may not change the Permit based on comments received from you or the public.

If you should have questions or comments regarding the above, please contact Mark E. Liska at 217/782-0610.

Sincerely,

Darin E. LeCrone, P.E.
Manager, Permit Section
Division of Water Pollution Control

DEL:MEL:24022801.docx

Attachments: Draft Permit, Public Notice/Fact Sheet

cc: Records Unit
Compliance Assurance Section

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 · (217) 782-3397
JB PRITZKER, GOVERNOR **JOHN J. KIM**, DIRECTOR

MEMORANDUM

DATE:

TO: Manager, DWPC/FOS, Peoria Region

FROM: Darin E. LeCrone, Manager, Permit Section

SUBJECT: Midwest Generation, LLC
Powerton Generating Station
Coal Combustion Residual Surface Impoundment Retrofit Construction and Operating Permit No. 2021-CO-100029
Bureau ID: W1798010008
Draft Permit, Public Notice/Fact Sheet

Please review the attached copy of the subject documents, and notify the Industrial Unit if you take exception to the limitations, sampling frequency, sample type or other requirements therein.

If no response is received within fifteen (15) days from the date of this memorandum, we will assume that you concur in the issuance of the Public Notice.

If you have any questions, please contact Mark E. Liska at 217/782-0610.

Thank you for your cooperation.

DEL:MEL:24022801.docx

Attachments: Draft Permit, Public Notice/Fact Sheet

cc: Records Unit

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 · (217) 782-3397
JB PRITZKER, GOVERNOR **JOHN J. KIM**, DIRECTOR

217/782-0610

Municipal Clerk
111 South Capitol Street
Pekin, Illinois 61554

Re: Midwest Generation, LLC
Powerton Generating Station
Coal Combustion Residual Surface Impoundment Retrofit Construction and Operating Permit No. 2021-CO-100029
Bureau ID: W1798010008
Public Notice of Permit

Municipal Clerk:

In accordance with the requirements of the Illinois Pollution Control Board regulations of 35 Ill. Adm. Code 845.260, the attached Coal Combustion Residual Surface Impoundment Operating Permit Public Notice is sent to a municipality in the vicinity of the applicant. The Agency understands that the applicant may not be associated with the municipality to which it is sent.

Please post the attached Coal Combustion Residual Surface Impoundment Public Notice for a period of 45 days. In addition, please complete and return the enclosed postcard indicating the date of posting. Should you choose not to post the attached notice, please indicate so on the postcard and return.

Thank you for your cooperation.

Sincerely,

Darin E. LeCrone, P.E.
Manager, Permit Section
Division of Water Pollution Control

DEL:MEL:24022801.docx

Attachments: Public Notice/Fact Sheet, Post Card

cc: Records Unit

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 · (217) 782-3397
JB PRITZKER, GOVERNOR **JOHN J. KIM**, DIRECTOR

217/782-0610

Midwest Generation, LLC
13082 East Manito Road
Pekin, Illinois 61554

Re: Midwest Generation, LLC
Powerton Generating Station
Coal Combustion Residual Surface Impoundment Permit No. 2021-CO-100029
Bureau ID: W1798010008

Dear Permittee:

Attached is the final Coal Combustion Residual Surface Impoundment Operating Permit for your facility. The Permit as issued covers monitoring and related reporting requirements. Failure to meet any portion of the Permit could result in civil and/or criminal penalties. The Illinois Environmental Protection Agency is ready and willing to assist you in interpreting any of the conditions of the Permit as they relate specifically to your discharge.

The attached Permit is effective as of the date indicated on the first page of the Permit. Until the effective date of any re-issued Permit, the limitations and conditions of the previously issued Permit remain in full effect. You have the right to appeal any condition of the Permit to the Illinois Pollution Control Board within a 35 day period following the issuance date.

Should you have questions concerning the Permit, please contact Mark E. Liska at 217/782-0610.

Sincerely,

Darin E. LeCrone, P.E.
Manager, Permit Section
Division of Water Pollution Control

DEL:MEL:24022801.docx

Attachment: Final Permit

cc: Records
Compliance Assurance Section
Peoria Region
Billing
USEPA

DOCUMENT 27

From: Liska, Mark <Mark.Liska@Illinois.gov>
Sent: Monday, April 1, 2024 4:02 PM
To: Guy, Jeff
Subject: RE: Powerton CCR Permits
Attachments: 24032601 Powerton construct bypass basin.docx; 24032701 Powerton operating.docx

Here's the two fact sheet/permits.

Mark E. Liska
Environmental Protection Engineer
Industrial Permits Section, Bureau of Water
Illinois Environmental Protection Agency
1021 N. Grand Ave. East, P.O. Box 19276
Springfield, IL 62794-9276
Phone: (217) 782-0610
Fax: (217) 782-9891

From: Guy, Jeff <Jeff.Guy@Illinois.gov>
Sent: Monday, April 1, 2024 3:54 PM
To: Liska, Mark <Mark.Liska@Illinois.gov>
Subject: RE: Powerton CCR Permits

Mark,

Can we chat for a minute?

Jeffrey J. Guy
Illinois Environmental Protection Agency
Office of Community Relations
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276
(217) 785-8724
Jeff.Guy@illinois.gov

From: Liska, Mark <Mark.Liska@Illinois.gov>
Sent: Monday, April 1, 2024 3:42 PM
To: Guy, Jeff <Jeff.Guy@Illinois.gov>
Subject: Powerton CCR Permits

Jeff, we're planning on public noticing the two CCR Powerton permits tomorrow. We have the following info on the public hearing notice:

A public hearing on this draft permit will be held on May 8, 2024 at x:xx p.m. at xxxxx, in Pekin/Peoria.

Interested persons are invited to submit written comments on the draft permit to the IEPA at:

Hearing Officer Dean Studer, Office of Community Relations

Re: Midwest Generation, LLC – Powerton Generating Station
Illinois Environmental Protection Agency
1021 North Grand Avenue East, P. O. Box 19276
Springfield, IL 62794-9276

Comments may also be e-mailed to epa.publichearingcom@iilinois.gov and must specify either "Midwest Generation, LLC – Powerton Generating Station CCR" or "2024-CO-100029" in the subject line. E-mail comments originating on third party systems or servers intended for submittal of multiple emails of the same or nearly the same content will not be accepted without prior approval from the hearing officer.

The application, engineer's review notes including load limit calculations, Public Notice/Fact Sheet, draft permit, comments received, and other documents are available for inspection and may be copied at the IEPA between 9:30 a.m. and 3:30 p.m. Monday through Friday when scheduled by the interested person.

Response to comments will be provided in a responsiveness summary which will be available at the time a final decision is made in this matter.

For further information on the draft permit, please call Mark E. Liska at 217/782-0610.

Are we missing anything? This is the usual language we put in NPDES permits for public hearings. Can you also give me the name and time of the place for May 8?

Mark E. Liska
Environmental Protection Engineer
Industrial Permits Section, Bureau of Water
Illinois Environmental Protection Agency
1021 N. Grand Ave. East, P.O. Box 19276
Springfield, IL 62794-9276
Phone: (217) 782-0610
Fax: (217) 782-9891

State of Illinois - CONFIDENTIALITY NOTICE: The information contained in this communication is confidential, may be attorney-client privileged or attorney work product, may constitute inside information or internal deliberative staff communication, and is intended only for the use of the addressee. Unauthorized use, disclosure or copying of this communication or any part thereof is strictly prohibited and may be unlawful. If you have received this communication in error, please notify the sender immediately by return e-mail and destroy this communication and all copies thereof, including all attachments. Receipt by an unintended recipient does not waive attorney-client privilege, attorney work product privilege, or any other exemption from disclosure.

DOCUMENT 28

CCR Permit No. 2024-CC-100030
Notice No. MEL:24032601.docx

Public Notice Beginning Date: April 2, 2024

Public Notice Ending Date: May 17, 2024

Coal Combustion Residual Surface Impoundment
Permit Program

Draft Permit for Retrofit Construction of a Coal Combustion Residual Surface Impoundment.

Public Notice/Fact Sheet Issued By:

Illinois Environmental Protection Agency
Bureau of Water
Division of Water Pollution Control
Permit Section
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276
217/782-0610

Name and Address of Permittee:

Midwest Generation, LLC
13082 East Manito Rd.
Pekin, IL 61554

Name and Address of Facility:

Midwest Generation, LLC
Powerton Generating Station
13082 East Manito Rd.
Pekin, IL 61554
(Tazewell County)

The Illinois Environmental Protection Agency (IEPA) has made a tentative determination to issue a Permit for Retrofit Construction of a Coal Combustion Surface Impoundment pursuant to 35 Illinois Administrative Code Part 845 and has prepared a draft permit and associated fact sheet. The IEPA is holding a public comment period and public hearing to offer an opportunity to the public to provide both written and oral comments on this proposed action prior to making a final decision.

The IEPA is accepting written public comments on the draft permit until 11:59 p.m. Friday, May 17, 2024. If you would like to provide written comments, please email your comments to epa.publichearingcom@illinois.gov, RE: "Midwest Generation, LLC – Powerton Generating Station CCR" or "2024-CC-100030". Written comments on the draft permit may also be mailed to IEPA, attention Jeff Guy, IEPA Hearing Officer, P.O. Box 19276, 1021 North Grand Avenue East, Springfield, Illinois 62794-9276. Email comments originating on third party systems or servers intended for submittal of multiple emails of the same or nearly the same content will not be accepted without prior approval from the hearing officer.

In addition to accepting written public comments, the IEPA will host a public hearing on May 8, 2024 beginning at 6:00 p.m. to receive oral public comments on the draft permit. The public hearing will be conducted pursuant to 35 Ill. Adm. Code Part 845. The public hearing will be held in Room A at the Miller Center, 551 South 14th Street, Pekin, Illinois 61554.

A public hearing on this draft permit will be held on May 8, 2024 at 6:00 p.m. in Room A at the Miller Center, 551 South 14th Street, Pekin, Illinois 61554.

Interested persons are invited to submit written comments on the draft permit to the IEPA at:

Hearing Officer Jeff Guy, Office of Community Relations
Re: Midwest Generation, LLC – Powerton Generating Station
Illinois Environmental Protection Agency
1021 North Grand Avenue East, P. O. Box 19276
Springfield, IL 62794-9276

Requests for interpretation (including sign language) must be made by 5:00 p.m. on Wednesday, May 17, 2024 by contacting the IEPA Hearing Officer by email at epa.publichearingcom@illinois.gov, or by calling (217) 785-8724. Questions regarding hearing procedures

or requests to address special needs should be made to the IEPA Hearing Officer by email at epa.publichearingcom@illinois.gov, by calling (217) 785-8724, or by calling (866) 273-5488 (TDD phone number).

The IEPA will provide a Responsiveness Summary, which will be available at the time a final decision is made in this matter. The Responsiveness Summary will include a summary of all significant comments, criticisms, and suggestions, whether written or oral, submitted during the public comment period, at the hearing, or during the time the hearing record is open. The Responsiveness Summary will provide IEPA's response to all significant comments, criticisms, and suggestions and a statement of IEPA's action, including, when applicable, the issuance or denial of the permit.

The permit application, IEPA review notes including load limit calculations, public notice, fact sheet, draft permit, comments received, and other pertinent documents are available for inspection and may be copied at the IEPA between 9:30 a.m. and 3:30 p.m. Monday through Friday when scheduled by the interested person.

You can join the listserv for this facility at the following address:
https://epa.illinois.gov/topics/water-quality/watershed-management/ccr-surface-impoundments.html

For further information on the draft permit, please call Mark E. Liska at 217/782-0610.

The applicant has been operating a steam electric generating station (SIC 4911). The station operates four cyclone coal-fired wet bottom boilers to supply steam to two generating units, designated units #5 and #6 rated at 851 and 846 MW respectively.

CCR basins at the facility consist of the Ash Surge Basin, the Ash Bypass Basin, the Former Ash Basin, and the Metal Cleaning Basin. This permit will cover the retrofit construction of the Ash Bypass Basin only. The operation of the Ash Bypass Basin, Ash Surge Basin, Former Ash Basin, and Metal Cleaning Basin will be covered under a separate permit.

The Ash Bypass Basin is a settling pond for sluiced CCR and other process waters related to power generation when the Ash Surge Basin is not currently in use due to maintenance. The Ash Bypass Basin has a surface area of 0.83 acres and a storage capacity of approximately 6,700 cubic yards. The Ash Bypass Basin has not been in use since April 11, 2021.

Midwest Generation – Powerton Generating Station has an active NPDES Permit IL0002232 that regulates the discharges of wastewater from the property to waters of the United States.

The proposed Coal Combustion Residual Surface Impoundment Retrofit Construction Permit No. 2021-C0-100029 does not address the closure of any of the CCR Basins. Midwest Generation – Powerton Generating Station has submitted a separate Permit application to address the closure of the CCR basins.

Retrofit Construction of Ash Bypass Basin:

Midwest Generation – Powerton Generating Station must comply with the requirements of 35 Illinois Administrative Code Part 845. This proposed Coal Combustion Residual Surface Impoundment Retrofit Construction Permit (Permit No. 2024-CC-100030) is being issued to specify the conditions that must be followed to comply with 35 Illinois Administrative Code Part 845. In order for the permittee to use the Ash Bypass Basin for receiving CCR, it must be retrofitted with a new composite liner system and a new leachate collection and removal system in accordance with federal and state environmental regulations for CCR surface impoundments. It is therefore subject to the requirements of 35 IAC 845.220 for construction permits.

Midwest Generation, LLC – Powerton Station is currently a 1,785 MW coal-fired power plant located in Pekin, IL along the Illinois River. The facility has produced electricity since the 1928 and currently utilizes four coal-fired boilers and two electric generating units, Units 5 and 6. The site is located within Pekin Lake-Illinois River watershed which is approximately 28,834 acres.

The basin historically has managed bottom ash since it was constructed in 1980 and was retrofitted in 2010. The chemical constituents of the CCR have been analyzed in mg/kg. The max capacity of the basin is 6,700 cubic yards. The basin is currently not receiving CCR, but will receive it after retrofit and will receive up to 20 MGD of dewatering effluent, slag tank overflow, basin overflow, etc. until December 31, 2028. The facility has secure, on-site roads for transportation of people and material.

The permittee submitted a construction permit containing the physical and engineering properties of the foundation and abutment materials, the type, size, range, and physical and engineering properties of the materials used in constructing each zone or stage of the CCR surface impoundment and the method of site preparation and construction of each zone of the CCR surface impoundment.

Site drawings show details to the design, construction, operation, and maintenance of the CCR surface impoundment, detailed dimensional drawings of the CCR surface impoundment, including a plan view and cross-sections of the length and width of the CCR surface impoundment, showing all zones, foundation improvements, drainage provisions, spillways, diversion ditches, outlets, instrument locations, and slope protection, in addition to the normal operating pool surface elevation and the maximum pool surface

elevation following peak discharge from the inflow design flood, the expected maximum depth of CCR within the CCR surface impoundment, and any identifiable natural or manmade features that could adversely affect operation of the CCR surface impoundment due to malfunction or mis-operation.

Narrative Description of Proposed Construction:

The permittee's narrative of the construction is as follows: obtain the construction permit, remove the gravel warning and sand cushion layers or the existing liner, decontaminate the existing liner for re-use as a supplemental liner, decontaminate appurtenant structures, place structural fill in the basin floor to establish slopes of the new leachate collection and removal system, install new composite liner, install new leachate collection system, install sand filter layer, and install protective warning layer.

Location Standards:

The permittee provided information and certification on the placement being above the aquifer, wetlands, fault areas, seismic impact zones, unstable areas, and floodplains.

Above the Uppermost Aquifer – October 2018 conclusion approved by Geosyntec that the bottom of the Ash Bypass Basin's existing liner is separated from the upper limit of the uppermost aquifer by at least five feet.

Wetlands - October 2018 conclusion approved by Geosyntec that the Ash Bypass Basin is not located in mapped wetlands.

Fault Areas - October 2018 conclusion approved by Geosyntec that the Ash Bypass Basin is not located within 200 feet of the outermost damage zone of a fault that has had displacement in Holocene time.

Seismic Impact Zones - October 2018 conclusion approved by Geosyntec that the Ash Bypass Basin is not located within a seismic impact zone.

Unstable Areas - October 2018 conclusion approved by Geosyntec that the Ash Bypass Basin is not located in an unstable area.

Floodplain - October 2018 conclusion approved by KPRG that the Ash Bypass Basin is not located in a floodplain according to the National Flood Hazard Layer FIRMette Map No. 17179C0175E prepared by FEMA.

Meeting Design Criteria:

The plans meet these criteria in that it will have a liner that meets the criteria, it will have a new leachate collection system installed, and will have slope protection.

A. Liner requirements – 845.400(c)(1-4)

The permittee has chosen to install an alternative composite liner that meets the requirements of 35 Ill. Adm. Code 845.400(c).

The permittee submitted information and drawings showing that the composite liner will meet these specifications. The maximum hydraulic conductivity of 1.0×10^{-9} cm/sec and has a liquid flow rate of 4.24×10^{7} $cm^3/sec/cm^2$. The information and drawings have been certified by Thomas J. Dehlin, an Illinois licensed P.E. An inspection of the drawings have shown no deficiencies in the basin and liner system.

The composite liner also meets all requirements from 845.400(b) as is required in 845.400(c)(4). It is constructed of sufficient materials that are exposed to climatic conditions, installation stress, daily operation, shear resistance, and is on a base capable of supporting the basin and is installed to cover all surrounding earth likely to come into contact with CCR or leachate.

B. Leachate Collection System – 845.420

The permittee submitted information and drawings showing that the composite liner will meet these specifications. This system is being placed above the retrofitted Ash Bypass Basin's new composite liner. It will have a sand filter layer having a hydraulic conductivity of at least 10×10^{-5} cm/sec. It has a bottom slope of 3%. For drainage material, they chose option B; it is a drainage geocomposite with a transmissivity of at least $6 * 10^{-4}$ m^2/sec. The drainage components are HDPE and natural soil components which are chemically resistant to CCR and non-CCR waste.

The perforated leachate collection pipe will be surrounded by coarse aggregate bedding in order to prevent fines from clogging the piping. The piping itself is a 6-inch diameter perforated leachate collection pipe which is sloped towards a

sump with a submersible pump and riser pipe to convey leachate out of the basin.

The protective waring layer for the leachate collection system will be 6 inches of densely graded aggregate installed over the sand filter layer. Along the sides, riprap on a gravel bedding layer will protect the sand filter layer from erosion. The upper non-woven geotextile component of the drainage geocomposite will prevent CCR and non-CCR sediments from intruding into, clogging, and impeding the flow of leachate through the HDPE geonet core during the active life and post-closure care period of the retrofitted Ash Bypass Basin.

The information and drawings have been certified by Thomas J. Dehlin, an Illinois licensed P.E. An inspection of the drawings have shown no deficiencies in the leachate collection system.

C. CCR fugitive dust control plant (845.220(b)(3))

The application has a fugitive dust control plan for the construction of the Ash Bypass Basin which conforms to 845.500. A special condition has been added that they keep proper records as required in the regulations.

D. Preliminary written closure plan (845.220(b)(4))

The permittee will close the retrofitted Ash Bypass Basin by removing the CCR and other materials remaining in the basin after the plant has closed, then decontaminating the areas (closure by removal).

E. Initial post-closure care plan (845.220(b)(5))

After removal of all CCR material and this has been verified and certified, groundwater will be sampled to make sure that it is not exceeding the groundwater protection standards.

Special Conditions:

The following explains the conditions of the proposed permit:

The special conditions specify that various plans relating to the operation and maintenance of the basins must be maintained and kept up to date, that the permittee must operate and maintain the groundwater monitoring system, specifies the groundwater standards at the waste boundary, and specifies recordkeeping and reporting requirements.

1. Permittee must Comply with Air and Land Regulations
2. No construction for closure or corrective actions, only retrofit construction of the Ash Bypass Basin
3. Fugitive Dust Control Plan Requirements
4. Permanent Signage Requirements
5. Emergency Action Plan Requirements
6. Safety and Health Plan Requirements
7. Financial Assurance Requirements
8. Lateral expansions must be inspected
9. All impoundments must be inspected annually
10. Two additional down gradient wells in the silty clay silt unit, two piezometers must be added
11. Addresses to mail to Agency
12. Construct according to plans approved by Agency
13. Notify Agency when construction is completed
14. Not released from prior liabilities
15. Sludges generated must be properly disposed of
16. Wastewater discharges governed by NPDES permit
17. All certs, logs etc. as part of construction must be submitted

Public Notice of Draft Permit

Public Notice Number MEL:24032601.docx is hereby given by Illinois EPA, Division of Water Pollution Control, Permit Section, 1021 North Grand Avenue East, Post Office Box 19276, Springfield, Illinois 62794-9276 (herein Agency) that a draft Coal Combustion Residual Surface Impoundment Retrofit Construction Permit (CCR) Permit Number 2024-CC-100030 has been prepared under 40 CFR 124.6(d) for Midwest Generation, LLC for discharge into Illinois River from the Powerton Generating Station, 13082 East Manito Rd., Pekin, IL 61554, (Tazewell County).

The application, draft permit and other documents are available for inspection and may be copied at the Agency between 9:30 A.M. and 3:30 P.M. Monday through Friday. A Fact Sheet containing more detailed information is available at no charge. For further information, call the Public Notice Clerk at 217/782-0610.

Interested persons are invited to submit written comments on the draft permit to the Agency at the above address. The NPDES Permit and Joint Public Notice numbers must appear on each comment page. All comments received by the Agency not later than 30 days from the date of this publication shall be considered in making the final decision regarding permit issuance.

Any interested person may submit written request for a public hearing on the draft permit, stating their name and address, the nature of the issues proposed to be raised and the evidence proposed to be presented with regards to these issues in the hearing. Such requests must be received by the Agency not later than 45 days from the date of this publication.

If written comments and/or requests indicate a significant degree of public interest in the draft permit, the permitting authority may, at its discretion, hold a public hearing. Public notice will be given 45 days before any public hearing.

Coal Combustion Residual Surface Impoundment Permit No. 2024-CC-100030

Illinois Environmental Protection Agency

Division of Water Pollution Control

1021 North Grand Avenue East

Post Office Box 19276

Springfield, Illinois 62794-9276

Coal Combustion Residual Surface Impoundment Retrofit Construction Permit

Expiration Date:

Issue Date:
Effective Date:

Name and Address of Permittee:

Midwest Generation, LLC
13082 East Manito Rd.
Pekin, IL 61554

Name and Address of Facility:

Midwest Generation, LLC
Powerton Generating Station
13082 East Manito Rd.
Pekin, IL 61554
(Tazewell County)

CCR Impoundment:

W1798010008-04 Ash Bypass Basin

In compliance with the provisions of the Illinois Environmental Protection Act, Title 35 of Ill. Adm. Code, Subtitle C and/or Subtitle D, Chapter 1, and the Clean Water Act (CWA), the above-named permittee is hereby authorized to retrofit construct a coal combustion residual (CCR) surface impoundment, at the above location in accordance with the standard conditions and attachments herein.

Coal Combustion Residual Surface Impoundment Permit No. 2024-CC-100030 authorizes the retrofit construction of the Ash Bypass Basin in accordance with 35 Illinois Administrative Code Part 845 as described below.

Coal Combustion Residual Surface Impoundment Permit No. 2024-CC-100030 does not authorize the operation of the Ash Surge Basin, the Metal Cleaning Basin, the Ash Bypass Basin, or the Former Ash Basin.

Coal Combustion Residual Surface Impoundment Permit No. 2024-CC-100030 does not authorize the closure of the Ash Bypass Basin, corrective action for the Ash Bypass Basin, or any construction activities associated with the closure of the Ash Bypass Basin.

Coal Combustion Residual Surface Impoundment Permit No. 2024-CC-100030 does not authorize the closure, corrective action, or any construction for the Ash Surge Basin, the Former Ash Basin, or the Metal Cleaning Basin.

Coal Combustion Residual Surface Impoundment Permit No. 2024-CC-100030 does not authorize the discharge of any wastewater to waters of the United States. NPDES Permit No. IL0002232 authorizes this facility to discharge wastewater to waters of the United States.

Coal combustion residuals, consisting of bottom ash discharged from the station's dewatering bins and other process waste streams related to electric power-generating operations when the Ash Surge Basin was being cleaned. The Ash Bypass Basin covers approximately 0.83 acres and has a storage capacity of approximately 6,700 cubic yards.

Permit is hereby granted to the above designated permittee(s) to construct facilities described as follows:

The retrofit construction of the Ash Bypass Basin including the removal of the gravel warning and sand cushion layers over the existing

geomembrane liner, decontaminating the basin's existing geomembrane liner for re-use as a supplemental liner, decontaminating the basin's appurtenant structures, installing a new basin floor and slopes, installing a composite liner system consisting of a 60-mil HDPE geomembrane over a geosynthetic clay liner, installing a leachate collection and removal system consisting of a drainage geocomposite, leachate collection pipe, and submersible sump pump, installing a sand filter layer over the leachate collection and removal system, and installing a protective warning layer over the sand filter layer. Retrofit construction includes all pipes, pumps, and appurtenances as specified in the Application for Retrofit Construction Permit application dated July 15, 2022 and the Amended Written Retrofit Plan Revision 1 dated March 5, 2024.

Permittee is not authorized to operate after the above expiration date. In order to receive authorization to operate beyond the expiration date, the permittee shall submit the proper application as required by the Illinois Environmental Protection Agency (IEPA) not later than 180 days prior to the expiration date.

Darin E. LeCrone P.E.
Manager, Permit Section
Division of Water Pollution Control

DEL:MEL:24032601.docx

CCR Impoundment Permit No. 2021-CO-100029

Special Conditions

SPECIAL CONDITION 1: This permit does not relieve the Permittee of the responsibility of complying with the provisions of the State of Illinois Rules and Regulations, 35 Ill. Adm. Code Subtitle B, Air Pollution Control, Chapter 1 and 35 Ill. Adm. Code Subtitle G, Land Pollution Control, Chapter 1. The Permittee may be required to file reports and/or obtain applicable permits through the Illinois EPA's Bureau of Air (BOA) - Division of Air Pollution Control (DAPC) and/or Illinois EPA's Bureau of Land (BOL) – Division of Land Pollution Control (DLPC).

SPECIAL CONDTION 2: This construction permit is for Retrofitting of the Ash Bypass Basin and does not cover any closure construction or post-closure care of the Ash Bypass Basin. This permit does not authorize any construction activities necessary for closure and/or corrective action of the Ash Bypass Basin.

SPECIAL CONDITION 3: The operator shall implement methods for controlling dust, including the Fugitive Dust Control Plan included in Application Log No. 2021-100029, so as to prevent wind dispersal of particulate matter off-site.

SPECIAL CONDITION 4: A permanent sign shall be maintained at each CCR impoundment that contains the information required under 35 IAC, Section 845.130.

SPECIAL CONDITION 5: The written Emergency Action Plan (EAP), shall be maintained by the facility. The EAP and all amendments must be placed in the facility's operating record. Upon activation of the EAP, the facility must notify Illinois EPA in writing within 30 days of activation and place all corresponding documentation in the facility operating record. The permittee may amend the EAP at any time but must amend the EAP when there is a change in conditions that would substantially affect the EAP.

SPECIAL CONDITION 6: The Safety and Health Plan and accompanying certification has been submitted as part of Permit Application Log No. 2021-100029 and must be maintained by the facility. The plan must be updated annually and on an as needed basis. The Safety and Health Plan and all amendments must be placed in the facility operating record.

SPECIAL CONDITION 7: The permittee shall provide and maintain financial assurance in accordance with Part 845 Subpart I.

SPECIAL CONDITION 8: All CCR impoundments and any lateral expansion of a CCR surface impoundment must be inspected by a qualified person on a weekly basis and after each 25-year, 24-hour storm event. All CCR surface impoundment instrumentation must be inspected at least every 30 days. A report for each inspection shall be generated and placed into the facility operating record.

SPECIAL CONDITION 9: Each CCR Surface impoundment must be inspected on an annual basis by a qualified Professional Engineer, in accordance with 35 IAC 845.540. An inspection report must be completed and included with the Annual Consolidated Report, as specified in Special Condition 29.

SPECIAL CONDITION 10: Within 60 days of the effective date of this construction permit, the facility must install and begin to monitor at least two additional down gradient wells in the Silty Clay/Silt Unit, two piezometers in the fill unit, and two staff gages in the intermittent stream and standing water within the wetlands north of the service road splitting up the Former Ash Basin.

SPECIAL CONDITION 11: All certifications, logs, reports, plan sheets, notices, and groundwater monitoring data required to be submitted to the Illinois EPA by the permittee shall be mailed to the following address:

Illinois Environmental Protection Agency
Compliance Assurance Section
Bureau of Water
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

Information submittals transmitted by FedEX or UPS shall be mailed to the following address:

Illinois Environmental Protection Agency
Compliance Assurance Section
Bureau of Water
1021 North Grand Avenue East
Springfield, Illinois 62702

Electronic groundwater monitoring data shall be emailed to Illinois EPA at the following email address:
EPA.BOW.GWS.CCR@illinois.gov

CCR Impoundment Permit No. 2021-CO-100029

Special Conditions

Except for electronic groundwater and leachate monitoring data, the operator shall provide the Illinois EPA with the original and two (2) copies of all certifications, logs, reports, and plan sheets required by this permit.

SPECIAL CONDITION 12: The permittee will commence construction in accordance with the specifications listed in the Application for Retrofit Construction Permit application dated July 15, 2022 and the Amended Written Retrofit Plan Revision 1 dated March 5, 2024. Any changes made to the construction plans must be approved by the Agency.

SPECIAL CONDITION 13: The permittee shall notify the Agency when construction has been completed.

SPECIAL CONDITION 14: Issuance of this permit does not release the Permittees from any liability for prior violations of the Act or Rules and Regulations promulgated thereunder.

SPECIAL CONDITION 15: All sludges generated on site shall be disposed of at a site and in a manner acceptable to the Agency.

SPECIAL CONDITION 16: All discharges to a Water of the United States shall be governed by NPDES Permit No. IL0002232.

SPECIAL CONDITION 17: All certifications, logs, reports, plan sheets, notices, and groundwater monitoring data generated as a part of the construction quality assurance program must be reported in the retrofit construction completion report in accordance with 35 IAC 845.770(g) and is required to be submitted to the Illinois EPA prior to termination of the retrofit construction permit by the permittee. The permittee shall mail the retrofit construction completion report to the following address:

Illinois Environmental Protection Agency
Compliance Assurance Section
Bureau of Water
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

Information submittals transmitted by FedEX or UPS shall be mailed to the following address:

Illinois Environmental Protection Agency
Compliance Assurance Section
Bureau of Water
1021 North Grand Avenue East
Springfield, Illinois 62702

DOCUMENT 29

CCR Permit No. 2024-CC-100030
Notice No. MEL:24032601.docx

Public Notice Beginning Date: April 2, 2024

Public Notice Ending Date: May 17, 2024

Coal Combustion Residual Surface Impoundment
Permit Program

Draft Permit for Retrofit Construction of a Coal Combustion Residual Surface Impoundment.

Public Notice/Fact Sheet Issued By:

Illinois Environmental Protection Agency
Bureau of Water
Division of Water Pollution Control
Permit Section
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276
217/782-0610

Name and Address of Permittee:

Midwest Generation, LLC
13082 East Manito Rd.
Pekin, IL 61554

Name and Address of Facility:

Midwest Generation, LLC
Powerton Generating Station
13082 East Manito Rd.
Pekin, IL 61554
(Tazewell County)

The Illinois Environmental Protection Agency (IEPA) has made a tentative determination to issue a Permit for Retrofit Construction of a Coal Combustion Surface Impoundment pursuant to 35 Illinois Administrative Code Part 845 and has prepared a draft permit and associated fact sheet. The IEPA is holding a public comment period and public hearing to offer an opportunity to the public to provide both written and oral comments on this proposed action prior to making a final decision.

The IEPA is accepting written public comments on the draft permit until 11:59 p.m. Friday, May 17, 2024. If you would like to provide written comments, please email your comments to epa.publichearingcom@illinois.gov, RE: "Midwest Generation, LLC – Powerton Generating Station CCR" or "2024-CC-100030". Written comments on the draft permit may also be mailed to IEPA, attention Jeff Guy, IEPA Hearing Officer, P.O. Box 19276, 1021 North Grand Avenue East, Springfield, Illinois 62794-9276. Email comments originating on third party systems or servers intended for submittal of multiple emails of the same or nearly the same content will not be accepted without prior approval from the hearing officer.

In addition to accepting written public comments, the IEPA will host a public hearing on May 8, 2024 beginning at 6:00 p.m. to receive oral public comments on the draft permit. The public hearing will be conducted pursuant to 35 Ill. Adm. Code Part 845. The public hearing will be held in Room A at the Miller Center, 551 South 14th Street, Pekin, Illinois 61554.

A public hearing on this draft permit will be held on May 8, 2024 at 6:00 p.m. in Room A at the Miller Center, 551 South 14th Street, Pekin, Illinois 61554.

Interested persons are invited to submit written comments on the draft permit to the IEPA at:

Hearing Officer Jeff Guy, Office of Community Relations
Re: Midwest Generation, LLC – Powerton Generating Station
Illinois Environmental Protection Agency
1021 North Grand Avenue East, P. O. Box 19276
Springfield, IL 62794-9276

Requests for interpretation (including sign language) must be made by 5:00 p.m. on Wednesday, May 17, 2024 by contacting the IEPA Hearing Officer by email at epa.publichearingcom@illinois.gov, or by calling (217) 785-8724. Questions regarding hearing procedures

or requests to address special needs should be made to the IEPA Hearing Officer by email at epa.publichearingcom@illinois.gov, by calling (217) 785-8724, or by calling (866) 273-5488 (TDD phone number).

The IEPA will provide a Responsiveness Summary, which will be available at the time a final decision is made in this matter. The Responsiveness Summary will include a summary of all significant comments, criticisms, and suggestions, whether written or oral, submitted during the public comment period, at the hearing, or during the time the hearing record is open. The Responsiveness Summary will provide IEPA's response to all significant comments, criticisms, and suggestions and a statement of IEPA's action, including, when applicable, the issuance or denial of the permit.

The permit application, IEPA review notes including load limit calculations, public notice, fact sheet, draft permit, comments received, and other pertinent documents are available for inspection and may be copied at the IEPA between 9:30 a.m. and 3:30 p.m. Monday through Friday when scheduled by the interested person.

You can join the listserv for this facility at the following address:
https://epa.illinois.gov/topics/water-quality/watershed-management/ccr-surface-impoundments.html

For further information on the draft permit, please call Mark E. Liska at 217/782-0610.

The applicant has been operating a steam electric generating station (SIC 4911). The station operates four cyclone coal-fired wet bottom boilers to supply steam to two generating units, designated units #5 and #6 rated at 851 and 846 MW respectively.

CCR basins at the facility consist of the Ash Surge Basin, the Ash Bypass Basin, the Former Ash Basin, and the Metal Cleaning Basin. This permit will cover the retrofit construction of the Ash Bypass Basin only. The operation of the Ash Bypass Basin, Ash Surge Basin, Former Ash Basin, and Metal Cleaning Basin will be covered under a separate permit.

The Ash Bypass Basin is a settling pond for sluiced CCR and other process waters related to power generation when the Ash Surge Basin is not currently in use due to maintenance. The Ash Bypass Basin has a surface area of 0.83 acres and a storage capacity of approximately 6,700 cubic yards. The Ash Bypass Basin has not been in use since April 11, 2021.

Midwest Generation – Powerton Generating Station has an active NPDES Permit IL0002232 that regulates the discharges of wastewater from the property to waters of the United States.

The proposed Coal Combustion Residual Surface Impoundment Retrofit Construction Permit No. 2021-C0-100029 does not address the closure of any of the CCR Basins. Midwest Generation – Powerton Generating Station has submitted a separate Permit application to address the closure of the CCR basins.

Retrofit Construction of Ash Bypass Basin:

Midwest Generation – Powerton Generating Station must comply with the requirements of 35 Illinois Administrative Code Part 845. This proposed Coal Combustion Residual Surface Impoundment Retrofit Construction Permit (Permit No. 2024-CC-100030) is being issued to specify the conditions that must be followed to comply with 35 Illinois Administrative Code Part 845. In order for the permittee to use the Ash Bypass Basin for receiving CCR, it must be retrofitted with a new composite liner system and a new leachate collection and removal system in accordance with federal and state environmental regulations for CCR surface impoundments. It is therefore subject to the requirements of 35 IAC 845.220 for construction permits.

Midwest Generation, LLC – Powerton Station is currently a 1,785 MW coal-fired power plant located in Pekin, IL along the Illinois River. The facility has produced electricity since the 1928 and currently utilizes four coal-fired boilers and two electric generating units, Units 5 and 6. The site is located within Pekin Lake-Illinois River watershed which is approximately 28,834 acres.

The basin historically has managed bottom ash since it was constructed in 1980 and was retrofitted in 2010. The chemical constituents of the CCR have been analyzed in mg/kg. The max capacity of the basin is 6,700 cubic yards. The basin is currently not receiving CCR, but will receive it after retrofit and will receive up to 20 MGD of dewatering effluent, slag tank overflow, basin overflow, etc. until December 31, 2028. The facility has secure, on-site roads for transportation of people and material.

The permittee submitted a construction permit containing the physical and engineering properties of the foundation and abutment materials, the type, size, range, and physical and engineering properties of the materials used in constructing each zone or stage of the CCR surface impoundment and the method of site preparation and construction of each zone of the CCR surface impoundment.

Site drawings show details to the design, construction, operation, and maintenance of the CCR surface impoundment, detailed dimensional drawings of the CCR surface impoundment, including a plan view and cross-sections of the length and width of the CCR surface impoundment, showing all zones, foundation improvements, drainage provisions, spillways, diversion ditches, outlets, instrument locations, and slope protection, in addition to the normal operating pool surface elevation and the maximum pool surface

elevation following peak discharge from the inflow design flood, the expected maximum depth of CCR within the CCR surface impoundment, and any identifiable natural or manmade features that could adversely affect operation of the CCR surface impoundment due to malfunction or mis-operation.

Narrative Description of Proposed Construction:

The permittee's narrative of the construction is as follows: obtain the construction permit, remove the gravel warning and sand cushion layers or the existing liner, decontaminate the existing liner for re-use as a supplemental liner, decontaminate appurtenant structures, place structural fill in the basin floor to establish slopes of the new leachate collection and removal system, install new composite liner, install new leachate collection system, install sand filter layer, and install protective warning layer.

Location Standards:

The permittee provided information and certification on the placement being above the aquifer, wetlands, fault areas, seismic impact zones, unstable areas, and floodplains.

Above the Uppermost Aquifer – October 2018 conclusion approved by Geosyntec that the bottom of the Ash Bypass Basin's existing liner is separated from the upper limit of the uppermost aquifer by at least five feet.

Wetlands - October 2018 conclusion approved by Geosyntec that the Ash Bypass Basin is not located in mapped wetlands.

Fault Areas - October 2018 conclusion approved by Geosyntec that the Ash Bypass Basin is not located within 200 feet of the outermost damage zone of a fault that has had displacement in Holocene time.

Seismic Impact Zones - October 2018 conclusion approved by Geosyntec that the Ash Bypass Basin is not located within a seismic impact zone.

Unstable Areas - October 2018 conclusion approved by Geosyntec that the Ash Bypass Basin is not located in an unstable area.

Floodplain - October 2018 conclusion approved by KPRG that the Ash Bypass Basin is not located in a floodplain according to the National Flood Hazard Layer FIRMette Map No. 17179C0175E prepared by FEMA.

Meeting Design Criteria:

The plans meet these criteria in that it will have a liner that meets the criteria, it will have a new leachate collection system installed, and will have slope protection.

A. Liner requirements – 845.400(c)(1-4)

The permittee has chosen to install an alternative composite liner that meets the requirements of 35 Ill. Adm. Code 845.400(c).

The permittee submitted information and drawings showing that the composite liner will meet these specifications. The maximum hydraulic conductivity of 1.0×10^{-9} cm/sec and has a liquid flow rate of 4.24×10^{7} $cm^3/sec/cm^2$. The information and drawings have been certified by Thomas J. Dehlin, an Illinois licensed P.E. An inspection of the drawings have shown no deficiencies in the basin and liner system.

The composite liner also meets all requirements from 845.400(b) as is required in 845.400(c)(4). It is constructed of sufficient materials that are exposed to climatic conditions, installation stress, daily operation, shear resistance, and is on a base capable of supporting the basin and is installed to cover all surrounding earth likely to come into contact with CCR or leachate.

B. Leachate Collection System – 845.420

The permittee submitted information and drawings showing that the composite liner will meet these specifications. This system is being placed above the retrofitted Ash Bypass Basin's new composite liner. It will have a sand filter layer having a hydraulic conductivity of at least 10×10^{-5} cm/sec. It has a bottom slope of 3%. For drainage material, they chose option B; it is a drainage geocomposite with a transmissivity of at least $6 * 10^{-4}$ m^2/sec. The drainage components are HDPE and natural soil components which are chemically resistant to CCR and non-CCR waste.

The perforated leachate collection pipe will be surrounded by coarse aggregate bedding in order to prevent fines from clogging the piping. The piping itself is a 6-inch diameter perforated leachate collection pipe which is sloped towards a

sump with a submersible pump and riser pipe to convey leachate out of the basin.

The protective waring layer for the leachate collection system will be 6 inches of densely graded aggregate installed over the sand filter layer. Along the sides, riprap on a gravel bedding layer will protect the sand filter layer from erosion. The upper non-woven geotextile component of the drainage geocomposite will prevent CCR and non-CCR sediments from intruding into, clogging, and impeding the flow of leachate through the HDPE geonet core during the active life and post-closure care period of the retrofitted Ash Bypass Basin.

The information and drawings have been certified by Thomas J. Dehlin, an Illinois licensed P.E. An inspection of the drawings have shown no deficiencies in the leachate collection system.

C. CCR fugitive dust control plant (845.220(b)(3))

The application has a fugitive dust control plan for the construction of the Ash Bypass Basin which conforms to 845.500. A special condition has been added that they keep proper records as required in the regulations.

D. Preliminary written closure plan (845.220(b)(4))

The permittee will close the retrofitted Ash Bypass Basin by removing the CCR and other materials remaining in the basin after the plant has closed, then decontaminating the areas (closure by removal).

E. Initial post-closure care plan (845.220(b)(5))

After removal of all CCR material and this has been verified and certified, groundwater will be sampled to make sure that it is not exceeding the groundwater protection standards.

Special Conditions:

The following explains the conditions of the proposed permit:

The special conditions specify that various plans relating to the operation and maintenance of the basins must be maintained and kept up to date, that the permittee must operate and maintain the groundwater monitoring system, specifies the groundwater standards at the waste boundary, and specifies recordkeeping and reporting requirements.

1. Permittee must Comply with Air and Land Regulations
2. No construction for closure or corrective actions, only retrofit construction of the Ash Bypass Basin
3. Fugitive Dust Control Plan Requirements
4. Permanent Signage Requirements
5. Emergency Action Plan Requirements
6. Safety and Health Plan Requirements
7. Financial Assurance Requirements
8. Lateral expansions must be inspected
9. All impoundments must be inspected annually
10. Two additional down gradient wells in the silty clay silt unit, two piezometers must be added
11. Addresses to mail to Agency
12. Construct according to plans approved by Agency
13. Notify Agency when construction is completed
14. Not released from prior liabilities
15. Sludges generated must be properly disposed of
16. Wastewater discharges governed by NPDES permit
17. All certs, logs etc. as part of construction must be submitted

DOCUMENT 30

Public Notice of Draft Permit

Public Notice Number MEL:24032601.docx is hereby given by Illinois EPA, Division of Water Pollution Control, Permit Section, 1021 North Grand Avenue East, Post Office Box 19276, Springfield, Illinois 62794-9276 (herein Agency) that a draft Coal Combustion Residual Surface Impoundment Retrofit Construction Permit (CCR) Permit Number 2024-CC-100030 has been prepared under 40 CFR 124.6(d) for Midwest Generation, LLC for discharge into Illinois River from the Powerton Generating Station, 13082 East Manito Rd., Pekin, IL 61554, (Tazewell County).

The application, draft permit and other documents are available for inspection and may be copied at the Agency between 9:30 A.M. and 3:30 P.M. Monday through Friday. A Fact Sheet containing more detailed information is available at no charge. For further information, call the Public Notice Clerk at 217/782-0610.

Interested persons are invited to submit written comments on the draft permit to the Agency at the above address. The NPDES Permit and Joint Public Notice numbers must appear on each comment page. All comments received by the Agency not later than 30 days from the date of this publication shall be considered in making the final decision regarding permit issuance.

Any interested person may submit written request for a public hearing on the draft permit, stating their name and address, the nature of the issues proposed to be raised and the evidence proposed to be presented with regards to these issues in the hearing. Such requests must be received by the Agency not later than 45 days from the date of this publication.

If written comments and/or requests indicate a significant degree of public interest in the draft permit, the permitting authority may, at its discretion, hold a public hearing. Public notice will be given 45 days before any public hearing.

DOCUMENT 31

State of Illinois
Environmental Protection Agency

Subject: Powerton Generating Station – Construction Retrofit Review

Reviewed By: Mark E. Liska
Permit No. 2024-CC-100030
Page 1 of 9
Log No. 2021-100030
Date: 4/1/2024

Permittee: Midwest Generation, LLC 804 Carnegie Center Princeton, NJ 08540	Facility: Powerton Generating Station 13082 E. Manito Rd. Pekin, IL 61554
Consultant: KPRG and Associates, Inc. 14665 W. Lisbon Rd., Suite 1A Brookfield, WI 53005	

Pond	Pond ID	Pond Status	Closure Prioritization Category
Ash Bypass Basin (Retrofit)	W1798010008-04	Active – Currently Closed	6

Forms Submitted: CCR1, CCR2OE, Construction Permit Application,

Facility ID: W1798010008 NPDES: IL0002232

Facility Overview:

Midwest Generation, LLC – Powerton Station is (currently) a 1,785 MW coal-fired power plant located in Pekin, IL along the Illinois River.

The facility has produced electricity since the 1928 utilizing four coal-fired boilers and two electric generating units, Units 5 and 6.

The Ash Bypass Basin was constructed in 1980 and was taken out of service in October 2020 to be retrofitted with a new composite liner system and a new leachate collection system.

These notes are for the retrofit construction of the Ash Bypass Basin in order to meet 35 Ill. Adm. Code 845 criteria and for the operation of the Ash Bypass Basin only. This permit will not cover the construction of any corrective or closure activities of the Ash Bypass Basin. These notes do not cover the operation of the Ash Surge Basin, Former Ash Basin, or the Metal Cleaning Basin; those are further down. The permit itself will cover the retrofit construction of the Ash Bypass Basin only while a separate permit will cover all of the operating permits.

FORM CCR 1

1. Facility, Operator, Owner Information

State of Illinois
Environmental Protection Agency

Subject: Powerton Generating Station – Construction Retrofit Review
Reviewed By: Mark E. Liska
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- No Problems Noted

2. Legal Description - Provided in Attachment 1: Property Survey and Legal Description

- No Problems noted

3. Publicly Accessible Internet Site Requirements

- No Problems noted

4. Impoundment Identification

- No Problems noted

Environmental Justice –

CCR 2OE

	35 IAC 845.220 – Construction Permit	Submitted	n/a
1	History of construction	☒	☐
2	Purpose, length of use, types of CCR	☒	☐
3	Name and Size of watershed	☒	☐
4	Engineering Properties of Foundation / Abutment Materials	☒	☐
5	Engineering properties, site preparation, construction dates	☒	☐
6	Detailed drawings, plan and cross-section view	☒	☐
7	Description of existing instrumentation	☒	☐
8	Area capacity curves	☒	☐
9	Description of each spillway and diversion design features	☒	☐
10	Specifications for surveillance, maintain, and repair		
11	Record of any instability of impoundment	☐	☐
12	Narrative description of facility	☒	☐
13	Site location map	☒	☐
14	Site Plan Map	☒	☐
15	Narrative Description of proposed construction	☒	☐
16	Plans describing design, nature, function	☒	☐

State of Illinois
Environmental Protection Agency

Subject: Powerton Generating Station – Construction Retrofit Review
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17	New groundwater monitoring plan	☒	☐
18	Signature / seal of qualified professional engineer	☒	☐
19	Certification of completed public notification	☒	☐
20	Location Standards	☒	☐
21	Plans that demonstrate meeting design criteria	☒	☐
22	CCR fugitive dust control plant	☒	☐
23	Preliminary written closure plan	☒	☐
24	Initial post-closure care plan	☒	☐

1. Construction History (845.220(a)(1)(A))

   See name and identification above

2. Statement of Purpose CCR Impoundment used, how long, types (845.220(a)(1)(B))

   Historically used as a settling pond for bottom ash remaining in decant water from their watering bins and other process water. 1980-2020.

3. Name and Size of Watershed (845.220(a)(1)(C))

   Located within Pekin Lake-Illinois River watershed, approximately 28,834 acres

4. Engineering Properties of Foundation / Abutment Materials (845.220(a)(1)(D))

   Foundation is interlaying of sandy and clayey units. Clay and sand are 115-125 pcf in weight with a drained friction angle of 32 degrees. Silt and clay
   layers were observed beneath the fill material used to construct the basin's embankments based on logs from monitoring wells installed in the basin's embankments as well as borings and cone penetration test soundings performed in the vicinity of the basin.

5. Engineering properties, site preparation, construction dates (845.220(a)(1)(E))

   1980 construction plans show the basin's embankments were constructed using compacted fill with a weight of 125 pcf at a drain angle of 35 degrees. The north and west embankments were already there because they share with the ash surge basin and east yard runoff basin, respectively. In 1980, it was lined with a Hypalon liner and a 12" thick poz-o-pac liner. In 2010, these two liners were replaced with a 60-mil HDPE geomembrane liner.

6. Detailed drawings, plan and cross-section view (845.220(a)(1)(F))

State of Illinois
Environmental Protection Agency

Subject: Powerton Generating Station – Construction Retrofit Review

Reviewed By: Mark E. Liska
Permit No. 2024-CC-100030
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Date: 4/1/2024

Detailed drawings were provided in the application. An inspection of these drawings show that they agree with what was written above.

7. Description of existing instrumentation (845.230(a)(1)(G))

The basin has an ultrasonic level detector in the pump house sump north of the ash surge basin to control pumps. A staff gauge determines the water level visually.

8. Area capacity curves (845.220(a)(1)(H))

The permittee provided an area capacity curve in the application.

9. Description of each spillway and diversion design features (845.220(a)(1)(I))

There is a riser in the NE corner of the bypass basin that connects between the bypass basin and the ash surge basin.

10. Specifications for surveillance, maintain, and repair (845.220(a)(1)(J))

Again, the liner was replaced in 2010.

11. Record of any instability of impoundment (845.220(a)(1)(K))

The permittee has no knowledge of structural instability of the structure and the Agency has no record of instability from any inspections performed.

12. Narrative description of facility (845.220(a)(2))

The basin historically has managed bottom ash since it was constructed in 1980 and was retrofitted in 2010. The chemical constituents of the CCR have been analyzed in mg/kg. The max capacity of the basin is 6,700 cubic yards. The basin is currently not receiving CCR, but will receive it after retrofit and will receive up to 20 MGD of dewatering effluent, slag tank overflow, basin overflow, etc. until December 31, 2028. The facility has secure, on-site roads for transportation of people and material.

13. Site location map (845.220(a)(3))

The permittee submitted a detailed site location map in the application.

14. Site Plan map (845.220(a)(4))

State of Illinois
Environmental Protection Agency

Subject: Powerton Generating Station – Construction Retrofit Review
Reviewed By: Mark E. Liska
Permit No. 2024-CC-100030
Page 5 of 9
Log No. 2021-100030
Date: 4/1/2024

The permittee submitted a detailed site plan map in the application showing surface impoundments, roads, boundaries, and existing groundwater monitoring well locations.

15. Narrative Description of proposed construction (845.220(a)(5))

The permittee's narrative of the construction is as follows: obtain the construction permit, remove the gravel warning and sand cushion layers or the existing liner, decontaminate the existing liner for re-use as a supplemental liner, decontaminate appurtenant structures, place structural fill in the basin floor to establish slopes of the new leachate collection and removal system, install new composite liner, install new leachate collection system, install sand filter layer, and install protective warning layer. Each of these items will be described below.

16. Plans describing design, nature, function (845.220(a)(6))

The permittee described the design, nature and function of the ash bypass basin as was mentioned previously above.

As listed above, the permittee fires four coal-fired boilers whose steam turns two electric generating units (Units 5 & 6). Bottom ash from the bottom of the boilers fall into slag tanks where it is quenched with water and sluiced to two dewater bins; one for each unit. Each dewatering bin has a decant pipe where treated overflow water drains into a concrete trench that heads to the Ash Bypass Basin and Ash Surge Basin. Only one of these basins is active at a time; the Ash Surge Basin is the larger and primary one. Upon entering the pond, ash particles still suspended in the ash transport water settle to the pond floor as wastewater discharges to the basin outlet structure at the opposite end. Treated water discharges to the Service Water Basin and is either recycled or discharges through outfall 001.

When the Ash Surge Basin is being cleaned to recover ash particles stored within, overflow from the dewatering bins is diverted tot the smaller Ash Bypass Basin.

Currently, the Ash Bypass Basin has been out of service since 2020 and cannot be used again until it has been retrofitted.

17. New groundwater monitoring plan (845.220(a)(7))

See Groundwater Section Notes

18. Signature / seal of qualified professional engineer ((845.220(a)(8))

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The P.E. signature was provided in the application.

19. Certification of completed public notification (845.220(a)(9))

Certification of completed public notification was provided in the application.

20. Location Standards (845.220(b)(1))

The permittee provided information and certification on the placement being above the aquifer, wetlands, fault areas, seismic impact zones, unstable areas, and floodplains.

Above the Uppermost Aquifer – October 2021 conclusion approved by Geosyntec that the bottom of the Bypass Basin's existing liner is separated from the upper limit of the uppermost aquifer by at least five feet.

Wetlands - October 2021 conclusion approved by Geosyntec that the Ash Bypass Basin is not located in mapped wetlands.

Fault Areas - October 2021 conclusion approved by Geosyntec that the Ash Bypass Basin is not located within 200 feet of the outermost damage zone of a fault that has had displacement in Holocene time.

Seismic Impact Zones - October 2021 conclusion approved by Geosyntec that the Ash Bypass Basin is not located within a seismic impact zone.

Unstable Areas - October 2021 conclusion approved by Geosyntec that the Ash Bypass Basin is not located in an unstable area.

Floodplain - October 2021 conclusion approved by Geosyntec that The Ash Bypass Basin is not located in a floodplain according to the National Flood Hazard Layer FIRMeete Map No. 17179C0175E prepared by FEMA.

21. Plans that demonstrate meeting design criteria (845.220(b)(2))

The plans meet these criteria in that it will have a liner that meets the criteria, it will have a new leachate collection system installed, and will have slope protection.

A. Liner requirements – 845.400(c)(1-4)

State of Illinois
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Subject: Powerton Generating Station – Construction Retrofit Review

The permittee has chosen to install an alternative composite liner that meets the requirements of 35 Ill. Adm. Code 845.400(c).

The permittee submitted information and drawings showing that the composite liner will meet these specifications. The maximum hydraulic conductivity of 1.0×10^{-9} cm/sec and has a liquid flow rate of 4.24×10^{7} $cm^3/sec/cm^2$. The information and drawings have been certified by Thomas J. Dehlin, an Illinois licensed P.E. An inspection of the drawings have shown no deficiencies in the basin and liner system.

The composite liner also meets all requirements from 845.400(b) as is required in 845.400(c)(4). It is constructed of sufficient materials that are exposed to climatic conditions, installation stress, daily operation, shear resistance, and is on a base capable of supporting the basin and is installed to cover all surrounding earth likely to come into contact with CCR or leachate.

B. Leachate Collection System – 845.420

The permittee submitted information and drawings showing that the composite liner will meet these specifications. This system is being placed above the retrofitted Ash Bypass Basin's new composite liner. It will have a sand filter layer having a hydraulic conductivity of at least 10×10^{-5} cm/sec. It has a bottom slope of 3%. For drainage material, they chose option B; it is a drainage geocomposite with a transmissivity of at least $6 * 10^{-4}$ m^2/sec. The drainage components are HDPE and natural soil components which are chemically resistant to CCR and non-CCR waste.

The perforated leachate collection pipe will be surrounded by coarse aggregate bedding in order to prevent fines from clogging the piping. The piping itself is a 6-inch diameter perforated leachate collection pipe which is sloped towards a sump with a submersible pump and riser pipe to convey leachate out of the basin.

The protective waring layer for the leachate collection system will be 6 inches of densely graded aggregate installed over the sand filter layer. Along the sides, riprap on a gravel bedding layer will protect the sand filter layer from erosion. The upper non-woven geotextile component of the drainage geocomposite will prevent CCR and non-CCR sediments from intruding into, clogging, and impeding the flow of leachate through the HDPE geonet core during the active life and post-closure care period of the retrofitted Ash Bypass Basin.

The information and drawings have been certified by Thomas J. Dehlin, an Illinois licensed P.E. An inspection of the drawings have shown no deficiencies in the leachate collection system.

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22. CCR fugitive dust control plant (845.220(b)(3))

The application has a fugitive dust control plan for the construction of the Ash Bypass Basin which conforms to 845.500. A special condition has been added that they keep proper records as required in the regulations.

23. Preliminary written closure plan (845.220(b)(4))

The permittee will close the retrofitted Ash Bypass Basin by removing the CCR and other materials remaining in the basin after the plant has closed, then decontaminating the areas (closure by removal).

24. Initial post-closure care plan (845.220(b)(5))

After removal of all CCR material and this has been verified and certified, groundwater will be sampled to make sure that it is not exceeding the groundwater protection standards.

Special Conditions

1. Permittee must Comply with Air and Land Regulations
2. No construction for closure or corrective actions, only retrofit construction of the Ash Bypass Basin
3. Fugitive Dust Control Plan Requirements
4. Permanent Signage Requirements
5. Emergency Action Plan Requirements
6. Safety and Health Plan Requirements
7. Financial Assurance Requirements
8. Lateral expansions must be inspected
9. All impoundments must be inspected annually
10. Two additional down gradient wells in the silty clay silt unit, two piezometers must be added
11. Background wells for the 3 aquifer unit requirements
12. Downgradient wells for the three aquifer unit requirements
13. Surface water and groundwater interaction monitoring
14. Start groundwater sampling at all wells
15. Statistical methods for evaluating groundwater requirements
16. Groundwater monitoring program must be in compliance with 845

State of Illinois
Environmental Protection Agency

Subject: Powerton Generating Station – Construction Retrofit Review

17. Within 240 days, must submit statistical calculations from Special Condition 16
18. Within 60 days, must provide analysis of CCR
19. Analysis of all waste streams in Bypass Basin
20. Groundwater standards at the waste boundary for the Fill Unit approved
21. Groundwater standards for Silty Clay/Silt unit requirements
22. Groundwater standards for the Sand and Gravel unit requirements
23. Annual consolidated report requirements
24. Annual Groundwater Monitoring and Corrective Action Report requirements
25. Addresses to mail to
26. Construct according to plans approved by Agency
27. Notify Agency when construction is completed
28. Not released from prior liabilities
29. Sludges generated must be properly disposed of
30. Wastewater discharges governed by NPDES permit
31. All certs, logs etc. as part of construction must be submitted

DOCUMENT 32

From: Guy, Jeff <Jeff.Guy@Illinois.gov>
Sent: Tuesday, April 2, 2024 9:43 AM
To: LeCrone, Darin; Liska, Mark; Diers, Stefanie
Cc: Bailey, Sabrina
Subject: RE: Powerton CCR Permits
Attachments: Recommendations.docx; 24032601 Powerton construct bypass basin.docx; 24032701 Powerton operating.docx

Recommendations attached on the two documents.

Jeffrey J. Guy
Illinois Environmental Protection Agency
Office of Community Relations
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276
(217) 785-8724
Jeff.Guy@illinois.gov

From: Liska, Mark <Mark.Liska@Illinois.gov>
Sent: Monday, April 1, 2024 4:02 PM
To: Guy, Jeff <Jeff.Guy@Illinois.gov>
Subject: RE: Powerton CCR Permits

Here's the two fact sheet/permits.

Mark E. Liska
Environmental Protection Engineer
Industrial Permits Section, Bureau of Water
Illinois Environmental Protection Agency
1021 N. Grand Ave. East, P.O. Box 19276
Springfield, IL 62794-9276
Phone: (217) 782-0610
Fax: (217) 782-9891

From: Guy, Jeff <Jeff.Guy@Illinois.gov>
Sent: Monday, April 1, 2024 3:54 PM
To: Liska, Mark <Mark.Liska@Illinois.gov>
Subject: RE: Powerton CCR Permits

Mark,

Can we chat for a minute?

Jeffrey J. Guy
Illinois Environmental Protection Agency
Office of Community Relations

1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276
(217) 785-8724
Jeff.Guy@illinois.gov

From: Liska, Mark <Mark.Liska@Illinois.gov>
Sent: Monday, April 1, 2024 3:42 PM
To: Guy, Jeff <Jeff.Guy@Illinois.gov>
Subject: Powerton CCR Permits

Jeff, we're planning on public noticing the two CCR Powerton permits tomorrow. We have the following info on the public hearing notice:

A public hearing on this draft permit will be held on May 8, 2024 at x:xx p.m. at xxxxx, in Pekin/Peoria.

Interested persons are invited to submit written comments on the draft permit to the IEPA at:

Hearing Officer Dean Studer, Office of Community Relations
Re: Midwest Generation, LLC – Powerton Generating Station
Illinois Environmental Protection Agency
1021 North Grand Avenue East, P. O. Box 19276
Springfield, IL 62794-9276

Comments may also be e-mailed to epa.publichearingcom@iilinois.gov and must specify either "Midwest Generation, LLC – Powerton Generating Station CCR" or "2024-CO-100029" in the subject line. E-mail comments originating on third party systems or servers intended for submittal of multiple emails of the same or nearly the same content will not be accepted without prior approval from the hearing officer.

The application, engineer's review notes including load limit calculations, Public Notice/Fact Sheet, draft permit, comments received, and other documents are available for inspection and may be copied at the IEPA between 9:30 a.m. and 3:30 p.m. Monday through Friday when scheduled by the interested person.

Response to comments will be provided in a responsiveness summary which will be available at the time a final decision is made in this matter.

For further information on the draft permit, please call Mark E. Liska at 217/782-0610.

Are we missing anything? This is the usual language we put in NPDES permits for public hearings. Can you also give me the name and time of the place for May 8?

Mark E. Liska
Environmental Protection Engineer
Industrial Permits Section, Bureau of Water
Illinois Environmental Protection Agency
1021 N. Grand Ave. East, P.O. Box 19276
Springfield, IL 62794-9276
Phone: (217) 782-0610
Fax: (217) 782-9891

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Recommendations for both documents:

Very top:

Illinois Environmental Protection Agency

Notice of Public Comment Period and Public Hearing
Midwest Generation, LLC – Powerton Generating Station CCR

CCR Permit No. 2024-CC-100030
Notice No. MEL:24032601.docx
Coal Combustion Residual Surface Impoundment Permit Program

Public ~~Notice~~ Comment Period Beginning Date: April 2, 2024

Public ~~Notice~~ Comment Period Ending Date: May 17, 2024

The Illinois Environmental Protection Agency (IEPA) has made a tentative determination to issue a permit ~~Permit~~ for Retrofit Construction of a Coal Combustion Surface Impoundment pursuant to 35 ~~Illinois Administrative Code~~ Il. Adm. Code Part 845 and has prepared a draft permit and associated fact sheet [Attached] ~~or the above-named discharger~~. ~~The Public Notice period will begin and end on the dates indicated in the heading of this Public Notice/Fact Sheet.~~ The IEPA is holding a public comment period and public hearing to offer an opportunity to the public to provide both written and oral comments on this proposed action prior to making a final decision.

The IEPA is accepting written public comments on the draft permit until 11:59 p.m. Friday, May 17, 2024. If you would like to provide written comments, please email your comments to ~~to Written comments may also be e-mailed to epa.publichearingcom@iillinois.gov~~ epa.publichearingcom@illinois.gov, RE: ~~and must specify either~~ "Midwest Generation, LLC – Powerton Generating Station CCR" or "2024-CC-100030" ~~in the subject line~~. Written comments on the draft permit may also be mailed to IEPA, attention Jeff Guy, IEPA Hearing Officer, P.O. Box 19276, 1021 North Grand Avenue East, Springfield, Illinois 62794-9276. ~~E-mail~~ Email comments originating on third party systems or servers intended for submittal of multiple emails of the same or nearly the same content will not be accepted without prior approval from the hearing officer.

[please note that 845.260(c)(2) requires that all comments must be submitted to the Agency and to the applicant. Please advise if this information should be included in this notice or how this will be handled internally].

In addition to accepting written public comments, the IEPA will host a public hearing on May 8, 2024 beginning at 6:00 p.m. to receive oral public comments on the draft permit. The public hearing will be conducted pursuant to 35 Ill. Adm. Code Part 845. The public hearing will be held in Room A at the Miller Center, 551 South 14th Street, Pekin, Illinois 61554.

Requests for interpretation (including sign language) must be made by 5:00 p.m. on Wednesday, May 17, 2024 by contacting the IEPA Hearing Officer by email at epa.publichearingcom@illinois.gov, or by calling (217) 785-8724. Questions regarding hearing procedures or requests to address special needs should be made to the IEPA Hearing Officer by email at epa.publichearingcom@illinois.gov, by calling (217) 785-8724, or by calling (866) 273-5488 (TDD phone number).

The IEPA will provide a Responsiveness Summary, which will be available at the time a final decision is made in this matter. The Responsiveness Summary will include a summary of all significant comments, criticisms, and suggestions, whether written or oral, submitted during the public comment period, at the hearing, or during the time the hearing record is open. The Responsiveness Summary will provide IEPA's response to all significant comments, criticisms, and suggestions and a statement of IEPA's action, including, when applicable, the issuance or denial of the permit.

The permit application, ~~engineer's~~ IEPA review notes including load limit calculations, public notice, fact sheet, ~~Public Notice/Fact Sheet,~~ draft permit, comments received, and other pertinent documents are available for inspection and may be copied at the IEPA between 9:30 a.m. and 3:30 p.m. Monday through Friday when scheduled by the interested person. Interested persons may obtain further information and request a copy of pertinent documents by contacting:
[Should we reference the IEPA webpage in which documents can be obtained? e.g., public notice webpage or similar?]

[Pursuant to the 845.260(b)(2)(I), please insert a brief description of how members of the public can request being added to the Agency's listserv for the facility.]

~~Draft Permit for Retrofit Construction of a Coal Combustion Residual Surface Impoundment.~~

~~Public Notice/Fact Sheet Issued By~~:

Mark. E. Liska
IEPA Bureau of Water
Division of Water Pollution Control
Permit Section
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276
217/782-0610

Name and Address of Permittee:

Midwest Generation, LLC
13082 East Manito Rd.
Pekin, IL 61554

Name and Address of Facility:

Midwest Generation, LLC
Powerton Generating Station
13082 East Manito Rd.
Pekin, IL 61554
(Tazewell County)

include the Fact Sheet and Draft Permit as attachments to the Notice of Public Comment Period and Public Hearing

DOCUMENT 33

MWG

Midwest Generation, LLC

POWERTON GENERATING STATION

SPECIFICATION P-1402

GEOSYNTHETIC MATERIALS FOR BYPASS BASIN RETROFIT

S&L PROJECT NO.: 12661-181

REVISION 1

ISSUE PURPOSE: MATERIAL ORDER

ISSUE DATE: 04-04-2024

Sargent & Lundy

Midwest Generation, LLC
Powerton Generating Station
Project No. 12661-181
Issue Summary and Approval Page

Specification P-1402
Rev. 1
Issue: Material Order
Date: 04-04-2024

SECTION 000106

ISSUE SUMMARY AND APPROVAL PAGE

Rev.	Purpose of Issue	Date	Sections Affected
0	For Proposal	03-15-2024	All
1	Material Order	04-04-2024	All

This is to confirm that this Specification has been prepared, reviewed, and approved in accordance with Sargent & Lundy's Standard Operating Procedure SOP-0407, Specifications and Bills of Materials, which is part of our Quality Management System.

Contributor Summary & Current Revision Signatures

Rev.	Prepared By	Reviewed By	Approved By
0	A. Sahlas	T. Dehlin	T. Dehlin
1	Aimee Sahlas A. Sahlas	Digitally signed by Thomas Dehlin Date: 2024.04.04 16:25:41-05'00' T. Dehlin	Digitally signed by Thomas Dehlin Date: 2024.04.04 16:25:52-05'00' T. Dehlin

Midwest Generation, LLC
Powerton Generating Station
Project No. 12661-181
Certification Page

Specification P-1402
Rev. 1
Issue: Material Order
Date: 04-04-2024

SECTION 000107

CERTIFICATION PAGE

Sargent & Lundy (S&L) is registered in the State of Illinois to practice engineering. S&L's Illinois Department of Financial and Professional Regulation registration number is 184-000106.

I certify that this Specification was prepared by me or under my direct supervision and that I am a registered professional engineer under the laws of the State of Illinois.

Certified By: Thomas J. Dehlin Date: April 4, 2024

Seal:



Digitally signed by Thomas Dehlin
Date: 2024.04.04 16:26:09-05'00'



SECTION 000110

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DIVISION 00 – PROCUREMENT AND CONTRACTING

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Section 319020	High Density Polyethylene Geomembrane Liner and Drainage Geocomposite
Section 319025	Geosynthetic Clay Liner

ATTACHMENTS

Attachment 1	Design Drawings
Attachment 2	Reference Drawings

END OF SECTION 000110

SECTION 011100

SUMMARY OF WORK

PART 1 - GENERAL

101. PROJECT INFORMATION

101.1 Owner: Midwest Generation, LLC (MWG)

101.2 Design Engineer: Sargent & Lundy (S&L)

101.3 Project Name: Bypass Basin Retrofit

101.4 Project Location: Powerton Generating Station
13082 E. Manito Rd.
Pekin, IL 61554

102. DESCRIPTION OF THE PROJECT AND GENERAL BACKGROUND

102.1 The purpose of this project is to retrofit the Bypass Basin at Midwest Generation, LLC's Powerton Generating Station in accordance with the Illinois Pollution Control Board's Coal Combustion Residuals (CCR) Rule, 35 Ill. Adm. Code Part 845, and with the U.S. Environmental Protection Agency's (EPA) CCR Rule, 40 CFR Part 257 Subpart D.

102.2 The Bypass Basin will be retrofitted by removing all CCR and CCR-mixed materials stored in the basin and decontaminating the basin's existing geomembrane liner and appurtenant structures, which will remain in place. Following removal of CCR and CCR-mixed material from the basin and decontamination of the basin facilities remaining in-place, a new composite liner system and new leachate collection and removal system (LCRS) will be installed within the Bypass Basin over the basin's existing decontaminated and leak-tested geomembrane liner.

103. SCOPE OF WORK

103.1 In general, this Specification covers the technical requirements for a Geosynthetics Contractor to verify the integrity of the Bypass Basin's existing geomembrane liner, to install the new composite liner system over the existing geomembrane liner, and to install the drainage geocomposite component of the LCRS. The Work includes the following activities:

a. Ensuring all appropriate measures are taken to protect the Bypass Basin's existing HDPE geomembrane liner system from damage throughout all phases of the Work.

b. Verifying the integrity of the Bypass Basin's existing, decontaminated geomembrane liner by:

b1. Conducting a visual inspection of the entire lined area. Observations made during the visual inspection shall be supported by digital photographs, which shall include time, date, and location information.

b2. Performing an electrical leak location survey over the entire lined area in accordance with ASTM D7953, "Standard Practice for Electrical Leak Location on Exposed Geomembranes Using the Arc Testing Method," or an equivalent leak location survey method approved by the Owner.

b3. Repairing all holes, punctures, tears, defects, etc. identified by the electrical leak location survey, if any, in accordance with Section 319020. All repairs shall be documented with digital photographs, which shall include time, date, and location information.

b4. Preparing a report documenting the results of the visual inspection and electrical leak location survey. The report shall include, at a minimum, all field notes, digital photographs, field test data sheets, and repair information (if any).

c. Furnishing and installing a new composite liner system over the existing, decontaminated geomembrane liner and Structural Fill placed within the basin (by Others). The composite liner system consists of an HDPE geomembrane liner over a geosynthetic clay liner (GCL).

d. Furnishing and installing the drainage geocomposite component of the basin's new leachate collection and removal system (LCRS). The drainage geocomposite is an HDPE geonet core with a non-woven geotextile layer heat-laminated to each side of the geonet.

e. Performing specified quality assurance tests to verify the manufactured geosynthetic materials consistently meet or exceed the requirements of this Specification.

f. Restoring and cleaning the project site.

g. Developing fueling and maintenance facilities and practices to protect the project site from hydrocarbon spills or other environmental impacts that may impact the project site, adjacent property, or the Illinois River and connected waterways.

103.2 In addition, the Work shall include but not be limited to the following:

a. Engineering and construction services required to perform or install the Work.

b. Surveying to ensure the Work is located as indicated on the Design Drawings.

c. Furnishing all installation equipment and tools including any calibrated instruments required for monitoring and testing.

d. Disposing of construction-related debris offsite in a permitted landfill approved by the Owner.

e. Maintaining a record of the installation (i.e., as-built drawings) in accordance with the technical requirements of this Specification.

f. Furnishing the services of qualified personnel at the project site to perform the Work.

g. Progress reporting as specified in the Commercial Terms and Conditions.

h. Daily site cleanup and disposal of waste and debris.

i. Participation in the Owner's on-site safety program, including the Owner's CCR Safety and Health Plan Training.

103.3 The Work shall conform to the requirements of this Specification and shall be performed and supervised by personnel who are experienced and knowledgeable in the crafts and trades required by the Scope of Work. The Work shall be performed exclusively by the Geosynthetics Contractor's trained and competent personnel or, where permitted, that of its subcontractor(s); and shall comply with all applicable safety laws, regulations, programs, and practices to ensure the safety of all people located on the work site, including the Geosynthetics Contractor's personnel (or that of its subcontractor(s)) performing the Work.

103.4 Performance of the Work shall include all the labor, supervision, administration, management, material procurement, tools, installation and testing equipment, miscellaneous material, and consumables to perform the Work specified herein.

103.5 Provide all installation equipment and all incidental items not shown or specified but reasonably implied for successful completion of the Work and in strict accordance with Design Drawings and this Specification, including inspection, testing and quality standards.

103.6 Provide installation quality assurance and quality control submittals where required.

103.7 Prepare red-lined as-built drawings for review upon completion of the Work to document any variances between the construction issue of the Design Drawings and the actual installation. Finalize as-built drawings after the Owner and the Design Engineer review.

103.8 All other work, as indicated on the Design Drawings, as specified herein or as required to properly complete the Work.

104. DIVISION OF RESPONSIBILITY & CONTRACTOR QUALIFICATIONS

104.1 Owner:

a. MWG is the Owner of the facility and has the authority to accept or reject materials and workmanship of the Geosynthetics Contractor or the Earthwork Contractor, or reports and recommendations of the CQA Contractor.

b. The Owner will ultimately be responsible for the retrofit construction for the Bypass Basin and for assuring the Permitting Authority that the construction meets or exceeds the requirements specified in state regulations, permits, Project Specifications, and the Design Drawings.

104.2 Design Engineer:

a. S&L is the Design Engineer and is responsible for designing the retrofitted features for the Bypass Basin.

b. The Design Engineer will ensure that the retrofit design meets the construction requirements of the Owner and meets or exceeds the requirements of the Permitting Authority.

c. The Design Engineer will resolve unexpected conditions or unanticipated problems during construction, which may require changes to the permitted design. Changes to the permitted design shall require approval of the Owner and Design Engineer to ensure that the original design objectives are still maintained. All changes shall meet state regulatory requirements and the rules promulgated thereunder and may include Permitting Authority-approved variances to the rules.

104.3 Permitting Authority:

a. The Illinois EPA is the Permitting Authority and is responsible for reviewing the permit application for retrofitting the Bypass Basin to assure compliance with state regulations and for granting the construction permit for the project.

b. The Permitting Authority may review any design revisions during construction and any requests for variance submitted by the Owner. The Permitting Authority has the authority to review and approve all CQA documentation and reports and to confirm the Bypass Basin was retrofitted as specified in Project Specifications and the Design Drawings.

104.4 Geosynthetics Contractor:

a. The Geosynthetics Contractor is the firm with whom the Owner establishes a contract for the satisfactory performance of the Scope of Work covered by this Specification.

b. The Geosynthetics Contractor is responsible for the work, quality, and safety of their staff and all subcontractors and suppliers.

c. The Geosynthetics Contractor shall have a minimum 10-year history of successfully performing similar work.

104.5 Earthwork Contractor. The Earthwork Contractor is the firm with whom the Owner establishes a contract to perform all earthwork and sitework required to retrofit the Bypass Basin, as specified on the Design Drawings and in Specification P-1400.

104.6 Construction Quality Assurance (CQA) Contractor:

a. The CQA Contractor is the firm with whom the Owner establishes a contract to perform all CQA work as specified on the Design Drawings and in Specification P-1401.

b. The CQA Contractor is independent of the Earthwork Contractor, Geosynthetics Contractor, and their subcontractors.

105. MATERIAL AND SERVICES FURNISHED BY OTHERS

105.1 The following work has been, or will be, performed and/or provided by Others:

a. Initial dewatering of the Bypass Basin. The Geosynthetics Contractor shall be responsible for dewatering the basin as necessary for proper installation of geosynthetics materials.

b. Removing all CCR, gravel, and sand above the basin's existing geomembrane liner.

c. Decontaminating the basin's existing geomembrane liner and appurtenant structures for re-use, including conducting and documenting visual inspections and analytical testing to demonstrate the existing liner is no longer contaminated with CCR constituents.

d. Earthwork services as detailed in Specification P-1400 will be procured by the Owner.

e. Third-party CQA services as detailed in Specification P-1401 will be procured by the Owner.

106. DEFINITIONS

106.1 The term "Design Drawing" means the Design Engineer's drawings indicating the Work to be performed.

106.2 The term "Project Specifications" means the technical specifications issued by the Design Engineer that define minimum material, installation, and/or testing requirements for the Work. Project Specifications include this Specification, the Earthwork Specification (P-1400) and the CQA Specification (P-1401).

106.3 The term "Work" means the material and services furnished to retrofit the Bypass Basin as identified on the Design Drawings and as specified herein.

106.4 The term "Owner-approved equal" means an acceptable equivalent to a specified material that has been accepted by the Owner.

107. INTENT OF DOCUMENTS

107.1 The Contract Documents are complementary, and what is called for by any one shall be as binding as if called for by all. The intention of the documents is to include all labor, material, equipment, and transportation necessary for the proper execution of the Work.

107.2 Discrepancies between the Design Drawings and this Specification, or errors or omissions, ambiguities, or mis-description in either the Design Drawings or in this Specification, shall be referred to the Design Engineer for interpretation and adjustment prior to beginning the Work. Do not proceed without the Design Engineer's written acceptance.

108. PERFORMANCE OF THE WORK

108.1 The Geosynthetics Contractor shall provide materials and employ construction practices that are sustainable to the greatest extent possible, including disposal of waste.

108.2 The performance of the Work, as specified herein and as indicated on the Design Drawings, shall comply with the current safety and health standards authorized by the U.S. Department of Labor's Occupational Safety and Health Administration, as well as state and local jurisdictional requirements.

108.3 The Geosynthetics Contractor shall take all appropriate precautions to ensure the safety of all of their personnel (and of their subcontractor's personnel) working on site.

108.4 The Geosynthetics Contractor shall maintain the necessary skilled and qualified labor force for the Work to ensure the on-time completion of the Work.

108.5 The Geosynthetics Contractor's personnel shall be competent, capable, qualified, and able to perform the duties required to the satisfaction of the Owner. A supervisor vested with authority to make decisions binding on the Geosynthetics Contractor shall be assigned to the task to resolve installation problems as they arise so as not to delay completion of the Work.

108.6 The Geosynthetics Contractor shall be solely responsible for advising the Design Engineer in writing of any conflicts between this Specification and the Design Drawings and the Geosynthetics Contractor's drawings, including performance and levels of quality. The Geosynthetics Contractor agrees that its obligations, liabilities, and warranties shall not be diminished or extinguished due to its meeting the requirements of this Specification and the Design Drawings.

109. REGULATORY REQUIREMENTS

109.1 The Geosynthetics Contractor shall at all times be solely responsible for complying with all applicable laws, ordinances, regulations, and codes, including those relating to safety of all persons, in connection with the Work. No obligation of the Owner or Design Engineer shall impose upon them any duty to review the Geosynthetics Contractor's compliance with safety measures.

110. PROTECTION OF PROPERTY AND PERSONNEL SAFETY

110.1 The Geosynthetics Contractor shall conduct safety training of all its personnel (including any subcontractors) in accordance with the Owner's safety requirements, including the Owner's CCR Safety and Health Plan.

111. CLEAN-UP AND DISPOSAL OF DEBRIS

111.1 The Geosynthetics Contractor shall be responsible for clean-up and disposal of all debris resulting from the geosynthetic installation work. All construction related debris shall be properly disposed of (i.e., in an environmentally responsible way) offsite in a permitted landfill approved by the Owner.

111.2 Work areas shall be kept clean and orderly at all times with as little disturbance as possible to existing conditions. Upon completion of work at each site, all tools, equipment, material, and debris shall be completely removed and the area left in a clean condition.

112. EXISTING SITE CONDITIONS

112.1 Prior to performing any Work in any part of the project site, the Geosynthetics Contractor shall make a thorough field check for the purposes of verifying existing conditions that may affect the Work. The Geosynthetics Contractor shall include a thorough investigation of the potential interferences and difficulties that it may encounter in the proper and complete execution of the Work. The Geosynthetics Contractor shall advise the Owner immediately of the discovery of any conditions.

112.2 The Geosynthetics Contractor shall be responsible for location of underground utilities and obstructions prior to performance of the Work and shall promptly notify Owner of any potential interferences that may impact performance of the Work. Modifications to the design to resolve these interferences shall not be implemented until approved by the Owner.

112.3 The Geosynthetics Contractor further acknowledges that it has satisfied itself as to the character, quality and quantity of surface and subsurface material and obstacles, including underground or embedded utilities, to be encountered insofar as this information is reasonably ascertainable from:

a. An inspection of the site (including field location and identification of underground utilities).

b. Reference drawings made available by the Owner.

c. Drawings and specifications that are a part of the Contract.

d. The character and extent of existing work within or adjacent thereto.

e. Any other work being performed thereon at the time of the submission of bids.

112.4 Should the Geosynthetics Contractor fail to perform any of the obligations set forth above, the Geosynthetics Contractor's later plea of ignorance of existing or foreseeable conditions which create difficulties or hindrances in the execution of the Work will not be considered as an excuse for any failure on the part of the Geosynthetics Contractor to fulfill in every detail the requirements of the Contract nor will such a plea be acceptable as the basis of a claim for additional compensation or time to complete the work.

113. VERIFICATION OF DIMENSIONS ON DRAWINGS AND MEASUREMENTS AT SITE

113.1 The Geosynthetics Contractor shall make a thorough field check for the purpose of verifying existing conditions that may affect the Work, such as existing topographic data shown on the Design Drawings, difficulties that might be encountered in the execution of the Work for any reason, and dimensions and other questions relating to interconnection of the Work with the existing ash basin construction.

113.2 The Geosynthetics Contractor shall satisfy itself as to the accuracy of the dimensions of the existing ash basin construction as such dimensions relate to the dimensions given on any drawing issued by the Design Engineer. It shall be understood that neither the Design Engineer nor the Owner guarantee the exactness of such dimensions.

113.3 Should the Geosynthetics Contractor discover any variation in the dimensions of existing conditions and the dimensions given on any drawings issued by the Design Engineer, the Geosynthetics Contractor shall give immediate notice thereof to the Owner and the Geosynthetics Contractor shall not proceed with the Work until such variation is resolved.

114. CONTROL AND CHARGE OF CONTRACTOR'S WORK

114.1 The Design Engineer shall have no authority to stop the Work by the Geosynthetics Contractor for any reason.

114.2 The Geosynthetics Contractor shall be responsible for the safety of its employees and subcontractors and for maintaining the safety of the job site.

114.3 The Geosynthetics Contractor shall be solely responsible for construction means, methods, techniques, sequences, and procedures used in the construction of the Work. The Owner, however, reserves the right to request, and the Contractor shall supply, detailed information regarding the Work such as procedures or work methods.

114.4 Only the Owner (or its authorized representative) has the authority to stop the Work (in accordance with the Commercial Terms and Conditions) if such Work is determined to be not in accordance with this Specification, the Design Drawings, or the Contract documents.

115. DESIGN DRAWINGS

a. The Design Drawings prepared by the Design Engineer indicate the physical dimensions of the geosynthetic material to be manufactured and installed as defined by the Scope of Work and form a part hereof.

b. Refer to Attachment 1 of this Specification for the applicable Design Drawings for this project.

116. REFERENCE DOCUMENTS

116.1 Applicable reference documents for the Scope of Work are provided in Attachment 2 of this Specification.

116.2 The reference documents assembled by the Design Engineer are for information only.

a. The as-built panel layout drawing for the Bypass Basin's existing HDPE geomembrane liner, which was installed in 2010 by Clean Air and Water Systems, LLC, is included in Attachment 2.

b. The 2010 as-built geomembrane panel layout drawing in Attachment 2 is for information only and shall not be used to determine material quantities or the physical dimensions for the Scope of Work.

END OF SECTION 011100

SECTION 319020

HIGH-DENSITY POLYETHYLENE GEOMEMBRANE LINER WITH GEOCOMPOSITE

PART 1 - GENERAL

101. EXTENT

101.1 This section defines the minimum requirements for furnishing and installing the following materials, all in accordance with the Design Drawings and as specified herein:

a. High-density polyethylene (HDPE) geomembrane liner to be used as the upper component of the retrofitted Bypass Basin's new composite liner system.

b. Drainage geocomposite to be used in the retrofitted Bypass Basin's new leachate collection and removal system (LCRS).

101.2 The Work shall include, but not be limited to, the following items:

a. Manufacturing and shipping the HDPE geomembrane liner and drainage geocomposite materials.

b. Performing specified quality assurance tests to verify the manufactured HDPE geomembrane liner and drainage geocomposite materials consistently meet or exceed the requirements of this Specification.

c. Contracting an independent, third-party Quality Assurance (QA) Testing Laboratory to perform the specified quality assurance conformance tests to verify the manufactured HDPE geomembrane liner and drainage geocomposite materials consistently meet or exceed the requirements of this Specification.

d. Preparation and inspection of surfaces to be lined.

e. Placement and seaming of geomembrane.

f. Placement and joining drainage geocomposite.

g. Crest anchorage of geomembrane and drainage geocomposite.

h. Attachment of the geomembrane to concrete structures, existing marker posts, and an existing corrugated metal pipe (CMP) riser.

i. Non-destructive field testing of 100% of geomembrane seams.

j. Removal of samples of geomembrane seams and transportation to an independent third-party laboratory for destructive testing.

k. Repair of defective geomembrane seams.

l. Repair of defects in the geomembrane and at locations where samples were taken.

m. Visual inspection of the completed geomembrane liner.

101.3 Definitions:

a. The following definitions of terms shall apply throughout this section:

a1. GM/GC Manufacturer: The manufacturer who is responsible for manufacture of geomembrane and drainage geocomposite materials and for transporting geomembrane and drainage geocomposite materials to the site.

a2. QA Testing Laboratory: The company employed by the GM/GC Manufacturer who is responsible for performing the specified quality assurance conformance tests. The QA Testing Laboratory shall be objective, competent, and independent from the GM/GC Manufacturer whose products are being tested. The QA Testing Laboratory shall remain independent throughout the duration of the project.

a3. CQA Geosynthetics Inspector: An inspector who works for the CQA Contractor and is responsible for inspection of the Geosynthetics Contractor's work.

101.4 Qualifications:

a. GM/GC Manufacturer:

a1. The GM/GC Manufacturer shall be approved by the Owner. Owner's considerations when approving the GM/GC Manufacturer may include, but are not limited to, financial, safety, and prior performance aspects of the manufacturer.

a2. The GM/GC Manufacturer shall have an internal QA/QC program to ensure and to verify the manufactured products consistently meet or exceed the requirements of this section.

a3. The GM/GC Manufacturer shall have at least 10 years of experience manufacturing products similar to those required for this Work.

b. QA Testing Laboratory:

b1. The QA Testing Laboratory shall be approved by the Owner. Owner's considerations when approving the QA Testing Laboratory may include, but are not limited to, financial, safety, and prior performance aspects of the company.

b2. The QA Testing Laboratory shall have an internal QA/QC program to ensure and to verify the specified tests are performed correctly.

b3. The QA Testing Laboratory shall have at least 10 years of experience testing manufactured products similar to those required for this Work.

102. RELATED WORK SPECIFIED IN OTHER SECTIONS AND SPECIFICATIONS

102.1 The work specified in this section shall be coordinated with work specified in the following related sections and specifications:

a. Earthwork Specification (P-1400):

a1. Section 319005 – Earthwork.

b. CQA Specification (P-1401):

b1. Section 014362 – Quality Assurance for Fill, Liner, and Leachate Collection Materials.

c. Geosynthetic Materials Specification (P-1402):

c1. Section 319025 – Geosynthetic Clay Liner.

103. REFERENCE DOCUMENTS

103.1 Standards, specifications, manuals, codes, and other publications of nationally recognized organizations and associations are referenced herein. Methods, equipment, and materials specified herein shall comply with the specified and applicable portions of the referenced documents, in addition to federal, state, or local agencies having jurisdiction.

103.2 References to these documents are to the latest issue date of each document, unless otherwise indicated, together with the latest additions, addenda, amendments, supplements, etc., thereto, in effect as of the date of Contract for the Work.

103.3 Abbreviations listed indicate the form used to identify the reference documents cited in this section.

103.4 ASTM — ASTM International:

a. A276 Specification for Stainless and Heat Resisting Steel Bars and Shapes.

b. B633 Specification for Electrodeposited Coatings of Zinc on Iron and Steel.

c. D792 Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement.

d. D1004 Test Method for Initial Tear Resistance of Plastic Film and Sheeting.

e. D1505 Test Method for Density of Plastics by the Density-Gradient Technique.

f. D1603 Standard Test Method for Carbon Black Content in Olefin Plastics.

g. D4218 Standard Test Method for Determination of Carbon Black Content of Polyethylene Compounds by the Muffle-Furnace Technique.

h. D4355 Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc-Type Apparatus.

i. D4491 Standard Test Methods for Water Permeability of Geotextiles by Permittivity.

j. D4533 Standard Test Method for Trapezoid Tearing Strength of Geotextiles.

k. D4632 Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.

l. D4716 Test Method for Determining the (In-Plane) Flow Rate Per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head.

m. D4751 Standard Test Methods for Determining Apparent Opening Size of a Geotextile.

n. D4833 Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products.

o. D5199 Standard Test Method for Measuring the Nominal Thickness of Geosynthetics.

p. D5261 Test Method for Measuring Mass per Unit Area of Geotextiles.

q. D5397 Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test.

r. D5596 Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics.

s. D5641 Standard Practice for Geomembrane Seam Evaluation by Vacuum Chamber.

t. D5721 Standard Practice for Air-Oven Aging of Polyolefin Geomembranes.

u. D5820 Standard Practice for Pressurized Air Channel Evaluation of Dual Seamed Geomembranes.

v. D5885 Test Method for Oxidative Induction Time of Polyolefin Geosynthetics by High-Pressure Differential Scanning Colorimetry.

w. D5994 Test Method for Measuring Core Thickness of Textured Geotextile.

x. D6241 Standard Test Method for Static Puncture Strength of Geotextiles and Geotextile Related Products Using a 50-mm Probe.

y. D6364 Standard Test Method for Determining Short-Term Compression Behavior of Geosynthetics.

z. D6392 Standard Test Method for Determining the Integrity of Non-Reinforced Geomembrane Seams Produced Using Thermo-fusion Methods.

aa. D7005 Standard Test Method for Determining the Bond Strength (Ply Adhesion) of Geocomposites.

bb. D7179 Standard Test Method for Determining Geonet Breaking Force.

cc. D7466 Standard Test Method for Measuring Asperity Height of Textured Geomembranes.

dd. D8117 Standard Test Method for Oxidative Induction Time of Polyolefin Geosynthetics by Differential Scanning Calorimetry.

103.5 Geosynthetic Research Institute (GRI):

a. GM6 Standard Practice for Pressurized Air Channel Test for Dual Seamed Geomembrane.

b. GM9 Cold Weather Seaming of Geomembranes.

c. GM10 Specification for the Stress Crack Resistance of Geomembrane Sheet.

d. GM13 Standard Specification for Test Properties, Testing Frequency and Recommended Warranty for High Density Polyethylene (HDPE) Smooth and Textured Geomembranes.

e. GM14 Standard Guide for Selecting Variable Intervals for Taking Geomembrane Destructive Seam Samples Using the Method of Attributes.

f. GM19a Standard Specification for Seam Strength and Related Properties of Thermally Bonded Homogenous Polyolefin Geomembranes/Barriers.

103.6 Industrial Fabrics Association International (IFAI):

a. Field Sewing of Geotextiles by V. Diaz and B. Myles, 1989.

104. SUBMITTALS

104.1 The Geosynthetics Contractor shall submit the following drawings and data as specified. The Geosynthetics Contractor's drawings and data shall be submitted via electronic medium in a format compatible for importing into the Owner's information systems (as specified by the Owner).

104.2 Submittals with Bid Proposal:

a. Copies of the GM/GC Manufacturer's catalog data describing the HDPE geomembrane liner and drainage geocomposite materials proposed for use on this project.

b. Copies of the GM/GC Manufacturer's Quality Control and Quality Assurance Policies and Procedures for the HDPE geomembrane and drainage geocomposite materials proposed for use on this project.

c. Warranty:

c1. Written warranties from the GM/GC Manufacturer and Geosynthetics Contractor covering the quality of the material and workmanship as applicable.

c2. The minimum period of warranty for materials shall be 20 years from the date of shipment.

c3. The minimum period of warranty for installation shall be 2 years.

104.3 Submittals After Material Order:

a. Geomembrane Resin:

a1. Certification signed by the GM/GC Manufacturer's authorized representative stating that the resin meets the requirements of this Specification.

a2. Certification signed by the GM/GC Manufacturer's authorized representative stating the origin of the resin used and that all resin is from the same supplier. This certification shall include, at a minimum, the resin supplier's name and contact information and the resin identification brand name.

a3. Copies of the GM/GC Manufacturer's and the resin supplier's QA/QC certificates. Certificates shall include a summary report of test results conducted to verify the quality of the resin used in each batch used to manufacture geomembrane for this project. As a minimum, the summary report shall include tests on specific gravity, melt flow index, and percent carbon black.

b. Geomembrane Sheeting:

b1. HDPE geomembrane manufacturing lot and roll numbers with corresponding shipping information.

b2. The following certifications shall be submitted to the Owner and signed by an authorized representative of the GM/GC Manufacturer:

b2.1 Certification stating that the geomembrane liner material manufactured for this project meets the requirements of this Specification and that those requirements are guaranteed by the GM/GC Manufacturer.

b2.2 Certification stating that no post-consumer resin (PCR) has been added to the formulation.

b2.3 Certification stating that the manufactured geomembrane sheeting is free of per- and polyfluoroalkyl substances (PFAS).

b3. Copies of all of the GM/GC Manufacturer's QA/QC certificates on tests performed on the geomembrane liner material as specified in Table 319020-1 and a summary report of the test results.

b4. Copies of all the third-party, independent QA Testing Laboratory test reports documenting the results of the conformance tests specified in Table 319020-3, as performed by the laboratory on the representative samples provided by the GM/GC Manufacturer.

c. Drainage Geocomposite:

c1. Drainage geocomposite manufacturing lot and roll numbers with corresponding shipping information.

c2. Copies of the raw material producers' certificates describing the origin and identification of the raw materials.

c3. Copies of the raw material producers' QA/QC certificates.

c4. Certification stating that the drainage geocomposite material manufactured for this project meets the requirements of this Specification and that those requirements are guaranteed by the GM/GC Manufacturer.

c5. Certification stating that the manufactured drainage geocomposite is free of per- and polyfluoroalkyl substances (PFAS).

c6. Copies of all of the GM/GC Manufacturer's QA/QC certificates on tests performed on the geonet core, geotextile cap and carrier, and double-sided laminated geocomposite as specified in Table 319020-2 and a summary of the results of the tests.

c7. Copies of all the third-party, independent QA Testing Laboratory test reports document the results of the conformance tests specified in Table 319020-4, as performed by the laboratory on the representative samples provided by the GM/GC Manufacturer.

d. Extrudate Resins or Rods for Seaming Geomembranes. Certification that all extrudate is the same resin type as the geomembrane and was obtained from the same resin supplier as the resin used to manufacture the geomembrane liner materials.

e. Installation Data:

e1. GM/GC Manufacturer's proposed geomembrane panel layout for the retrofitted Bypass Basin.

e2. GM/GC Manufacturer's recommended procedures for making and testing seams if different from those specified herein.

e3. GM/GC Manufacturer's recommended procedures for repairing damaged geomembrane and drainage geocomposite material sections and seams if different from those specified herein.

e4. GM/GC Manufacturer's details of geomembrane liner anchorage and attachment to structures and penetrations if different from those specified herein and from the details shown on the Design Drawings.

104.4 Submittals After Construction is Complete:

a. As-built panel layout.

b. Plan drawing showing locations of repairs and types of repairs made.

c. Locations of destructive tests.

d. Results of destructive tests.

e. Results of non-destructive tests.

105. QUALITY ASSURANCE

105.1 Materials and construction procedures shall be subject to inspection and testing by the CQA Contractor employed by the Owner. Such inspections and tests will not relieve the Geosynthetics Contractor of the responsibility for providing and installing materials in compliance with specified requirements.

105.2 The Owner reserves the right, at any time before final acceptance, to reject materials or workmanship not complying with specified requirements. The Geosynthetics Contractor shall correct the deficiencies which the inspections and tests have indicated are not in compliance with specified requirements.

105.3 CQA activities will be performed by the CQA Contractor as described herein and in Specification P-1401.

PART 2 – MATERIALS

201. HIGH-DENSITY POLYETHYLENE GEOMEMBRANE LINER

201.1 General Requirements:

a. All HDPE geomembrane shall be textured on both sides and meet the requirements of Table 319020-1.

b. Textured surfaces shall be manufactured using a co-extrusion process, have a uniform texturing appearance, and be free from agglomerated texturing material and such defects that would affect the specified properties of the HDPE geomembrane.

c. Each roll of geomembrane shall have 6-inch wide (minimum) smooth edges to provide suitable seaming surfaces. Textured HDPE geomembrane without smooth edges may be provided if approved by the Owner.

d. HDPE geomembrane shall be manufactured from first quality, virgin resin. Blending of resins shall not be allowed. No recycled or reworked geomembrane may be used except edge trim generated during the manufacturing process, which shall be limited to at most 10%. No post-consumer resin (PCR) of any type shall be added to the formulation.

e. The resin used to produce the HDPE geomembrane shall be formulated to be resistant to chemical and ultraviolet degradation.

f. The HDPE geomembrane shall be free of plasticizers, leachable additives, and per- and polyfluoroalkyl substances (PFAS).

g. During manufacture, each roll of HDPE geomembrane shall be continuously monitored across the width to assure uniformity of thickness. Thickness measurements shall meet the requirements of Table 319020-1.

h. The HDPE geomembrane shall be free of factory seams.

i. The HDPE geomembrane shall be free from dirt, oil, foreign matter, scratches, cracks, creases, bubbles, blisters, pits, tears, holes, pores, pinholes, voids, undispersed raw material, any sign of contamination, or other defects that may affect serviceability, and shall be uniform in color, thickness, and surface texture.

j. Panels of HDPE geomembrane shall be capable of being seamed in the field to yield seams that are as resistant to waste liquids as the sheets.

k. The HDPE geomembrane shall be manufactured in the United States or Canada.

201.2 Panel Layout:

a. Prior to manufacturing the HDPE geomembrane liner for the retrofitted Bypass Basin, the GM/GC Manufacturer shall make a panel layout of the surface to be lined. Each panel to be used for the installation shall be given a numeric or alphanumeric identification number.

b. Each panel identification number shall be related in writing to the manufacturing roll number that identifies the resin type, batch number, and date of manufacture.

c. The panel layout shall be made considering the following requirements:

c1. Panel lengths shall include slope gain and anchorage.

c2. Perpendicular tie-ins shall be made a minimum of 5 feet beyond the toe of the slope.

c3. A minimum 6-inch-wide overlap shall be allowed at double fusion welded seams.

c4. All field seams on slopes shall be oriented parallel to the slope (oriented along, not across the slope).

c5. The number of seams in corners or odd-shaped geometric locations shall be minimized.

Midwest Generation, LLC
Powerton Generating Station
Project No. 12661-181
High-Density Polyethylene
Geomembrane Liner with Geocomposite

Specification P-1402
Rev. 1
Issue: Material Order
Date: 04-04-2024

TABLE 319020-1

TEXTURED HIGH-DENSITY POLYETHYLENE GEOMEMBRANE REQUIREMENTS(1)

Property	ASTM Test Method	Polyethylene Base Compound	Geomembrane	Testing Frequency
Nominal Thickness (mil)	--	--	60	--
Resin Properties				
Density of Base Resin, g/cc (min.)	D1505 / D792	0.932		5,000 lbs. of Resin
Oxidative Induction Time (OIT) (min. ave.)				
a. Standard OIT (minutes)	D8117	100	--	5,000 lbs. of Resin
– or –				
b. High Pressure OIT (minutes)	D5885	400	--	5,000 lbs. of Resin
Oven Aging at 85°C	D5721	--	--	
a. Standard OIT (min. ave.), % retained after 90 days	D8117	55	--	One per Formulation
– or –				
b. High Pressure OIT (min. ave.), % retained after 90 days	D5885	80	--	One per Formulation
UV Resistance				
High Pressure OIT (min. ave.), % retained after 1600 hrs.	D5885	50	--	One per Formulation
Analytical Properties				
Formulated Density, g/cc (min.)	D1505 / D792	--	0.940	5,000 lbs. of Resin
Carbon Black Content, % (range)	D4218	2.0 – 3.0	--	5,000 lbs. of Resin
Carbon Black Dispersion for 10 Different Views	D5596	Note (2)	--	5,000 lbs. of Resin
Mechanical Properties				
Thickness, mils	D5994	--	--	One per Roll
Minimum Average			57	
Lowest Individual for 8 out of 10 Values			54	
Lowest Individual for 10 out of 10 Values			51	
Asperity Height, mils (min. ave.)	D7466	--	16	Every Second Roll(3)
Tensile Properties in Each Direction (min. ave.)	D6693 (Type IV Specimen at 2 ipm)			5,000 lbs. of Resin
Tensile Stress at Yield, ppi (min.)		--	126	
Elongation at Yield, % (min.)		--	12	
Tensile Stress at Break, ppi (min.)		--	90	
Elongation at Break, % (min. 2" gage length)		--	100	
Tear Resistance, lbs. (min. ave.)	D1004		42	5,000 lbs. of Resin
Puncture Resistance, lbs. (min. ave.)	D4833		90	5,000 lbs. of Resin
Environmental Aging Effect on Properties				
Stress Crack Resistance, hours (min.)	D5397	--	500	Per GRI GM10

Notes:
(1) Requirements shown in this table meet the minimum requirements of GRI Standard GM13, Revision 17 (July 17, 2023).
(2) Carbon black dispersion (only near spherical agglomerates) for 10 different views: 9 in Categories 1 or 2 and 1 in Category 3.
(3) Alternate measurement side for double-sided textured sheet.

202. DRAINAGE GEOCOMPOSITE

202.1 General Requirements:

a. The drainage geocomposite shall consist of a HDPE geonet core with a non-woven geotextile layer heat-laminated to each side of the geonet.

b. HDPE Geonet:

b1. The geonet shall be a profiled geonet manufactured by extruding two sets of polyethylene strands to form a three-dimensional structure in a diamond shape to provide planar water flow.

b2. The HDPE geonet formulation shall consist of a minimum of 97 percent of polyethylene resin, with the balance being carbon black and antioxidants for protection during extrusion and long-term service performance. No fillers, extenders, or other materials shall be mixed into the formulation.

b3. Regrind or reworked polymer which is previously processed HDPE geonet in chip form is acceptable if:

b3.1 It is the same formulation as the geonet being produced.

b3.2 No more than 25% rework material is used in the formulation.

b4. No PCR of any type shall be added to the formulation.

c. Non-Woven Geotextiles:

c1. The geotextiles shall be non-woven, spun bonded fabric manufactured from long chain polymeric filaments, yarns, staple fibers, or other structural components of polyester or polypropylene formed into a stable network (mesh).

c2. The nominal weight of each geotextile shall be 8 oz/sy.

202.2 Material Requirements. The drainage geocomposite shall meet the requirements of Table 319020-2.

TABLE 319020-2

DRAINAGE GEOCOMPOSITE MATERIAL REQUIREMENTS

Property	Value	ASTM Test Method	Test Frequency
Geonet Core (Before Lamination)			
Thickness(1)	300 mil (min. ave.)	D5199	Per 5,000 lb.
Density of Formulated Material(2)	0.95 g/cm^3 (min. ave.)	D1505 / D792	Per 5,000 lb.
Carbon Black Content	1.5% to 3.0%	D1603 / D4218	Per 5,000 lb.
Tensile Strength	75 lb/in. (min. ave.)(3)	D7179	Per 5,000 lb.
Compressive Strength	120 psi (min. ave.)	D6364(4)	Per 5,000 lb.
Geotextile Cap and Carrier (Before Lamination)			
Mass per Unit Area	8 oz/sy (Min. ARV)	D5261	Varies(5)
Grab Strength	200 lb (Min. ARV)	D4632	
Grab Elongation	50% (Min. ARV)	D4632	
Tear Strength	80 lb (Min. ARV)	D4533	
Puncture Strength	430 lb (Min. ARV)	D6241	
Permittivity	0.2 sec^{-1} (Min. ARV)	D4491	
AOS	0.25 (Max. ARV)	D4751	
UV Stability	50% Retained (500 hr)	D4355	
Double-Sided Laminated Composite			
Flow Rate / Width	0.42 gpm / ft (min. ave.)	D4716(6)	Per 5,000 lb.
Hydraulic Gradient	0.03		
Pressure	1,260 psf		
Seating Dwell Time	15 min.		
Ply Adhesion	1.0 lb/in. (min. ave.)(7)	D7005	Per 5,000 lb.

Notes:

(1) The diameter of the presser foot shall be 2.22 in. and the pressure shall be 2.9 psi.

(2) The density of the base resin will be slightly lower than the density of the formulated material.

(3) This is the average peak value for five equally spaced machine direction tests across the roll width.

(4) Test shall be conducted using ASTM D6364 Section 6.3, the movable plate method.

(5) Because the specified geotextile properties are based on average roll values (ARV), the statistics needed to obtain such values will dictate the frequency of testing.

(6) Geocomposite shall be tested for ASTM D4716 flow rate per unit width between rigid end plates. Test values are for machine direction only.

(7) This is the average of five equally spaced machine direction tests across the roll width. Both sides of the geocomposite shall be tested for ply adhesion.

202.3 Panel Layouts:

a. Prior to manufacturing the drainage geocomposite for the retrofitted Bypass Basin, the GM/GC Manufacturer shall make a panel layout of the surface to be lined. Each panel to be used for the installation shall be given a numeric or alphanumeric identification number.

b. Each panel identification number shall be related in writing to the manufacturing roll number that identifies the manufacturing lot number and date of manufacture.

c. The panel layout shall be made considering the following requirements:

c1. Panel lengths shall include slope gain and anchorage.

c2. Perpendicular tie-ins shall be made a minimum of 5 feet beyond the toe of the slope.

c3. The drainage geocomposite shall be positioned on both the slopes and the bottom so that the geonet core overlaps by a minimum of 4 inches.

c4. All field seams on slopes shall be oriented parallel to the slope (oriented along, not across the slope).

c5. The number of seams in corners or odd-shaped geometric locations shall be minimized.

203. MATERIALS FOR ATTACHMENT OF GEOMEMBRANE TO CONCRETE

203.1 Batten Strip:

a. Batten strip material shall be hot rolled, annealed, and pickled Type 316L stainless steel in accordance with ASTM A276.

b. Strips shall be ¼ inch thick by 2 inches wide. Random lengths are acceptable.

203.2 Expansion Anchors:

a. Expansion anchors shall be stud type with a single piece three section wedge and zinc plated in accordance with ASTM B633. Wedges shall be manufactured from ANSI Type 304 stainless steel. Hilti Kwik Bolt 3 Expansion Anchors, or equal, are acceptable.

b. Wedge-type anchors shall have a minimum yield strength of 60,000 psi. Stud-type anchors shall have a minimum tensile strength of 65,000 psi.

c. Anchors shall be 3/8-inch diameter by 3 ½-inches long.

d. Washers for anchors shall be Type 18-8 stainless steel flat washers for 3/8-inch diameter bolt size.

203.3 Neoprene Gaskets for Batten Strips:

a. Neoprene gaskets shall be ¼-inch thick by 2-inches wide, closed cell neoprene sponge sealing strips. Operating temperature range of neoprene shall be -40°F to +220°F.

b. Neoprene gaskets placed against concrete shall have a pressure sensitive adhesive on the side of the gasket placed against the concrete.

PART 3 – EXECUTION

301. THIRD-PARTY QUALITY ASSURANCE CONFORMANCE TESTING

301.1 Prior to material shipment to the site, the GM/GC Manufacturer shall submit to the QA Testing Laboratory representative samples of the HDPE geomembrane and drainage geocomposite materials to be shipped to the project site. Samples sent to the QA Testing Laboratory shall be accompanied by a chain of custody and a certification that the samples submitted are from the geomembrane materials to be delivered to the project site.

301.2 HDPE Geomembrane:

a. The QA Testing Laboratory shall perform conformance testing of the received geomembrane samples in accordance with Table 319020-3. The laboratory tests shall be performed at least at the corresponding minimum frequencies specified in Table 319020-3.

b. Conformance test acceptance criteria shall be as specified in Table 319020-1.

c. The QA Testing Laboratory shall prepare a test report documenting the results of all tests performed on each sample. The QA Testing Laboratory shall submit each test report to the GM/GC Manufacturer within 24 hours of completing the tests.

d. If the results from any of the tests in Table 319020-3 do not meet the respective pass/fail thresholds, then the geomembrane materials from the resin batch(es) corresponding to the failed test(s) are to be considered rejected and shall not be shipped to the project site.

301.3 Drainage Geocomposite:

a. The QA Testing Laboratory shall perform conformance testing of the received drainage geocomposite samples in accordance with Table 319020-4. The laboratory tests shall be performed at least at the corresponding minimum frequencies specified in Table 319020-4.

b. Conformance test acceptance criteria shall be as specified in Table 319020-2.

c. The QA Testing Laboratory shall prepare a test report documenting the results of all tests performed on each sample. The QA Testing Laboratory shall submit each test report to the GM/GC Manufacturer within 24 hours of completing the tests.

d. If the results from any of the tests in Table 319020-4 do not meet the respective pass/fail thresholds, then the drainage geocomposite materials from the resin batch(es) corresponding to the failed test(s) are to be considered rejected and shall not be shipped to the project site.

TABLE 319020-3

THIRD-PARTY QUALITY ASSURANCE TESTING REQUIREMENTS

FOR HDPE GEOMEMBRANE LINER

Property	ASTM Test Method	Min. Testing Frequency
Thickness	D5994	Five per roll at locations evenly distributed throughout the roll
Density	D1505 / D792	Per resin batch, but not less than once per 20,000 SF
Tensile Properties: (1) Strength at Yield (2) Elongation at Yield (3) Strength at Break (4) Elongation at Break	D6693	
Tear Resistance	D1004	
Puncture Resistance	D4833	
Carbon Black Content	D4218	
Carbon Black Dispersion	D5596	

TABLE 319020-4

THIRD-PARTY QUALITY ASSURANCE TESTING REQUIREMENTS

FOR DRAINAGE GEOCOMPOSITE

Property	ASTM Test Method	Min. Testing Frequency
Flow Rate per Width	D4716	Once per 20,000 SF
Ply Adhesion	D7005	

302. SHIPPING

302.1 All geomembrane liner and drainage geocomposite materials shall be shipped to the project site in rolls. No geomembrane liner or drainage geocomposite materials shall be folded.

302.2 Transportation of all geomembrane liner and drainage geocomposite materials to the project site shall be the responsibility of the GM/GC Manufacturer.

303. PACKAGING

303.1 Packaging of all geomembrane liner and drainage geocomposite materials shall be the responsibility of the GM/GC Manufacturer. All rolls of geomembrane and drainage geocomposite shall be completely wrapped / covered in order to provide protection from ultraviolet degradation and damage during shipping and storage.

303.2 A label shall be attached or adhered to each roll of geomembrane. The label shall identify the following:

a. Name of GM/GC Manufacturer.

b. Product identification (e.g., brand name, product code), which can be traced back to the origin of the base material (resin supplier's name, resin production plant, resin brand name type, and production date of the resin).

c. Order number.

d. Date of manufacture.

e. Manufacturing lot number.

f. Geomembrane thickness and type.

g. Roll identification number.

h. Roll dimensions (i.e., length and width) and weight.

i. Panel number, which shall be referenced to the proposed HDPE geomembrane panel layout drawing prepared by the GM/GC Manufacturer.

303.3 A label shall be attached or adhered to each roll of drainage geocomposite. The label shall identify the following:

a. Name of GM/GC Manufacturer.

b. Product identification (e.g., brand name, product code).

c. Order number.

d. Date of manufacture.

e. Manufacturing lot number.

f. Drainage geocomposite thickness and type.

g. Roll identification number.

h. Roll dimensions (i.e., length and width) and weight.

i. Panel number, which shall be referenced to proposed drainage geocomposite panel layout drawing prepared by the GM/GC Manufacturer.

304. ONSITE UNLOADING, INSPECTION, AND STORAGE

304.1 Unloading:

a. Handling and unloading will be the responsibility of the Earthwork Contractor.

b. Upon arrival at the site, HDPE geomembrane rolls and drainage geocomposite rolls will be carefully unloaded by the Earthwork Contractor.

304.2 Inspection:

a. Upon delivery of the material to the project site, the Geosynthetics Contractor shall visually inspect all of the rolls of HDPE geomembrane and drainage geocomposite for damage or rips or tears. This inspection shall be done without unrolling any rolls unless damage to the inside of a roll is found or suspected.

b. Any damage or defects shall be noted and immediately reported to the Owner, the GM/GC Manufacturer, and the carrier that transported the material. Any HDPE

geomembrane or drainage geocomposite roll or portion thereof, which, in the judgement of the Owner, is seriously damaged, shall be removed from the project site and replaced with complying material at no additional cost to the Owner.

304.3 Storage:

a. The Owner will provide on-site, outdoor storage space for the HDPE geomembrane and drainage geocomposite materials. The Earthwork Contractor will prepare the space as necessary to provide a smooth surface free of rocks and standing water. The Earthwork Contractor will be responsible for protecting the geomembrane liner and drainage geocomposite rolls from damage, moisture, theft, and vandalism.

b. All HDPE geomembrane and drainage geocomposite materials will be placed in the allocated storage space horizontally in their original, unopened, wrapped cover.

c. Rolls will be placed into the allocated storage space in a manner that prevents them from sliding or rolling.

305. PREPARATION OF SURFACES TO BE LINED

305.1 Preparation of Concrete Surfaces:

a. All concrete surfaces that will come in contact with a geomembrane shall be free of sharp edges or rough spots that can puncture or abrade the geomembrane. Where necessary, the concrete will be ground smooth by the Earthwork Contractor as specified in Specification P-1400, Section 319005.

b. Where specified on the Design Drawings, one or more layers of geomembrane scuff strips shall be placed between the concrete and the geomembrane liner to act as a protective layer for the geomembrane liner.

305.2 Geosynthetic Clay Liner:

a. See Section 319025 regarding installation, inspection, and acceptance of the geosynthetic clay liner (GCL) underlying the HDPE geomembrane liner.

306. INSTALLATION OF HDPE GEOMEMBRANE LINER

306.1 Weather:

a. Geomembrane shall not be placed when the air temperature is above 104°F or below 41°F unless it can be demonstrated to the approval of the Owner by trial welds that acceptable welds can be made at the prevailing temperature. Under no circumstances shall geomembrane be placed when the air temperature is below 5°F.

a1. If the air temperature is above 32°F, trial welds shall be as described in Paragraph 306.7c.

a2. If the air temperature is at or below 32°F, trial welds and field seaming shall be as described in GRI Test Method GM9.

b. Geomembrane shall not be deployed or placed in any of the following conditions:

b1. During any rainfall or snowfall.

b2. In the presence of excessive moisture due to fog or dew.

b3. In ponded water.

b4. On frozen subgrade.

b5. During high winds.

306.2 Precautions to Prevent Wind Damage:

a. If possible, work shall be oriented in the direction of the prevailing wind.

b. Provide adequate temporary loading and/or anchoring of the geomembrane by the use of sandbags, tires or other means which will not damage the geomembrane, to prevent uplift of the geomembrane by wind.

306.3 Other Precautions to Prevent Damage:

a. Protection of the geomembrane from damage due to foot traffic on the slopes shall be provided.

b. Provisions of facilities for safe entrance and egress of employees from sloped depressions is required.

306.4 Panel Layout:

a. The panels shall be placed in accordance with the GM/GC Manufacturer's panel layout drawing to ensure that they are placed in the proper direction for seaming.

b. If panels are installed in a location other than indicated on the panel layout drawing, the revised location shall be indicated on an "as-built" layout drawing prepared by the Geosynthetics Contractor. The "as-built" record drawing shall be submitted to the Owner and the CQA Contractor at the completion of the project.

306.5 Panel Deployment:

a. Only the panels that can be anchored and seamed together in one shift shall be unrolled.

b. Unroll and layout panels in as close to the final position as possible. Pulling geomembrane panels should be minimized to reduce the chance of permanent tension.

c. The methods and equipment used to deploy the panels shall not damage the geomembrane or the supporting surface.

d. Wrinkles and folds shall be minimized. However, enough slack shall be provided in both directions so that there will be no tension in the geomembrane at the lowest expected operating temperature.

306.6 Replacement of Damaged Geomembrane:

a. Any area of a panel, which, in the judgement of the Owner and/or the CQA Contractor, becomes seriously damaged (torn, twisted, or crimped permanently) shall be replaced at no additional cost to the Owner.

306.7 Field Seaming:

a. Method of Seaming:

a1. The primary welding procedure for seams shall be double wedge fusion welding.

a2. Extrusion welding shall be used only for repairs, detail work, and for seaming where double wedge fusion welding is not possible.

a3. The rods used for extrusion welding shall be the same type of resin as the geomembrane, unless otherwise approved by the Owner.

a4. The use of solvents or adhesives is not permitted.

b. General Requirements for Seaming:

b1. On slopes steeper than 10 horizontal to 1 vertical, seams shall be oriented parallel to the line of maximum slope (oriented up and down, not across the slope) when possible. No seams oriented across the slope shall be used unless approved by the Owner.

b2. Seams parallel to the toe of the slope shall be located a minimum of 5 feet from the toe.

b3. Seams parallel to the crest of the slope shall be located a minimum of 2 feet from the crest.

b4. Seams at the bottom of a slope shall be overlapped so that the upslope sheet is positioned above the downslope sheet.

b5. Seaming shall extend to the outside edge of panels to be placed in the anchor trench. Seams at sheet corners of three or four sheets shall be completed with a patch having a minimum dimension of 24 inches, extrusion welded to the parent sheets.

b6. All cross seams between the two rows of seamed panels shall be welded during the coolest time of the day to allow for contraction of geomembrane.

c. Trial Welds Prior to Beginning Seaming:

c1. Trial welds are required for pre-qualification of personnel, equipment, and procedures for making seams on identical geomembrane material under the same climatic conditions as the actual field production seams will be made.

c2. Trial welds shall be made as follows:

c2.1 Prior to each seaming period.

c2.2 Every 4 to 5 hours (i.e., at the beginning of the work shift and after the lunch break).

c2.3 Whenever personnel or equipment are changed.

c2.4 When climatic conditions result in wide changes in geomembrane temperature.

c2.5 When requested by CQA Geosynthetics Inspector for any seaming crew or piece of welding equipment if problems are suspected.

c3. Once qualified by passing a trial weld, welding technicians shall not change parameters without performing another trial weld.

c4. Trial welds shall be made on both double wedge fusion welds and on extrusion welds.

c5. A test strip shall be prepared by joining two pieces of geomembrane; each piece shall be at least 6 inches wide. The length of double wedge fusion welded seams shall be a minimum of 10 feet long. The length of an extrusion welded seam shall be a minimum of 4 feet long. The CQA Geosynthetics Inspector shall witness the fabrication of each test strip.

c6. All test welds shall be tested by destructive testing. Testing can be done as soon as the seam cools.

c7. A minimum of three (3) one (1) inch wide sample strips shall be cut from each test strip, one from each end and one from the middle. The location of each sample shall be selected by the CQA Geosynthetics Inspector. The test strips shall be tested in peel at 2 inches per minute using a field tensiometer. The CQA Geosynthetics Inspector shall witness all tests.

c8. If any of the test specimens fail, a new test strip shall be fabricated and the tests repeated for the new strip. If additional specimens fail, the seaming apparatus and the seamer shall not be accepted and shall not be used for seaming until the deficiencies are corrected and successful trial welds have been achieved.

c9. The trial weld is considered acceptable if, when tested for peel adhesion using the field tensiometer, all three specimens meet the criteria specified in Paragraph 306.7c or the three specimens exhibit Film Tear Bond (FTB) (yielding of the parent material before seam failure). In the case of a double wedge fusion welded seam, both welds must pass in order to be considered acceptable.

c10. If the specimens pass the tests, production seaming operations can begin.

c11. The Geosynthetics Contractor shall document all data on each trial weld, including:

c11.1 Date.

c11.2 Time.

c11.3 Operator.

c11.4 Machine number.

c11.5 Ambient temperature.

c11.6 Operating temperature.

c11.7 Speed setting.

c11.8 Pass/Fail designation.

d. Preparation for Seaming:

d1. Prior to seaming, the surface of the geomembrane shall be wiped with a clean cloth to ensure that it is clean and free from moisture, grease, dust, dirt, and debris of any kind before seam welding is started.

d2. The panels shall be adjusted so that the seams are aligned to eliminate wrinkles and fish mouths. Where necessary, fish mouths and wrinkles shall be cut to achieve flat overlap.

e. Seaming:

e1. Seaming shall be performed in accordance with the GM/GC Manufacturer's accepted procedure.

e2. Double Wedge Fusion Welds:

e2.1 The panels shall be overlapped a minimum of 4 inches prior to welding.

e2.2 A vehicle-mounted automated hot wedge welding apparatus shall be used to make each seam.

e3. Extrusion Fillet Welding:

e3.1 Geomembrane overlap shall be a minimum of 3 inches for extrusion welding.

e3.2 Geomembrane panels shall be temporarily bonded using a hot air device prior to extrusion welding.

e3.3 The edge of the geomembrane to be fillet welded shall be pre-beveled before heat-tacking the seam in place.

e3.4 The seam overlap shall be ground (abraded) no more than one hour prior to welding.

e3.5 Grinding shall be performed in accordance with the GM/GC Manufacturer's instructions in a manner that does not damage the geomembrane.

e3.6 Grinding shall not extend more than 1/4 inch past the area to be covered with extrudate during welding.

e3.7 All grind marks shall be covered with extrudate.

306.8 Non-Destructive Field Testing:

a. General:

a1. All non-destructive field testing shall be performed and documented by the Geosynthetics Contractor.

a2. The CQA Geosynthetics Inspector shall observe all non-destructive test procedures.

a3. One hundred (100) percent of the seam length shall be tested using non-destructive procedures to check the continuity of the field seams. Non-destructive testing is not meant to qualify seam strength.

a4. Air pressure testing shall be performed in accordance with ASTM D5820 and GRI GM6.

a5. Vacuum box testing shall be performed in accordance with ASTM D5641 and as specified herein.

a6. Continuity testing shall be performed as seaming progresses or as soon as a suitable length of seam is available, not at the completion of all field seaming.

b. Double Wedge Fusion Welded Seams:

b1. Double wedge fusion welded seams shall be tested using air pressure testing.

b2. The procedure for testing shall be as specified in GRI GM6 for the type and thickness of geomembrane in use.

b3. The following pressures are applicable to all HDPE geomembrane. After an initial 2-minute pressure stabilization period, the pressure shall be maintained between 27 and 30 psi for 60 mil HDPE geomembrane. The pressure shall be sustained for a minimum of 5 minutes. The loss of pressure shall not exceed a maximum of 3 psi in 5 minutes. If the pressure does not stabilize in the first two minutes or the pressure loss exceeds the loss specified, the seam test shall be considered a failure.

b4. For every seam that fails a seam test:

b4.1 The leak or suspected leak shall be located and repaired.

b4.2 The repaired seam shall be re-tested as required until all leaks are identified, and repaired, and the seam passes a subsequent air pressure test.

b5. When the geometry of a double wedge fusion weld makes air testing impossible or impractical, vacuum testing may be used to test the seam.

c. Extrusion Welded Seams:

c1. Extrusion welded seams shall be tested using vacuum chamber testing in accordance with ASTM D5641.

c2. The completed seam shall exhibit no leakage when tested between 4 and 8 psi minimum vacuum for approximately 10 seconds.

c3. If leaks are discovered during vacuum box testing, they shall be located, marked, and repaired.

c4. The repaired area shall be re-tested and exhibit no leakage.

d. Inaccessible Seams:

d1. Where extrusion welded seam locations make use of vacuum box testing impractical, then the electric wire method of testing shall be used or the seam shall be cap stripped as approved by the Owner.

d2. If cap stripping is approved by the Owner, the seams shall be cap stripped as described in Paragraph 306.11d with strips of the same type and thickness of geomembrane being installed. The cap stripping shall be performed in the presence of the CQA Geosynthetics Inspector and the Owner's representative.

d3. The electric wire test method shall consist of placing a 24-gauge copper wire 1/8 inch beneath the top sheet overlap of the two sheets prior to welding with the extruder. The wire shall be embedded in the seam. After welding, a holiday spark detector, operating at 20,000 volts, shall be connected to one end of the wire, and slowly moved over the length of the seam. A seam defect between the probe and the embedded wire shall result in an audible alarm indicating where the defect is located.

e. Test Reports:

e1. Test reports for all air pressure tests shall contain all data specified in ASTM D5820 and GRI GM6.

e2. Test reports for vacuum box testing shall contain all of the data specified in ASTM D5641.

e3. Test report for other types of non-destructive tests shall contain the following data for each test as a minimum:

e3.1 Location.

e3.2 Type of test.

e3.3 Test parameters.

e3.4 Test data.

e3.5 Test number.

e3.6 Name of tester.

e3.7 Outcome of the test.

306.9 Destructive Testing

a. Testing:

a1. Destructive testing shall be performed by an independent third-party laboratory employed by the CQA Contractor on samples cut from production welds in the field by the Geosynthetics Contractor.

a2. Samples shall be taken by the CQA Geosynthetics Inspector to the third-party laboratory and tested for shear strength and peel adhesion. For double wedge seam samples, both welds shall be tested for peel adhesion.

b. Location and Frequency:

b1. Test locations shall be determined after seaming. The location where the test samples shall be taken shall be marked by the CQA Geosynthetics Inspector. Locations may be prompted by the appearance of excessive heating, contaminations, offset welds, or a suspected defect. Destructive test samples shall be taken at a minimum average frequency of one per every 500 linear feet of seam length.

b2. The Method of Attributes described in GRI GM14 may be exercised to minimize the number of test samples taken if more than 100 destructive seam samples will be required based on the sampling strategy given in Paragraph 306.9b1.

b3. Each sample location shall be numbered and marked with permanent identification and the location of the sample and these locations shall be indicated on a plan drawing prepared and maintained by the Geosynthetics Contractor. The following shall be recorded for each sample:

b3.1 Date and time.

b3.2 Ambient temperature.

b3.3 Seam number and location.

b3.4 Welding apparatus used.

b3.5 Name of Master Geomembrane Seamer.

b3.6 Reason for taking the sample.

b3.7 Size of sample.

b3.8 Test results.

b3.9 Name of tester.

b4. Samples shall be cut by the Geosynthetics Contractor. The CQA Geosynthetics Inspector shall witness test sample cutting.

b5. Test samples shall be cut every shift and taken by the CQA Geosynthetics Inspector to the third-party laboratory the same day that the sample is prepared.

c. Sample Size:

c1. The minimum sample size shall be 12-inches wide with a seam 16-inches long centered length wise in the sample.

c2. As agreed to with Owner, a sample may be increased in size to accommodate the requirements of the testing laboratory.

d. Field Testing:

d1. A one-inch wide specimen shall be cut from each end of each sample for field testing.

d2. Each one-inch wide specimen shall be tested with a field tensiometer for peel adhesion.

d3. The Geosynthetics Contractor shall perform each field test in the presence of the CQA Geosynthetics Inspector.

d4. A test is considered acceptable if a specimen meets the criteria specified in Paragraph 306.9f for both peel and shear under Bonded Seam Strength, or exhibits Film Tear Bond (FTB). For double wedge fusion welds, both welds must pass the test. If either sample fails the field test, it shall be assumed that the seam will not pass the specified laboratory testing, and the sample shall be given a fail designation.

e. Laboratory Testing:

e1. Full size (12-inch minimum length) samples shall be given to the CQA Geosynthetics Inspector for transportation to the independent third-party laboratory for testing.

e2. Destructive laboratory testing of all field seam samples will be performed in accordance with CQA Specification P-1401. All samples shall meet minimum requirements for shear strength and peel adhesion given in Paragraph 306.9f.

f. Bonded Seam Strength Requirements. Geomembrane seams shall meet the following minimum strengths as specified by GRI GM19a:

f1. Shear strength: 120 ppi.

f2. Peel adhesion (hot wedge): 91 ppi.

f3. Peel adhesion (extrusion fillet): 78 ppi.

g. Test Results:

g1. Written test results shall be given to the CQA Geosynthetics Contractor at the conclusion of each field test.

g2. In accordance with CQA Specification P-1401, verbal laboratory test results will be given by the CQA Contractor to the Geosynthetics Contractor within 24 hours of receipt of the samples. Written results will follow within one week.

g3. All test locations shall be marked with a pass/fail designation on the liner and on the drawings maintained by the Geosynthetics Contractor for submittal to the Owner after construction is complete.

h. Re-Testing if Failure Occurs:

h1. If a seam fails testing, one additional sample shall be taken 10 feet on each side of the location of the failed test. Additional samples shall continue to be taken at 10-foot

intervals until tests show that seam strength is adequate and the zone in which the seam requires reconstruction is identified. Additional field and laboratory tests required to determine failed seams and any necessary patching and rework shall be performed at no additional cost to the Owner.

h2. All passing seams shall be bounded by two locations from which samples passing laboratory destructive tests have been taken.

h3. The entire seam length failing strength tests shall be reconstructed at no additional cost to the Owner.

h4. If the length of reconstructed seam exceeds 150 feet, a sample shall be taken of the reconstructed seam every 150 feet and shall pass destructive testing.

306.10 Inspection:

a. After seaming is complete, the Geosynthetics Contractor and the CQA Geosynthetics Inspector shall conduct a detailed walk-down to visually check all seamed and non-seamed areas of the HDPE geomembrane liner.

b. All defects, holes, blisters, tears, signs of damage during installation, areas of undispersed carbon, and holes from destructive or non-destructive testing shall be marked and repaired.

306.11 Repair of Defects and Seams

a. Patching:

a1. Patching shall be used to repair large holes, tears, and destructive sample locations.

a2. All patches shall be round or oval, or shall have rounded corners.

a3. All patches shall be made of the base HDPE geomembrane material and shall extend a minimum of 3 inches beyond the edges of the defect.

a4. Patches shall be extrusion welded to the base sheet.

b. Grinding and Welding:

b1. Grinding and welding shall be used to repair sections of extruded fillet seams with small defects.

c. Spot Welding:

c1. Spot welding shall be used to repair small tears, pinholes, or other minor localized flaws.

d. Capping:

d1. Capping shall be used to repair lengths of extrusion welded seams with large defects and to repair double wedge fusion welded seams.

d2. Cap strips shall be made with strips of the same type and thickness of geomembrane being installed. Strips shall extend a minimum of 6 inches beyond the weld and shall have rounded corners.

d3. Cap strips shall be extrusion welded to the base sheet.

e. Cut Out and Replacement:

e1. When approved by the Owner, a length of defective seam may be cut out and replaced with a strip of new material seamed into place.

f. Verification of Repairs:

f1. All repairs shall be non-destructive tested using one of the procedures described in Paragraph 306.8.

f2. Repairs passing non-destructive testing shall be deemed acceptable.

f3. Repairs of a seam in excess of 150 feet in length shall have one destructive seam test per 150 feet in length.

307. INSTALLATION OF DRAINAGE GECOMPOSITE

307.1 General Requirements:

a. In the presence of wind, all drainage geocomposite shall be weighted with sand bags or the equivalent. Weights shall be installed during deployment and shall remain in place until deployment of the cover material.

b. The drainage geocomposite shall not be welded to the geomembrane liner.

c. All necessary precautions shall be taken to prevent damage to underlying geomembrane during placement of the drainage geocomposite.

d. During placement of the drainage geocomposite, care shall be taken not to entrap dirt or excessive dust that could cause clogging of the drainage system, and/or stones that could damage the adjacent geomembrane. If dirt or excessive dust is entrapped in the drainage geocomposite, it shall be cleaned and all dirt removed prior to placement of the cover material. Care shall be taken in the handling of sand bags to prevent rupture or damage of the sand bag.

307.2 Placement of Drainage Geocomposite:

a. On slopes, the drainage geocomposite shall be secured in the anchor trench and then rolled down the slope in such a manner as to continuously keep the net in tension. If necessary, the net shall be positioned by hand after unrolling to minimize wrinkles.

b. The drainage geocomposite shall be placed on side slopes with no horizontal seams along the slope and so that the long dimension is parallel to the slope.

c. No horizontal seam shall be located within 5 feet of the toe of a slope.

d. The drainage geocomposite shall be positioned on both the slopes and the bottom so that the geonet core overlaps by a minimum of 4 inches.

e. Drainage geocomposite placed in the corners of the side slope shall be cut to eliminate excessive overlap of material.

e1. The drainage geocomposite shall only be cut using scissors or other cutting tools approved by the GM/GC Manufacturer that will not damage the underlying geomembrane.

e2. Care shall be taken not to leave tools in the drainage geocomposite.

307.3 Joining Geonet Cores:

a. The geonet cores between adjacent drainage geocomposite panels shall be joined using white or yellow self-locking straps. Metal fastening devices are not permitted and shall not be used.

b. Adjacent panels on slopes shall be joined on 5-foot centers.

c. Adjacent panels on the basin floor shall be joined on 10-foot centers.

d. End seams on the basin floor shall be joined on 12-inch centers.

e. Horizontal and end seams in anchor trenches shall be joined on 12-inch centers.

307.4 Joining Geotextile Caps:

a. Sewing on Basin Floor:

a1. On the basin floor and interior slopes flatter than 10H:1V (i.e., 10%), the geotextile caps between adjacent drainage geocomposite panels shall be continuously sewn or continuously heat bonded in accordance with the GM/GC Manufacturer's recommendations.

a2. Spot seaming is not allowed.

b. Sewing on Basin Slopes:

b1. On basin slopes greater than 10H:1V (i.e., 10%), the geotextile caps between adjacent drainage geocomposite panels shall be continuously sewn. All seams shall be vertical (i.e., parallel with the slope). No horizontal seams (i.e., across the slope) shall be permitted on basin slopes greater than 10H:1V (i.e., 10%).

b2. Spot seaming and heat bonding are not allowed.

c. Sewing Requirements:

c1. Sewing shall be done using polyester or heat-set UV stabilized polypropylene sewing thread with chemical and ultraviolet light resistance properties such that at least 50% of the thread's design strength is retained after 500 hours of exposure under ASTM D4355 test conditions. The thread color shall contrast with the color of the geotextile cap to assist in inspection of the seam. Tex size or denier number of the thread shall be specified by the Geosynthetics Contractor.

c2. Seams shall be "prayer" or "flat" seams. Seams shall be formed by mating the edge of the geotextile caps and sewing the caps together with continuous stitches located a minimum of four inches from the mated edges.

c3. Sewing procedures shall conform to the latest procedures recommended by the GM/GC Manufacturer.

c4. Stitching:

c4.1 For drainage geocomposites placed on the interior slopes of the basin, stitching shall be two rows (SSa-2) of stitching using a 01 two-thread locking chain stitch as described in the IFAI with 6 to 10 stitches per inch. Thread strength shall be such field seam strength will be a minimum of 90 percent of the tensile strength of the geotextile cap.

c4.2 For drainage geocomposites used elsewhere in the basin, stitching shall be one row (SSa-1) of stitching using a Type 401 two-thread locking chain stitch as described in the IFAI with a minimum of 5 stitches per inch, or the seam shall be heat bonded. Thread strength shall be selected by the Geosynthetics Contractor.

c5. Seam Inspections:

c5.1 Visual examinations shall be conducted to ensure that 100 percent of the seams are sewn or heat bonded as required.

c5.2 Seam sampling and testing are not required.

307.5 Protection of HDPE Geomembrane:

a. The Geosynthetics Contractor shall be responsible for protection of the HDPE geomembrane liner during installation of the drainage geocomposite and shall be responsible for repair of any damage caused to the liner by installation of the drainage geocomposite.

307.6 Repair of Holes or Tears:

a. All holes or tears in the drainage geocomposite shall be repaired by placing a patch of drainage geocomposite over the hole or tear. The patch shall extend 2 feet beyond the edges of the hole or tear. If the hole or tear width across the role is more than 50% of the width of the roll, the damaged drainage geocomposite shall be removed and replaced.

b. A patch's geonet core shall be secured to the original geonet core by tying every 12 inches.

c. A patch's geotextile cap shall be sewn into place by hand or machine so as the patch will not accidentally shift out of position or be moved when it is covered. The thread shall be the same as specified for sewing seams.

308. CREST ANCHORAGE

308.1 The HDPE geomembrane liner and the drainage geocomposite shall be anchored in an anchor trench at the top of the slope.

308.2 Prior to the placement of the geosynthetic clay liner (GCL) underlying the HDPE geomembrane liner in accordance with Section 319025, the Earthwork Contractor shall excavate the crest anchor trench to the lines and widths shown on the Design Drawings and in accordance with the excavation and shaping requirements specified in Specification P-1400, Section 319005.

308.3 After placement of the drainage geocomposite, the Earthwork Contractor will backfill the crest anchor trench in accordance with the backfilling requirements specified in Specification P-1400, Section 319005 and on the Design Drawings.

309. ATTACHMENT TO CONCRETE

309.1 Geomembrane shall be attached to concrete using batten strips in accordance with the details shown on the Design Drawings.

310. ATTACHMENT TO PIPE PENETRATIONS

310.1 Geomembrane shall be attached to pipe penetrations through the lining in accordance with the details shown on the Design Drawings.

310.2 Prefabricated or field fabricated HDPE sleeves (pipe boots) used for attaching the geomembrane to the pipe shall be supplied by the GM/GC Manufacturer.

END OF SECTION 319020

SECTION 319025

GEOSYNTHETIC CLAY LINER

PART 1 – GENERAL

101. EXTENT

101.1 This section defines the minimum requirements for furnishing and installing the geosynthetic clay liner (GCL) to be used as the lower component of the retrofitted Bypass Basin's new composite liner system, all in accordance with the Design Drawings and as specified herein.

101.2 The Work shall include, but not be limited to, the following items:

a. Manufacturing and shipping of the GCL.

b. Performing specified quality assurance tests to verify the manufactured GCL consistently meets or exceeds the requirements of this Specification.

c. Contracting an independent, third-party Quality Assurance (QA) Testing Laboratory to perform the specified quality assurance conformance tests to verify the manufactured GCL consistently meets or exceeds the requirements of this Specification.

d. Preparation and inspection of surfaces to be lined.

e. Placement and seaming of GCL.

f. Crest anchorage of GCL.

g. Sealing GCL around existing marker posts and an existing corrugated metal pipe (CMP) riser.

h. Sealing GCL at vertical walls of existing inlet and outlet structures and existing marker posts within the basin.

i. Visual inspection of the completed GCL.

j. Patching and repairs.

101.3 Definitions:

a. The following definitions of terms shall apply throughout this section:

a1. GCL Manufacturer: The manufacturer who is responsible for manufacture of GCL materials and for transporting GCL materials to the site.

a2. QA Testing Laboratory: The company employed by the GCL Manufacturer who is responsible for performing the specified quality assurance conformance tests. The QA Testing Laboratory shall be objective, competent, and independent from the GCL Manufacturer whose products are being tested. The QA Testing Laboratory shall remain independent throughout the duration of the project.

a3. CQA Geosynthetics Inspector: An inspector who works for the CQA Contractor and is responsible for inspection of the Geosynthetics Contractor's work.

101.4 Qualifications:

a. GCL Manufacturer:

a1. The GCL Manufacturer shall be approved by the Owner. Owner's considerations when approving the GCL Manufacturer may include, but are not limited to, financial, safety, and prior performance aspects of the manufacturer.

a2. The GCL Manufacturer shall have an internal QA/QC program to ensure and to verify the manufactured products consistently meet or exceed the requirements of this section.

a3. The GCL Manufacturer shall have at least 10 years of experience manufacturing products similar to those required for this Work.

b. QA Testing Laboratory:

b1. The QA Testing Laboratory shall be approved by the Owner. Owner's considerations when approving the QA Testing Laboratory may include, but are not limited to, financial, safety, and prior performance aspects of the company.

b2. The QA Testing Laboratory shall have an internal QA/QC program to ensure and to verify the specified tests are performed correctly.

b3. The QA Testing Laboratory shall have at least 10 years of experience testing manufactured products similar to those required for this Work.

102. RELATED WORK SPECIFIED IN OTHER SECTIONS AND SPECIFICATIONS

102.1 The work specified in this section shall be coordinated with work specified in the following related sections and specifications:

a. Earthwork Specification (P-1400):

a1. Section 319005 – Earthwork.

b. CQA Specification (P-1401):

b1. Section 014362 – Quality Assurance for Fill, Liner, and Leachate Collection Materials.

c. Geosynthetic Materials Specification (P-1402):

c1. Section 319020 – High-Density Polyethylene Geomembrane Liner with Drainage Geocomposite.

103. REFERENCE DOCUMENTS

103.1 Standards, specifications, manuals, codes, and other publications of nationally recognized organizations and associations are referenced herein. Methods, equipment, and materials specified herein shall comply with the specified and applicable portions of the referenced documents, in addition to federal, state, or local agencies having jurisdiction.

103.2 References to these documents are to the latest issue date of each document, unless otherwise indicated, together with the latest additions, addenda, amendments, supplements, etc., thereto, in effect as of the date of Contract for the Work.

103.3 Abbreviations listed indicate the form used to identify the reference documents cited in this Specification.

103.4 ASTM – ASTM International:

a. D4643 Standard Test Method for Determination of Water (Moisture) Content of Soil by Microwave Oven Method.

b. D5261 Standard Test Method for Measuring Mass per Unit Area of Geotextiles.

c. D5887 Standard Test Method for Measurement of Index Flux through Saturated Geosynthetic Clay Liner Specimens using a Flexible Wall Permeameter.

d. D5889 Standard Practice for Quality Control of Geosynthetic Clay Liners.

e. D5890 Standard Test Method for Swell Index of Clay Mineral Component of Geosynthetic Clay Liners.

f. D5891 Standard Test Method for Fluid Loss of Clay Component of Geosynthetic Clay Liners.

g. D5993 Standard Test Method for Measuring Mass per Unit of Geosynthetic Clay Liners.

h. D6243 Standard Test Method for Determining the Internal and Interface Shear Resistance of Geosynthetic Clay Liner by Direct Shear Method.

i. D6496 Standard Test Method for Determining Average Bonding Peel Strength Between Top and Bottom Layers of Needle-Punched Geosynthetic Clay Liners.

j. D6768 Standard Test Method for Tensile Strength of Geosynthetic Clay Liners.

104. SUBMITTALS

104.1 The Geosynthetics Contractor shall submit the following drawings and data as specified. The Geosynthetics Contractor's drawings and data shall be submitted via electronic medium in a format compatible for importing into the Owner's information systems (as specified by the Owner).

104.2 Submittals After Material Order:

a. Copies of the GCL Manufacturer's catalog data describing the GCL material proposed for use on this project.

b. Copies of GCL Manufacturer's quality assurance and quality control (QA/QC) certificates on tests performed on the material and a summary of the test results.

c. Certification of Compliance from the GCL Manufacturer, signed by its authorized representative, stating that the GCL material meets the requirements of this Specification and that those requirements are guaranteed by the GCL Manufacturer.

d. A copy of the GCL Manufacturer's Quality Control and Quality Assurance Policies and Procedures.

e. Warranty:

e1. Written warranty from the GCL Manufacturer covering the quality of the material and the installation and workmanship as applicable.

e2. The minimum period of warranty for materials shall be 5 years from the date of shipment.

e3. The minimum period of warranty for installation shall be 2 years.

f. GCL Manufacturer's proposed GCL panel layout drawing for the Bypass Basin.

g. GCL Manufacturer's recommended procedures for making seams if different from those specified herein.

h. GCL Manufacturer's recommended procedures for repairing damaged GCL sections and seams if different from those specified herein.

i. GCL Manufacturer's details of GCL anchorage and attachment to structures and penetrations if different from those specified herein and from the details shown on the Design Drawings.

104.3 Submittals Upon Shipment:

a. GCL Manufacturer's QA/QC certificates with each shipment of GCL. The QA/QC certificates shall include:

a1. GCL lot and roll numbers with corresponding shipping information.

a2. GCL Manufacturer's test data for the geotextile materials used in GCL production including, at a minimum, mass per unit area data and tensile test data.

a3. Certificates of analyses for the bentonite clay used in GCL production including, at a minimum, test data for the properties shown in Table 319025-1.

a4. GCL Manufacturer's test data for the finished GCL product including, at a minimum, test data for the properties shown in Table 319025-2.

b. Copies of all the third-party, independent QA Testing Laboratory test reports documenting the results of the conformance tests specified in Table 319025-3, as performed by the laboratory on the representative samples provided by the GCL Manufacturer.

104.4 Submittals After Installation:

a. As-built panel layout.

b. Plan drawing showing locations of repairs and types of repairs made.

105. QUALITY ASSURANCE

105.1 Materials and construction procedures shall be subject to inspection and testing by the CQA Contractor employed by the Owner. Such inspections and tests will not relieve the Geosynthetics Contractor of the responsibility for providing and installing materials in compliance with specified requirements.

105.2 The Owner reserves the right, at any time before final acceptance, to reject materials or workmanship not complying with specified requirements. The Geosynthetics Contractor shall correct the deficiencies which the inspections and tests have indicated are not in compliance with specified requirements.

105.3 CQA activities will be performed by the CQA Contractor as described herein and in Specification P-1401.

PART 2 - MATERIALS

201. GENERAL REQUIREMENTS:

201.1 The GCL shall be a needle-punched GCL. The GCL shall be manufactured by placing a uniform layer of high-swell sodium bentonite encapsulated between two geotextiles and then needle punching through both layers of the geotextile and the bentonite to push fibers from the non-woven geotextile cap through the bentonite layer and embed them in the geotextile carrier on the other side.

201.2 The upper and lower support materials shall protect the bentonite but shall be sufficiently porous to allow bentonite flow-through to create a positive bentonite-to-bentonite seal at the seams.

201.3 The support materials used in the manufacturing shall not interfere with the swelling, self-healing, or low permeability characteristics of the GCL.

201.4 The GCL shall be fabricated such that bentonite will not be displaced when the liner is cut.

201.5 Six-inch and nine- or twelve-inch overlap marks shall be marked longitudinally on both edges of the geotextile cap by the GCL Manufacturer to assist in obtaining the proper overlap. The lines shall be printed in easily visible, non-toxic ink.

202. GCL MATERIAL SPECIFICATIONS

202.1 Sodium Bentonite. The bentonite utilized in the manufacture of the GCL, as well as any accessory bentonite provided for seaming and detail work, shall be Wyoming-grade sodium bentonite with the properties listed in Table 319025-1.

TABLE 319025-1
PROPERTIES OF BASE BENTONITE IN GCL MATERIALS

Property[1]	ASTM Test Method	Value	Min. Testing Frequency[2]
Free Swell	D5890	24 mL / 2g min.	1/100,000 lb
Fluid Loss	D5891	18 mL max.	1/100,000 lb
Moisture Content	D4643	12% max.	1/100,000 lb

Notes:

(1) Properties of the base bentonite prior to incorporation into the finished GCL product.
(2) Minimum testing frequencies are per ASTM D5889. One test per 45 tonnes is also acceptable.

202.2 Geosynthetic Clay Liner. The finished GCL shall have the properties listed in Table 319025-2.

TABLE 319025-2
PROPERTIES OF FINISHED GCL MATERIALS

Property	ASTM Test Method	Value	Min Testing Frequency(1)
Geotextile Properties			
Non-Woven Cap	D5261	6.0 oz/yd^2 min.	1/20,000 SF
Non-Woven Carrier	D5261	6.0 oz/yd^2 min.	1/20,000 SF
Finished GCL Properties			
Bentonite Mass/Area	D5993	0.75 lb/ft^2 min. at 0% moisture content	1/20,000 SF
Moisture Content	D5993	35% max.	1/20,000 SF
Hydrated Internal Shear Strength	D6243	500 psf min.(2)	1/20,000 SF
Tensile Strength(3)	D6768	45 lb/in. min.	1/20,000 SF
Peel Strength	D6496	3.5 lb/in. min.	1/20,000 SF
Index Flux(4)	D5887	2x10^{-9} m^3/m^2/sec max.	1/20,000 SF
Hydraulic Conductivity(4)(5)	D5887	1x10^{-9} cm/sec max.	1/20,000 SF

Notes:

(1) Minimum testing frequencies listed are in accordance with ASTM D5889.
(2) Typical peak value for specimen sheared under a 200 psf normal stress.
(3) Machine (warp) direction of primary backing.
(4) Index flux and hydraulic conductivity measured at 5 psi effective confining stress and 2 psi head.
(5) Hydraulic conductivity based on a 7-mm-thick bentonite layer.

202.3 Panel Layout:

a. Prior to manufacturing the GCL for the Bypass Basin, the GCL Manufacturer shall make a panel layout of the surface to be lined. Each panel to be used for the installation shall be given a numeric or alphanumeric identification number.

b. Each panel identification number shall be related in writing to the manufacturing roll number that identifies the manufacturing lot number and the date of manufacture.

c. The panel layout shall be made considering the following requirements:

c1. Panel lengths shall include slope gain and anchorage.

c2. Perpendicular tie-ins shall be made a minimum of 5 feet beyond the toe of the slope.

c3. A minimum 6-inch-wide overlap shall be allowed at longitudinal seams and a 24 inch-wide overlap at end seams. The GCL Manufacturer shall document the seam widths used to develop the panel layout on the plan drawing.

c4. All field seams on slopes shall be oriented parallel to the slope (oriented along, not across the slope).

c5. The number of seams in corners or odd-shaped geometric locations shall be minimized.

203. BENTONITE SEALING COMPOUND (BSC) AND GRANULAR BENTONITE (GB)

203.1 The BSC and GB shall be supplied by the GCL Manufacturer and shall be comprised of the same bentonite used in the manufacturing of the GCL.

203.2 The BSC shall be a mixture of non-aqueous liquid suspension agents which creates a paste-like texture. The suspension agents shall be non-toxic and water-soluble and shall not restrict the bentonite's ability to swell and absorb water upon hydration.

PART 3 - EXECUTION

301. THIRD-PARTY QUALITY ASSURANCE CONFORMANCE TESTING

301.1 Prior to material shipment to the site, the GCL Manufacturer shall submit to the QA Testing Laboratory representative samples of the GCL material to be shipped to the project site. Samples sent to the QA Testing Laboratory shall be accompanied by a chain of custody and a certification that the samples submitted are from the GCL materials to be delivered to the project site.

301.2 The QA Testing Laboratory shall perform conformance testing of the received GCL samples in accordance with Table 319025-3. The laboratory tests shall be performed at least at the corresponding minimum frequencies specified in Table 319025-3.

301.3 Conformance test acceptance criteria shall be as specified in Table 319025-1 and Table 319025-2.

301.4 The QA Testing Laboratory shall prepare a test report documenting the results of all tests performed on each sample. The QA Testing Laboratory shall submit each test report to the GCL Manufacturer within 24 hours of completing the tests.

301.5 If the results from any of the tests in Table 319025-3 do not meet the respective pass/fail thresholds, then the GCL material(s) represented by the failed test(s) shall be considered rejected and shall not be shipped to the project site.

TABLE 319025-3
THIRD-PARTY QUALITY ASSURANCE TESTING REQUIREMENTS

Property	ASTM Test Method	Min. Testing Frequency
Swell Potential	D5890	One test per material, and one test per 20,000 SF
Fluid Loss Properties	D5891	
Moisture Content	D4643	
Bentonite Mass / Area	D5993	
Peel Strength	D6496	
Hydrated Internal Shear Strength	D6243	
Tensile Strength	D6768	
Nonwoven Cap and Nonwoven Carrier Mass / Area	D5261	
Index Flux	D5887	
Hydraulic Conductivity	D5887	

302. SHIPPING

302.1 All GCL material shall be shipped to the project site in rolls. No GCL material shall be folded.

302.2 Transportation of the GCL material to the project site shall be the responsibility of the GCL Manufacturer.

303. PACKAGING

303.1 The finished GCL shall be completely wrapped and adequately secured with a durable polyethylene protective cover in order to provide protection from ultraviolet degradation of the Primary Backing Material (PBM) and excessive loss of moisture during shipping and storage.

303.2 A label shall be attached or adhered to each roll of the GCL. The label shall identify the following:

a. Name of GCL Manufacturer.

b. Product identification (e.g., brand name, product code).

c. Order number.

d. Date of manufacture.

e. Manufacturing lot number.

f. GCL thickness.

g. Roll identification number.

h. Roll dimensions (i.e., length and width) and weight.

i. Panel number, which shall be referenced to the proposed GCL panel layout drawing prepared by the GCL Manufacturer.

303.3 The GCL shall be stenciled throughout each roll with the product name and name of the GCL Manufacturer, which can be cross-referenced to the roll number marked on the label and to the production and quality control data sheets.

304. ONSITE UNLOADING, INSPECTION, AND STORAGE

304.1 Unloading:

a. Handling and unloading will be the responsibility of the Earthwork Contractor.

b. Upon arrival at the site, the rolls of the GCL will be carefully unloaded by the Earthwork Contractor in accordance with the GCL Manufacturer's recommendations.

304.2 Inspection:

a. Upon delivery of the material to the project site, the Geosynthetics Contractor shall conduct a visual inspection of the polyethylene sleeves of all rolls of GCL for damage or rips or tears. Sleeve damage shall be repaired immediately with tape or additional plastic sheeting and immediately reported to the Owner.

b. Any damage shall be noted and immediately reported to the Owner, the GCL Manufacturer, and to the carrier that transported the material. Any GCL roll or portion

thereof, which, in the judgement of the Owner, is seriously damaged, shall be removed from the project site and replaced with complying material at no additional cost to the Owner.

304.3 Storage:

a. The Owner will provide on-site, outdoor storage space for the GCL in a location near the area to be lined. The Earthwork Contractor will be responsible for protection of materials from damage, moisture, theft, and vandalism.

b. All GCL rolls will be placed in the allocated storage space horizontally in their original, unopened, wrapped cover. The rolls will be stored off the ground on pallets or plywood in small stacks not to exceed five rolls in height. The rolls will be covered with a heavy protective tarpaulin or plastic sheeting. Care will be used to keep the GCL clean and free from debris prior to installation.

c. Rolls will be stacked in a manner recommended by the GCL Manufacturer that prevents them from sliding or rolling from the stacks.

d. Any rolls that come in contact with moisture while in storage will be set aside by the Earthwork Contractor to await examination by the Owner. Damaged rolls shall also be set aside and inspected to determine suitability of the material for use.

305. PREPARATION OF SURFACE TO BE LINED

305.1 The Earthwork Contractor will be responsible for the initial preparation and maintenance of the surfaces to be lined as specified in Specification P-1400, Section 319005 prior to placement of the GCL.

305.2 The Geosynthetics Contractor shall provide written certification to both the Earthwork Contractor and the Owner that the surface on which the GCL is to be installed is acceptable. The surface then becomes the responsibility of the Geosynthetics Contractor.

305.3 The surface upon which the GCL is to be placed shall be free of standing water and maintained in a firm, clean and smooth condition during liner installation.

306. GENERAL INSTALLATION REQUIREMENTS

306.1 Weather:

a. GCL shall not be deployed or placed in any of the following conditions:

a1. During any rainfall or snowfall.

a2. In ponded water.

a3. During high winds.

a4. In the presence of excessive moisture due to fog or dew.

a5. On frozen subgrade.

b. GCL shall not be deployed when the air temperature is above 104°F or below 41°F unless it can be demonstrated to the approval of the Owner by trial welds the overlying HDPE geomembrane liner sheets can be welded at the prevailing temperature in accordance with the field seaming requirements specified in Section 319020. Under no circumstances shall GCL be deployed when the air temperature is below 5°F.

306.2 Precautions to Prevent Wind Damage

a. When possible, work shall be oriented in the direction of the prevailing wind.

b. To prevent uplift of GCL by wind, the Geosynthetics Contractor shall provide adequate temporary anchoring of the edges of the exposed sheets using sandbags, tires, or other means which will not damage the GCL.

306.3 Other Precautions to Prevent Damage

a. Protection of the GCL from damage due to foot traffic on the slopes shall be provided.

b. Provisions of facilities for safe entrance and egress of employees from sloped depressions shall be provided.

306.4 Panel Layout:

a. Horizontal panel seams are not allowed on slopes, except as required at the intersection of two slopes (valley). All panel seams on slopes shall be parallel to the flow line down the slope.

b. The panels shall be placed in accordance with the GCL Manufacturer's panel layout drawing to ensure that they are placed in the proper direction for overlapping.

c. If panels are installed in a location other than indicated on the panel layout drawing, the revised location shall be indicated on an "as-built" layout drawing prepared by the Geosynthetics Contractor. The as-built record drawing of the panel layout shall be submitted to the Owner and the CQA Contractor at the completion of the project.

307. PANEL DEPLOYMENT

307.1 The rolls of GCL shall be brought to the area to be lined with a front-end loader and support pipes set up such that the GCL roll is fully supported across its length and freely suspended so that it can unroll freely. The core bar and spreader bar shall not flex or bend excessively when a full roll is lifted.

307.2 Any rutting of the subgrade (i.e., Structural Fill) shall be smoothed and leveled prior to covering that area with GCL.

307.3 Deploy only as much GCL as can be covered with the HDPE geomembrane liner (in accordance with Section 319020) by the end of the day or in a reasonably short time in the event of precipitation.

307.4 Prior to the placement of the GCL, the Earthwork Contractor will excavate the anchor trench for the area to be lined in accordance with Article 312.

307.5 The cap material (non-woven geotextile) shall face upwards, toward the installer. The GCL shall be placed over the prepared surface in such a manner as to assure minimum handling.

307.6 Installation shall begin at a high elevation and proceed to a low elevation.

307.7 Pulling GCL panels shall be minimized to reduce the chance of permanent tension.

307.8 Wrinkles and folds shall be minimized. However, enough slack shall be provided in both directions so that there will be no tension in the GCL at the lowest expected operating temperature.

308. FIELD SEAMING

308.1 General Requirements for Seaming:

a. Horizontal seams shall be located not less than five (5) feet from the toe of the slope.

b. On slopes, all runs shall be continuous with the long dimension of all panels oriented parallel to the slope.

c. Panels placed on the basin floor require no particular orientation.

d. Once the first run has been laid, adjoining runs shall be laid with a six (6) inch minimum overlap on the longitudinal seams and twenty-four (24) inch minimum overlap on end seams. If the GCL Manufacturer recommends larger overlap seams, then the GCL Manufacturer's recommendations shall be followed.

e. The edges of GCL panels shall be adjusted to smooth out wrinkles, creases, or "fishmouths" in order to maximize contact with the underlying panel.

f. If the air temperature is higher than 85°F and the humidity is low, contraction may occur soon after placement when no confining stress has been placed over the GCL. To allow for the possibility of contraction under these conditions, the minimum seam overlap shall be increased to a minimum of twelve (12) inches on longitudinal seams and thirty-six (36) inches on end seams, or to 4% of the distance to the next parallel seams, whichever is greater.

308.2 Seaming:

a. Seaming shall be performed in accordance with the GCL Manufacturer's accepted procedure (to be provided by the Owner).

b. All seams shall be formed by executing a bentonite-enhanced overlap to ensure that a continuous seal is achieved.

c. The side of the overlying panel shall be pulled back to expose and examine the overlap areas. Seam overlap areas shall be clean and free from moisture, free from dust and debris of any kind before seaming is started. Any contamination shall be removed.

d. A fillet of dry granular bentonite shall be poured in a continuous manner along the overlap zone (between the edge of the panel and the six-inch line) at a rate of at least one-quarter pound per linear foot. All dry granular bentonite used shall be that provided by the GCL Manufacturer.

e. Seam overlap on the bottom shall be placed such that the direction of flow is from the top sheet to the bottom sheet to form a shingle effect and prevent flow into the seam.

309. SEALING AROUND AND AGAINST EXISTING STRUCTURES

309.1 The GCL shall be sealed to the existing structures within the Bypass Basin.

309.2 A wedge of granular bentonite shall be installed at the point of intersection of an existing structure and the basin floor or sideslope. This granular bentonite wedge shall be placed between the existing liner and the new GCL and shall be at least 1.0 lbs per foot.

309.3 At the intersection of the GCL and an existing structure, the GCL shall extend higher on the structure than the termination point for the existing geomembrane liner.

309.4 If the attachment hardware for the existing geomembrane liner are sharp or protrude to the extent that they could damage the GCL, a supplement HDPE geomembrane rub sheet shall be installed between the GCL and existing attachment hardware.

309.5 Vertical GCL shall be anchored to an existing structure at an elevation higher than the existing HDPE geomembrane liner and lower than the new HDPE geomembrane liner as shown on the Design Drawings. As an alternate, the Geosynthetics Contractor may propose a self-adhering GCL product that demonstrates similar properties to the base GCL in accordance with GCL Manufacturer's written recommendations.

310. INSPECTION

310.1 After seaming is complete, the Geosynthetics Contractor and the CQA Contractor shall conduct a detailed walkdown to visually check all seamed and non-seamed areas of the GCL.

310.2 All defects, holes, blisters, tears, and signs of damage during installation shall be marked for repair.

311. PATCHING AND REPAIRS

311.1 Patching shall be used to repair small defects, blisters, holes, and tears.

311.2 All dirt and debris present in the patched area shall be removed.

311.3 All patches shall be round or oval or shall have rounded corners.

311.4 All patches shall be made of the base GCL and shall extend a minimum of twelve (12) inches beyond the edges of the defect. Accessory bentonite shall be placed around the perimeter of the affected area at a rate of one-quarter pound per lineal foot prior to placing the patch. Adhesive, such as wood glue, may be used if necessary to secure the patch.

312. CREST ANCHORAGE

312.1 The GCL shall be anchored in an anchor trench at the top of the slope.

312.2 Prior to the placement of the GCL, the Earthwork Contractor will excavate the crest anchor trench in accordance with the excavation and shaping requirements specified in Specification P-1400, Section 319005 and on the Design Drawings.

312.3 After installation of the drainage geocomposite in accordance with Section 319020, the Earthwork Contractor will backfill the anchor trench in accordance with the backfilling requirements specified in Specification P-1400, Section 319005 and on the Design Drawings.

313. PROTECTIVE COVER

313.1 The GCL shall be covered the same day with the HDPE geomembrane liner as shown on the Design Drawings in accordance with Section 319020. Precautions shall be taken to prevent damage to the GCL by restricting heavy equipment traffic.

313.2 To prevent premature contraction or hydration, only the amount of GCL that can be installed, inspected, repaired, and covered in the same day shall be installed.

313.3 Any leading edge or panels of GCL left unprotected shall be covered with a heavy, waterproofing tarp which is adequately secured and protected with sand bags or other ballast.

314. CORRECTIVE MEASURES FOR PREMATURE HYDRATION OF GCL

314.1 If the GCL is prematurely hydrated, becomes saturated, etc., then the following corrective action program shall be implemented:

a. The affected panels shall be identified, documented, and exposed so that they can dry. Traffic over the impacted area shall be kept to a minimum during the drying process.

b. Once the affected panels have had enough time to dry, the Geosynthetics Contractor, the CQA Geosynthetics Inspector, and the Owner shall evaluate the impacted area for damage.

c. Following evaluation of the impacted area, the Geosynthetics Contractor shall recommend to either leave the GCL in place or to replace the GCL. The Geosynthetics Contractor's recommendation shall be made in writing, submitted with photographs documenting the evaluated area, and based on the extent of damage (or lack thereof).

c1. If the Geosynthetics Contractor's recommendation is to replace the affected GCL panels, then they shall be replaced at no additional cost to the Owner.

c2. If the Geosynthetics Contractor's recommendation is to leave the affected GCL panels in-place, and if either the Owner or CQA Geosynthetics Inspector disagree with that recommendation, then the Owner will contact the GCL Manufacturer for their recommendation.

c2.1 If the GCL Manufacturer's recommendation is to replace the affected GCL panels, then they shall be replaced at no additional cost to the Owner.

c2.2 If the GCL Manufacturer's recommendation is to leave the affected GCL panels in-place, and if either the Owner or CQA Geosynthetics Inspector disagree with that recommendation, then the GCL panels shall be removed in accordance with a negotiated agreement between the Owner and the Geosynthetics Contractor.

END OF SECTION 319025

DOCUMENT 34

Thomas Dehlin, P.E.
Manager / Consultant (Licensed in IL, KY, and WY)
(312) 269-6373
tdehlin@sargentlundy.com

Letter No. 12661-181-SL-IEPA-0002
April 5, 2024
Project No. File No. 12661-181

Re: Revised Design Drawings and Liner Design Certification for Bypass Basin Retrofit Project

Mr. Mark Liska
Illinois EPA, Bureau of Water
1021 North Grand Avenue East
Springfield, IL 62702

Submitted via email to Mark.Liska@Illinois.gov

Dear Mr. Liska:

On behalf of Midwest Generation, LLC (MWG), Sargent & Lundy is submitting revised design drawings and a revised liner design certification for the Bypass Basin Retrofit Project at the Powerton Generating Station ("Powerton") in Pekin, IL. These revised documents are being submitted in accordance with proposed Special Condition 12 in Draft CCR Permit No. 2024-CC-100030 for retrofitting the Bypass Basin. The revised design drawings and certification show / account for the following updates to the retrofit design for the Bypass Basin:

- A collection sump has been added to the leachate collection and removal system (LCRS), and the diameter of the sideslope riser pipe out of the LCRS has been increased from 6 inches to 12 inches.
- Existing and proposed design grades / elevations have been adjusted in accordance with updated topographical survey information obtained in 2022.
- The maximum design liquid flow rate through the geosynthetic clay liner (GCL) component is now estimated to be 4.58×10^{-7} $cm^3/sec/cm^2$, which is still less than the maximum design liquid flow rate through two feet of compacted soil with a hydraulic conductivity of 1×10^{-7} cm/sec. Please refer to the revised liner design certification for additional details.
- GCL, high-density polyethylene (HDPE) geomembrane liner, and drainage geocomposite materials will be furnished and installed by a company contracted directly by MWG in lieu of a subcontract with a general contractor. The liner work will be performed in accordance with a new Specification P-1402.

Following the Agency's review of these updated documents, we kindly request Illinois EPA (1) provide written approval of the revised design drawings and liner design certification and (2) incorporate these revised documents into Special Condition 12 of the final retrofit construction permit issued by Illinois EPA for the Bypass Basin.

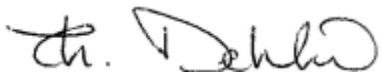
Finally, MWG plans to submit revised technical specifications for the Bypass Basin Retrofit Project later this month. The revised specifications reflect the changes made to MWG's procurement strategy since

the initial retrofit construction permit application was submitted in July 2022. As noted on the design drawings, earthwork will be performed by one contractor in accordance with Specification P-1400, while the composite liner and drainage geocomposite will be furnished and installed by a different contractor in accordance with Specification P-1402. All construction quality assurance (CQA) work will be performed in accordance with Specification P-1401.

We appreciate Illinois EPA's feedback and support on the Bypass Basin Retrofit Project, and we look forward to continuing to work with the Agency on this matter.

Please do not hesitate to contact me directly at (312) 269-6373 or via email at tdehlin@sargentlundy.com if you have any questions on MWG's plans for retrofitting Powerton's Bypass Basin.

Best Regards,



Thomas Dehlin, P.E.
Manager / Consultant

Enclosures:

1. Revised Bypass Basin Retrofit Design Drawings (10 Drawings)
2. Revised Bypass Basin Liner Design Certification (Rev. 1)

Copies Furnished (via Email):

1. Lauren Hunt, Illinois EPA
2. Darin LeCrone, Illinois EPA
3. EPA.CCR.Part845.Coordinator@Illinois.gov
4. Sharene Shealey, MWG
5. Jill Buckley, MWG
6. Todd Mundorf, MWG

DOCUMENT

35

MWG

Midwest Generation, LLC

Powerton Generating Station

Alternative Composite Liner Design Certification for Retrofitted Bypass Basin

Revision 1

April 5, 2024

Issue Purpose: Use

Project No.: 12661-181

55 East Monroe Street
Chicago, IL 60603-5780 USA
312-269-2000
www.sargentlundy.com

Sargent & Lundy

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1.0 PURPOSE & SCOPE

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.410(c)
Federal CCR Rule Reference: 40 CFR 257.72(c)

1.1 PURPOSE

The Bypass Basin at Midwest Generation, LLC's (MWG) Powerton Generating Station ("Powerton" or the "Station") is an existing coal combustion residual (CCR) surface impoundment that is being retrofitted with a new composite liner system and a new leachate collection and removal system (LCRS). As a CCR surface impoundment, the Bypass Basin is regulated by the Illinois Pollution Control Board's "Standards for the Disposal of Coal Combustion Residuals in CCR Surface Impoundments," which is codified in Part 845 to Title 35 of the Illinois Administrative Code (35 Ill. Adm. Code 845, Ref. 1) and is referred to herein as the "Illinois CCR Rule." The Bypass Basin is also regulated by the U.S. Environmental Protection Agency's (EPA) "Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments," 40 CFR Part 257 Subpart D (Ref. 2), which is referred to herein as the "Federal CCR Rule."

Pursuant to 35 Ill. Adm. Code 845.410(c) and 40 CFR 257.72(c), this document demonstrates and provides certification that the design of the new composite liner system for the retrofitted Bypass Basin complies with the requirements of 35 Ill. Adm. Code 845.410 and 40 CFR 257.72 for an alternative composite liner.

Revision 1 of this document represents the first revision to the initial certification for the design of the new composite liner system to be installed in the retrofitted Bypass Basin, which was included with the retrofit construction permit application submitted to Illinois EPA on July 15, 2022. This liner design certification was revised to account for the following updates to the retrofit design for the Bypass Basin:

- A collection sump has been added to the leachate collection and removal system.
- The final embankment crest elevations have been adjusted in accordance with updated topographical survey information obtained in 2022.

1.2 SCOPE & APPLICABLE CCR REGULATIONS

Per the 2016 Water Infrastructure Improvements for the Nation (WIIN) Act, the retrofitted Bypass Basin will continue to be subject to both the Illinois and Federal CCR Rules until the U.S. EPA approves the Illinois EPA's CCR permit program. The Illinois EPA has yet to publish a timeline for submitting its proposed CCR permit program to the U.S. EPA for approval, and so this demonstration and certification has been prepared pursuant to both sets of regulations.

1.2.1 FEDERAL CCR RULE

The following excerpts from the Federal CCR Rule are applicable to the design of an alternative composite liner system for a retrofitted CCR surface impoundment:

- § 257.72(a): New CCR surface impoundments… must be designed, constructed, operated, and maintained with either a composite liner or an alternative composite liner that meets the requirements of § 257.70(b) or (c).
- § 257.70(c): If the owner or operator elects to install an alternative composite liner, all of the following requirements must be met:
    - An alternative composite liner must consist of two components: the upper component consisting of, at a minimum, a 30-mil GM, and a lower component, that is not a geomembrane, with a liquid flow rate no greater than the liquid flow rate of two feet of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec. GM components consisting of high density polyethylene (HDPE) must be at least 60-mil thick. If the lower component of the alternative liner is compacted soil, the GM must be installed in direct and uniform contact with the compacted soil.
    - The hydraulic conductivity for the two feet of compacted soil used in comparison [to the alternative composite liner's lower component] shall be no greater than 1×10^{-7} cm/sec. The hydraulic conductivity of any alternative to the two feet of compacted soil must be determined using recognized and generally accepted methods. The liquid flow rate comparison must be made using Equation 1 of [40 CFR 257.70(c)], which is derived from Darcy's Law for gravity flow through porous media.

1.2.2 ILLINOIS CCR RULE

The following excerpts from the Illinois CCR Rule are applicable to the design of an alternative composite liner system for a retrofitted CCR surface impoundment:

- § 845.410(a): New CCR surface impoundments… must be designed, constructed, operated, and maintained with either a composite liner or an alternative composite liner that meets the requirements of Section 845.400(b) or (c).
- § 845.400(c)(1): An alternative composite liner must consist of two components: the upper component consisting of, at a minimum, a 30-mil geomembrane liner, and a lower component, that is not a geomembrane, with a liquid flow rate no greater than the liquid flow rate of two feet of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec. The geomembrane liner components consisting of high-density polyethylene (HDPE) must be at least 60 mil. If the lower component of the alternative liner is compacted soil, the geomembrane liner must be installed in direct and uniform contact with the compacted soil.

- § 845.400(c)(2): The liquid flow rate through the lower component of the alternative composite liner must be no greater than the liquid flow rate through two feet of compacted soil with a hydraulic conductivity of 1×10^{-7} cm/sec. The hydraulic conductivity for the two feet of compacted soil used in the comparison must be no greater than 1×10^{-7} cm/sec. The hydraulic conductivity of any alternative to the two feet of compacted soil must be determined using recognized and generally accepted methods.
- § 845.400(c)(3): The liquid flow rate comparison must be made using the following equation, which is derived from Darcy's Law for gravity flow through porous media.

2.0 DEMONSTRATION

The alternative composite liner design for the retrofitted Bypass Basin at the Powerton Generating Station is compliant with the referenced regulations as demonstrated in the following sections.

2.1 UPPER COMPONENT

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.400(c)(1)
Federal CCR Rule Reference: 40 CFR 257.70(c)(1)

The upper component of the alternative composite liner design for the retrofitted Bypass Basin consists of a 60-mil HDPE geomembrane. This complies with 35 Ill. Adm. Code 845.400(c)(1) and 40 CFR 257.70(c)(1).

2.2 LOWER COMPONENT

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.400(c)(2) & 845.400(c)(3)
Federal CCR Rule Reference: 40 CFR 257.70(c)(2)

The lower component of the alternative composite liner design for the retrofitted Bypass Basin consists of a geosynthetic clay liner (GCL). To demonstrate the specified GCL complies with 35 Ill. Adm. Code 845.400(c)(2) and 845.400(c)(3) and 40 CFR 257.70(c)(2), the maximum liquid flow rate allowed by the project construction specifications is compared to the liquid flow rate through two feet of soil with a hydraulic conductivity of 1×10^{-7} cm/sec. Table 1 presents this flow rate comparison. As shown in the table, the maximum allowable hydraulic conductivity specified for the GCL is 1×10^{-9} cm/sec. The GCL's hydraulic conductivity will be determined by ASTM D5887, which is a recognized and generally accepted method for determining the hydraulic conductivity of a GCL.

Per Table 1, the design liquid flow rate through the GCL specified for the lower component of the alternative composite liner for the retrofitted Bypass Basin is less than the liquid flow rate through two feet of compacted

soil with a hydraulic conductivity of 1×10^{-7} cm/sec. This complies with 35 Ill. Adm. Code 845.400(c)(2) and 845.400(c)(3) and 40 CFR 257.70(c)(2).

Table 1 – Liquid Flow Rate Comparison Between Compacted Soil Liner & GCL for Retrofitted Bypass Basin

Parameter	Symbol	Compacted Soil Liner	GCL
Crest Elevation	EL_{crest}	468 feet	
Minimum Retrofitted Bypass Basin Floor Elevation	EL_{floor}	457.5 feet	
Hydraulic Head on Liner (Omitting Geomembrane Thickness)	$h = EL_{crest} - EL_{floor}$	10.5 feet	
Thickness of Liner Lower Component	t	2 feet	7 mm = 0.023 feet
Hydraulic Gradient Through Liner	$i = h / t$	5.25	457
Maximum Hydraulic Conductivity of Liner	k	1.0×10^{-7} cm/sec	1.0×10^{-9} cm/sec
Liquid Flow Rate Through Liner (per Unit Area)	$q = k \times (i + 1)$	6.25×10^{-7} cm^3/sec/cm^2	4.58×10^{-7} cm^3/sec/cm^2

3.0 CERTIFICATION

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.410(c)

Federal CCR Rule Reference: 40 CFR 257.72(c)

I hereby certify that:

- Per the preceding demonstration and pursuant to 35 Ill. Adm. Code 845.400(c)(2) and 845.400(c)(3) and 40 CFR 257.70(c)(2), the design liquid flow rate through the lower component of the alternative composite liner for the retrofitted Bypass Basin is no greater than the liquid flow rate through two feet of compacted soil with a hydraulic conductivity of 1×10^{-7} cm/sec.
- The design of the alternative composite liner for the retrofitted Bypass Basin complies with the requirements of 35 Ill. Adm. Code 845.410 and 40 CFR 257.72.
- This pre-construction composite liner design certification was prepared by me or under my direct supervision, and
- I am a registered professional engineer under the laws of the State of Illinois.

Certified By: Thomas J. Dehlin Date: April 5, 2024

Seal:



Digitally signed by Thomas Dehlin
Date: 2024.04.05 08:29:55-05'00'

4.0 REFERENCES

1. Illinois Pollution Control Board. "Standards for Disposal of Coal Combustion Residuals in CCR Surface Impoundments." 35 Ill. Adm. Code 845. Accessed April 4, 2024.
2. U.S. Environmental Protection Agency. "Standards for Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments." 40 CFR Part 257 Subpart D. https://www.ecfr.gov/current/title-40/chapter-I/subchapter-I/part-257/subpart-D. Accessed April 4, 2024.

DOCUMENT 36

From: Rompot, Derek <Derek.Rompot@Illinois.gov>
Sent: Monday, April 8, 2024 8:32 AM
To: MacDonna, Keegan; Azeem, Anwar; Liska, Mark; Herrera, Francisco
Subject: FYI: CCR 1st permit to public notice; second draft permit getting close
Attachments: 24032701 Powerton operating.docx; 24032601 Powerton construct bypass basin.docx

As most of you know, the first CCR permit went out to public notice (Marks got Howerton out, the initial operating permit and a construction permit for retrofit). Attached are word docs of the draft permit in case you are interested.

A public hearing has been scheduled - May 8, 2024 beginning at 6:00 p.m. in Room A at the Miller Center, 551 South 14th Street, Pekin, Illinois 61554.

I have my Joliet 9 drafted, it has not goner out to public notice yet. The Agency will be having a public hearing for Joliet 9/Lincoln Stone quarry; it will be taking place sometime near the end of July.

Derek

State of Illinois - CONFIDENTIALITY NOTICE: The information contained in this communication is confidential, may be attorney-client privileged or attorney work product, may constitute inside information or internal deliberative staff communication, and is intended only for the use of the addressee. Unauthorized use, disclosure or copying of this communication or any part thereof is strictly prohibited and may be unlawful. If you have received this communication in error, please notify the sender immediately by return e-mail and destroy this communication and all copies thereof, including all attachments. Receipt by an unintended recipient does not waive attorney-client privilege, attorney work product privilege, or any other exemption from disclosure.

CCR Permit No. 2024-CO-100029
Notice No. MEL:24022801.docx

Public Notice Beginning Date: April 2, 2024

Public Notice Ending Date: May 17, 2024

Coal Combustion Residual Surface Impoundment
Permit Program

Draft Permit to Operate a Coal Combustion Residual Surface Impoundment.

Public Notice/Fact Sheet Issued By:

Illinois Environmental Protection Agency
Bureau of Water
Division of Water Pollution Control
Permit Section
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276
217/782-0610

Name and Address of Permittee:

Midwest Generation, LLC
13082 East Manito Rd.
Pekin, IL 61554

Name and Address of Facility:

Midwest Generation, LLC
Powerton Generating Station
13082 East Manito Rd.
Pekin, IL 61554
(Tazewell County)

The Illinois Environmental Protection Agency (IEPA) has made a tentative determination to issue a Permit for Retrofit Construction of a Coal Combustion Surface Impoundment pursuant to 35 Illinois Administrative Code Part 845 and has prepared a draft permit and associated fact sheet. The IEPA is holding a public comment period and public hearing to offer an opportunity to the public to provide both written and oral comments on this proposed action prior to making a final decision.

The IEPA is accepting written public comments on the draft permit until 11:59 p.m. Friday, May 17, 2024. If you would like to provide written comments, please email your comments to epa.publichearingcom@illinois.gov, RE: "Midwest Generation, LLC – Powerton Generating Station CCR" or "2024-CO-100029". Written comments on the draft permit may also be mailed to IEPA, attention Jeff Guy, IEPA Hearing Officer, P.O. Box 19276, 1021 North Grand Avenue East, Springfield, Illinois 62794-9276. Email comments originating on third party systems or servers intended for submittal of multiple emails of the same or nearly the same content will not be accepted without prior approval from the hearing officer.

In addition to accepting written public comments, the IEPA will host a public hearing on May 8, 2024 beginning at 6:00 p.m. to receive oral public comments on the draft permit. The public hearing will be conducted pursuant to 35 Ill. Adm. Code Part 845. The public hearing will be held in Room A at the Miller Center, 551 South 14th Street, Pekin, Illinois 61554.

A public hearing on this draft permit will be held on May 8, 2024 at 6:00 p.m. in Room A at the Miller Center, 551 South 14th Street, Pekin, Illinois 61554.

Interested persons are invited to submit written comments on the draft permit to the IEPA at:

Hearing Officer Jeff Guy, Office of Community Relations
Re: Midwest Generation, LLC – Powerton Generating Station
Illinois Environmental Protection Agency
1021 North Grand Avenue East, P. O. Box 19276
Springfield, IL 62794-9276

Requests for interpretation (including sign language) must be made by 5:00 p.m. on Wednesday, May 17, 2024 by contacting the IEPA Hearing Officer by email at epa.publichearingcom@illinois.gov, or by calling (217) 785-8724. Questions regarding hearing procedures

or requests to address special needs should be made to the IEPA Hearing Officer by email at epa.publichearingcom@illinois.gov, by calling (217) 785-8724, or by calling (866) 273-5488 (TDD phone number).

The IEPA will provide a Responsiveness Summary, which will be available at the time a final decision is made in this matter. The Responsiveness Summary will include a summary of all significant comments, criticisms, and suggestions, whether written or oral, submitted during the public comment period, at the hearing, or during the time the hearing record is open. The Responsiveness Summary will provide IEPA's response to all significant comments, criticisms, and suggestions and a statement of IEPA's action, including, when applicable, the issuance or denial of the permit.

The permit application, IEPA review notes including load limit calculations, public notice, fact sheet, draft permit, comments received, and other pertinent documents are available for inspection and may be copied at the IEPA between 9:30 a.m. and 3:30 p.m. Monday through Friday when scheduled by the interested person.

You can join the listserv for this facility at the following address:
https://epa.illinois.gov/topics/water-quality/watershed-management/ccr-surface-impoundments.html

For further information on the draft permit, please call Mark E. Liska at 217/782-0610.

The applicant has been operating a steam electric generating station (SIC 4911). The station operates four cyclone coal-fired wet bottom boilers to supply steam to two generating units, designated units #5 and #6 rated at 851 and 846 MW respectively.

CCR basins at the facility consist of the Ash Surge Basin, the Ash Bypass Basin, the Former Ash Basin, and the Metal Cleaning Basin. This permit will cover the operation of the Ash Bypass Basin, Ash Surge Basin, Former Ash Basin, and Metal Cleaning Basin.

Midwest Generation – Powerton Generating Station has an active NPDES Permit IL0002232 that regulates the discharges of wastewater from the property to waters of the United States.

The proposed Coal Combustion Residual Surface Impoundment Operating Permit No. 2021-C0-100029 does not address the closure of any of the CCR Basins. Midwest Generation – Powerton Generating Station has submitted a separate Permit application to address the closure of the CCR basins.

Operation of All Basins:

Midwest Generation, LLC – Powerton Station is (currently) a 1,785 MW coal-fired power plant located in Pekin, IL along the Illinois River.

The facility has produced electricity since the 1928 utilizing four coal-fired boilers and two electric generating units, Units 5 and 6.

The Ash Surge Basin was constructed in 1978 and is currently in operation.

The Ash Bypass Basin was used as a bypass when the Ash Surge Basin required maintenance – decant water would divert to it instead of the Ash Surge Basin. The Ash Bypass Basin was taken out of service in 2020 and has not been used for managing CCR or non-CCR waste streams since 2020. The Ash Bypass Basin will be retrofitted with a new composite liner system and a new leachate collection and removal system. The retrofit construction of this permit will be covered under a separate permit.

The Former Ash Basin has an unknown construction date and could possibly be old as from the plant first generated power in 1928. It is estimated that it stopped receiving ash sometime in the 1970s.

The Metal Cleaning Basin was constructed in 1978 and has been in continuous operation. It has been used to temporarily store fly ash and bottom ash which are both routinely removed after the time needed for temporary storage is complete. Bottom ash comes from street sweeping and cleanup activities.

The basins described above must meet the requirements pursuant to 35 Ill. Adm. Code 845.230(d) for initial Operating Permits.

The Ash Surge Basin, Metal Cleaning Basin, and Ash Bypass Basin were constructed in 1978. The Former Ash Basin has an unknown construction date. The Ash Surge basin contains bottom ash. The Ash Bypass Basin contained bottom ash and economizer ash which have been removed. The Former Ash Basin does not have documentation of what was put in there. The Metal Cleaning Basin occasionally has both fly and bottom ash in it.

The permittee performed a Locations Restrictions Compliance Demonstration in October 2018. All of the basins except the Former Ash Basin are separated from the upper limit of the uppermost aquifer by a minimum distance of 5 feet which meets compliance with 845.300. All of the basins except the Former Ash Basin are not located in a wetlands according to the National Wetlands Inventory – Version 2 by the USFW. All of the basins are not located within a Holocene-aged fault or a seismic impact zone as mapped by the

USGS. All of the basins except the Former Ash Basin are also not in an unstable area or floodplain according to the NFHL FIRMette Map.

Documentation and Maintenance of Slope Protection: The exterior north slope has erosion protection because of the Ash Surge Basin's geomembrane-lined interior slope. The exterior east and south slopes have erosion protection because of the established vegetation. The exterior west slope is covered with gravel that protects the slope from erosion. Photo documentation is included in the application.

The Ash Bypass Basin, like the Ash Surge Basin, is lined and has established vegetation.

The Former Ash Basin has fill embankments on the north, west and east sides and is incised on the south side. Heavy vegetation from decades on non-use provides additional protection.

The Metal Cleaning Basin has partial embankments on all sides with slopes lined with 60-mil high-density PE geomembrane.

The permittee submitted an Initial Emergency Action Plan and a Fugitive Dust Control Plan for all basins that meets the requirements and are certified.

The permittee has submitted a Groundwater Monitoring Plan which has been reviewed by the Groundwater Section and meets the requirements. The Groundwater Monitoring Plan's monitoring wells, limits, and other requirements are explained in the Special Conditions of the permit.

The permittee submitted a preliminary written closure plan in the operating permit application for all four basins in accordance with 845.230. For the Ash Surge Basin, Ash Bypass Basin, and Metal Cleaning Basin, the preliminary closure plan is to remove all CCR material. The permittee submitted a written closure plan for the Former Ash Basin in accordance with 845.740. For the Former Ash Basin, the permittee will close the basin by consolidating the CCR and close the consolidated ash in place.

The permittee submitted a written post-closure plan for the Former Ash in accordance with 845.780. The Former Ash Basin will have regulator maintenance for the required 30 years. The permittee submitted a preliminary written post-closure plan for the Ash Surge Basin, Ash Bypass Basin, and Metal Cleaning Basin in the operating permit application in accordance with 845.230.

Liner Certification: The liners for the Ash Surge Basin, Ash Bypass Basin, and Metal Cleaning Basin have 60-mil HDPE geomembrane liner, 12 inches of limestone screenings, and 6 inches of sand, but do not comply with the requirements of 35 Ill. Adm. Code 845.400 and are considered unlined. The construction of the Former Ash Basin is unknown and, based on its age, is believed to be unlined.

The permittee submitted a hazard potential classification assessment under 35 Ill. Adm. Code 845.440 and 40 CFR 257.73(a)(2) which was certified by an IL licensed professional engineer. The basins are considered Class 2 as an Illinois Hazard Potential Classification.

The permittee submitted a structural stability assessment which was certified by an IL licensed professional engineer. The assessment recommended mowing vegetation, removing woody vegetation, and making sure the basins' discharge pipes are in good, working order.

The permittee submitted an initial safety factor assessment which was certified by an IL licensed professional engineer. The assessment did not find any issues.

The permittee submitted an initial inflow design flood control system plan assessment which was certified by an IL licensed professional engineer. The assessment found that the basins met a 1,000 year flood event without water overflowing the basins' emergency spillway structures.

The permittee submitted a safety and health plan underlining safety requirements.

The permittee submitted notice of a bond showing financial assurance in accordance with 35 Ill. Adm. Code 845.230(d)(2)(N).

Special Conditions:

The following explains the conditions of the proposed permit:

The special conditions specify that various plans relating to the operation and maintenance of the basins must be maintained and kept up to date, that the permittee must operate and maintain the groundwater monitoring system, specifies the groundwater standards at the waste boundary, and specifies recordkeeping and reporting requirements.

1. Permittee must Comply with Air and Land Regulations
2. No construction activities

3. Fugitive Dust Control Plan Requirements
4. Permanent Signage Requirements
5. Emergency Action Plan Requirements
6. Written Closure Plan Requirements
7. Financial Assurance Requirements
8. Health and Safety Plan
9. Lateral expansions must be inspected
10. All impoundments must be inspected annually
11. Two additional down gradient wells in the silty clay silt unit, two piezometers must be added
12. Background wells for the 3 aquifer unit requirements
13. Downgradient wells for the three aquifer unit requirements
14. Surface water and groundwater interaction monitoring
15. Start groundwater sampling at all wells
16. Statistical methods for evaluating groundwater requirements
17. Groundwater monitoring program must be in compliance with 845
18. Within 240 days, must submit statistical calculations from Special Condition 16
19. Within 60 days, must provide analysis of CCR
20. Analysis of all waste streams in basins
21. Groundwater standards for Silty Clay/Silt unit requirements
22. Groundwater standards for the Sand and Gravel unit requirements
23. Annual consolidated report requirements
24. Groundwater monitoring data submission requirements
25. Groundwater monitor results submitted within 60 days\
26. Annual Groundwater Monitoring and Corrective Action Report requirements
27. Annual consolidated report requirements
28. Addresses to mail to
29. Issuance does not release from prior liabilities
30. All sludges on site shall be disposed of properly
31. Water discharges through NPDES Permit IL0002232

Public Notice of Draft Permit

Public Notice Number MEL:24022801.docx is hereby given by Illinois EPA, Division of Water Pollution Control, Permit Section, 1021 North Grand Avenue East, Post Office Box 19276, Springfield, Illinois 62794-9276 (herein Agency) that a draft Coal Combustion Residual Surface Impoundment Operating Permit (CCR) Permit Number 2024-CO-100029 has been prepared under 40 CFR 124.6(d) for Midwest Generation, LLC for discharge into Illinois River from the Powerton Generating Station, 13082 East Manito Rd., Pekin, IL 61554, (Tazewell County).

The application, draft permit and other documents are available for inspection and may be copied at the Agency between 9:30 A.M. and 3:30 P.M. Monday through Friday. A Fact Sheet containing more detailed information is available at no charge. For further information, call the Public Notice Clerk at 217/782-0610.

Interested persons are invited to submit written comments on the draft permit to the Agency at the above address. The NPDES Permit and Joint Public Notice numbers must appear on each comment page. All comments received by the Agency not later than 30 days from the date of this publication shall be considered in making the final decision regarding permit issuance.

Any interested person may submit written request for a public hearing on the draft permit, stating their name and address, the nature of the issues proposed to be raised and the evidence proposed to be presented with regards to these issues in the hearing. Such requests must be received by the Agency not later than 45 days from the date of this publication.

If written comments and/or requests indicate a significant degree of public interest in the draft permit, the permitting authority may, at its discretion, hold a public hearing. Public notice will be given 45 days before any public hearing.

Coal Combustion Residual Surface Impoundment Permit No. 2024-CO-100029

Illinois Environmental Protection Agency

Division of Water Pollution Control

1021 North Grand Avenue East

Post Office Box 19276

Springfield, Illinois 62794-9276

Coal Combustion Residual Surface Impoundment Operating Permit

Expiration Date:

Issue Date:
Effective Date:

Name and Address of Permittee:

Midwest Generation, LLC
13082 East Manito Rd.
Pekin, IL 61554

Name and Address of Facility:

Midwest Generation, LLC
Powerton Generating Station
13082 East Manito Rd.
Pekin, IL 61554
(Tazewell County)

CCR Impoundment:

W1798010008-01 Ash Surge Basin
W1798010008-03 Metal Cleaning Basin
W1798010008-04 Ash Bypass Basin
W1798010008-05 Former Ash Basin

In compliance with the provisions of the Illinois Environmental Protection Act, Title 35 of Ill. Adm. Code, Subtitle C and/or Subtitle D, Chapter 1, and the Clean Water Act (CWA), the above-named permittee is hereby authorized to operate a coal combustion residual (CCR) surface impoundment, at the above location in accordance with the standard conditions and attachments herein.

Coal Combustion Residual Surface Impoundment Permit No. 2024-CO-100029 authorizes the operation of the Ash Surge Basin, the Metal Cleaning Basin, the Ash Bypass Basin, and the Former Ash Basin.

Coal Combustion Residual Surface Impoundment Permit No. 2024-CO-100029 does not authorize the closure, corrective action, or any construction for the Ash Surge Basin, the Former Ash Basin, the Ash Bypass Basin, or the Metal Cleaning Basin.

Coal Combustion Residual Surface Impoundment Permit No. 2024-CO-100029 does not authorize the discharge of any wastewater to waters of the United States. NPDES Permit No. IL0002232 authorizes this facility to discharge wastewater to waters of the United States.

Permittee is not authorized to operate after the above expiration date. In order to receive authorization to operate beyond the expiration date, the permittee shall submit the proper application as required by the Illinois Environmental Protection Agency (IEPA) not later than 180 days prior to the expiration date.

Darin E. LeCrone P.E.
Manager, Permit Section
Division of Water Pollution Control

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CCR Impoundment Permit No. 2021-CO-100029

Special Conditions

SPECIAL CONDITION 1: This permit does not relieve the Permittee of the responsibility of complying with the provisions of the State of Illinois Rules and Regulations, 35 Ill. Adm. Code Subtitle B, Air Pollution Control, Chapter 1 and 35 Ill. Adm. Code Subtitle G, Land Pollution Control, Chapter 1. The Permittee may be required to file reports and/or obtain applicable permits through the Illinois EPA's Bureau of Air (BOA) - Division of Air Pollution Control (DAPC) and/or Illinois EPA's Bureau of Land (BOL) – Division of Land Pollution Control (DLPC).

SPECIAL CONDTION 2: This permit does not authorize any construction activities necessary for closure and/or corrective action of the CCR impoundment(s) at the site.

SPECIAL CONDITION 3: The operator shall implement methods for controlling dust, including the Fugitive Dust Control Plan included in Application Log No. 2021-100029, so as to prevent wind dispersal of particulate matter off-site.

SPECIAL CONDITION 4: A permanent sign shall be maintained at each CCR impoundment that contains the information required under 35 IAC, Section 845.130.

SPECIAL CONDITION 5: The written Emergency Action Plan (EAP), shall be maintained by the facility. The EAP and all amendments must be placed in the facility's operating record. Upon activation of the EAP, the facility must notify Illinois EPA in writing within 30 days of activation and place all corresponding documentation in the facility operating record. The permittee may amend the EAP at any time but must amend the EAP when there is a change in conditions that would substantially affect the EAP.

Commented [HL1]: EAPs for initial operating permits are subject to 845.520 and 29 CFR 1910.

EAPs for Construction permits are subject to 845.520 and 29 CFR 1926 which has much more extensive requirements for emergencies during construction.

SPECIAL CONDITION 6: The written closure plan has been submitted as part of Permit Application Log No. 2021-100028. The closure plan and all amendments must be placed in the facility's operating record. The permittee may amend the written closure plan at any time but must amend the closure plan when there is a change in a CCR surface impoundment that would substantially affect the written closure plan, and before closure activities have started or unanticipated events necessitate a revision. The closure plan shall be amended at least 60 days before a planned change and within 60 days after an unanticipated event.

SPECIAL CONDITION 7: The permittee shall provide and maintain financial assurance in accordance with Part 845 Subpart I.

SPECIAL CONDITION 8: The Safety and Health Plan and accompanying certification has been submitted as part of Permit Application Log No. 2021-100029. The plan must be updated annually and on an as needed basis. The Safety and Health Plan and all amendments must be placed in the facility operating record.

SPECIAL CONDITION 9: All CCR impoundments and any lateral expansion of a CCR surface impoundment must be inspected by a qualified person on a weekly basis and after each 25-year, 24-hour storm event. All CCR surface impoundment instrumentation must be inspected at least every 30 days. A report for each inspection shall be generated and placed into the facility operating record.

SPECIAL CONDITION 10: Each CCR Surface impoundment must be inspected on an annual basis by a qualified Professional Engineer, in accordance with 35 IAC 845.540. An inspection report must be completed and included with the Annual Consolidated Report, as specified in Special Condition 29.

Commented [HL2]: This has been broken up into the multiunit system with the additional two wells in the water table unit being required below. This is based on the Landfill Groundwater Impact Assessment.

SPECIAL CONDITION 11: Within 90 days of the effective date of this operating permit, the facility must install and monitor as a part of the groundwater monitoring network at one additional downgradient well, MW-21D, in the Sand and Gravel Unit and two additional down gradient wells, MW-22 and MW-23 in the Silty Clay/Silt Unit. MWG must also install and monitor for groundwater elevations two piezometers in the fill unit, P-1 and P-2, and install and monitor for surface water elevations one staff gage in the Lost Creek. The piezometers must be installed with 10 feet screens, placed with the bottom of the screen installed at the bottom of the fill sand or top of the native soils.

Commented [HL3]: Edits started here. 3/27/24

SPECIAL CONDTION 12: The background wells for the three migration pathways are as follows:

a) Silty Clay/Silt Unit —MW-16.

b) Sand and Gravel Unit— MW16.

SPECIAL CONDITION 13: The downgradient wells for the three migration pathways are as follows:

a) Silty Clay/Silt Unit —MW-06, MW-14, Newly installed well MW-22, Second newly installed well MW-23.

Commented [HL4]: MWG to install a new well or use this one.

b) Sand and Gravel Unit— MW-01, MW02, MW03, MW04, MW05, MW-07, MW-10, New well installed MW-21D.

Commented [HL5]: MWG to install a new well or use this one.

SPECIAL CONDITION 14: Surface water and groundwater interaction monitoring and sand and gravel aquifer unit groundwater monitoring includes surface water elevations and groundwater elevations collected and reported in accordance with 35 IAC

CCR Impoundment Permit No. 2021-CO-100029

Special Conditions

845.610(e)(3)(C), 35 IAC 845.640(c)(1) and (3), and 35 IAC 845.650(b)(2). The groundwater and surface water elevation monitoring locations are as follows:

a) Surface water—the Illinois River USGS staff gage at Kingston Mines and one new staff gage, installed in the Lost Creek.

b) Groundwater:

1. Fill Sand connected to the Sand and Gravel Unit—two newly installed piezometers, P-1 and P-2. .

2. Silty Clay/Silt Unit— MW-06, MW-12, MW-14, MW-15, MW-17, MW-18MW-22, MW-23.

3. Sand and Gravel Unit—MW-01, MW02, MW03, MW04, MW05, MW-07, MW-09, MW-11, MW-16, MW-19MW-21D.

Commented [HL6]: Waiting on MWG on whether they want to install a new well or use this one.

Commented [HL7]: Waiting on MWG resolution of whether they want to install a new well or use this one.

MWG must install the silty clay/silt and sand and gravel unit groundwater monitoring wells, fill unit piezometers and staff gages within 90 days of the issuance of this permit.

After completion of the initial surface water/groundwater interaction investigation, lasting 2 calendar years, the necessity of additional wells to monitor storm water infiltration and flooding recharge will be assessed by MWG. A report for review and approval by the Agency will be provided to the Agency by the end of 2.5 years from the beginning of the groundwater and surface water elevation monitoring.

SPECIAL CONDITION 15: Within 30 days of the effective date of this operating permit, the facility must initiate groundwater sampling and analysis in accordance with 35 IAC Section 845.640 at every well. Compliance with Section 845.640(a) requires the collection and submission of monitoring data during annual reporting of laboratory reports, field documents and records of collection and analysis, and documentation of environmental data compliant with SW 846.

SPECIAL CONDITION 16: Within 90 days of the effective date of this permit, the permittee must select a statistical method for evaluating groundwater monitoring data, pursuant to Section 845.640(f)(1), and notify Illinois EPA of the chosen statistical method. The permittee must use the data from the groundwater monitoring program required by this permit to conduct the statistical analysis. Data to be provided or an amended Attachment 9-4 of the Initial Operating Permit Application is as follows:

a) Outlier analysis must be struck from Attachment 9-4 or revised to adhere to the following for any laboratory analyzed constituent listed in 35 IAC 845.600:

1. Verified data from a NELAP certified laboratory is representative of the aquifer properties analyzed. Outliers cannot be evaluated for exclusion from any dataset without explicit data validation identifying discrepancies from the laboratory and/or field procedures that would qualify a data point to be considered an outlier. Midwest Generation must use the USEPA data validation procedures to determine when or if a data point is to be excluded from a data set. (EPA QA/G-8).

b) All input data sets for each constituent must be provided in a table in accordance with SW-846 chapter 1, incorporated by reference in 35 IAC 845. Chapter 1 of SW846 states that regulatory decisions must be made with environmental data.

c) All data sets, used for statistical analysis of background, must be within the last eight consecutive quarterly sampling events in order to validate the statistical methods for recent activity (35 IAC 845.650(b));

d) Non-parametric statistical analysis must be provided to the Agency for review and approval each time that a non-parametric data set occurs.

SPECIAL CONDITION 17: Within 30 days of the effective date of this permit, the groundwater monitoring program must be in compliance with 35 IAC 845.650 at all wells.

a. The permittee must analyze each sample for the constituents listed in 845.600(a), calcium and turbidity.

b. When analyzing groundwater quality, the permittee must measure total recoverable metals pursuant to Section 845.640(i).

c. The permittee must collect a minimum of eight independent samples from each background and downgradient well within 550 days of operating permit issuance.

Commented [HL8]: Permits? Are you ok with this even though we say in 845 and in the hearings for the rule making that 180 days is the standard?

Commented [HL9R8]: I would prefer they take more time because it will allow for an actual trend over the course of the year or more. Illinois has a diurnal system for gw elevations so 550 is actually a very accurate number.

CCR Impoundment Permit No. 2021-CO-100029

Special Conditions

d. After background groundwater monitoring has been completed, the permittee must conduct monitoring pursuant to Section 845.650(b).

SPECIAL CONDITION 18: Within 640 days of the effective date of this permit, the permittee must submit statistical calculations using the method selected in Special Condition 16. As part of this submittal, the applicant must provide a groundwater protection standard for each constituent, the statistical evaluations and calculations including the raw data used, and a description of any assumptions used when calculating the groundwater protection standards.

SPECIAL CONDITION 19: Within 60 days of the effective date of the operating permit, the permittee must provide an analysis of the coal combustion residual located inside the Former Ash Basin, Ash Surge Basin, Metal Cleaning Basin, and Ash Bypass Basin, if any remains and in the embankments of the Former Ash Basin, Ash Surge Basin, Metal Cleaning Basin, and Ash Bypass Basin. The samples must be compliant with the sampling requirements of SW 846 pursuant to 845.230(d)(2)(B).

SPECIAL CONDITION 20: Within 60 days of the effective date of this permit, the permittee must provide an analysis of all waste streams entering or currently at the Former Ash Basin, Ash Surge Basin, Metal Cleaning Basin, and Bypass Basin. Sources that have historically discharged in the Former Ash Basin, Ash Surge Basin, Metal Cleaning Basin, and Bypass Basin include: coal pile runoff, gas side metal cleaning waste, plant drains, yard runoff, roof drains, road runoff. For each of these sources and any other sources not identified, the permittee must provide an analysis of the waste stream compliant with the sampling requirements of SW 846 pursuant to 845.230(d)(2)(C) or a statement that the identified source is no longer discharging and the approximate date of the last discharge.

SPECIAL CONDITION 21: The groundwater standards at the waste boundary for the Silty Clay/Silt unit are:

Pollutant	Concentration
Antimony	0.006 mg/L
Arsenic	0.010 mg/L
Barium	2.0 mg/L
Beryllium	0.004 mg/L
Boron	4.7 mg/L
Cadmium:	0.005 mg/L
Chloride:	200 mg/L
Chromium:	0.1 mg/L
Cobalt:	0.006 mg/L
Fluoride:	4.0 mg/L
Lead:	0.0075 mg/L
Lithium:	0.04 mg/L
Mercury:	0.002 mg/L
Molybdenum:	0.1 mg/L
pH:	6.5-9.0 units
Selenium:	0.05 mg/L
Sulfate:	400 mg/L
Thallium:	0.002 mg/L
Total Dissolved Solids:	1200 mg/L
Radium 226 and 228 combined:	5 pCi/L

If the statistical analysis performed as part of Special Condition 19 determines a groundwater protection standard that is higher than the currently permitted limits, the applicant may submit a permit application modification to modify the above standards. Chloride and pH will only be amended through statistical analysis during permit renewal.

After review and approval of initial background concentrations by the Agency, background concentrations for constituents listed in 35 IAC 845.600(a) will only be evaluated for changes during permit renewal and after implementation and completion of construction permits.

SPECIAL CONDITION 22: The groundwater standards at the waste boundary for the Sand and Gravel unit are:

Pollutant	Concentration
Antimony	0.006 mg/L
Arsenic	0.010 mg/L
Barium	2.0 mg/L
Beryllium	0.004 mg/L
Boron	4.7 mg/L
Cadmium:	0.005 mg/L

CCR Impoundment Permit No. 2021-CO-100029

Special Conditions

Chloride:	200 mg/L
Chromium:	0.1 mg/L
Cobalt:	0.006 mg/L
Fluoride:	4.0 mg/L
Lead:	0.0075 mg/L
Lithium:	0.04 mg/L
Mercury:	0.002 mg/L
Molybdenum:	0.1 mg/L
pH:	6.5-9.0 units
Selenium:	0.05 mg/L
Sulfate:	400 mg/L
Thallium:	0.002 mg/L
Total Dissolved Solids:	1200 mg/L
Radium 226 and 228 combined:	5 pCi/L

If the statistical analysis performed as part of Special Condition 19 determines a groundwater protection standard that is higher than the currently permitted limits, the applicant may submit a permit application modification to modify the above standards. Chloride and pH will only be amended through statistical analysis during permit renewal.

After review and approval of initial background concentrations by the Agency, background concentrations for constituents listed in 35 IAC 845.600(a) will only be evaluated for changes during permit renewal and after implementation and completion of construction permits.

SPECIAL CONDITION 23: Annual consolidated reports must contain the following items in accordance with Section 845.550, 845.500(c), 845.540(b)(3), and 845.610(e):

Fugitive Dust Control Report in accordance with Section 845.500(c);

Annual Inspection Report in accordance with Section 845.540(b)(2);

Groundwater Monitoring and Corrective Action Report in accordance with Section 845.610(e)(3) and (e)(4); documentation in the report must satisfy Section 845.640(a), (b), (c),

SPECIAL CONDITION 24: The permittee must maintain a written operating record at the facility. Each record must be retained for at least three years past the date the Agency approved the owner's or operator's request to terminate post-closure care, when closure is with a final cover system, or the completion of groundwater monitoring under Section 845.740(b), when closure is by removal. Records for each individual surface impoundment must be identified by name and identification number.

The permittee must place the following information, as it becomes available, in the facility's operating record:

a. Copies of all permit applications and permits;

b. Documentation recording the public meetings held under Section 845.240;

c. Weekly CQA reports under Section 845.290(b);

d. Hazard potential classification assessments for CCR surface impoundments (see Section 845.440(a)(3)(D));

e. Structural stability assessments for CCR surface impoundments (see Section 845.450(d)(4));

f. Safety factor assessments for CCR surface impoundments (see Section 845.460(c)(4));

g. The CCR fugitive dust control plan and any subsequent amendment of the plan (see Section 845.500(b)(6)), except that only the most recent fugitive dust control plan must be maintained in the facility's operating record, irrespective of the time requirement specified in subsection (b);

h. Inflow design flood control system plans for CCR surface impoundments (see Section 845.510(c)(4)(D));

i. Emergency Action Plan (see Section 845.520(a)), except that only the most recent EAP must be maintained in the facility's operating record irrespective of the time requirement specified in subsection (b);

CCR Impoundment Permit No. 2021-CO-100029

Special Conditions

j. Documentation prepared by the owner or operator recording all activations of the EAP (see Section 845.520(f));

k. Documentation prepared by the owner or operator recording the annual face-to-face meeting or exercise between representatives of the owner or operator of the CCR surface impoundment and the local emergency responders (see Section 845.520(g));

l. Safety and Health Plan (see Section 845.530(a));

m. Documentation recording the results of each inspection and instrumentation monitoring by a qualified person (see Section 845.540(a)(2));

n. Annual consolidated report (see Section 845.550), which contains the following:

    1. The annual CCR fugitive dust control report (see Section 845.500(c));

    2. The annual inspection report (see Section 845.540(b)(3)); and

    3. The annual groundwater monitoring and corrective action report (see Section 845.610(e));

o. All groundwater monitoring data submitted to the Agency and any analysis performed (see Section 845.610(b)(3)(D) and 845.640(a), (b), and (c));

p. Within 30 days after detecting one or more monitored constituents above the groundwater protection standard, the notifications required by Section 845.650(d) and (e);

q. The semi-annual report describing the progress in selecting and designing the remedy (see Section 845.670(a));

r. Within 30 days after completing implementation of the corrective action plan, the notification required by Section 845.680(e);

s. USEPA-approved or denied demonstration as required by Section 845.700(d)(2)(F);

t. The preliminary written closure plan and any amendment of the plan (see Section 845.720(a)) except that only the most recent closure plan must be maintained in the facility's operating record, irrespective of the time requirement specified in subsection (b);

u. The written demonstrations, including the certification required by Section 845.730(b)(3), for a time extension for initiating closure (see Section 845.730(b)(2)); 22) The notification of intent to close a CCR surface impoundment (see Section 845.730(d));

v. The monthly reports for closure by removal (see Section 845.740(d));

w. The closure report and certification (see Section 845.760(e)(3)), or the completion of groundwater monitoring report and certification (see Section 845.740(f)); completion of groundwater monitoring in accordance with Section 845.740 with concurrence of the Agency must be in the record;

x. The notification of completion of closure of a CCR surface impoundment (see Section 845.760(f));

y. The notification recording a notation on the deed (see Section 845.760(h));

z. The preliminary written retrofit plan for a CCR surface impoundment (see Section 845.770(a)(3));

aa. The notification of intent to initiate retrofit of a CCR surface impoundment (see Section 845.770(d));

bb. The retrofit completion report and certification (see Section 845.770(g)(3));

cc. The notification of completion of retrofit activities (see Section 845.770(h));

dd. The notification of completion of post-closure care period (see Section 845.780(f));

ee. The completion of CCR removal and decontamination report and certification (see Section 845.740(e)); and

CCR Impoundment Permit No. 2021-CO-100029

Special Conditions

ff. The most current cost estimates (see Section 845.940(d)).

SPECIAL CONDITION 25: All groundwater monitoring data and resulting analysis must be submitted to Illinois EPA within 60 days after completion of sampling and must be place into the facility operating record.

SPECIAL CONDITION 26: The permittee shall prepare an Annual Groundwater Monitoring and Corrective Action Report each year. The Annual Groundwater Monitoring and Corrective Action Report shall be submitted to Illinois EPA as part of the Annual Consolidated Report required in Special Condition 24, and must be placed into the facility operating record. The annual report shall include at a minimum and to the extent available:

a. A map, aerial image, or diagram showing the CCR surface impoundment, all background (or upgradient) and downgradient monitoring wells, including the well identification numbers, that are part of the groundwater monitoring program for the CCR surface impoundment, and a visual delineation of any exceedances of the groundwater protection standards;

b. Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;

c. A potentiometric surface map of each monitored groundwater migration pathway unit (Fill Unit, Silty/Clay-Silt Unit and Sand and Gravel Unit) for each groundwater elevation sampling event required by Section 845.650(b)(2);

d. Monitoring data must include analytical results, documentation of field sampling procedures, and laboratory reports in accordance with 35 IAC 845.640(a).

e. An assessment of corrective measures, corrective action plans, interim corrective measures and any other corrective action measures conducted during the year must be summarized and/or documented in the submission of the annual groundwater monitoring and corrective action report in accordance with 35 IAC 845.610(e) and 35 IAC 845.550(3).

f. In addition to all the monitoring data obtained in the year, a summary including the number of groundwater samples that were collected for analysis for each Illinois EPA approved background and downgradient well, and the dates the samples were collected;

g. In accordance with 35 IAC 845.610(e), a narrative discussion of any statistically significant increases over background levels for the constituents listed in Section 845.600. Any statistically significant increases over background concentrations for one or more constituents listed in 35 IAC 845.600 must be identified and summarized or documented in accordance with 35 IAC 845.610(e)(4). Corrective action assessments, planning, and actions must be documented in accordance with 35 IAC 845.610(e); and

h. All other information required to be included in the annual report as specified in 35 IAC 845 Subpart F.

SPECIAL CONDTION 27: The Annual Consolidated report each calendar year shall be submitted to the Illinois EPA by January 31 of the following year and placed into the facility operating record. The Annual Consolidated Report shall consist of the following:

a. The Annual CCR fugitive dust control report.

b. The Annual Inspection Report, which may include:

1. Annual Hazard potential certification, if applicable.

2. Annual structural stability assessment certification, if applicable.

3. Annual Safety factor assessment certification, if applicable.

4. Inflow design flood control system certification, if applicable.

c. The Annual Groundwater Monitoring and Corrective Action Report.

SPECIAL CONDITION 28: All certifications, logs, reports, plan sheets, notices, and groundwater and leachate monitoring data required to be submitted to the Illinois EPA by the permittee shall be mailed to the following address:

CCR Impoundment Permit No. 2021-CO-100029

Special Conditions

Illinois Environmental Protection Agency
Compliance Assurance Section
Bureau of Water
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

Information submittals transmitted by FedEX or UPS shall be mailed to the following address:

Illinois Environmental Protection Agency
Compliance Assurance Section
Bureau of Water
1021 North Grand Avenue East
Springfield, Illinois 62702

Electronic groundwater monitoring data shall be emailed to Illinois EPA at the following email address:
EPA.BOW.GWS.CCR@illinois.gov

Except for electronic groundwater and leachate monitoring data, the operator shall provide the Illinois EPA with the original and two (2) copies of all certifications, logs, reports, and plan sheets required by this permit.

SPECIAL CONDITION 29: Issuance of this permit does not release the Permittees from any liability for prior violations of the Act or Rules and Regulations promulgated thereunder.

SPECIAL CONDITION 30: All sludges generated on site shall be disposed of at a site and in a manner acceptable to the Agency.

SPECIAL CONDITION 31: All discharges to a Water of the United States shall be governed by NPDES Permit No. IL0002232.

Commented [BJ10]: Not the Part 845 mailing address?

Commented [BJ11]: Not the Part 845 mailing address?

Commented [BJ12]: Please clarify electronic groundwater and leachate monitoring data? Confirming Agency wants 3 hardcopies of quarterly GW monitoring data, for example?

Commented [BJ13]: Please clarify electronic groundwater and leachate monitoring data? Confirming Agency wants 3 hardcopies of quarterly GW monitoring data, for example?

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 · (217) 782-3397
JB PRITZKER, GOVERNOR **JOHN J. KIM**, DIRECTOR

217/782-0610

Midwest Generation, LLC
13082 East Manito Road
Pekin, Illinois 61554

Re: Midwest Generation, LLC
Powerton Generating Station
Coal Combustion Residual Surface Impoundment Operating Permit No. 2024-CO-100029
Bureau ID: W1798010008
Draft Permit

Dear Permittee:

Attached to this letter is a copy of the draft Permit, Public Notice/Fact Sheet for your facility. The Agency proposes to issue the Coal Combustion Residual Surface Impoundment Operating Permit for your facility as shown in the draft Permit.

Fifteen days from the date of this letter, the Agency proposes to distribute the attached Public Notice/Fact Sheet statewide. If you have objections to the content of the Public Notice/Fact Sheet, a written statement must be received by the Agency at the indicated address, attention: CCR PN Clerk within 10 days.

The Agency will receive comments regarding the Permit for a period of 45 days after the Public Notice is issued. If you wish to comment or object to any of the terms and conditions of the Permit, you must state the objections in writing prior to the end of the public notice. The Agency may or may not change the Permit based on comments received from you or the public.

If you should have questions or comments regarding the above, please contact Mark E. Liska at 217/782-0610.

Sincerely,

Darin E. LeCrone, P.E.
Manager, Permit Section
Division of Water Pollution Control

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Attachments: Draft Permit, Public Notice/Fact Sheet

cc: Records Unit
Compliance Assurance Section

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 · (217) 782-3397
JB PRITZKER, GOVERNOR **JOHN J. KIM**, DIRECTOR

MEMORANDUM

DATE:

TO: Manager, DWPC/FOS, Peoria Region

FROM: Darin E. LeCrone, Manager, Permit Section

SUBJECT: Midwest Generation, LLC
Powerton Generating Station
Coal Combustion Residual Surface Impoundment Operating Permit No. 2024-CO-100029
Bureau ID: W1798010008
Draft Permit, Public Notice/Fact Sheet

Please review the attached copy of the subject documents, and notify the Industrial Unit if you take exception to the limitations, sampling frequency, sample type or other requirements therein.

If no response is received within fifteen (15) days from the date of this memorandum, we will assume that you concur in the issuance of the Public Notice.

If you have any questions, please contact Mark E. Liska at 217/782-0610.

Thank you for your cooperation.

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Attachments: Draft Permit, Public Notice/Fact Sheet

cc: Records Unit

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 · (217) 782-3397
JB PRITZKER, GOVERNOR **JOHN J. KIM**, DIRECTOR

217/782-0610

Municipal Clerk
111 South Capitol Street
Pekin, Illinois 61554

Re: Midwest Generation, LLC
Powerton Generating Station
Coal Combustion Residual Surface Impoundment Operating Permit No. 2024-CO-100029
Bureau ID: W1798010008
Public Notice of Permit

Municipal Clerk:

In accordance with the requirements of the Illinois Pollution Control Board regulations of 35 Ill. Adm. Code 845.260, the attached Coal Combustion Residual Surface Impoundment Operating Permit Public Notice is sent to a municipality in the vicinity of the applicant. The Agency understands that the applicant may not be associated with the municipality to which it is sent.

Please post the attached Coal Combustion Residual Surface Impoundment Public Notice for a period of 45 days. In addition, please complete and return the enclosed postcard indicating the date of posting. Should you choose not to post the attached notice, please indicate so on the postcard and return.

Thank you for your cooperation.

Sincerely,

Darin E. LeCrone, P.E.
Manager, Permit Section
Division of Water Pollution Control

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Attachments: Public Notice/Fact Sheet, Post Card

cc: Records Unit

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 · (217) 782-3397
JB PRITZKER, GOVERNOR **JOHN J. KIM**, DIRECTOR

217/782-0610

Midwest Generation, LLC
13082 East Manito Road
Pekin, Illinois 61554

Re: Midwest Generation, LLC
Powerton Generating Station
Coal Combustion Residual Surface Impoundment Operating Permit No. 2024-CO-100029
Bureau ID: W1798010008

Dear Permittee:

Attached is the final Coal Combustion Residual Surface Impoundment Operating Permit for your facility. The Permit as issued covers monitoring and related reporting requirements. Failure to meet any portion of the Permit could result in civil and/or criminal penalties. The Illinois Environmental Protection Agency is ready and willing to assist you in interpreting any of the conditions of the Permit as they relate specifically to your discharge.

The attached Permit is effective as of the date indicated on the first page of the Permit. Until the effective date of any re-issued Permit, the limitations and conditions of the previously issued Permit remain in full effect. You have the right to appeal any condition of the Permit to the Illinois Pollution Control Board within a 35 day period following the issuance date.

Should you have questions concerning the Permit, please contact Mark E. Liska at 217/782-0610.

Sincerely,

Darin E. LeCrone, P.E.
Manager, Permit Section
Division of Water Pollution Control

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Attachment: Final Permit

cc: Records
Compliance Assurance Section
Peoria Region
Billing
USEPA

CCR Permit No. 2024-CC-100030
Notice No. MEL:24032601.docx

Public Notice Beginning Date: April 2, 2024

Public Notice Ending Date: May 17, 2024

Coal Combustion Residual Surface Impoundment
Permit Program

Draft Permit for Retrofit Construction of a Coal Combustion Residual Surface Impoundment.

Public Notice/Fact Sheet Issued By:

Illinois Environmental Protection Agency
Bureau of Water
Division of Water Pollution Control
Permit Section
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276
217/782-0610

Name and Address of Permittee:

Midwest Generation, LLC
13082 East Manito Rd.
Pekin, IL 61554

Name and Address of Facility:

Midwest Generation, LLC
Powerton Generating Station
13082 East Manito Rd.
Pekin, IL 61554
(Tazewell County)

The Illinois Environmental Protection Agency (IEPA) has made a tentative determination to issue a Permit for Retrofit Construction of a Coal Combustion Surface Impoundment pursuant to 35 Illinois Administrative Code Part 845 and has prepared a draft permit and associated fact sheet. The IEPA is holding a public comment period and public hearing to offer an opportunity to the public to provide both written and oral comments on this proposed action prior to making a final decision.

The IEPA is accepting written public comments on the draft permit until 11:59 p.m. Friday, May 17, 2024. If you would like to provide written comments, please email your comments to epa.publichearingcom@illinois.gov, RE: "Midwest Generation, LLC – Powerton Generating Station CCR" or "2024-CC-100030". Written comments on the draft permit may also be mailed to IEPA, attention Jeff Guy, IEPA Hearing Officer, P.O. Box 19276, 1021 North Grand Avenue East, Springfield, Illinois 62794-9276. Email comments originating on third party systems or servers intended for submittal of multiple emails of the same or nearly the same content will not be accepted without prior approval from the hearing officer.

In addition to accepting written public comments, the IEPA will host a public hearing on May 8, 2024 beginning at 6:00 p.m. to receive oral public comments on the draft permit. The public hearing will be conducted pursuant to 35 Ill. Adm. Code Part 845. The public hearing will be held in Room A at the Miller Center, 551 South 14th Street, Pekin, Illinois 61554.

A public hearing on this draft permit will be held on May 8, 2024 at 6:00 p.m. in Room A at the Miller Center, 551 South 14th Street, Pekin, Illinois 61554.

Interested persons are invited to submit written comments on the draft permit to the IEPA at:

Hearing Officer Jeff Guy, Office of Community Relations
Re: Midwest Generation, LLC – Powerton Generating Station
Illinois Environmental Protection Agency
1021 North Grand Avenue East, P. O. Box 19276
Springfield, IL 62794-9276

Requests for interpretation (including sign language) must be made by 5:00 p.m. on Wednesday, May 17, 2024 by contacting the IEPA Hearing Officer by email at epa.publichearingcom@illinois.gov, or by calling (217) 785-8724. Questions regarding hearing procedures

or requests to address special needs should be made to the IEPA Hearing Officer by email at epa.publichearingcom@illinois.gov, by calling (217) 785-8724, or by calling (866) 273-5488 (TDD phone number).

The IEPA will provide a Responsiveness Summary, which will be available at the time a final decision is made in this matter. The Responsiveness Summary will include a summary of all significant comments, criticisms, and suggestions, whether written or oral, submitted during the public comment period, at the hearing, or during the time the hearing record is open. The Responsiveness Summary will provide IEPA's response to all significant comments, criticisms, and suggestions and a statement of IEPA's action, including, when applicable, the issuance or denial of the permit.

The permit application, IEPA review notes including load limit calculations, public notice, fact sheet, draft permit, comments received, and other pertinent documents are available for inspection and may be copied at the IEPA between 9:30 a.m. and 3:30 p.m. Monday through Friday when scheduled by the interested person.

You can join the listserv for this facility at the following address:
https://epa.illinois.gov/topics/water-quality/watershed-management/ccr-surface-impoundments.html

For further information on the draft permit, please call Mark E. Liska at 217/782-0610.

The applicant has been operating a steam electric generating station (SIC 4911). The station operates four cyclone coal-fired wet bottom boilers to supply steam to two generating units, designated units #5 and #6 rated at 851 and 846 MW respectively.

CCR basins at the facility consist of the Ash Surge Basin, the Ash Bypass Basin, the Former Ash Basin, and the Metal Cleaning Basin. This permit will cover the retrofit construction of the Ash Bypass Basin only. The operation of the Ash Bypass Basin, Ash Surge Basin, Former Ash Basin, and Metal Cleaning Basin will be covered under a separate permit.

The Ash Bypass Basin is a settling pond for sluiced CCR and other process waters related to power generation when the Ash Surge Basin is not currently in use due to maintenance. The Ash Bypass Basin has a surface area of 0.83 acres and a storage capacity of approximately 6,700 cubic yards. The Ash Bypass Basin has not been in use since April 11, 2021.

Midwest Generation – Powerton Generating Station has an active NPDES Permit IL0002232 that regulates the discharges of wastewater from the property to waters of the United States.

The proposed Coal Combustion Residual Surface Impoundment Retrofit Construction Permit No. 2021-C0-100029 does not address the closure of any of the CCR Basins. Midwest Generation – Powerton Generating Station has submitted a separate Permit application to address the closure of the CCR basins.

Retrofit Construction of Ash Bypass Basin:

Midwest Generation – Powerton Generating Station must comply with the requirements of 35 Illinois Administrative Code Part 845. This proposed Coal Combustion Residual Surface Impoundment Retrofit Construction Permit (Permit No. 2024-CC-100030) is being issued to specify the conditions that must be followed to comply with 35 Illinois Administrative Code Part 845. In order for the permittee to use the Ash Bypass Basin for receiving CCR, it must be retrofitted with a new composite liner system and a new leachate collection and removal system in accordance with federal and state environmental regulations for CCR surface impoundments. It is therefore subject to the requirements of 35 IAC 845.220 for construction permits.

Midwest Generation, LLC – Powerton Station is currently a 1,785 MW coal-fired power plant located in Pekin, IL along the Illinois River. The facility has produced electricity since the 1928 and currently utilizes four coal-fired boilers and two electric generating units, Units 5 and 6. The site is located within Pekin Lake-Illinois River watershed which is approximately 28,834 acres.

The basin historically has managed bottom ash since it was constructed in 1980 and was retrofitted in 2010. The chemical constituents of the CCR have been analyzed in mg/kg. The max capacity of the basin is 6,700 cubic yards. The basin is currently not receiving CCR, but will receive it after retrofit and will receive up to 20 MGD of dewatering effluent, slag tank overflow, basin overflow, etc. until December 31, 2028. The facility has secure, on-site roads for transportation of people and material.

The permittee submitted a construction permit containing the physical and engineering properties of the foundation and abutment materials, the type, size, range, and physical and engineering properties of the materials used in constructing each zone or stage of the CCR surface impoundment and the method of site preparation and construction of each zone of the CCR surface impoundment.

Site drawings show details to the design, construction, operation, and maintenance of the CCR surface impoundment, detailed dimensional drawings of the CCR surface impoundment, including a plan view and cross-sections of the length and width of the CCR surface impoundment, showing all zones, foundation improvements, drainage provisions, spillways, diversion ditches, outlets, instrument locations, and slope protection, in addition to the normal operating pool surface elevation and the maximum pool surface

elevation following peak discharge from the inflow design flood, the expected maximum depth of CCR within the CCR surface impoundment, and any identifiable natural or manmade features that could adversely affect operation of the CCR surface impoundment due to malfunction or mis-operation.

Narrative Description of Proposed Construction:

The permittee's narrative of the construction is as follows: obtain the construction permit, remove the gravel warning and sand cushion layers or the existing liner, decontaminate the existing liner for re-use as a supplemental liner, decontaminate appurtenant structures, place structural fill in the basin floor to establish slopes of the new leachate collection and removal system, install new composite liner, install new leachate collection system, install sand filter layer, and install protective warning layer.

Location Standards:

The permittee provided information and certification on the placement being above the aquifer, wetlands, fault areas, seismic impact zones, unstable areas, and floodplains.

Above the Uppermost Aquifer – October 2018 conclusion approved by Geosyntec that the bottom of the Ash Bypass Basin's existing liner is separated from the upper limit of the uppermost aquifer by at least five feet.

Wetlands - October 2018 conclusion approved by Geosyntec that the Ash Bypass Basin is not located in mapped wetlands.

Fault Areas - October 2018 conclusion approved by Geosyntec that the Ash Bypass Basin is not located within 200 feet of the outermost damage zone of a fault that has had displacement in Holocene time.

Seismic Impact Zones - October 2018 conclusion approved by Geosyntec that the Ash Bypass Basin is not located within a seismic impact zone.

Unstable Areas - October 2018 conclusion approved by Geosyntec that the Ash Bypass Basin is not located in an unstable area.

Floodplain - October 2018 conclusion approved by KPRG that the Ash Bypass Basin is not located in a floodplain according to the National Flood Hazard Layer FIRMette Map No. 17179C0175E prepared by FEMA.

Meeting Design Criteria:

The plans meet these criteria in that it will have a liner that meets the criteria, it will have a new leachate collection system installed, and will have slope protection.

A. Liner requirements – 845.400(c)(1-4)

   The permittee has chosen to install an alternative composite liner that meets the requirements of 35 Ill. Adm. Code 845.400(c).

   The permittee submitted information and drawings showing that the composite liner will meet these specifications. The maximum hydraulic conductivity of 1.0×10^{-9} cm/sec and has a liquid flow rate of 4.24×10^{7} $cm^3/sec/cm^2$. The information and drawings have been certified by Thomas J. Dehlin, an Illinois licensed P.E. An inspection of the drawings have shown no deficiencies in the basin and liner system.

   The composite liner also meets all requirements from 845.400(b) as is required in 845.400(c)(4). It is constructed of sufficient materials that are exposed to climatic conditions, installation stress, daily operation, shear resistance, and is on a base capable of supporting the basin and is installed to cover all surrounding earth likely to come into contact with CCR or leachate.

B. Leachate Collection System – 845.420

   The permittee submitted information and drawings showing that the composite liner will meet these specifications. This system is being placed above the retrofitted Ash Bypass Basin's new composite liner. It will have a sand filter layer having a hydraulic conductivity of at least 10×10^{-5} cm/sec. It has a bottom slope of 3%. For drainage material, they chose option B; it is a drainage geocomposite with a transmissivity of at least $6 * 10^{-4}$ m^2/sec. The drainage components are HDPE and natural soil components which are chemically resistant to CCR and non-CCR waste.

   The perforated leachate collection pipe will be surrounded by coarse aggregate bedding in order to prevent fines from clogging the piping. The piping itself is a 6-inch diameter perforated leachate collection pipe which is sloped towards a

sump with a submersible pump and riser pipe to convey leachate out of the basin.

The protective waring layer for the leachate collection system will be 6 inches of densely graded aggregate installed over the sand filter layer. Along the sides, riprap on a gravel bedding layer will protect the sand filter layer from erosion. The upper non-woven geotextile component of the drainage geocomposite will prevent CCR and non-CCR sediments from intruding into, clogging, and impeding the flow of leachate through the HDPE geonet core during the active life and post-closure care period of the retrofitted Ash Bypass Basin.

The information and drawings have been certified by Thomas J. Dehlin, an Illinois licensed P.E. An inspection of the drawings have shown no deficiencies in the leachate collection system.

C. CCR fugitive dust control plant (845.220(b)(3))

The application has a fugitive dust control plan for the construction of the Ash Bypass Basin which conforms to 845.500. A special condition has been added that they keep proper records as required in the regulations.

D. Preliminary written closure plan (845.220(b)(4))

The permittee will close the retrofitted Ash Bypass Basin by removing the CCR and other materials remaining in the basin after the plant has closed, then decontaminating the areas (closure by removal).

E. Initial post-closure care plan (845.220(b)(5))

After removal of all CCR material and this has been verified and certified, groundwater will be sampled to make sure that it is not exceeding the groundwater protection standards.

Special Conditions:

The following explains the conditions of the proposed permit:

The special conditions specify that various plans relating to the operation and maintenance of the basins must be maintained and kept up to date, that the permittee must operate and maintain the groundwater monitoring system, specifies the groundwater standards at the waste boundary, and specifies recordkeeping and reporting requirements.

1. Permittee must Comply with Air and Land Regulations
2. No construction for closure or corrective actions, only retrofit construction of the Ash Bypass Basin
3. Fugitive Dust Control Plan Requirements
4. Permanent Signage Requirements
5. Emergency Action Plan Requirements
6. Safety and Health Plan Requirements
7. Financial Assurance Requirements
8. Lateral expansions must be inspected
9. All impoundments must be inspected annually
10. Two additional down gradient wells in the silty clay silt unit, two piezometers must be added
11. Addresses to mail to Agency
12. Construct according to plans approved by Agency
13. Notify Agency when construction is completed
14. Not released from prior liabilities
15. Sludges generated must be properly disposed of
16. Wastewater discharges governed by NPDES permit
17. All certs, logs etc. as part of construction must be submitted

Public Notice of Draft Permit

Public Notice Number MEL:24032601.docx is hereby given by Illinois EPA, Division of Water Pollution Control, Permit Section, 1021 North Grand Avenue East, Post Office Box 19276, Springfield, Illinois 62794-9276 (herein Agency) that a draft Coal Combustion Residual Surface Impoundment Retrofit Construction Permit (CCR) Permit Number 2024-CC-100030 has been prepared under 40 CFR 124.6(d) for Midwest Generation, LLC for discharge into Illinois River from the Powerton Generating Station, 13082 East Manito Rd., Pekin, IL 61554, (Tazewell County).

The application, draft permit and other documents are available for inspection and may be copied at the Agency between 9:30 A.M. and 3:30 P.M. Monday through Friday. A Fact Sheet containing more detailed information is available at no charge. For further information, call the Public Notice Clerk at 217/782-0610.

Interested persons are invited to submit written comments on the draft permit to the Agency at the above address. The NPDES Permit and Joint Public Notice numbers must appear on each comment page. All comments received by the Agency not later than 30 days from the date of this publication shall be considered in making the final decision regarding permit issuance.

Any interested person may submit written request for a public hearing on the draft permit, stating their name and address, the nature of the issues proposed to be raised and the evidence proposed to be presented with regards to these issues in the hearing. Such requests must be received by the Agency not later than 45 days from the date of this publication.

If written comments and/or requests indicate a significant degree of public interest in the draft permit, the permitting authority may, at its discretion, hold a public hearing. Public notice will be given 45 days before any public hearing.

Coal Combustion Residual Surface Impoundment Permit No. 2024-CC-100030

Illinois Environmental Protection Agency

Division of Water Pollution Control

1021 North Grand Avenue East

Post Office Box 19276

Springfield, Illinois 62794-9276

Coal Combustion Residual Surface Impoundment Retrofit Construction Permit

Expiration Date:

Issue Date:
Effective Date:

Name and Address of Permittee:

Midwest Generation, LLC
13082 East Manito Rd.
Pekin, IL 61554

Name and Address of Facility:

Midwest Generation, LLC
Powerton Generating Station
13082 East Manito Rd.
Pekin, IL 61554
(Tazewell County)

CCR Impoundment:

W1798010008-04 Ash Bypass Basin

In compliance with the provisions of the Illinois Environmental Protection Act, Title 35 of Ill. Adm. Code, Subtitle C and/or Subtitle D, Chapter 1, and the Clean Water Act (CWA), the above-named permittee is hereby authorized to retrofit construct a coal combustion residual (CCR) surface impoundment, at the above location in accordance with the standard conditions and attachments herein.

Coal Combustion Residual Surface Impoundment Permit No. 2024-CC-100030 authorizes the retrofit construction of the Ash Bypass Basin in accordance with 35 Illinois Administrative Code Part 845 as described below.

Coal Combustion Residual Surface Impoundment Permit No. 2024-CC-100030 does not authorize the operation of the Ash Surge Basin, the Metal Cleaning Basin, the Ash Bypass Basin, or the Former Ash Basin.

Coal Combustion Residual Surface Impoundment Permit No. 2024-CC-100030 does not authorize the closure of the Ash Bypass Basin, corrective action for the Ash Bypass Basin, or any construction activities associated with the closure of the Ash Bypass Basin.

Coal Combustion Residual Surface Impoundment Permit No. 2024-CC-100030 does not authorize the closure, corrective action, or any construction for the Ash Surge Basin, the Former Ash Basin, or the Metal Cleaning Basin.

Coal Combustion Residual Surface Impoundment Permit No. 2024-CC-100030 does not authorize the discharge of any wastewater to waters of the United States. NPDES Permit No. IL0002232 authorizes this facility to discharge wastewater to waters of the United States.

Coal combustion residuals, consisting of bottom ash discharged from the station's dewatering bins and other process waste streams related to electric power-generating operations when the Ash Surge Basin was being cleaned. The Ash Bypass Basin covers approximately 0.83 acres and has a storage capacity of approximately 6,700 cubic yards.

Permit is hereby granted to the above designated permittee(s) to construct facilities described as follows:

The retrofit construction of the Ash Bypass Basin including the removal of the gravel warning and sand cushion layers over the existing

geomembrane liner, decontaminating the basin's existing geomembrane liner for re-use as a supplemental liner, decontaminating the basin's appurtenant structures, installing a new basin floor and slopes, installing a composite liner system consisting of a 60-mil HDPE geomembrane over a geosynthetic clay liner, installing a leachate collection and removal system consisting of a drainage geocomposite, leachate collection pipe, and submersible sump pump, installing a sand filter layer over the leachate collection and removal system, and installing a protective warning layer over the sand filter layer. Retrofit construction includes all pipes, pumps, and appurtenances as specified in the Application for Retrofit Construction Permit application dated July 15, 2022 and the Amended Written Retrofit Plan Revision 1 dated March 5, 2024.

Permittee is not authorized to operate after the above expiration date. In order to receive authorization to operate beyond the expiration date, the permittee shall submit the proper application as required by the Illinois Environmental Protection Agency (IEPA) not later than 180 days prior to the expiration date.

Darin E. LeCrone P.E.
Manager, Permit Section
Division of Water Pollution Control

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CCR Impoundment Permit No. 2021-CO-100029

Special Conditions

SPECIAL CONDITION 1: This permit does not relieve the Permittee of the responsibility of complying with the provisions of the State of Illinois Rules and Regulations, 35 Ill. Adm. Code Subtitle B, Air Pollution Control, Chapter 1 and 35 Ill. Adm. Code Subtitle G, Land Pollution Control, Chapter 1. The Permittee may be required to file reports and/or obtain applicable permits through the Illinois EPA's Bureau of Air (BOA) - Division of Air Pollution Control (DAPC) and/or Illinois EPA's Bureau of Land (BOL) – Division of Land Pollution Control (DLPC).

SPECIAL CONDTION 2: This construction permit is for Retrofitting of the Ash Bypass Basin and does not cover any closure construction or post-closure care of the Ash Bypass Basin. This permit does not authorize any construction activities necessary for closure and/or corrective action of the Ash Bypass Basin.

SPECIAL CONDITION 3: The operator shall implement methods for controlling dust, including the Fugitive Dust Control Plan included in Application Log No. 2021-100029, so as to prevent wind dispersal of particulate matter off-site.

SPECIAL CONDITION 4: A permanent sign shall be maintained at each CCR impoundment that contains the information required under 35 IAC, Section 845.130.

SPECIAL CONDITION 5: The written Emergency Action Plan (EAP), shall be maintained by the facility. The EAP and all amendments must be placed in the facility's operating record. Upon activation of the EAP, the facility must notify Illinois EPA in writing within 30 days of activation and place all corresponding documentation in the facility operating record. The permittee may amend the EAP at any time but must amend the EAP when there is a change in conditions that would substantially affect the EAP.

SPECIAL CONDITION 6: The Safety and Health Plan and accompanying certification has been submitted as part of Permit Application Log No. 2021-100029 and must be maintained by the facility. The plan must be updated annually and on an as needed basis. The Safety and Health Plan and all amendments must be placed in the facility operating record.

SPECIAL CONDITION 7: The permittee shall provide and maintain financial assurance in accordance with Part 845 Subpart I.

SPECIAL CONDITION 8: All CCR impoundments and any lateral expansion of a CCR surface impoundment must be inspected by a qualified person on a weekly basis and after each 25-year, 24-hour storm event. All CCR surface impoundment instrumentation must be inspected at least every 30 days. A report for each inspection shall be generated and placed into the facility operating record.

SPECIAL CONDITION 9: Each CCR Surface impoundment must be inspected on an annual basis by a qualified Professional Engineer, in accordance with 35 IAC 845.540. An inspection report must be completed and included with the Annual Consolidated Report, as specified in Special Condition 29.

SPECIAL CONDITION 10: Within 60 days of the effective date of this construction permit, the facility must install and begin to monitor at least two additional down gradient wells in the Silty Clay/Silt Unit, two piezometers in the fill unit, and two staff gages in the intermittent stream and standing water within the wetlands north of the service road splitting up the Former Ash Basin.

SPECIAL CONDITION 11: All certifications, logs, reports, plan sheets, notices, and groundwater monitoring data required to be submitted to the Illinois EPA by the permittee shall be mailed to the following address:

Illinois Environmental Protection Agency
Compliance Assurance Section
Bureau of Water
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

Information submittals transmitted by FedEX or UPS shall be mailed to the following address:

Illinois Environmental Protection Agency
Compliance Assurance Section
Bureau of Water
1021 North Grand Avenue East
Springfield, Illinois 62702

Electronic groundwater monitoring data shall be emailed to Illinois EPA at the following email address:
EPA.BOW.GWS.CCR@illinois.gov

Commented [HL1]: EAPs for initial operating permits are subject to 845.520 and 29 CFR 1910.

EAPs for Construction permits are subject to 845.520 and 29 CFR 1926 which has much more extensive requirements for emergencies during construction.

Commented [HL2]: Safety Plans for construction have different training requirements for staff under 29 CFR 1926. therefore, under 834.530 the training requirements change because the federal training requirements change. Additionally SDS's under 845.530 will need updated for new equipment and activities on site.

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Commented [BJ4]: Not the Part 845 mailing address?

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Commented [BJ6]: Please clarify electronic groundwater and leachate monitoring data? Confirming Agency wants 3 hardcopies of quarterly GW monitoring data, for example?

CCR Impoundment Permit No. 2021-CO-100029

Special Conditions

Except for electronic groundwater and leachate monitoring data, the operator shall provide the Illinois EPA with the original and two (2) copies of all certifications, logs, reports, and plan sheets required by this permit.

SPECIAL CONDITION 12: The permittee will commence construction in accordance with the specifications listed in the Application for Retrofit Construction Permit application dated July 15, 2022 and the Amended Written Retrofit Plan Revision 1 dated March 5, 2024. Any changes made to the construction plans must be approved by the Agency.

SPECIAL CONDITION 13: The permittee shall notify the Agency when construction has been completed.

SPECIAL CONDITION 14: Issuance of this permit does not release the Permittees from any liability for prior violations of the Act or Rules and Regulations promulgated thereunder.

SPECIAL CONDITION 15: All sludges generated on site shall be disposed of at a site and in a manner acceptable to the Agency.

SPECIAL CONDITION 16: All discharges to a Water of the United States shall be governed by NPDES Permit No. IL0002232.

SPECIAL CONDITION 17: All certifications, logs, reports, plan sheets, notices, and groundwater monitoring data generated as a part of the construction quality assurance program must be reported in the retrofit construction completion report in accordance with 35 IAC 845.770(g) and is required to be submitted to the Illinois EPA prior to termination of the retrofit construction permit by the permittee. The permittee shall mail the retrofit construction completion report to the following address:

Illinois Environmental Protection Agency
Compliance Assurance Section
Bureau of Water
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

Information submittals transmitted by FedEX or UPS shall be mailed to the following address:

Illinois Environmental Protection Agency
Compliance Assurance Section
Bureau of Water
1021 North Grand Avenue East
Springfield, Illinois 62702

Commented [BJ7]: Please clarify electronic groundwater and leachate monitoring data? Confirming Agency wants 3 hardcopies of quarterly GW monitoring data, for example?

Commented [DL8]: I don't understand what we want MWG to do here, unless you're saying the retrofit completion report must be included in the closure construction permit? In the future when closure happens

Commented [BJ9]: Not the Part 845 mailing address?

Commented [BJ10]: Not the Part 845 mailing address?

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 · (217) 782-3397
JB PRITZKER, GOVERNOR **JOHN J. KIM**, DIRECTOR

217/782-0610

Midwest Generation, LLC
13082 East Manito Road
Pekin, Illinois 61554

Re: Midwest Generation, LLC
Powerton Generating Station
Coal Combustion Residual Surface Impoundment Retrofit Construction Permit No. 2024-CC-100030
Bureau ID: W1798010008
Draft Permit

Dear Permittee:

Attached to this letter is a copy of the draft Permit, Public Notice/Fact Sheet for your facility. The Agency proposes to issue the Coal Combustion Residual Surface Impoundment Permit for your facility as shown in the draft Permit.

Fifteen days from the date of this letter, the Agency proposes to distribute the attached Public Notice/Fact Sheet statewide. If you have objections to the content of the Public Notice/Fact Sheet, a written statement must be received by the Agency at the indicated address, attention: CCR PN Clerk within 10 days.

The Agency will receive comments regarding the Permit for a period of 45 days after the Public Notice is issued. If you wish to comment or object to any of the terms and conditions of the Permit, you must state the objections in writing prior to the end of the public notice. The Agency may or may not change the Permit based on comments received from you or the public.

If you should have questions or comments regarding the above, please contact Mark E. Liska at 217/782-0610.

Sincerely,

Darin E. LeCrone, P.E.
Manager, Permit Section
Division of Water Pollution Control

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Attachments: Draft Permit, Public Notice/Fact Sheet

cc: Records Unit
Compliance Assurance Section

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 · (217) 782-3397
JB PRITZKER, GOVERNOR **JOHN J. KIM**, DIRECTOR

MEMORANDUM

DATE:

TO: Manager, DWPC/FOS, Peoria Region

FROM: Darin E. LeCrone, Manager, Permit Section

SUBJECT: Midwest Generation, LLC
Powerton Generating Station
Coal Combustion Residual Surface Impoundment Retrofit Construction
Permit No. 2024-CC-100030
Bureau ID: W1798010008
Draft Permit, Public Notice/Fact Sheet

Please review the attached copy of the subject documents, and notify the Industrial Unit if you take exception to the limitations, sampling frequency, sample type or other requirements therein.

If no response is received within fifteen (15) days from the date of this memorandum, we will assume that you concur in the issuance of the Public Notice.

If you have any questions, please contact Mark E. Liska at 217/782-0610.

Thank you for your cooperation.

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Attachments: Draft Permit, Public Notice/Fact Sheet

cc: Records Unit

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 · (217) 782-3397
JB PRITZKER, GOVERNOR **JOHN J. KIM**, DIRECTOR

217/782-0610

Municipal Clerk
111 South Capitol Street
Pekin, Illinois 61554

Re: Midwest Generation, LLC
Powerton Generating Station
Coal Combustion Residual Surface Impoundment Retrofit Construction Permit No. 2024-CC-100030
Bureau ID: W1798010008
Public Notice of Permit

Municipal Clerk:

In accordance with the requirements of the Illinois Pollution Control Board regulations of 35 Ill. Adm. Code 845.260, the attached Coal Combustion Residual Surface Impoundment Retrofit Construction Permit Public Notice is sent to a municipality in the vicinity of the applicant. The Agency understands that the applicant may not be associated with the municipality to which it is sent.

Please post the attached Coal Combustion Residual Surface Impoundment Public Notice for a period of 45 days. In addition, please complete and return the enclosed postcard indicating the date of posting. Should you choose not to post the attached notice, please indicate so on the postcard and return.

Thank you for your cooperation.

Sincerely,

Darin E. LeCrone, P.E.
Manager, Permit Section
Division of Water Pollution Control

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Attachments: Public Notice/Fact Sheet, Post Card

cc: Records Unit

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 · (217) 782-3397
JB PRITZKER, GOVERNOR **JOHN J. KIM**, DIRECTOR

217/782-0610

Midwest Generation, LLC
13082 East Manito Road
Pekin, Illinois 61554

Re: Midwest Generation, LLC
Powerton Generating Station
Coal Combustion Residual Surface Impoundment Permit No. 2024-CC-100030
Bureau ID: W1798010008

Dear Permittee:

Attached is the final Coal Combustion Residual Surface Impoundment Retrofit Construction Permit for your facility. The Permit as issued covers monitoring and related reporting requirements. Failure to meet any portion of the Permit could result in civil and/or criminal penalties. The Illinois Environmental Protection Agency is ready and willing to assist you in interpreting any of the conditions of the Permit as they relate specifically to your discharge.

The attached Permit is effective as of the date indicated on the first page of the Permit. Until the effective date of any re-issued Permit, the limitations and conditions of the previously issued Permit remain in full effect. You have the right to appeal any condition of the Permit to the Illinois Pollution Control Board within a 35 day period following the issuance date.

Should you have questions concerning the Permit, please contact Mark E. Liska at 217/782-0610.

Sincerely,

Darin E. LeCrone, P.E.
Manager, Permit Section
Division of Water Pollution Control

DEL:MEL:24032601.docx

Attachment: Final Permit

cc: Records
Compliance Assurance Section
Peoria Region
Billing
USEPA

DOCUMENT 37

From: Guy, Jeff <Jeff.Guy@Illinois.gov>
Sent: Wednesday, April 10, 2024 4:23 PM
To: Bailey, Sabrina
Cc: Frost, Brad; Rompot, Derek; Seif, Josiah; Liska, Mark
Subject: CCR Public Notices - error on date
Attachments: 24032601-Powerton-construction.pdf; 24032701-Powerton-operating.pdf; Pekin Midwest Generation Powerton CCR Outreach List.xlsx

Hi Sabrina,

The two notices posted last week had an error regarding the date for requesting interpretation under the hearing information. It should have stated April 17, not May 17. Kim Biggs corrected both documents and reposted on the webpage (corrected docs attached). Brad asked me to talk to you about any emails sent; I assume you sent emails to the recipients on the attached spreadsheet already, but I am unsure if you attached the documents with the email or just provided a link to the applicable webpage. Regardless, we should let them know that corrected documents are available at https://epa.illinois.gov/public-notices/ccr-public-notices.html or resend the corrected documents via email. Is this something you can help with please? I cc'd BOW to just to inform them of this matter.

Thank you,

Jeffrey J. Guy
Illinois Environmental Protection Agency
Office of Community Relations
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276
(217) 785-8724
Jeff.Guy@illinois.gov

State of Illinois - CONFIDENTIALITY NOTICE: The information contained in this communication is confidential, may be attorney-client privileged or attorney work product, may constitute inside information or internal deliberative staff communication, and is intended only for the use of the addressee. Unauthorized use, disclosure or copying of this communication or any part thereof is strictly prohibited and may be unlawful. If you have received this communication in error, please notify the sender immediately by return e-mail and destroy this communication and all copies thereof, including all attachments. Receipt by an unintended recipient does not waive attorney-client privilege, attorney work product privilege, or any other exemption from disclosure.

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Representative Travis Weaver	afisher.repbillhauter@gmail.com	State Rep
Mayor Mary Burress	mburress@ci.pekin.il.us	Mayor
Sue McMillan,	smcmillan@ci.pekin.il.us	City Clerk
John Dossey	jvdossey@ci.pekin.il.us	City Manager
Nicole Stewart	nlstewart@ci.pekin.il.us	Deputy City Clerk
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Chris Oneken	conken@ci.pekin.il.us	

CCR Permit No. 2024-CC-100030
Notice No. MEL:24032601.docx

Public Notice Beginning Date: April 4, 2024

Public Notice Ending Date: May 17, 2024

Coal Combustion Residual Surface Impoundment
Permit Program

Draft Permit for Retrofit Construction of a Coal Combustion Residual Surface Impoundment.

Public Notice/Fact Sheet Issued By:

Illinois Environmental Protection Agency
Bureau of Water
Division of Water Pollution Control
Permit Section
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276
217/782-0610

Name and Address of Permittee:

Midwest Generation, LLC
13082 East Manito Rd.
Pekin, IL 61554

Name and Address of Facility:

Midwest Generation, LLC
Powerton Generating Station
13082 East Manito Rd.
Pekin, IL 61554
(Tazewell County)

The Illinois Environmental Protection Agency (IEPA) has made a tentative determination to issue a Permit for Retrofit Construction of a Coal Combustion Surface Impoundment pursuant to 35 Illinois Administrative Code Part 845 and has prepared a draft permit and associated fact sheet. The IEPA is holding a public comment period and public hearing to offer an opportunity to the public to provide both written and oral comments on this proposed action prior to making a final decision.

The IEPA is accepting written public comments on the draft permit until 11:59 p.m. Friday, May 17, 2024. If you would like to provide written comments, please email your comments to epa.publichearingcom@illinois.gov, RE: "Midwest Generation, LLC – Powerton Generating Station CCR" or "2024-CC-100030". Written comments on the draft permit may also be mailed to IEPA, attention Jeff Guy, IEPA Hearing Officer, P.O. Box 19276, 1021 North Grand Avenue East, Springfield, Illinois 62794-9276. Email comments originating on third party systems or servers intended for submittal of multiple emails of the same or nearly the same content will not be accepted without prior approval from the hearing officer.

In addition to accepting written public comments, the IEPA will host a public hearing on May 8, 2024 beginning at 6:00 p.m. to receive oral public comments on the draft permit. The public hearing will be conducted pursuant to 35 Ill. Adm. Code Part 845. The public hearing will be held in Room A at the Miller Center, 551 South 14th Street, Pekin, Illinois 61554.

A public hearing on this draft permit will be held on May 8, 2024 at 6:00 p.m. in Room A at the Miller Center, 551 South 14th Street, Pekin, Illinois 61554.

Interested persons are invited to submit written comments on the draft permit to the IEPA at:

Hearing Officer Jeff Guy, Office of Community Relations
Re: Midwest Generation, LLC – Powerton Generating Station
Illinois Environmental Protection Agency
1021 North Grand Avenue East, P. O. Box 19276
Springfield, IL 62794-9276

Requests for interpretation (including sign language) must be made by 5:00 p.m. on Wednesday, April 17, 2024 by contacting the IEPA Hearing Officer by email at epa.publichearingcom@illinois.gov, or by calling (217) 785-8724. Questions regarding hearing procedures or

requests to address special needs should be made to the IEPA Hearing Officer by email at epa.publichearingcom@illinois.gov, by calling (217) 785-8724, or by calling (866) 273-5488 (TDD phone number).

The IEPA will provide a Responsiveness Summary, which will be available at the time a final decision is made in this matter. The Responsiveness Summary will include a summary of all significant comments, criticisms, and suggestions, whether written or oral, submitted during the public comment period, at the hearing, or during the time the hearing record is open. The Responsiveness Summary will provide IEPA's response to all significant comments, criticisms, and suggestions and a statement of IEPA's action, including, when applicable, the issuance or denial of the permit.

The permit application, IEPA review notes including load limit calculations, public notice, fact sheet, draft permit, comments received, and other pertinent documents are available for inspection and may be copied at the IEPA between 9:30 a.m. and 3:30 p.m. Monday through Friday when scheduled by the interested person.

You can join the listserv for this facility at the following address:
https://epa.illinois.gov/topics/water-quality/watershed-management/ccr-surface-impoundments.html

For further information on the draft permit, please call Mark E. Liska at 217/782-0610.

The applicant has been operating a steam electric generating station (SIC 4911). The station operates four cyclone coal-fired wet bottom boilers to supply steam to two generating units, designated units #5 and #6 rated at 851 and 846 MW respectively.

CCR basins at the facility consist of the Ash Surge Basin, the Ash Bypass Basin, the Former Ash Basin, and the Metal Cleaning Basin. This permit will cover the retrofit construction of the Ash Bypass Basin only. The operation of the Ash Bypass Basin, Ash Surge Basin, Former Ash Basin, and Metal Cleaning Basin will be covered under a separate permit.

The Ash Bypass Basin is a settling pond for sluiced CCR and other process waters related to power generation when the Ash Surge Basin is not currently in use due to maintenance. The Ash Bypass Basin has a surface area of 0.83 acres and a storage capacity of approximately 6,700 cubic yards. The Ash Bypass Basin has not been in use since April 11, 2021.

Midwest Generation – Powerton Generating Station has an active NPDES Permit IL0002232 that regulates the discharges of wastewater from the property to waters of the United States.

The proposed Coal Combustion Residual Surface Impoundment Retrofit Construction Permit No. 2021-C0-100029 does not address the closure of any of the CCR Basins. Midwest Generation – Powerton Generating Station has submitted a separate Permit application to address the closure of the CCR basins.

Retrofit Construction of Ash Bypass Basin:

Midwest Generation – Powerton Generating Station must comply with the requirements of 35 Illinois Administrative Code Part 845. This proposed Coal Combustion Residual Surface Impoundment Retrofit Construction Permit (Permit No. 2024-CC-100030) is being issued to specify the conditions that must be followed to comply with 35 Illinois Administrative Code Part 845. In order for the permittee to use the Ash Bypass Basin for receiving CCR, it must be retrofitted with a new composite liner system and a new leachate collection and removal system in accordance with federal and state environmental regulations for CCR surface impoundments. It is therefore subject to the requirements of 35 IAC 845.220 for construction permits.

Midwest Generation, LLC – Powerton Station is currently a 1,785 MW coal-fired power plant located in Pekin, IL along the Illinois River. The facility has produced electricity since the 1928 and currently utilizes four coal-fired boilers and two electric generating units, Units 5 and 6. The site is located within Pekin Lake-Illinois River watershed which is approximately 28,834 acres.

The basin historically has managed bottom ash since it was constructed in 1980 and was retrofitted in 2010. The chemical constituents of the CCR have been analyzed in mg/kg. The max capacity of the basin is 6,700 cubic yards. The basin is currently not receiving CCR, but will receive it after retrofit and will receive up to 20 MGD of dewatering effluent, slag tank overflow, basin overflow, etc. until December 31, 2028. The facility has secure, on-site roads for transportation of people and material.

The permittee submitted a construction permit containing the physical and engineering properties of the foundation and abutment materials, the type, size, range, and physical and engineering properties of the materials used in constructing each zone or stage of the CCR surface impoundment and the method of site preparation and construction of each zone of the CCR surface impoundment.

Site drawings show details to the design, construction, operation, and maintenance of the CCR surface impoundment, detailed dimensional drawings of the CCR surface impoundment, including a plan view and cross-sections of the length and width of the CCR surface impoundment, showing all zones, foundation improvements, drainage provisions, spillways, diversion ditches, outlets, instrument locations, and slope protection, in addition to the normal operating pool surface elevation and the maximum pool surface

elevation following peak discharge from the inflow design flood, the expected maximum depth of CCR within the CCR surface impoundment, and any identifiable natural or manmade features that could adversely affect operation of the CCR surface impoundment due to malfunction or mis-operation.

Narrative Description of Proposed Construction:

The permittee's narrative of the construction is as follows: obtain the construction permit, remove the gravel warning and sand cushion layers or the existing liner, decontaminate the existing liner for re-use as a supplemental liner, decontaminate appurtenant structures, place structural fill in the basin floor to establish slopes of the new leachate collection and removal system, install new composite liner, install new leachate collection system, install sand filter layer, and install protective warning layer.

Location Standards:

The permittee provided information and certification on the placement being above the aquifer, wetlands, fault areas, seismic impact zones, unstable areas, and floodplains.

Above the Uppermost Aquifer – October 2018 conclusion approved by Geosyntec that the bottom of the Ash Bypass Basin's existing liner is separated from the upper limit of the uppermost aquifer by at least five feet.

Wetlands - October 2018 conclusion approved by Geosyntec that the Ash Bypass Basin is not located in mapped wetlands.

Fault Areas - October 2018 conclusion approved by Geosyntec that the Ash Bypass Basin is not located within 200 feet of the outermost damage zone of a fault that has had displacement in Holocene time.

Seismic Impact Zones - October 2018 conclusion approved by Geosyntec that the Ash Bypass Basin is not located within a seismic impact zone.

Unstable Areas - October 2018 conclusion approved by Geosyntec that the Ash Bypass Basin is not located in an unstable area.

Floodplain - October 2018 conclusion approved by KPRG that the Ash Bypass Basin is not located in a floodplain according to the National Flood Hazard Layer FIRMette Map No. 17179C0175E prepared by FEMA.

Meeting Design Criteria:

The plans meet these criteria in that it will have a liner that meets the criteria, it will have a new leachate collection system installed, and will have slope protection.

A. Liner requirements – 845.400(c)(1-4)

The permittee has chosen to install an alternative composite liner that meets the requirements of 35 Ill. Adm. Code 845.400(c).

The permittee submitted information and drawings showing that the composite liner will meet these specifications. The maximum hydraulic conductivity of 1.0×10^{-9} cm/sec and has a liquid flow rate of 4.24×10^{7} $cm^3/sec/cm^2$. The information and drawings have been certified by Thomas J. Dehlin, an Illinois licensed P.E. An inspection of the drawings have shown no deficiencies in the basin and liner system.

The composite liner also meets all requirements from 845.400(b) as is required in 845.400(c)(4). It is constructed of sufficient materials that are exposed to climatic conditions, installation stress, daily operation, shear resistance, and is on a base capable of supporting the basin and is installed to cover all surrounding earth likely to come into contact with CCR or leachate.

B. Leachate Collection System – 845.420

The permittee submitted information and drawings showing that the composite liner will meet these specifications. This system is being placed above the retrofitted Ash Bypass Basin's new composite liner. It will have a sand filter layer having a hydraulic conductivity of at least 10×10^{-5} cm/sec. It has a bottom slope of 3%. For drainage material, they chose option B; it is a drainage geocomposite with a transmissivity of at least $6 * 10^{-4}$ m^2/sec. The drainage components are HDPE and natural soil components which are chemically resistant to CCR and non-CCR waste.

The perforated leachate collection pipe will be surrounded by coarse aggregate bedding in order to prevent fines from clogging the piping. The piping itself is a 6-inch diameter perforated leachate collection pipe which is sloped towards a

sump with a submersible pump and riser pipe to convey leachate out of the basin.

The protective waring layer for the leachate collection system will be 6 inches of densely graded aggregate installed over the sand filter layer. Along the sides, riprap on a gravel bedding layer will protect the sand filter layer from erosion. The upper non-woven geotextile component of the drainage geocomposite will prevent CCR and non-CCR sediments from intruding into, clogging, and impeding the flow of leachate through the HDPE geonet core during the active life and post-closure care period of the retrofitted Ash Bypass Basin.

The information and drawings have been certified by Thomas J. Dehlin, an Illinois licensed P.E. An inspection of the drawings have shown no deficiencies in the leachate collection system.

C. CCR fugitive dust control plant (845.220(b)(3))

The application has a fugitive dust control plan for the construction of the Ash Bypass Basin which conforms to 845.500. A special condition has been added that they keep proper records as required in the regulations.

D. Preliminary written closure plan (845.220(b)(4))

The permittee will close the retrofitted Ash Bypass Basin by removing the CCR and other materials remaining in the basin after the plant has closed, then decontaminating the areas (closure by removal).

E. Initial post-closure care plan (845.220(b)(5))

After removal of all CCR material and this has been verified and certified, groundwater will be sampled to make sure that it is not exceeding the groundwater protection standards.

Special Conditions:

The following explains the conditions of the proposed permit:

The special conditions specify that various plans relating to the operation and maintenance of the basins must be maintained and kept up to date, that the permittee must operate and maintain the groundwater monitoring system, specifies the groundwater standards at the waste boundary, and specifies recordkeeping and reporting requirements.

1. Permittee must Comply with Air and Land Regulations
2. No construction for closure or corrective actions, only retrofit construction of the Ash Bypass Basin
3. Fugitive Dust Control Plan Requirements
4. Permanent Signage Requirements
5. Emergency Action Plan Requirements
6. Safety and Health Plan Requirements
7. Financial Assurance Requirements
8. Lateral expansions must be inspected
9. All impoundments must be inspected annually
10. Two additional down gradient wells in the silty clay silt unit, two piezometers must be added
11. Addresses to mail to Agency
12. Construct according to plans approved by Agency
13. Notify Agency when construction is completed
14. Not released from prior liabilities
15. Sludges generated must be properly disposed of
16. Wastewater discharges governed by NPDES permit
17. All certs, logs etc. as part of construction must be submitted

Public Notice of Draft Permit

Public Notice Number MEL:24032601.docx is hereby given by Illinois EPA, Division of Water Pollution Control, Permit Section, 1021 North Grand Avenue East, Post Office Box 19276, Springfield, Illinois 62794-9276 (herein Agency) that a draft Coal Combustion Residual Surface Impoundment Retrofit Construction Permit (CCR) Permit Number 2024-CC-100030 has been prepared under 40 CFR 124.6(d) for Midwest Generation, LLC for discharge into Illinois River from the Powerton Generating Station, 13082 East Manito Rd., Pekin, IL 61554, (Tazewell County).

The application, draft permit and other documents are available for inspection and may be copied at the Agency between 9:30 A.M. and 3:30 P.M. Monday through Friday. A Fact Sheet containing more detailed information is available at no charge. For further information, call the Public Notice Clerk at 217/782-0610.

Interested persons are invited to submit written comments on the draft permit to the Agency at the above address. The NPDES Permit and Joint Public Notice numbers must appear on each comment page. All comments received by the Agency not later than 30 days from the date of this publication shall be considered in making the final decision regarding permit issuance.

Any interested person may submit written request for a public hearing on the draft permit, stating their name and address, the nature of the issues proposed to be raised and the evidence proposed to be presented with regards to these issues in the hearing. Such requests must be received by the Agency not later than 45 days from the date of this publication.

If written comments and/or requests indicate a significant degree of public interest in the draft permit, the permitting authority may, at its discretion, hold a public hearing. Public notice will be given 45 days before any public hearing.

Coal Combustion Residual Surface Impoundment Permit No. 2024-CC-100030

Illinois Environmental Protection Agency

Division of Water Pollution Control

1021 North Grand Avenue East

Post Office Box 19276

Springfield, Illinois 62794-9276

Coal Combustion Residual Surface Impoundment Retrofit Construction Permit

Expiration Date:

Issue Date:
Effective Date:

Name and Address of Permittee:

Midwest Generation, LLC
13082 East Manito Rd.
Pekin, IL 61554

Name and Address of Facility:

Midwest Generation, LLC
Powerton Generating Station
13082 East Manito Rd.
Pekin, IL 61554
(Tazewell County)

CCR Impoundment:

W1798010008-04 Ash Bypass Basin

In compliance with the provisions of the Illinois Environmental Protection Act, Title 35 of Ill. Adm. Code, Subtitle C and/or Subtitle D, Chapter 1, and the Clean Water Act (CWA), the above-named permittee is hereby authorized to retrofit construct a coal combustion residual (CCR) surface impoundment, at the above location in accordance with the standard conditions and attachments herein.

Coal Combustion Residual Surface Impoundment Permit No. 2024-CC-100030 authorizes the retrofit construction of the Ash Bypass Basin in accordance with 35 Illinois Administrative Code Part 845 as described below.

Coal Combustion Residual Surface Impoundment Permit No. 2024-CC-100030 does not authorize the operation of the Ash Surge Basin, the Metal Cleaning Basin, the Ash Bypass Basin, or the Former Ash Basin.

Coal Combustion Residual Surface Impoundment Permit No. 2024-CC-100030 does not authorize the closure of the Ash Bypass Basin, corrective action for the Ash Bypass Basin, or any construction activities associated with the closure of the Ash Bypass Basin.

Coal Combustion Residual Surface Impoundment Permit No. 2024-CC-100030 does not authorize the closure, corrective action, or any construction for the Ash Surge Basin, the Former Ash Basin, or the Metal Cleaning Basin.

Coal Combustion Residual Surface Impoundment Permit No. 2024-CC-100030 does not authorize the discharge of any wastewater to waters of the United States. NPDES Permit No. IL0002232 authorizes this facility to discharge wastewater to waters of the United States.

Coal combustion residuals, consisting of bottom ash discharged from the station's dewatering bins and other process waste streams related to electric power-generating operations when the Ash Surge Basin was being cleaned. The Ash Bypass Basin covers approximately 0.83 acres and has a storage capacity of approximately 6,700 cubic yards.

Permit is hereby granted to the above designated permittee(s) to construct facilities described as follows:

The retrofit construction of the Ash Bypass Basin including the removal of the gravel warning and sand cushion layers over the existing geomembrane liner, decontaminating the basin's existing geomembrane liner for re-use as a supplemental liner, decontaminating the basin's appurtenant structures, installing a new basin floor and slopes, installing a composite liner system consisting of a 60-mil HDPE geomembrane over a geosynthetic clay liner, installing a leachate collection and removal system consisting of a drainage geocomposite, leachate collection pipe, and submersible sump pump, installing a sand filter layer over the leachate collection and removal system, and installing a protective warning layer over the sand filter layer. Retrofit construction includes all pipes, pumps, and appurtenances as specified in the Application for Retrofit Construction Permit application dated July 15, 2022 and the Amended Written Retrofit Plan Revision 1 dated March 5, 2024.

Permittee is not authorized to operate after the above expiration date. In order to receive authorization to operate beyond the expiration date, the permittee shall submit the proper application as required by the Illinois Environmental Protection Agency (IEPA) not later than 180 days prior to the expiration date.

Darin E. LeCrone P.E.
Manager, Permit Section
Division of Water Pollution Control

SPECIAL CONDITION 1: This permit does not relieve the Permittee of the responsibility of complying with the provisions of the State of Illinois Rules and Regulations, 35 Ill. Adm. Code Subtitle B, Air Pollution Control, Chapter 1 and 35 Ill. Adm. Code Subtitle G, Land Pollution Control, Chapter 1. The Permittee may be required to file reports and/or obtain applicable permits through the Illinois EPA's Bureau of Air (BOA) - Division of Air Pollution Control (DAPC) and/or Illinois EPA's Bureau of Land (BOL) – Division of Land Pollution Control (DLPC).

SPECIAL CONDTION 2: This construction permit is for Retrofitting of the Ash Bypass Basin and does not cover any closure construction or post-closure care of the Ash Bypass Basin. This permit does not authorize any construction activities necessary for closure and/or corrective action of the Ash Bypass Basin.

SPECIAL CONDITION 3: The operator shall implement methods for controlling dust, including the Fugitive Dust Control Plan included in Application Log No. 2021-100029, so as to prevent wind dispersal of particulate matter off-site.

SPECIAL CONDITION 4: A permanent sign shall be maintained at each CCR impoundment that contains the information required under 35 IAC, Section 845.130.

SPECIAL CONDITION 5: The written Emergency Action Plan (EAP), shall be maintained by the facility. The EAP and all amendments must be placed in the facility's operating record. Upon activation of the EAP, the facility must notify Illinois EPA in writing within 30 days of activation and place all corresponding documentation in the facility operating record. The permittee may amend the EAP at any time but must amend the EAP when there is a change in conditions that would substantially affect the EAP.

SPECIAL CONDITION 6: The Safety and Health Plan and accompanying certification has been submitted as part of Permit Application Log No. 2021-100029 and must be maintained by the facility. The plan must be updated annually and on an as needed basis. The Safety and Health Plan and all amendments must be placed in the facility operating record.

SPECIAL CONDITION 7: The permittee shall provide and maintain financial assurance in accordance with Part 845 Subpart I.

SPECIAL CONDITION 8: All CCR impoundments and any lateral expansion of a CCR surface impoundment must be inspected by a qualified person on a weekly basis and after each 25-year, 24-hour storm event. All CCR surface impoundment instrumentation must be inspected at least every 30 days. A report for each inspection shall be generated and placed into the facility operating record.

SPECIAL CONDITION 9: Each CCR Surface impoundment must be inspected on an annual basis by a qualified Professional Engineer, in accordance with 35 IAC 845.540. An inspection report must be completed and included with the Annual Consolidated Report, as specified in Special Condition 29.

SPECIAL CONDITION 10: Within 60 days of the effective date of this construction permit, the facility must install and begin to monitor at least two additional down gradient wells in the Silty Clay/Silt Unit, two piezometers in the fill unit, and two staff gages in the intermittent stream and standing water within the wetlands north of the service road splitting up the Former Ash Basin.

SPECIAL CONDITION 11: All certifications, logs, reports, plan sheets, notices, and groundwater monitoring data required to be submitted to the Illinois EPA by the permittee shall be mailed to the following address:

Illinois Environmental Protection Agency
Compliance Assurance Section
Bureau of Water
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

Information submittals transmitted by FedEX or UPS shall be mailed to the following address:

Illinois Environmental Protection Agency
Compliance Assurance Section
Bureau of Water
1021 North Grand Avenue East
Springfield, Illinois 62702

Electronic groundwater monitoring data shall be emailed to Illinois EPA at the following email address: EPA.BOW.GWS.CCR@illinois.gov

Except for electronic groundwater and leachate monitoring data, the operator shall provide the Illinois EPA with the original and two (2) copies of all certifications, logs, reports, and plan sheets required by this permit.

SPECIAL CONDITION 12: The permittee will commence construction in accordance with the specifications listed in the Application for Retrofit Construction Permit application dated July 15, 2022 and the Amended Written Retrofit Plan Revision 1 dated March 5, 2024. Any changes made to the construction plans must be approved by the Agency.

SPECIAL CONDITION 13: The permittee shall notify the Agency when construction has been completed.

SPECIAL CONDITION 14: Issuance of this permit does not release the Permittees from any liability for prior violations of the Act or Rules and Regulations promulgated thereunder.

SPECIAL CONDITION 15: All sludges generated on site shall be disposed of at a site and in a manner acceptable to the Agency.

SPECIAL CONDITION 16: All discharges to a Water of the United States shall be governed by NPDES Permit No. IL0002232.

SPECIAL CONDITION 17: All certifications, logs, reports, plan sheets, notices, and groundwater monitoring data generated as a part of the construction quality assurance program must be reported in the retrofit construction completion report in accordance with 35 IAC 845.770(g) and is required to be submitted to the Illinois EPA prior to termination of the retrofit construction permit by the permittee. The permittee shall mail the retrofit construction completion report to the following address:

Illinois Environmental Protection Agency
Compliance Assurance Section
Bureau of Water
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

Information submittals transmitted by FedEX or UPS shall be mailed to the following address:

Illinois Environmental Protection Agency
Compliance Assurance Section
Bureau of Water
1021 North Grand Avenue East
Springfield, Illinois 62702

CCR Permit No. 2024-CO-100029
Notice No. MEL:24022801.docx

Public Notice Beginning Date: April 4, 2024

Public Notice Ending Date: May 17, 2024

Coal Combustion Residual Surface Impoundment
Permit Program

Draft Permit to Operate a Coal Combustion Residual Surface Impoundment.

Public Notice/Fact Sheet Issued By:

Illinois Environmental Protection Agency
Bureau of Water
Division of Water Pollution Control
Permit Section
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276
217/782-0610

Name and Address of Permittee:

Midwest Generation, LLC
13082 East Manito Rd.
Pekin, IL 61554

Name and Address of Facility:

Midwest Generation, LLC
Powerton Generating Station
13082 East Manito Rd.
Pekin, IL 61554
(Tazewell County)

The Illinois Environmental Protection Agency (IEPA) has made a tentative determination to issue a Permit for Retrofit Construction of a Coal Combustion Surface Impoundment pursuant to 35 Illinois Administrative Code Part 845 and has prepared a draft permit and associated fact sheet. The IEPA is holding a public comment period and public hearing to offer an opportunity to the public to provide both written and oral comments on this proposed action prior to making a final decision.

The IEPA is accepting written public comments on the draft permit until 11:59 p.m. Friday, May 17, 2024. If you would like to provide written comments, please email your comments to epa.publichearingcom@illinois.gov, RE: "Midwest Generation, LLC – Powerton Generating Station CCR" or "2024-CO-100029". Written comments on the draft permit may also be mailed to IEPA, attention Jeff Guy, IEPA Hearing Officer, P.O. Box 19276, 1021 North Grand Avenue East, Springfield, Illinois 62794-9276. Email comments originating on third party systems or servers intended for submittal of multiple emails of the same or nearly the same content will not be accepted without prior approval from the hearing officer.

In addition to accepting written public comments, the IEPA will host a public hearing on May 8, 2024 beginning at 6:00 p.m. to receive oral public comments on the draft permit. The public hearing will be conducted pursuant to 35 Ill. Adm. Code Part 845. The public hearing will be held in Room A at the Miller Center, 551 South 14th Street, Pekin, Illinois 61554.

A public hearing on this draft permit will be held on May 8, 2024 at 6:00 p.m. in Room A at the Miller Center, 551 South 14th Street, Pekin, Illinois 61554.

Interested persons are invited to submit written comments on the draft permit to the IEPA at:

Hearing Officer Jeff Guy, Office of Community Relations
Re: Midwest Generation, LLC – Powerton Generating Station
Illinois Environmental Protection Agency
1021 North Grand Avenue East, P. O. Box 19276
Springfield, IL 62794-9276

Requests for interpretation (including sign language) must be made by 5:00 p.m. on Wednesday, April 17, 2024 by contacting the IEPA Hearing Officer by email at epa.publichearingcom@illinois.gov, or by calling (217) 785-8724. Questions regarding hearing procedures or

requests to address special needs should be made to the IEPA Hearing Officer by email at epa.publichearingcom@illinois.gov, by calling (217) 785-8724, or by calling (866) 273-5488 (TDD phone number).

The IEPA will provide a Responsiveness Summary, which will be available at the time a final decision is made in this matter. The Responsiveness Summary will include a summary of all significant comments, criticisms, and suggestions, whether written or oral, submitted during the public comment period, at the hearing, or during the time the hearing record is open. The Responsiveness Summary will provide IEPA's response to all significant comments, criticisms, and suggestions and a statement of IEPA's action, including, when applicable, the issuance or denial of the permit.

The permit application, IEPA review notes including load limit calculations, public notice, fact sheet, draft permit, comments received, and other pertinent documents are available for inspection and may be copied at the IEPA between 9:30 a.m. and 3:30 p.m. Monday through Friday when scheduled by the interested person.

You can join the listserv for this facility at the following address:
https://epa.illinois.gov/topics/water-quality/watershed-management/ccr-surface-impoundments.html

For further information on the draft permit, please call Mark E. Liska at 217/782-0610.

The applicant has been operating a steam electric generating station (SIC 4911). The station operates four cyclone coal-fired wet bottom boilers to supply steam to two generating units, designated units #5 and #6 rated at 851 and 846 MW respectively.

CCR basins at the facility consist of the Ash Surge Basin, the Ash Bypass Basin, the Former Ash Basin, and the Metal Cleaning Basin. This permit will cover the operation of the Ash Bypass Basin, Ash Surge Basin, Former Ash Basin, and Metal Cleaning Basin.

Midwest Generation – Powerton Generating Station has an active NPDES Permit IL0002232 that regulates the discharges of wastewater from the property to waters of the United States.

The proposed Coal Combustion Residual Surface Impoundment Operating Permit No. 2021-C0-100029 does not address the closure of any of the CCR Basins. Midwest Generation – Powerton Generating Station has submitted a separate Permit application to address the closure of the CCR basins.

Operation of All Basins:

Midwest Generation, LLC – Powerton Station is (currently) a 1,785 MW coal-fired power plant located in Pekin, IL along the Illinois River.

The facility has produced electricity since the 1928 utilizing four coal-fired boilers and two electric generating units, Units 5 and 6.

The Ash Surge Basin was constructed in 1978 and is currently in operation.

The Ash Bypass Basin was used as a bypass when the Ash Surge Basin required maintenance – decant water would divert to it instead of the Ash Surge Basin. The Ash Bypass Basin was taken out of service in 2020 and has not been used for managing CCR or non-CCR waste streams since 2020. The Ash Bypass Basin will be retrofitted with a new composite liner system and a new leachate collection and removal system. The retrofit construction of this permit will be covered under a separate permit.

The Former Ash Basin has an unknown construction date and could possibly be old as from the plant first generated power in 1928. It is estimated that it stopped receiving ash sometime in the 1970s.

The Metal Cleaning Basin was constructed in 1978 and has been in continuous operation. It has been used to temporarily store fly ash and bottom ash which are both routinely removed after the time needed for temporary storage is complete. Bottom ash comes from street sweeping and cleanup activities.

The basins described above must meet the requirements pursuant to 35 Ill. Adm. Code 845.230(d) for initial Operating Permits.

The Ash Surge Basin, Metal Cleaning Basin, and Ash Bypass Basin were constructed in 1978. The Former Ash Basin has an unknown construction date. The Ash Surge basin contains bottom ash. The Ash Bypass Basin contained bottom ash and economizer ash which have been removed. The Former Ash Basin does not have documentation of what was put in there. The Metal Cleaning Basin occasionally has both fly and bottom ash in it.

The permittee performed a Locations Restrictions Compliance Demonstration in October 2018. All of the basins except the Former Ash Basin are separated from the upper limit of the uppermost aquifer by a minimum distance of 5 feet which meets compliance with 845.300. All of the basins except the Former Ash Basin are not located in a wetlands according to the National Wetlands Inventory – Version 2 by the USFW. All of the basins are not located within a Holocene-aged fault or a seismic impact zone as mapped by the

USGS. All of the basins except the Former Ash Basin are also not in an unstable area or floodplain according to the NFHL FIRMette Map.

Documentation and Maintenance of Slope Protection: The exterior north slope has erosion protection because of the Ash Surge Basin's geomembrane-lined interior slope. The exterior east and south slopes have erosion protection because of the established vegetation. The exterior west slope is covered with gravel that protects the slope from erosion. Photo documentation is included in the application.

The Ash Bypass Basin, like the Ash Surge Basin, is lined and has established vegetation.

The Former Ash Basin has fill embankments on the north, west and east sides and is incised on the south side. Heavy vegetation from decades on non-use provides additional protection.

The Metal Cleaning Basin has partial embankments on all sides with slopes lined with 60-mil high-density PE geomembrane.

The permittee submitted an Initial Emergency Action Plan and a Fugitive Dust Control Plan for all basins that meets the requirements and are certified.

The permittee has submitted a Groundwater Monitoring Plan which has been reviewed by the Groundwater Section and meets the requirements. The Groundwater Monitoring Plan's monitoring wells, limits, and other requirements are explained in the Special Conditions of the permit.

The permittee submitted a preliminary written closure plan in the operating permit application for all four basins in accordance with 845.230. For the Ash Surge Basin, Ash Bypass Basin, and Metal Cleaning Basin, the preliminary closure plan is to remove all CCR material. The permittee submitted a written closure plan for the Former Ash Basin in accordance with 845.740. For the Former Ash Basin, the permittee will close the basin by consolidating the CCR and close the consolidated ash in place.

The permittee submitted a written post-closure plan for the Former Ash in accordance with 845.780. The Former Ash Basin will have regulator maintenance for the required 30 years. The permittee submitted a preliminary written post-closure plan for the Ash Surge Basin, Ash Bypass Basin, and Metal Cleaning Basin in the operating permit application in accordance with 845.230.

Liner Certification: The liners for the Ash Surge Basin, Ash Bypass Basin, and Metal Cleaning Basin have 60-mil HDPE geomembrane liner, 12 inches of limestone screenings, and 6 inches of sand, but do not comply with the requirements of 35 Ill. Adm. Code 845.400 and are considered unlined. The construction of the Former Ash Basin is unknown and, based on its age, is believed to be unlined.

The permittee submitted a hazard potential classification assessment under 35 Ill. Adm. Code 845.440 and 40 CFR 257.73(a)(2) which was certified by an IL licensed professional engineer. The basins are considered Class 2 as an Illinois Hazard Potential Classification.

The permittee submitted a structural stability assessment which was certified by an IL licensed professional engineer. The assessment recommended mowing vegetation, removing woody vegetation, and making sure the basins' discharge pipes are in good, working order.

The permittee submitted an initial safety factor assessment which was certified by an IL licensed professional engineer. The assessment did not find any issues.

The permittee submitted an initial inflow design flood control system plan assessment which was certified by an IL licensed professional engineer. The assessment found that the basins met a 1,000 year flood event without water overflowing the basins' emergency spillway structures.

The permittee submitted a safety and health plan underlining safety requirements.

The permittee submitted notice of a bond showing financial assurance in accordance with 35 Ill. Adm. Code 845.230(d)(2)(N).

Special Conditions:

The following explains the conditions of the proposed permit:

The special conditions specify that various plans relating to the operation and maintenance of the basins must be maintained and kept up to date, that the permittee must operate and maintain the groundwater monitoring system, specifies the groundwater standards at the waste boundary, and specifies recordkeeping and reporting requirements.

1. Permittee must Comply with Air and Land Regulations
2. No construction activities

3. Fugitive Dust Control Plan Requirements
4. Permanent Signage Requirements
5. Emergency Action Plan Requirements
6. Written Closure Plan Requirements
7. Financial Assurance Requirements
8. Health and Safety Plan
9. Lateral expansions must be inspected
10. All impoundments must be inspected annually
11. Two additional down gradient wells in the silty clay silt unit, two piezometers must be added
12. Background wells for the 3 aquifer unit requirements
13. Downgradient wells for the three aquifer unit requirements
14. Surface water and groundwater interaction monitoring
15. Start groundwater sampling at all wells
16. Statistical methods for evaluating groundwater requirements
17. Groundwater monitoring program must be in compliance with 845
18. Within 240 days, must submit statistical calculations from Special Condition 16
19. Within 60 days, must provide analysis of CCR
20. Analysis of all waste streams in basins
21. Groundwater standards for Silty Clay/Silt unit requirements
22. Groundwater standards for the Sand and Gravel unit requirements
23. Annual consolidated report requirements
24. Groundwater monitoring data submission requirements
25. Groundwater monitor results submitted within 60 days\
26. Annual Groundwater Monitoring and Corrective Action Report requirements
27. Annual consolidated report requirements
28. Addresses to mail to
29. Issuance does not release from prior liabilities
30. All sludges on site shall be disposed of properly
31. Water discharges through NPDES Permit IL0002232

Public Notice of Draft Permit

Public Notice Number MEL:24022801.docx is hereby given by Illinois EPA, Division of Water Pollution Control, Permit Section, 1021 North Grand Avenue East, Post Office Box 19276, Springfield, Illinois 62794-9276 (herein Agency) that a draft Coal Combustion Residual Surface Impoundment Operating Permit (CCR) Permit Number 2024-CO-100029 has been prepared under 40 CFR 124.6(d) for Midwest Generation, LLC for discharge into Illinois River from the Powerton Generating Station, 13082 East Manito Rd., Pekin, IL 61554, (Tazewell County).

The application, draft permit and other documents are available for inspection and may be copied at the Agency between 9:30 A.M. and 3:30 P.M. Monday through Friday. A Fact Sheet containing more detailed information is available at no charge. For further information, call the Public Notice Clerk at 217/782-0610.

Interested persons are invited to submit written comments on the draft permit to the Agency at the above address. The NPDES Permit and Joint Public Notice numbers must appear on each comment page. All comments received by the Agency not later than 30 days from the date of this publication shall be considered in making the final decision regarding permit issuance.

Any interested person may submit written request for a public hearing on the draft permit, stating their name and address, the nature of the issues proposed to be raised and the evidence proposed to be presented with regards to these issues in the hearing. Such requests must be received by the Agency not later than 45 days from the date of this publication.

If written comments and/or requests indicate a significant degree of public interest in the draft permit, the permitting authority may, at its discretion, hold a public hearing. Public notice will be given 45 days before any public hearing.

Coal Combustion Residual Surface Impoundment Permit No. 2024-CO-100029

Illinois Environmental Protection Agency

Division of Water Pollution Control

1021 North Grand Avenue East

Post Office Box 19276

Springfield, Illinois 62794-9276

Coal Combustion Residual Surface Impoundment Operating Permit

Expiration Date:

Issue Date:
Effective Date:

Name and Address of Permittee:

Midwest Generation, LLC
13082 East Manito Rd.
Pekin, IL 61554

Name and Address of Facility:

Midwest Generation, LLC
Powerton Generating Station
13082 East Manito Rd.
Pekin, IL 61554
(Tazewell County)

CCR Impoundment:

W1798010008-01 Ash Surge Basin
W1798010008-03 Metal Cleaning Basin
W1798010008-04 Ash Bypass Basin
W1798010008-05 Former Ash Basin

In compliance with the provisions of the Illinois Environmental Protection Act, Title 35 of Ill. Adm. Code, Subtitle C and/or Subtitle D, Chapter 1, and the Clean Water Act (CWA), the above-named permittee is hereby authorized to operate a coal combustion residual (CCR) surface impoundment, at the above location in accordance with the standard conditions and attachments herein.

Coal Combustion Residual Surface Impoundment Permit No. 2024-CO-100029 authorizes the operation of the Ash Surge Basin, the Metal Cleaning Basin, the Ash Bypass Basin, and the Former Ash Basin.

Coal Combustion Residual Surface Impoundment Permit No. 2024-CO-100029 does not authorize the closure, corrective action, or any construction for the Ash Surge Basin, the Former Ash Basin, the Ash Bypass Basin, or the Metal Cleaning Basin.

Coal Combustion Residual Surface Impoundment Permit No. 2024-CO-100029 does not authorize the discharge of any wastewater to waters of the United States. NPDES Permit No. IL0002232 authorizes this facility to discharge wastewater to waters of the United States.

Permittee is not authorized to operate after the above expiration date. In order to receive authorization to operate beyond the expiration date, the permittee shall submit the proper application as required by the Illinois Environmental Protection Agency (IEPA) not later than 180 days prior to the expiration date.

Darin E. LeCrone P.E.
Manager, Permit Section
Division of Water Pollution Control

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SPECIAL CONDITION 1: This permit does not relieve the Permittee of the responsibility of complying with the provisions of the State of Illinois Rules and Regulations, 35 Ill. Adm. Code Subtitle B, Air Pollution Control, Chapter 1 and 35 Ill. Adm. Code Subtitle G, Land Pollution Control, Chapter 1. The Permittee may be required to file reports and/or obtain applicable permits through the Illinois EPA's Bureau of Air (BOA) - Division of Air Pollution Control (DAPC) and/or Illinois EPA's Bureau of Land (BOL) – Division of Land Pollution Control (DLPC).

SPECIAL CONDTION 2: This permit does not authorize any construction activities necessary for closure and/or corrective action of the CCR impoundment(s) at the site.

SPECIAL CONDITION 3: The operator shall implement methods for controlling dust, including the Fugitive Dust Control Plan included in Application Log No. 2021-100029, so as to prevent wind dispersal of particulate matter off-site.

SPECIAL CONDITION 4: A permanent sign shall be maintained at each CCR impoundment that contains the information required under 35 IAC, Section 845.130.

SPECIAL CONDITION 5: The written Emergency Action Plan (EAP), shall be maintained by the facility. The EAP and all amendments must be placed in the facility's operating record. Upon activation of the EAP, the facility must notify Illinois EPA in writing within 30 days of activation and place all corresponding documentation in the facility operating record. The permittee may amend the EAP at any time but must amend the EAP when there is a change in conditions that would substantially affect the EAP.

SPECIAL CONDITION 6: The written closure plan has been submitted as part of Permit Application Log No. 2021-100028. The closure plan and all amendments must be placed in the facility's operating record. The permittee may amend the written closure plan at any time but must amend the closure plan when there is a change in a CCR surface impoundment that would substantially affect the written closure plan, and before closure activities have started or unanticipated events necessitate a revision. The closure plan shall be amended at least 60 days before a planned change and within 60 days after an unanticipated event.

SPECIAL CONDITION 7: The permittee shall provide and maintain financial assurance in accordance with Part 845 Subpart I.

SPECIAL CONDITION 8: The Safety and Health Plan and accompanying certification has been submitted as part of Permit Application Log No. 2021-100029. The plan must be updated annually and on an as needed basis. The Safety and Health Plan and all amendments must be placed in the facility operating record.

SPECIAL CONDITION 9: All CCR impoundments and any lateral expansion of a CCR surface impoundment must be inspected by a qualified person on a weekly basis and after each 25-year, 24-hour storm event. All CCR surface impoundment instrumentation must be inspected at least every 30 days. A report for each inspection shall be generated and placed into the facility operating record.

SPECIAL CONDITION 10: Each CCR Surface impoundment must be inspected on an annual basis by a qualified Professional Engineer, in accordance with 35 IAC 845.540. An inspection report must be completed and included with the Annual Consolidated Report, as specified in Special Condition 29.

SPECIAL CONDITION 11: Within 90 days of the effective date of this operating permit, the facility must install and monitor as a part of the groundwater monitoring network at one additional downgradient well, MW-21D, in the Sand and Gravel Unit and two additional down gradient wells, MW-22 and MW-23 in the Silty Clay/Silt Unit. MWG must also install and monitor for groundwater elevations two piezometers in the fill unit, P-1 and P-2, and install and monitor for surface water elevations one staff gage in the Lost Creek. The piezometers must be installed with 10 feet screens, placed with the bottom of the screen installed at the bottom of the fill sand or top of the native soils.

SPECIAL CONDTION 12: The background wells for the three migration pathways are as follows:

a) Silty Clay/Silt Unit —MW-16.

b) Sand and Gravel Unit— MW16.

SPECIAL CONDITION 13: The downgradient wells for the three migration pathways are as follows:

a) Silty Clay/Silt Unit —MW-06, MW-14, Newly installed well MW-22, Second newly installed well MW-23.

b) Sand and Gravel Unit— MW-01, MW02, MW03, MW04, MW05, MW-07, MW-10, New well installed MW-21D.

SPECIAL CONDITION 14: Surface water and groundwater interaction monitoring and sand and gravel aquifer unit groundwater monitoring includes surface water elevations and groundwater elevations collected and reported in accordance with 35 IAC 845.610(e)(3)(C), 35 IAC 845.640(c)(1) and (3), and 35 IAC 845.650(b)(2). The groundwater and surface water elevation monitoring locations are as follows:

a) Surface water—the Illinois River USGS staff gage at Kingston Mines and one new staff gage, installed in the Lost Creek.

b) Groundwater:

1. Fill Sand connected to the Sand and Gravel Unit—two newly installed piezometers, P-1 and P-2. .

2. Silty Clay/Silt Unit— MW-06, MW-12, MW-14, MW-15, MW-17, MW-18MW-22, MW-23.

3. Sand and Gravel Unit—MW-01, MW02, MW03, MW04, MW05, MW-07, MW-09, MW-11, MW-16, MW-19MW-21D.

MWG must install the silty clay/silt and sand and gravel unit groundwater monitoring wells, fill unit piezometers and staff gages within 90 days of the issuance of this permit.

After completion of the initial surface water/groundwater interaction investigation, lasting 2 calendar years, the necessity of additional wells to monitor storm water infiltration and flooding recharge will be assessed by MWG. A report for review and approval by the Agency will be provided to the Agency by the end of 2.5 years from the beginning of the groundwater and surface water elevation monitoring.

SPECIAL CONDITION 15: Within 30 days of the effective date of this operating permit, the facility must initiate groundwater sampling and analysis in accordance with 35 IAC Section 845.640 at every well. Compliance with Section 845.640(a) requires the collection and submission of monitoring data during annual reporting of laboratory reports, field documents and records of collection and analysis, and documentation of environmental data compliant with SW 846.

SPECIAL CONDITION 16: Within 90 days of the effective date of this permit, the permittee must select a statistical method for evaluating groundwater monitoring data, pursuant to Section 845.640(f)(1), and notify Illinois EPA of the chosen statistical method. The permittee must use the data from the groundwater monitoring program required by this permit to conduct the statistical analysis. Data to be provided or an amended Attachment 9-4 of the Initial Operating Permit Application is as follows:

a) Outlier analysis must be struck from Attachment 9-4 or revised to adhere to the following for any laboratory analyzed constituent listed in 35 IAC 845.600:

1. Verified data from a NELAP certified laboratory is representative of the aquifer properties analyzed. Outliers cannot be evaluated for exclusion from any dataset without explicit data validation identifying discrepancies from the laboratory and/or field procedures that would qualify a data point to be considered an outlier. Midwest Generation must use the USEPA data validation procedures to determine when or if a data point is to be excluded from a data set. (EPA QA/G-8).

b) All input data sets for each constituent must be provided in a table in accordance with SW-846 chapter 1, incorporated by reference in 35 IAC 845. Chapter 1 of SW846 states that regulatory decisions must be made with environmental data.

c) All data sets, used for statistical analysis of background, must be within the last eight consecutive quarterly sampling events in order to validate the statistical methods for recent activity (35 IAC 845.650(b));

d) Non-parametric statistical analysis must be provided to the Agency for review and approval each time that a non-parametric data set occurs.

SPECIAL CONDITION 17: Within 30 days of the effective date of this permit, the groundwater monitoring program must be in compliance with 35 IAC 845.650 at all wells.

a. The permittee must analyze each sample for the constituents listed in 845.600(a), calcium and turbidity.

b. When analyzing groundwater quality, the permittee must measure total recoverable metals pursuant to Section 845.640(i).

c. The permittee must collect a minimum of eight independent samples from each background and downgradient well within 550 days of operating permit issuance.

d. After background groundwater monitoring has been completed, the permittee must conduct monitoring pursuant to Section 845.650(b).

SPECIAL CONDITION 18: Within 640 days of the effective date of this permit, the permittee must submit statistical calculations using the method selected in Special Condition 16. As part of this submittal, the applicant must provide a groundwater protection standard for each constituent, the statistical evaluations and calculations including the raw data used, and a description of any assumptions used when calculating the groundwater protection standards.

SPECIAL CONDITION 19: Within 60 days of the effective date of the operating permit, the permittee must provide an analysis of the coal combustion residual located inside the Former Ash Basin, Ash Surge Basin, Metal Cleaning Basin, and Ash Bypass Basin, if any remains and in the embankments of the Former Ash Basin, Ash Surge Basin, Metal Cleaning Basin, and Ash Bypass Basin. The samples must be compliant with the sampling requirements of SW 846 pursuant to 845.230(d)(2)(B).

SPECIAL CONDITION 20: Within 60 days of the effective date of this permit, the permittee must provide an analysis of all waste streams entering or currently at the Former Ash Basin, Ash Surge Basin, Metal Cleaning Basin, and Bypass Basin. Sources that have historically discharged in the Former Ash Basin, Ash Surge Basin, Metal Cleaning Basin, and Bypass Basin include: coal pile runoff, gas side metal cleaning waste, plant drains, yard runoff, roof drains, road runoff. For each of these sources and any other sources not identified, the permittee must provide an analysis of the waste stream compliant with the sampling requirements of SW 846 pursuant to 845.230(d)(2)(C) or a statement that the identified source is no longer discharging and the approximate date of the last discharge.

SPECIAL CONDITION 21: The groundwater standards at the waste boundary for the Silty Clay/Silt unit are:

Pollutant	Concentration
Antimony	0.006 mg/L
Arsenic	0.010 mg/L
Barium	2.0 mg/L
Beryllium	0.004 mg/L
Boron	4.7 mg/L
Cadmium:	0.005 mg/L
Chloride:	200 mg/L
Chromium:	0.1 mg/L
Cobalt:	0.006 mg/L
Fluoride:	4.0 mg/L
Lead:	0.0075 mg/L
Lithium:	0.04 mg/L
Mercury:	0.002 mg/L
Molybdenum:	0.1 mg/L
pH:	6.5-9.0 units
Selenium:	0.05 mg/L
Sulfate:	400 mg/L
Thallium:	0.002 mg/L
Total Dissolved Solids:	1200 mg/L
Radium 226 and 228 combined:	5 pCi/L

If the statistical analysis performed as part of Special Condition 19 determines a groundwater protection standard that is higher than the currently permitted limits, the applicant may submit a permit application modification to modify the above standards. Chloride and pH will only be amended through statistical analysis during permit renewal.

After review and approval of initial background concentrations by the Agency, background concentrations for constituents listed in 35 IAC 845.600(a) will only be evaluated for changes during permit renewal and after implementation and completion of construction permits.

SPECIAL CONDITION 22: The groundwater standards at the waste boundary for the Sand and Gravel unit are:

Pollutant	Concentration
Antimony	0.006 mg/L
Arsenic	0.010 mg/L
Barium	2.0 mg/L
Beryllium	0.004 mg/L
Boron	4.7 mg/L
Cadmium:	0.005 mg/L
Chloride:	200 mg/L
Chromium:	0.1 mg/L
Cobalt:	0.006 mg/L
Fluoride:	4.0 mg/L
Lead:	0.0075 mg/L
Lithium:	0.04 mg/L
Mercury:	0.002 mg/L
Molybdenum:	0.1 mg/L
pH:	6.5-9.0 units
Selenium:	0.05 mg/L
Sulfate:	400 mg/L
Thallium:	0.002 mg/L
Total Dissolved Solids:	1200 mg/L
Radium 226 and 228 combined:	5 pCi/L

If the statistical analysis performed as part of Special Condition 19 determines a groundwater protection standard that is higher than the currently permitted limits, the applicant may submit a permit application modification to modify the above standards. Chloride and pH will only be amended through statistical analysis during permit renewal.

After review and approval of initial background concentrations by the Agency, background concentrations for constituents listed in 35 IAC 845.600(a) will only be evaluated for changes during permit renewal and after implementation and completion of construction permits.

SPECIAL CONDITION 23: Annual consolidated reports must contain the following items in accordance with Section 845.550, 845.500(c), 845.540(b)(3), and 845.610(e):

Fugitive Dust Control Report in accordance with Section 845.500(c);

Annual Inspection Report in accordance with Section 845.540(b)(2);

Groundwater Monitoring and Corrective Action Report in accordance with Section 845.610(e)(3) and (e)(4); documentation in the report must satisfy Section 845.640(a), (b), (c),

SPECIAL CONDITION 24: The permittee must maintain a written operating record at the facility. Each record must be retained for at least three years past the date the Agency approved the owner's or operator's request to terminate post-closure care, when closure is with a final cover system, or the completion of groundwater monitoring under Section 845.740(b), when closure is by removal. Records for each individual surface impoundment must be identified by name and identification number.

The permittee must place the following information, as it becomes available, in the facility's operating record:

a. Copies of all permit applications and permits;

b. Documentation recording the public meetings held under Section 845.240;

c. Weekly CQA reports under Section 845.290(b);

d. Hazard potential classification assessments for CCR surface impoundments (see Section 845.440(a)(3)(D));

e. Structural stability assessments for CCR surface impoundments (see Section 845.450(d)(4));

f. Safety factor assessments for CCR surface impoundments (see Section 845.460(c)(4));

g. The CCR fugitive dust control plan and any subsequent amendment of the plan (see Section 845.500(b)(6)), except that only the most recent fugitive dust control plan must be maintained in the facility's operating record, irrespective of the time requirement specified in subsection (b);

h. Inflow design flood control system plans for CCR surface impoundments (see Section 845.510(c)(4)(D));

i. Emergency Action Plan (see Section 845.520(a)), except that only the most recent EAP must be maintained in the facility's operating record irrespective of the time requirement specified in subsection (b);

j. Documentation prepared by the owner or operator recording all activations of the EAP (see Section 845.520(f));

k. Documentation prepared by the owner or operator recording the annual face-to-face meeting or exercise between representatives of the owner or operator of the CCR surface impoundment and the local emergency responders (see Section 845.520(g));

l. Safety and Health Plan (see Section 845.530(a));

m. Documentation recording the results of each inspection and instrumentation monitoring by a qualified person (see Section 845.540(a)(2));

n. Annual consolidated report (see Section 845.550), which contains the following:

    1. The annual CCR fugitive dust control report (see Section 845.500(c));

    2. The annual inspection report (see Section 845.540(b)(3)); and

    3. The annual groundwater monitoring and corrective action report (see Section 845.610(e));

o. All groundwater monitoring data submitted to the Agency and any analysis performed (see Section 845.610(b)(3)(D) and 845.640(a), (b), and (c));

p. Within 30 days after detecting one or more monitored constituents above the groundwater protection standard, the notifications required by Section 845.650(d) and (e);

q. The semi-annual report describing the progress in selecting and designing the remedy (see Section 845.670(a));

r. Within 30 days after completing implementation of the corrective action plan, the notification required by Section 845.680(e);

s. USEPA-approved or denied demonstration as required by Section 845.700(d)(2)(F);

t. The preliminary written closure plan and any amendment of the plan (see Section 845.720(a)) except that only the most recent closure plan must be maintained in the facility's operating record, irrespective of the time requirement specified in subsection (b);

u. The written demonstrations, including the certification required by Section 845.730(b)(3), for a time extension for initiating closure (see Section 845.730(b)(2)); 22) The notification of intent to close a CCR surface impoundment (see Section 845.730(d));

v. The monthly reports for closure by removal (see Section 845.740(d));

w. The closure report and certification (see Section 845.760(e)(3)), or the completion of groundwater monitoring report and certification (see Section 845.740(f)); completion of groundwater monitoring in accordance with Section 845.740 with concurrence of the Agency must be in the record;

x. The notification of completion of closure of a CCR surface impoundment (see Section 845.760(f));

y. The notification recording a notation on the deed (see Section 845.760(h));

z. The preliminary written retrofit plan for a CCR surface impoundment (see Section 845.770(a)(3));

aa. The notification of intent to initiate retrofit of a CCR surface impoundment (see Section 845.770(d));

bb. The retrofit completion report and certification (see Section 845.770(g)(3));

cc. The notification of completion of retrofit activities (see Section 845.770(h));

dd. The notification of completion of post-closure care period (see Section 845.780(f));

ee. The completion of CCR removal and decontamination report and certification (see Section 845.740(e)); and

ff. The most current cost estimates (see Section 845.940(d)).

SPECIAL CONDITION 25: All groundwater monitoring data and resulting analysis must be submitted to Illinois EPA within 60 days after completion of sampling and must be place into the facility operating record.

SPECIAL CONDITION 26: The permittee shall prepare an Annual Groundwater Monitoring and Corrective Action Report each year. The Annual Groundwater Monitoring and Corrective Action Report shall be submitted to Illinois EPA as part of the Annual Consolidated Report required in Special Condition 24, and must be placed into the facility operating record. The annual report shall include at a minimum and to the extent available:

a. A map, aerial image, or diagram showing the CCR surface impoundment, all background (or upgradient) and downgradient monitoring wells, including the well identification numbers, that are part of the groundwater monitoring program for the CCR surface impoundment, and a visual delineation of any exceedances of the groundwater protection standards;

b. Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;

c. A potentiometric surface map of each monitored groundwater migration pathway unit (Fill Unit, Silty/Clay-Silt Unit and Sand and Gravel Unit) for each groundwater elevation sampling event required by Section 845.650(b)(2);

d. Monitoring data must include analytical results, documentation of field sampling procedures, and laboratory reports in accordance with 35 IAC 845.640(a).

e. An assessment of corrective measures, corrective action plans, interim corrective measures and any other corrective action measures conducted during the year must be summarized and/or documented in the submission of the annual groundwater monitoring and corrective action report in accordance with 35 IAC 845.610(e) and 35 IAC 845.550(3).

f. In addition to all the monitoring data obtained in the year, a summary including the number of groundwater samples that were collected for analysis for each Illinois EPA approved background and downgradient well, and the dates the samples were collected;

g. In accordance with 35 IAC 845.610(e), a narrative discussion of any statistically significant increases over background levels for the constituents listed in Section 845.600. Any statistically significant increases over background concentrations for one or more constituents listed in 35 IAC 845.600 must be identified and summarized or documented in accordance with 35 IAC 845.610(e)(4). Corrective action assessments, planning, and actions must be documented in accordance with 35 IAC 845.610(e); and

h. All other information required to be included in the annual report as specified in 35 IAC 845 Subpart F.

SPECIAL CONDTION 27: The Annual Consolidated report each calendar year shall be submitted to the Illinois EPA by January 31 of the following year and placed into the facility operating record. The Annual Consolidated Report shall consist of the following:

a. The Annual CCR fugitive dust control report.

b. The Annual Inspection Report, which may include:

1. Annual Hazard potential certification, if applicable.

2. Annual structural stability assessment certification, if applicable.

3. Annual Safety factor assessment certification, if applicable.

4. Inflow design flood control system certification, if applicable.

c. The Annual Groundwater Monitoring and Corrective Action Report.

SPECIAL CONDITION 28: All certifications, logs, reports, plan sheets, notices, and groundwater and leachate monitoring data required to be submitted to the Illinois EPA by the permittee shall be mailed to the following address:

Illinois Environmental Protection Agency
Compliance Assurance Section
Bureau of Water
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

Information submittals transmitted by FedEX or UPS shall be mailed to the following address:

Illinois Environmental Protection Agency
Compliance Assurance Section
Bureau of Water
1021 North Grand Avenue East
Springfield, Illinois 62702

Electronic groundwater monitoring data shall be emailed to Illinois EPA at the following email address: EPA.BOW.GWS.CCR@illinois.gov

Except for electronic groundwater and leachate monitoring data, the operator shall provide the Illinois EPA with the original and two (2) copies of all certifications, logs, reports, and plan sheets required by this permit.

SPECIAL CONDITION 29: Issuance of this permit does not release the Permittees from any liability for prior violations of the Act or Rules and Regulations promulgated thereunder.

SPECIAL CONDITION 30: All sludges generated on site shall be disposed of at a site and in a manner acceptable to the Agency.

SPECIAL CONDITION 31: All discharges to a Water of the United States shall be governed by NPDES Permit No. IL000223

DOCUMENT 38

From: Hunt, Lauren
To: Logan-Pugh, Joey L.; LeCrone, Darin; Dunaway, Lynn
Cc: Bierwagen, Justin; Liska, Mark
Subject: DRAFT Powerton Geotech Memo.docx
Date: Thursday, April 18, 2024 3:59:51 PM
Attachments: DRAFT Powerton Geotech Memo.docx

Hi Joey and Darin.

Please see attached for the Draft memo on Powerton.

Thank you.

Lauren

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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 · (217) 782-3397
JB PRITZKER, GOVERNOR JOHN J. KIM, DIRECTOR

TO: Mark Liska, Permits Section

CC: Joey Logan-Pugh, Lynn Dunaway, Darin LeCrone

FROM: Groundwater Section, Hydrogeologic Compliance Unit

DATE: April 3, 2025

SUBJECT: W1798010008, Powerton Generating Station, Bypass Basin, Technical Position Regarding the Waste Boundary, Waste Characterization and Structural Components of the Former Ash Basin, Ash Surge Basin, Metal Cleaning Basin and Bypass Basin

The purpose of this internal memorandum is to provide the technical decision-making details for use in any further matters regarding the Bypass Basin construction permit application and initial operating permit application and subsequent special conditions.

Executive Summary: The fill material used to raise grade at the site above the Silty Clay/Clay unit and Sand and Gravel unit at Powerton Generating Station is a part of the engineering design and "structural components" to prevent the CCRSIs from being located in unstable areas in accordance with 35 IAC 845. By design and the certification of MWG's qualified professional engineer, the foundations and other structural components are crucial in ensuring that the CCRSIs are stable and not subject to inundation from flooding, changes in the Illinois River course and other natural or man-made hazards that may compromise the CCRSIs leading to a release of CCRSI to the environment.

Background

Facility background:

The Bypass Basin was constructed in 1978 and operated until April 2021. The Ash Surge Basin was constructed in 1978 and continues to operate as of 2021. The Metal Cleaning Basin was constructed in 1978 and continues to operate as of 2021. (MWG, 2021 and MWG, 2022)

It is not known when the Former Ash Basin was constructed. The facility began operations in 1928. It is not known when the facility began using the Former Ash Basin. However, it stopped receiving CCR in the 1970s. According to the USGS topographic maps from 1905, 1927, 1958, 1960 and 1963, the Former Ash Basin was not present in the 1927 and 1905 topographic maps and present in the 1958 topographic map. The Former Ash Basin is labeled as "tailings pond and settling ponds" which seem to extend to the Illinois River in the 1958 topographic map.

Definitions:

35 IAC 845.120: "Act" means the Illinois Environmental Protection Act [415 ILCS 5].

"Coal combustion residuals" or "CCR" means fly ash, bottom ash, boiler slag, and flue gas desulfurization materials generated from burning coal for the purpose of generating electricity by electric utilities and independent power producers. [415 ILCS 5/3.142]

"CCR surface impoundment" or "impoundment" means a natural topographic depression, man-made excavation, or diked area, which is designed to hold an accumulation of CCR and liquids, and the surface impoundment treats, stores, or disposes of CCR. [415 ILCS 5/3.143]

"Hydraulic conductivity" means the rate at which water can move through a permeable medium (i.e., the coefficient of permeability).

"Recognized and generally accepted engineering practices" means engineering maintenance or operation activities based on established codes, widely accepted standards, published technical reports, or a practice widely recommended throughout the industry. These practices generally detail approved ways to perform specific engineering, inspection, or mechanical integrity activities.

"Static factor of safety" means the factor of safety (safety factor) determined using analysis under the long-term, maximum storage pool loading condition, the maximum surcharge pool loading condition, and the end-of-construction loading condition.

"Structural components" means liners, leachate collection and removal systems, final covers, run-on and run-off systems, inflow design flood control systems, and any other component used in the construction and operation of the CCR surface impoundment that is necessary to ensure the integrity of the surface impoundment and ensure that the contents of the surface impoundment are not released into the environment.

"Unstable area" means a location that is susceptible to natural or human-induced events or forces capable of impairing the integrity of that area, including structural components of some or all the CCR surface impoundment that are responsible for preventing releases from the surface impoundment. Unstable areas can include poor foundation conditions, areas susceptible to mass movements, and karst terrains.

The “waste boundary” means a vertical surface located at the hydraulically downgradient limit of the CCR surface impoundment. The vertical surface extends down into the uppermost aquifer.

Regulatory Background of the Waste Boundary:

35 IAC 845.600(a): defines the groundwater protection standards at the waste boundary including background values that exceed the numerical values in 35 IAC 845.600(a)(1).

MWG has wells installed hydraulically downgradient from the CCRSIs or the CCRSI’s toe of structural components providing support for the integrity of the CCRSIs. These are MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-10, MW-14, MW-20, and MW-21. The determination of where the Silty Clay/Clay unit terminates before the shoreline. Consequently, the fill sand, CCR used as structural fill, is in partial contact with the Sand and Gravel unit and partial contact with the Silty Clay/Clay unit.

MWG is performing further investigation to delineate interaction between the surface water and groundwater and the upper limit of groundwater in the uppermost aquifer which includes the fill sand connected to the Sand and Gravel unit (underlying the fill sand and the Silty Clay/Clay unit) and the fill sand overlying the Silty Clay/Clay unit.

35 IAC 845.600(b): defines the groundwater protection standards at the waste boundary for new CCRSIs.

MWG does not have any new CCRSIs at Powerton Generating Station.

35 IAC 845.630(a)(2): states that the groundwater monitoring system must accurately monitor the groundwater at the waste boundary of the CCRSI in all applicable contaminant pathways. Downward vertical hydraulic gradients

that exhibit the potential for contaminants to be transported into aquifers below the uppermost aquifer must be monitored in accordance with 35 IAC 845.630(d).

MWG is monitoring two aquifers, the Sand and Gravel unit and the Silty Clay/Clay unit. The Agency has agreed with MWG that the fill sand (CCR fill materials) overlying the Silty Clay/Clay unit and the Sand and Gravel unit are connected to the Sand and Gravel unit, creating one hydrostatic unit separate from the Silty Clay/Clay unit. Further investigation of the fill sand and interaction with the groundwater and surface water is being conducted as a special condition of the initial operating permit.

35 IAC 845.630(c)(2): requires that the groundwater monitoring system accurately monitor the groundwater at the waste boundary and accurately represent groundwater that has not been impacted by the CCRSI.

MWG provided statistical evaluation of groundwater data from MW-01, MW-09, MW-10, and MW-19 for the Initial Operating Permit Application background constituent values. MW-01 and MW-10 are downgradient wells as documented by MWG in their initial operating permit application documents. MW-09 and MW-19 are installed into the Sand and Gravel unit at Powerton Station. Although MW-09 and MW-19 are installed in the Sand and Gravel unit, the wells were drilled through CCR or fill materials utilized in the stabilization of grade for the CCRSI. The Agency agreed to allow an alternative boron concentration using data from MW-09 and MW-19 until 8 samples of total metals are collected, analyzed and evaluated for all constituents in 35 IAC 845.600(a) at MW-16. MW-16 is the background well as shown in Special Condition 12.

35 IAC 845.660(a)(1): requires that the assessment of corrective measures be initiated for any exceedance of the groundwater protection standard that is downgradient of the waste boundary OR immediately upon detection of release from the CCR from a CCRSI.

Special conditions provided in the permit will necessitate groundwater corrective measures assessments for groundwater exceedances of any of the constituents listed in 35 IAC 845.600(a).

35 IAC 845.680(c)(1): provides that the corrective action is only complete when the plume is not exceeding the groundwater protection standards at the waste boundary.

Groundwater corrective action must be adequate to prevent the contaminant plume from exceeding groundwater protection standards at the waste boundary. The waste boundary may be defined as the vertical hydraulic boundary that coincides with the outer limits of the bearing capacity and factor of safety calculated influence of the CCRSI.

Regulatory Background of the Waste Characterization:

35 IAC 845.230(d)(2)(C): Initial operating permit for existing, inactive and inactive closed surface impoundments requires “an analysis of the chemical constituents of all waste streams, chemical additives and sorbent materials entering or contained in the CCR surface impoundment.”

35 IAC 845.230(d)(3)(C): Initial operating permit for existing inactive surface impoundments requires “an analysis of the chemical constituents of all waste streams, chemical additives and sorbent materials entering or contained in the CCR surface impoundment.”

Regulatory Background of the CCRSI Location:

35 IAC 845.300: Placement above the uppermost aquifer requires that the CCRSIs be placed at least 5 feet above the uppermost aquifer. The MWG qualified professional engineer certified that the bottom of the Powerton CCRSIs, excluding the Former Ash Basin, were 5 feet above the uppermost aquifer. The MWG qualified professional engineer certified that the Former Ash Basin will be closed in accordance with 35 IAC 845.700.

35 IAC 845.310: Wetlands location restriction prohibits CCRSIs being located in a wetland. The MWG qualified professional engineer certified that the CCRSIs, excluding the Former Ash Basin, are not placed in a wetland. The MWG qualified professional engineer certified that the Former Ash Basin will be closed in accordance with 35 IAC 845.700.

35 IAC 845.320: Fault areas location restriction prohibits CCRSIs from being located within 200 feet of a fault area. The MWG qualified professional engineer certified that the CCRSIs are not placed within 200 feet of a fault area.

35 IAC 845.330: Seismic impact zones location restriction prohibits CCRSIs from being located in seismic impact zones unless the owner or operator demonstrates that all structural components, including liners, leachate collection and removal systems, and surface water control systems, are designed to resist the maximum horizontal acceleration in lithified earth material. The MWG qualified professional engineer certified that the CCRSIs are not within seismic impact zones.

35 IAC 845.340: Unstable areas and floodplains location restriction prohibits CCRSIs from being located in unstable areas as defined in 35 IAC 845.340(b) or floodplains as defined in 35 IAC 845.340(c) unless MWG's qualified professional engineer has demonstrated that the design has incorporated necessary design features and construction to ensure that the CCRSI will not be compromised due to the unstable area or floodplain. MWG's qualified professional engineer has certified that the CCRSIs are not located in an unstable area. MWG's qualified professional engineer certified that the CCRSIs, excluding the Former Ash Basin, are not within a floodplain. The MWG qualified professional engineer certified that the Former Ash Basin will be closed in accordance with 35 IAC 845.700.

35 IAC 845.350: Failure to meet location standards requires the closure of the CCRSI in accordance with 35 IAC 845.700.

Regulatory Background of the CCRSI Engineering and Hydraulic Properties:

35 IAC 845.400(g): According to the MWG Initial Operating Permit Applications for the Former Ash Basin, Ash Surge Basin, Bypass Basin and Metal Cleaning Basin, the CCRSIs are not lined in accordance with 35 IAC 845.400 and therefore must be closed in accordance with 35 IAC 845.700.

According to the KPRG 2005 Geotechnical Summary Report, the structural fill material placed on top of the Silty Clay/Clay Unit and load bearing fill supporting the CCRSIs consists of bottom ash and slag, which are CCR. In order to use the CCR as structural fill to support the load of the CCRSIs, the requirements of Section 3.135 of the Act must be met. Section 3.135 requires that screening for leachability and Class I groundwater quality standards must be conducted to allow for use of the CCR as CCB. [35 IAC 845.400(b)(2)(A) and 35 IAC 845.120 "beneficial reuse of CCR" definition]

According to Illinois Pollution Control Board Order dated May 4, 2023 in Case No. AS 21-1, MWG must sample all CCR materials used as structural fill at Joliet 29 Pond 2. The Agency concurs that CCR materials used as structural fill, "structural components", must be characterized for the purpose of complying with Section 3.135 of the Act.

35 IAC 845.400(c): The alternative liner must consist of an upper component with a minimum 30-mil geomembrane liner and a lower component of compacted soil with a liquid flow rate to thickness ratio equivalent to 2-feet of compacted soil with a 1×10^{-7} cm/sec. For example, 3-feet compacted soil thickness with a flow rate that ensures that the liquid moves through the 3-feet totally within the same amount of time as the 2-feet with a 1×10^{-7} cm/sec.

MWG does not have an alternative liner for any of the CCRSIs at Powerton Generating Station.

35 IAC 845.400(d): The hydraulic conductivity of the compacted soil must be determined using recognized and generally accepted methods. A summary of accepted methods for testing compaction and hydraulic conductivity is summarized in the Engineering Background.

The fill sand or CCR used as structural fill does not have the ability to be compacted to a hydraulic conductivity necessary to meet the requirement of this subpart. MWG states in the Initial Operating Permit Application that the fill sand has no cohesivity. Consequently, the fill sand cannot meet the hydraulic conductivity requirements for 35 IAC 845.400(b) and (c).

35 IAC 845.400(e): The O/O is required to provide a demonstration of whether there is a composite liner or an alternative liner with the initial operating permit application. Section 12.0 and 12.2 of the initial operating permit applications for the Former Ash Basin, Ash Surge Basin, Metal Cleaning Basin and Bypass Basin identifies that the liner does not comply with 35 IAC 845.400 and is considered unlined (initial operating permit applications, Section 12.0 and 12.2).

35 IAC 845.400(f): See above. The Former Ash Basin, Ash Surge Basin, Metal Cleaning Basin and Bypass Basin are unlined.

35 IAC 845.400(g): All unlined CCRSIs are subject to the retrofit or closure requirements of 35 IAC 845.700.

35 IAC 845.430: Slope maintenance requires that slopes and pertinent surrounding areas of the CCRSI must be designed, constructed, operated and maintained with one of the forms of slope protection specified in this section. The Agency understands that slope protection is one of the structural components of the design, construction, operation and maintenance of a CCRSI.

MWG's qualified professional engineer has certified that the Former Ash Basin, Ash Surge Basin, Metal Cleaning Basin and Bypass Basin are designed, constructed, and inspected regularly to ensure that the slope stability is preserved as designed, constructed, operated and maintained.

35 IAC 845.450: The structural stability assessment requires that the owner or operator of a CCRSI conduct initial and annual structural stability assessments and document whether the design, construction, operation and maintenance of the CCRSI is consistent with recognized and generally accepted engineering practices for the maximum volume of the CCRSI. The structural stability assessment includes stable foundations and abutments, dikes, slope protection and many other structural components. The Agency understands that the structural stability assessment will identify any changes to the CCRSI and/or damage to the CCRSI causing the potential for a release of CCR to the ground or surface water.

The Agency understands that the CCRSI would be compromised by removal of fill materials around the CCRSIs that would impact the bearing capacity of the CCRSI. See below for further explanation of bearing capacity.

MWG's qualified professional engineer certified that the structural stability assessment was conducted in accordance with 35 IAC 845.450.

35 IAC 845.460: The safety factor assessment must be conducted initially and annually to determine that the factor of safety has not changed or been compromised. Factor of safety is explained below in detail. The Agency understands that the factor of safety could be changed by a change to the fill material used for the foundations or to support the foundations of the CCRSI.

MWG's qualified professional engineer certified that the safety factor assessment was conducted in accordance with 35 IAC 845.460.

35 IAC 845.700(b): The O/O is required to retrofit or close if the CCRSI is unlined. Retrofit must include a schedule [35 IAC 845.700(h)], retrofit plan [35 IAC 845.770(a)(3)] and construction permit application [35 IAC 845.770].

35 IAC 845.700(h): MWG claimed that the Bypass Basin was a Category 7 CCRSI. The retrofit construction permit application is signed and dated July 15, 2022. The Bypass Basin is a Category 7 CCRSI and was required to provide a retrofit construction permit application or closure construction permit application by August 1, 2023.

35 IAC 845.770(a)(3): MWG submitted their category designation on May 21, 2021, in accordance with this section. They stated that the Bypass Basin is Category 7.

35 IAC 845.770(a)(4): The O/O may request the Agency approve the use of an existing competent liner as a supplemental liner by submitting visual inspection, and analytical testing results to demonstrate that the existing liner is not contaminated with CCR constituents.

MWG has not provided analytical testing results exhibiting that the CCR used as structural fill for the CCRSIs is not leaching 35 IAC 845.600(a) constituents above Class I groundwater quality standards.

35 IAC 845.770(b): The CCRSI undergoing retrofit is subject to all other requirements of this Part, including the requirement to conduct any necessary corrective action. The Agency understands that groundwater corrective action is required for all CCR placed in load bearing support, or rather design and construction to support the integrity, of the CCRSIs.

Engineering background:

Soil classification: Soil classification is the process of describing the soil properties to determine the soil parameters for engineering studies. Soil texture, moisture, Atterberg limits and engineering properties are used to determine the suitability of a soil for design and construction. (Rahn, 1996)

Types of soil classification systems include Unified Soil Classification System (USCS) and American Association of State Highway and Transportation Officials (AASHTO) (Das, 2002). USCS is used generally for geotechnical engineering. AASHTO is generally used for transportation infrastructure. In Illinois, the Illinois Department of Transportation (IDOT) has their own soil classification system based on textural classification similar to Figure 5.1 of Engineering Geology (Rahn, 1996). For the purposes of CCR, USCS is solely used as it is not associated with transportation in Illinois or on the national level (Das, 2002).

Organic soils have separate classification symbols and descriptions under the USCS soil classification system. Peat, which is the geologic precursor to coal, is a highly organic soil that is not suitable for structural fill. (Das, 2002)

Bottom ash, a byproduct of burning coal, while still containing minor amounts of organic materials, is a waste material acceptable for use as structural fill and other types of fill in construction as long as it complies with Section 3.135 of the Act (Das, 2002). Bottom ash is logged as having been used for structural fill in the Bypass Basin embankments (KPRG, 2005).

Soil compaction: According to Engineering Geology: An Environmental Approach by Perry H. Rahn, “compaction in engineering refers to the practice of artificially increasing the density of a soil mass by rolling, tamping, vibrating, or other means.”

Soil consolidation and settlement: According to Rahn, “consolidation is a form of compressibility that occurs under a static load. It usually happens because water is driven out of the voids.”

Settlement is when a load is applied to a soil causing water and air to be forced out of the soil and leaving the soil taking up less space. During the geotechnical evaluation of a site, insitu soils and potential fill materials will be tested for consolidation and potential settlement to determine suitability of the soils for the design. (Rahn, 1996)

Bearing capacity and factor of safety: Bearing capacity is the point at which shear failure occurs under a load. The expanse of soils that share the load are wider than the base of the foundations as depicted by shear failure diagrams (Das, 2002).

The factor of safety is used to calculate the gross allowable load-bearing capacity of foundations. (Das, 2002)

According to 35 IAC 845.460, a qualified professional engineer must certify the safety factor assessment of each CCRSI. The safety factor assessment is recertified every year and requires the qualified engineer to certify that site conditions have not changed causing the factor of safety to have changed to values that are not in accordance with 35 IAC 845.460(a).

Soil compaction testing with hydraulic testing: The soil compacted or consolidated in place must be tested in the geotechnical laboratory by a proctor test (ASTM D 698) or modified proctor compaction test (ASTM D 1557). After laboratory compaction testing, the laboratory sample must be tested for its hydraulic conductivity or permeability (ASTM D 5084). After that the soil compacted in place in the field must be tested at regular intervals, defined in the construction quality assurance plan, using a nuclear compaction gauge or another compaction field testing method. Possible other test methods can be used such as proof rolling, laboratory testing of core samples used in conjunction with field hydraulic conductivity, percolation testing or permeability testing could also be utilized for characterization of soil compaction and hydraulic conductivity. (Das, 2002)

At Powerton, the fill material has been compacted to provide a stable foundation for the CCRSIs. The method of compaction has not been disclosed as soil compaction in lifts or consolidation over time, but was verified by geotechnical testing of core samples from the site, as presented in the 2005 KPRG Geotechnical Summary Report.

Engineering properties used in the structural fill of the CCRSIs: The KPRG Geotechnical Summary Letter dated October 13, 2005 detailed the presence of CCR in the embankments of the Bypass Basin, Ash Surge Basin, Metal Cleaning Basin and Former Ash Basin. A review of the boring logs for PS-GT-05, PS-GT-06, PS-GT-07, PS-GT-08, and PS-GT-09 indicates that CCR was utilized as structural fill on top of the Silty Clay/Clay Unit and remains in place as a part of the foundations of the Former Ash Basin, Bypass Basin, Ash Surge Basin and Metal Cleaning Basin.

In accordance with 35 IAC 845.340, MWG certified that the Former Ash Basin, Ash Surge Basin, Bypass Basin and Metal Cleaning Basin are not located in unstable areas. Consequently, MWG knows that the CCR beneath the Former Ash Basin, Ash Surge Basin, Bypass Basin and Metal Cleaning Basin is stable and had been compacted or consolidated over time to ensure that the CCRSIs were not on unstable areas.

Hydrogeologic and Contaminant Transport Background:

Source characterization and the mass transport equation: Source characterization (“waste characterization” in 35 IAC 845) is the analysis of the source material (waste material) for the purpose of characterizing what constituents are present in the source material and therefore could potentially become a part of the groundwater plume. The mass transport equation is derived from the Law of Mass Conservation. Mass conservation can be synthesized to understanding that total mass in equals total mass out during fluid flow. However, chemical properties can change based on chemical reactions that occur in that mass, which changes the chemical makeup of the output from the total mass with fluid flow through it. (Fetter, 1999)

Source or waste characterization of the CCR utilized as a structural component at Powerton has not been completed adequately at the Powerton Bypass Basin. Adequate sampling and analysis must include more than one or two samples from the CCRSI. In the case of the Bypass Basin, only one sample was collected for the Bypass Basin and the Ash Surge Basin combined. SW846, incorporated by reference in 35 IAC 845, requires sampling rationale to support the number of samples collected and analyzed for characterization. One sample or less than one sample per CCRSI is not adequate for characterization of the CCRSIs given that the total amount of CCR, including CCR used as structural components of the CCRSI, has not been quantified.

MWG was notified in October 2023 that the source characterization currently provided in their permit application for the purpose of implementation of the mass transport equation was inadequate.

Groundwater and Waste Boundary Discussion

The Former Ash Basin, Ash Surge Basin, Bypass Basin and Metal Cleaning Basin were placed on top of the native soils at the Powerton Generating Station. CCR was used as structural fill to raise grade at the site to provide a stable foundation and placement of the CCRSIs.

MWG has wells installed hydraulically downgradient from the CCRSIs or the CCRSI's toe of structural components providing support for the integrity of the CCRSIs. These are MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-10, MW-14, MW-20, and MW-21. The determination of where the Silty Clay/Clay unit terminates before the shoreline. Consequently, the fill sand, CCR used as structural fill, is in partial contact with the Sand and Gravel unit and partial contact with the Silty Clay/Clay unit.

MWG is performing further investigation to delineate interaction between the surface water and groundwater and the upper limit of groundwater in the uppermost aquifer which includes the fill sand connected to the Sand and Gravel unit (underlying the fill sand and the Silty Clay/Clay unit) and the fill sand overlying the Silty Clay/Clay unit.

MWG is monitoring two aquifers, the Sand and Gravel unit and the Silty Clay/Clay unit. The Agency has agreed with MWG that the fill sand (CCR fill materials) overlying the Silty Clay/Clay unit and the Sand and Gravel unit are connected to the Sand and Gravel unit, creating one hydrostatic unit separate from the Silty Clay/Clay unit. Further investigation of the fill sand and interaction with the groundwater and surface water is being conducted as a special condition of the initial operating permit.

MWG provided statistical evaluation of groundwater data from MW-01, MW-09, MW-10, and MW-19 for the Initial Operating Permit Application background constituent values. MW-01 and MW-10 are downgradient wells as documented by MWG in their initial operating permit application documents. MW-09 and MW-19 are installed into the Sand and Gravel unit at Powerton Station. Although MW-09 and MW-19 are installed in the Sand and Gravel unit, the wells were drilled through CCR or fill materials utilized in the stabilization of grade for the CCRSI. The Agency agreed to allow an alternative boron concentration using data from MW-09 and MW-19 until 8 samples of total metals are collected, analyzed and evaluated for all constituents in 35 IAC 845.600(a) at MW-16. MW-16 is the background well as shown in Special Condition 12.

Special conditions provided in the permit will necessitate groundwater corrective measures assessments for groundwater exceedances of any of the constituents listed in 35 IAC 845.600(a).

Groundwater corrective action must be adequate to prevent the contaminant plume from exceeding groundwater protection standards at the waste boundary. The waste boundary may be defined as the vertical hydraulic boundary that coincides with the outer limits of the bearing capacity and factor of safety calculated influence of the CCRSI.

CCRSI Structural Components Discussion

The Former Ash Basin, Ash Surge Basin, Bypass Basin and Metal Cleaning Basin were placed on top of the native soils at the Powerton Generating Station. CCR was used as structural fill to raise grade at the site to provide a stable foundation and placement of the CCRSIs.

The MWG qualified professional engineer certified that the bottom of the Powerton CCRSIs, excluding the Former Ash Basin, were 5 feet above the uppermost aquifer. The MWG qualified professional engineer certified that the CCRSIs, excluding the Former Ash Basin, are not placed in a wetland. The MWG qualified professional engineer certified that the CCRSIs are not placed within 200 feet of a fault area. The MWG qualified professional engineer certified that the CCRSIs are not within seismic impact zones. MWG's qualified professional engineer has certified that the CCRSIs are not located in an unstable area. MWG's qualified professional engineer certified that the CCRSIs, excluding the Former Ash Basin, are not within a floodplain. The MWG qualified professional engineer certified that the Former Ash Basin will be closed in accordance with 35 IAC 845.700.

According to the KPRG 2005 Geotechnical Summary Report, the structural fill material placed on top of the Silty Clay/Clay Unit and load bearing fill supporting the CCRSIs consists of bottom ash and slag, which are CCR. In order to use the CCR as structural fill to support the load of the CCRSIs, the requirements of Section 3.135 of the Act must be met. Section 3.135 requires that screening for leachability and Class I groundwater quality standards must be conducted to allow for use of the CCR as CCB. [35 IAC 845.400(b)(2)(A) and 35 IAC 845.120 "beneficial reuse of CCR" definition]

According to Illinois Pollution Control Board Order dated May 4, 2023 in Case No. AS 21-1, MWG must sample all CCR materials used as structural fill at Joliet 29 Pond 2. The Agency concurs that CCR materials used as structural fill, "structural components", must be characterized for the purpose of complying with Section 3.135 of the Act.

Section 12.0 and 12.2 of the initial operating permit applications for the Former Ash Basin, Ash Surge Basin, Metal Cleaning Basin and Bypass Basin identifies that the liner does not comply with 35 IAC 845.400 and is considered unlined (initial operating permit applications, Section 12.0 and 12.2). All unlined CCRSIs are subject to the retrofit or closure requirements of 35 IAC 845.700.

MWG's qualified professional engineer has certified that the Former Ash Basin, Ash Surge Basin, Metal Cleaning Basin and Bypass Basin are designed, constructed, and inspected regularly to ensure that the slope stability is preserved as designed, constructed, operated and maintained. MWG's qualified professional engineer certified that the structural stability assessment was conducted in accordance with 35 IAC 845.450.

At Powerton, the fill material has been compacted to provide a stable foundation for the CCRSIs. The method of compaction has not been disclosed as soil compaction in lifts or consolidation/settlement over time, but was verified by geotechnical testing of core samples from the site, as presented in the 2005 KPRG Geotechnical Summary Report. MWG also cites a Geosyntec Geotechnical study from 2017 and 2018 in their initial operating permit applications, reiterating that the Former Ash Basin, Ash Surge Basin, Metal Cleaning Basin and Bypass Basin are structurally stable and not in unstable areas.

In accordance with 35 IAC 845.340, MWG certified that the Former Ash Basin, Ash Surge Basin, Bypass Basin and Metal Cleaning Basin are not located in unstable areas. Consequently, MWG knows that the CCR beneath the Former Ash Basin, Ash Surge Basin, Bypass Basin and Metal Cleaning Basin is stable and had been compacted or consolidated over time to ensure that the CCRSIs were not on unstable areas.

Conclusions and Special Conditions

The Agency drafted the Initial Operating Permit for Powerton Generating Station using the aforementioned regulatory and technical decisions.

The Former Ash Basin, Ash Surge Basin, Bypass Basin and Metal Cleaning Basin are located in stable areas with certified stable foundations. The structural components designed and constructed to provide the stable foundation for the CCRSIs includes the fill sand that overlies native silty clay/clay and sand and gravel. The nature of the fill overlying the native soils is CCR and must be characterized for leaching properties in accordance with Section 3.135 of the Act.

The Former Ash Basin, Ash Surge Basin, Bypass Basin and Metal Cleaning Basin waste boundary is at the end of the structural components designed and constructed for the purpose of ensuring the integrity of the Former Ash Basin, Ash Surge Basin, Bypass Basin and Metal Cleaning Basin.

The nature and extent of groundwater in the fill sand, which is an extension of the uppermost aquifer, Sand and Gravel unit, is being investigated as a part of the special conditions set forth in the initial operating permit for Powerton Station.

The following Special Conditions were formulated with the aforementioned regulatory and technical details:

SPECIAL CONDITION 10: Each CCR Surface impoundment must be inspected on an annual basis by a qualified Professional Engineer, in accordance with 35 IAC 845.540. An inspection report must be completed and included with the Annual Consolidated Report, as specified in Special Condition 29.

SPECIAL CONDITION 11: Within 90 days of the effective date of this operating permit, the facility must install and monitor as a part of the groundwater monitoring network at one additional downgradient well, MW-21D, in the Sand and Gravel Unit and two additional down gradient wells, MW-22 and MW-23 in the Silty Clay/Silt Unit. MWG must also install and monitor for groundwater elevations two piezometers in the fill unit, P-1 and P-2, and install and monitor/or surface water elevations one staff gage in the Lost Creek. The piezometers must be installed with 10 feet screens, placed with the bottom of the screen installed at the bottom of the fill sand or top of the native soils.

SPECIAL CONDTION 12: The background wells for the three migration pathways are as follows:

a) Silty Clay/Sill Unit-MW-16.
b) Sand and Gravel Unit- MW16.

SPECIAL CONDITION 13: The downgradient wells for the three migration pathways are as follows:

a) Silty Clay/Silt Unit -MW-06, MW-14, Newly installed well MW-22, Second newly installed well MW-23.
b) Sand and Gravel Unit- MW-01, MW02, MW03, MW04, MW05, MW-07, MW-10, New well installed MW-210.

SPECIAL CONDITION 14: Surface water and groundwater interaction monitoring and sand and gravel aquifer unit groundwater monitoring includes surface water elevations and groundwater elevations collected and reported in accordance with 35 IAC 845.610(e)(3)(C), 35 IAC 845.640(c)(1) and (3), and 35 IAC 845.650(b)(2). The groundwater and surface water elevation monitoring locations are as follows:

a) Surface water-the Illinois River USGS staff gage at Kingston Mines and one new staff gage, installed in the Lost Creek.

b) Groundwater:

1. Fill Sand connected to the Sand and Gravel Unit-two newly installed piezometers, P-1 and P-2.

2. Silty Clay/Silt Unit-MW-06, MW-12, MW-14, MW-15, MW-17, MW-18MW-22, MW-23.

3. Sand and Gravel Unit-MW-01, MW02, MW03, MW04, MW05, MW-07, MW-09, MW-11, MW-16, MW-19MW-21D.

MWG must install the silty clay/sill and sand and gravel unit groundwater monitoring wells, fill unit piezometers and staff gages within 90 days of the issuance of this permit.

After completion of the initial surface water/groundwater interaction investigation, lasting 2 calendar years, the necessity of additional wells to monitor storm water infiltration and flooding recharge will be assessed by MWG. A report for review and approval by the Agency will be provided to the Agency by the end of 2.5 years from the beginning of the groundwater and surface water elevation monitoring.

SPECIAL CONDITION 15: Within 30 days of the effective date of this operating permit, the facility must initiate groundwater sampling and analysis in accordance with 35 IAC Section 845.640 at every well. Compliance with Section 845.640(a) requires the collection and submission of monitoring data during annual reporting of laboratory reports, field documents and records of collection and analysis, and documentation of environmental data compliant with SW 846.

SPECIAL CONDITION 17: Within 30 days of the effective date of this permit, the groundwater monitoring program must be in compliance with 35 IAC 845.650 at all wells.

a. The permitee must analyze each sample for the constituents listed in 845.600(a), calcium and turbidity.

b. When analyzing groundwater quality, the permittee must measure total recoverable metals pursuant to Section 845.640(i).

c. The permittee must collect a minimum of eight independent samples from each background and downgradient well within 550 days of operating permit issuance.

d. After background groundwater monitoring has been completed, the permittee must conduct monitoring pursuant to Section 845.650(b).

SPECIAL CONDITION 18: Within 640 days of the effective date of this permit, the permittee must submit statistical calculations using the method selected in Special Condition 16. As part of this submittal, the applicant must provide a groundwater protection standard for each constituent, the statistical evaluations and calculations including the raw data used, and a description of any assumptions used when calculating the groundwater protection standards.

SPECIAL CONDITION 19: Within 60 days of the effective date of the operating permit, the permittee must provide an analysis of the coal combustion residual located inside the Former Ash Basin, Ash Surge Basin, Metal Cleaning Basin, and Ash Bypass Basin, if any remains and in the embankments of the Former Ash Basin, Ash Surge Basin, Metal Cleaning Basin, and Ash Bypass Basin. The samples must be compliant with the sampling requirements of SW 846 pursuant to 845.230(d)(2)(B).

SPECIAL CONDITION 20: Within 60 days of the effective date of this permit, the permittee must provide an analysis of all waste streams entering or currently at the Former Ash Basin, Ash Surge Basin, Metal Cleaning Basin, and Bypass Basin. Sources that have historically discharged in the Former Ash Basin, Ash Surge Basin, Metal Cleaning Basin, and Bypass Basin include: coal pile runoff, gas side metal cleaning waste, plant drains, yard runoff, roof drains, road runoff. For each of these sources and any other sources not identified, the permittee must provide an analysis of the waste stream compliant

with the sampling requirements of SW 846 pursuant to 845.230(d)(2)(C) or a statement that the identified source is no longer discharging and the approximate date of the last discharge.

SPECIAL CONDITION 21: The groundwater standards at the waste boundary for the Silty Clay/Silt unit are:

Pollutant	**Concentration**
Antimony	0.006 mg/L
Arsenic	0.010 mg/L
Barium	2.0 mg/L
Beryllium	0.04 mg/L
Boron	4.7 mg/L
Cadmium:	0.05 mg/L
Chloride:	200 mg/L
Chromium:	0.1 mg/L
Cobalt:	0.06 mg/L
Fluoride:	4.0 mg/L
Lead:	0.0075 mg/L
Lithium:	0.04 mg/L
Mercury:	0.002 mg/L
Molybdenu	0.1 mg/L
m:	6.5-9.0 units
pH:	0.05 mg/L
Selenium:	400 mg/L
Sulfate:	0.002 mg/L
Thallium:	1200 mg/L
Total Dissolved Solids:	5 pCi/L
Radium 226 and 228 combined:	

If the statistical analysis performed as part of Special Condition 19 determines a groundwater protection standard that is higher than the currently permitted limits, the applicant may submit a permit application modification to modify the above standards. Chloride and pH will only be amended through statistical analysis during permit renewal.

After review and approval of initial background concentrations by the Agency, background concentrations for constituents listed in 35 IAC 845.600(a) will only be evaluated for changes during permit renewal and after implementation and completion of construction permits.

SPECIAL CONDITION 22: The groundwater standards at the waste boundary for the Sand and Gravel unit are:

Pollutant	Concentration
Antimony	0.006 mg/L
Arsenic	0.010 mg/L

Barium	2.0 mg/L
Beryllium	0.004 mg/L
Boron	4.7 mg/L
Cadmium:	0.005 mg/L
Chloride:	200 mg/L
Chromium:	0.1 mg/L
Cobalt:	0.006 mg/L
Fluoride:	4.0 mg/L
Lead:	0.0075 mg/L
Lithium:	0.04 mg/L
Mercury:	0.002 mg/L
Molybdenum:	0.1 mg/L
pH:	6.5-9.0 units
Selenium:	0.05 mg/L
Sulfate:	400 mg/L
Thallium:	0.002 mg/L
Total Dissolved Solids:	1200 mg/L
Radium 226 and 228 combined:	5 pCi/L

If the statistical analysis performed as part of Special Condition 19 determines a groundwater protection standard that is higher than the currently permitted limits, the applicant may submit a permit application modification to modify the above standards. Chloride and pH will only be amended through statistical analysis during permit renewal.

After review and approval of initial background concentrations by the Agency, background concentrations for constituents listed in 35 IAC 845.600(a) will only be evaluated for changes during permit renewal and after implementation and completion of construction permits.

SPECIAL CONDITION 23: Annual consolidated reports must contain the following items in accordance with Section 845.550, 845.500(c), 845.540(b)(3), and 845.610(e):

Fugitive Dust Control Report in accordance with Section 845.500(c);

Annual Inspection Report in accordance with Section 845.540(b)(2);

Groundwater Monitoring and Corrective Action Report in accordance with Section 845.610(e)(3) and (e)(4); documentation in the report must satisfy Section 845.640(a), (b), (c),

SPECIAL CONDITION 25: All groundwater monitoring data and resulting analysis must be submitted to Illinois EPA within 60 days after completion of sampling and must be place into the facility operating record.

SPECIAL CONDITION 26: The permittee shall prepare an Annual Groundwater Monitoring and Corrective Action Report each year. The Annual Groundwater Monitoring and Corrective Action Report shall be submitted to Illinois EPA as part of the Annual Consolidated Report required in Special Condition 24, and must be placed into the facility operating record. The annual report shall include at a minimum and to the extent available:

a. A map, aerial image, or diagram showing the CCR surface impoundment, all background (or upgradient) and downgradient monitoring wells, including the well identification numbers, that are part of the groundwater monitoring program for the CCR surface impoundment, and a visual delineation of any exceedances of the groundwater protection standards;

b. Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;

c. A potentiometric surface map of each monitored groundwater migration pathway unit (Fill Unit, Silty/Clay-Silt Unit and Sand and Gravel Unit) for each groundwater elevation sampling event required by Section 845.650(b)(2);

d. Monitoring data must include analytical results, documentation of field sampling procedures, and laboratory reports in accordance with 35 IAC 845.640(a).

e. An assessment of corrective measures, corrective action plans, interim corrective measures and any other corrective action measures conducted during the year must be summarized and/or documented in the submission of the annual groundwater monitoring and corrective action report in accordance with 35 IAC 845.610(e) and 35 IAC 845.550(3).

f. In addition to all the monitoring data obtained in the year, a summary including the number of groundwater samples that were collected for analysis for each Illinois EPA approved background and downgradient well, and the dates the samples were collected;

g. In accordance with 35 IAC 845.610(e), a narrative discussion of any statistically significant increases over background levels for the constituents listed in Section 845.600. Any statistically significant increases over background concentrations for one or more constituents listed in 35 IAC 845.600 must be identified and summarized or documented in accordance with 35 IAC 845.610(e)(4). Corrective action assessments, planning, and actions must be documented in accordance with 35 IAC 845.610(e); and

h. All other information required to be included in the annual report as specified in 35 IAC 845 Subpart F.

SPECIAL CONDTION 27: The Annual Consolidated report each calendar year shall be submitted to the Illinois EPA by January 31 of the following year and placed into the facility operating record. The Annual Consolidated Report shall consist of the following:

a. The Annual CCR fugitive dust control report.

b. The Annual Inspection Report, which may include:

1. Annual Hazard potential certification, if applicable.

2. Annual structural stability assessment certification, if applicable.

3. Annual Safety factor assessment certification, if applicable.

4. Inflow design flood control system certification, if applicable.

c. The Annual Groundwater Monitoring and Corrective Action Report.

SPECIAL CONDITION 28: All certifications, logs, reports, plan sheets, notices, and groundwater and leachate monitoring data required to be submitted to the Illinois EPA by the permittee shall be mailed to the following address:

Illinois Environmental Protection Agency
Compliance Assurance Section
Bureau of Water
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

Information submittals transmitted by FedEX or UPS shall be mailed to the following address:

Illinois Environmental Protection Agency
Compliance Assurance Section
Bureau of Water
1021 North Grand Avenue East
Springfield, Illinois 62702

Electronic groundwater monitoring data shall be emailed to Illinois EPA at the following email address: EPA.BOW.GWS.CCR@illinois.gov

Except for electronic groundwater and leachate monitoring data, the operator shall provide the Illinois EPA with the original and two (2) copies of all certifications, logs, reports, and plan sheets required by this permit.

Works Cited

Das, Braja M. *Principles of Foundation Engineering*. Sixth Edition. Nelson, a division of Thomson Canada Limited. 2007.

Das, Braja M. *Principles of Geotechnical Engineering*. Fifth Edition. Wadsworth Group, a division of Thomson Learning. 2002.

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Midwest Generation with KPRG. Initial Operating Permit Application for the Bypass Basin, Ash Surge Basin and Former Ash Basin. Powerton Generating Station. Submitted October 29, 2021.

Midwest Generation with KPRG. Initial Operating Permit Application for the Metal Cleaning Basin. Powerton Generating Station. Submitted October 29, 2021.

Midwest Generation with Sargent and Lundy. Bypass Basin Retrofit Construction Permit Application. Powerton Generating Station. Submitted July 15, 2022.

Rahn, Perry H. *Engineering Geology: An Environmental Approach*. Second Edition. Prentice Hall PTR. 1996.

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DOCUMENT 39

Thomas Dehlin, P.E.
Manager / Consultant (Licensed in IL, KY, and WY)
(312) 269-6373
tdehlin@sargentlundy.com

Letter No. 12661-181-SL-IEPA-0003
April 19, 2024
Project No. File No. 12661-181

Re: Revised Technical Specifications for Bypass Basin Retrofit Project

Mr. Mark Liska
Illinois EPA, Bureau of Water
1021 North Grand Avenue East
Springfield, IL 62702

Submitted via email to Mark.Liska@Illinois.gov

Dear Mr. Liska:

On behalf of Midwest Generation, LLC (MWG), Sargent & Lundy is submitting revised technical specifications for the Bypass Basin Retrofit Project at the Powerton Generating Station ("Powerton") in Pekin, IL. These revised documents are being submitted in accordance with proposed Special Condition 12 in Draft CCR Permit No. 2024-CC-100030 for retrofitting the Bypass Basin.

The technical specifications for the Bypass Basin Retrofit Project have been revised to reflect the changes made to MWG's procurement strategy since the initial retrofit construction permit application was submitted in July 2022. As noted on the design drawings submitted on April 5, 2024 (12661-181-SL-IEPA-0002), the retrofit work will be performed as follows:

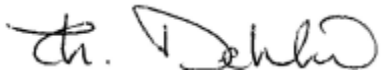
- Earthwork will be performed in accordance with Specification P-1400.
- All construction quality assurance (CQA) work will be performed in accordance with Specification P-1401.
- Composite liner and drainage geocomposite materials will be furnished and installed in accordance with Specification P-1402.

Following the Agency's review of these updated documents, we kindly request Illinois EPA (1) provide written approval of the revised technical specifications and (2) incorporate these revised documents into Special Condition 12 of the final retrofit construction permit issued by Illinois EPA for the Bypass Basin.

We appreciate Illinois EPA's feedback and support on the Bypass Basin Retrofit Project, and we look forward to continuing to work with the Agency on this matter.

Please do not hesitate to contact me directly at (312) 269-6373 or via email at tdehlin@sargentlundy.com if you have any questions on MWG's plans for retrofitting Powerton's Bypass Basin.

Best Regards,



Thomas Dehlin, P.E.
Manager / Consultant

Enclosures:

1. Specification P-1400 (Rev. 0)
2. Specification P-1401 (Rev. 0)
3. Specification P-1402 (Rev. 1)

Copies Furnished (via Email):

1. Lauren Hunt, Illinois EPA
2. Darin LeCrone, Illinois EPA
3. EPA.CCR.Part845.Coordinator@Illinois.gov
4. Sharene Shealey, MWG
5. Jill Buckley, MWG
6. Todd Mundorf, MWG

DOCUMENT 40

MWG

Midwest Generation, LLC

POWERTON GENERATING STATION

SPECIFICATION P-1400

EARTHWORK FOR BYPASS BASIN RETROFIT

S&L PROJECT NO.: 12661-181

REVISION 0

ISSUE PURPOSE: BIDS

ISSUE DATE: 04-19-2024

Sargent & Lundy

Midwest Generation, LLC
Powerton Generating Station
Project No. 12661-181
Issue Summary and Approval Page

Specification P-1400
Rev. 0
Issue: Bids
Date: 04-19-2024

SECTION 000106

ISSUE SUMMARY AND APPROVAL PAGE

Rev.	Purpose of Issue	Date	Sections Affected
0	Bids	04-19-2024	All

This is to confirm that this Specification has been prepared, reviewed, and approved in accordance with Sargent & Lundy's Standard Operating Procedure SOP-0407, Specifications and Bills of Materials, which is part of our Quality Management System.

Contributor Summary & Current Revision Signatures

Rev.	Prepared By	Reviewed By	Approved By
0	Aimee Sahlas A. Sahlas	Digitally signed by Thomas Dehlin Date: 2024.04.19 14:59:58-05'00' T. Dehlin	Digitally signed by Thomas Dehlin Date: 2024.04.19 15:00:09-05'00' T. Dehlin

Midwest Generation, LLC
Powerton Generating Station
Project No. 12661-181
Certification Page

Specification P-1400
Rev. 0
Issue: Bids
Date: 04-19-2024

SECTION 000107

CERTIFICATION PAGE

Sargent & Lundy (S&L) is registered in the State of Illinois to practice engineering. S&L's Illinois Department of Financial and Professional Regulation registration number is 184-000106.

I certify that this Specification was prepared by me or under my direct supervision and that I am a registered professional engineer under the laws of the State of Illinois.

Certified By: Thomas J. Dehlin Date: April 19, 2024

Seal:



Digitally signed by Thomas Dehlin
Date: 2024.04.19 15:00:22-05'00'



SECTION 000110

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DIVISION 31 - EARTHWORK

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ATTACHMENTS

Attachment 1	Design Drawings
Attachment 2	Reference Drawings
Attachment 3	2016 Structural Stability & Factor of Safety Assessment

END OF SECTION 000110

SECTION 011100

SUMMARY OF WORK

PART 1 - GENERAL

101. PROJECT INFORMATION

101.1 Owner: Midwest Generation, LLC (MWG)

101.2 Design Engineer: Sargent & Lundy (S&L)

101.3 Project Name: Bypass Basin Retrofit

101.4 Project Location: Powerton Generating Station
13082 E. Manito Rd.
Pekin, IL 61554

102. DESCRIPTION OF THE PROJECT AND GENERAL BACKGROUND

102.1 The purpose of this project is to retrofit the Bypass Basin at Midwest Generation, LLC's Powerton Generating Station in accordance with the Illinois Pollution Control Board's Coal Combustion Residuals (CCR) Rule, 35 Ill. Adm. Code Part 845, and with the U.S. Environmental Protection Agency's (EPA) CCR Rule, 40 CFR Part 257 Subpart D.

102.2 The Bypass Basin will be retrofitted by removing all CCR and CCR-mixed materials stored in the basin and decontaminating the basin's existing geomembrane liner and appurtenant structures, which will remain in place. Following removal of CCR and CCR-mixed material from the basin and decontamination of the basin facilities remaining in-place, a new composite liner system and new leachate collection and removal system (LCRS) will be installed within the Bypass Basin over the basin's existing decontaminated and leak-tested geomembrane liner.

103. SCOPE OF WORK

103.1 In general, this Specification covers the technical requirements for an Earthwork Contractor to perform all earthwork and sitework required to retrofit the Bypass Basin. The Work includes the following activities:

a. Furnishing and installing temporary sediment and erosion control best management practices (BMPs) prior to and during all phases of earth disturbance work.

b. Onsite unloading and storage of rolls of geosynthetic clay liner (GCL), high-density polyethylene (HDPE) geomembrane liner, and drainage geocomposite delivered to the project site by the respective manufacturers.

c. Retrofitting the Bypass Basin by:

c1. Ensuring all appropriate measures are taken to protect the Bypass Basin's existing HDPE geomembrane liner system from damage.

c2. Placing, compacting, and grading Structural Fill to establish the lines and grades for the basin's LCRS as specified on the Design Drawings.

c3. Installing a new LCRS over the new composite liner system. The LCRS consists of drainage geocomposite – an HDPE geonet core with a non-woven geotextile layer heat-laminated to each side of the geonet (to be installed by Others) – over a perforated

leachate collection pipe, a perforated sump pipe, pipe bedding material, and a solid wall riser pipe.

c4. Installing a Sand Filter Layer above the drainage geocomposite.

c5. Installing a Protective Warning Layer above the Sand Filter Layer on the basin floor.

c6. Installing riprap on a gravel bedding layer above the Sand Filter Layer along the basin's side slopes to protect the Sand Filter Layer from erosion.

d. Restoring and cleaning the project site.

e. Earthwork Contractor shall allow access to all work areas by Owner, Design Engineer, Geosynthetics Contractor, CQA Contractor staff, and other parties as approved by Owner. Earthwork Contractor shall not install, modify, repair or work on any elements of the project that are subject to the CQA testing and inspection services without notifying the CQA firm at least 2 work days in advance. Work on weekends or holidays shall be scheduled as soon as possible with the CQA Contractor. Failure to provide CQA Contractor adequate advanced notice to staff the site shall result in a hold on work until the CQA contractor staff arrive on site.

f. Developing fueling and maintenance facilities and practices to protect the project site from hydrocarbon spills or other environmental impacts that may impact the project site, adjacent property, or the Illinois River and connected waterways.

103.2 In addition, the Work shall include but not be limited to the following:

a. Engineering and construction services required to perform or install the Work.

b. Surveying to ensure the Work is located as indicated on the Design Drawings.

c. Furnishing all installation equipment and tools including any calibrated instruments required for monitoring and testing.

d. Maintaining the project site in a dry condition that includes dewatering of all areas that collect storm water or groundwater in the area controlled by the Earthwork Contractor, redirecting any surface water as a result of rainfall or water generated by the installation Work. Any groundwater and/or surface water which requires removal from the area of work shall be disposed of in compliance with the Powerton Generating Station's National Pollutant Discharge Elimination System (NPDES) discharge permit in effect at the time of the Work. The methods and proposed place of discharge shall be approved by the Owner prior to disposing of the water.

e. Excess excavated material and other construction related debris shall be disposed of offsite in a permitted landfill approved by the Owner.

f. Maintaining a record of the installation (i.e., as-built drawings) in accordance with the technical requirements of this Specification.

g. Furnishing the services of qualified personnel at the project site to perform the Work.

h. Progress reporting as specified in the Commercial Terms and Conditions.

i. Daily site cleanup and disposal of waste and debris.

j. Participation in the Owner's on-site safety program, including the Owner's CCR Safety and Health Plan Training.

103.3 The Work shall conform to the requirements of this Specification and shall be performed and supervised by personnel who are experienced and knowledgeable in the crafts and trades required by the Scope of Work. The Work shall be performed exclusively by the Earthwork Contractor's trained and competent personnel or, where permitted, that of its subcontractor(s); and shall comply with all applicable safety laws, regulations, programs, and practices to ensure the safety of all people located on the work site, including the Contractor's personnel (or that of its subcontractor(s)) performing the Work.

103.4 Performance of the Work shall include all the labor, supervision, administration, management, material procurement, tools, installation and testing equipment, miscellaneous material, and consumables to perform the Work specified herein.

103.5 Provide all installation equipment and all incidental items not shown or specified but reasonably implied for successful completion of the Work and in strict accordance with Design Drawings and this Specification, including inspection, testing and quality standards.

103.6 Provide installation quality assurance and quality control submittals where required.

103.7 Prepare red-lined as-built drawings for review upon completion of the Work to document any variances between the construction issue of the Design Drawings and the actual installation. Finalize as-built drawings after the Owner and the Design Engineer review.

103.8 All other work, as indicated on the Design Drawings, as specified herein or as required to properly complete the Work.

104. DIVISION OF RESPONSIBILITY & CONTRACTOR QUALIFICATIONS

104.1 Owner:

a. MWG is the Owner of the facility and has the authority to accept or reject materials and workmanship of the Earthwork Contractor or reports and recommendations of the CQA Contractor.

b. The Owner will ultimately be responsible for the retrofit construction for the Bypass Basin and for assuring the Permitting Authority that the construction meets or exceeds the requirements specified in state regulations, permits, Project Specifications, and the Design Drawings.

104.2 Design Engineer:

a. S&L is the Design Engineer and is responsible for designing the retrofitted features for the Bypass Basin.

b. The Design Engineer will ensure that the retrofit design meets the construction requirements of the Owner and meets or exceeds the requirements of the Permitting Authority.

c. The Design Engineer shall resolve unexpected conditions or unanticipated problems during construction, which may require changes to the permitted design. Changes to the permitted design shall require approval of the Owner and Design Engineer to ensure that the original design objectives are still maintained. All changes shall meet state regulatory requirements and the rules promulgated thereunder and may include Permitting Authority-approved variances to the rules.

104.3 Permitting Authority:

a. The Illinois EPA is the Permitting Authority and is responsible for reviewing the permit application for retrofitting the Bypass Basin to assure compliance with state regulations and for granting the construction permit for the project.

b. The Permitting Authority may review any design revisions during construction and any requests for variance submitted by the Owner. The Permitting Authority has the authority to review and approve all CQA documentation and reports and to confirm the Bypass Basin was retrofitted as specified in Project Specifications and the Design Drawings.

104.4 Earthwork Contractor:

a. The Earthwork Contractor is the contractor responsible for:

a1. Earthwork and sitework.

a2. Placement of fill material to support the basin's new composite liner system and to establish the lines and grades of the basin's new LCRS.

a3. Excavation and backfill of crest anchor trenches.

a4. Placement of bedding material around and installation of the leachate collection pipe.

a5. Installation of the granular materials above the basin's new LCRS.

104.5 Geosynthetics Contractor:

a. The Geosynthetics Contractor is the contractor responsible for the installation of all geosynthetic materials for the project, including geosynthetic clay liner (GCL), high-density polyethylene (HDPE) geomembrane, drainage geocomposite, and non-woven geotextile all in accordance with the Design Drawings and Specification P-1402.

104.6 Construction Quality Assurance (CQA) Contractor:

a. The CQA Contractor is the firm with whom the Owner establishes a contract to perform all CQA work as specified on the Design Drawings and in Specification P-1401.

b. The CQA Contractor is independent of the GW Contractor and their subcontractors.

105. MATERIAL AND SERVICES FURNISHED BY OTHERS

105.1 The following work has been, or will be, performed and/or provided by Others:

a. Initial dewatering of the Bypass Basin. The Earthwork Contractor shall be responsible for dewatering the basin as necessary after the Earthwork Contractor mobilizes to the site.

b. Removing all CCR, gravel, and sand above the basin's existing geomembrane liner.

c. Decontaminating the basin's existing geomembrane liner and appurtenant structures, including conducting and documenting visual inspections and analytical testing to demonstrate the existing liner is no longer contaminated with CCR constituents.

d. Construction Quality Assurance services as detailed in Specification P-1401 will be procured by the Owner.

e. GCL materials will be supplied and installed by the Geosynthetics Contractor hired by the Owner in accordance with Specification P-1402.

f. HDPE geomembrane and drainage geocomposite materials will be supplied and installed by the Geosynthetics Contractor hired by the Owner in accordance with Specification P-1402.

106. DEFINITIONS

106.1 The term "Design Drawing" means the Design Engineer's drawings indicating the Work to be performed.

106.2 The term “Project Specifications” means the technical specifications issued by the Design Engineer that define minimum material, installation, and/or testing requirements for the Work. Project Specifications include this Specification and the CQA Specification (P-1401), and the Geosynthetic Contractor Specification (P-1402).

106.3 The term "Work" means the material and services furnished to retrofit the Bypass Basin as identified on the Design Drawings and as specified herein.

106.4 The term "Owner-approved equal" means an acceptable equivalent to a specified material that has been accepted by the Owner.

107. INTENT OF DOCUMENTS

107.1 The Contract Documents are complementary, and what is called for by any one shall be as binding as if called for by all. The intention of the documents is to include all labor, material, equipment, and transportation necessary for the proper execution of the Work.

107.2 Discrepancies between the Design Drawings and this Specification, or errors or omissions, ambiguities, or mis-description in either the Design Drawings or in this Specification, shall be referred to the Design Engineer for interpretation and adjustment prior to beginning the Work. Do not proceed without the Design Engineer’s written acceptance.

108. PERFORMANCE OF THE WORK

108.1 The Earthwork Contractor shall provide materials and employ construction practices that are sustainable to the greatest extent possible, including disposal of waste.

108.2 The Earthwork Contractor shall provide a representative that will input and provide daily force reports and daily production reports.

108.3 The performance of the Work, as specified herein and as indicated on the Design Drawings, shall comply with the current safety and health standards authorized by the U.S. Department of Labor's Occupational Safety and Health Administration, as well as state and local jurisdictional requirements.

108.4 The Earthwork Contractor shall take all appropriate precautions to ensure the safety of all people working on site.

108.5 The Earthwork Contractor shall maintain the necessary skilled and qualified labor force for the Work to ensure the on-time completion of the Work.

108.6 The Earthwork Contractor's personnel shall be competent, capable, qualified, and able to perform the duties required to the satisfaction of the Owner. A supervisor vested with authority to make decisions binding on the Earthwork Contractor shall be assigned to the task to resolve installation problems as they arise so as not to delay completion of the Work.

108.7 The Earthwork Contractor shall be solely responsible for advising the Design Engineer in

writing of any conflicts between this Specification and the Design Drawings and the Earthwork Contractor's drawings, including performance and levels of quality. The Contractor agrees that its obligations, liabilities, and warranties shall not be diminished or extinguished due to its meeting the requirements of this Specification and the Design Drawings.

109. REGULATORY REQUIREMENTS

109.1 The Earthwork Contractor shall at all times be solely responsible for complying with all applicable laws, ordinances, regulations, and codes, including those relating to safety of all persons, in connection with the Work. No obligation of the Owner or Design Engineer shall impose upon them any duty to review the Earthwork Contractor's compliance with safety measures.

110. PROTECTION OF PROPERTY AND PERSONNEL SAFETY

110.1 The Earthwork Contractor shall take adequate precautions to protect existing structures, fences, pavements, aboveground utilities and underground utilities and to avoid damage thereto. The Earthwork Contractor shall, at its own expense, repair any damage caused by its operations.

110.2 The Earthwork Contractor shall conduct safety training of all its personnel (including any subcontractors) in accordance with the Owner's safety requirements, including the Owner's CCR Safety and Health Plan.

110.3 The Earthwork Contractor shall take adequate precautions to protect the Illinois River, other waterways, and adjacent properties from environmental damage.

111. CLEAN-UP AND DISPOSAL OF DEBRIS

111.1 The Contractor shall be responsible for clean-up and disposal of all debris resulting from the installation work. All excess excavated material and other construction related debris shall be properly disposed of (i.e., in an environmentally responsible way) offsite in a permitted landfill approved by the Owner.

111.2 Clean up, disposal, and site restoration, if required, shall be in compliance with the applicable requirements of all access permits. If any additional permits are required for disposal of debris, these shall be the responsibility of the Earthwork Contractor.

111.3 Work areas shall be kept clean and orderly at all times with as little disturbance as possible to existing conditions. Upon completion of work at each site, all tools, equipment, material, and debris shall be completely removed and the area left in a clean condition.

112. EXISTING SITE CONDITIONS

112.1 Prior to performing any Work in any part of the project site, the Earthwork Contractor shall make a thorough field check for the purposes of verifying existing conditions that may affect the Work. The Earthwork Contractor shall include a thorough investigation of the potential interferences and difficulties that it may encounter in the proper and complete execution of the Work, including the field location and identification of underground and overhead utilities within and adjacent to the limits of the Work. The Earthwork Contractor shall advise the Owner immediately of the discovery of any conditions, including the existence of underground and overhead utilities that may affect the timely and safe execution of the Work.

112.2 The Earthwork Contractor shall be responsible for location of underground utilities and obstructions prior to performance of the Work and shall promptly notify Owner of any potential interferences that may impact performance of the Work. Modifications to the design to resolve these interferences shall not be implemented until approved by the Owner.

112.3 The Earthwork Contractor further acknowledges that it has satisfied itself as to the character, quality and quantity of surface and subsurface material and obstacles, including underground or embedded utilities, to be encountered insofar as this information is reasonably ascertainable from:

a. An inspection of the site (including field location and identification of underground utilities).

b. Reference drawings made available by the Owner.

c. Drawings and specifications that are a part of the Contract.

d. The character and extent of existing work within or adjacent thereto.

e. Any other work being performed thereon at the time of the submission of bids.

112.4 Should the Earthwork Contractor fail to perform any of the obligations set forth above, the Earthwork Contractor's later plea of ignorance of existing or foreseeable conditions which create difficulties or hindrances in the execution of the Work will not be considered as an excuse for any failure on the part of the Earthwork Contractor to fulfill in every detail the requirements of the Contract nor will such a plea be acceptable as the basis of a claim for additional compensation or time to complete the work.

113. VERIFICATION OF DIMENSIONS ON DRAWINGS AND MEASUREMENTS AT SITE

113.1 The Earthwork Contractor shall make a thorough field check for the purpose of verifying existing conditions that may affect the Work, such as existing topographic data shown on the Design Drawings, difficulties that might be encountered in the execution of the Work for any reason, and dimensions and other questions relating to interconnection of the Work with the existing ash basin construction.

113.2 The Earthwork Contractor shall satisfy itself as to the accuracy of the dimensions of the existing ash basin construction as such dimensions relate to the dimensions given on any drawing issued by the Design Engineer. It shall be understood that neither the Design Engineer nor the Owner guarantee the exactness of such dimensions.

113.3 Should the Earthwork Contractor discover any variation in the dimensions of existing conditions and the dimensions given on any drawings issued by the Design Engineer, the Earthwork Contractor shall give immediate notice thereof to the Owner and the Earthwork Contractor shall not proceed with the Work until such variation is resolved.

114. SOIL DATA

114.1 A structural stability and factor of safety assessment for the Bypass Basin was prepared in October 2016. Site specific soil data and geotechnical recommendations are provided and referenced therein. The geotechnical information in and referenced by this assessment indicates the general character of the subsurface conditions at the site. This information is made available for the Earthwork Contractor's information and for interpretation of soil and water conditions that may be encountered at the site. The logs and test data that are provided are not to be taken as a complete description of the site soil and water information, but only display what was found in borings at the indicated

locations. The Owner and the Design Engineer take no responsibility for the accuracy of this information.

114.2 The Earthwork Contractor may obtain additional subsurface information, as it deems necessary, for installation purposes.

115. LINES AND GRADES

115.1 The Earthwork Contractor shall use the existing benchmarks established at the site, as identified on the survey drawings included in the reference documents for the project, to lay out lines and grades on the project site. The Earthwork Contractor is fully responsible for the correctness of such lines and grades and for proper execution of work to such lines and grades.

115.2 The Owner reserves the right to verify correctness of lines and grades during progress of the Work. Such verification by the Owner will not relieve the Earthwork Contractor of responsibility as herein specified.

115.3 The Earthwork Contractor shall preserve and maintain existing benchmarks and reference points established at the project site. Should the Earthwork Contractor, during execution of the Work, destroy or remove any existing benchmark or reference point, the cost to the Owner for re-establishing the benchmark or reference point will be charged to the Earthwork Contractor.

116. CONTROL AND CHARGE OF CONTRACTOR'S WORK

116.1 The Design Engineer shall have no authority to stop the Work by the Earthwork Contractor for any reason.

116.2 The Earthwork Contractor shall be responsible for the safety of its employees and subcontractors and for maintaining the safety of the job site.

116.3 The Earthwork Contractor shall be solely responsible for construction means, methods, techniques, sequences, and procedures used in the construction of the Work. The Owner, however, reserves the right to request, and the Contractor shall supply, detailed information regarding the Work such as procedures or work methods.

116.4 Only the Owner (or its authorized representative) has the authority to stop the Work (in accordance with the Commercial Terms and Conditions) if such Work is determined to be not in accordance with this Specification, the Design Drawings, or the Contract documents.

117. DESIGN DRAWINGS

117.1 The Design Drawings prepared by the Design Engineer indicate the physical dimensions of the Work to be installed as defined by the Scope of Work and form a part hereof.

117.2 Refer to Attachment 1 for a list of the applicable Design Drawings for this project.

118. REFERENCE DOCUMENTS

118.1 The reference documents assembled by the Design Engineer are for information only.

118.2 Refer to Attachments 2 and 3 for applicable reference documents for this project.

END OF SECTION 011100

SECTION 311010

TEMPORARY SEDIMENT CONTROL DURING CONSTRUCTION

PART 1 - GENERAL

101. EXTENT

101.1 This section defines the minimum material and installation requirements for temporary sediment control throughout retrofit construction for the Bypass Basin at the Powerton Generating Station.

101.2 The Work shall include, but not be limited to, the following items:

a. Furnishing all materials.

b. Installation of self-supporting silt fence.

c. Cleaning and maintenance of silt fence.

d. Installation of straw wattles.

e. Cleaning and maintenance of straw wattles.

f. Installation of straw bale barriers.

g. Cleaning and maintenance of straw bale barriers.

h. Final cleanup and removal of all temporary facilities.

101.3 Requirements for Sediment Control:

a. The Earthwork Contractor shall be responsible for control of sediment throughout retrofit construction for the Bypass Basin.

b. Temporary sediment and erosion control facilities shall be installed where specified on the Design Drawings, as indicated in (and to ensure compliance with) the project's Stormwater Pollution Prevention Plan (SWPPP), where instructed by the Owner's on-site representative, and/or where needed to control sediment in accordance with federal, state, and local regulations.

102. RELATED WORK SPECIFIED IN OTHER SECTIONS AND SPECIFICATIONS

102.1 The work specified in this section shall be coordinated with work specified in the following related sections and specifications:

a. Earthwork Specification (P-1400):

a1. Section 319005 – Earthwork.

b. CQA Specification (P-1401):

b1. Section 014362 – Quality Assurance for Fill, Liner, and Leachate Collection Materials.

103. REFERENCE DOCUMENTS

103.1 Standards, specifications, manuals, codes and other publications of nationally recognized organizations and associations are referenced herein. Methods, equipment, and

materials specified herein shall comply with the specified and applicable portions of the referenced documents, in addition to federal, state, or local agencies having jurisdiction.

103.2 References to these documents are to the latest issue date of each document, unless otherwise indicated, together with the latest additions, addenda, amendments, supplements, etc., thereto, in effect as of the date of Contract for the Work.

103.3 Abbreviations listed indicate the form used to identify the reference documents herein.

103.4 FHWA – Federal Highway Administration:

a. FHWA Geosynthetic Design and Construction Guidelines, Report No. FHWA-HI-95-038.

103.5 AASHTO – American Association of State Highway and Transportation Officials:

a. M288 Standard Specification for Geotextile Specification for Highway Applications.

104. SUBMITTALS

104.1 The Earthwork Contractor shall submit the following data. The Earthwork Contractor's drawings and data shall be submitted via electronic medium in a format compatible for importing into the Project Owners' information systems specified by the Owner.

104.2 Data shall be submitted a minimum of 30 days prior to installation.

104.3 Submittals During Construction:

a. Material certificate(s) signed by the manufacturer of the silt fencing stating:

a1. Name of manufacturer.

a2. Chemical composition of filaments or yarns used for the geotextile.

a3. Specification sheet describing the geotextile.

a4. Other information required to fully describe the product.

a5. Guarantee stating that the furnished geotextile meets the requirements specified herein and on the Design Drawings.

b. Material certificate signed by the manufacturer of prefabricated silt fences stating:

b1. Manufacturer's catalog data.

b2. Manufacturer's installation instructions.

b3. Manufacturer's preventive maintenance instructions.

b4. Manufacturer's inspection instructions.

105. QUALITY ASSURANCE

105.1 Materials and construction procedures shall be subject to inspection and testing by the CQA Contractor employed the Owner. Such inspections and tests will not relieve the Earthwork Contractor of responsibility for providing and installing materials in compliance with specified requirements.

105.2 The Owner reserves the right, at any time before final acceptance, to reject materials and workmanship not complying with specified requirements. The Earthwork Contractor shall

correct the deficiencies which the inspections and tests have indicated are not in compliance with specified requirements.

105.3 CQA activities shall be performed as described herein and in Specification P-1401.

PART 2 - PRODUCTS

201. MATERIALS FOR GEOTEXTILE SILT FENCES

201.1 Silt fences shall be classified as "Self-Supporting Silt Fences" pursuant to AASHTO M288 and/or the FHWA.

201.2 Additional material requirements for silt fences are provided on the Design Drawings.

201.3 The geotextile manufacturer shall be responsible for establishing and maintaining a quality control program to assure compliance with the requirements of this Specification and of the Design Drawings.

202. ACCEPTABLE SILT FENCE PRODUCTS

202.1 Self-Supporting Geotextile Fence Materials:

a. The following self-supporting geotextile fence materials meet the requirements of this Specification and are acceptable for use:

a1. Typar 3301 – Woven Slit-Film Polypropylene.

a2. Thrace-Linq GTF-180SF – Woven Slit-Film Polypropylene.

a3. Carthage Mills FX – Woven Slit-Film Polypropylene.

a4. Propex, Inc. Geotex 2130 – Woven Slit-Film Polypropylene.

a5. Owner-approved equal.

202.2 Packaging, Identification Requirements, and Storage:

a. Deliver geotextile to the project site in rolls, each wrapped securely with a heavy duty protective covering. The protective covering shall bar the entrance of water, vermin, and dirt and shall be adequate for protection against ultraviolet exposure.

b. Attach or adhere a tag to each geotextile roll identifying the following:

b1. Manufacturer and product name and number.

b2. Date of manufacture of the geotextile.

b3. Roll identification number.

b4. Earthwork Contractor's order number (matching Bill of Lading).

c. Verify that manufacturer includes a label on the inside of the roll core indicating the manufacturer's name, product name, and roll identification number.

d. During periods of shipment and storage, the fabric shall be protected from temperatures greater than 140°F. To the extent possible, the fabric shall remain wrapped in the protective covering until ready for use.

e. Stakes shall be packaged separately from geotextiles.

202.3 Silt Fence Fabrication:

a. Silt fences shall be fabricated as specified on the Design Drawings.

202.4 Line Posts for Silt Fence:

a. Line posts may be steel posts or wooden posts as specified on the Design Drawings.

203. MATERIALS FOR STRAW WATTLES

203.1 Straw Wattles:

a. Straw wattles shall be tube-shaped erosion-control devices filled with straw and wrapped with biodegradable netting.

b. Straw wattle dimensions shall be as specified on the Design Drawings.

203.2 Stakes for Straw Wattles:

a. Wooden stakes shall be used for anchor straw wattles.

b. Wooden stakes shall be, at a minimum 1" by 1" square and at least 1'-6" long with pointed ends.

c. Wooden stakes shall be free from decay, splits, or cracks longer than the thickness of the stake, or other defects that would weaken the stakes and cause the stakes to be structurally unsuitable.

204. MATERIALS FOR STRAW BALE BARRIERS

204.1 Straw Bales:

a. Straw bale barriers shall be erosion-control devices made of baled straw bound with wire or nylon bands.

b. Straw bale barriers shall be approximately 14-inches wide by 18-inches high by 36-inches long and have a minimum weight of 50 pounds.

c. Straw bales shall be bound by steel wire, nylon, or polypropylene string placed horizontally. Jute and cotton binding shall not be used. Baling wire shall be 14 gauge minimum. Nylon or polypropylene string shall be approximately 12 gauge with a breaking strength of 80 pounds.

204.2 Stakes for Straw Bales:

a. Stakes for anchoring straw bales shall be wooden stakes.

b. Wooden stakes shall be commercial quality oak or other hardwood and, at a minimum, be 2" by 2" square and at least 3'-0" long with pointed ends.

c. Wooden stakes shall be free from decay, splits, or cracks longer than the thickness of the stake, or other defects that would weaken the stakes and cause the stakes to be structurally unsuitable.

PART 3 - EXECUTION

301. GEOTEXTILE SILT FENCING

301.1 Locations:

a. The following are location guidelines for installing silt fences in addition to the locations specified on the Design Drawings:

a1. No further than 10 feet from the toes of slopes or the ends of large graded areas.

a2. At least 3 feet from the toe of a slope. Where this minimum setback distance is determined to be not practicable due to specific site conditions, the silt fence may be constructed at the toe of the slope, but should be constructed as far from the toe of the slope as practicable. Silt fences close to the toe of the slope will be less effective and difficult to maintain.

a3. On the upstream edge of the bank of a natural drainage course traversing the property.

301.2 Silt Fence Construction:

a. Silt fences shall be installed as specified on the Design Drawings.

301.3 Silt Fence Maintenance:

a. After installation, the Earthwork Contractor shall be responsible for satisfactorily maintaining the silt fence until it is no longer required.

b. The Earthwork Contractor shall inspect the silt fence:

b1. Prior to forecasted rain.

b2. Daily during extended rain events.

b3. After every rainfall.

b4. Weekly during the rainy season.

b5. At two-week intervals during the non-rainy season.

c. The Earthwork Contractor shall be responsible for replacing portions of the silt fence that tear, start to decompose, or become ineffective in any way.

d. Repair or replace split, torn, slumping, or weathered fabric.

e. Repair or replace any missing or broken stakes immediately.

f. Silt fences that are damaged and become unsuitable for the intended purpose shall be removed from the project site, disposed of, and replaced with new silt fence barriers.

g. The Earthwork Contractor shall remove sediment deposits when the deposits reach one-third of the silt fence height or when heavy runoff or high water is expected. When removing sediment deposits, care shall be taken not to tear the fabric or to dig up the bottom of the geotextile and disturb the anchorage.

h. Silt fences shall be left in place, inspected, and maintained until the upstream area is permanently stabilized.

i. Holes, depressions, or other ground disturbance caused by the removal of the silt fences shall be backfilled and repaired.

301.4 Removal of Silt Fencing:

a. The Earthwork Contractor shall be responsible for removal of silt fences when they are no longer needed and for proper disposal of fencing materials.

b. Silt fences shall not be removed until adequate vegetative growth or other means of erosion protection ensures no additional erosion of the contributing drainage area.

c. Sediment deposits remaining in place after the silt fence is removed shall be graded to conform to the existing terrain, and the area shall be covered with topsoil and seeded or otherwise stabilized.

302. STRAW WATTLES

302.1 Locations. Straw wattles shall be installed where specified on the Design Drawings.

302.2 Installation:

a. Excavate a 3-inch-deep trench along the contour of the slope. The trench shall be wide enough to embed the straw wattle 3 inches into the existing ground surface. Excavated soil shall be placed up-slope from the trench.

b. Place the straw wattle in the trench so that it is embedded 3 inches into the existing ground surface and conforms to the shape of the trench. Compact soil excavated from the trench against the wattle on the up-slope side.

c. Adjacent straw wattles shall tightly abut such that no sediment can pass between the wattles.

d. To secure the straw wattles in-place, a wooden stake shall be driven through the wattle every 3 to 4 feet along the length of the wattle and at each end of the wattle. Wooden stakes shall be driven through the middle of the wattle, perpendicular to the slope face, leaving at least 2 to 3 inches of the stake extending above the wattle.

302.3 Maintenance:

a. After installation, the Earthwork Contractor shall be responsible for satisfactorily maintaining the straw wattles until they are no longer required.

b. The Earthwork Contractor shall inspect the straw wattles:

b1. Prior to forecasted rain.

b2. Daily during extended rain events.

b3. After every rainfall.

b4. Weekly during the rainy season.

b5. At two-week intervals during the non-rainy season.

c. The Earthwork Contractor shall be responsible for replacing straw wattles that start to decompose or become ineffective in any way.

d. Sediment that accumulates in or against straw wattles must be periodically removed in order to maintain the straw wattles' effectiveness. Sediment shall be removed when the

sediment accumulation reaches one-third of the barrier height or when heavy runoff or high water is expected.

302.4 Removal:

a. The Earthwork Contractor shall be responsible for removing all straw wattles when they are no longer needed and for disposing of the straw wattles.

b. Straw wattles shall not be removed until the contributing drainage area has been restored and/or stabilized.

c. Sediment deposits remaining in place after the straw wattles have been removed shall be graded to conform to the existing terrain, and the area shall be covered with topsoil and seeded or otherwise stabilized.

303. STRAW BALE BARRIERS

303.1 Locations. Straw bale barriers shall be installed where specified on the Design Drawings.

303.2 Installation:

a. Bales shall be placed in a row with the ends lightly abutting adjacent bales.

b. Each bale shall be embedded in soil a minimum of 4-inches deep and placed with the bindings horizontal so that bales project about 14 inches vertically above the surface. Backfill and compact excavated soil against the bales to ground level.

c. Each bale shall be securely anchored in place with two stakes. The first stake shall be driven at an angle toward the previously-placed bale to force the bales together. The second stake shall be driven vertically. Stakes shall be driven flush with the bale.

d. Chink (tightly wedge) straw into any gaps between bales to prevent sediment-laden water from running through the gaps. Use sand bags or gravel to seal larger gaps.

303.3 Maintenance:

a. After installation, the Earthwork Contractor shall be responsible for satisfactorily maintaining the straw bale barriers until they are no longer required.

b. The Earthwork Contractor shall inspect the straw bale barriers:

b1. Prior to forecasted rain.

b2. Daily during extended rain events.

b3. After every rainfall.

b4. Weekly during the rainy season.

b5. At two-week intervals during the non-rainy season.

c. The Earthwork Contractor shall be responsible for replacing straw bale barriers that start to decompose or become ineffective in any way.

d. Sediment that accumulates in or against straw bale barriers must be periodically removed in order to maintain the straw bale barriers' effectiveness. Sediment shall be removed when the sediment accumulation reaches one-third of the barrier height or when heavy runoff or high water is expected.

303.4 Removal:

a. The Earthwork Contractor shall be responsible for removing all straw bale barriers when they are no longer needed and for disposing of the straw bales.

b. Straw bale barriers shall not be removed until the contributing drainage area has been restored and/or stabilized.

c. Sediment deposits remaining in place after the straw bale barriers have been removed shall be graded to conform to the existing terrain, and the area shall be covered with topsoil and seeded or otherwise stabilized.

END OF SECTION 311010

SECTION 319005

EARTHWORK

PART 1 - GENERAL

101. EXTENT

101.1 This section defines the material and work requirements associated with preparation for, and placement of, Structural Fill to be placed in the Bypass Basin and other tasks associated with the installation of a new composite liner system for the Bypass Basin. The Structural Fill will support the basin's new composite liner system and will establish the lines and grades for the basin's new leachate collection and removal system (LCRS). This work is further defined and depicted on the Design Drawings.

101.2 The work shall include, but not be limited to, the following items:

a. Clearing, and grubbing, and topsoil stripping.

b. Preparation of the on-site, outdoor storage space for the rolls of geosynthetic clay liner (GCL), high-density polyethylene (HDPE) geomembrane liner, and drainage geosynthetic delivered to the project site.

c. Unloading of the GCL, HDPE geomembrane liner, and drainage geosynthetic rolls delivered to the project site.

d. Placement and compaction of Structural Fill over the Bypass Basin's existing liner.

e. Preparation of the Structural Fill surface to be lined with the Bypass Basin's new composite liner system.

f. Preparation of concrete surfaces that will come into contact with geosynthetic materials.

g. Excavation and backfill of crest anchor trenches for geosynthetic materials.

h. Placement of crushed stone to re-surface existing roads on the top of the Bypass Basin's dikes.

i. Placement of crushed rock surfacing for erosion protection along exterior slopes.

j. Offsite disposal of excess or unsuitable excavated earthen material and debris.

101.3 Definitions. The following definitions of terms shall apply throughout this section:

a. GCL Manufacturer: The manufacturer who is responsible for manufacture of GCL materials and for transporting the GCL materials to the site.

b. GM/GC Manufacturer: The manufacturer who is responsible for manufacture of geomembrane and drainage geocomposite materials and for transporting geomembrane and drainage geocomposite materials to the site.

102. RELATED WORK SPECIFIED IN OTHER SECTIONS AND SPECIFICATIONS

102.1 The work specified in this section shall be coordinated with work specified in the following related sections and specifications:

a. Earthwork Specification (P-1400):

a1. Section 319050 – Leachate Collection and Removal System.

a2. Refer to Section 319050 for material and installation requirements for granular materials associated with the Bypass Basin's new LCRS.

b. CQA Specification (P-1401):

b1. Section 014362 – Quality Assurance for Fill, Liner, and Leachate Collection Materials.

c. Geosynthetic Materials Specification (P-1402):

c1. Section 319020 – High-Density Polyethylene Geomembrane Liner with Geocomposite.

c2. Section 319025 – Geosynthetic Clay Liner.

103. REFERENCE DOCUMENTS

103.1 Standards, specifications, manuals, codes and other publications of nationally recognized organizations and associations are referenced herein. Methods, equipment, and materials specified herein shall comply with the specified and applicable portions of the referenced documents, in addition to federal, state, or local agencies having jurisdiction.

103.2 References to these documents are to the latest issue of each document, unless otherwise indicated, together with the latest additions, addenda, amendments, supplements, etc., thereto, in effect as of the date of the Contract for the Work.

103.3 Abbreviations listed indicate the form used to identify the reference documents cited in this section.

103.4 ASTM – ASTM International:

a. C136 Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

b. D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3))

c. D2487 Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).

d. D2974 Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils

103.5 IDOT – Illinois Department of Transportation:

a. Standard Specifications for Road and Bridge Construction (Adopted January 1, 2022).

103.6 ITP – Illinois Test Procedure:

a. 27 Sieve Analysis of Fine and Coarse Aggregates

b. 96 Resistance by Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

c. 104 Soundness of Aggregate by Use of Sodium Sulfate

d. 203 Deleterious Particles in Coarse Aggregate

104. SUBMITTALS

104.1 The Earthwork Contractor shall submit drawings and data as specified. The Earthwork Contractor's drawings and data shall be submitted via electronic medium in a format compatible for importing into the Owner's information systems specified by the Owner.

104.2 Submittals with Bid Proposal:

a. Catalog data on all compaction equipment and proofrolling equipment the Earthwork Contractor plans to use on the project.

b. Earthwork Contractor's plan for placing Structural Fill material to meet the requirements specified herein while preventing damage to the Bypass Basin's existing geomembrane liner.

104.3 Submittals After Award:

a. Earthwork Equipment:

a1. Earthwork Contractor's demonstration that all earthwork equipment to be used to transport and place Structural Fill material will not exert a ground pressure greater than 8 psi.

b. Structural Fill Material:

b1. At least 30 days prior to scheduled delivery, the Earthwork Contractor shall submit certificates for the Structural Fill material signed by the supplier or a qualified geotechnical engineering consultant that certify the following items comply with or exceed specifications for the material:

Property		Standard(1)	Data Required
b1.1	Sieve Analysis	ASTM C136	Percent Passing Selected Sieves
b1.2	Classification of Material	ASTM D2487	Classification
b1.3	Organic Content	ASTM D2974	Percent of Organic Material
b1.4	Atterberg Limits(2)	ASTM D4318	Liquid Limit and Plasticity Index

Note:

(1) Test results shall be provided on two random samples taken from each borrow area. If processing of borrow area material is required to meet material specifications, the tests shall be performed on the process material.

(2) Atterberg limits are only required if cohesive/fine grained materials are to be used for Structural Fill.

c. Crushed Stone Surfacing for Roads:

c1. At least 30 days prior to scheduled delivery, the Earthwork Contractor shall submit certificates for the crushed stone material to be used to re-surface the existing roads on top of the basin dikes, which shall be signed by the supplier or a qualified geotechnical engineering consultant certifying the following items comply with or exceed specifications for the material:

Property		Standard(1)	Data Required
c1.1	Sieve Analysis	ITP 27	Percent Passing Selected Sieves
c1.2	Na_2SO_4 Soundness 5 Cycle	ITP 104	Percent Loss Max.
c1.3	Los Angeles Abrasion	ITP 96	Percent Loss Max.

Note:

(1) Test results shall be provided on two random samples taken from each borrow area. If processing of borrow area material is required to meet material specifications, the tests shall be performed on the process material.

d. Crushed Rock Slope Surfacing Material:

d1. At least 30 days prior to scheduled delivery, the Earthwork Contractor shall submit certificates for the crushed rock slope surfacing material signed by the supplier or a qualified geotechnical engineering consultant certifying that the following items comply with or exceed specifications for the material:

Property		Standard(1)	Data Required
d1.1	Sieve Analysis	ITP 27	Percent Passing Selected Sieves
d1.2	Na_2SO_4 Soundness 5 Cycle	ITP 104	Percent Loss Max.
d1.3	Los Angeles Abrasion	ITP 96	Percent Loss Max.
d1.4	Deleterious Materials	ITP 203	Shale, Percent Max. Clay Lumps, Percent Max. Soft & Unsound Fragments, Percent Max. Other Deleterious, Percent Max. Total Deleterious, Percent Max.

Note:

(1) Test results shall be provided on two random samples taken from each borrow area. If processing of borrow area material is required to meet material specifications, the tests shall be performed on the process material.

105. QUALITY ASSURANCE

105.1 Material and construction procedures shall be subject to inspection and testing by the CQA Contractor hired by Owner. Such inspections and tests will not relieve the Earthwork Contractor of responsibility for providing and placing materials in compliance with specified requirements.

105.2 The Owner reserves the right, at any time before final acceptance, to reject material not complying with the specified requirements. The Earthwork Contractor shall correct all deficiencies which inspections, laboratory tests, or field tests have indicated are not in compliance with specified requirements. The Earthwork Contractor shall perform additional tests, at their expense, as may be necessary to reconfirm any noncompliance of the original work, and as may be necessary to show compliance of corrected work.

105.3 The Earthwork Contractor shall promptly correct errors or flaws in the work or material identified during construction and which prevent proper installation. The Earthwork Contractor shall make immediate substitution of the noncomplying material or shall make field changes to make the noncomplying material acceptable. The correction or substitution shall be performed at no cost to the Owner.

105.4 CQA activities will be performed by the CQA Contractor as described herein and in Specification P-1401.

PART 2 - PRODUCTS

201. MATERIAL FOR STRUCTURAL FILL

201.1 Definitions:

a. Structural Fill is fill placed within the Bypass Basin to support the basin's new composite liner system as identified on the Design Drawings.

201.2 Satisfactory Material:

a. Granular Material:

a1. Granular material for use as Structural Fill shall be rounded and not crushed, with less than two percent organic or other deleterious material, free of excess moisture, and a maximum particle size less than one inch.

a2. Acceptable granular materials are soils which are classified as coarse-grained soils in the Unified Soil Classification System, ASTM D2487. Classifications are GW, GP, GC, SW, SP, or SC, or combinations of these such as SP-SC.

a3. No material with a silt content of greater than 12 percent (i.e., SM or GM) shall be used for Structural Fill.

b. Cohesive Material:

b1. Cohesive material is suitable for use as Structural Fill if it contains not more than two percent organic or other deleterious material, has a maximum particle size of one inch, has a liquid limit of less than 45, and has a plasticity index of less than 25.

b2. Acceptable cohesive materials are soils which are classified as fine-grained soils in the Unified Soil Classification System, ASTM D2487. Classification is CL.

201.3 Unsatisfactory Material:

a. Material unsatisfactory use as Structural Fill is as follows:

a1. Soils classified as silt, silty, or organic soils in the Unified Soil Classification System, ASTM D2487. Classifications are SM, GM, ML, MH, PT, OL and OH.

a2. Clay soils classified as CH in the Unified Soil Classification System, ASTM D2487.

a3. Soils classified as CL-ML (plasticity index of 4 to 7) in the Unified Soil Classification System, ASTM D2487.

a4. Coal combustion residuals and fill containing coal combustion residuals.

a5. Rock material without a soil matrix in which nesting of rocks could occur.

a6. Uncontrolled fill.

a7. Debris.

b. Material Sources:

b1. Structural Fill material shall be obtained from an offsite borrow source identified by the Earthwork Contractor and approved by the Owner.

202. RESTRICTIONS ON THE USE OF MATERIAL FOR ANY PURPOSE

202.1 Any material which is frozen is considered unsatisfactory for use as fill.

202.2 Fill and backfill soils placed by previous construction shall be considered unsatisfactory for use as fill unless they meet the requirements for satisfactory material. This specifically includes using any of the existing protective layers below the Bypass Basin's new composite liner system or on roads outside of the basin.

203. CRUSHED STONE SURFACING FOR ROADS

203.1 Material Requirements:

a. Crushed stone for re-surfacing existing roads on the top of the basin dikes shall be composed of gravel, crushed gravel, or crushed stone that is processed to meet the following requirements:

a1. The material shall conform to Gradation CA 6 in accordance with Paragraph 1004.01(c) of the IDOT Standard Specifications for Road and Bridge Construction.

a2. The material quality shall be Class D or better in accordance with Paragraph 1004.01(b) of the IDOT Standard Specifications for Road and Bridge Construction.

203.2 Material Sources:

a. Crushed stone surfacing material shall be obtained from an offsite borrow source identified by the Earthwork Contractor and approved by the Owner.

204. CRUSHED ROCK SLOPE SURFACING

204.1 Material Requirements:

a. When specified on the Design Drawings, material for surfacing exterior slopes shall be crushed aggregate that is processed to meet the following requirements:

a1. The material shall conform to Gradation CA 7 in accordance with Paragraph 1004.01(c) of the IDOT Standard Specifications for Road and Bridge Construction.

a2. The material quality shall be Class B or better in accordance with Paragraph 1004.01(b) of the IDOT Standard Specifications for Road and Bridge Construction.

204.2 Material Sources:

a. Crushed rock slope surfacing material shall be obtained from an offsite borrow source identified by the Earthwork Contractor and approved by the Owner.

PART 3 - EXECUTION

301. DEMOLITION, CLEARING, GRUBBING AND STRIPPING

301.1 General:

a. The work required is shown on the Design Drawings. No work shall be performed outside of the designated area without prior written approval of the Owner.

b. All work incidental to excavation or fill work will not be specifically indicated on the Design Drawings but shall be performed as part of the work.

301.2 Demolition:

a. Concrete Infills:

a1. The Earthwork Contractor shall remove concrete infills from inlet, outlet, and emergency overflow structures as indicated on the Design Drawings.

a2. All concrete surfaces impacted by demolition work that will also come into contact with the Bypass Basin's new composite liner system shall be ground smooth in accordance with Article 305.

b. Demolition and removal of minor items which are incidental to the earthwork may be required. The Earthwork Contractor shall identify any such items during their pre-bid walkdown. The Earthwork Contractor shall demolish such items as required as part of the performance of the work.

c. All waste resulting from demolition work shall be disposed of by the Earthwork Contractor in an offsite disposal area.

301.3 Clearing, Grubbing, and Topsoil Stripping:

a. All vegetation within areas to be excavated or to receive fill shall be cleared and grubbed, stripped of topsoil and debris, and shall be inspected and approved by the Owner prior to beginning the earthwork operations.

b. Weeds, small roots, heavy grass, and other vegetation remaining after clearing and grubbing operations shall be removed with the topsoil.

c. Disposal:

c1. Stripped topsoil shall be placed in an onsite stockpile area as directed by Owner. Topsoil may be removed from the stockpile area at a later date and used to cover finished slopes and other designated areas.

c2. If any material remains in the topsoil stockpile area after construction is complete, the stockpile area side slopes shall be graded to a maximum slope of 20 percent (five horizontal to one vertical), the top of the pile shall be sloped to drain properly and provided with devices to control erosion, and the stockpile shall be seeded.

302. UNLOADING AND STORAGE OF GEOSYNTHETIC MATERIALS

302.1 Storage:

a. The Owner will provide an on-site, outdoor storage space near the Bypass Basin for the rolls of GCL, HDPE geomembrane liner, and drainage geosynthetic delivered to the project site.

b. The Earthwork Contractor shall, in coordination with the Geosynthetics Contractor, prepare the storage space for geosynthetic materials to ensure the rolls are protected from damage, moisture, theft, and vandalism. At a minimum, the storage space for geosynthetic materials shall be prepared such that the surface is smooth and is free of rocks and standing water.

c. GCL Rolls:

c1. Rolls of GCL shall be stored horizontally in their original, unopened, wrapped cover in a clean, dry area. The material shall be stored off the ground on pallets or plywood in small stacks not to exceed five rolls in height. Rolls shall be stacked in a manner recommended by the GCL Manufacturer that prevents them from sliding or rolling from the stacks.

c2. All GCL rolls shall be covered with a heavy, protective tarpaulin or plastic sheeting. Care shall be used to keep the GCL dry, clean, and free from debris prior to installation.

c3. Any GCL roll that comes into contact with moisture while in storage shall be set aside by the Earthwork Contractor to await examination by the Owner. Damaged rolls shall also be set aside and inspected to determine suitability of the material for use.

d. HDPE Geomembrane Liner and Drainage Geocomposite Rolls:

d1. Rolls of HDPE geomembrane liner and drainage geocomposite shall be stored horizontally in their original, unopened, wrapped cover in a clean, dry area. The materials shall be stored in accordance with the GM/GC Manufacturer's recommendations.

d2. Any roll of HDPE geomembrane liner or drainage geocomposite that is damaged in storage shall be set aside and inspected to determine suitability of the material for use.

302.2 Unloading:

a. The Earthwork Contractor shall unload all geosynthetic materials delivered to the project site by the respective manufacturers. During unloading, all rolls of geosynthetic materials shall be handled with care in a manner that prevents damage to the rolls.

b. All rolls of GCL shall be unloaded in accordance with the GCL Manufacturer's recommendations.

c. All rolls of HDPE geomembrane liner and drainage geocomposite shall be unloaded in accordance with the GM/GC Manufacturer's recommendations.

d. Any roll of GCL, HDPE geomembrane, or drainage geocomposite that is damaged during unloading shall be replaced at no additional cost to the Owner.

303. PLACEMENT OF STRUCTURAL FILL

303.1 Acceptable Placement Methods:

a. Acceptable placement methods for Structural Fill include:

a1. Using a conveyor truck to place material from outside of the basin.

a2. Using a crane to place material from outside of the basin.

a3. Transporting material into the basin to the point of dumping using trucks or scrapers, while complying with maximum ground pressure requirements.

a4. Alternate placement method(s) proposed by the Earthwork Contractor and approved by the Owner.

b. Requirements for Transportation of Structural Fill Materials into Basin:

b1. Under no circumstances shall any equipment (wheeled or tracked) traverse the Bypass Basin's existing geomembrane liner or new liner when less than 10 inches of earthen material are above the subject liner.

b2. Equipment transporting material into the basin shall use the permanent ramp along the basin's east dike. Following removal of the existing ramp surface layer, Structural Fill shall be installed above the existing geomembrane liner along the ramp surface as detailed on the Design Drawings and as specified herein before any equipment uses the ramp to access the basin floor.

b3. Only earthmoving equipment with low ground pressure shall be used to transport material inside of the basin. The Earthwork Contractor shall demonstrate that equipment entering the basin will not exert a ground pressure greater than 8 psi. The ground pressure is influenced by the tread pattern / tire contact area and is not the reading from a tire pressure gauge.

b4. Equipment operating within the basin shall avoid hard braking on ramps and avoid sharp turns or quick stops that could pinch or tear the existing geomembrane liner.

b5. Structural Fill shall be placed by the "dump and spread" method in which lightweight equipment with low ground pressure is used to spread the material.

b6. Material placement over the geomembrane liner during periods of warm weather can cause wrinkling and damage to the geosynthetic materials. Placement of the initial lift of Structural Fill shall be halted when the air temperature is greater than 85°F or less than 40°F.

b7. When Structural Fill is being placed, a worker shall safely walk alongside earthmoving equipment spreading the material to spot and remove rocks, stones, roots, and other debris that may be present in the Structural Fill that could cause damage to the liner.

303.2 Moisture Content of Structural Fill Material:

a. Unless granular materials are used for Structural Fill, he moisture content of Structural Fill material shall be within ±3 percent of optimum moisture content as determined by ASTM D1557 at the time of compaction. The moisture content of granular materials shall not be used as a criterion for acceptance of Structural Fill.

b. Fill material containing excessive moisture shall not be compacted unless the material has dried and the moisture content is within the specified limits.

c. Fill material that is too dry shall have moisture added and then be blended so that the moisture content is uniform prior to compaction.

303.3 Lift Thickness:

a. Fill shall be placed in horizontal layers in thicknesses compatible with the material being placed, equipment being used and the compaction requirements.

b. Unless otherwise approved by the Owner the loose thickness shall not exceed the following:

b1. 12 inches maximum loose lift thickness for the lowest lift in contact with the Bypass Basin's existing geomembrane liner.

b2. 8 inches maximum loose lift thickness for compaction by self-propelled equipment.

b3. 4 inches maximum loose lift thickness for compaction by hand-operated equipment.

303.4 Placement Structural Fill:

a. Each layer of fill shall be evenly spread and moistened or aerated as required to achieve the required moisture content.

b. Each lift of Structural Fill in the Bypass Basin shall be uniformly placed to cover the entire length and width of the basin prior to compaction or placement of the next lift.

c. As allowed by the design of the LCRS, the top surface of each layer shall be approximately level but shall have sufficient crown or cross fall to provide adequate drainage of water at all times during the construction period. The crown or crossfall shall be at least 1 in 50 (2 percent) but no greater than 1 in 20 (5 percent).

d. Fill placed on slopes steeper than 20 percent (i.e., 5 horizontal to 1 vertical) shall be overfilled a minimum of 6 inches beyond the face of the slope, measured horizontally, and then cut back and trimmed to the required line and grade to expose a smooth surface uniformly compacted to the required density. Installing the fill slope to lines and grades shown on the Design Drawings and then compacting is not acceptable on the basin side slopes.

303.5 Compacting Structural Fill:

a. Equipment:

a1. Sheepsfoot, modified sheepsfoot, padfoot, or other non-smooth drums shall not be used to compact Structural Fill placed for this work.

a2. Each layer of fill shall be compacted by tamping, pneumatic-tired roller, or other mechanical means acceptable to the Owner that will produce the specified compaction.

a3. At locations where it would be impractical because of inaccessibility to use self-propelled compacting equipment, fill layers shall be compacted using hand directed compaction equipment.

a4. When soils are used that develop a densely packed surface as a result of spreading or compacting equipment, the surface of each layer of fill shall be sufficiently roughened after compaction to ensure bonding of the succeeding layer.

b. Inspection and Testing:

b1. All work is subject to inspection and testing by the CQA Contractor. The CQA Contractor shall have access to the work at all times. Testing shall be in accordance with the Contract. Refer to Specification P-1401 for inspection and testing requirements.

b2. Each layer of compacted fill shall be tested before proceeding with the next layer.

b3. It is the Earthwork Contractor's responsibility to request inspection prior to proceeding with further work that would make parts of the work inaccessible for inspection.

b4. If the fill material fails to meet the required density, the material shall be removed and replaced or reworked, altering the construction method as necessary to obtain the required density and compaction. Sufficient time shall be allotted between lifts for the necessary testing of the soils.

c. Compaction Density:

c1. Structural Fill shall be compacted to a minimum of 95% of the maximum dry density as determined by ASTM D1557.

303.6 Fine Grading:

a. Structural Fill shall be fine graded using equipment with low ground pressure.

303.7 Reporting Damage:

a. If damage occurs to the Bypass Basin's existing geomembrane liner while placing Structural Fill material, the Earthwork Contractor shall report the damage(s) to the Owner and Geosynthetics Contractor immediately so that repairs can be performed without delay.

b. Repairs to the existing geomembrane liner shall be made by the Geosynthetics Contractor as specified in Specification P-1402, Section 319020 at no additional cost to the Owner.

304. REQUIREMENTS FOR PREPARATION AND ACCEPTANCE OF STRUCTURAL FILL SURFACE SUPPORTING COMPOSITE LINER

304.1 Intersections Between Planes:

a. Intersections between planes shall be rounded as specified below to provide a firm bearing without abrupt change:

	Intersection of Slope	Radius of Rounding
a1.	Side slope and bottom plane	3 feet minimum
a2.	Side slope and top of dike or grade	6 inch minimum
a3.	Intersection of 2 bottom planes (planes sloped at 10% or less)	Straight line is acceptable

304.2 Responsibility:

a. The Earthwork Contractor shall be responsible for preparing the surface of the Structural Fill beneath the composite liner system prior to placement of the liner. The subgrade is

subject to inspection and acceptance by the Owner and the Geosynthetics Contractor prior to installation of the lower component of the composite liner system.

304.3 Inspection:

a. The Earthwork Contractor, the Owner, the Geosynthetics Contractor, and the CQA Contractor shall inspect and document the following:

a1. Lines, grades, and slopes are in conformance with the Design Drawings.

a2. Surface has been graded and rolled such that it is free of irregularities, protrusions, loose soil, and abrupt changes in grade.

a3. The surface is free of debris, clods, stones, roots, and organic material.

a4. That no settlement or erosion has occurred.

a5. That there are no side slope failures.

a6. That there are no moisture seeps, puddling or ponding.

a7. That there are no soft spots.

304.4 Certification:

a. The Geosynthetics Contractor shall provide written certification that the surface is acceptable. The acceptance shall be recorded and copies of the certification given to both the Earthwork Contractor, the CQA Contractor, and the Owner.

b. Only as much surface as will be lined the following day shall be inspected, certified, and documented as acceptable.

305. PREPARATION OF CONCRETE SURFACES

305.1 All concrete surfaces that will come in contact with the Bypass Basin's new composite liner system shall be free of sharp edges or rough spots that can puncture or abrade the new liner materials. Where necessary, the concrete shall be ground smooth by the Earthwork Contractor.

306. CREST ANCHOR TRENCH EXCAVATION AND BACKFILLING

306.1 Excavation and Shaping:

a. The anchor trench for geosynthetic materials shall be excavated by the Earthwork Contractor at the top of the basin slope to the lines and widths shown on the Design Drawings prior to the Geosynthetics Contractor deploying the geosynthetic clay liner component of the Bypass Basin's new composite liner system in accordance with Specification P-1402, Section 319025.

b. A slightly rounded corner shall be provided in the trench where the geosynthetic materials adjoin the trench to avoid sharp bends in the geosynthetic materials. The radius of rounding is shown on the Design Drawings. No loose soil shall be allowed to underlie the geosynthetic materials in the anchor trench.

c. The anchor trench shall be adequately drained to prevent ponding or otherwise softening of the adjacent soils while the trench is open.

306.2 Backfilling:

a. The anchor trench shall be backfilled by the Earthwork Contractor after all geosynthetic materials are in place and seams are welded.

b. Backfilling of the anchor trench shall occur during the morning or during extended periods of overcast skies when the geosynthetic materials are at their most contracted states.

c. The first lift of fill above the geosynthetic materials in the anchor trench may be 12 inches in thickness.

d. If compacted using hand-operated equipment, backfill shall be placed in lifts not exceeding 4 inches loose thickness and shall be compacted to a minimum of 95% of the maximum dry density as determined by ASTM D1557.

e. If compacted using self-propelled equipment, backfill shall be placed in lifts not exceeding 8 inches loose thickness and shall be compacted to a minimum of 95% of the maximum dry density as determined by ASTM D1557.

307. GRADING TOLERANCES

307.1 The acceptable deviation from lines and grades indicated on the Design Drawings shall be as shown in Table 319005-1.

307.2 Slopes shall be finished in conformance with the lines and grades shown on the Design Drawings. When completed, the average plane of a slope shall conform to the slope indicated on the Design Drawings and no point on the completed slope shall vary from the designated plane by more than 6 inches measured at right angles to the slope.

308. CLEAN-UP

308.1 All waste, excess materials and debris shall be disposed of in an offsite disposal area approved by the Owner.

TABLE 319005-1
ACCEPTABLE DEVIATIONS FROM DESIGN LINES AND GRADES

Type of Installation (Excavation or Fill)	Maximum Acceptable Deviation from Line (feet)	Maximum Acceptable Deviation from Grade[1] (feet)
General Earthwork		
Top of Structural Fill	±0.3	+0.1 to -0.0
Roads		
Road Embankment	±0.2	+0.1 to -0.0
Leachate Collection & Removal System		
Leachate Collection Pipe Trench and Sump	±0.3	+0.1 to -0.0

Note:

(1) After initial settlement has taken place. Initial settlement is that settlement that will occur up to the time of determination and acceptance of final grade elevation as approved by the Owner.

END OF SECTION 319005

SECTION 319050

LEACHATE COLLECTION AND REMOVAL SYSTEM

PART 1 - GENERAL

101. EXTENT

101.1 This section defines the minimum material and installation requirements for the components of the Bypass Basin's new leachate collection and removal system (LCRS) including high-density polyethylene (HDPE) leachate collection and sideslope riser pipes, non-woven geotextiles, Coarse Aggregate Bedding Material, Sand Filter Layer material, Protective Warning Layer material, Riprap Bedding Layer material, and riprap, all in accordance with the Design Drawings and as specified herein.

101.2 The components and dimensions of the LCRS are shown on the Design Drawings. The division of work shall include, but not be limited to, the following items:

a. The following items shall be furnished and installed by the Earthwork Contractor:

a1. Coarse Aggregate Bedding Material.

a2. Non-woven geotextile between Coarse Aggregate Bedding Material and composite liner system, as specified on the Design Drawings.

a3. Sand Filter Layer.

a4. Protective Warning Layer.

a5. Perforated leachate collection pipe.

a6. Perforated sump pipe.

a7. Solid sideslope riser pipe and cover.

b. The following items shall be installed by the Geosynthetics Contractor in accordance with Specification P-1402, Sections 319020 and 319025:

b1. HDPE geomembrane.

b2. Drainage geocomposite.

b3. Geosynthetic clay liner (GCL).

c. The following items will be furnished and installed by Others:

c1. Wheeled submersible pump with flexible hose.

c2. Flowmeters.

c3. Control station for pumps and meters.

c4. Electrical and instrument conduit.

101.3 Definitions:

a. The following definitions of terms shall apply throughout this section:

a1. Pipe Manufacturer: The manufacturer who is responsible for manufacture of LCRS pipe materials and fittings and for transporting these materials to the site.

102. RELATED WORK SPECIFIED IN OTHER SECTIONS AND SPECIFICATIONS

102.1 The work specified in this section shall be coordinated with work specified in the following related sections and specifications:

a. Earthwork Specification (P-1400):

a1. Section 319005 – Earthwork.

b. CQA Specification (P-1401):

b1. Section 014362 – Quality Assurance for Fill, Liner, and Leachate Collection Materials.

c. Geosynthetic Materials Specification (P-1402):

c1. Section 319020 – High-Density Polyethylene Geomembrane Liner with Geocomposite.

c2. Section 319025 – Geosynthetic Clay Liner.

103. REFERENCE DOCUMENTS

103.1 Standards, specifications, manuals, codes and other publications of nationally recognized organizations and associations are referenced herein. Methods, equipment, and materials specified herein shall comply with the specified and applicable portions of the referenced documents in addition to federal, state, or local codes having jurisdiction.

103.2 References to these documents are to the latest issue date of each document, unless otherwise indicated, together with the latest additions, addenda, amendments, supplements, etc., thereto, in effect as of the date of Contract for the Work.

103.3 Abbreviations listed indicate the form used to identify the reference documents cited in this section.

103.4 ASTM – ASTM International:

a. D2434 Standard Test Method for Permeability of Granular Soils (Constant Head)

b. D2487 Standard Practice for Classification of Soils for Engineering Purposes

c. D2513 Standard Specification for Thermoplastic Gas Pressure Pipe, Tubing, and Fittings

d. D2657 Standard Practice for Heat Fusion Joining of Polyolefin Pipe and Fittings

e. D3261 Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing

f. D6473 Standard Test Method for Specific Gravity and Absorption of Rock for Erosion Control

g. D6825 Standard Guide for Placement of Riprap Revetments

h. F714 Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Outside Diameter

103.5 IDOT – Illinois Department of Transportation:

a. Standard Specifications for Road and Bridge Construction (Adopted January 1, 2022)

103.6 ITP – Illinois Test Procedure:

a. 27 Sieve Analysis of Fine and Coarse Aggregates

b. 96 Resistance by Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

c. 104 Soundness of Aggregate by Use of Sodium Sulfate

d. 203 Deleterious Particles in Coarse Aggregate

103.7 NSF – National Sanitation Foundation International:

a. NSF Listings: Plastics and Plumbing System Components

104. SUBMITTALS

104.1 The Earthwork Contractor shall submit drawings and data at least 30 days prior to use. The Earthwork Contractor's drawings and data shall be submitted via electronic medium in a format compatible for importing into the Owner's information systems specified by the Owner.

104.2 Submittals with Bid Proposal:

a. HDPE Pipe:

a1. Pipe Manufacturer's name, address, and telephone number.

a2. Pipe Manufacturer's literature providing specifications of the pipes that will be supplied for the project.

a3. Pipe Manufacturer's signed certification that the pipes that will be supplied comply with the requirements of this Specification.

a4. Pipe Manufacturer's signed certification that no reclaimed polymer has been added to the resin.

104.3 Submittals After Award:

a. Coarse Aggregate Bedding Material:

a1. At least 30 days prior to scheduled delivery, the Earthwork Contractor shall submit certificates for the Coarse Aggregate Bedding Material signed by the supplier or a qualified geotechnical engineering consultant certifying that the following items comply with or exceed specifications for the material:

Property	Standard(1)	Data Required
a1.1 Sieve Analysis	ITP 27	Percent Passing Selected Sieves
a1.2 Na_2SO_4 Soundness 5 Cycle	ITP 104	Percent Loss Max.
a1.3 Los Angeles Abrasion	ITP 96	Percent Loss Max.
a1.4 Deleterious Materials	ITP 203	Shale, Percent Max. Clay Lumps, Percent Max. Soft & Unsound Fragments, Percent Max. Other Deleterious, Percent Max. Total Deleterious, Percent Max.

Note:

(1) Test results shall be provided on two random samples taken from each borrow area. If processing of borrow area material is required to meet material specifications, the tests shall be performed on the process material.

b. Sand Filter Layer Material:

b1. At least 30 days prior to scheduled delivery, the Earthwork Contractor shall submit certificates for the Sand Filter Layer material signed by the supplier or a qualified geotechnical engineering consultant certifying that the following items comply with or exceed specifications for the material:

Property	Standard(1)	Data Required
b1.1 Classification of Material	ASTM D2487	Classification
b1.2 Sieve Analysis	ITP 27	Percent Passing Selected Sieves
b1.3 Hydraulic Conductivity	ASTM D2434	Hydraulic Conductivity

Note:

(1) Test results shall be provided on two random samples taken from each borrow area. If processing of borrow area material is required to meet material specifications, the tests shall be performed on the process material.

c. Protective Warning Layer Material:

c1. At least 30 days prior to scheduled delivery, the Earthwork Contractor shall submit certificates for the Protective Warning Layer material signed by the supplier or a qualified geotechnical engineering consultant certifying that the following items comply with or exceed specifications for the material:

Property	Standard(1)	Data Required
c1.1 Sieve Analysis	ITP 27	Percent Passing Selected Sieves
c1.2 Na_2SO_4 Soundness 5 Cycle	ITP 104	Percent Loss Max.
c1.3 Los Angeles Abrasion	ITP 96	Percent Loss Max.

Note:

(1) Test results shall be provided on two random samples taken from each borrow area. If processing of borrow area material is required to meet material specifications, the tests shall be performed on the process material.

d. Riprap Bedding Layer Material:

d1. At least 30 days prior to scheduled delivery, the Earthwork Contractor shall submit certificates for the Riprap Bedding Layer material signed by the supplier or a qualified geotechnical engineering consultant certifying that the following items comply with or exceed specifications for the material:

Property	Standard(1)	Data Required
d1.1 Sieve Analysis	ITP 27	Percent Passing Selected Sieves
d1.2 Na_2SO_4 Soundness 5 Cycle	ITP 104	Percent Loss Max.
d1.3 Los Angeles Abrasion	ITP 96	Percent Loss Max.
d1.4 Deleterious Materials	ITP 203	Shale, Percent Max. Clay Lumps, Percent Max. Soft & Unsound Fragments, Percent Max. Other Deleterious, Percent Max. Total Deleterious, Percent Max.

Note:

(1) Test results shall be provided on two random samples taken from each borrow area. If processing of borrow area material is required to meet material specifications, the tests shall be performed on the process material.

e. Riprap:

e1. At least 30 days prior to scheduled delivery, the Earthwork Contractor shall submit certificates for the riprap material signed by the supplier or a qualified geotechnical engineering consultant certifying that the following items comply with or exceed specifications for the material:

Property	Standard(1)	Data Required
e1.1 Sieve Analysis	ITP 27	Percent Passing Selected Sieves
e1.2 Na_2SO_4 Soundness 5 Cycle	ITP 104	Percent Loss Max.

Note:

(1) Test results shall be provided on two random samples taken from each borrow area. If processing of borrow area material is required to meet material specifications, the tests shall be performed on the process material.

104.4 Submittals Upon Shipment:

a. HDPE Pipe:

a1. Copies of Pipe Manufacturer's QA/QC certificates on tests performed during fabrication.

104.5 Submittals After Construction is Complete:

a. HDPE Pipe:

a1. Logs indicating the location of each joint that did not pass visual examination and the work done to correct improper fusion weld.

105. QUALITY ASSURANCE

105.1 Materials and construction procedures shall be subject to inspection and testing by the CQA Contractor employed by the Owner. Such inspections and tests will not relieve the Earthwork Contractor of the responsibility of providing and placing materials in compliance with specified requirements.

105.2 The Owner reserves the right, at any time before final acceptance, to reject materials or workmanship not complying with specified requirements. The Earthwork Contractor shall correct the deficiencies which the inspections and tests have indicated are not in compliance with specified requirements.

105.3 CQA activities shall be performed as described herein and in Specification P-1401.

PART 2 - PRODUCTS

201. PIPE

201.1 Pipe Materials:

a. Perforated leachate collection pipe, perforated sump pipe, and solid wall sideslope riser pipe shall meet the general and material requirements presented in Table 319050-1.

201.2 Pipe Requirements:

a. Leachate collection and removal system piping shall be single wall piping.

201.3 Fittings:

a. All fittings shall be prefabricated and manufactured by the same manufacturer as the pipe.

TABLE 319050-1
MATERIAL REQUIREMENTS FOR LEACHATE COLLECTION AND REMOVAL SYSTEM PIPING

General Requirements for Leachate Collection & Removal System Pipes & Fittings			
Items	Leachate Collection Pipe, Sump Pipe, and Sideslope Riser Pipe		
Service	Leachate Collection and Removal System		
Location	Leachate Collection Trench and Sump		
Material	Perforated and Solid Wall High-Density Polyethylene, Thermal Butt Fusion Welded Joints(1)		
Listing	NSF Listed and Approved		
Rating	Maximum Working Temperature:	Ambient	
	Maximum Working Pressure:	Atmospheric	

Material Requirements for Leachate Collection & Removal System Pipes & Fittings			
Item	**ASTM Test Method**	**Size (in.)**	**Remarks**
Pipe(1)	ASTM F714, Pipe Grade PE4710 Resin	6	SDR 11 (160 psi)
		12	SDR 17 (100 psi)
Joints	Not Applicable	All	Thermal Butt Fusion Welded
Fittings(2): 30°, 45°, 60°, and 90° Bends	ASTM D2513 and ASTM D3261	6	SDR 11 (120 psi) (reduced pressure) Injection molded butt fittings from same resins as pipe.
		12	SDR 17 (75 psi) Mitered fittings fabricated from angular cut sections of pipe.
Fittings(2): Tees, Wyes, and Reducers	Not Applicable	6	SDR 11 (160 psi) (reduced pressure) Mitered fittings fabricated from angular cut sections of pipe.
		12	SDR 17 (75 psi) Mitered fittings fabricated from angular cut sections of pipe.
Cleanout	Not Applicable	12	Lockable Cap

Approved Manufacturers of Leachate Collection & Removal System Pipes and Fittings		
Manufacturer	**Trade Name**	**Size Range (in.)**
Chevron Phillips Chemical Company	Performance Pipe DriscoPlex® 4100	6 to 12
KWH Pipe	Sclairpipe	6 to 12
JM Eagle	HDPE Water Sewer C906	6 to 12
Others as Approved by the Owner	--	--

Notes:

(1) Solid or perforated pipe shall be provided as specified on the Design Drawings. Perforated pipe shall be perforated in accordance with the details shown on the Design Drawings.
(2) Fittings are reduced pressure rating fittings.

202. COARSE AGGREGATE BEDDING MATERIAL:

a. The bedding material for the leachate collection and removal system piping shall be washed gravel or washed crushed coarse aggregate. Crushed slag or Portland cement concrete shall not be used.

b. The gradation for Coarse Aggregate Bedding Material shall conform to Gradation CA 7 in accordance with Paragraph 1004.01(c) of the IDOT Standard Specifications for Road and Bridge Construction.

c. The material quality for Coarse Aggregate Bedding Material shall be Class B or better in accordance with Paragraph 1004.01(b) of the IDOT Standard Specifications for Road and Bridge Construction.

203. SAND FILTER LAYER MATERIAL:

a. The "Sand Filter Layer" placed on top of the HDPE geonet and geotextile shall be composed of washed sand imported from an offsite borrow source, which shall be identified by the Earthwork Contractor and approved by the Owner, that is processed to meet the following requirements:

a1. The material shall be classified as SP, SM, or SP-SM in the Unified Soil Classification System, ASTM D2487.

a2. The material shall conform to Gradations FA 1 or FA 2 in accordance with Paragraph 1003.01(c) of the IDOT Standard Specifications for Road and Bridge Construction.

a3. The material shall have a permeability of greater than 1×10^{-5} cm/sec when tested in accordance with ASTM D2434.

a4. The material shall be free from all organic material and deleterious material.

a5. Fine aggregate produced by crushing slag or Portland cement concrete is not acceptable.

204. PROTECTIVE WARNING LAYER MATERIAL:

a. The "Protective Warning Layer" placed on top of the Sand Filter Layer along the basin floor shall be composed of gravel, crushed gravel, or crushed stone imported from an offsite borrow source, which shall be identified by the Earthwork Contractor and approved by the Owner, that is processed to meet the following requirements:

a1. The material shall conform to Gradation CA 6 in accordance with Paragraph 1004.01(c) of the IDOT Standard Specifications for Road and Bridge Construction.

a2. The material quality for Protective Warning Layer material shall be Class D or better in accordance with Paragraph 1004.01(b) of the IDOT Standard Specifications for Road and Bridge Construction.

205. RIPRAP BEDDING LAYER MATERIAL

a. The "Riprap Bedding Layer" placed on top of the Sand Filter Layer along the basin side slopes shall be composed of gravel, crushed gravel, or crushed stone imported from an offsite borrow source, which shall be identified by the Earthwork Contractor and approved by the Owner, that meets the following requirements:

a1. The material shall conform to Gradation CA 16 in accordance with Paragraph 1004.01(c) of the IDOT Standard Specifications for Road and Bridge Construction.

a2. The material quality for Riprap Bedding Layer material shall be Class B or better in accordance with Paragraph 1004.01(b) of the IDOT Standard Specifications for Road and Bridge Construction.

206. RIPRAP

a. Riprap placed along the basin side slopes shall consist of quarried or crushed stone imported from an offsite borrow source, which shall be identified by the Earthwork Contractor and approved by the Owner, that meets the following requirements:

a1. Riprap stones shall have 100% of all faces angular or crushed and shall be free from structural defects, laminations, seams, weak cleavage planes, and undesirable effects of weathering. Stone containing shale, unsound sandstone, or any other material which will readily disintegrate under handling and placing or under weathering shall not be used. All riprap material shall be clean and free from deleterious material and impurities, including but not limited to earth, clay, and refuse.

a2. Riprap material shall conform to Gradation RR 2 in accordance with Paragraph 1005.01(c) of the IDOT Standard Specifications for Road and Bridge Construction.

a3. Riprap material shall meet Quality A requirements in accordance with Paragraph 1005.01(b) of the IDOT Standard Specifications for Road and Bridge Construction, except that the bulk specific gravity of the riprap shall not be less than 2.55 per ASTM D6473 (approximate unit weight of 160 pounds per cubic foot).

a4. Riprap color shall be gray unless otherwise approved by the Owner.

PART 3 - EXECUTION

301. LEACHATE COLLECTION PIPE INSTALLATION

301.1 The perforated leachate collection pipe shall be installed according to the elevations and locations indicated on the Design Drawings.

301.2 The maximum vertical variation from the correct profile and section shall not exceed ±0.1 ft. The slope of the pipe shall not vary from the specified slopes by more than ±0.1%. The Earthwork Contractor shall regrade any area which does not meet the specified tolerances.

301.3 Perforated pipe shall have two rows of 1/2-inch diameter perforations spaced 5 inches apart along the length of the pipe. The perforations shall face down in the collection trench.

301.4 All PE pipes shall be joined by the thermal butt-fusion process described in Article 303.

301.5 The Earthwork Contractor shall provide hydraulic jet cleaning of all pipelines following installation. The jet cleaning shall verify that each pipe is intact and unobstructed. Defects in any pipeline identified by the cleaning process shall be repaired by the Earthwork Contractor.

302. COLLECTION SUMP PIPE INSTALLATION

302.1 The collection sump shall be provided with a horizontal perforated pipe for housing the pump and a solid riser pipe for inserting and removing the pump. The size and location of the pipes and the perforation pattern for the perforated pipe shall be as shown on the Design Drawings.

302.2 All PE pipes shall be joined by the thermal butt-fusion process described in Article 303. The inside of the pipe shall be ground smooth so that it will not impede the sliding of pumps.

303. WELDING AND TESTING OF HDPE PIPE JOINTS

303.1 Joints for HDPE Pipe:

a. HDPE pipe shall be joined together by the thermal butt fusion method in accordance with ASTM D2657 Procedure 2. Fittings shall be fabricated to provide a smooth inside surface. The hot plate butt fusion procedure shall be performed using apparatus recommended by the Pipe Manufacturer and which complies with ASTM D2657.

303.2 Bent Strap Test

a. Test Requirements:

a1. A bent strap test shall be made on each diameter of pipe prior to the start of joint welding procedures. A test joint shall be made and a specimen cut from the joint and destructively tested to confirm fusion joint integrity, operator procedure, and fusion machine settings, including temperature and pressure.

a2. Additional bent strap tests may be required by the Owner and/or CQA Contractor during the joint welding process if it is found that the joints of unacceptable quality are being made. These tests shall be used to adjust fusion machine settings and/or operator procedures as required. Test joints shall be prepared at no additional cost to the Owner.

b. Test Procedure:

b1. Using waste pieces of pipe, a joint specimen shall be prepared and then butt fusion welded and allowed to cool to ambient temperature.

b2. A test strap shall be cut from the specimen:

b2.1 The width of the strap shall be 1-1/2 times the pipe wall thickness, but not less than one inch.

b2.2 The length of the strap on each side of the fusion weld shall be 15 times the pipe wall thickness, but not less than six inches.

b3. The cut shall be bent so that the ends of the strap touch. If any separation, cracks or voids are observed, the fusion is unacceptable and indicates poor fusion quality.

b4. If failure occurs, fusion procedures and/or machine settings shall be changed, and a new trial fusion weld and new bent strap specimen shall be prepared and tested.

b5. The CQA Contractor shall witness all bent strap tests.

b6. Field fusion of pipe shall not proceed until a test joint has passed the bent strap test and visual inspection indicates that the fusion beads and "V" groove are the correct size.

304. VISUAL INSPECTION OF HDPE PIPE DURING INSTALLATION

304.1 General:

a. The Earthwork Contractor shall visually inspect all pipes during installation for:

a1. Verification that all perforated pipe has been placed with the perforations facing down.

a2. Surface damage.

a3. Weld quality.

304.2 Surface Damage:

a. Surface damage to a pipe that occurs during handling or installation shall be minimized. The maximum acceptable depth of damage is 10 percent of wall thickness of the pipe. If excessive damage occurs, the damaged portions of pipe shall be cut out and replaced. Deep, sharp notches may be filled with extrudite and dressed smooth.

b. Butt fuse on misalignment shall not exceed 10 percent of the pipe wall thicknesses. Misaligned butt fusions shall be cut out and redone.

304.3 Butt-Fusion Joint Weld Quality:

a. All butt fusion welded joints shall be visually inspected to ensure joint quality. The size and shape of the fusion beads shall be used as an indicator of joint quality. Specifically:

a1. The double bead width shall be 2 to 2-1/2 times the height of the bead measured from the pipe surface.

a2. Both beads shall be uniform in size and shape around the joint.

a3. The depth of the "V" between the two beads shall not be more than half the bead height.

b. If the "V" groove is too deep a "cold" fusion may have occurred (uneven heating or insufficient heating time, or excessive pressure during heating or during joining). A non-uniform bead shape around the pipe indicates uneven heating.

c. A joint with cold fusion or a non-uniform bead is a poor quality joint that shall be removed (i.e., cut-out) and remade.

305. INSTALLATION OF GRANULAR AND RIPRAP MATERIALS

305.1 "Granular Materials" in this article include Coarse Aggregate Bedding Material, Sand Filter Layer material, Protective Warning Layer material, and Riprap Bedding Layer material.

305.2 Acceptable Placement Methods:

a. Acceptable placement methods for Granular Materials include:

a1. Using a conveyor truck to place material from outside of the basin.

a2. Using a crane to place material from outside of the basin.

a3. Transporting material into the basin to the point of dumping using trucks or scrapers.

a4. Alternate placement method(s) proposed by the Earthwork Contractor and approved by the Owner.

b. Requirements for Transportation of Granular and Riprap Materials into Basin:

b1. Under no circumstances shall there be direct equipment travel over any geosynthetic material (GCL, geomembrane, geotextile, geonet, etc.).

b2. Equipment transporting material into the basin shall use the permanent ramp along the basin's east dike. Structural Fill shall be installed above the existing HDPE geomembrane liner along the ramp surface as detailed on the Design Drawings and as specified in Section 319005 before any equipment uses the ramp to access the basin floor.

b3. Only earthmoving equipment with low ground pressure shall be used to transport material inside of the basin. The Earthwork Contractor shall demonstrate that equipment entering the basin will not exert a ground pressure greater than 8 psi. The ground pressure is influenced by the tread pattern / tire contact area and is not the reading from a tire pressure gauge.

b4. Equipment operating within the basin shall avoid hard braking on ramps and avoid sharp turns or quick stops that could pinch or tear the geosynthetic materials.

b5. The Sand Filter Layer, Protective Warning Layer, and Riprap Bedding Layer Materials shall be placed by the "dump and spread" method in which appropriate lightweight equipment with low ground pressure are used to spread the material.

b6. No travel over piping shall be allowed without sufficient protection of the piping.

b7. Material placement over geosynthetic materials during periods of warm weather can cause wrinkling in the geosynthetic materials. The wrinkling effect can cause damage to the geosynthetic materials. Placement of Granular Materials shall be halted when the air temperature is greater than 85°F or less than 40°F.

b8. When Sand Filter Layer, Protective Warning Layer, or Riprap Bedding Layer materials are being placed, a worker shall walk alongside earthmoving equipment spreading the material to spot and remove all rocks, stones, roots, and other debris that may be remaining in the materials that could cause damage to a geosynthetic material.

b9. Placement of Granular Materials and riprap on the basin's side slopes shall begin at the toe of the slope and proceed up the slope.

305.3 Placement of Coarse Aggregate Bedding Material:

a. Coarse Aggregate Bedding Material shall be placed under and around the leachate collection, sump collection, and sideslope riser pipes to the thicknesses shown on the Design Drawings.

b. All piping shall be installed over an initial layer of Coarse Aggregate Bedding Material. After a pipe is installed, Coarse Aggregate Bedding Material shall be placed by hand beneath the

haunches and above the pipe and compacted to ensure complete and uniform support of the pipe.

305.4 Placement of Sand Filter Layer Material:

a. Installation of the Sand Filter Layer shall not begin until Geosynthetics Contractor has finished installing the non-woven geotextile and HDPE geonet components of the LCRS, the CQA Contractor has finished inspecting those geosynthetic components of the LCRS, and the area has been released to the Earthwork Contractor in writing to proceed.

b. Sand Filter Layer material shall be placed in a single layer to the thickness shown on the Design Drawings without compaction or working of the material that could cause intrusion through the non-woven geotextile into the underlying HDPE geonet.

c. The Sand Filter Layer shall be fine graded using low ground pressure equipment.

305.5 Placement of Protective Warning Layer Material:

a. Protective Warning Layer materials shall be placed to the thickness shown on the Design Drawings.

b. Compaction:

b1. Protective Warning Layer materials shall be placed and maintained to a uniform thickness, free of ruts and irregularities.

b2. The Protective Warning Layer shall be compacted by a minimum of four passes in each direction (perpendicular to each other) by the equipment spreading the material. The upper surface shall then be compacted with a minimum of four passes each way by a vibratory drum roller with a minimum static weight of 13 tons.

b3. Acceptance of the fill shall be based on ruts less than 1 inch between the last successive passes. Compaction testing is not required.

c. The Protective Warning Layer shall be fine graded using low ground pressure equipment.

305.6 Placement of Riprap Bedding Layer Material:

a. Riprap Bedding Layer materials shall be placed to the full thickness shown on the Design Drawings in one operation using methods which will not cause segregation of particle sizes.

b. Riprap Bedding Layer materials shall not be dropped onto the underlying Sand Filter Layer from a height exceeding 3 feet.

c. Compaction of the Riprap Bedding Layer is not required; however, the surface shall be reasonably even and free from mounds or windrows.

d. The Riprap Bedding Layer shall be fine graded using low ground pressure equipment.

305.7 Placement of Riprap:

a. Riprap shall be placed in general accordance with the methods described in ASTM D6825 in designated areas to the lines, grades, and thickness specified on the Design Drawings. Riprap shall be placed to the full thickness in one operation.

b. Riprap placement operations – including handling, stockpiling, and transporting – shall be accomplished in such a manner as to produce a reasonably well graded mass of rock with minimum percentage of voids, free from objectionable pockets of small stone and clusters of

large stones. The larger stones shall be well distributed and the entire mass of stones in their final positions shall be roughly graded to conform to the gradation specified.

c. Riprap shall be placed by dragline, clamshell, appropriately-sized excavators, or similar equipment, which shall be operated so as to place each load of material in approximately its final position without reworking and without excessive height drop (i.e., more than 12 inches).

d. Placing riprap in layers is not permitted.

e. Placing stones by dumping into chutes or other methods, which cause segregation of various stone sizes, is not permitted.

305.8 Grading Tolerances:

a. Horizontal and vertical tolerances for the Sand Filter Layer and Protective Warning Layer shall be as specified in Table 319050-2.

b. Thickness determination of riprap and Riprap Bedding Layer materials will be made at points selected by the CQA Contractor. When the average constructed thickness is less than the thickness specified on the Design Drawings, additional material shall be added to obtain the specified thickness at no additional cost to the Owner.

305.9 Reporting Damage:

a. If damage occurs (or is suspected to have occurred) to any portion of the LCRS, composite liner system, or existing HDPE geomembrane liner under the composite liner system while placing Granular Materials, the Earthwork Contractor shall report the damage(s) to the Owner immediately so that repairs can be performed without delay.

b. Repairs to a geosynthetic material shall be made as specified in Specification P-1402, Section 319020 (HDPE geomembrane liner and/or drainage geosynthetic) and/or Section 319025 (GCL). The Geosynthetics Contractor shall perform all geosynthetic repair work at no additional cost to the Owner.

c. Repairs to components of the LCRS shall be repaired as specified herein. The Earthwork Contractor shall perform all LCRS repair work at no additional cost to the Owner.

TABLE 319050-2
ACCEPTABLE DEVIATIONS FROM DESIGN LINES AND GRADES

Type of Installation (Excavation or Fill)	Maximum Acceptable Deviation from Line (feet)	Maximum Acceptable Deviation from Grade[1] (feet)
Granular Materials		
Top of Sand Filter Layer	±0.3	+0.1 to -0.0
Top of Protective Warning Layer		
Top of Riprap Bedding Layer		

END OF SECTION 319050

ATTACHMENT 1

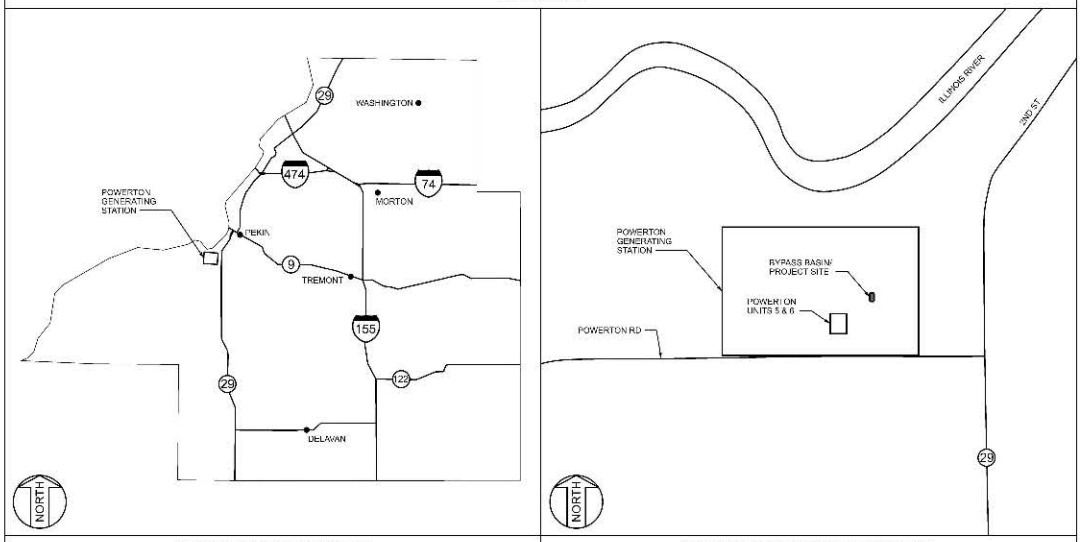
DESIGN DRAWINGS

DWG NO.	REV.	TITLE
POW-BBR-CSK-001	1	COVER SHEET
POW-BBR-CSK-002	1	GENERAL NOTES
POW-BBR-CSK-003	1	POST-EXCAVATION CONDITIONS
POW-BBR-CSK-004	0	TEMPORARY EROSION AND SEDIMENT CONTROL PLAN
POW-BBR-CSK-005	0	TEMPORARY EROSION AND SEDIMENT CONTROL DETAILS
POW-BBR-CSK-006	1	STRUCTURAL FILL GRADING PLAN
POW-BBR-CSK-007	1	COMPOSITE LINER & LEACHATE COLLECTION SYSTEM PLAN
POW-BBR-CSK-008	1	COMPOSITE LINER & LEACHATE COLLECTION SYSTEM SECTIONS & DETAILS
POW-BBR-CSK-009	1	INLET & OUTLET STRUCTURE DETAILS SHEET 1
POW-BBR-CSK-010	1	INLET & OUTLET STRUCTURE DETAILS SHEET 2

R001468

MIDWEST GENERATION, LLC
POWERTON GENERATING STATION
BYPASS BASIN RETROFIT PROJECT

VICINITY MAP



TAZEWELL COUNTY MAP (N.T.S)

SITE LOCATION ENLARGED PLAN (N.T.S)

PREPARED FOR:
MIDWEST GENERATION, LLC
POWERTON GENERATING STATION
13082 E. MANITO RD.
PEKIN, IL 61554

PREPARED BY:
SARGENT & LUNDY
55 E. MONROE ST.
CHICAGO, IL 60603

POWERTON BYPASS BASIN RETROFIT PROJECT DRAWING LIST	
DWG NO.	DRAWING TITLE
POW-BBR-CSK-001	COVER SHEET
POW-BBR-CSK-002	GENERAL NOTES
POW-BBR-CSK-003	POST-EXCAVATION CONDITIONS
POW-BBR-CSK-004	TEMPORARY EROSION AND SEDIMENT CONTROL PLAN
POW-BBR-CSK-005	TEMPORARY EROSION AND SEDIMENT CONTROL DETAILS
POW-BBR-CSK-006	STRUCTURAL FILL GRADING PLAN
POW-BBR-CSK-007	COMPOSITE LINER & LEACHATE COLLECTION SYSTEM PLAN
POW-BBR-CSK-008	COMPOSITE LINER & LEACHATE COLLECTION SYSTEM SECTIONS & DETAILS
POW-BBR-CSK-009	INLET & OUTLET STRUCTURE DETAILS SHEET 1
POW-BBR-CSK-010	INLET & OUTLET STRUCTURE DETAILS SHEET 2

PRELIMINARY
NOT FOR CONSTRUCTION

UNDERGROUND OR EMBEDDED UTILITIES MAY BE LOCATED WITHIN OR ADJACENT TO THE AREA IN WHICH EXCAVATION, DEMOLITION, FOUNDATION, OR MODIFICATION WORK IS TO BE PERFORMED.

REFERENCES RELATING TO THE UNDERGROUND OR EMBEDDED UTILITIES ARE PROVIDED TO ASSIST THE CONTRACTOR/INSTALLER IN THE FIELD LOCATING THOSE UTILITIES AND OTHER POSSIBLE UNDERGROUND OR EMBEDDED INTERFERENCES WITH THE WORK.

THE CONTRACTOR/INSTALLER SHALL EXERCISE DUE CAUTION DURING ALL EXCAVATION/FOUNDATION/DEMOLITION WORK.

FIELD INFORMATION

NO.	DESCRIPTION

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUB CONTRACTOR(S)) PERFORMING THE WORK.

RELEASE INFORMATION

REV.	DATE	DESCRIPTION
0	04-01-2024	FOR MATERIAL ORDER SPEC P-1402
1	04-19-2024	FOR BIDS SPEC P-1400

ISSUE PURPOSE: BIDS
SPECIFICATION: P-1400, P-1401 & P-1402
PROJECT NO.: 12661 181

CAD FILE NAME: POW-BBR-CSK-001.DGN
PREPARED BY: J. CHAVEZ
REVIEWED BY: T. DEHLIN
APPROVED BY: --

ANY MODIFICATION OR ADDITION TO THIS DRAWING BY AN ORGANIZATION OTHER THAN SARGENT & LUNDY, IS NOT THE RESPONSIBILITY OF SARGENT & LUNDY.

Sargent & Lundy LLC
SARGENT & LUNDY LLC
55 EAST MONROE STREET
CHICAGO, ILLINOIS 60603-5780

MWG
Midwest Generation, LLC

PROJECT
POWERTON
GENERATING STATION
BYPASS BASIN RETROFIT

DRAWING TITLE
COVER SHEET

DRAWING NUMBER: POW-BBR-CSK-001
REVISION: 1
SHEET 1 OF 1

4/19/2024 1:51:21 PM
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PL12793\0041864\Z:\Shared\INFO CENTER\DISCIPLINE REF MATERIAL\CIVIL\DESIGN\2-Powerton - CCR\Bypass Basin Retrofit Drawings\POW-BBR-CSK-001.dgn
Form DDC-001-01-08, ANSI (Imperial) MicroStation Border - Size E - 34 x 44
Revision 11A, Revision Date: 04-30-2010

R001469

GENERAL NOTES

1. ALL WORK SHALL BE PERFORMED ACCORDING TO THE REQUIREMENTS OF SPECIFICATIONS P-1400, P-1401, AND P-1402, AS NOTED ON THE DESIGN DRAWINGS.
2. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR AND HAVE CONTROL AND CHARGE OF CONSTRUCTION MEANS, METHODS, TECHNIQUES, WORK SEQUENCING, AND PROCEDURES IN CONNECTION WITH THE WORK. THE CONTRACTOR SHALL CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, COMPOSED OF THE DESIGN DRAWINGS AND SPECIFICATIONS.
3. ALL WORK DONE BY CONTRACTOR/INSTALLER PURSUANT TO THESE DRAWINGS SHALL: (A) CONFORM TO THE GOVERNING CONTRACT DOCUMENTS; (B) BE PERFORMED EXCLUSIVELY BY ITS TRAINED, COMPETENT PERSONNEL OR, WHERE PERMITTED, THAT OF ITS SUBCONTRACTOR(S); AND (C) COMPLY WITH ALL APPLICABLE SAFETY LAWS, REGULATIONS, PROGRAMS AND PRACTICES TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING THE CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUBCONTRACTOR(S)) PERFORMING THE WORK.
4. THE CONTRACTOR SHALL PERFORM INSTALLATION AND REMOVAL WORK IN A NEAT AND SKILLFUL MANNER, CAREFULLY TERMINATING WORK NEAR MATERIAL TO REMAIN IN PLACE. PRECAUTIONS SHALL BE TAKEN NOT TO DAMAGE OR DEFACE WORK, EXISTING FACILITIES, AND/OR MATERIAL TO REMAIN IN PLACE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY SUCH DAMAGE OR REPAIR THEREOF.
5. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF FEDERAL,STATE OR LOCAL CODES, STANDARDS AND SPECIFICATIONS.
6. ANY WORK FOUND DEFECTIVE OR NOT IN COMPLIANCE WITH THE REQUIREMENTS OF THE PROJECT SPECIFICATIONS OR THE DESIGN DRAWINGS SHALL BE REPLACED/FIXED AT NO ADDITIONAL COST TO THE OWNER.
7. EARTHWORK AND COMPACTION:

   SEE SPECIFICATION P-1400 FOR EARTHWORK AND COMPACTION REQUIREMENTS UNLESS OTHERWISE NOTED.
8. SOIL EROSION AND SEDIMENTATION CONTROL:

   PROPER SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSTALLED TO MEET THE APPLICABLE REGULATORY CODES AND THE PERMIT REQUIREMENTS.
9. CONSTRUCTION QUALITY ASSURANCE:
   - A. MATERIALS AND CONSTRUCTION PROCEDURES WILL BE SUBJECT TO INSPECTION AND TESTING BY A CONSTRUCTION QUALITY ASSURANCE (CQA) CONTRACTOR EMPLOYED BY THE OWNER. SUCH INSPECTIONS AND TESTS WILL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR PROVIDING MATERIALS AND INSTALLATION IN COMPLIANCE WITH SPECIFIED REQUIREMENTS.
   - B. THE OWNER RESERVES THE RIGHT, AT ANY TIME BEFORE FINAL ACCEPTANCE, TO REJECT MATERIALS OR WORKMANSHIP NOT COMPLYING WITH SPECIFIED REQUIREMENTS. THE CONTRACTOR SHALL CORRECT THE DEFICIENCIES WHICH THE INSPECTIONS AND TESTS HAVE INDICATED ARE NOT IN COMPLIANCE WITH SPECIFIED REQUIREMENTS.
   - C. CQA ACTIVITIES WILL BE PERFORMED AS DESCRIBED ON THE DESIGN DRAWINGS AND IN SPECIFICATION P-1401.
10. TOPOGRAPHIC MAP & COORDINATES:
    - A. EXISTING TOPOGRAPHY FOR THE PROJECT SITE SHOWN ON THE DESIGN DRAWINGS WAS PREPARED IN 2022 BY RUETTIGER, TONELLI & ASSOCIATES, INC.
    - B. THE PLANT COORDINATE SYSTEM SHOWN ON THE DESIGN DRAWINGS IS BASED ON THE ILLINOIS STATE PLANE, WEST ZONE, NORTH AMERICAN DATUM OF 1983 (2011) (NAD 83/2011), U.S. SURVEY FEET.
11. HORIZONTAL AND VERTICAL CONTROL:
    - A. THE BASIS FOR HORIZONTAL CONTROL IS AS DESCRIBED IN NOTE 10.
    - B. THE BASIS FOR VERTICAL CONTROL IS THE LOCAL PLANT DATUM.
    - C. THE FOLLOWING PERMANENT BENCHMARKS FOR HORIZONTAL AND VERTICAL CONTROL HAVE BEEN ESTABLISHED AT THE PROJECT SITE. THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY DISCREPANCIES IN EXISTING BENCHMARK LOCATIONS AND/OR ELEVATIONS.

ID #	NORTHING	EASTING	ELEVATION
528	1,412,067.47	2,432,531.82	465.02
1193	1,412,960.21	2,432,343.81	459.51

    - D. CONTRACTOR IS RESPONSIBLE FOR SETTING ADDITIONAL MONUMENTS AND CONTROL POINTS THAT THEY DEEM NECESSARY FOR COMPLETION OF THE WORK.
12. GEOTECHNICAL WORK:

    A STRUCTURAL STABILITY AND FACTOR OF SAFETY ASSESSMENT FOR THE ASH SURGE AND BYPASS BASINS WAS PREPARED BY GEOSYNTEC CONSULTANTS IN OCTOBER 2016. SITE SPECIFIC SOIL DATA AND GEOTECHNICAL RECOMMENDATIONS ARE PROVIDED AND REFERENCED THEREIN.
13. EXISTING CONDITIONS:
    - A. DIMENSIONS OF EXISTING WORK SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO THE START OF WORK IN ACCORDANCE WITH THE SPECIFICATION AS FIELD CONDITIONS MAY VARY FROM INFORMATION SHOWN ON THE DESIGN DRAWINGS. DIMENSIONS NOTED FOR REFERENCE (REF) INDICATE NOMINAL DIMENSIONS FOR THE EXISTING STRUCTURE, UTILITY, ETC. NEW WORK SHALL NOT BE LOCATED BASED ON THE REFERENCE DIMENSIONS.
    - B. PRIOR TO COMMENCING THE WORK, THE CONTRACTOR SHALL EXAMINE THE AREAS AND CONDITIONS UNDER WHICH THE RETROFIT WORK IS TO TAKE PLACE, AND NOTIFY THE OWNER IN WRITING OF CONDITIONS WHICH MAY IMPACT THE PROPER AND TIMELY COMPLETION OF THE WORK.
    - C. UNDERGROUND OR EMBEDDED UTILITIES MAY EXIST WITHIN THE AREA OF AND ADJACENT TO THE LIMITS OF THE WORK. THE LOCATION OR IDENTIFICATION OF SUCH UTILITIES HAS NOT BEEN VERIFIED BY THE OWNER OR BY S&L. CONTRACTOR/INSTALLER IS RESPONSIBLE FOR FIELD LOCATING AND IDENTIFYING UNDERGROUND OR EMBEDDED UTILITIES AND ANY OTHER UNDERGROUND OR EMBEDDED UTILITY DIMENSIONS.
    - D. REFERENCES USED HAVE BEEN IDENTIFIED ON EXCAVATION/FOUNDATION/DEMOLITION DRAWINGS AND HAVE BEEN PROVIDED TO ASSIST THE CONTRACTOR/INSTALLER IN THE FIELD LOCATING EXISTING UTILITIES AND OTHER POTENTIAL UNDERGROUND OR EMBEDDED INTERFERENCES. THESE REFERENCES ONLY SHOW THE APPROXIMATE LOCATION OF POTENTIAL UNDERGROUND OR EMBEDDED UTILITIES AND MAY NOT INDICATE OR REFLECT ALL EXISTING UNDERGROUND OR EMBEDDED UTILITIES OR THEIR ACTUAL LOCATIONS.
    - E. REFERENCES IDENTIFIED SHALL NOT SUBSTITUTE FOR THE CONTRACTOR'S/INSTALLER'S OBLIGATION TO FIELD LOCATE ANY UNDERGROUND OR EMBEDDED UTILITIES OR INTERFERENCES THAT MAY AFFECT THE WORK.
    - F. DUE CAUTION SHALL BE TAKEN DURING ANY EXCAVATION/FOUNDATION/DEMOLITION WORK WITHIN THE AREA OF, AND ADJACENT TO THE LIMITS OF THE WORK DUE TO POSSIBLE INTERFERENCES THAT MAY NOT BE REFLECTED ON THE REFERENCES IDENTIFIED.
    - G. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PRESERVATION AND RESTORATION OF THE EXISTING UTILITIES IF DAMAGED DURING CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER.

ABBREVIATIONS

ROAD AND GRADING

T/RD	TOP OF ROAD ELEVATION
EL OR ELEV	GRADE ELEVATION
INV	INVERT ELEVATION
HP	HIGH POINT
LP	LOW POINT
HPFS	HIGH POINT FINISH SURFACING
BC	BEGINNING OF CURVE (HORIZONTAL CURVE)
EC	END OF CURVE (HORIZONTAL CURVE)
PI	POINT OF INTERSECTION (HORIZONTAL CURVE)
PT	POINT OF TANGENT
PC	POINT OF CURVE
STA	STATION
VC	VERTICAL CURVE
BVC	BEGINNING OF VERTICAL CURVE
EVC	END OF VERTICAL CURVE
PIVC	POINT OF INTERSECTION OF VERT. CURVE
PRC	POINT OF REVERSE CURVE
PCC	POINT OF COMPOUND CURVE
R	RADIUS
T	TANGENT
L	LENGTH OF CURVE
D	DEGREE OF CURVE
I	INTERIOR/DEFLECTION ANGLE OF CURVE
UN	UNLESS NOTED
ROW	RIGHT OF WAY
OHL	OVERHEAD LINE
OC	ON CENTER
WL	WATER LEVEL
HWL	HIGH WATER LEVEL
YR	YEAR
DS	DOWNSTREAM
US	UPSTREAM
CL	CENTERLINE
AC	ACRE
N.T.S.	NOT TO SCALE
LWL	LOW WATER LEVEL

SYMBOLS

	CENTERLINE OF NATURAL DRAINAGE PATTERN
	VALLEY LINE OR "V" DITCH
	SWALE
	CENTERLINE OF TRAPEZOIDAL DRAINAGE
	TRAPEZOIDAL DRAINAGE DITCH WITH BOTTOM WIDTH GREATER THAN 2'. BOTTOM WIDTH AND SIDE SLOPE SHOWN ON PLAN OR DETAIL
	RIPRAP EROSION PROTECTION
C-1	PIPE CULVERT CULVERT NUMBER SHOWN
DOWN	TOP OF EMBANKMENT SLOPE OR DITCH SIDE SLOPE AND DIRECTION OF SLOPE
3:1	HORIZONTAL TO VERTICAL SLOPE WHEN SLOPE IS CONSTANT
SLOPE VARIES	SLOPE IS NOT CONSTANT
1%	DIRECTION OF ROAD OR AREA SLOPE. PERCENT OF SLOPE SHOWN WHERE APPLICABLE
	TOP OF DIKE
R=50'	RADIUS OF CURVATURE
1	SECTION NUMBER (FIRST NUMBER=DRAWING SECOND NUMBER=SECTION NUMBER)
	CHAIN LINK FENCE
PLAN SECTION	WATER LINE
G—G	BURIED GAS LINE
E—E	BURIED ELECTRICAL CABLE
	INDEX CONTOUR
	INTERMEDIATE CONTOUR
405	ELEVATION CONTOUR
	EXISTING DEPRESSION
x 408.8	SPOT ELEVATION
x	VERTICAL CONTROL POINT
	HORIZONTAL CONTROL POINT
	EXISTING FIRE HYDRANT
	EXISTING UTILITY POLE
	EXISTING UTILITY POLE WITH GUY
	WOOD OR BRUSH OUTLINE
	GRATING
	SINGLE SIGN ON POST
	DOUBLE SIGN ON POST
	GUARD POST

SYMBOLS & ABBREVIATIONS

EROSION CONTROL SYMBOLS

S	SILT FENCE
IP	INLET PROTECTION
	ROCK CHECK

SEWERS AND UNDERGROUND PIPE

CB	CATCH BASIN
CO	CLEANOUT
MH	MANHOLE
RE	RIM ELEVATION
℄	CENTERLINE
S	SLOPE
BOP	BOTTOM OF PIPE
PVC	POLY VINYL CHLORIDE PIPE
HDPE	HIGH DENSITY POLYETHYLENE PIPE
RCP	REINFORCED CONCRETE PIPE
CMP	CORRUGATED METAL PIPE
CHDPE	CORRUGATED HIGH DENSITY POLYETHYLENE PIPE
CISP	CAST IRON SOIL PIPE
DIWP	DUCTILE IRON WATER PIPE
STL	CARBON STEEL PIPE
IP	IN PLACE
SWS	STORM WATER SEWER
OWS	OILY WATER SEWER
SAN	SANITARY SEWER
PWS	PROCESS WASTE SEWER
C.S.	CARBON STEEL

ROAD, PAVEMENT AND SURFACING SYMBOLS

	ASPHALT OR CONCRETE PAVED ROAD. OUTER LINES SHOW OVERALL WIDTH. INTERIOR LINES SHOW EDGES OF PAVEMENT.
	ROCK SURFACED ROAD
I	ISOLATION JOINT
IT	THICKENED EDGE ISOLATION JOINT
TE	THICKENED EDGE EXPANSION JOINT
T	PAVEMENT THICKENED EDGE
C	CONTRACTION JOINT
	CONCRETE PAVING
	CRUSHED ROCK SURFACING
	ASPHALT PAVEMENT
	6" THICK CRUSHED STONE GROUND COVER SURFACING
	4" THICK SEEDED TOPSOIL

HOLD INFORMATION

NO.	DESCRIPTION

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUB-CONTRACTOR(S)) PERFORMING THE WORK.

RELEASE INFORMATION

REV.	DATE	DESCRIPTION
0	04-04-2024	FOR MATERIAL ORDER SPEC P-1402
1	04-19-2024	FOR BIDS SPEC P-1400

ISSUE PURPOSE: BIDS

SPECIFICATION: P-1400, P-1401 & P-1402

PROJECT NO.: 12661-181

CAD FILE NAME: POW-BBR-CSK-002.DGN

PREPARED BY: J. CHAVEZ

REVIEWED BY: T. DEHLIN

APPROVED BY: --

ANY MODIFICATION OR ADDITION TO THIS DRAWING BY AN ORGANIZATION OTHER THAN SARGENT & LUNDY, IS NOT THE RESPONSIBILITY OF SARGENT & LUNDY.

Sargent & Lundy LLC

SARGENT & LUNDY LLC
55 EAST MONROE STREET
CHICAGO, ILLINOIS 60603-5780

MWG
Midwest Generation, LLC

PROJECT

POWERTON
GENERATING STATION
BYPASS BASIN RETROFIT

DRAWING TITLE

GENERAL NOTES

UNDERGROUND OR EMBEDDED UTILITIES MAY BE LOCATED WITHIN OR ADJACENT TO THE AREA IN WHICH EXCAVATION, DEMOLITION, FOUNDATION, OR MODIFICATION WORK IS TO BE PERFORMED.

REFERENCES RELATING TO THE UNDERGROUND OR EMBEDDED UTILITIES ARE PROVIDED TO ASSIST THE CONTRACTOR/INSTALLER IN THE FIELD LOCATING THOSE UTILITIES AND OTHER POSSIBLE UNDERGROUND OR EMBEDDED INTERFERENCES WITH THE WORK.

THE CONTRACTOR/INSTALLER SHALL EXERCISE DUE CAUTION DURING ALL EXCAVATION/FOUNDATION/DEMOLITION WORK.

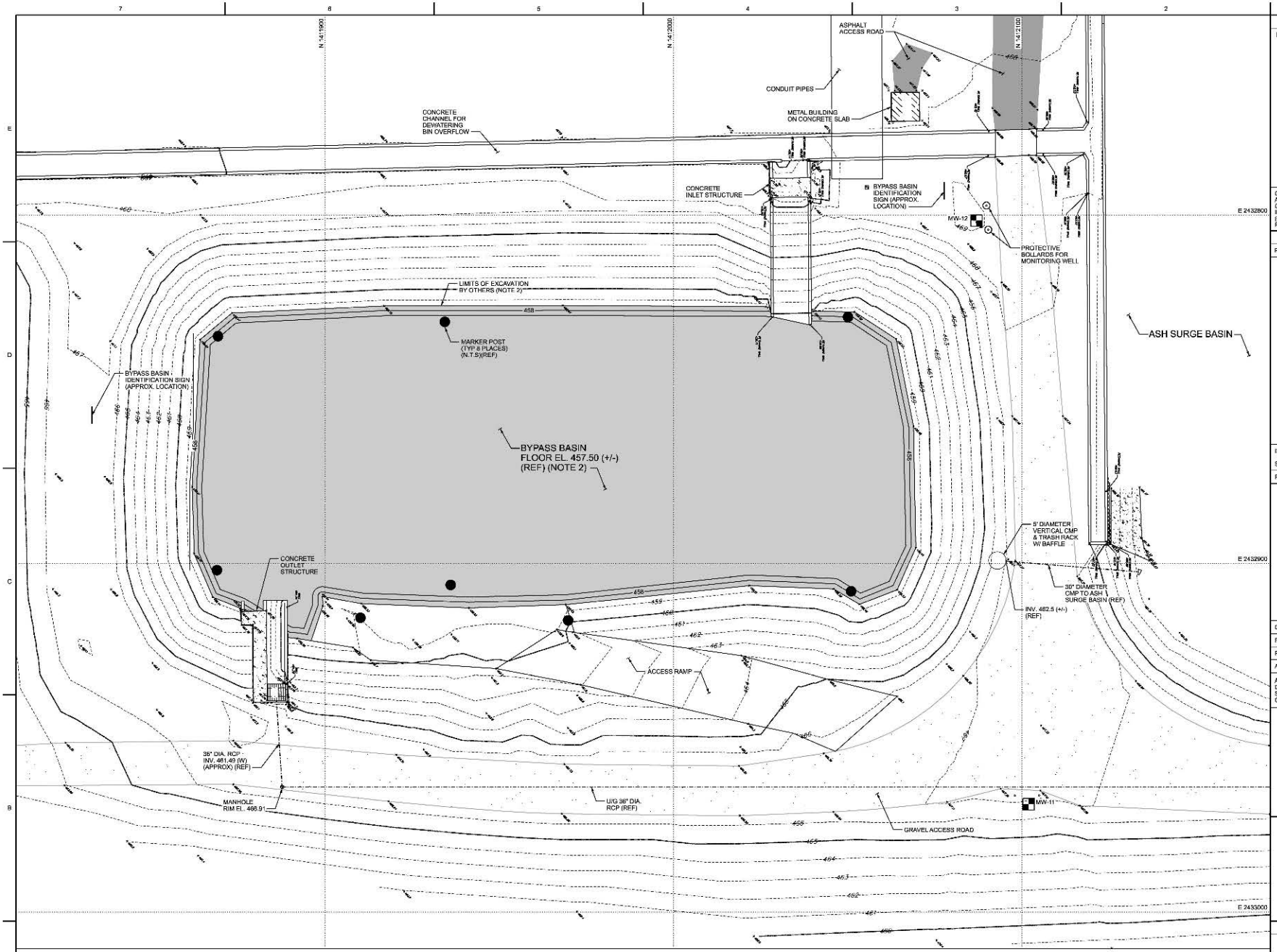
PRELIMINARY
NOT FOR CONSTRUCTION

DRAWING NUMBER	REVISION
POW-BBR-CSK-002	1

SHEET 1 OF 1

PL12783/0M1864/Z:\Shared\INFO CENTER\DISCIPLINE REF MATERIAL\CIVIL\DESIGN\2-Powerton - CCR\Bypass Basin Retrofit Drawings\POW-BBR-CSK-002.dgn
Form GDG-3401-01-38, ANSI (Imperial) MicroStation Border - Size E - 34 x 44
Revision 11A, Revision Date: 04-30-2010

R001470



NOTES

1. FOR GENERAL NOTES, ABBREVIATIONS, AND SYMBOLS, SEE DRAWING POW-BBR-CSK-002.
2. EXCAVATION / REMOVAL OF BYPASS BASIN'S GRANULAR PROTECTIVE LAYER MATERIALS AND UPPER NON-WOVEN GEOTEXTILE WILL BE PERFORMED BY OTHERS. MATERIAL WILL BE REMOVED TO TOP OF BASIN'S EXISTING GEOMEMBRANE LINER. LIMITS OF EXCAVATION / REMOVAL AND CONTOURS WITHIN LIMITS OF EXCAVATION / REMOVAL ARE APPROXIMATE.

LEGEND

MW-12	MONITORING WELL
465	MAJOR CONTOUR (POST-EXCAVATION)
464	MINOR CONTOUR (POST-EXCAVATION)

REFERENCE DRAWINGS

	NATURAL RESOURCE TECHNOLOGY
D1965C030-02	BYPASS BASIN LINER REPLACEMENT WARNING LAYER PLAN
	NUS CORPORATION
5925-C-5001	ASH SURGE BASIN BY PASS PLAN AND PROFILE
5925-C-5003	ASH SURGE BASIN BY PASS MISCELLANEOUS DETAILS

NORTH

10' 0' 10' 20'
GRAPHIC SCALE

PRELIMINARY
NOT FOR CONSTRUCTION

UNDERGROUND OR EMBEDDED UTILITIES MAY BE LOCATED WITHIN OR ADJACENT TO THE AREA IN WHICH EXCAVATION, DEMOLITION, FOUNDATION, OR MODIFICATION WORK IS TO BE PERFORMED.

REFERENCES RELATING TO THE UNDERGROUND OR EMBEDDED UTILITIES ARE PROVIDED TO ASSIST THE CONTRACTOR/INSTALLER IN THE FIELD LOCATING THOSE UTILITIES AND OTHER POSSIBLE UNDERGROUND OR EMBEDDED INTERFERENCES WITH THE WORK.

THE CONTRACTOR/INSTALLER SHALL EXERCISE DUE CAUTION DURING ALL EXCAVATION/FOUNDATION/DEMOLITION WORK.

AS-BUILT INFORMATION

NO.	DESCRIPTION

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTORS/INSTALLER'S PERSONNEL (OR THAT OF ITS SUB-CONTRACTOR(S)) PERFORMING THE WORK.

RELEASE INFORMATION

REV.	DATE	DESCRIPTION
0	04-04-2024	FOR MATERIAL ORDER SPEC P-1402
1	04-19-2024	FOR BIDS SPEC P-1400

ISSUE PURPOSE:	BIDS
SPECIFICATION:	P-1400, P-1401 & P-1402
PROJECT NO.:	12661-181
CAD FILE NAME:	POW-BBR-CSK-003.DGN
PREPARED BY:	J. CHAVEZ
REVIEWED BY:	T. DEHLIN
APPROVED BY:	--

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MWG
Midwest Generation, LLC

PROJECT

POWERTON
GENERATING STATION
BYPASS BASIN RETROFIT

DRAWING TITLE

POST-EXCAVATION CONDITIONS

DRAWING NUMBER	REVISION
POW-BBR-CSK-003	1

SHEET 1 OF 1

PL:\279300\#\18842\Shared\NFO CENTER\DISCIPLINE REF MATERIAL\CIVIL\DSS\CIV2-Powerton - CCR\Bypass Basin Retrofit Drawings\POW-BBR-CSK-003.dgn
Form GDG-0401-01-06, ANSI (Imperial) MicroStation Border - Size E - 34 x 44
Revision 11A, Revision Date: 04-30-2010
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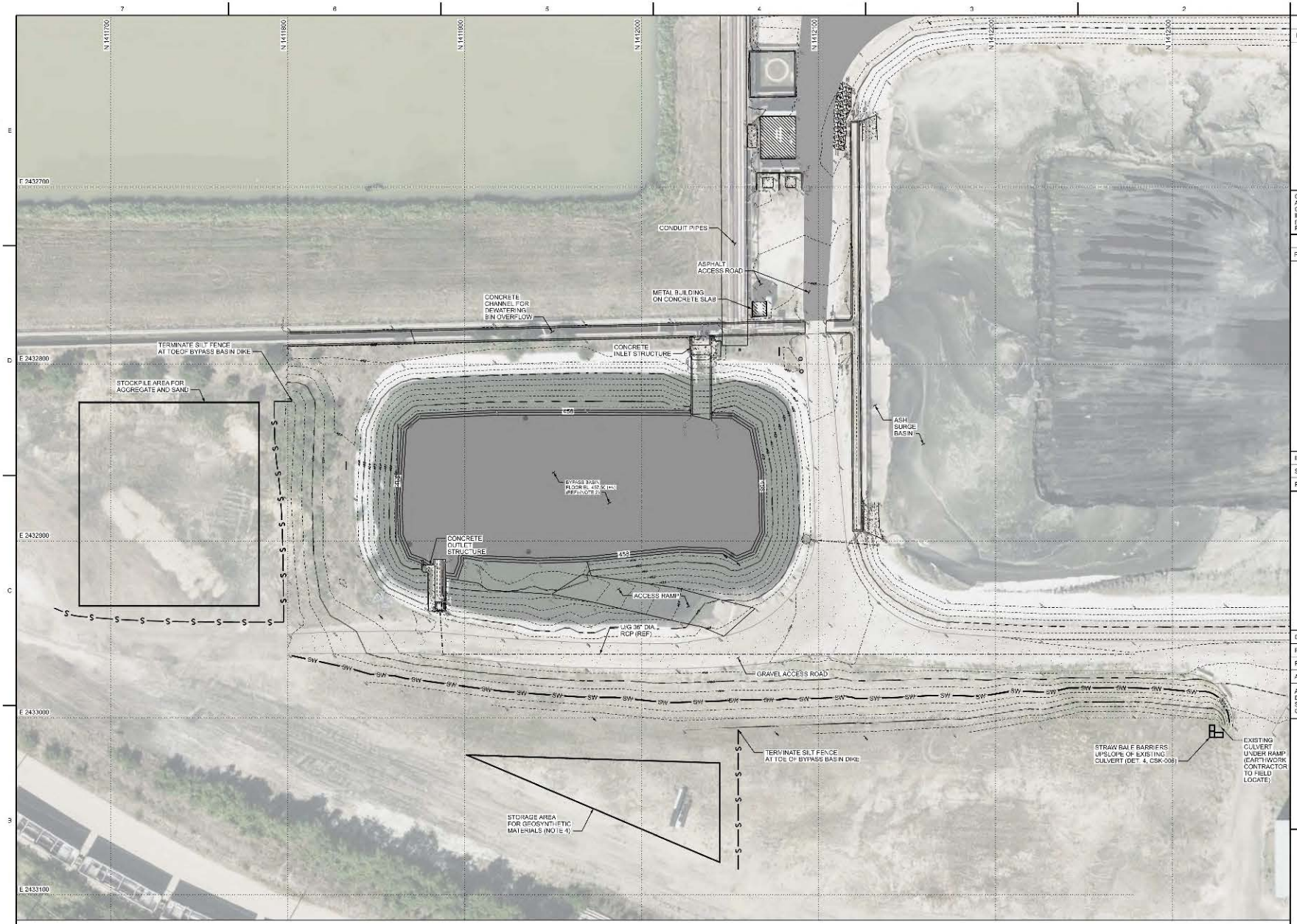

NOTES	LEGEND
1. ALL WORK SHALL BE PERFORMED AND INSTALLED PER SPECIFICATION P-1400 UNLESS NOTED OTHERWISE.	—S—S— SILT FENCE (DET. 1, CSK-005)
2. FOR GENERAL NOTES, ABBREVIATIONS, AND SYMBOLS, SEE DRAWING POW-BBR-CSK-002.	—SW— STRAW WATTLE (DET. 3, CSK-005)
3. FOR TEMPORARY EROSION AND SEDIMENT CONTROL DETAILS AND NOTES, SEE DRAWING POW-BBR-CSK-005.	**REFERENCE DRAWINGS**
4. EARTHWORK CONTRACTOR SHALL INSTALL SILT FENCE DOWNSLOPE OF GEOSYNTHETIC MATERIAL STORAGE AREA BEFORE PREPARING / IMPROVING STORAGE AREA IN ACCORDANCE WITH SPECIFICATION P-1400, SECTION 319005.	CSK-005 — SARGENT & LUNDY: TEMPORARY EROSION AND SEDIMENT CONTROL DETAILS

NORTH

20' 0' 20' 40'
GRAPHIC SCALE

PRELIMINARY
NOT FOR CONSTRUCTION

UNDERGROUND OR EMBEDDED UTILITIES MAY BE LOCATED WITHIN OR ADJACENT TO THE AREA IN WHICH EXCAVATION, DEMOLITION, FOUNDATION, OR MODIFICATION WORK IS TO BE PERFORMED.

REFERENCES RELATING TO THE UNDERGROUND OR EMBEDDED UTILITIES ARE PROVIDED TO ASSIST THE CONTRACTOR/INSTALLER IN THE FIELD LOCATING THOSE UTILITIES AND OTHER POSSIBLE UNDERGROUND OR EMBEDDED INTERFERENCES WITH THE WORK.

THE CONTRACTOR/INSTALLER SHALL EXERCISE DUE CAUTION DURING ALL EXCAVATION/FOUNDATION/DEMOLITION WORK.

R001471

HOLD INFORMATION

NO.	DESCRIPTION

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUB-CONTRACTOR(S)) PERFORMING THE WORK.

RELEASE INFORMATION

REV.	DATE	DESCRIPTION
0	04-19-2024	FOR BIDS SPEC P-1400

ISSUE PURPOSE:	BIDS
SPECIFICATION:	P-1400
PROJECT NO.:	12661-181

CAD FILE NAME:	POW-BBR-CSK-004.DGN
PREPARED BY:	J. CHAVEZ
REVIEWED BY:	T. DEHLIN
APPROVED BY:	--

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55 EAST MONROE STREET
CHICAGO, ILLINOIS 60603-5780

MWG
Midwest Generation, LLC

PROJECT

POWERTON
GENERATING STATION
BYPASS BASIN RETROFIT

DRAWING TITLE

TEMPORARY EROSION AND SEDIMENT CONTROL PLAN

DRAWING NUMBER	REVISION
POW-BBR-CSK-004	0

SHEET 1 OF 1

PLOT BY: Shaer, Hind (SHINDO) on 4/19/2024 11:09:27 AM
Form CDC-0101-04, ANSI (Imperial) Mod-Shaker Border - Size E - 34 x 44
(Revision 11A, Revision Date: 04-30-2019)
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R001472

SEDIMENT AND EROSION CONTROL MEASURES DURING CONSTRUCTION:

THE EARTHWORK CONTRACTOR IS REQUIRED TO FOLLOW BEST MANAGEMENT PRACTICES (BMPS) ACCORDING TO THE PROJECT STORMWATER POLLUTION PREVENTION PLAN (SWPPP). THE DESIGN DRAWINGS, AND PROJECT SPECIFICATIONS. THESE BMPS INCLUDE, BUT ARE NOT LIMITED TO:

1. PROVIDING TEMPORARY CRUSHED STONE CONSTRUCTION ENTRANCES. MINIMUM WIDTH SHALL BE AS SHOWN IN DETAIL 2, INCREASED AS NECESSARY TO ACCOMMODATE LARGER VEHICLES.
2. PROVIDING SILT FENCES, STRAW WATTLES, AND STRAW BALE BARRIERS UNTIL FINAL SITE STABILIZATION IS ACHIEVED.
3. ENCLOSING MATERIAL STOCKPILE, STORAGE, AND LAYDOWN AREAS WITH SILT FENCES AS SHOWN ON DRAWING POW-BBR-CSK-004.
4. PERIODICALLY INSPECTING SILT FENCES, STRAW WATTLES, STRAW BALE BARRIERS, FOR ACCUMULATED SEDIMENT AND REMOVING BUILT UP SEDIMENT WHEN IT HAS REACHED THE LESSER OF ONE-THIRD OF THE HEIGHT OF THE BARRIER OR SIX INCHES. ALL INSPECTIONS SHALL BE PERFORMED AT A MINIMUM OF ONCE EVERY SEVEN CALENDAR DAYS OR WITHIN 24 HOURS OF THE END OF A STORM EVENT THAT PRODUCES 0.5 INCH OR MORE OF PRECIPITATION.
5. PERIODICALLY INSPECTING SILT FENCES FOR DEPTH OF SEDIMENT, TEARS IN THE FABRIC, AND FABRIC ATTACHMENT TO POSTS. INSPECTING POSTS TO ENSURE THEY ARE FIRMLY ANCHORED IN THE GROUND.
6. IN ADDITION TO THE SITE PERIMETER CONTROLS SHOWN AND GENERAL MEASURES, PERFORM WORK ACCORDING TO BEST MANAGEMENT PRACTICES TO MINIMIZE SOIL EROSION AND CONTROL SEDIMENT MIGRATION.
7. THE EARTHWORK CONTRACTOR SHALL EMPLOY CONSTRUCTION METHODS AND MEANS THAT KEEP FUGITIVE DUST TO A MINIMUM AND SHALL NOT DISCHARGE INTO THE ATMOSPHERE OF SUCH QUANTITY, CHARACTER OR DURATION THAT IT INTERFERES WITH THE COMFORTABLE ENJOYMENT OF LIFE AND PROPERTY OR IS HARMFUL TO PLANTS OR ANIMALS. THE EARTHWORK CONTRACTOR SHALL PROVIDE SUFFICIENT WATER AND MEANS OF STORING, SPREADING AND SPRAYING AT ALL TIMES DURING CONSTRUCTION TO CONTROL FLYING DUST AS NECESSITATED BY WEATHER CONDITIONS AND CONSTRUCTION ACTIVITIES.

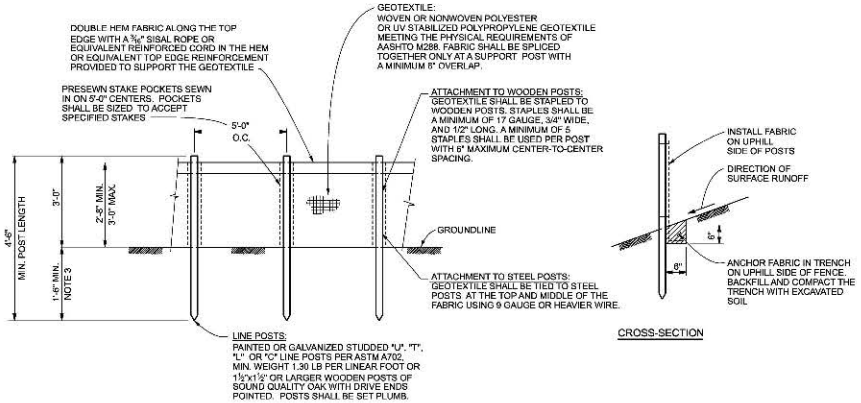
MAINTENANCE:

THE EARTHWORK CONTRACTOR SHALL PROVIDE, INSPECT, AND MAINTAIN ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES THROUGHOUT CONSTRUCTION.

ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO THE ROADWAY AND PUBLIC RIGHT-OF-WAY MUST BE REMOVED IMMEDIATELY.

THE CONTRACTOR SHALL WORK IN SEQUENCE AS STATED BELOW:

1. INSTALL STABILIZED CONSTRUCTION ENTRANCE.
2. INSTALL PERIMETER EROSION AND SEDIMENT CONTROL (SILT FENCE, STRAW WATTLES, STRAW BALE BARRIERS, AND CONSTRUCTION ENTRANCE) PRIOR TO ANY LAND DISTURBING ACTIVITIES AS SHOWN ON THE DESIGN DRAWINGS AND AS REQUIRED TO CONTROL EROSION.
3. INSTALL SILT FENCING AROUND EQUIPMENT AND MATERIAL STORAGE / STAGING AREAS.
4. INSTALL SILT FENCING AND STRAW WATTLES DOWNGRADIENT OF PROPOSED CONSTRUCTION AREAS AS REQUIRED.
5. INSTALL STRAW BALE BARRIERS UPSTREAM OF EXISTING CULVERT AS SHOWN ON DRAWING POW-BBR-CSK-004.
6. PERIODICALLY INSPECT EROSION AND SEDIMENT CONTROLS THROUGHOUT CONSTRUCTION. REMOVE SEDIMENT AND REPAIR CONTROLS AS REQUIRED.



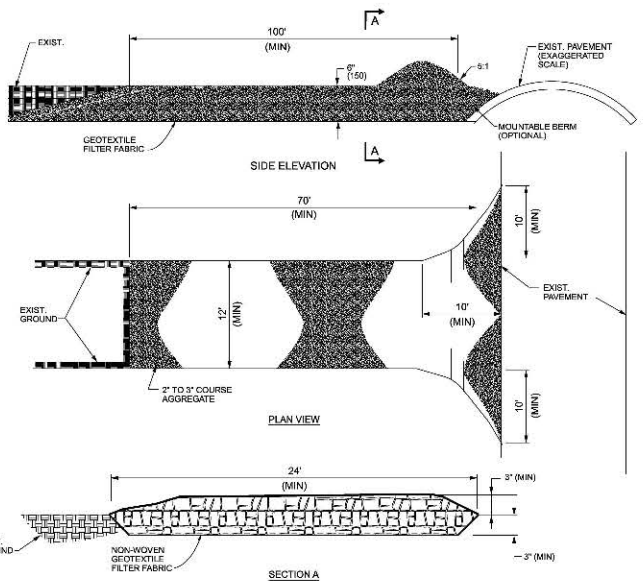
FRONT ELEVATION

CROSS-SECTION

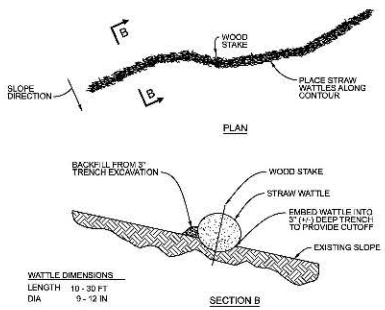
NOTES:

1. AFTER INSTALLATION, THE EARTHWORK CONTRACTOR SHALL BE RESPONSIBLE FOR SATISFACTORILY MAINTAINING THE FENCE. THE EARTHWORK CONTRACTOR SHALL INSPECT FENCES AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. THE EARTHWORK CONTRACTOR IS RESPONSIBLE FOR REMOVING AND REPLACING SILT FENCING NOT FUNCTIONING DUE TO CLOGGING, DAMAGE OR DETERIORATION.
2. THE EARTHWORK CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL AND DISPOSAL OF FENCING WHEN, AS DETERMINED BY THE PROJECT MANAGERS, THE FENCING IS NO LONGER NEEDED.
3. WHERE 16" DEPTH IS IMPOSSIBLE TO ACHIEVE THE POSTS SHALL BE SECURED TO PREVENT OVERTURNING OF THE FENCE DUE TO SEDIMENT LOAD.

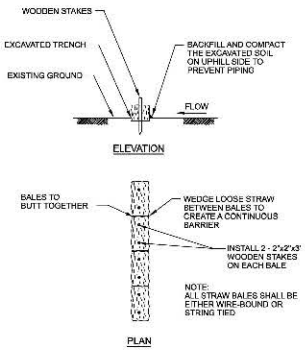
TYPICAL DETAIL
SELF-SUPPORTING SILT FENCE
DETAIL 1
N.T.S.



TYPICAL DETAIL
STONE CONSTRUCTION ENTRANCE
DETAIL 2
N.T.S.



CONTOUR STRAW WATTLES
DETAIL 3
N.T.S.



STRAW BALE BARRIERS
DETAIL 4
N.T.S.

NOTES
1. ALL WORK SHOWN ON THIS DRAWING SHALL BE FURNISHED AND INSTALLED BY SPECIFICATION P-1400 UNLESS NOTED OTHERWISE.
2. FOR GENERAL NOTES, ABBREVIATIONS, AND SYMBOLS, SEE DRAWING POW-BBR-CSK-002.

REFERENCE DRAWINGS	
CSK-004	SARGENT & LUNDY TEMPORARY EROSION AND SEDIMENT CONTROL PLAN

UNDERGROUND OR EMBEDDED UTILITIES MAY BE LOCATED WITHIN OR ADJACENT TO THE AREA IN WHICH EXCAVATION, DEMOLITION, FOUNDATION, OR MODIFICATION WORK IS TO BE PERFORMED.

REFERENCES RELATING TO THE UNDERGROUND OR EMBEDDED UTILITIES ARE PROVIDED TO ASSIST THE CONTRACTOR/INSTALLER IN THE FIELD LOCATING THOSE UTILITIES AND OTHER POSSIBLE UNDERGROUND OR EMBEDDED INTERFERENCES WITH THE WORK.

THE CONTRACTOR/INSTALLER SHALL EXERCISE DUE CAUTION DURING ALL EXCAVATION/FOUNDATION/DEMOLITION WORK.

PRELIMINARY
NOT FOR CONSTRUCTION

ISSUED INFORMATION	
NO.	DESCRIPTION

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTORS/INSTALLER'S PERSONNEL (OR THAT OF ITS SUB-CONTRACTOR(S)) PERFORMING THE WORK.

RELEASE INFORMATION

REV.	DATE	DESCRIPTION
0	04-19-2024	FOR BIDS SPEC P-1400

ISSUE PURPOSE:	BIDS
SPECIFICATION:	P-1400
PROJECT NO.:	12661-181

CAD FILE NAME:	POW-BBR-CSK-005.DGN
PREPARED BY:	J. CHAVEZ
REVIEWED BY:	T. DEHLIN
APPROVED BY:	--

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Sargent & Lundy LLC

SARGENT & LUNDY LLC
55 EAST MONROE STREET
CHICAGO, ILLINOIS 60603-5780

MWG
Midwest Generation, LLC

PROJECT

POWERTON
GENERATING STATION
BYPASS BASIN RETROFIT

DRAWING TITLE

TEMPORARY EROSION AND SEDIMENT CONTROL DETAILS

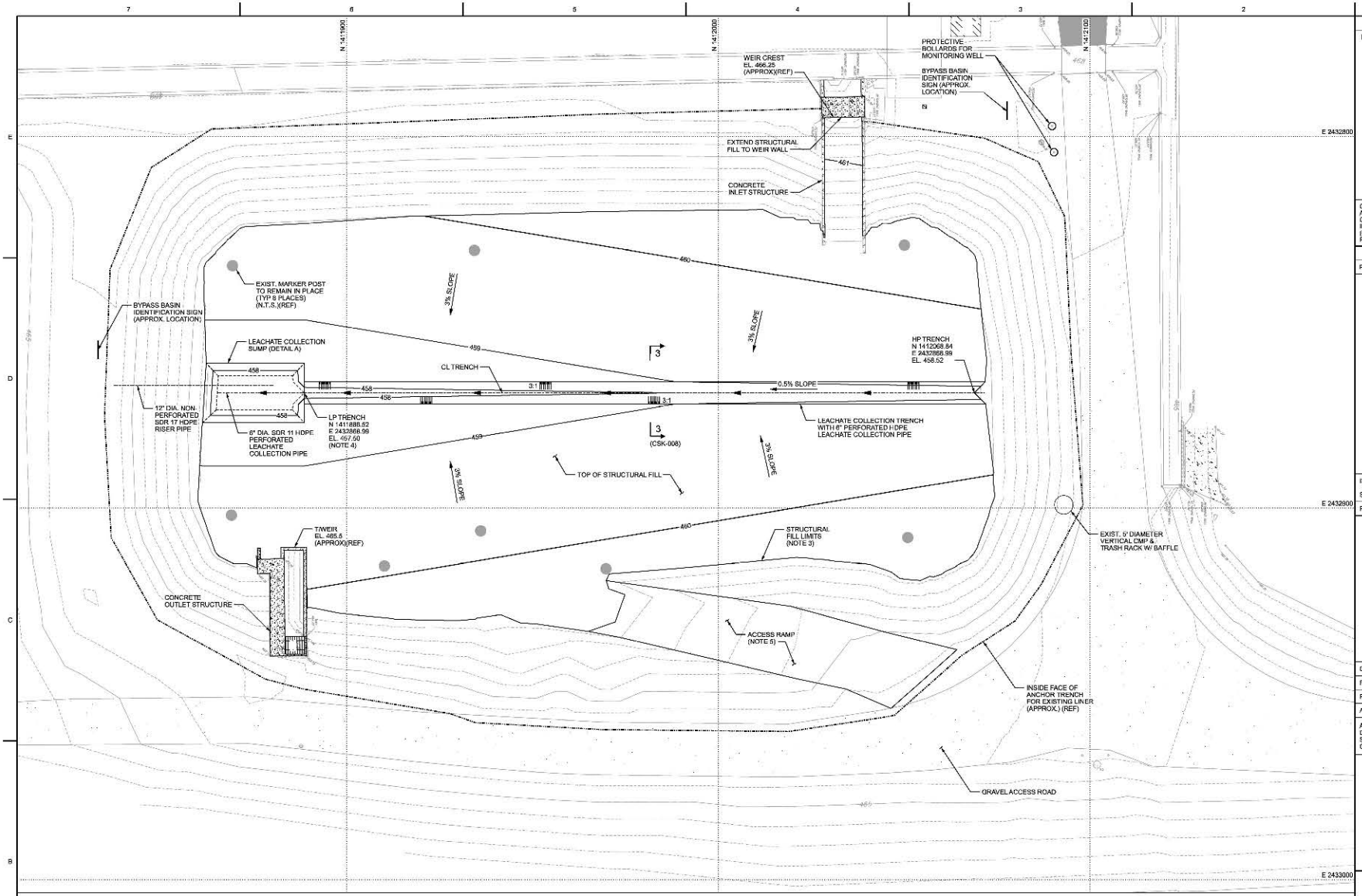
DRAWING NUMBER	REVISION
POW-BBR-CSK-005	0

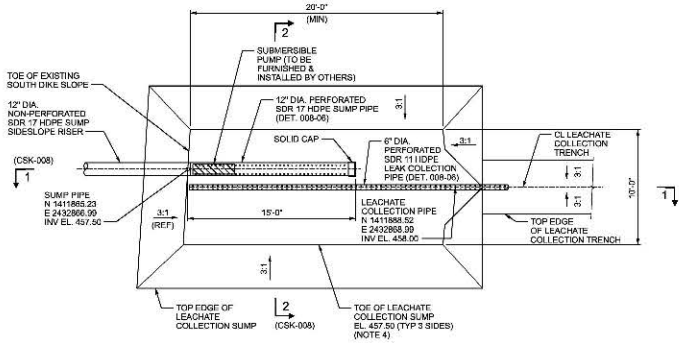
SHEET 1 OF 1

PL:\2793\0#\18842\Shared\NFO CENTER\DISCIPLINE REF MATERIAL\CIVIL\DS\SIV2-Powerton - CCR\Bypass Basin Retrofit Drawings\POW-BBR-CSK-005.dgn
Form GDG-0401-01-06, ANSI (Imperial) MicroStation Border - Size E - 34 x 44
Revision 11A, Revision Date: 04-30-2010

4/19/2024 11:38:42 AM ...\POW-BBR-CSK-005.dgn

R001473





PLAN VIEW OF LEACHATE COLLECTION TRENCH & SUMP
DETAIL A
SCALE: 1/8"=1'-0"

PRELIMINARY
NOT FOR CONSTRUCTION

UNDERGROUND OR EMBEDDED UTILITIES MAY BE LOCATED WITHIN OR ADJACENT TO THE AREA IN WHICH EXCAVATION, DEMOLITION, FOUNDATION, OR MODIFICATION WORK IS TO BE PERFORMED.

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NORTH

10' 0' 10' 20'
GRAPHIC SCALE

LEGEND

465	MAJOR CONTOUR
464	MINOR CONTOUR

NOTES

1. ALL WORK SHOWN ON THIS DRAWING SHALL BE FURNISHED AND INSTALLED BY SPECIFICATION P-1400 UNLESS NOTED OTHERWISE.
2. FOR GENERAL NOTES, ABBREVIATIONS, AND SYMBOLS, SEE DRAWING POW-BBR-CSK-002.
3. STRUCTURAL FILL SHALL EXTEND TO BYPASS BASIN'S EXISTING GEOMEMBRANE LINER.
4. AT LOW POINTS, LEACHATE COLLECTION TRENCH AND SUMP ELEVATIONS SHALL MATCH EXISTING GEOMEMBRANE LINER ELEVATION.
5. SEE SECTION 8 ON DRAWING POW-BBR-CSK-010 FOR STRUCTURAL FILL REQUIREMENTS ALONG ACCESS RAMP.

REFERENCE DRAWINGS

	SARGENT & LUNDY
CSK-008	COMPOSITE LINER & LEACHATE COLLECTION SYSTEM SECTIONS & DETAILS
CSK-010	INLET & OUTLET STRUCTURE DETAILS SHEET 2
	NUS CORPORATION
5295-C-5501	ASH SURGE BASIN BY PASS, BASIN INLET STRUCTURE
5295-C-5502	ASH SURGE BASIN BY PASS, BASIN OUTLET STRUCTURE
	NATURAL RESOURCE TECHNOLOGY
D1965C020-02	LINER SUBGRADE PREPARATION
D1965C031-02	DETAILS AND SECTIONS

ISSUE INFORMATION

NO.	DESCRIPTION

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTORS/INSTALLER'S PERSONNEL (OR THAT OF ITS SUB-CONTRACTOR(S)) PERFORMING THE WORK.

RELEASE INFORMATION

REV.	DATE	DESCRIPTION
0	04-04-2024	FOR MATERIAL ORDER SPEC P-1402
1	04-19-2024	FOR BIDS SPEC P-1400

ISSUE PURPOSE: BIDS
SPECIFICATION: P-1400, P-1401 & P-1402
PROJECT NO.: 12661-181

CAD FILE NAME: POW-BBR-CSK-006.DGN
PREPARED BY: J. CHAVEZ
REVIEWED BY: T. DEHLIN
APPROVED BY: --

ANY MODIFICATION OR ADDITION TO THIS DRAWING BY AN ORGANIZATION OTHER THAN SARGENT & LUNDY, IS NOT THE RESPONSIBILITY OF SARGENT & LUNDY.

Sargent & Lundy LLC
SARGENT & LUNDY LLC
55 EAST MONROE STREET
CHICAGO, ILLINOIS 60603-5780

MWG
Midwest Generation, LLC

PROJECT

POWERTON
GENERATING STATION
BYPASS BASIN RETROFIT

DRAWING TITLE

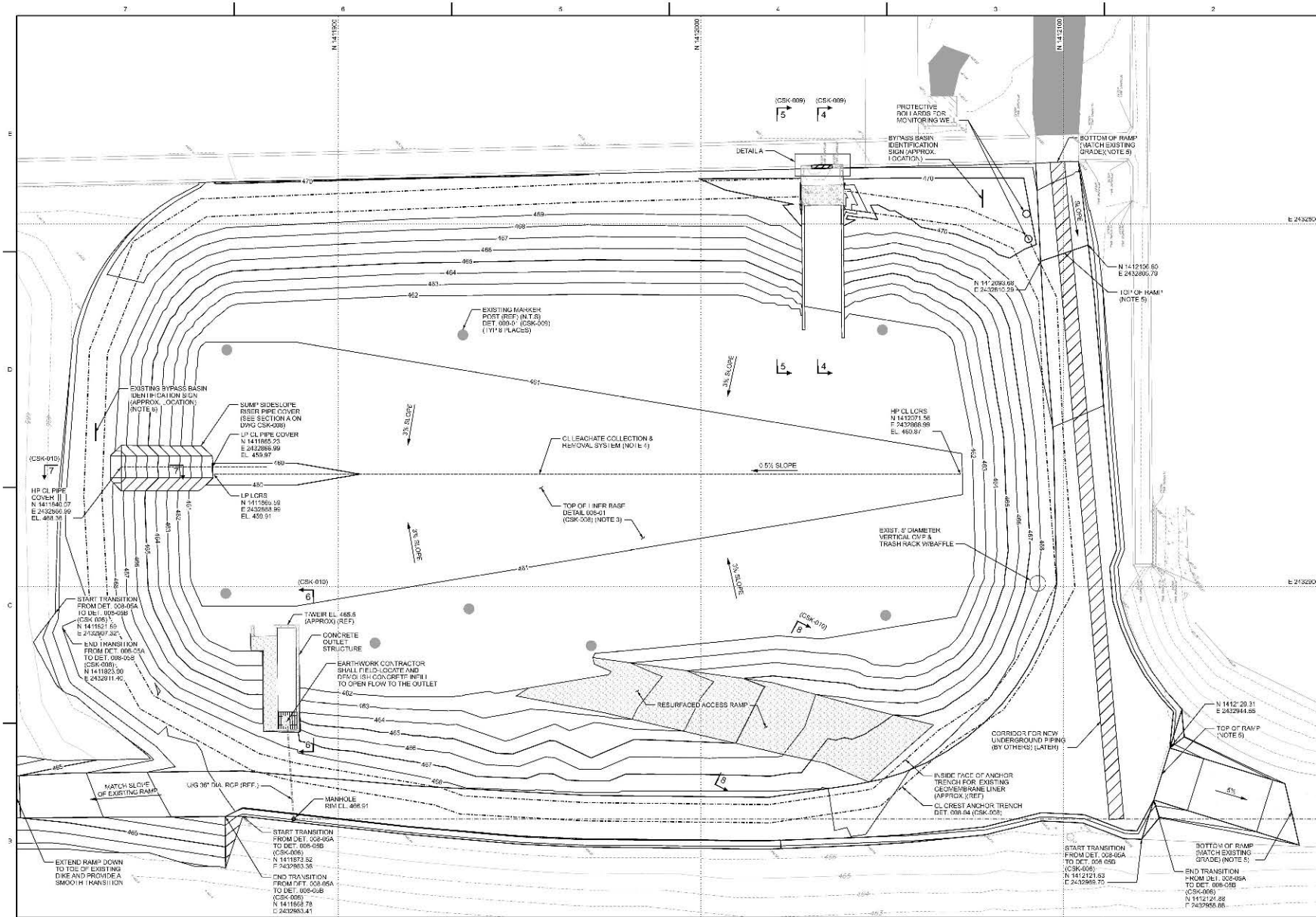
STRUCTURAL FILL GRADING PLAN

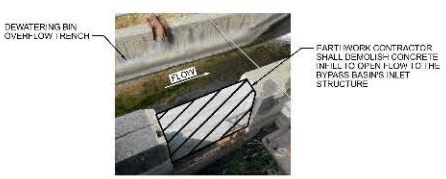
DRAWING NUMBER	REVISION
POW-BBR-CSK-006	1

SHEET 1 OF 1

PL:\27930\M\18842\Shared\NFO CENTER\DISCIPLINE REF MATERIAL\CIVIL\DGS\CIV2-Powerton - CCR\Bypass Basin Retrofit Drawings\POW-BBR-CSK-006.dgn
Form GDG-0401-01-06, ANSI (Imperial) MicroStation Border - - Size E - 34 x 44
Revision 11A, Revision Date: 04-30-2010
4/19/2024 11:08:16 AM ...\POW-BBR-CSK-006.dgn

R001474





DETAIL A

N.T.S.
DEMOLITION OF CONCRETE INFILL AT BYPASS BASIN INLET STRUCTURE (LOOKING NORTHWEST)

NORTH

10' 0' 10' 20'
GRAPHIC SCALE

PRELIMINARY

NOT TO BE USED FOR CONSTRUCTION

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LEGEND

465	MAJOR CONTOUR
464	MINOR CONTOUR

NOTES

1. ALL WORK SHOWN ON THIS DRAWING SHALL BE FURNISHED AND INSTALLED BY SPECIFICATION P-1400 UNLESS NOTED OTHERWISE.
2. FOR GENERAL NOTES, ABBREVIATIONS, AND SYMBOLS, SEE DRAWING POW-BBR-CSK-002.
3. CCL, HDPE GEOMEMBRANE, AND DRAINAGE GEOCOMPOSITE SHALL BE FURNISHED AND INSTALLED BY SPECIFICATION P-1402.
4. FOR LEACHATE COLLECTION TRENCH AND SUMP PLANS, SEE DRAWING POW-BBR-CSK-006. FOR LEACHATE COLLECTION TRENCH AND SUMP DETAILS, SEE DRAWING POW-BBR-CSK-008.
5. PROVIDE SMOOTH TRANSITIONS AT TOPS AND BOTTOMS OF RAMPS.
6. EARTHWORK CONTRACTOR (SPEC. P-1400) SHALL COORDINATE WITH OWNER TO RELOCATE EXISTING IDENTIFICATION SIGN AT SOUTHERN END OF BASIN OUTSIDE OF NEW LINER AREA.

REFERENCE DRAWINGS

	SARGENT & LUNDY
CSK-008	COMPOSITE LINER & LEACHATE COLLECTION SYSTEM SECTIONS & DETAILS
CSK-009	INLET & OUTLET STRUCTURE DETAILS - SHEET 1
CSK-010	INLET & OUTLET STRUCTURE DETAILS - SHEET 2
	VUS CORPORATION
5925-C-5001	ASH SURGE BASIN BY PASS PLAN AND PROFILE

HOLD INFORMATION

NO.	DESCRIPTION

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUB CONTRACTOR(S)) PERFORMING THE WORK.

RELEASE INFORMATION

REV.	DATE	DESCRIPTION
0	04-04-2024	FOR MATERIAL ORDER SPEC P-1402
1	04-19-2024	FOR BIDS SPEC P-1400

ISSUE PURPOSE:	BIDS
SPECIFICATION:	P-1400, P-1401 & P-1402
PROJECT NO.:	12661 181

CAD FILE NAME:	POW-BBR-CSK-007.DGN
PREPARED BY:	J. CHAVEZ
REVIEWED BY:	T. DEHLIN
APPROVED BY:	--

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Sargent & Lundy LLC

SARGENT & LUNDY LLC
55 EAST MONROE STREET
CHICAGO, ILLINOIS 60603-5780

MWG
Midwest Generation, LLC

PROJECT

POWERTON
GENERATING STATION
BYPASS BASIN RETROFIT

DRAWING TITLE

COMPOSITE LINER & LEACHATE COLLECTION SYSTEM PLAN

DRAWING NUMBER	REVISION
POW-BBR-CSK-007	1

SHEET 1 OF 1

PL12793\0041864\Z:\Shared\INFO CENTER\DISCIPLINE REF MATERIAL\CIVIL\DESIGN\2-Powerton - CCR\Bypass Basin Retrofit Drawings\POW-BBR-CSK-007.dgn
Form DDC-0401-01-08, ANSI (Imperial) MicroStation Border - Size E - 34 x 44
Revision 11A, Revision Date: 04-30-2010
4/19/2024 1:26:06 PM
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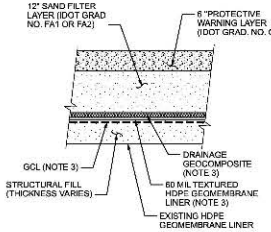
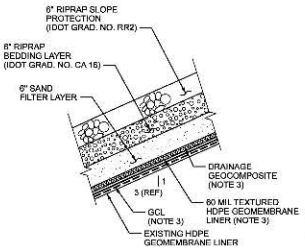
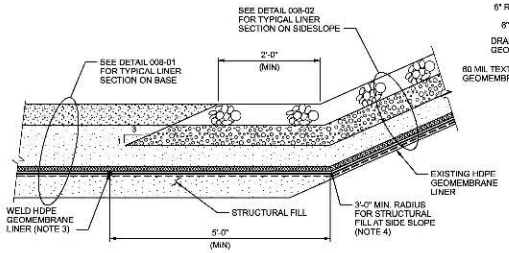
R001475



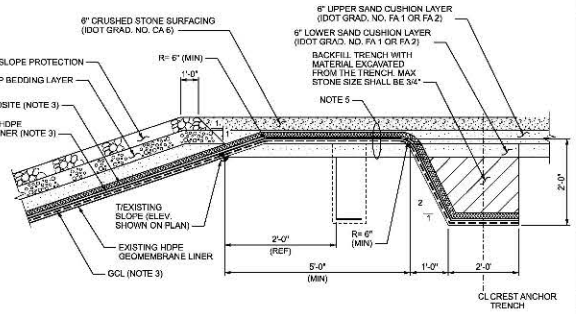
TYPICAL LINER BASE DETAIL
DETAIL 008-01
N.T.S.



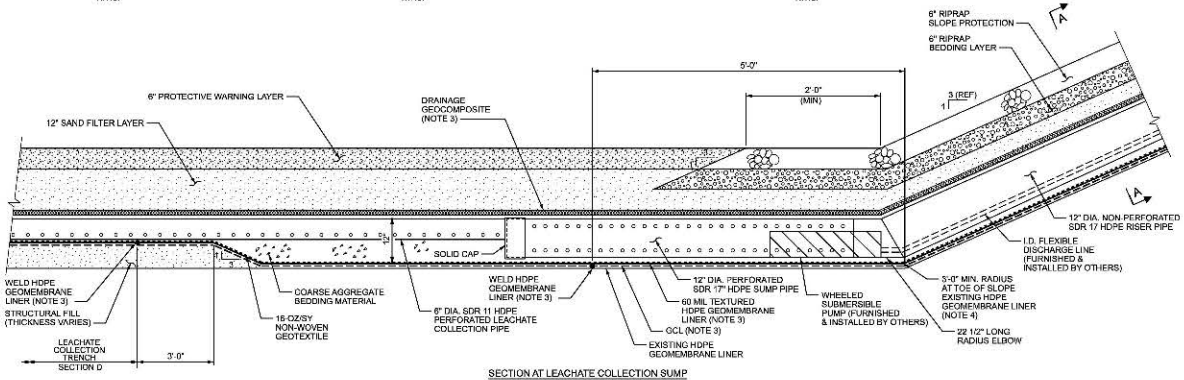
TYPICAL LINER SIDESLOPE DETAIL
DETAIL 008-02
N.T.S.



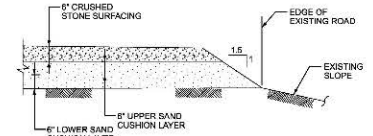
TYPICAL SIDESLOPE TO FLOOR TRANSITION
DETAIL 008-03
N.T.S.



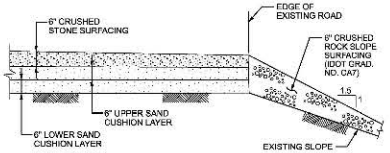
TYPICAL ANCHOR TRENCH
DETAIL 008-04
N.T.S.



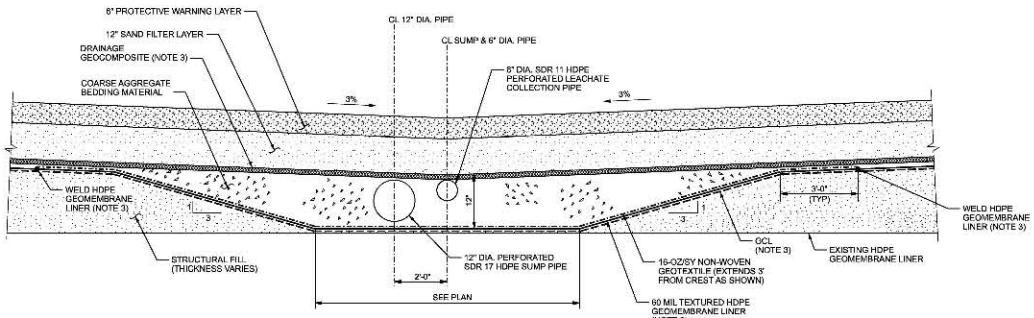
SECTION AT LEACHATE COLLECTION SUMP
SECTION 1
N.T.S.
(CSK-006, DETAIL A)



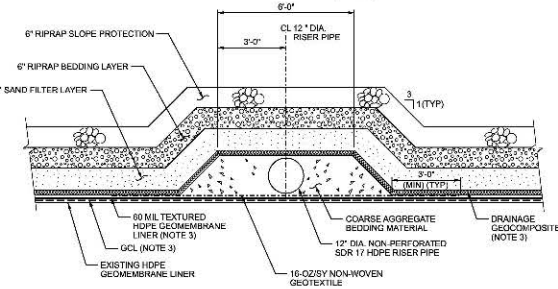
EDGE OF NEW ROAD ON BASIN DIKE
DETAIL 008-05A
N.T.S.
TIE INTO EXISTING SLOPE (CSK-007)



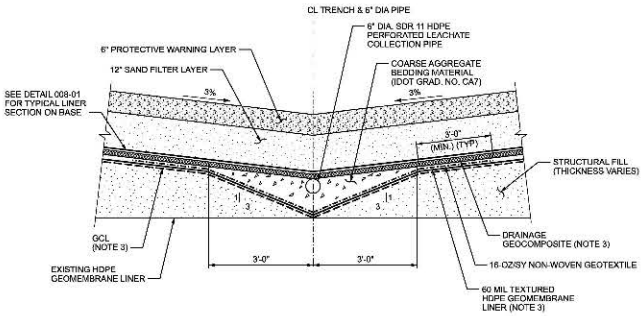
EDGE OF NEW ROAD ON BASIN DIKE
DETAIL 008-05B
N.T.S.
ROCK SLOPE SURFACING ON EXISTING SLOPE (CSK-007)



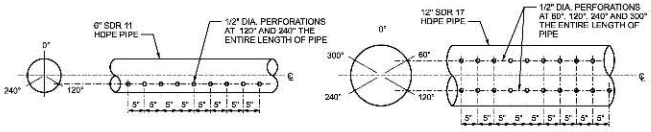
TYPICAL SECTION AT LEACHATE COLLECTION SUMP
SECTION 2
(CSK-006, DETAIL A)



SECTION AT SIDESLOPE RISER PIPE
SECTION A
N.T.S.



TYPICAL SECTION AT LEACHATE COLLECTION TRENCH
SECTION 3
(CSK-006)



6" DIAMETER PERFORATED SDR 11 HDPE LEACHATE COLLECTION PIPE

12" DIAMETER PERFORATED SDR 17 HDPE SUMP PIPE

TYPICAL PERFORATED PIPE DETAIL
DETAIL 008-06
N.T.S.

NOTES

1. ALL WORK SHOWN ON THIS DRAWING SHALL BE FURNISHED AND INSTALLED BY SPECIFICATION P-1400 UNLESS NOTED OTHERWISE.
2. FOR GENERAL NOTES, ABBREVIATIONS, AND SYMBOLS, SEE DRAWING POW-BBR-CSK-002.
3. GCL, HDPE GEOMEMBRANE AND DRAINAGE GEOCOMPOSITE SHALL BE FURNISHED AND INSTALLED BY SPECIFICATION P-1402.
4. EARTHWORK CONTRACTOR (SPEC. P-1400) SHALL PLACE STRUCTURAL FILL AT TRANSITION BETWEEN LINER BASE AND LINER SIDESLIP AS NEEDED TO PROVIDE 3'-0" MINIMUM RADIUS FOR LINER MATERIALS.
5. AT CREST / TOP OF SIDESLOPES, GCL, HDPE GEOMEMBRANE, AND DRAINAGE GEOCOMPOSITE SHALL BE INSTALLED ON TOP OF, AND IN CONTACT WITH, THE LOWER SAND CUSHION LAYER. THE UPPER SAND CUSHION LAYER SHALL BE INSTALLED ON TOP OF THESE GEOSYNTHETIC MATERIALS.

REFERENCE DRAWINGS

D1968C031-02	NATURAL RESOURCE TECHNOLOGY BYPASS BASIN LINER REPLACEMENT DETAILS AND SECTIONS

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PRELIMINARY
NOT FOR CONSTRUCTION

ISSUE INFORMATION

NO.	DESCRIPTION

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RELEASE INFORMATION

REV.	DATE	DESCRIPTION
0	04-04-2024	FOR MATERIAL ORDER SPEC P-1402
1	04-19-2024	FOR BIDS SPEC P-1400

ISSUE PURPOSE:	BIDS
SPECIFICATION:	P-1400, P-1401 & P-1402
PROJECT NO.:	12661-181

CAD FILE NAME:	POW-BBR-CSK-008.DGN
PREPARED BY:	J. CHAVEZ
REVIEWED BY:	T. DEHLIN
APPROVED BY:	--

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Sargent & Lundy LLC

SARGENT & LUNDY LLC
55 EAST MONROE STREET
CHICAGO, ILLINOIS 60603-5780

MWG
Midwest Generation, LLC

PROJECT

POWERTON
GENERATING STATION
BYPASS BASIN RETROFIT

DRAWING TITLE

COMPOSITE LINER &
LEACHATE COLLECTION SYSTEM
SECTIONS & DETAILS

DRAWING NUMBER	REVISION
POW-BBR-CSK-008	1

SHEET 1 OF 1

4/19/2024 2:02:21 PM
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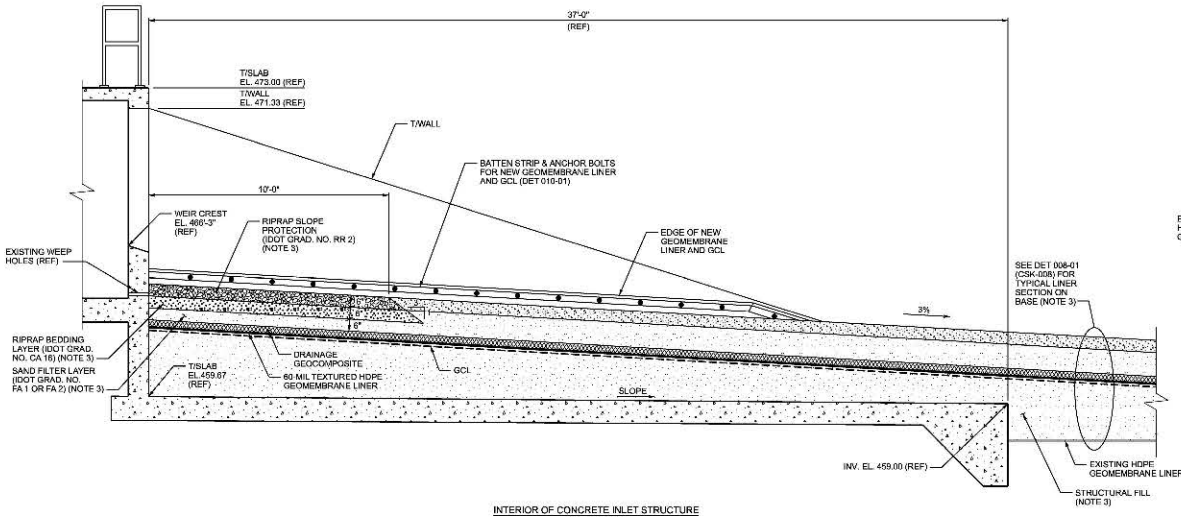
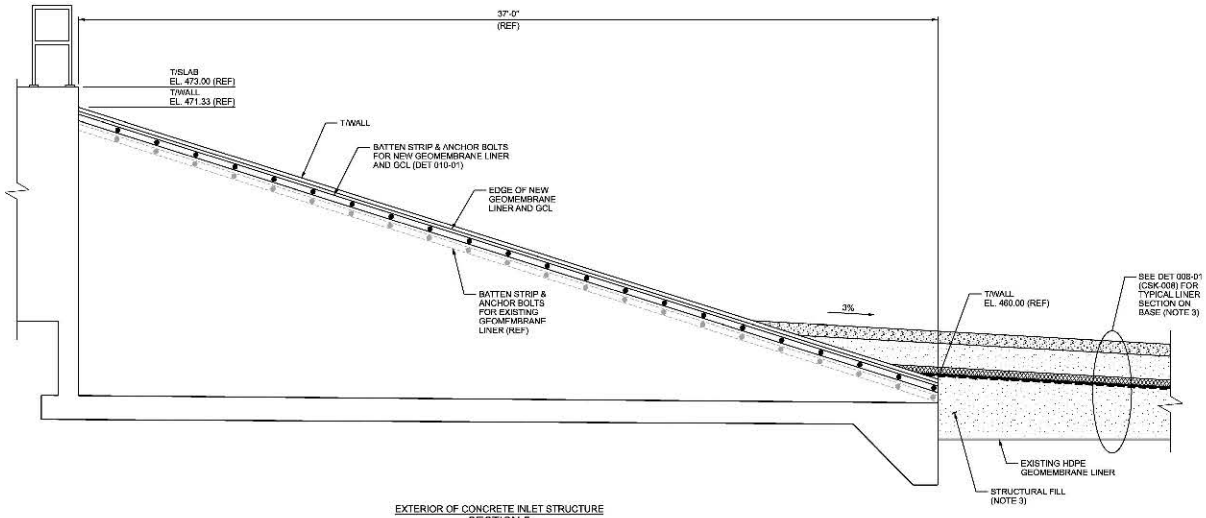
PL:\279300\158427\Shared\NFO CENTER\DISCIPLINE REF MATERIAL\CIVIL\DGS\CIV2-Powerton - CCR\Bypass Basin Retrofit Drawings\POW-BBR-CSK-008.dgn
Form GDG-0401-01-06, ANSI (Imperial) MicroStation Border - Size E - 34 x 44
Revision 11A, Revision Date: 04-30-2010

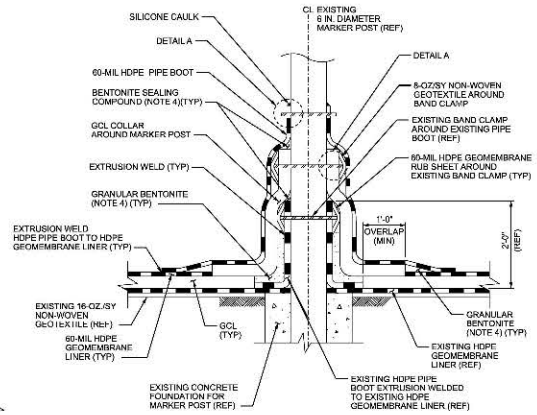
R001476



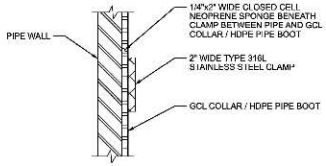
INTERIOR OF CONCRETE INLET STRUCTURE
SECTION 4
N.T.S.
(CSK-007)



EXTERIOR OF CONCRETE INLET STRUCTURE
SECTION 5
N.T.S.
(CSK-007)



LINER CONNECTION AT EXISTING MARKER POST
DETAIL 009-01
N.T.S.
NOTE: PROTECTIVE WARNING LAYER, SAND FILTER LAYER, AND DRAINAGE GEOCOMPOSITE ARE NOT SHOWN FOR CLARITY (CSK-007)



DETAIL A
N.T.S.

NOTES

1. ALL WORK SHOWN ON THIS DRAWING SHALL BE FURNISHED AND INSTALLED BY SPECIFICATION P-1402 UNLESS NOTED OTHERWISE.
2. FOR GENERAL NOTES, ABBREVIATIONS, AND SYMBOLS, SEE DRAWING POW-BBR-CSK-002.
3. FILL MATERIALS SHALL BE FURNISHED AND INSTALLED BY SPECIFICATION P-1400.
4. GEOSYNTHETICS CONTRACTOR (SPEC. P-1402) SHALL APPLY GRANULAR BENTONITE AND BENTONITE SEALING COMPOUND IN BETWEEN EXISTING HDPE GEOMEMBRANE LINER AND GCL AS SPECIFIED AT A MINIMUM RATE OF 1 LB PER LINEAR FOOT.

REFERENCE DRAWINGS

CSK-007	SARGENT & LUNDY COMPOSITE LINER & LEACHATE COLLECTION SYSTEM PLAN
D1965C032-02	NATURAL RESOURCE TECHNOLOGY BYPASS BASIN LINER REPLACEMENT DETAILS AND SECTIONS
5295-C-5501	NUS CORPORATION ASH SURGE BASIN BYPASS BASIN INLET STRUCTURE

UNDERGROUND OR EMBEDDED UTILITIES MAY BE LOCATED WITHIN OR ADJACENT TO THE AREA IN WHICH EXCAVATION, DEMOLITION, FOUNDATION, OR MODIFICATION WORK IS TO BE PERFORMED.

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THE CONTRACTOR/INSTALLER SHALL EXERCISE DUE CAUTION DURING ALL EXCAVATION/FOUNDATION/DEMOLITION WORK.

PRELIMINARY
NOT FOR CONSTRUCTION

ISSUED INFORMATION

NO.	DESCRIPTION

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTORS/INSTALLER'S PERSONNEL (OR THAT OF ITS SUB-CONTRACTOR(S)) PERFORMING THE WORK.

RELEASE INFORMATION

REV.	DATE	DESCRIPTION
0	04-04-2024	FOR MATERIAL ORDER SPEC P-1402
1	04-19-2024	FOR BIDS SPEC P-1400

ISSUE PURPOSE:	BIDS
SPECIFICATION:	P-1400, P-1401 & P-1402
PROJECT NO.:	12661-181

CAD FILE NAME:	POW-BBR-CSK-009.DGN
PREPARED BY:	J. CHAVEZ
REVIEWED BY:	T. DEHLIN
APPROVED BY:	T. DEHLIN

ANY MODIFICATION OR ADDITION TO THIS DRAWING BY AN ORGANIZATION OTHER THAN SARGENT & LUNDY, IS NOT THE RESPONSIBILITY OF SARGENT & LUNDY.

Sargent & Lundy L.L.C.
SARGENT & LUNDY L.L.C.
55 EAST MONROE STREET
CHICAGO, ILLINOIS 60603-5780

MWG
Midwest Generation, LLC

PROJECT

POWERTON
GENERATING STATION
BYPASS BASIN RETROFIT

DRAWING TITLE

INLET & OUTLET STRUCTURE DETAILS
SHEET 1

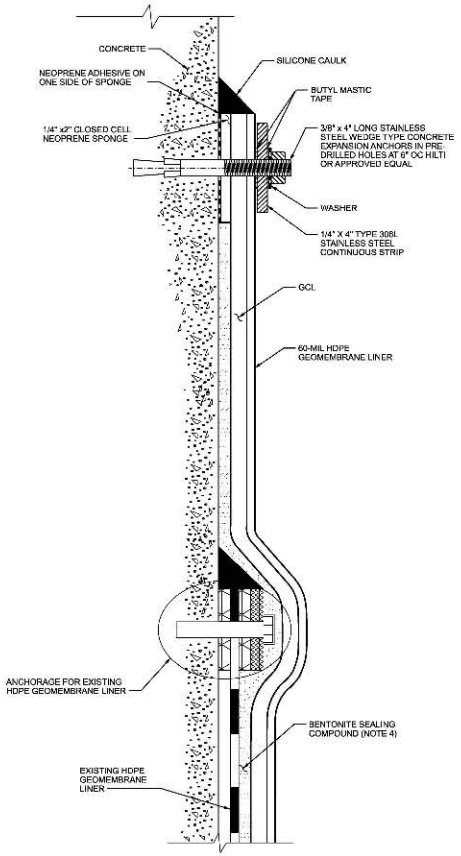
DRAWING NUMBER	REVISION
POW-BBR-CSK-009	1

SHEET 1 OF 1

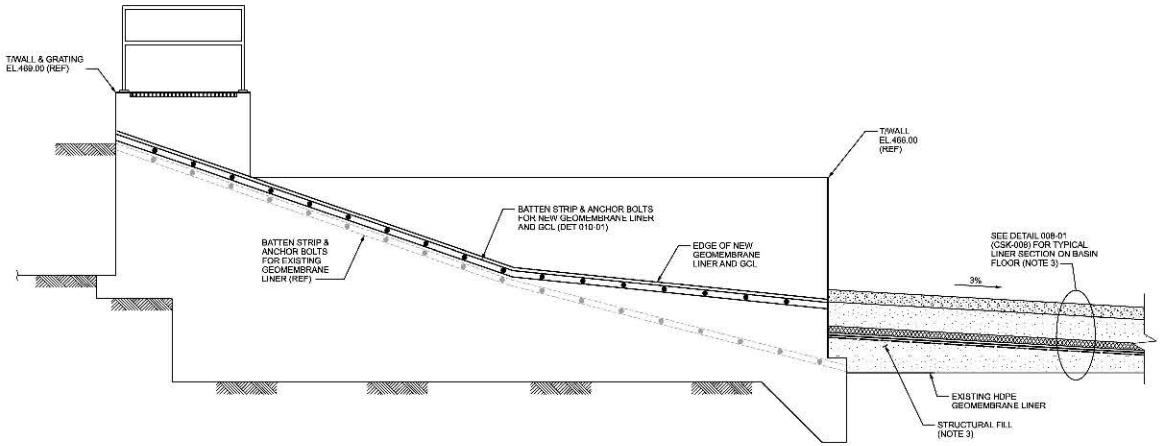
PL:12793(M:18842;\Shared\NFO CENTER\DISCIPLINE REF MATERIAL\CIVIL\DS\IGN\2-Powerton - CCR\Bypass Basin Retrofit Drawings\POW-BBR-CSK-009.dgn
Form GDG-0401-01-06, ANSI (Imperial) MicroStation Border - Size E - 34 x 44
Revision 11A, Revision Date: 04-30-2010

4/19/2024 11:43:45 AM ...\POW-BBR-CSK-009.dgn

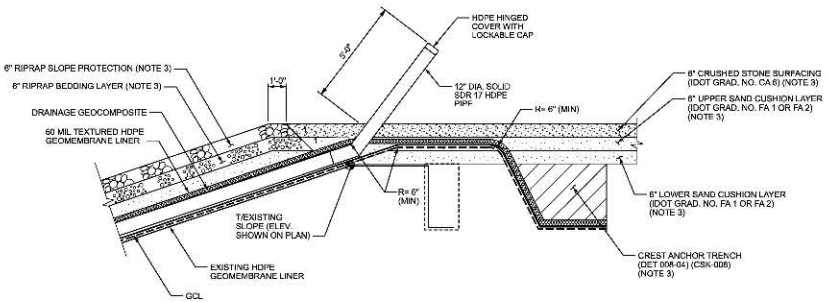
R001477



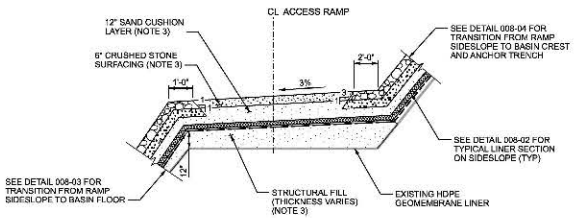
GCL & GEOMEMBRANE LINER ANCHORING TO CONCRETE
DETAIL 010-01
N.T.S.



EXTERIOR OF CONCRETE OUTLET STRUCTURE
SECTION 6
N.T.S.
(CSK-007)



SECTION THROUGH SIDESLOPE RISER PIPE
SECTION 7
N.T.S.
(CSK-007)



ACCESS RAMP
SECTION 8
N.T.S.
(CSK-007)

NOTES

1. ALL WORK SHOWN ON THIS DRAWING SHALL BE FURNISHED AND INSTALLED BY SPECIFICATION P-1402 UNLESS NOTED OTHERWISE.
2. FOR GENERAL NOTES, ABBREVIATIONS, AND SYMBOLS, SEE DRAWING POW-BBR-CSK-002.
3. FILL MATERIALS SHALL BE FURNISHED AND INSTALLED BY SPECIFICATION P-1400. ANCHOR TRENCH SHALL BE EXCAVATED AND BACKFILLED BY SPECIFICATION P-1400.
4. GW CONTRACTOR SHALL APPLY GRANULAR BENTONITE AND BENTONITE SEALING COMPOUND IN BETWEEN EXISTING HDPE GEOMEMBRANE LINER AND GCL AS SPECIFIED AT A MINIMUM RATE OF 1 LB PER LINEAR FOOT.

REFERENCE DRAWINGS

CSK-007	SARGENT & LUNDY COMPOSITE LINER & LEACHATE COLLECTION SYSTEM PLAN
D'1965C031-02	NATURAL RESOURCE TECHNOLOGY BYPASS BASIN LINER REPLACEMENT DETAILS AND SECTIONS
5295-C-5502	NUS CORPORATION ASH SURGE BASIN BY-PASS BASIN OUTLET STRUCTURE

UNDERGROUND OR EMBEDDED UTILITIES MAY BE LOCATED WITHIN OR ADJACENT TO THE AREA IN WHICH EXCAVATION, DEMOLITION, FOUNDATION, OR MODIFICATION WORK IS TO BE PERFORMED.

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PRELIMINARY
NOT FOR CONSTRUCTION

HOLD INFORMATION

NO.	DESCRIPTION

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RELEASE INFORMATION

REV.	DATE	DESCRIPTION
0	04-04-2024	FOR MATERIAL ORDER SPEC P-1402
1	04-19-2024	FOR BIDS SPEC P-1400

ISSUE PURPOSE:	BIDS
SPECIFICATION:	P-1400, P-1401 & P-1402
PROJECT NO.:	12661-181
CAD FILE NAME:	POW-BBR-CSK-010.DGN
PREPARED BY:	J. CHAVEZ
REVIEWED BY:	T. DEHLIN
APPROVED BY:	T. DEHLIN

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55 EAST MONROE STREET
CHICAGO, ILLINOIS 60603-5780

MWG
Midwest Generation, LLC

PROJECT

POWERTON
GENERATING STATION
BYPASS BASIN RETROFIT

DRAWING TITLE

INLET & OUTLET STRUCTURE DETAILS
SHEET 2

DRAWING NUMBER	REVISION
POW-BBR-CSK-010	1

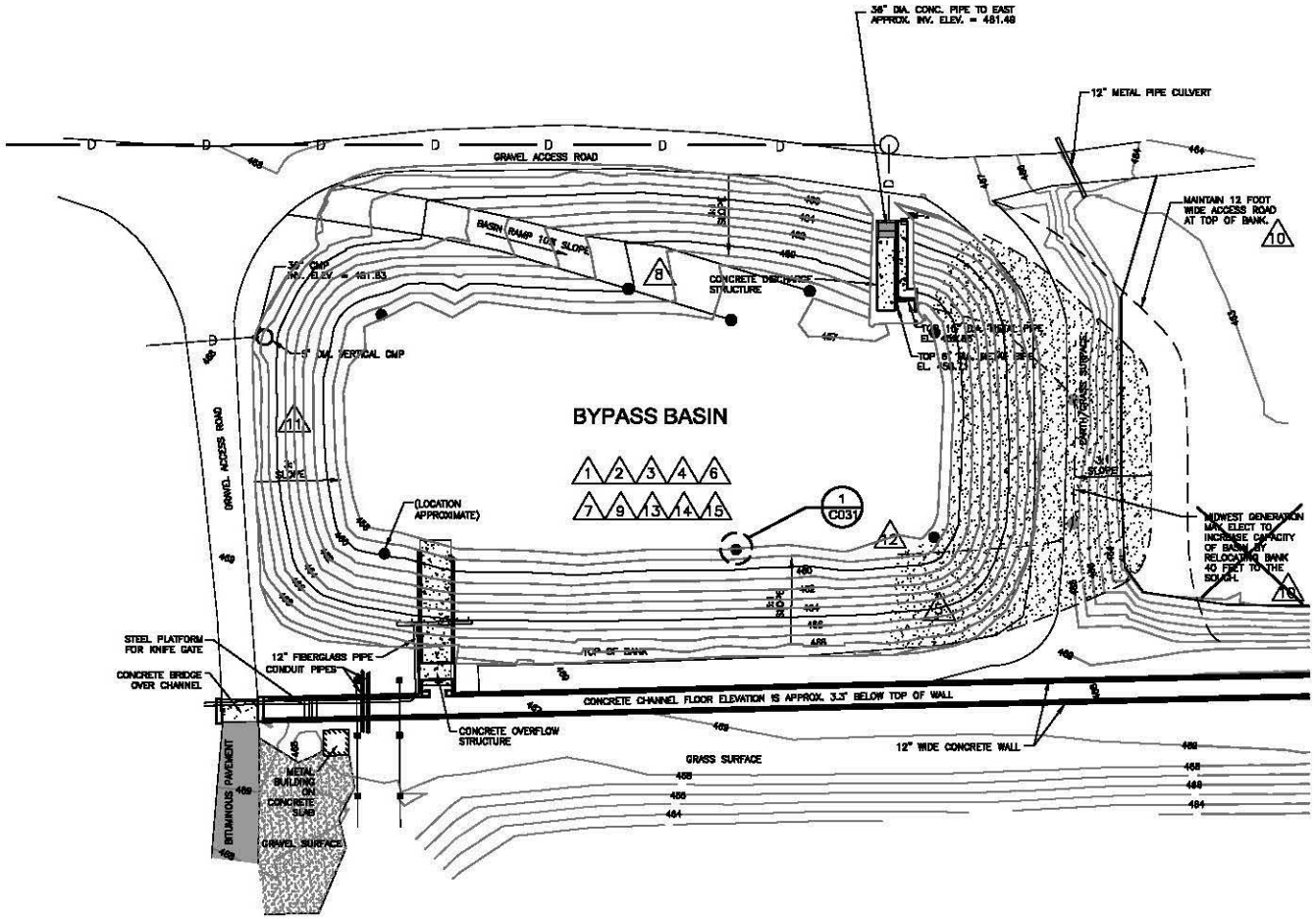
SHEET 1 OF 1

PL:12793(M:18842;\Shared\NFO CENTER\DISCIPLINE REF MATERIAL\CIVIL\DSIGN\2-Powerton - CCR\Bypass Basin Retrofit Drawings\POW-BBR-CSK-010.dgn
Form GDG-0401-01-06, ANSI (Imperial) MicroStation Border - Size E - 34 x 44
Revision 11A, Revision Date: 04-30-2010
4/19/2024 11:41:39 AM ...\POW-BBR-CSK-010.dgn

ATTACHMENT 2

REFERENCE DRAWINGS

DWG NO.	TITLE	DATE
D1965C020-02	BYPASS BASIN LINER REPLACEMENT, LINER SUBGRADE PREPARATION, REV. 2	06-08-2011
D1965C030-02	BYPASS BASIN LINER REPLACEMENT, WARNING LAYER PLAN, REV. 2	06-08-2011
D1965C031-02	BYPASS BASIN LINER REPLACEMENT, DETAILS AND SECTIONS, REV. 2	06-16-2011
D1965C032-02	BYPASS BASIN LINER REPLACEMENT, DETAILS AND SECTIONS, REV. 2	06-16-2011
5925-C-5001	ASH SURGE BASIN BY PASS PLAN AND PROFILE, REV. 2	06-26-1980
5925-C-5003	ASH SURGE BASIN BY PASS MISCELLANEOUS DETAILS, REV. 2	06-26-1980
5295-C-5501	ASH SURGE BASIN BY PASS, BASIN INLET STRUCTURE, REV. 1	02-08-1980
5295-C-5502	ASH SURGE BASIN BY PASS, BASIN OUTLET STRUCTURE, REV. 1	02-08-1980



LEGEND

- UNDERGROUND DISCHARGE PIPE
- ABOVEGROUND INTAKE PIPE
- PREPARED SUBGRADE SURFACE CONTOUR
- 12 OZ. NON-WOVEN GEOTEXTILE
- MARKER POST LOCATION
- ADDITIONAL MARKER POST LOCATION IF BANK IS RELOCATED.
- BANK/AREA FOR POSSIBLE RELOCATION
- BM-2 BENCHMARK 2

CONTRACTOR NOTES:

1. CONTRACTOR SHALL FIELD VERIFY LOCATION OF UNDERGROUND PIPES WITH ASSISTANCE OF OWNER'S UTILITY LOCATOR.
2. CONTRACTOR SHALL FIELD VERIFY LOCATION OF CONCRETE STRUCTURES AND ABOVE GROUND PIPING.
3. CONTRACTOR SHALL STORE ALL GEOSYNTHETICS AND SUBGRADE MATERIALS IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
4. CONTRACTOR SHALL STORE AND STAGE EQUIPMENT AT LOCATION APPROVED BY OWNER.
5. CLEAR AND GRUB ALL BRUSH ALONG TOP OF SLOPE OF BASIN.
6. PROTECT ALL CONCRETE AND UTILITY STRUCTURES THROUGHOUT PROJECT DURATION.
7. CONTRACTOR SHALL REMOVE ALL VEGETATION, ROCKS, AND OTHER DEBRIS FROM EXISTING LINER AND DISPOSE OF IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
8. CONTRACTOR SHALL CLEAN OFF THE RAMP SURFACE TO THE EXTENT PRACTICAL TO REMOVE ROCKS THAT MAY POSE A HAZARD TO GEOMEMBRANE, AS APPROVED BY GEOMEMBRANE INSTALLER, ENGINEER AND/OR OWNER.
9. CONTRACTOR SHALL REMOVE 12-INCH LAYER OF POZ-O-PAC AND 6-INCHES OF POZ-O-PAC SUBGRADE FROM THE BASE OF BASIN.
10. ~~CONTRACTOR SHALL RELOCATE SOUTHERN BANK 40 FEET TO THE SOUTH, AS DIRECTED BY OWNER. GENERATE GRAVEL ACCESS ROAD MATERIAL TO BE REUSED AS BASE SOURCE MATERIAL. MATERIAL REMOVED FROM THE EXISTING BANK MAY BE USED TO RECONSTRUCT NEW SOUTHERN BANK IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.~~
11. CONTRACTOR SHALL REMOVE "SOFT" SUBGRADE MATERIAL BENEATH EXISTING HYPALON LINER, AS DIRECTED BY OWNER AND/OR ENGINEER. BACK FILL AREAS WITH FILL IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS. CUT HYPALON AS NEEDED TO REPAIR THE "SOFT" SUBGRADE AREAS.
12. CONTRACTOR SHALL INSTALL MARKER POSTS ALONG THE TOE OF SLOPE AS SHOWN AND IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS AND DETAIL 1 ON SHEET C031.
13. CONTRACTOR SHALL PLACE 16 OZ. NONWOVEN GEOTEXTILE AT BASE OF BASIN AND WHERE HYPALON LINER DOES NOT EXIST OR WAS REMOVED OF THE PREPARED SUBGRADE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
14. SUBGRADE SHALL BE APPROVED BY OWNER AND/OR ENGINEER PRIOR TO INSTALLATION OF GEOMEMBRANE.
15. CONTRACTOR SHALL PROVIDE MEANS TO PROTECT SUBGRADE FROM EROSION, STORM WATER, AND HEAVY EQUIPMENT TRAFFIC. DAMAGE TO SUBGRADE SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

HORIZONTAL DATUM:
ILLINOIS STATE PLANE COORDINATE SYSTEM, WEST ZONE, NAD83.

VERTICAL DATUM:
LOCAL PLANT DATUM

BENCHMARK 2:
NORTHEAST CORNER OF CONCRETE DISCHARGE STRUCTURE. CHISELED "+" IN CONCRETE ELEVATION 468.75 FT.

SOURCE NOTES:
THIS DRAWING WAS DEVELOPED FROM A SURVEY MAURER STUTZ, INC. DATED SEPTEMBER 7, 2010, DRAWING NO. 23210023.
LOCATION OF BASIN AND ACCESS RAMP TAKEN FROM MIDWEST GENERATION DRAWING NO. 5385 C5001-2, DATED 6-26-1980.
BASIN SUBGRADE AND SITE IMPROVEMENTS FROM A SURVEY PROVIDED BY MILLENNIA PROFESSIONAL SERVICES, MARCH 2011.

0 10 20 40
SCALE IN FEET

5.			
5.			
4.			
3.			
2.	RECORD DOCUMENTATION	08/08/11	HMS
1.	ISSUED FOR BID	10/06/10	HMS
0.	ISSUED FOR PERMIT	08/30/10	HMS
REVISION:		DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

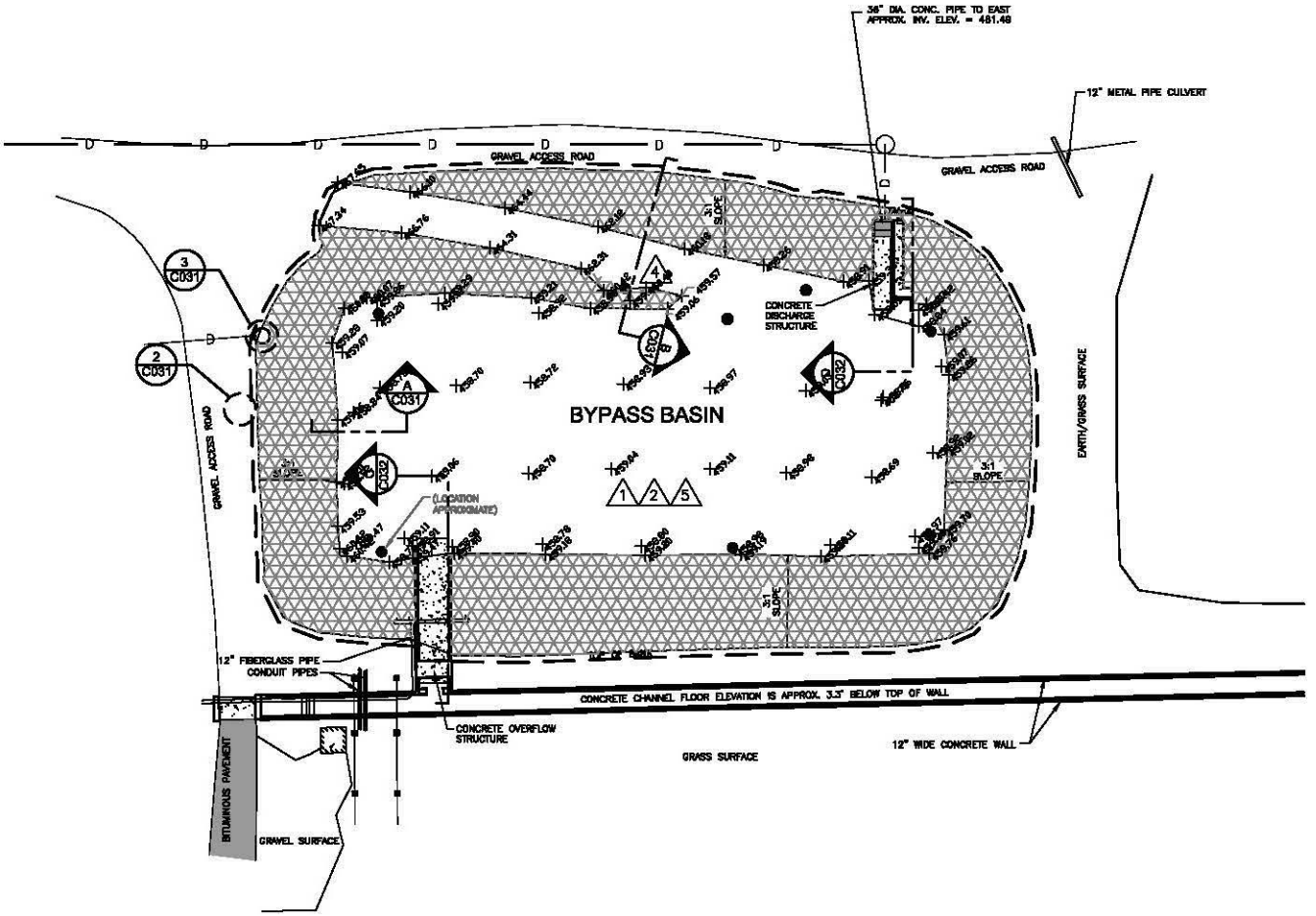
PROJECT NO. 1955/5.4
DRAWN BY: KRW 08/30/10
CHECKED BY: RJG 08/30/10
APPROVED BY: HMS 08/30/10

LINER SUBGRADE PREPARATION

BYPASS BASIN LINER REPLACEMENT
MIDWEST GENERATION
POWERTON POWER STATION
PEKIN, ILLINOIS

DRAWING NO: D1955C020-02
REFERENCE: -

SHEET NO. C020



LEGEND

- D — UNDERGROUND DISCHARGE PIPE
- ABOVEGROUND INTAKE PIPE
- ANCHOR TRENCH
- ×459.11 — TOP OF WARNING LAYER (ELEVATION, FT.)
- MARKER POST LOCATION
- BM-2 — BENCHMARK 2
- HDPE GEOMEMBRANE

HORIZONTAL DATUM:
ILLINOIS STATE PLANE COORDINATE SYSTEM, WEST ZONE, NAD83.

VERTICAL DATUM:
LOCAL PLANT DATUM

BENCHMARK 2:
NORTHEAST CORNER OF CONCRETE DISCHARGE STRUCTURE. CHISELED "+" IN CONCRETE ELEVATION 468.75 FT.

CONTRACTOR NOTES: △

1. CONTRACTOR SHALL INSTALL 60 MIL HDPE, WHITE, TEXTURED GEOMEMBRANE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION PRIOR TO PLACEMENT OF THE WARNING LAYER. CONTRACTOR SHALL PROVIDE AND FOLLOW AN APPROVED GEOMEMBRANE LAYOUT PLAN.
2. GEOMEMBRANE SHALL BE ANCHORED INTO 2.5 FEET DEEP TRENCHES ALONG TOP OF BASIN BANK, AS SHOWN ON SHEET C031. CONTRACTOR SHALL ADVISE OWNER AND/OR ENGINEER IF PROPOSED LOCATION FOR ANCHOR TRENCH IS NOT POSSIBLE.
3. CONTRACTOR SHALL PLACE 12-OZ. NON-WOVEN GEOTEXTILE, CUSHION MATERIAL AND WARNING LAYER MATERIAL OVER THE GEOMEMBRANE AT BASE AND 4 FEET ON SIDE SLOPES FOLLOWING ENGINEER APPROVAL AND PASSING QUALITY CONTROL RESULTS IN ACCORDANCE WITH TECHNICAL SPECIFICATIONS (SEE SHEET C031).
4. CONTRACTOR SHALL PLACE 2 LAYERS OF 12-OZ. NONWOVEN GEOTEXTILE, CUSHION AND WARNING LAYER MATERIALS OVER THE GEOMEMBRANE ON THE RAMP, AS SHOWN ON SHEET C031.
5. RESTORE AREAS DISTURBED BY EQUIPMENT AND MATERIAL LAYDOWN.
6. CONTRACTOR SHALL PROVIDE SURVEY DOCUMENTATION OF THE ITEMS LISTED IN THE TECHNICAL SPECIFICATIONS.
7. CONTRACTOR SHALL PERFORM A LEAK LOCATION SURVEY IN ACCORDANCE WITH TECHNICAL SPECIFICATIONS.

SOURCE NOTES:
THIS DRAWING WAS DEVELOPED FROM A SURVEY MAURER STUTZ, INC. DATED SEPTEMBER 7, 2010, DRAWING NO. 23210023.
LOCATION OF BASIN AND ACCESS RAMP TAKEN FROM MIDWEST GENERATION DRAWING NO. 5295 C5001-2, DATED 6-26-1980.
BASIN SUBGRADE AND SITE IMPROVEMENTS FROM A SURVEY PROVIDED BY MILLENNIA PROFESSIONAL SERVICE, MARCH 2011.

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0 10 20 40
SCALE IN FEET

REVISION:	DATE:	APP'D BY:
5.		
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3.		
2. RECORD DOCUMENTATION	08/08/11	HMS
1. ISSUED FOR BID	10/06/10	HMS
0. ISSUED FOR PERMIT	08/30/10	HMS

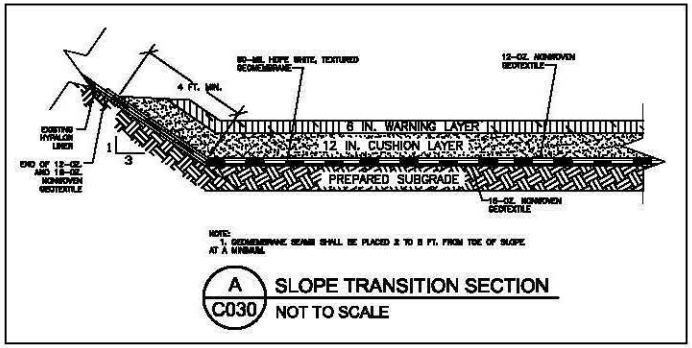
NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1955.5/5.4
DRAWN BY: KRW 08/30/10
CHECKED BY: RJG 08/30/10
APPROVED BY: HMS 08/30/10

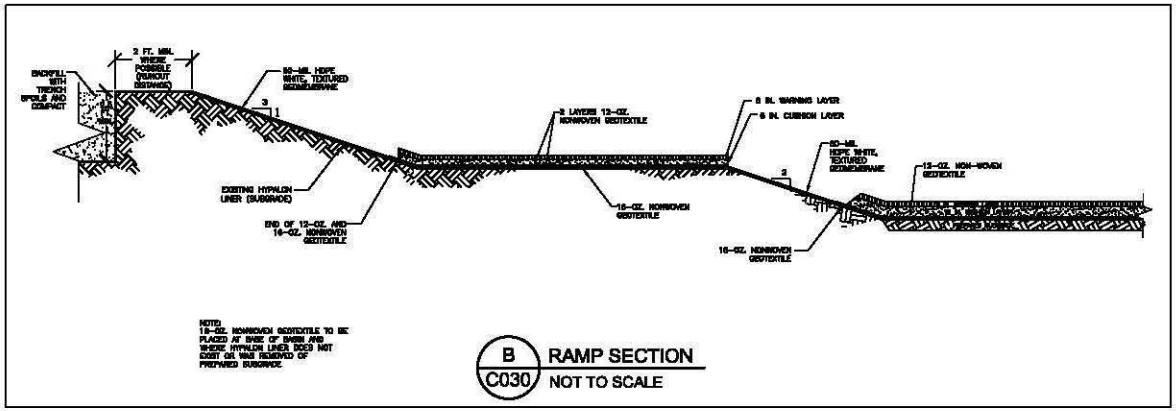
WARNING LAYER PLAN

BYPASS BASIN LINER REPLACEMENT
MIDWEST GENERATION
POWERTON POWER STATION
PEKIN, ILLINOIS

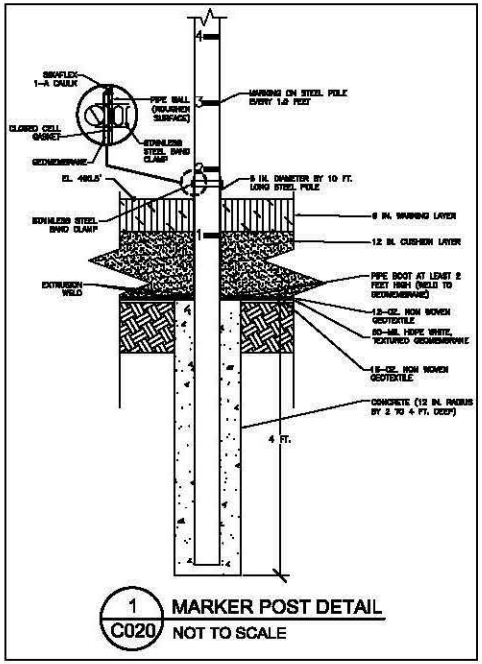
DRAWING NO: D1955C030-02
REFERENCE: -
SHEET NO. C030



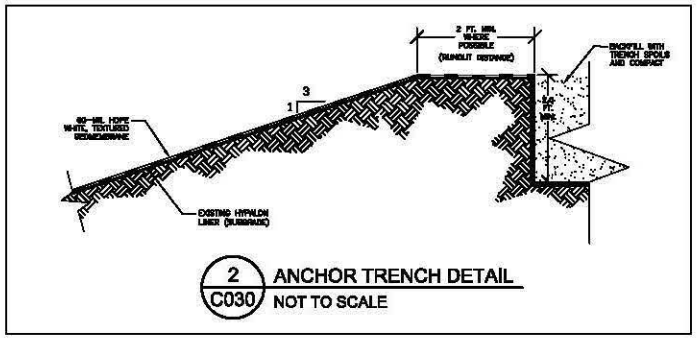
A C030 SLOPE TRANSITION SECTION
NOT TO SCALE



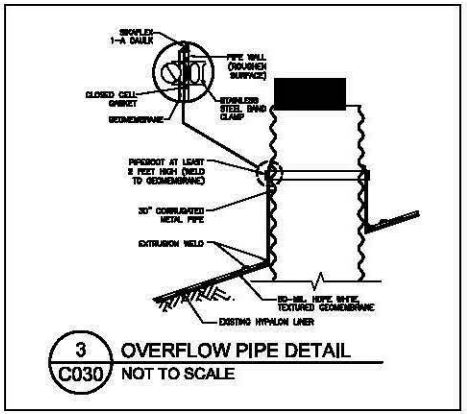
B C030 RAMP SECTION
NOT TO SCALE



1 C020 MARKER POST DETAIL
NOT TO SCALE



2 C030 ANCHOR TRENCH DETAIL
NOT TO SCALE



3 C030 OVERFLOW PIPE DETAIL
NOT TO SCALE

NOT FOR CONSTRUCTION

5.			
5.			
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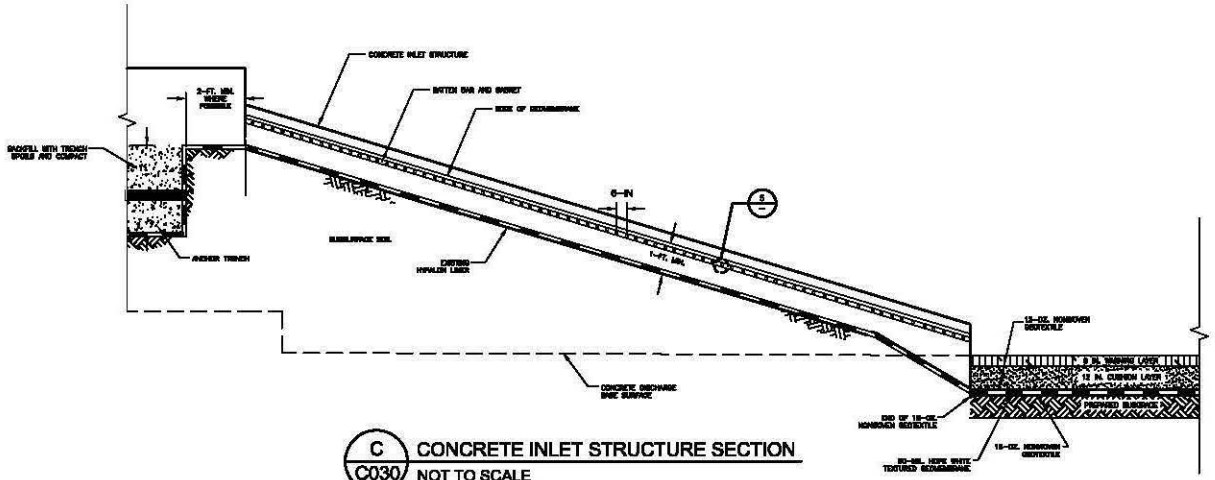
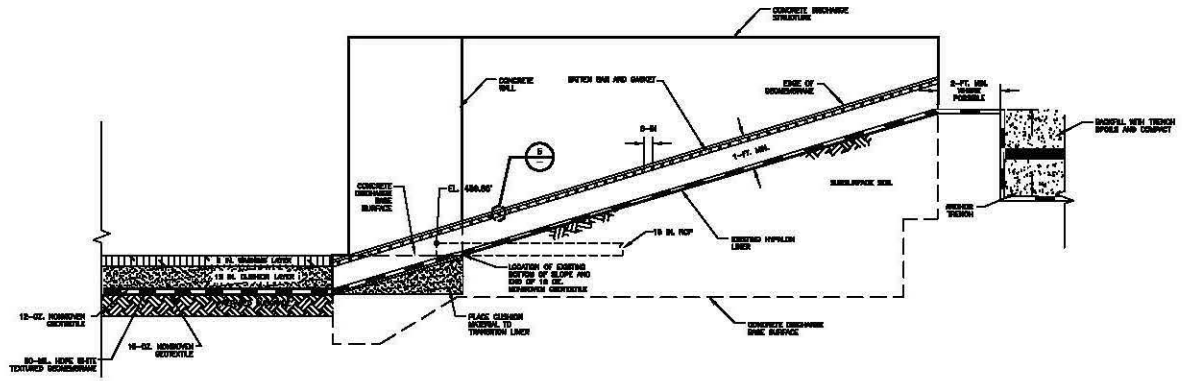
2.	RECORD DOCUMENTATION	06/16/11	HMS
1.	ISSUED FOR BID	10/06/10	HMS
0.	ISSUED FOR PERMIT	08/30/10	HMS
REVISION:		DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

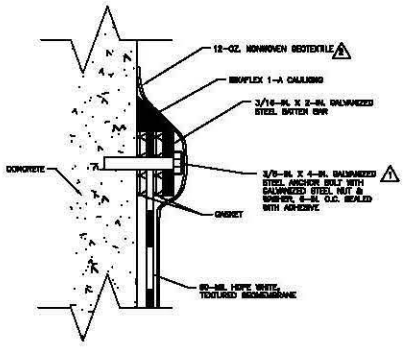
PROJECT NO. 1955/5.4	DETAILS AND SECTIONS
DRAWN BY: KNW 08/30/10	BYPASS BASIN LINER REPLACEMENT MIDWEST GENERATION POWERTON POWER STATION PEKIN, ILLINOIS
CHECKED BY: RJG 08/30/10	
APPROVED BY: HMS 08/30/10	DRAWING NO: D1955C031-02
	REFERENCE:
	SHEET NO. C031



C / C030 CONCRETE INLET STRUCTURE SECTION
NOT TO SCALE



D / - CONCRETE DISCHARGE STRUCTURE SECTION
NOT TO SCALE



NOTE:
1. ANCHOR BOLTS 6 IN. ON CENTER.
2. 12-OZ. NONWOVEN GEOTEXTILE TO BE USED TO PROTECT GEOMEMBRANE BELOW CUSHION/WARNING LAYERS.

5 / - BATTEN BAR ATTACHMENT
NOT TO SCALE

NOT FOR CONSTRUCTION

5.			
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2.	RECORD DOCUMENTATION	08/16/11	HMS
1.	ISSUED FOR BID	10/06/10	HMS
0.	ISSUED FOR PERMIT	08/30/10	HMS
REVISION:		DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1955/5.4	DETAILS AND SECTIONS
DRAWN BY: KNW 08/30/10	BYPASS BASIN LINER REPLACEMENT MIDWEST GENERATION POWERTON POWER STATION PEKIN, ILLINOIS
CHECKED BY: RJG 08/30/10	
APPROVED BY: HMS 08/30/10	DRAWING NO: D1955C032-02
	REFERENCE:
	SHEET NO. C032

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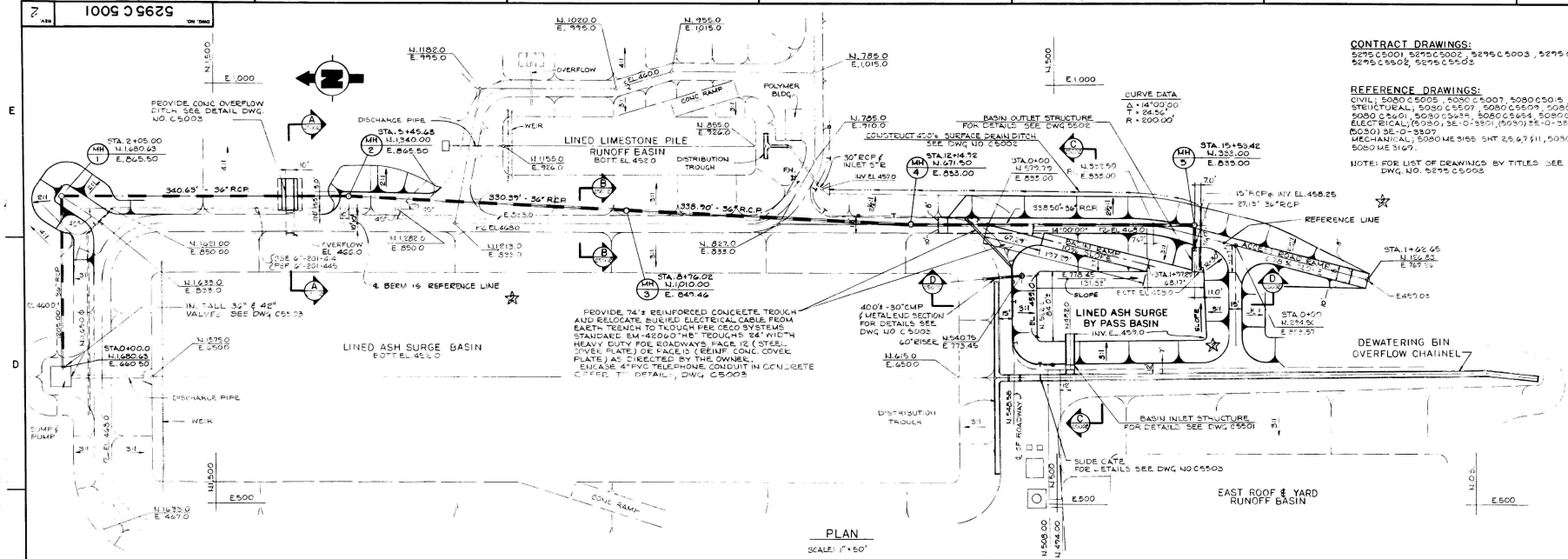
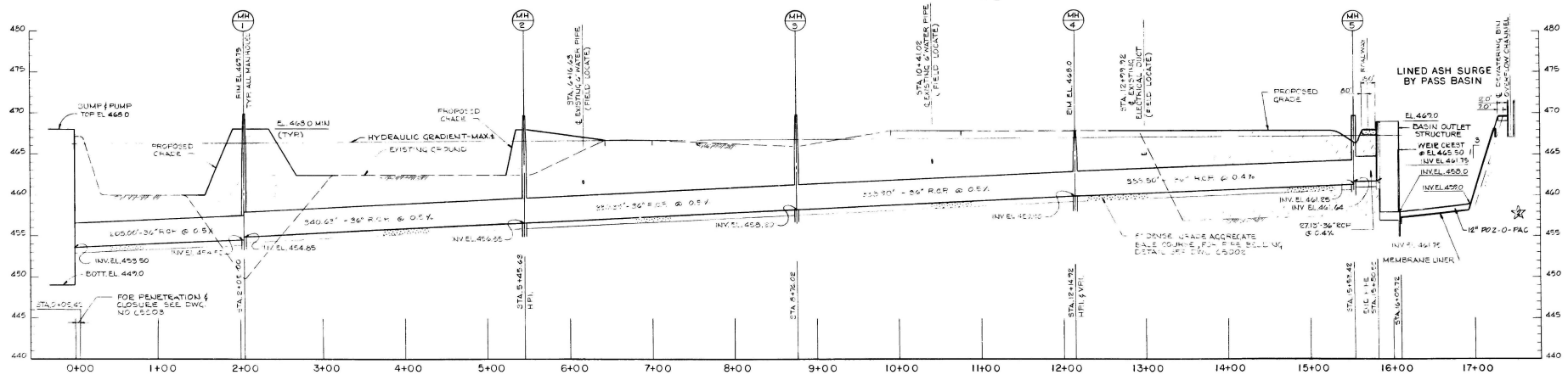
5295 C 5001 2



PLAN
SCALE: 1" = 50'



PROFILE
SCALE: HOR. 1" = 50'
VERT. 1" = 5'

SPECIFICATION:

1. EMBANKMENT SHALL CONFORM TO THE REQUIREMENTS OF THE NEAREST APPLICABLE LOW HEAD FILL, HIGH HEAD FILL, OR EARTH EMBANKMENT SECTION SHOWN ON THE CONTRACT DRAWINGS. MATERIAL FOR THE WALL SHALL BE EITHER CAST IN PLACE REINFORCED CONCRETE OR PRECAST REINFORCED CONCRETE SECTIONS. PRECAST MANHOLES SHALL BE MANUFACTURED TO THE REQUIREMENTS OF ANSI/ASTM C478-79 A STANDARD SPECIFICATION FOR PRECAST REINFORCED CONCRETE MANHOLE SECTIONS. JOINTS ARE TO BE SEALED WITH O-RING GASKETS. MANHOLES SHALL BE CONSTRUCTED FOR 15 FOOT HYDROSTATIC HEAD. THE SURFACE CHANNEL THROUGH THE MANHOLE SHALL BE U-SHAPED TO ANCHT THESE PO IETHS THE DIAMETER/CAST FRAME (SOLID) AND COVER EL. UL (115 LB±) SHALL BE GRAY IRON ILLINOIS DOT STANDARD 8213-4 TYPE 1 (NEENAH CAT NO. R-1015, SEE R-1712) OR EQ. AS CONTRACTOR TO SUBMIT VENDOR DRAWINGS FOR APPROVAL.

2. OUTLET DRAIN PIPE (18 INCH)
FROM THE OUTLET DRAIN PIPE SHALL CONFORM TO THE REQUIREMENTS FOR REINFORCED CONCRETE LOW HEAD PIPE, ASTM C361-75 CLASS III, SEE ALSO SPECIFICATION FOR CONCRETE PIPE. USE RUBBER GASKET TYPE JOINTS FOR WATER AND OTHER LIQUIDS, ANWA C505-74. JOINTS SHALL BE RUBBER GASKET TYPE, BELL & SPIGOT.

3. MANHOLES
MANHOLES SHALL BE THE SIZE AND AT THE LOCATIONS AND GRADES SHOWN ON THE CONTRACT DRAWINGS. MATERIAL FOR THE WALL SHALL BE EITHER CAST IN PLACE REINFORCED CONCRETE OR PRECAST REINFORCED CONCRETE SECTIONS. PRECAST MANHOLES SHALL BE MANUFACTURED TO THE REQUIREMENTS OF ANSI/ASTM C478-79 A STANDARD SPECIFICATION FOR PRECAST REINFORCED CONCRETE MANHOLE SECTIONS. JOINTS ARE TO BE SEALED WITH O-RING GASKETS. MANHOLES SHALL BE CONSTRUCTED FOR 15 FOOT HYDROSTATIC HEAD. THE SURFACE CHANNEL THROUGH THE MANHOLE SHALL BE U-SHAPED TO ANCHT THESE PO IETHS THE DIAMETER/CAST FRAME (SOLID) AND COVER EL. UL (115 LB±) SHALL BE GRAY IRON ILLINOIS DOT STANDARD 8213-4 TYPE 1 (NEENAH CAT NO. R-1015, SEE R-1712) OR EQ. AS CONTRACTOR TO SUBMIT VENDOR DRAWINGS FOR APPROVAL.

4. MISCELLANEOUS SPECIFICATION SEE DWG NO C5002

MANHOLE SCHEDULE

MH NO.	BY PASS STATION	EL TOP CONE	EL SIGN INV. IN	PIPE INV. OUT	MH DEPTH (MIN.)	NOTES
–	0+00	–	458.0	–	–	EXIST. PUMP SUMP
1	2+05	469.0	454.85	454.55	14.45'	HP1 & +50°
2	5+45.63	469.0	456.57	456.53	12.47'	HP1 & +102°27'
3	8+76.02	469.0	458.22	458.18	10.88'	STRAIGHT RUN
4	12+14.92	467.25	459.92	459.88	7.37'	HP1 & +12°27' USE SCALE RINGS & RD
5	15+55.42	469.0	461.64	461.25	7.75'	HP1 & +90°
–	15+80.58	–	–	461.75	–	OUTLET STRUCTURE

NOTE: MAX. HYDRAULIC GRADIENT EL. 467.85±

REV.	DESCRIPTION
1	APPROVED FOR CONSTRUCTION 5/16/90
2	(a) REMOVED 9" SELECT FILL AND 9" GRAVEL BLANKET (TOTAL 1'-6" FROM BOTTOM BY PASS BASIN. RE-PLACED WITH 12" POZ-O-PAC (b) ADDED ELEV., SLOPE AND REFERENCE LINE NOTATIONS TO PLAN.

CONTRACT DRAWINGS:
5295 C 5001, 5295 C 5002, 5295 C 5003, 5295 C 5501, 5295 C 5502, 5295 C 5503

REFERENCE DRAWINGS:
CIVIL; 5080 C 5005, 5080 C 5007, 5080 C 5013, 5080 C 5181 STRUCTURAL; 5080 C 5507, 5080 C 5509, 5080 C 55 , 5080 C 5601, 5080 C 5655, 5080 C 5654, 5080 C 5715 ELECTRICAL; (5080) SE-0-3301, (5080) SE-0-3305 (5080) SE-0-3307 MECHANICAL; 5080 ME 3155 SHT 2, 5, 6, 7, 11, 5080 ME 3165 5080 ME 3169.

NOTE: FOR LIST OF DRAWINGS BY TITLES SEE DWG. NO. 5295 C 5005

Robert D. Arrowsmith 2/1180

DRAWING STATUS
APPROVED FOR CONSTRUCTION
6/26/90

DRAWN	W. Tkac	5/23
CHECKED	[illegible]	5/16/90
CDC ENGINEER	[illegible]	5/16
CONSTRUCTION MGR.	[illegible]	5/16
APPROVAL		
APPROVAL		
APPROVAL		
APPROVED FOR CONSTRUCTION	[illegible]	5/16/90

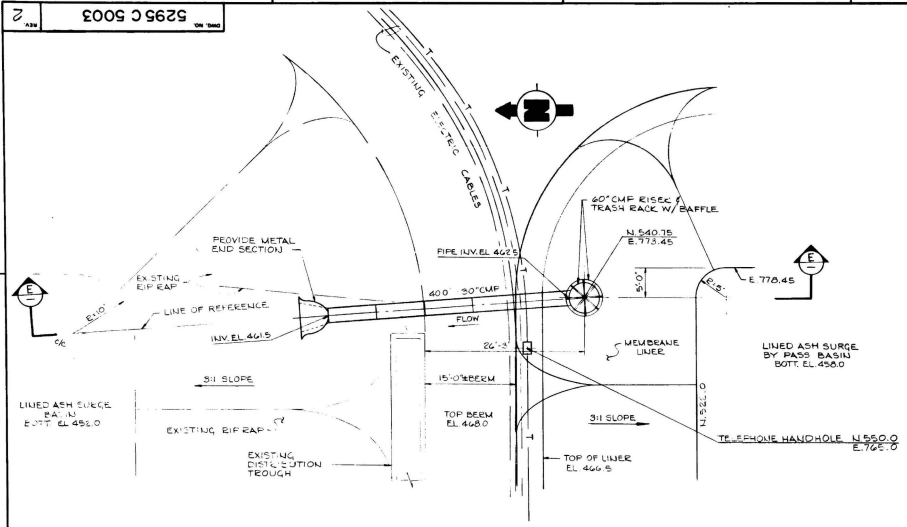
COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES
POWERTON
ASH SURGE BASIN BY PASS
PLAN AND PROFILE

CECO CONTRACT: 802668 | CECO DWG NO.
NUS CORPORATION, ROCKVILLE, MD.
DRAWING NO. 5295 C 5001 REV. 2
SCALE: AS SHOWN SHEET 1 OF 1

338

R001484

DWG. NO. 5295 C 5003 REV. 2



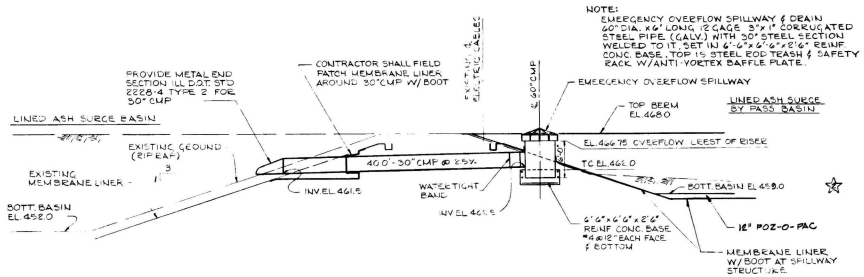
PLAN

LIST OF DRAWINGS

CONTRACT DRAWINGS		
DRAWING NO.	REV.	DRAWING TITLES
5295 C 5001	1	PLAN & PROFILE
5295 C 5002	1	DETAILS & SECTIONS
5295 C 5003	1	MISCELLANEOUS DETAILS
5295 C 5501	1	INLET STRUCTURE
5295 C 5502	1	OUTLET STRUCTURE
5295 C 5503	1	MISCELLANEOUS GATES
REFERENCE DRAWINGS		
5080 C 5005	2	DETAIL PLAN - EAST ROOF & YARD RUNOFF BASIN
5080 C 5007	2	DETAIL PLAN ASH SURGE BASIN
5080 C 5015	2	MISCELLANEOUS SECTIONS AND DETAILS, SHTS 1 & 2
5080 C 5121	1	BASIN END SECTION
5080 C 5507	1	RAMPS & ASH SURGE BASIN OVERFLOW STRUCTURE
5080 C 5509	1	ASH SURGE BASIN & LIMESTONE BASIN DISTRIBUTION TROUGH SECTION & DETAILS
5080 C 5511	2	DEWATERING BIN OVERFLOW CHANNEL SECTIONS & DETAILS
5080 C 5601	2	STANDARD DETAILS
5080 C 5658	2	ASH SURGE BASIN SUMP - CLARIFIER OVERFLOW SUMP
5080 C 5654	1	PIPE SUPPORTS FRAMING PLAN & SECTIONS COL. NO. 74 TO 131
5080 C 5713	1	ASH SURGE BASIN SUMP PLAT FORM SECTIONS & DETAILS
(5080) 3E-0-5301	2	ELECTRICAL AREA LAYOUT EAST RUNOFF BASIN - NORTH
(5080) 3E-0-3305	3	ELECTRICAL AREA LAYOUT LIMESTONE PILE RUNOFF BASIN
(5080) 3E-0-3307	2	ELECTRICAL AREA LAYOUT ASH SURGE BASIN AREA
5080 ME 3155 SHT. 2	4	PIPING ARRANGEMENT, YARD AREA
SHT. 5	3	
SHT. 6	3	
SHT. 7	3	
SHT. 11	3	
5080 ME 3162 SHT. 1	3	PIPING ARRANGEMENT, YARD DETAIL EAST ROOF & YARD RUNOFF BASIN
5080 ME 3169 SHT. 1	1	PIPING ARRANGEMENT YARD DETAIL, LIMESTONE PILE RUNOFF BASIN AND ASH SURGE BASIN SUMPS

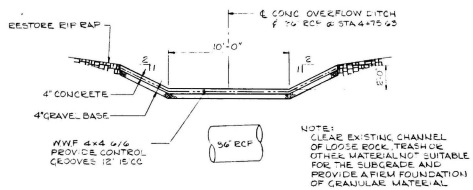
NOTE:
FOR ELECTRICAL CABLE TROUGH SEE CECO SYSTEMS STANDARD EM-42060 "HB" TROUGHS 24" WIDTH HEAVY DUTY FOR ROADWAYS PAGE 12 (STEEL COVER PLATE) OR PAGE 13 (REINFORCED CONCRETE CYCLE PLATE).

NOTE:
EMERGENCY OVERFLOW SPILLWAY & DRAIN 60" DIA. x 6' LONG 12 GAGE 3" x 1" CORRUGATED STEEL PIPE (GALV.) WITH 30" STEEL SECTION WELDED TO IT. SET IN 6'-6" x 2'-6" x 1'-6" REINF. CONC. BASE, TOP 15 STEEL EOD TRASH & SAFETY RACK W/ANTI-VORTEX BAFFLE PLATE.



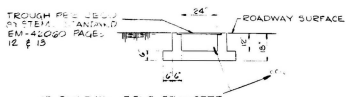
SECTION (E)

EMERGENCY OVERFLOW SPILLWAY
SCALE: 1/8" = 1'-0"



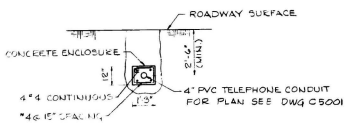
NOTE:
CLEAR EXISTING CHANNEL OF LOOSE ROCK, TRASH OR OTHER MATERIAL NOT SUITABLE FOR THE SUBGRADE AND PROVIDE A FIRM FOUNDATION OF GRANULAR MATERIAL

TYPICAL DETAIL
CONCRETE OVERFLOW DITCH
SCALE: 1/8" = 1'-0"



AT ROADWAY FIELD TRANSFER BURIED CABLE FROM EARTH TRENCH TO CONCRETE TROUGH MAINTAIN DESIGNATED GROUPING OF POWER AND OPERATING CABLES
FOR PLAN SEE DWG C 5001

DETAIL
ELECTRICAL CABLE TROUGH
SCALE: 3/8" = 1'-0"



DETAIL
CONCRETE ENCLOSURE FOR TELEPHONE CONDUIT
SCALE: 3/8" = 1'-0"

Peter D. Antonowich 4/21/86

DRAWING STATUS
APPROVED FOR CONSTRUCTION
Date 6/26/86

DESIGN		
CHECKED		
TECH. REVIEW		
PROJECT ENGR. APPROVAL		
APPROVAL		
APPROVAL		
APPROVAL		
APPROVAL		

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES
POWERTON
ASH SURGE BASIN BY PASS
MISCELLANEOUS DETAILS

CECO CONTRACT: 802668 | CECO DWG. NO.
NUS CORPORATION ROCKVILLE, MD. | DRAWING NO. 5295 C 5003 | REV. 2
SCALE: As Shown | SHEET 1 OF

REVISIONS	
REV	DESCRIPTION
1	APPROVAL FOR CONSTRUCTION 6/26/86
2	(A) REMOVED COMBINED SELECT AND GRAVEL BLANKET FROM BOTTOM OF BASIN AND ADDED 12" POZ-O-PAC, SEC. E (B) CHANGED BOTTOM EL. 458.0 TO 459.0

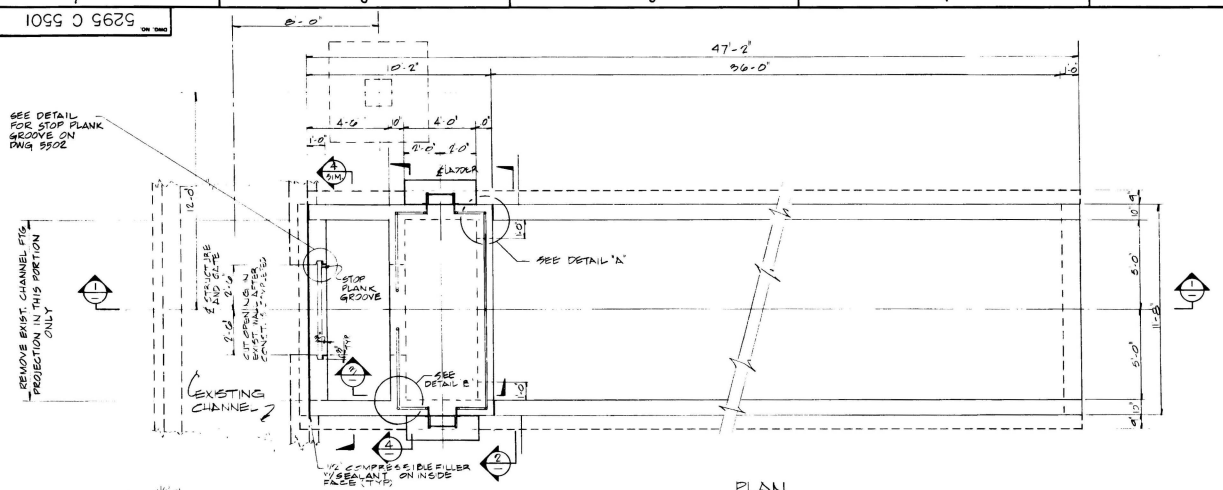
DRFTSMN 11/11 6/11
CHKR 6/11
COG ENGR 6/11
DSCIP MGR 6/11
PROJ MGR 6/11

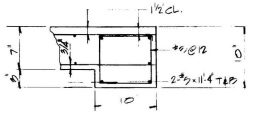
336

R001485

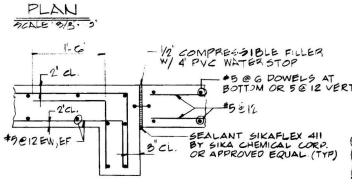
5295 C 5501

REVISIONS	
REV	DESCRIPTION
1	APPROVED FOR CONSTRUCTION
2	
3	

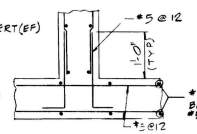




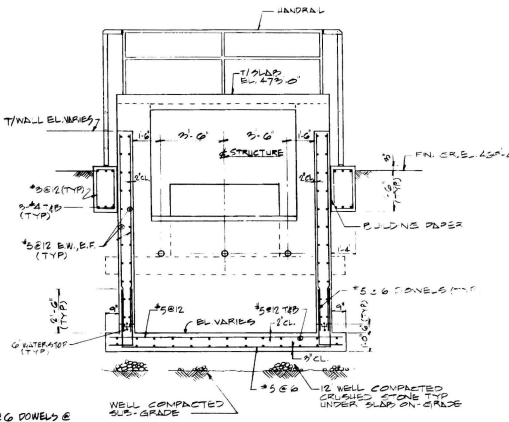
DETAIL 'C'
SCALE: 1½" = 1'-0"



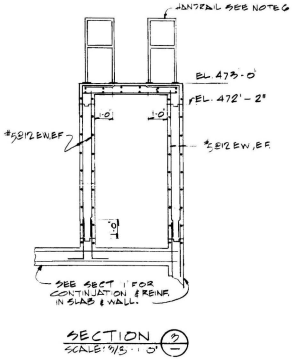
DETAIL "A"
SCALE: 1" = 1'-0"



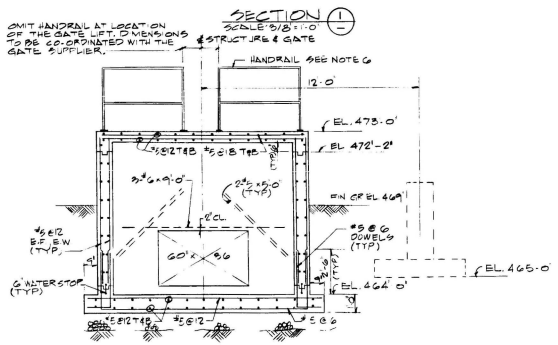
DETAIL "B"
SCALE: 1" = 1'-0"



SECTION (2)
SCALE: 3/8" = 1'-0"



SECTION (3)
SCALE: 3/8" = 1'-0"



SECTION (4)
SCALE: 3/8" = 1'-0"

NOTES:

1. CONCRETE: f'_c = 3000 PSI AT 28 DAYS
2. REINFORCING = ASTM A 615, GRADE 60
3. CONTRACTOR SHALL FURNISH AND INSTALL FAB STEEL GATE AND ACCESSORIES AS MANUFACTURED BY ARMCO STEEL CORP. CONFORMING TO THE FOLLOWING SPEC'S. OR APPROVED EQUAL.
   a. GATE MODEL 10-00
      QUANTITY REQUIRED = 1
      OPENING SIZE = 60" x 36"
      FRAME TYPE = FLAT BACK, STD. BOTTOM
      MATERIAL COMBINATION = # 2
      STEM DIA. = 1½" Φ
   b. ACCESSORIES
      TYPE OF LIFT = CPE 2
      LIFT SUPPORT = WALL BRACKET TO MATCH CPE 2
      STEM SUPPORT = ADJUSTABLE STEM GUIDES AT SPACING RECOMMENDED BY MANUFACTURER
4. CONTRACTOR SHALL COORDINATE WITH THE GATE SUPPLIER FOR THE NUMBER, SIZE AND LOCATION OF ANCHOR BOLTS REQUIRED TO ATTACH THE GATE, WALL BRACKET AND STEM GUIDES TO THE SUPPORTING WALL.
5. WORK THIS DWG. WITH CIVIL DWGS. 5295 C 5001 AND 5002.
6. FOR HANDRAIL & LADDER DETAILS SEE REF DWG. 5080 C 5601
7. FOR STOP PLANKS SEE DWG 5295 C 5502 NOTE 4

CONTRACT DRAWINGS:

5295 C 5001, 5002, 5003, 5501, 5502, 5503.

REFERENCE DRAWINGS:

CIVIL: 5080 C 5005, 5007, 5015, 5121

STRUCTURAL: 5080 C 5507, 5509, 5511, 5601, 5638, 5654, 5713

ELECTRICAL: (5080) 3E-0-3301, 3305, 3307

MECHANICAL: 5080 ME 3155 SHT 2, 5, 6, 7 & 11, 3162, 3169

NOTE: FOR LIST OF DRAWINGS BY TITLES SEE DWG NO. 5295 C 5003

Peter D. Arrowsmith 4/8/80

DRAWING STATUS

APPROVED FOR CONSTRUCTION

Date 2/8/80

DRAWN	KENNETH LONG	2/8/80
CHECKED	T-N	2/8/80
COG. ENGINEER		
PROJECT ENGINEER		2/8/80
APPROVAL		
APPROVAL		
APPROVAL PWD		2/8/80
APPROVAL CLIENT		

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES
POWERTON

ASH SURGE BASIN BY PASS
BASIN INLET STRUCTURE

FILE CENTRAL 802668 | FILE DRAWING | NO.

NUS CORPORATION
ROCKVILLE, MD.

DRAWING NO. 5295 C 5501 | REV 1

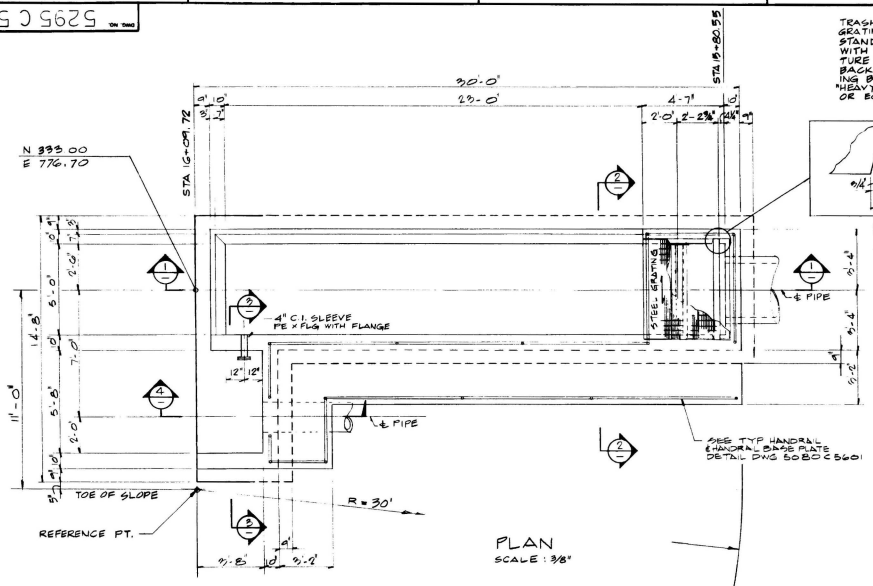
SCALE: AS SHOWN | SHEET 1 OF 1

33 11

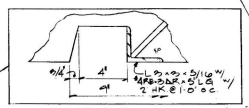
R001486

5295 C 5502

REVISIONS	
REV	DESCRIPTION
1	APPROVED FOR CONSTRUCTION

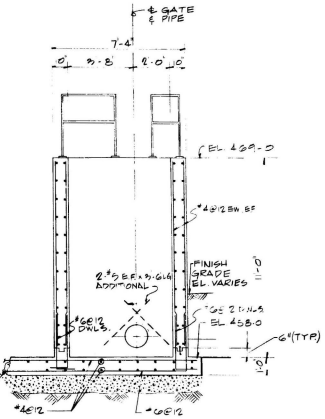


TRASH RACK — GALVANIZED STEEL GRATING PROVIDE 3 PANELS EACH STANDARD WIDTH 1'-7½" x 7'-01½" O/O WITH END BANDS. PLACE IN STRUCTURE AS SHOWN WITH CROSS BARS BACK FACE (DOWN STREAM). BEARING BARS 2½" x ⅛" @ 2⅜" C/C. IRVING "HEAVY WELD" TYPE HE (WT. 12.1 LBS/SQFT) OR EQUAL.

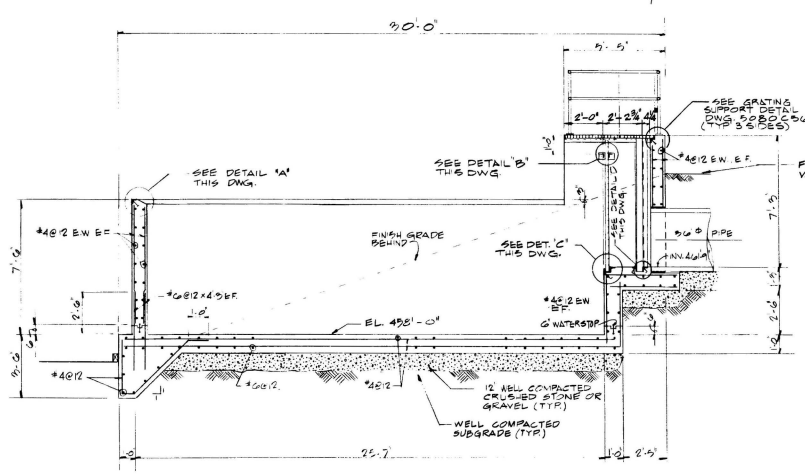


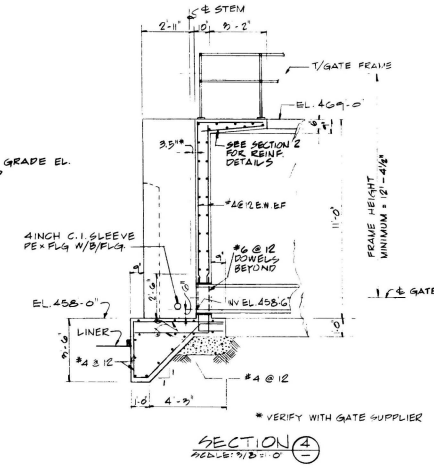
STOP PLANK GROOVE DETAIL

SECTION (2) SCALE 3/8" = 1'-0"



SECTION (3) SCALE 3/8" = 1'-0"

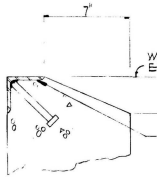




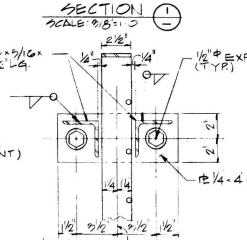
SECTION (4) SCALE: 3/8" = 1'-0"

NOTES:

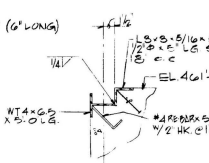
1. SEE NOTE NOS. 1, 2, 4, 5 AND 6 ON DWG 5501.
2. CONTRACTOR SHALL FURNISH & INSTALL MEDIUM DUTY SLUICE GATE & ACCESSORIES AS MANUFACTURED BY ARMCO STEEL CORP. OR APPROVED EQUAL, CONFORMING TO FOLLOWING SPECS:
   a. GATE
      MODEL 20-10C
      QUANTITY REQD = 1
      OPENING SIZE = 15" DIA.
      FRAME TYPE = FLAT BACK
      MATERIAL COMBINATION = #2
      STEM DIA. = 7/8"
   b. ACCESSORIES
      TYPE OF LIFT = H1-10
      FRAME HT = 12'-4½" MINIMUM.
3. STEEL GRATING TO BE IRVING WELDED RECTANGULAR DESIGN TYPE IHB-2 WITH 1¼" x ¼" MAIN BARS, AS MANUFACTURED BY IKG INDUSTRIES OR APPROVED EQUAL (GALVANIZED)
4. STOP PLANKS TO BE DOUGLAS FIR COMMERCIAL GRADE NO. 2 (WEST COAST)
   PROVIDE ONE SET OF 7 PLANKS 4" x 8" x 5'-5" LONG (DRESSED SIZE 3½" x 7¼" x 5'-5")
   STOP PLANKS ARE INTERCHANGEABLE AT THREE LOCATIONS — SEE ALSO DWGS C5501 & C5503 (ONLY ONE SET REQUIRED UNLESS DIRECTED OTHERWISE BY OWNER)



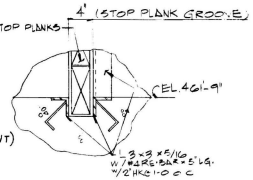
DETAIL - "A" SCALE: 3" = 1'-0"



DETAIL - "B" SCALE: 3" = 1'-0"



DETAIL - "C" SCALE: 1½" = 1'-0"



DETAIL - "D" SCALE: 1½" = 1'-0"

CONTRACT DRAWINGS:
5295 C 5001, 5002, 5003, 5501, 5502, 5503.

REFERENCE DRAWINGS:
CIVIL: 5080 C 5005, 5007, 5015, 5121.
STRUCTURAL: 5080 C 5507, 5509, 5511, 5601, 5638, 5654, 5713.
ELECTRICAL: (5080) 3E-0-3301, 3305, 3307
MECHANICAL: E 780 ME 3155 SHT 2, 5, 6, 7, & 11, & 62, 3169

NOTE: FOR LIST OF DRAWINGS BY TITLES SEE DWG NO. 5295 C 5009.

Rev'd. Arrangement 2/8/80

DRAWING STATUS
APPROVED FOR CONSTRUCTION
Date 2/8/80

DRAWN	LENG	1/80
CHECKED	[illegible]	2/4/80
COG. ENGINEER	[illegible]	2/4/80
PROJECT ENGINEER	[illegible]	2/4/80
APPROVAL		
APPROVAL		
APPROVAL PROJECT MGR.		2/4/80
APPROVAL CLIENT		

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES
POWERTON
ASH SURGE BASIN BY PASS
BASIN OUTLET STRUCTURE

CECO CONTRACT 80268	CECO DWG. NO.	REV.
NUS CORPORATION ROCKVILLE, MD.	5295 C 5502	1
	SCALE AS SHOWN	SHEET 1 OF 1

33 10

ATTACHMENT 3

2016 STRUCTURAL STABILITY AND SAFETY FACTOR ASSESSMENT

Geosyntec consultants

16644 West Bernardo Drive, Suite 301
San Diego, CA 92127
Phone: 858.674.6559
Fax: 858.674.6586
www.geosyntec.com

STRUCTURAL STABILITY AND FACTOR OF SAFETY ASSESSMENT
ASH SURGE BASIN AND BYPASS BASIN
POWERTON STATION
OCTOBER 2016

This report presents documentation of the initial periodic structural stability and initial safety factor assessments for the Ash Surge Basin and Bypass Basins (the Basins) at the Powerton Station (Site) in Pekin, Illinois (Figure 1). This report addresses the initial structural stability and safety factor assessment requirements of the Coal Combustion Residuals (CCR) regulations, Code of Federal Regulations Title 40, Part 257, Subpart D (referred to as the CCR Rule). These regulations were published in the Federal Register on 17 April 2015 and became effective on 19 October 2015. The Powerton Station is owned and operated by Midwest Generation, LLC (Midwest Generation). Based on the results provided in this report, the Ash Surge Basin and Bypass Basin meet the requirements of §257.73(d) and §257.73(e) of the CCR Rule.

The work presented in this report was performed under the direction of Ms. Jane Soule, P.E., of Geosyntec Consultants Inc. (Geosyntec) in accordance with §257.73(d) and §257.73(e). Mr. Robert White reviewed this report in accordance with Geosyntec's senior review policy.

1. Regulation Requirements - §257.73

Structural integrity criteria for existing CCR impoundments is described in §257.73 and includes structural stability and factor of safety assessments. The Ash Surge Basin and Bypass Basin meet the minimum size and capacity criteria under §257.73(b) and are subject to the structural stability and safety factor assessments required.

2. Site Conditions

The Ash Surge Basin is located east of the Main Wastewater Building, the cylindrical concrete clarifier and thickener structures, and the Metal Cleaning Basin, west of the inactive Limestone Basin, north of the Bypass Basin and East Roof and Yard Runoff (ERYR) Basin. The Ash Surge Basin is approximately 1,050 feet by 335 feet in plan dimensions (total plan area of approximately 8.1 acres). The surface impoundment is surrounded by a paved and a gravel perimeter access road around the western and eastern half of the impoundment, respectively.

The Bypass Basin is located east of the ERYR Basin and south of the southeast corner of the Ash Surge Basin. The Bypass Basin is approximately 160 feet by 255 feet in plan dimensions (total plan area of approximately 0.9 acres). A gravel perimeter access road is located along the northern and eastern boundaries of the Bypass Basin. A concrete-lined dewatering bin overflow

channel is located along the crest of the berm between the Bypass Basin and the ERYR Basin. A temporary construction staging area is located south of the surface impoundment.

The Ash Surge Basin and the Bypass Basin are both lined with a 60-mil high density polyethylene (HDPE) geomembrane.

Based on available documentation and discussions with site personnel, the Basins, in their current configuration, were constructed in the late 1970s and early 1980s. A history of construction for the basins was prepared in accordance with §257.73(c) and describes the design of the basins and their construction (Geosyntec, 2016a).

3. Structural Stability Assessment

The following subsections address the components of §257.73(d)(1).

3.1 Foundations and Abutments – §257.73(d)(1)(i)

The Ash Surge Basin and the Bypass Basin consist of embankments on all sides. Because no formational materials provide lateral structural support for the embankments, the Basins do not include abutments. The remainder of this section addresses the foundation materials for the Basins.

Previous subsurface investigations performed at the Site indicate foundation materials underlying the embankments for the Ash Surge Basin and Bypass Basin generally consists of approximately 17 to 28 feet of fat and lean clay overlying approximately 35 to 40 feet of loose to very dense poorly graded sand and silty sand with some gravel associated with the Henry Formation (Geosyntec, 2016b).

Elastic settlement of the clay and sand layers underlying the embankments likely occurred very soon after construction in the late 1970s and early 1980s. Because of the age of the embankments (approximately 35 years old), the majority of consolidation and secondary compression settlement of the clay layer has likely already occurred. The initial annual inspection performed for the Basins in accordance with §257.83(b) did not identify any adverse effects on the Basins or their appurtenant structures resulting from settlement that may have occurred since construction (Geosyntec, 2016c). There are no proposed changes in operation which would increase loading conditions on the foundation materials; therefore, no significant settlement of the foundation materials underlying the embankments is anticipated to occur in the future. Further, the embankments of the Basins were not constructed with abutments or separate engineered zones that would be most susceptible to the adverse effects of differential settlement. Therefore, potential settlement of the foundation is not anticipated to impact the integrity of the impoundment embankments.

A factor of safety against the triggering of liquefaction was calculated for saturated foundation materials underlying the Ash Surge Basin and Bypass Basin embankments. The factor of safety was calculated based methods outlined in Idriss and Boulanger (2008) using information obtained from field explorations, including borings, Cone Penetration Test (CPT) soundings, laboratory data (Geosyntec, 2016b) and seismic data (Geosyntec, 2016g). Overall, the foundation materials underlying the Ash Surge Basin and Bypass Basin have a low susceptibility to liquefaction and liquefaction-induced strength loss (Geosyntec, 2016d).

3.2 Upstream Slope Protection – §257.73(d)(1)(ii)

The Ash Surge Basin and Bypass Basin are lined with a 60-mil HDPE geomembrane that protects the interior basin slopes from erosion, the effects of wave action, and mitigates potential effects of rapid drawdown.

3.3 Dike Compaction – §257.73(d)(1)(iii)

Documentation of as-built construction conditions for the Ash Surge Basin and Bypass Basin embankments was not available at the time of this report. Samples of embankment fill materials obtained during Geosyntec's geotechnical investigations at the Site indicate that the Ash Surge Basin embankments are compacted to relative densities on the order of 95 percent based on Standard Proctor testing (Geosyntec, 2016b). No quantitative evaluation of the degree of compaction of the embankments for the Bypass Basin was performed for the embankments in their current state. Slope stability analyses show that the embankments for the Ash Surge Basin and Bypass Basin are sufficient to withstand the range of loading conditions in the CCR units (Geosyntec, 2016e).

3.4 Downstream Slope Vegetation – §257.73(d)(1)(iv)

Downstream slopes of the Ash Surge Basin and Bypass Basin have erosion protection from either vegetation or geomembrane liners located on the interior slopes of adjacent basins.

3.5 Spillway – §257.73(d)(1)(v)

The Ash Surge Basin and the Bypass Basin both contain emergency spillway structures. A description of these structures and the design storm event identified for the Basins is included in the Inflow Design Flood Control System Plan (IDFCSP) prepared for the site in accordance with §257.82(c) (Geosyntec, 2016f). The IDFCSP identifies the design event for the Site as the 1,000 year flood. Because the Ash Surge Basin and Bypass Basin do not impound water from a natural stream and do not impound stormwater flows, except for direct precipitation that falls on the embankment crest or within the Basins, the IDFCSP identifies the design event as the 24-hour, 1,000-year precipitation event. When the operating freeboard for the Basins is taken

into account, the water levels in the Basins estimated after the design precipitation event are estimated to be lower than the invert elevations of the emergency spillways and no discharge from the Basins is anticipated (Geosyntec, 2016f). Therefore, the hydraulic capacity of the spillways was not calculated.

3.6 Structural Integrity of Hydraulic Structures – §257.73(d)(1)(vi)

Hydraulic structures passing through or beneath the embankments of the Bypass Basin and Ash Surge Basin consist of several pipes and conveyance structures associated with the inlet and outlet structures of the Basins. These structures and pipes were inspected periodically between 10 May 2016 and 24 May 2016 by a company specializing in video camera pipe inspections. The inspected structures and pipes related to the Basins included are presented on Figure 2. The video inspections did not identify significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, or debris that would negatively affect operation of the pipes was observed.

3.7 Downstream Slopes Adjacent to Water Bodies – §257.73(d)(1)(vii)

Ponds or water bodies near downstream slopes of the Ash Surge Basin and Bypass Basin are identified on Figure 3 and include:

- The Metal Cleaning Basin located west of the Ash Surge Basin. This basin is lined with an HDPE geomembrane.
- The ERYR Basin located west of the Bypass Basin and south of the Ash Surge Basin;
- The inactive Limestone Basin located east of the Ash Surge Basin; and
- The FAB located northeast of the Ash Surge Basin.

For stability analyses performed, a "low pool" condition where the modeled groundwater depth is lowered so there is little or no stabilizing force present on the downstream slope of the Ash Surge Basin or Bypass Basin embankments was evaluated for the water bodies presented above (Geosyntec, 2016e).

Stability during rapid drawdown was also evaluated for the embankments affected by the ERYR Basin and the FAB. Rapid drawdown was not evaluated for the embankments affected by the Metal Cleaning Basin because its HDPE geomembrane minimizes potential inundation of the slopes and mitigates effects of rapid drawdown. Similarly, embankments affected by the inactive Limestone Basin were not evaluated for rapid drawdown because the volume of water in this basin is anticipated to be minimal (inflow is limited to direct precipitation) and there is no outlet structure associated with this basin that could create a rapid drawdown condition for the adjacent Ash Surge Basin embankment.

Slope stability analyses show that the embankments are designed and constructed to maintain structural stability during "low pool" and rapid drawdown conditions (Geosyntec, 2016e).

3.8 Structural Stability Assessment Deficiencies - §257.73(d)(2)

No structural stability deficiencies associated with the Ash Surge Basin and Bypass Basin were identified in this initial structural stability assessment and no corrective measures are required.

3.9 Annual Inspection Requirement - §257.83(b)(4)(ii)

In accordance with §257.83(b)(4)(ii), submittal of this structural stability assessment precludes the requirement of an annual inspection under §257.83(b) for the Ash Surge Basin and Bypass Basin during the 2016 calendar year. One deficiency identified in the initial annual inspection (Geosyntec, 2016c) for the Bypass Basin was corrected as documented in the Notice of Remedy prepared in response to the initial annual inspection.

4. Safety Factor Assessment

This section describes the initial safety factor assessment for the Ash Surge Basin and Bypass Basin and the methodology used to perform the assessment in accordance with §257.73(e)(1). This assessment includes slope stability analyses of the critical embankment cross-section for each basin, shown in Figure 3.

4.1 Slope Stability Methodology

Limit equilibrium slope stability analyses were performed to evaluate the stability of the embankments for the Ash Surge Basin and Bypass Basin. The process involved performing two-dimensional analyses on the critical cross-section for each basin using Spencer's Method as coded in the computer program SLOPE/W (Version 8.15.4.11512, www.geoslope.com) which satisfies vertical and horizontal force equilibrium and moment equilibrium. For each cross section analyzed, the program searches for the sliding surface that produces the lowest factor of safety (FS). Factor of safety is defined as the ratio of the shear forces/moments resisting movement along a sliding surface to the forces/moments driving the instability.

Subsurface stratigraphy, groundwater conditions, and engineering parameters for the embankment and foundation materials were developed based on previous subsurface investigations performed at the Site (Geosyntec, 2016b and Geosyntec, 2016e).

4.2 Slope Stability Analyses

Four cases were analyzed to satisfy the safety factor assessment requirements in §257.73(e) (Geosyntec, 2016e).

4.2.1 Static, Long-Term Maximum Storage Pool Loading – §257.73(e)(1)(i)

Pursuant to §257.73(e)(1)(i) a static, long-term condition with the maximum operating pool loading on the embankments was evaluated. For the Ash Surge Basin and Bypass Basin, this condition included a pool elevation at 465 feet MSL[1] for the Ash Surge Basin and 465.5 feet MSL for the Bypass Basin, and a groundwater elevation of 451.8 feet MSL (Geosyntec, 2016e).

4.2.2 Static, Maximum Storage Pool Loading – §257.73(e)(1)(ii)

The conditions for §257.73(e)(1)(ii) are identical to §257.73(e)(1)(i) with the exception of the pool elevation, which is set at the lowest points of the embankment crest (Geosyntec, 2016e).

4.2.3 Seismic – §257.73(e)(1)(iii)

Pursuant to §257.73(e)(1)(iii), a seismic condition for Ash Surge Basin and Bypass Basin was also analyzed. Seismic stability was evaluated with a pseudostatic analysis that uses constant horizontal accelerations to represent the effects of earthquake shaking. The horizontal accelerations are represented in SLOPE/W by a horizontal seismic coefficient. The horizontal seismic coefficient used for analysis was based on a peak ground acceleration with a 2 percent probability of exceedance in 50 years (Geosyntec, 2016g).

4.2.4 Liquefaction – §257.73(e)(1)(iv)

The majority of the embankment soils for the Ash Surge Basin and Bypass Basin are not considered susceptible to liquefaction because saturation of the embankment soils is unlikely based on the presence of a geomembrane liner system. Based on the design phreatic surface discussed in Geosyntec (2016b), a limited portion of the bottom of the embankments may become saturated from groundwater. Liquefaction triggering analyses of these saturated embankment soils show that liquefaction and associated post-liquefaction shear strength loss is unlikely for the seismic design event (Geosyntec, 2016d). Because the likelihood of liquefaction and associated shear strength loss of the embankment soils is very low, post-liquefaction conditions are represented by the static factor of safety analyses.

4.3 Results

The results of the slope stability analysis for the critical cross sections of the Ash Surge Basin and Bypass Basin embankments are summarized in Table 1 below and presented in Figures 4 through 9 (Geosyntec 2016e).

[1] Mean Sea Level based on local plant vertical datum.

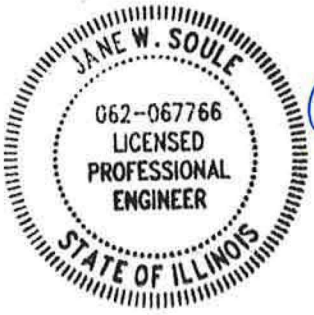
Table 1: Safety Factor Results

Section	Safety Factor			
	257.73(e)(1)(i)	257.73(e)(1)(ii)	257.73(e)(1)(iii)	257.73(e)(1)(iv)
1	≥1.50	≥1.40	≥1.00	≥1.20
2	≥1.50	≥1.40	≥1.00	≥1.20

These results meet the factor of safety requirements presented in §257.73(e)(1)(i) through §257.73(e)(1)(iv).

5. Limitations and Certification

This initial periodic structural stability and safety factor assessment meets the requirements of §257.73(d) and §257.73(e) of the Code of Federal Regulations Title 40, Part 257, Subpart D, and was prepared in accordance with current practices and the standard of care exercised by scientists and engineers performing similar tasks in the field of civil engineering. The contents of this report are based solely on the observations of the conditions observed by Geosyntec personnel and information provided to Geosyntec by Midwest Generation. Consistent with applicable professional standards of care, our opinions and recommendations were based in part on data furnished by others, which was consistent with other information that we developed in the course of our performance of the scope of services. The information contained in this report is intended for use solely by Midwest Generation and their subconsultants.



Jane W. Soule, P.E.
Illinois Professional Engineer No. 062-067766
Expiration Date: 11/30/2017

6. References

Das, 2007. "Principles of Foundation Engineering," Sixth edition. Thomson Canada Limited.

Geosyntec, 2016a. History of Construction Report, Ash Surge Basin and Bypass Basin, Powerton Station, October.

Geosyntec, 2016b. Ash Surge Basin and Bypass Basin – Soil Properties Calculation, Powerton Station, October.

Geosyntec, 2016c. Annual Inspection Report, Ash Surge Basin and Bypass Basin, Powerton Station, 18 January 2016.

Geosyntec, 2016d. Ash Surge Basin and Bypass Basin – Liquefaction Calculations, Powerton Station, October.

Geosyntec, 2016e. Ash Surge Basin and Bypass Basin – Slope Stability Calculations, Powerton Station, October.

Geosyntec, 2016f. Inflow Design Flood Control System Plan, Ash Surge Basin and Bypass Basin, Powerton Generating Station, October.

Geosyntec, 2016g. Ash Surge Basin and Bypass Basin – Seismic Coefficient Calculations, Powerton Station, October.

Idriss and Boulanger, 2008. "Soil Liquefaction During Earthquakes". Earthquake Engineering Research Institute, MNO-12.

Attachments

Figure 1 – Site Location
Figure 2 – Hydraulic Structure Locations
Figure 3 – Stability Sections
Figure 4 – Slope Stability Output, Section 1 - 257.73(e)(1)(i)
Figure 5 – Slope Stability Output, Section 1 - 257.73(e)(1)(ii)
Figure 6 – Slope Stability Output, Section 1 - 257.73(e)(1)(iii)
Figure 7 – Slope Stability Output, Section 2 - 257.73(e)(1)(i)
Figure 8 – Slope Stability Output, Section 2 - 257.73(e)(1)(ii)
Figure 9 – Slope Stability Output, Section 2 - 257.73(e)(1)(iii)

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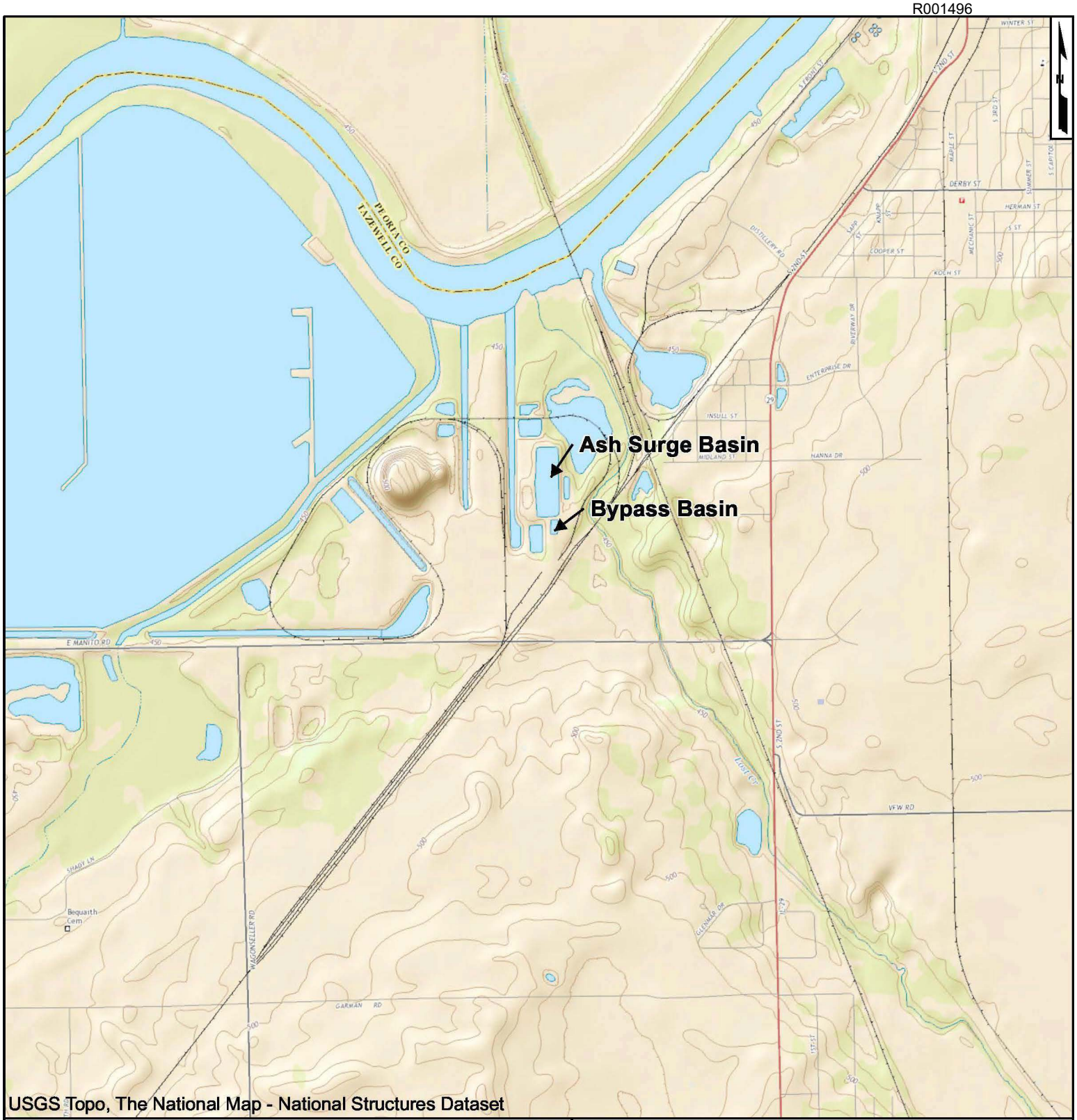




2,000 1,000 0 2,000 Feet

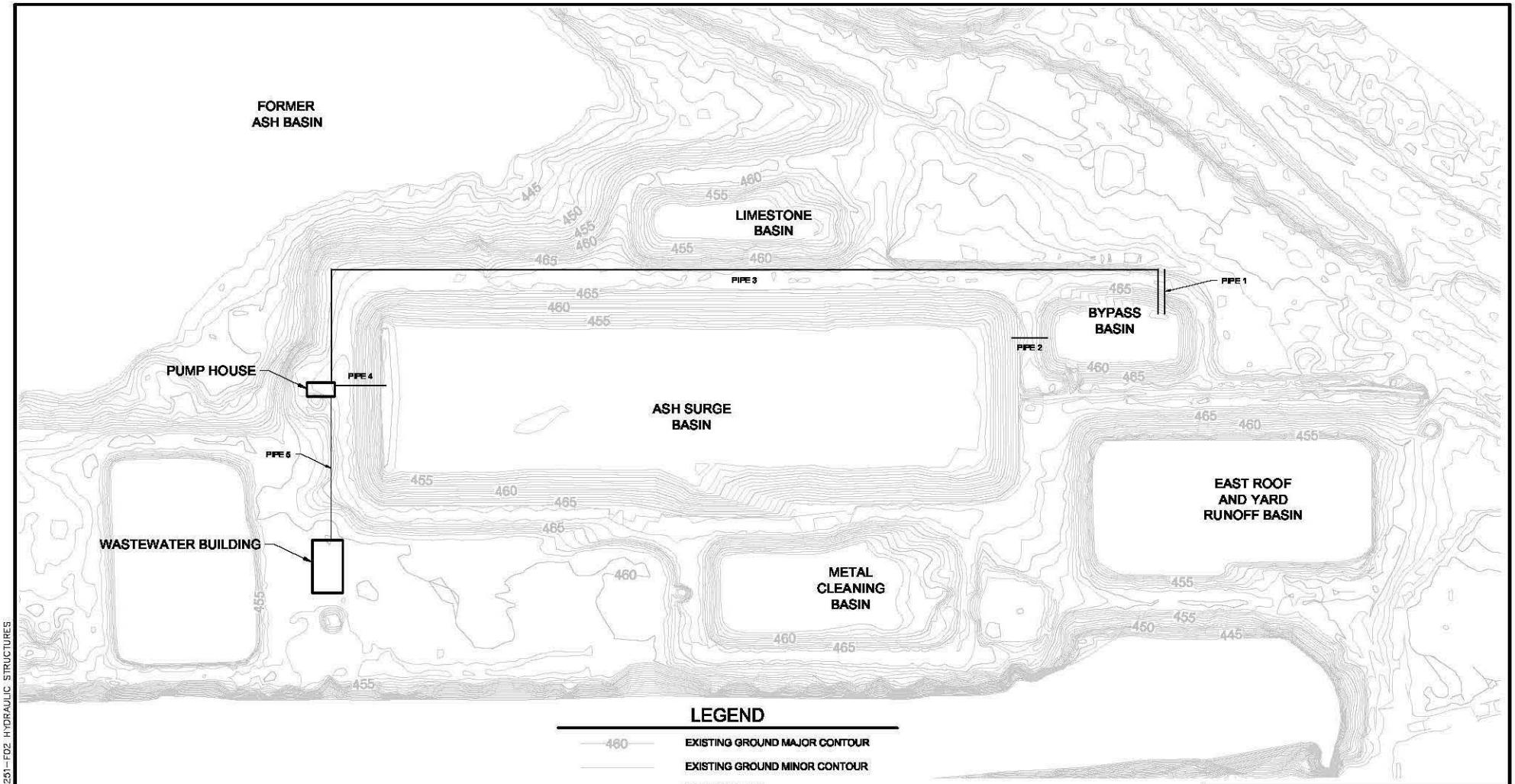
Site Location

Ash Surge and Bypass Basins
Powerton Station
Pekin, Illinois

Geosyntec consultants

San Diego	October 2016	Figure 1

K:\GIS\PowertonSiteLocation.mxd Name



LEGEND

- 460 — EXISTING GROUND MAJOR CONTOUR
- EXISTING GROUND MINOR CONTOUR
- PIPE LOCATION

SOURCE OF SURVEY:
TOPOGRAPHY WITHIN THE ASH SURGE AND BYPASS BASINS IS BASED ON TOP OF LINER TOPOGRAPHY FOR LINER REPLACEMENT PROJECTS (NRT, 2011 AND 2013). TOPOGRAPHY OUTSIDE THE LINER LIMIT OF THE BASINS IS AEROMETRIC, INC. PROJECT NUMBER 1080611, DATED 6-19-2008.

HORIZONTAL DATUM: NAD83 IL SPC WEST

VERTICAL DATUM: LOCAL PLANT DATUM

NOTES:
1. ALL PIPE LOCATIONS ARE APPROXIMATE.

N

0 150' 300'

SCALE IN FEET

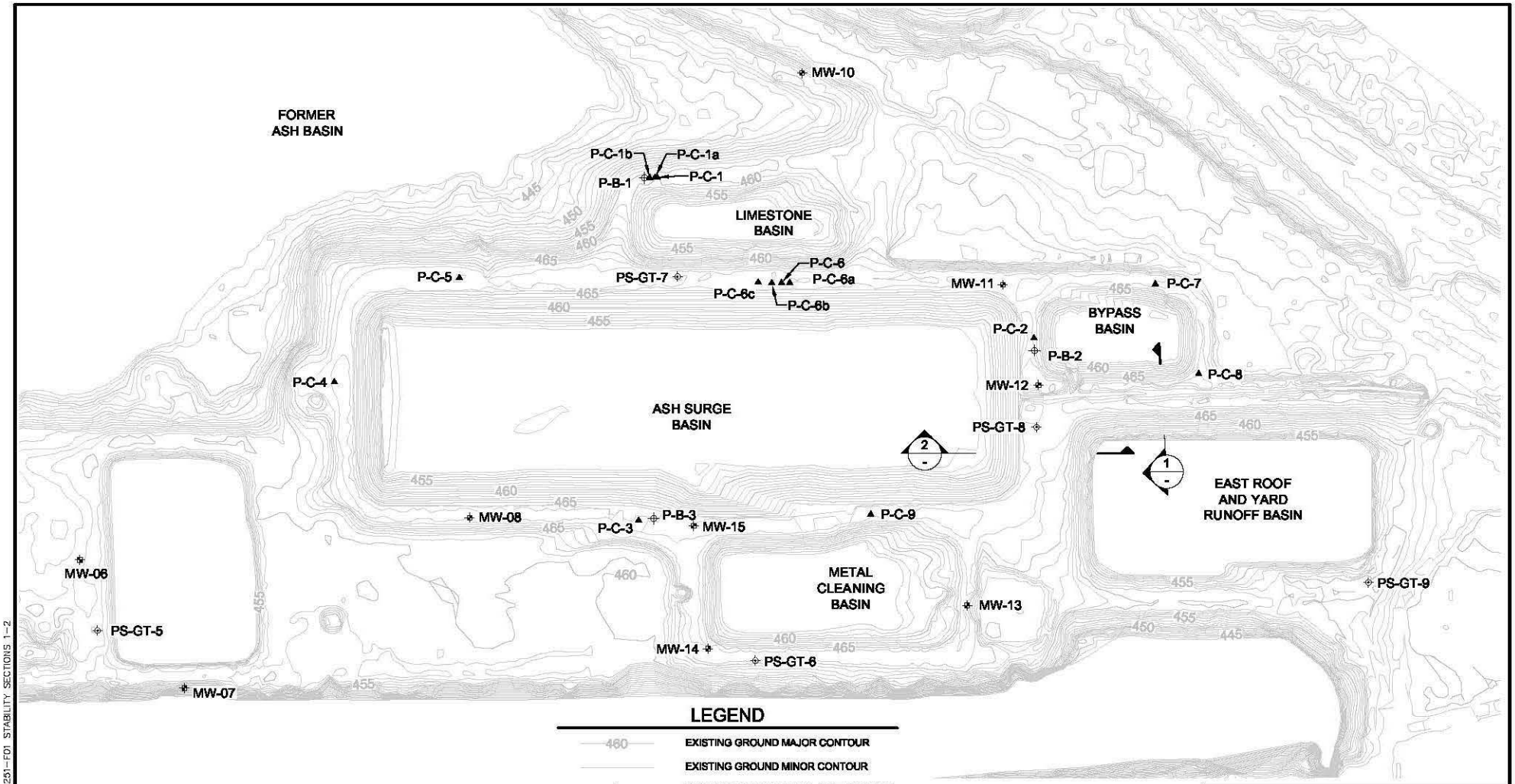
HYDRAULIC STRUCTURE LOCATIONS
ASH SURGE AND BYPASS BASINS
POWERTON STATION
PEKIN, ILLINOIS

Geosyntec consultants

FIGURE 2

PROJECT NO: SW0251-07 | OCTOBER 2016

Z:\CADD\FIGURES\POWERTON\SW0251-F02 HYDRAULIC STRUCTURES



LEGEND

- 460 — EXISTING GROUND MAJOR CONTOUR
- EXISTING GROUND MINOR CONTOUR
- MW-03 MONITORING WELL (PATRICK, 2011)
- P-B-1 BORING (GEOSYNTEC, 2016)
- P-C-1 CPT SOUNDING (GEOSYNTEC, 2016)
- PS-GT-5 BORING (KPRG, 2005)
- 1 - CROSS SECTION LOCATION

NOTES:
1. ALL EXPLORATION LOCATIONS ARE APPROXIMATE.

SOURCE OF SURVEY:
TOPOGRAPHY WITHIN THE ASH SURGE AND BYPASS BASINS IS BASED ON TOP OF LINER TOPOGRAPHY FOR LINER REPLACEMENT PROJECTS (NRT, 2011 AND 2013). TOPOGRAPHY OUTSIDE THE LINER LIMIT OF THE BASINS IS AEROMETRIC, INC. PROJECT NUMBER 1080611, DATED 6-19-2008.

HORIZONTAL DATUM: NAD83 IL SPC WEST

VERTICAL DATUM: LOCAL PLANT DATUM

N

0 150' 300'

SCALE IN FEET

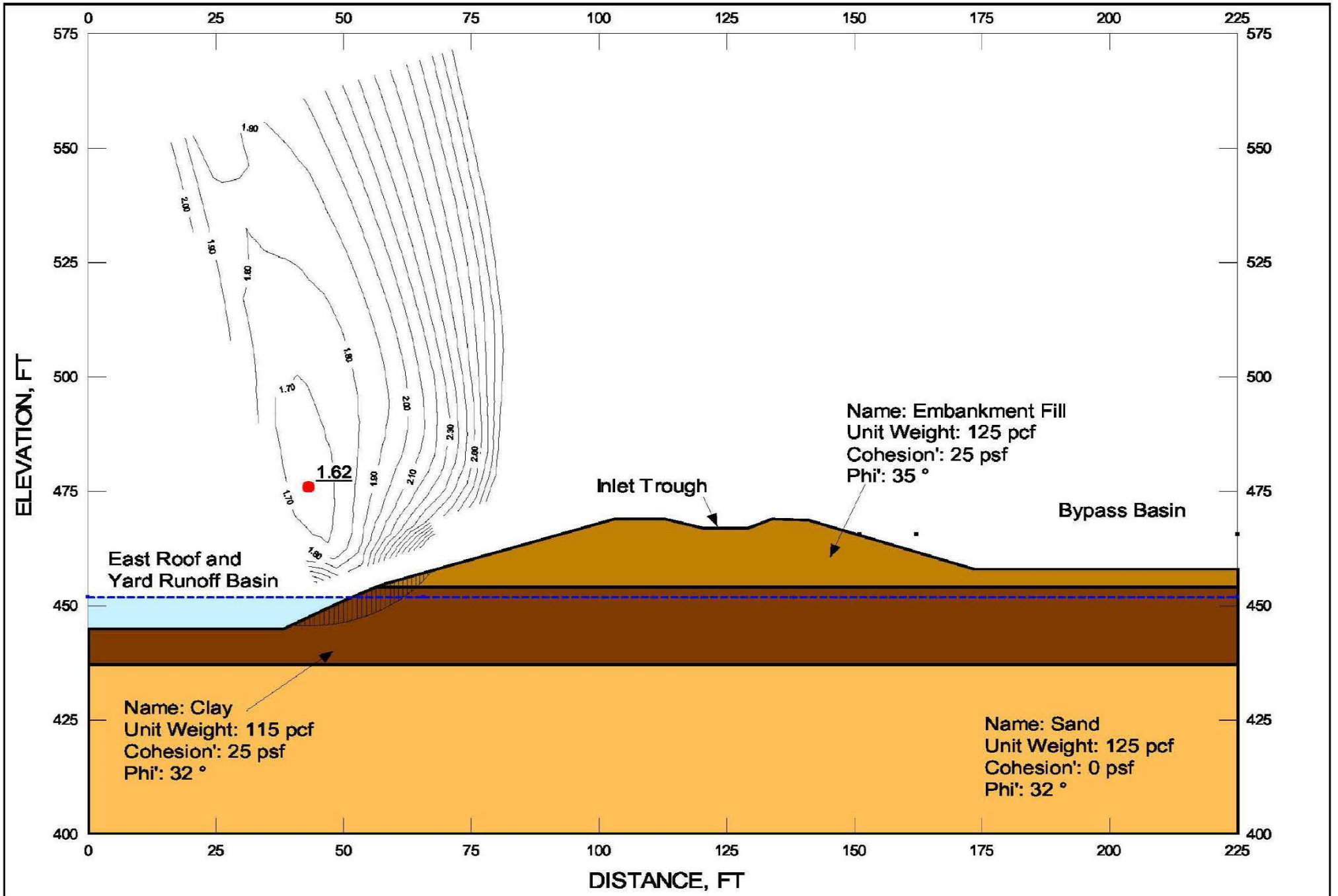
STABILITY SECTIONS
ASH SURGE AND BYPASS BASINS
POWERTON STATION
PEKIN, ILLINOIS

Geosyntec consultants

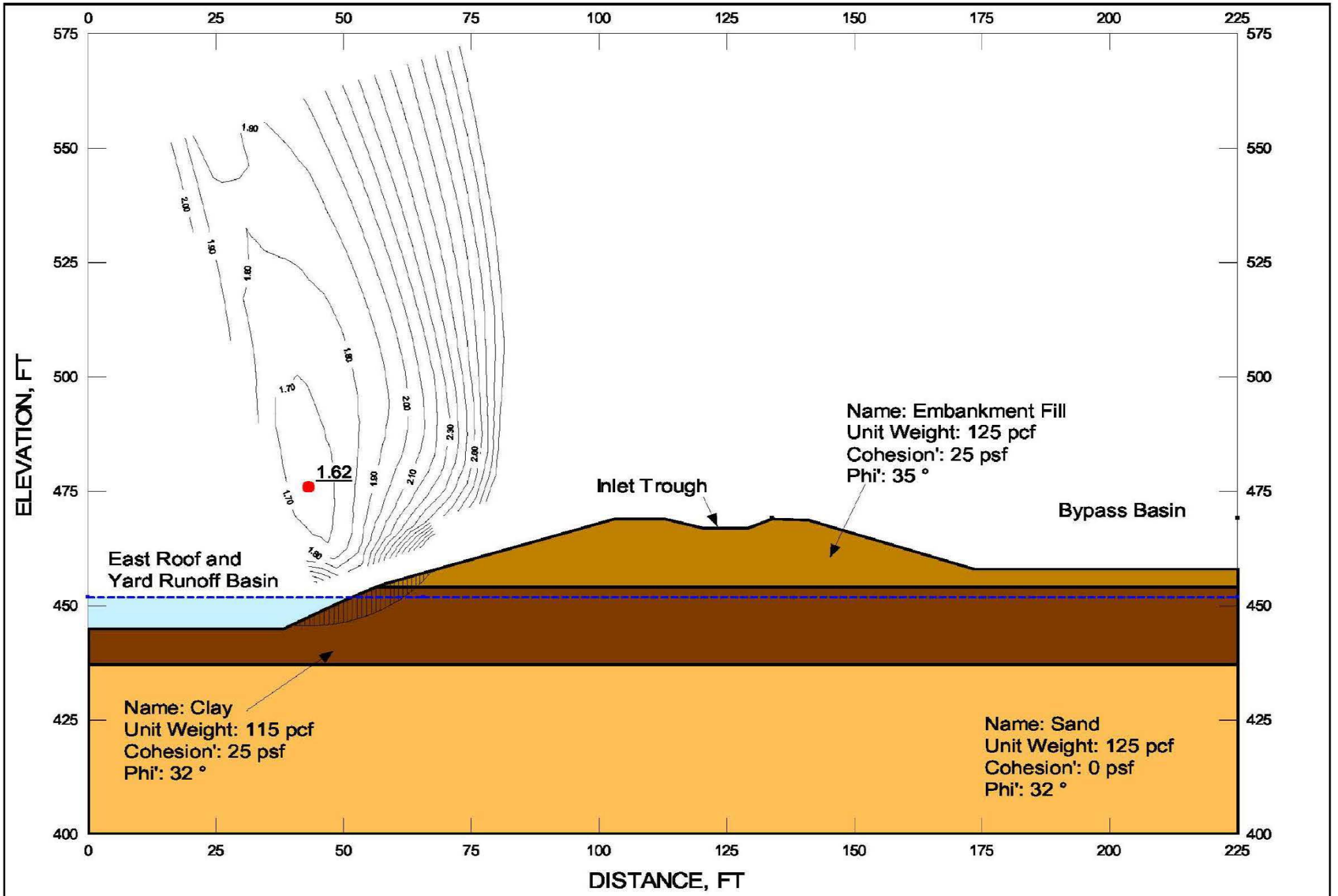
FIGURE 3

PROJECT NO: SW0251-07 | OCTOBER 2016

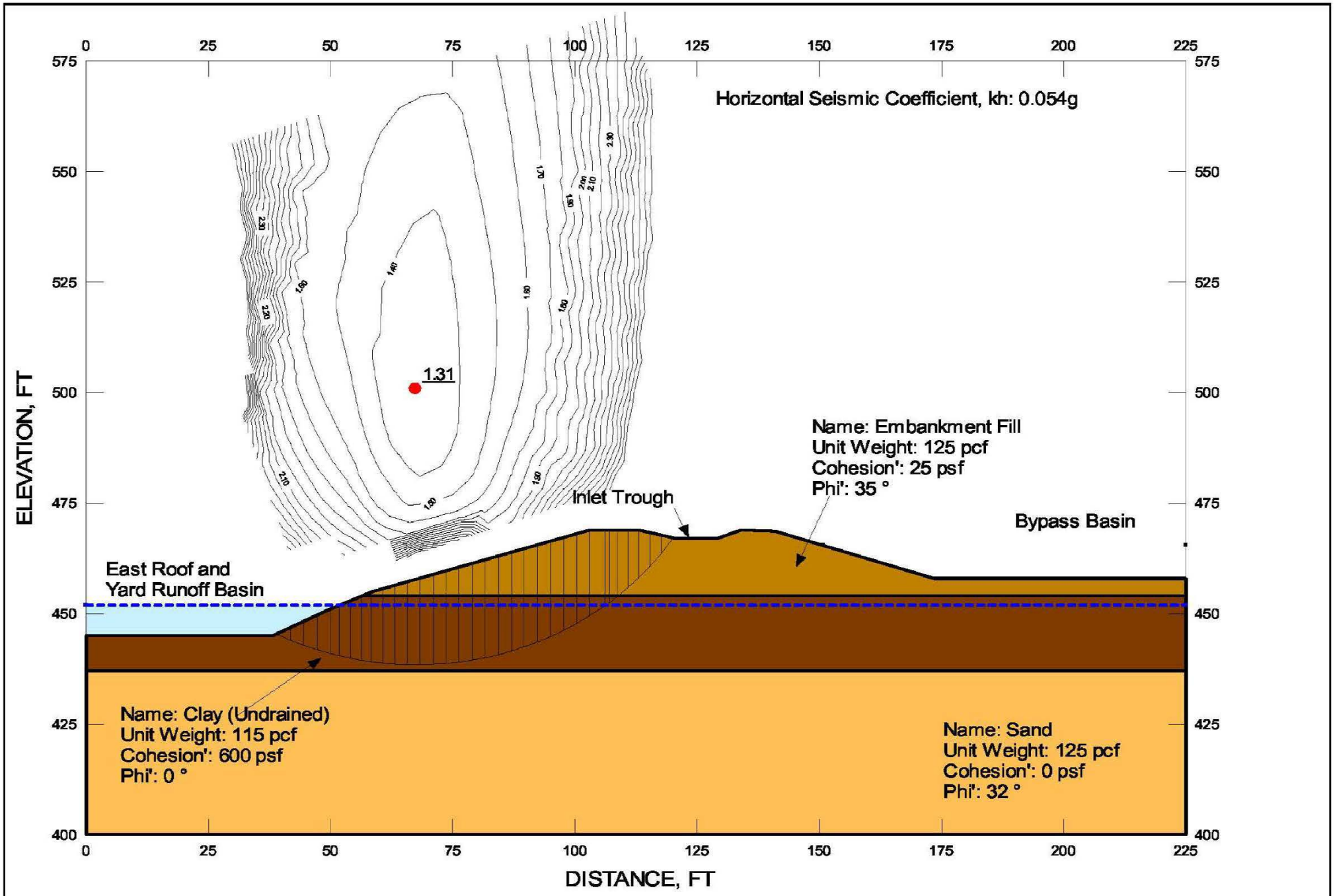
Z:\CADD\FIGURES\POWERTON\SW0251-F01 STABILITY SECTIONS 1-2



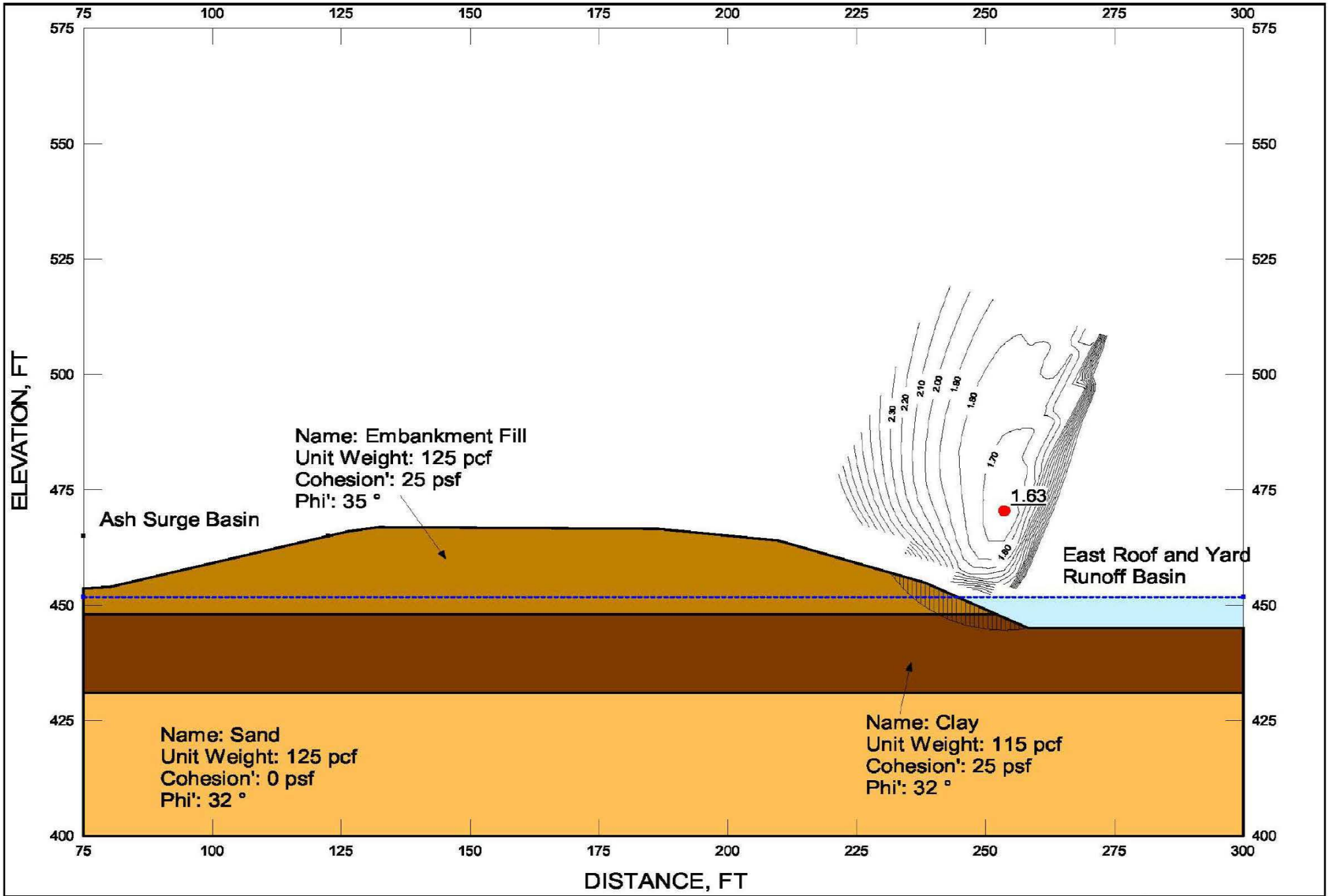
Geosyntec consultants	Analysis: Section 1 - §257.73(e)(1)(i): Long Term, Maximum Storage Pool Loading		FIGURE 4
	Project: Powerton Ash Surge and Bypass Basins	Analysis By: Cory Russell	
	File Name: Powerton Section 1.gsz	Date: October 2016	



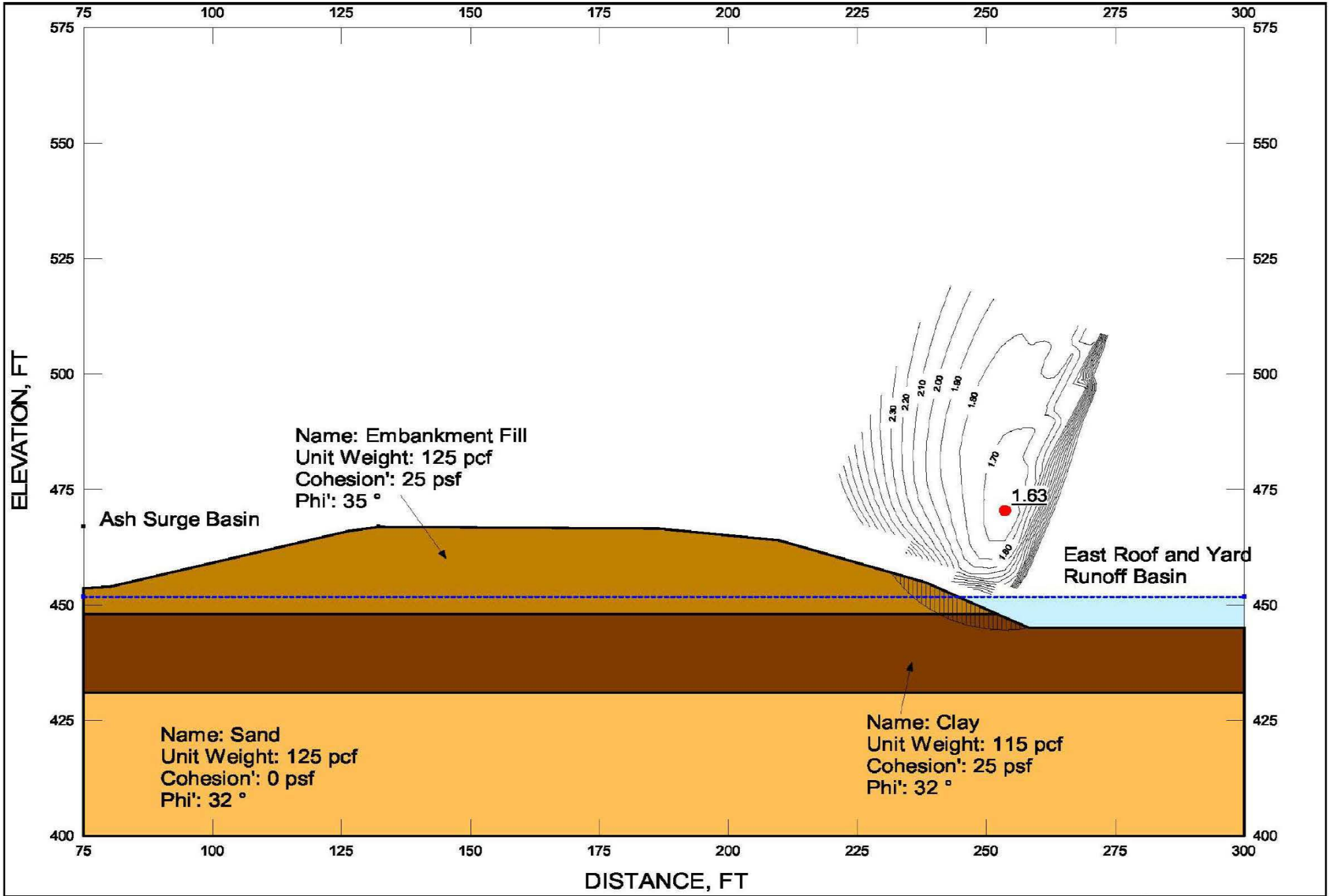
Geosyntec consultants	Analysis: Section 1 - §257.73(e)(1)(ii): Maximum Surcharge Pool Loading		FIGURE 5
	Project: Powerton Ash Surge and Bypass Basins	Analysis By: Cory Russell	
	File Name: Powerton Section 1.gsz	Date: October 2016	



Geosyntec consultants	Analysis: Section 1 - §257.73(e)(1)(iii): Long Term, Maximum Storage Pool Loading with Seismic (Undrained Conditions)		FIGURE 6
	Project: Powerton Ash Surge and Bypass Basins	Analysis By: Cory Russell	
	File Name: Powerton Section 7.gsz	Date: October 2016	



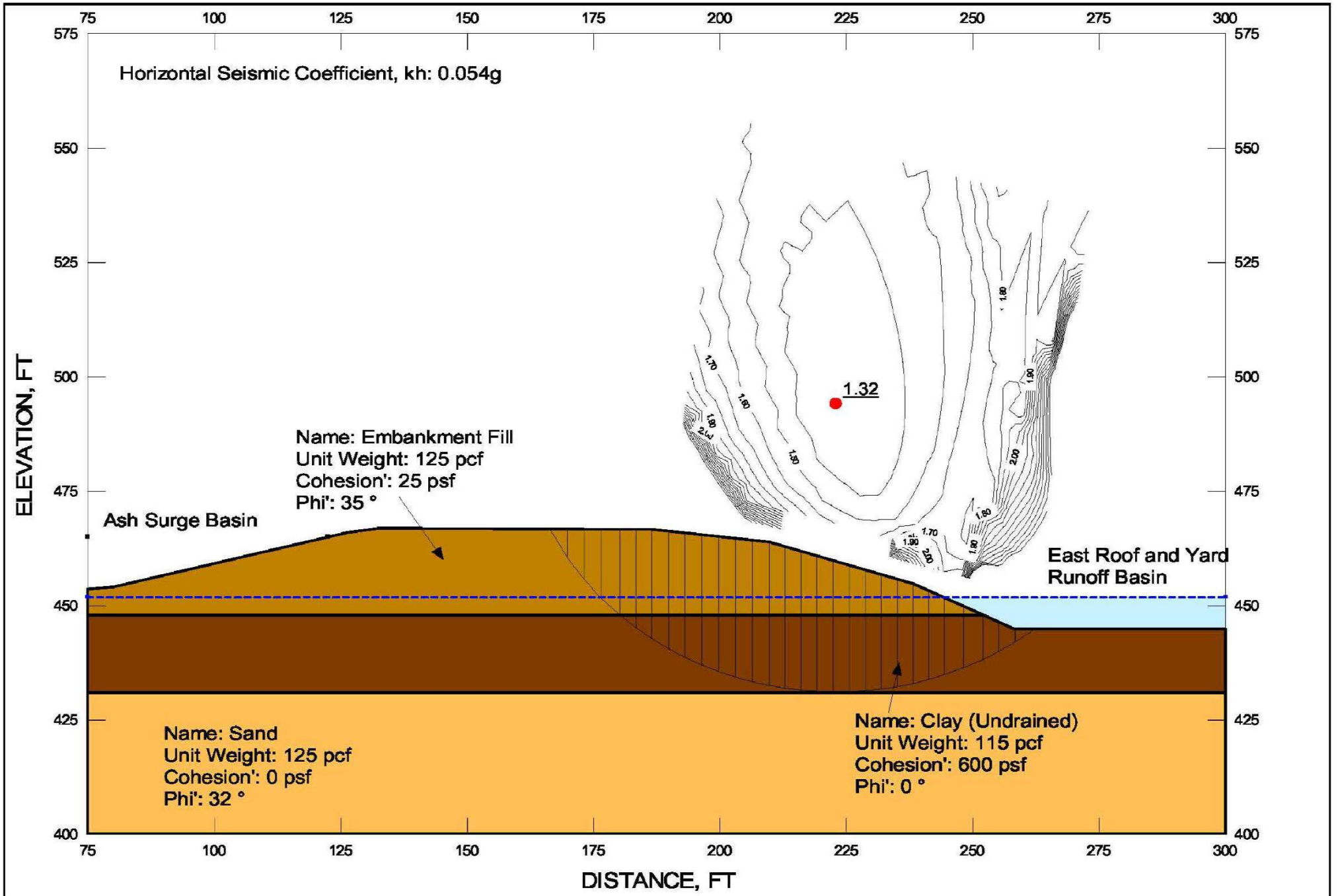
Geosyntec consultants	Analysis: Section 2 - §257.73(e)(1)(i): Long Term, Maximum Storage Pool Loading		FIGURE 7
	Project: Powerton Ash Surge and Bypass Basins	Analysis By: Cory Russell	
	File Name: Powerton Section 2.gsz	Date: October 2016	



Geosyntec consultants

Analysis	Section 2 - §257.73(e)(1)(ii): Maximum Surcharge Pool Loading		
Project	Powerton Ash Surge and Bypass Basins	Analysis By	Cory Russell
File Name	Powerton Section 2.gsz	Date	October 2016

FIGURE 8



Analysis	Section 2 - §257.73(e)(1)(iii): Long Term, Maximum Storage Pool Loading with Seismic (Undrained Conditions)		
Project	Powerton Ash Surge and Bypass Basins	Analysis By	Cory Russell
File Name	Powerton Section 2.gsz	Date	October 2016

Geosyntec consultants

FIGURE 9

DOCUMENT 41

MWG

Midwest Generation, LLC

POWERTON GENERATING STATION

SPECIFICATION P-1401

CONSTRUCTION QUALITY ASSURANCE FOR BYPASS BASIN RETROFIT

S&L PROJECT NO.: 12661-181

REVISION 0

ISSUE PURPOSE: BIDS

ISSUE DATE: 04-19-2024

Sargent & Lundy

Midwest Generation, LLC
Powerton Generating Station
Project No. 12661-181
Issue Summary and Approval Page

Specification P-1401
Rev. 0
Issue: Bids
Date: 04-19-2024

SECTION 000106

ISSUE SUMMARY AND APPROVAL PAGE

Rev.	Purpose of Issue	Date	Sections Affected
0	Bids	04-19-2024	All

This is to confirm that this Specification has been prepared, reviewed, and approved in accordance with Sargent & Lundy's Standard Operating Procedure SOP-0407, Specifications and Bills of Materials, which is part of our Quality Management System.

Contributor Summary & Current Revision Signatures

Rev.	Prepared By	Reviewed By	Approved By
0	Aimee Sahlas A. Sahlas	Digitally signed by Thomas Dehlin Date: 2024.04.19 15:01:22-05'00' T. Dehlin	Digitally signed by Thomas Dehlin Date: 2024.04.19 15:01:32-05'00' T. Dehlin

Midwest Generation, LLC
Powerton Generating Station
Project No. 12661-181
Certification Page

Specification P-1401
Rev. 0
Issue: Bids
Date: 04-19-2024

SECTION 000107

CERTIFICATION PAGE

Sargent & Lundy (S&L) is registered in the State of Illinois to practice engineering. S&L's Illinois Department of Financial and Professional Regulation registration number is 184-000106.

I certify that this Specification was prepared by me or under my direct supervision and that I am a registered professional engineer under the laws of the State of Illinois.

Certified By: Thomas J. Dehlin Date: April 19, 2024

Seal:



Digitally signed by Thomas Dehlin
Date: 2024.04.19 15:01:42-05'00'



SECTION 000110

TABLE OF CONTENTS

DIVISION 00 – PROCUREMENT AND CONTRACTING

Section 000110	Table of Contents

DIVISION 01 – GENERAL REQUIREMENTS

Section 011100	Summary of Work
Section 014362	Construction Quality Assurance for Fill, Liner, and Leachate Collection Materials

END OF SECTION 000110

SECTION 011100

SUMMARY OF WORK

PART 1 - GENERAL

101. PROJECT INFORMATION

101.1 Owner: Midwest Generation, LLC (MWG)

101.2 Design Engineer: Sargent & Lundy (S&L)

101.3 Project Name: Bypass Basin Retrofit

101.4 Project Location: Powerton Generating Station
13082 E. Manito Rd.
Pekin, IL 61554

102. DESCRIPTION OF THE PROJECT AND GENERAL BACKGROUND

102.1 The purpose of this project is to retrofit the Bypass Basin at Midwest Generation, LLC's Powerton Generating Station in accordance with the Illinois Pollution Control Board's Coal Combustion Residuals (CCR) Rule, 35 Ill. Adm. Code Part 845, and with the U.S. Environmental Protection Agency's (EPA) CCR Rule, 40 CFR Part 257 Subpart D.

102.2 The Bypass Basin will be retrofitted by removing all CCR and CCR-mixed materials stored in the basin and decontaminating the basin's existing geomembrane liner and appurtenant structures, which will remain in place. Following removal of CCR and CCR-mixed material from the basin and decontamination of the basin facilities remaining in-place, a new composite liner system and new leachate collection and removal system (LCRS) will be installed within the Bypass Basin over the basin's existing decontaminated and leak-tested geomembrane liner.

103. SCOPE OF WORK

103.1 In general, this Specification covers the field and laboratory activities for a Construction Quality Assurance (CQA) Contractor to provide assurance and documentation that the Bypass Basin at the Powerton Generating Station is retrofitted in accordance with the Earthwork Specification (P-1400), the Geosynthetic Materials Specification (P-1402), the Design Drawings, and permit requirements.

103.2 The CQA Work shall include but not be limited to the following:

a. Prepare a CQA Plan that provides a detailed description of the activities that will be performed by the CQA Contractor in accordance with the Design Drawings and this Specification.

b. Verify and document that all appropriate measures are taken by the Earthwork Contractor and the Geosynthetics Contractor to protect the Bypass Basin's existing geomembrane liner from damage throughout the project.

c. Perform earthwork inspection and testing work specified in Section 014362 to:

c1. Verify compliance of materials with Project Specifications and Design Drawings.

c2. Perform specified field material and installation tests.

c3. Obtain samples and perform laboratory tests and/or contract to have laboratory tests performed and audit laboratory test results.

c4. Perform inspections during construction as specified.

d. Perform geosynthetics inspection and testing work specified in Section 014362 to:

d1. Verify compliance of materials with the Project Specifications and Design Drawings.

d2. Perform field material and installation tests.

d3. Obtain samples and perform laboratory tests and/or contract to have laboratory tests performed and audit laboratory test results.

d4. Witness field testing and audit field test results as specified.

d5. Perform inspections during construction.

e. Identify non-conforming work.

f. Meetings, Documentation, and Reports:

f1. Participate in project meetings.

f2. Prepare CQA records and documents.

f3. Prepare CQA reports, including:

f3.1 Preparing an Index Report listing all CQA reports prepared throughout the project.

f3.2 Preparing and certifying Weekly Summary Reports until the end of the project.

f3.3 Preparing and certifying a Final Report at the end of the project.

103.3 The CQA Work shall conform to the requirements of this Specification and shall be performed and supervised by personnel who are experienced and knowledgeable in the crafts and trades required by the Scope of Work. The CQA Work shall be performed exclusively by the CQA Contractor's trained and competent personnel or, where permitted, that of its subcontractor(s); and shall comply with all applicable safety laws, regulations, programs, and practices to ensure the safety of those located on the work site and associated laboratories, including the CQA Contractor's personnel (or that of its subcontractor(s)) performing the CQA Work.

103.4 Performance of the CQA Work shall include all the labor, supervision, administration, management, tools, testing equipment, and consumables to execute the CQA Work identified herein.

103.5 Inspection and tests specified in this Specification shall be performed by personnel qualified to perform such inspections and tests.

104. RESPONSIBILITY AND AUTHORITY

104.1 The responsibilities and authority are described below for the organizations that will be involved in the design, permitting, and construction activities associated with the project.

a. Permitting Authority:

a1. The Illinois EPA is the Permitting Authority and is responsible for reviewing the permit application for retrofitting the Bypass Basin to assure compliance with state regulations and for granting the construction permit for the project.

a2. The Permitting Authority may review any design revisions during construction and any requests for variance submitted by the Owner. The Permitting Authority has the authority to review and approve all CQA documentation and reports and to confirm the Bypass Basin was retrofitted as specified in Project Specifications and the Design Drawings.

b. Owner:

b1. MWG is the Owner of the facility and has the authority to accept or reject materials and workmanship of the Earthwork Contractor or the Geosynthetics Contractor, or reports and recommendations of the CQA Contractor.

b2. The Owner will ultimately be responsible for the retrofit construction for the Bypass Basin and for assuring the Permitting Authority that the construction meets or exceeds the requirements specified in state regulations, permits, Project Specifications, and the Design Drawings. The Owner will accomplish this by retaining a CQA Contractor for the project.

c. Design Engineer:

c1. S&L is the Design Engineer and is responsible for designing the retrofitted features for the Bypass Basin.

c2. The Design Engineer will ensure that the retrofit design meets the construction requirements of the Owner and meets or exceeds the requirements of the Permitting Authority.

c3. The Design Engineer will resolve unexpected conditions or unanticipated problems during construction, which may require changes to the permitted design. Changes to the permitted design shall require approval of the Owner and Design Engineer to ensure that the original design objectives are still maintained. All changes shall meet state regulatory requirements and the rules promulgated thereunder and may include Permitting Authority-approved variances to the rules.

d. Earthwork Contractor. The Earthwork Contractor is the firm with whom the Owner establishes a contract to perform all earthwork and sitework required to retrofit the Bypass Basin, as specified on the Design Drawings and in Specification P-1400.

e. Geosynthetics Contractor. The Geosynthetics Contractor is the firm with whom the Owner establishes a contract to procure and install the geosynthetic clay liner, high-density polyethylene geomembrane liner, and drainage geocomposite for the retrofitted Bypass Basin, as specified on the Design Drawings and in Specification P-1402.

f. CQA Contractor:

f1. The CQA Contractor shall be the company employed by the Owner who is responsible for performing the CQA Work. The CQA Contractor shall be objective, competent, and independent from the Earthwork and Geosynthetics Contractors, whose work is being inspected. The CQA Contractor shall remain independent throughout the duration of the project.

f2. The CQA Contractor's team shall include the CQA Officer and two or more CQA Inspectors.

g. CQA Officer:

g1. The CQA Officer shall be a professional engineer licensed in the State of Illinois who shall be responsible for implementation of the CQA Work. The CQA Officer shall be responsible to the Owner.

g2. The CQA Officer shall be responsible for the performance of activities specified herein such as auditing, inspecting, sampling, testing, documenting, and for preparing and certifying the Final Report. In addition, the CQA Officer and/or its inspectors shall have the responsibility of daily coordination with CQA Inspectors, the Earthwork Contractor and its subcontractors, the Geosynthetics Contractor and its subcontractors, and the Owner to discuss daily progress, review completed work, plan for upcoming work, perform visual inspections, review test results, and discuss and assist in resolving any current or potential construction problems.

g3. Except as provided by Paragraph 104.1g4, the CQA Officer shall be present to provide supervision and assume responsibility for performing all inspections of the following activities, when applicable:

g3.1 Compaction of subgrade materials.

g3.2 Installation of the new composite liner system.

g4. If the CQA Officer is unable to be present as required by Paragraph 104.1g4, the CQA Officer shall provide the following in writing:

g4.1 The reasons for the CQA Officer's absence.

g4.2 A designation of a person who must exercise professional judgment in carrying out the duties of the CQA Officer-in-Absentia.

g4.3 A signed statement that the CQA Officer assumes full responsibility for all inspections performed and reports prepared by the designated CQA Officer-in-Absentia during the absence of the CQA Officer.

h. CQA Inspectors:

h1. The CQA Inspectors shall be responsible for performing visual examinations and for performing or obtaining field and laboratory tests. The CQA Inspectors shall be under the direct supervision of the CQA Officer.

h2. The CQA Inspectors shall be responsible for reporting to the CQA Officer and the Owner's representative the results of any inspections or tests indicating materials or installed work are of unacceptable quality or do not meet specified design requirements.

h3. The work shall be divided so that two or more CQA Inspectors, each with specialized knowledge and training, will be involved in inspection work.

105. QUALIFICATIONS

105.1 CQA Officer:

a. The CQA Officer shall be a registered professional engineer in the State of Illinois with at least 10 years of experience in design/construction/permitting/licensing, at least 5 years

of which is CQA experience as a certifying engineer on landfills or ponds with geomembrane liner systems.

b. The CQA Officer shall be qualified by education, technical knowledge, and experience to complete the technical certifications required by this Specification.

105.2 CQA Inspectors:

a. The CQA Inspectors shall have adequate formal academic training and sufficient practical and technical experience needed to execute and record auditing and inspection activities conducted at the site and perform all required laboratory and field testing. This includes a demonstrated knowledge of the various aspects of the type of work being conducted.

b. As required, different CQA Inspectors, each with specialized knowledge and experience, shall be employed for different portions of the work.

c. CQA Earthwork Inspectors:

c1. The lead CQA field inspector for earthwork (Lead CQA Earthwork Inspector) shall have at least 5 years of experience as an earthwork inspector.

c2. All CQA Earthwork Inspectors shall be knowledgeable in:

c2.1 Field practices relating to construction techniques used for the type of earthwork being performed.

c2.2 Construction and compaction equipment.

c2.3 All codes and regulations concerning material installation.

c2.4 Observation procedures for earthwork construction.

c2.5 Sampling and earthwork testing procedures.

c2.6 Testing equipment.

c2.7 Documentation procedures.

c2.8 Site safety.

d. CQA Geosynthetics Inspectors:

d1. The lead CQA field inspector for geosynthetics (Lead CQA Geosynthetics Inspector) shall have at least 5 years of CQA experience as a field inspector on projects with a geomembrane lining system including two years as a CQA inspector.

d2. All CQA Geosynthetics Inspectors shall be knowledgeable in:

d2.1 Field practice relating to techniques used for the installation of geosynthetic clay liners (GCLs), high-density polyethylene (HDPE) geomembranes, pipes, HDPE geonets, and non-woven geotextiles.

d2.2 Correct procedures for seaming GCL.

d2.3 HDPE geomembrane welding equipment and the correct operating procedures for seaming HDPE geomembranes, including but not limited to:

d2.3.1 Non-destructive seam testing procedures and failure criteria.

d2.3.2 Sampling for destructive testing of samples of seams and laboratory testing procedures.

d2.3.3 Laboratory testing equipment.

d2.4 Geotextile seaming equipment and the correct procedures for splicing geotextiles and joining HDPE geonets.

d2.5 All codes and regulations concerning material installation.

d2.6 Documentation procedures for field and laboratory tests.

d2.7 Site safety.

106. DEFINITIONS

106.1 The term "Design Drawing" means the Design Engineer's drawings indicating the Work to be performed.

106.2 The term “Project Specifications” means the technical specifications issued by the Design Engineer that define minimum material, installation, and/or testing requirements for the Work. Project Specifications include this Specification, the Earthwork Specification (P-1400), and the Geosynthetic Materials Specification (P-1402).

106.3 The term "Work" means the services furnished to complete the CQA activities specified herein.

106.4 The term "Owner-approved equal" means an acceptable equivalent to a specified material or equipment that has been accepted by the Owner.

107. PROJECT MEETINGS

107.1 Project meetings will be held on a periodic basis during the lifetime of the project. The meetings will include:

a. A preconstruction meeting.

b. Progress meetings.

c. Additional meetings as required to discuss problems or work deficiencies.

107.2 Preconstruction Meeting:

a. The preconstruction meeting will be organized by the Owner. In addition to the Owner, the Design Engineer, the Earthwork Contractor, the Geosynthetics Contractor, the CQA Officer (or CQA Officer-in-Absentia), the Lead CQA Inspectors, and any other interested party designated by the Owner shall attend the preconstruction meeting.

b. The preconstruction meeting shall be used to discuss:

b1. Site specific safety requirements.

b2. Requirements of the Design Drawings and the Project Specifications.

b3. The CQA Contractor’s CQA Plan and the responsibilities of each party.

b4. The lines of authority and communication.

b5. Procedure for submittal of manufacturer QA/QC documents for audit.

b6. Procedures for examination of materials delivered to the site.

b7. Location of material storage area(s).

b8. Field and laboratory test requirements and sample sizes.

b9. Procedures for observance of field tests.

b10. Coordination between each contractor and the Lead CQA Inspectors to obtain timely field samples and tests.

b11. Procedure for handling construction deficiencies, repairs, and retesting.

b12. Work area security and safety protocol.

b13. Work days and work hours.

b14. Coordination with other contractors or trades.

b15. Site visits.

107.3 Weekly Progress Meetings:

a. Weekly progress meetings will be scheduled by the Owner. In addition to the Owner, the meetings shall be attended by the Design Engineer, the Earthwork Contractor, the Geosynthetics Contractor, the CQA Officer (or CQA Officer-in-Absentia), and the Lead CQA Inspectors.

b. If needed, daily meetings shall be held each day to review the work schedule, work completed, results of tests, and to discuss potential construction problems.

c. The Owner or its designee will document each meeting and distribute copies of meeting minutes to all responsible parties.

107.4 Additional Meetings:

a. Additional meetings between one or more contractors, the Lead CQA Inspector(s), and the CQA Officer (or the CQA Officer-in-Absentia) shall be held immediately after a work deficiency is identified or a problem arises. These meetings shall be used to define and resolve the problem.

b. Any supervisor/superintendent can request such a meeting through their line of authority.

c. Possible solutions to the problem shall be discussed, and an acceptable solution shall be selected. This solution shall be implemented provided it does not conflict with or require a change to the Design Drawings, in which case the solution shall be submitted to the Design Engineer for review.

d. The Design Engineer will resolve unexpected conditions or unanticipated problems during construction, which may require changes to the permitted design. Changes from the permitted design shall require approval by the Owner and Design Engineer to ensure that the original design objectives are maintained. All changes shall meet the requirements of the Permitting Authority and may include regulations approved by the Permitting Authority.

e. The CQA Contractor shall document each special meeting and distribute copies of minutes to all responsible parties.

108. PERFORMANCE AUDITS AND CQA DOCUMENTATION

108.1 As a minimum, the CQA Officer shall conduct the following reviews and performance audits:

a. Full review and audit of results of preconstruction testing or Earthwork Contractor's material certificates used to qualify earthwork materials for construction use.

b. Full review and audit of manufacturer certificates that qualify geosynthetic materials for use in the composite liner system and leachate collection and removal system.

c. Weekly audit of reports and test data sheets during and after construction of the earthwork until completion of work.

d. Weekly audit of reports and test data sheets during and after installation of composite liner system materials until completion of the work.

e. Weekly audit of reports and test data sheets during and after installation of leachate collection and removal system materials until completion of the work.

108.2 When auditing documentation produced by material suppliers and third-party testing laboratories, the CQA Contractor shall, at a minimum:

a. Verify that material samples tested are representative of the material(s) to be used in this project.

b. Verify that material samples were tested in accordance with the specified tests and at the specified frequencies.

c. Verify that all tests performed meet the applicable testing standards and parameters specified (e.g., met specified ASTM method).

d. Verify that all test records include the information specified in the Project Specifications, Design Drawings, and/or the specified test standard (e.g., includes all reporting data required by the specified ASTM method).

108.3 CQA documentation shall be well-documented and include at least the following:

a. Daily records, which shall include:

a1. Inspection data sheets.

a2. Data sheets listing the number and types of construction equipment used by the Earthwork Contractor and/or Geosynthetics Contractor, including applicable construction equipment data.

a3. Problem identification reports and corrective action reports. Problem identification reports and corrective action reports shall include detailed descriptions of materials and/or workmanship that do not meet a specified design and shall be cross-referenced to specific inspection data sheets where the problem was identified and corrected.

b. Testing records, which shall include:

b1. Material shipping and manufacturer QA/QC data sheets.

b2. Data sheets describing field samples taken.

b3. Laboratory data sheets.

b4. Field test data sheets.

b5. Notes, charts, drawings, or sketches identifying the location and elevation of field tests, location of failures and repairs or retests, and where samples were obtained.

b6. Non-destructive test reports including location of failures, records of repairs, and results of retests.

c. Photographic records, which shall include:

c1. Digital photographs, each with a unique identifying number.

c2. Figure indicating the location from which each photograph was taken.

c3. Summary list giving the date and time of each photograph.

108.4 All records shall, at a minimum, bear the following:

a. Unique identifying sheet number.

b. The date.

c. Project name, project number, and location.

d. Descriptive remarks.

e. Data sheets for tests.

f. Written text descriptions for visual observations

g. Signature of the preparer of designated authority.

END OF SECTION 011100

SECTION 014362

QUALITY ASSURANCE FOR FILL, LINER, AND LEACHATE COLLECTION MATERIALS

PART 1 – GENERAL

101. EXTENT

101.1 This section defines the requirements for Construction Quality Assurance (CQA) activities to ensure that the quality of materials and installation procedures used to retrofit the Bypass Basin are in accordance with the Earthwork Specification (P-1400), Geosynthetic Materials Specification (P-1402), Design Drawings, permit requirements, and as specified herein.

101.2 The Work specified within this section is the responsibility of the CQA Contractor and shall include, but not be limited to, the following items:

a. Attend project meetings and site visits for coordination between the Owner, the Earthwork Contractor, the Geosynthetics Contractor, subcontractors, and the CQA Contractor.

b. Perform pre-construction material certification activities to ensure materials meet or exceed specified requirements, including, but not limited to:

b1. Testing for suitability of material prior to use.

b2. Performing pre-construction audits of material certifications prior to material use.

c. Perform CQA activities during construction to ensure materials meet or exceed specified requirements, including, but not limited to:

c1. Audits of material certifications.

c2. Perform field observations, inspections, and tests.

c3. Perform laboratory tests and reviews of test results.

c4. Material sampling.

d. Documentation of all observations, findings, and testing, and of conformance of work to the Project Specifications, the Design Drawings, and permit requirements, which will be submitted by the Owner to the Permitting Authority.

e. Preparation of an Index Report, an Acceptance Report, Weekly Summary Reports, and a Retrofit Completion Report.

f. Submit a draft version of the Retrofit Completion Report to the Owner and Design Engineer for their review and comment. Upon resolution of all comments, submit a final version of the Retrofit Completion Report, sealed and certified by the CQA Officer, to the Owner and Design Engineer.

101.3 Definitions:

a. The following definitions of terms shall apply throughout this section:

a1. GCL Manufacturer: The manufacturer who is, pursuant to Specification P-1402, responsible for manufacturing GCL materials and for transporting GCL materials to the site.

a2. GM/GC Manufacturer: The manufacturer who is, pursuant to Specification P-1402, responsible for manufacturing HDPE geomembrane and drainage geocomposite materials and for transporting HDPE geomembrane and drainage geocomposite materials to the site.

a3. Pipe Manufacturer: The manufacturer who is, pursuant to Specification P-1400, responsible for manufacturing LCRS pipe materials and fittings and for transporting these materials to the site.

102. RELATED WORK SPECIFIED IN OTHER SECTIONS AND SPECIFICATIONS

102.1 CQA Specification (P-1401):

a. Section 011100 – Summary of Work.

102.2 Earthwork Specification (P-1400):

a. Section 319005 – Earthwork.

b. Section 319050 – Leachate Collection and Removal System.

c. Geosynthetic Materials Specification (P-1402):

d. Section 319025 – Geosynthetic Clay Liner.

e. Section 319020 – High-Density Polyethylene Geomembrane Liner with Geocomposite.

103. REFERENCE DOCUMENTS

103.1 Standards, specifications, manuals, codes and other publications of nationally recognized organizations and associations are referenced herein.

103.2 References to these documents are to the latest issue date of each document, unless otherwise indicated, together with the latest additions, addenda, amendments, supplements, etc., thereto, in effect as of the date of Contract for the Work.

103.3 Abbreviations listed indicate the form used to identify the reference documents cited in this section.

103.4 ASTM – ASTM International:

a. D422 Standard Test Method for Particle-Size Analysis of Soils.

b. D1556 Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method.

c. D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).

d. D2167 Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.

e. D2216 Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.

f. D2434 Standard Test Method for Permeability of Granular Soils (Constant Head).

g. D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).

h. D2488 Standard Practice for Description and Identification of Soils (Visual-Manual Procedures).

i. D4318 Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

j. D4643 Standard Test Method for Determination of Water Content of Soil and Rock by Microwave Oven Heating.

k. D4959 Standard Test Method for Determination of Water Content of Soil By Direct Heating.

l. D5084 Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter.

m. D5261 Standard Test Method for Measuring Mass per Unit Area of Geotextiles.

n. D5887 Standard Test Method for Measurement of Index Flux Through Saturated Geosynthetic Clay Liner Specimens Using a Flexible Wall Permeameter.

o. D5890 Standard Test Method for Swell Index of Clay Mineral Component of Geosynthetic Clay Liners.

p. D5891 Standard Test Method for Fluid Loss of Clay Component of Geosynthetic Clay Liners.

q. D5993 Standard Test Method for Measuring Mass per Unit Area of Geosynthetic Clay Liners.

r. D6243 Standard Test Method for Determining the Internal and Interface Shear Strength of Geosynthetic Clay Liner by the Direct Shear Method.

s. D6496 Standard Test Method for Determining Average Bonding Peel Strength Between Top and Bottom Layers of Needle-Punched Geosynthetic Clay Liners.

t. D6768 Standard Test Method for Tensile Strength of Geosynthetic Clay Liners.

u. D6938 Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

103.5 ITP – Illinois Test Procedure:

a. 27 Sieve Analysis of Fine and Coarse Aggregates

104. SUBMITTALS

104.1 Submittals with Bid Proposal:

a. Documentation to substantiate that the CQA Contractor's and its laboratory's Accreditation Certifications are current.

b. Detailed resumes on all CQA laboratory and field personnel proposed for the Work, including:

b1. A complete description of their qualifications and previous experience in the same type of work.

b2. Documentation of certification to perform required testing.

104.2 Submittals During the Course of the Work:

a. Certifications and submittals as specified herein.

b. An Index Report, an Acceptance Report, Weekly Summary Reports, and a Retrofit Completion Report as described below shall be prepared.

b1. Index Report:

b1.1 An Index Report shall be prepared listing all records and reports.

b1.2 The Index Report shall be assembled in chronological framework for recording and identifying all reports.

b2. Weekly Summary Reports:

b2.1 At the end of each week of construction, until construction is complete, a Weekly Summary Report must be prepared by either the CQA Officer or under the supervision of the CQA Officer and submitted to the Owner and the Design Engineer. The CQA Officer must review and approve each Weekly Summary Report.

b2.2 The Weekly Summary Report shall contain descriptions of the weather, locations where construction occurred during the previous week, materials used, results of testing, inspection reports, and procedures used to perform inspections.

b3. Retrofit Completion Report:

b3.1 After the Earthwork Contractor and Geosynthetics Contractor have completed retrofit construction activities, the CQA Officer shall prepare a Retrofit Completion Report that demonstrates the Bypass Basin was retrofitted in conformance with Project Specifications, the Design Drawings, and permit requirements. At a minimum, this report shall include:

b3.1.1 All data sheets, testing records, manufacturer data sheets, and reports concerning items that were installed and tested.

b3.1.2 Photographs of the liner system and leachate collection system and any other photographs relied upon to document construction activities. All photographs shall include time, date, and location information.

b3.1.3 Any designations of CQA officers-in-absentia in accordance with Section 011100, Paragraph 104.1g4.

b3.1.4 Certification that the Earthwork Contractor's work and the Geosynthetic Contractor's work are in compliance with Project Specifications, the Design Drawings, and permit requirements.

b3.1.5 Certifications that:

b.3.1.5.1 Pipe bedding material contains no undesirable objects.

b.3.1.5.2 The anchor trench and backfill are constructed to prevent damage to a geosynthetic membrane.

b.3.1.5.3 All tears, rips, punctures, and other damage to geosynthetic materials are repaired.

b.3.1.5.4 All geomembrane seams are properly constructed and tested in accordance with the manufacturer's specifications.

b.3.1.5.5 Proper filter material consisting of uniform granular fill, to avoid clogging, is used in construction.

b.3.1.5.6 The filter material, as placed, possesses structural strength adequate to support the maximum loads imposed by the overlying materials and equipment used at the facility.

b3.2 The first draft version of the Retrofit Completion Report shall be submitted within 1 week after completion of CQA Work to the Owner and Design Engineer for their review and comment.

b3.3 Within 1 week of resolving all comments, the final version of the Retrofit Completion Report shall be sealed and certified by the CQA Officer and submitted to the Owner and Design Engineer.

105. CONSTRUCTION QUALITY ASSURANCE REQUIREMENTS

105.1 Organizations Involved:

a. The organizations involved in the design, permitting, and construction activities associated with the Work are defined in Section 011100.

b. The responsibilities and authorities of the organizations and personnel associated with the Work are described in Section 011100.

105.2 Qualifications:

a. The qualifications of the CQA Contractor personnel are described in Section 011100.

105.3 Project Meetings:

a. The requirements for project meetings and audits are described in Section 011100.

105.4 Performance Audits, CQA Documentation, and CQA Reports:

a. The requirements for performance audits and CQA documentation are described in Section 011100.

b. The requirements for CQA reports are described in Paragraph 104.2 of this section.

PART 2 – PRODUCTS

201. PRODUCTS

201.1 The requirements for the various products used for retrofitting the Bypass Basin are specified in their respective technical specification sections in the Project Specifications.

201.2 All HDPE geomembrane liner, drainage geocomposite, and GCL for the basin's new composite liner and leachate collection and removal system will be supplied by the Geosynthetics Contractor in accordance with Specification P-1402. All other permanent materials to be used in the Work will be supplied by the Earthwork Contractor in accordance with Specification P-1400.

a. The CQA Contractor shall coordinate with the Geosynthetics Contractor to obtain material certifications and third-party laboratory test reports required for performing the audits on GCL, HDPE geomembrane, and drainage geocomposite materials required by this Specification.

b. The CQA Contractor shall coordinate with the Earthwork Contractor to obtain material certifications and samples required for performing the audits and tests on all other permanent materials required by this Specification.

PART 3 – EXECUTION

301. GENERAL CQA TESTING AND INSPECTION REQUIREMENTS

301.1 Record daily weather conditions.

301.2 Field tests shall document the elevation and coordinate location for each test. The locations may be determined by survey, taping, or pacing off distances unless otherwise noted.

301.3 Material Source Testing: Material source testing activities include visual observations and laboratory and field testing at the material source to control material quality and material preparation prior to transport of the material to the project site.

302. CQA TESTING AND INSPECTION REQUIREMENTS FOR EXISTING LINER DECONTAMINATION AND INTEGRITY VERIFICATION

302.1 The CQA Contractor shall coordinate with the Geosynthetics Contractor to assemble, document the receipt of, and audit the report prepared by the Geosynthetics Contractor in accordance with Specification P-1402, Section 011100 containing the following:

a. Visual inspection notes and digital photographs.

b. Electrical leak location survey results.

c. Documentation of any repairs made to the existing liner.

302.2 The CQA Contractor shall coordinate with the Owner to assemble, document the receipt of, and audit the following documents related to the decontamination of the Bypass Basin's existing HDPE geomembrane liner and approval for re-using the existing liner:

a. Laboratory test results on samples of the existing liner demonstrating that the liner is no longer contaminated with CCR constituents.

b. Illinois EPA's written approval for re-using the existing liner as a supplemental liner in the retrofitted Bypass Basin.

302.3 The CQA Contractor shall include the documents listed in Paragraphs 302.1 and 302.2 in the Retrofit Completion Report.

303. CQA TESTING AND INSPECTION REQUIREMENTS FOR STRUCTURAL FILL MATERIAL

303.1 Initial Material Certification:

a. Prior to shipment of any Structural Fill material, the CQA Contractor shall assemble, document the receipt of, and audit the material supplier's test results and certifications that the properties of the material meet Specification P-1400 requirements.

303.2 Inspections and Testing During Construction:

a. CQA activities during placement of Structural Fill shall include visual observations and laboratory and field testing to ensure that Structural Fill is installed in accordance with Specification P-1400 requirements. Field observations and tests shall be performed in accordance with the requirements specified in Table 014362-1 and the following paragraphs.

b. Visual Observation of the Material Source for Structural Fill Material During Construction:

b1. Inspect materials to ensure that they are uniform.

b2. Visually inspect the material in accordance with ASTM D2488.

b3. Inspect to ensure that only suitable material is transported to the site, observe segregation operations if unsuitable materials are present, and observe (if necessary) the removal of organic soils, roots, stumps, and stones.

b4. Observe changes in color or texture that can be indicative of a change in material type or moisture content.

b5. Observe moisture conditioning activities to ensure that any required substantial changes in moisture content are made at the source.

c. Visual Observation of Fill Placement:

c1. Record the placement method(s) the Earthwork Contractor is utilizing for installing the Structural Fill.

c2. In instances where the Earthwork Contractor is transporting material into the basin, the CQA Contractor shall:

c2.1 Verify no equipment (wheeled or tracked) is traversing the Bypass Basin area when less than 10 inches of earthen material are above the basin's existing geomembrane liner.

c2.2 Verify Structural Fill has been installed above the existing geomembrane liner along the basin's ramp as detailed on the Design Drawings before the Earthwork Contractor's equipment uses the ramp to transport fill material into the basin.

c2.3 Document the receipt of and audit the Earthwork Contractor's demonstration(s) that equipment entering the basin will not exert a ground pressure greater than 8 psi.

c2.4 Verify equipment operating within the basin does not hard brake on the ramp, make sharp turns, nor make quick stops that could pinch or tear the Bypass Basin's existing geomembrane liner.

c3. Record type and size of compaction equipment in use:

c3.1 For rubber-tired rollers, record the tire inflation pressure, spacing of tires, and empty and ballasted wheel loads.

c3.2 For hand tampers, record make, model number, size and compactive effort.

c3.3 Observe and record compactive effort, uniformity of compaction and scarification and connection between compacted lifts. Record number of passes of a roller by type, size, and weight of roller.

c3.4 For proofrolling, record the type, size, and weight of compaction equipment or other vehicles used for proofrolling.

c4. Observe removal of roots, rocks, rubbish, or out-of-specification soil from the borrow material.

c5. Observe and record changes in soil characteristics necessitating a change in construction procedures.

c6. Observe fill placement and procedures for proper lift thickness.

c7. Observe procedures to be followed to adjust the soil moisture content to obtain uniform moisture content.

c8. Observe and record final finishing procedures.

c9. Observe and record that final grade is consistent with the design grade specified on the Design Drawings.

d. Laboratory and Field Tests:

d1. Laboratory and field testing shall be performed in accordance with the requirements specified in Table 014362-1.

e. Test Acceptance Criteria:

e1. Acceptance criteria shall be as specified in Specification P-1400 Section 319005.

304. CQA TESTING AND INSPECTION REQUIREMENTS FOR GEOSYNTHETIC CLAY LINER COMPONENT OF COMPOSITE LINER SYSTEM

304.1 Initial Material Certification:

a. The CQA Contractor shall assemble, document the receipt of, and audit the GCL Manufacturer's submittals listed below for conformance with Specification P-1402, Section 319025.

a1. Certificates describing the origin and identification of the raw materials.

a2. Copy of the GCL Manufacturer's QA/QC certificates on tests performed on the material and a summary of results of the tests.

a3. Certification and guarantee by the GCL Manufacturer that the properties of the manufactured material meet the requirements of Specification P-1402, Section 319025.

a4. Certification that the GCL was continuously inspected during the manufacturing process for, as a minimum, the following:

a4.1 Lack of uniformity.

a4.2 Damage.

a4.3 Imperfections.

a4.4 Holes.

a4.5 Tears.

a4.6 Thin spots.

a4.7 Foreign materials.

b. GCL Panel Layout:

b1. Document receipt of the GCL Manufacturer's proposed GCL panel layout.

c. Third-Party Quality Assurance Conformance Testing:

c1. Document receipt of copies of test reports prepared by the third-party, independent testing laboratory that performed conformance tests on representative samples provided by the GCL Manufacturer in accordance with Specification P-1402, Section 319025.

c2. Audit test reports to verify the third-party quality assurance conformance tests and test results meet the requirements of Specification P-1402, Section 319025.

304.2 Transportation, Handling, and Storage:

a. Documentation of Delivery:

a1. Document rolls of GCL delivered to the site.

a2. Document that each roll is labeled and that each label identifies the following information:

a2.1 Name of GCL Manufacturer.

a2.2 Product identification (brand name, product code).

a2.3 Order number.

a2.4 Date of manufacture.

a2.5 Manufacturing lot number.

a2.6 GCL thickness.

a2.7 Roll identification number.

a2.8 Roll dimensions (i.e., length and width) and weight.

a2.9 Panel number, which shall be referenced to the proposed GCL panel layout drawing prepared by the GCL Manufacturer.

a3. Check the QA/QC certificates on each roll to verify that the rolls received onsite meet the requirements of Specification P-1402, Section 319025. Take the identifying labels from each roll or pallet and save them for future reference.

a4. Recommend rejection of rolls which do not have the required documentation and ensure that the rolls are removed from the site.

b. Inspection of Manufactured Rolls:

b1. Inspect all manufactured rolls at the site.

b2. Ensure that packaging is secure and that no damage has occurred.

b3. If damage to packaging has occurred, inspect exposed roll surfaces, and note and identify any damage or repairable flaws. Note: This visual observation shall be conducted without unrolling rolls unless the extent of surface damage indicates that internal damage may be present.

b4. If damage to just the packaging has occurred, document repair of the packaging.

b5. If damage to the product has occurred, document that the damage or flaws are repaired or that the damaged material is wasted and removed from the site.

b6. Report all damage to the Owner.

c. Handling:

c1. Inspect the onsite handling equipment used to move materials to ensure that it is adequate to minimize the risk of damage to materials.

c2. Inspect the handling of materials by installing personnel to ensure that care is used.

d. Storage:

d1. Inspect the storage facility.

d2. Inspect the ground surface to ensure that it is dry, relatively level, smooth and free of rocks, holes, and debris.

d3. Document unsafe or improper storage conditions, and report conditions to the Owner.

304.3 Inspections During Construction:

a. CQA activities during placement of the GCL component of the Bypass Basin's new composite liner system shall include visual observations and field testing to ensure that the GCL is installed in accordance with the requirements of Specification P-1402, Section 319025. Field observations and tests shall be performed in accordance with the requirements specified in the following paragraphs.

b. Weather Conditions for Placement:

b1. Observe and document the weather conditions (i.e., temperature, humidity, precipitation, and wind) to ensure that they are appropriate for GCL placement. Specification P-1402, Section 319025 describes acceptable weather conditions.

b2. If the weather becomes unacceptable for installation of GCL, recommend stopping the installation until conditions again become favorable, thus minimizing the potential for unacceptable installation.

c. GCL Placement:

c1. Supporting Surface:

c1.1 Prior to placement of the GCL, visually inspect the Structural Fill surface to ensure that it meets the requirements of Specification P-1400, Section 319005. Confirm that it is compacted and is free from clods of soil, rocks larger than specified, roots, sudden or sharp changes in grade, and standing water. Field observations shall be performed in accordance with the requirements specified in Table 014362-3.

c1.2 Provide documentation of daily inspection of the Structural Fill surface for the area of GCL to be placed that day.

c2. Panel Deployment, Seams, and Repairs:

c2.1 As each panel is unrolled, visually inspect the GCL to ensure there are no flaws or damage. The CQA Geosynthetics Inspector shall traverse the panels in such a way that the entire surface is inspected. Any defects shall be documented on a drawing and marked on the GCL for repair.

c2.2 Document that the location of the seams meet the general requirements for seaming contained in Specification P-1402 Section 319025.

c2.3 At the time of placement, make measurements to confirm that required overlap of adjacent GCL panels has been achieved, that proper temporary anchorage is being used (e.g., sand bags or tires), and that the GCL is being placed in a relaxed (nonstressed) state.

c2.4 Document any liner damage from adverse weather conditions, equipment, inadequate temporary anchoring, or rough handling. Any damage shall be documented on a drawing and marked on the GCL for repair.

c2.5 Document improper GCL panel placement and, as a result, inadequate coverage with the available materials or an excess number of field seams.

c2.6 Document inadequate sheet overlap resulting in poor quality seams.

c2.7 Document unseamed or cut panels.

c2.8 Document repair of damage. Documentation shall include location, type, and method of repair.

305. CQA TESTING AND INSPECTION REQUIREMENTS FOR GEOMEMBRANE COMPONENT OF COMPOSITE LINER SYSTEM

305.1 Initial Material Certification and Inspection of Installation Plans:

a. The CQA Contractor shall assemble, document the receipt of, and audit the GM/GC Manufacturer's submittals listed below for conformance with Specification P-1402, Section 319020.

a1. Geomembrane Resin:

a1.1 Certificate that the resin meets requirements of Specification P-1402, Section 319020.

a1.2 Certificate of the origin of the resin and that all resin is from the same supplier (including resin supplier's name and contact information and identification brand name).

a1.3 Copies of the GM/GC Manufacturer's and resin supplier's QA/QC certificates. Certificates shall include a summary report of test results conducted to verify the quality of the resin used in each batch to manufacture geomembrane for this project. As a minimum, the report shall include tests on specific gravity, melt flow index, and percent carbon black.

a2. Geomembrane Sheeting:

a2.1 Certification that the properties of the manufactured sheeting meet the requirements of Specification P-1402, Section 319020, and are guaranteed by the GM/GC Manufacturer.

a2.2 Certification stating that no post-consumer resin (PCR) has been added to the formulation.

a2.3 Certification stating that the manufactured sheeting is free of per- and polyfluoroalkyl substances (PFAS).

a2.4 Copies of all of the GM/GC Manufacturer's QA/QC certificates for the geomembrane sheeting. The certificates shall include test results.

a3. Extrudate Resins or Rod for Seaming Geomembrane:

a3.1 Certification from the GM/GC Manufacturer that all extrudate is the same resin type as the geomembrane and was obtained from the same resin supplier as the resin used to manufacture the geomembrane.

b. Review of Geosynthetics Contractor's Installation Plans:

b1. Geomembrane Field Installation Quality Assurance Plan:

b1.1 Document receipt of the Geosynthetics Contractor's QA plan for installing geomembrane.

b1.2 Review the plan for compliance with Specification P-1402, Section 319020, and document where the plan is not in compliance.

b2. Geomembrane Panel Layout:

b2.1 Document receipt of the GM/GC Manufacturer's proposed geomembrane panel layout.

c. Third-Party Quality Assurance Conformance Testing:

c1. Document receipt of copies of test reports prepared by the third-party, independent testing laboratory that performed conformance tests on representative samples provided by the GM/GC Manufacturer in accordance with Specification P-1402, Section 319020.

c2. Audit test reports to verify the third-party quality assurance conformance tests and test results meet the requirements of Specification P-1402, Section 319020.

305.2 Transportation, Handling, and Storage:

a. Documentation of Delivery:

a1. Document rolls of geomembrane delivered to the site.

a2. Document that each roll is labeled and that each label identifies the following information:

a2.1 Name of GM/GC Manufacturer.

a2.2 Product identification (e.g., brand name, product code), which can be traced back to the origin of the base material (resin supplier's name, resin production plant, resin brand name type, and production date of the resin).

a2.3 Order number.

a2.4 Date of manufacture.

a2.5 Manufacturing lot number.

a2.6 Geomembrane thickness and type.

a2.7 Roll identification number.

a2.8 Roll dimensions (i.e., length and width) and weight.

a2.9 Panel number.

a3. Check the QA/QC certificates on each roll to verify that the rolls received onsite meet the requirements of Specification P-1402, Section 319020. Take the identifying labels from each roll or pallet and save them for future reference.

a4. Recommend rejection of rolls which do not have the required documentation and ensure that the rolls are removed from the site.

b. Inspection of Manufactured Rolls:

b1. Inspect all manufactured rolls at the site.

b2. Ensure that packaging is secure and that no damage has occurred.

b3. If damage to packaging has occurred, inspect exposed roll surfaces, and note and identify any damage or repairable flaws. Note: This visual observation shall be conducted without unrolling rolls unless the extent of surface damage indicates that internal damage may be present.

b4. If damage to just the packaging has occurred, document repair of the packaging.

b5. If damage to the product has occurred, document that the damage or flaws are repaired or that the damaged material is wasted and removed from the site.

b6. Report all damage to the Owner.

c. Handling:

c1. Inspect the onsite handling equipment being used to move materials to ensure that it is adequate to minimize the risk of damage to materials.

c2. Inspect the handling of materials by installing personnel to ensure that care is used.

d. Storage:

d1. Inspect the storage facility.

d2. Inspect the ground surface to ensure that it is dry, relatively level, smooth, and free of rocks, holes, and debris.

d3. Document unsafe or improper storage conditions, and report conditions to the Owner.

305.3 Inspections and Testing During Construction:

a. CQA activities during placement of the geomembrane component of the Bypass Basin's new composite liner system shall include visual observations and field testing to ensure that the geomembrane is installed in accordance with the requirements of Specification P-1402, Section 319020. Field observations and tests shall be performed in accordance with the requirements specified in Table 014362-5 and the following paragraphs.

b. Weather Conditions for Placement:

b1. Observe and document the weather conditions (i.e., temperature, humidity, precipitation, and wind) to ensure that they are acceptable for geomembrane placement and seaming. Specification P-1402, Section 319020, describes acceptable weather conditions.

b2. If the weather becomes unacceptable for installation of the geomembrane liner, recommend stopping the installation until conditions again become favorable, thus minimizing the potential for unacceptable installation.

c. Geomembrane Placement:

c1. Prior to placement of the geomembrane liner, the GCL component of the composite liner system in the area to be lined shall have been installed, seamed, and inspected and all necessary repairs made in accordance with Specification P-1402 Section 319025.

c2. Observe and document that the Geosynthetics Contractor's geomembrane placement plan is being followed. Note where the plan is not being followed and document the Geosynthetics Contractor's reasons for not following the plan. As each panel is placed, visually inspect the geomembrane for tears, punctures, and thin spots. The CQA Geosynthetics Inspector shall traverse the panels in such a way that the entire surface is inspected. Any defects shall be documented on a drawing and marked on the geomembrane for repair.

c3. Document that the location of the seams meet the general requirements for seaming specified in Specification P-1402 Section 319020.

c4. At the time of placement, make measurements to confirm that required overlap of adjacent geomembrane sheets has been achieved, that proper temporary anchorage is being used (e.g., sand bags or tires), and that the geomembrane is being placed in a relaxed (nonstressed) state.

c5. Document any liner damage from adverse weather conditions, equipment, inadequate temporary anchoring, or rough handling. Mark the location of damage on the geomembrane for repair and on a drawing.

c6. Document improper liner placement (if the Geosynthetics Contractor's geomembrane placement plan is not followed) and, as a result, inadequate coverage with the available materials or an excess number of field seams.

c7. Document inadequate sheet overlap resulting in poor quality seams.

c8. Document nonwelded or cut panels.

c9. Document repair of damage. Documentation shall include location, type, and method of repair.

d. Geomembrane Seaming and Seam Repair:

d1. Trial Welds Prior to Beginning Seaming:

d1.1 Observe that trial welds are being made at the frequency specified in Specification P-1402 Section 319020.

d1.2 Observe fabrication of test strips and note that test strips are fabricated correctly.

d1.3 Specify where samples are to be cut from the test strips and witness all destructive tests.

d1.4 Observe documentation of results of the destructive tests by the Geosynthetics Contractor.

d1.5 Audit documentation of each trial weld received from the Geosynthetics Contractor.

d2. Seaming and Seam Repair – Activities that shall be documented during field seaming operations include:

d2.1 Observe that the geomembrane is free from dirt, dust, and moisture.

d2.2 Observe that the seaming materials and seam welding equipment are as specified.

d2.3 Observe that a firm surface is available for seaming.

d2.4 Observe that geomembrane overlap and panel adjustment are correct prior to seaming.

d2.5 For extrusion welding, observe that the geomembrane is pre-beveled and the geomembrane is properly abraded and that the panels are temporarily bonded.

d2.6 Observe that grind marks are covered with extrudite.

d2.7 Observe weather conditions (e.g., temperature, humidity, wind) to ensure that they are acceptable for seaming.

d2.8 Measurements of temperatures, pressures, and speed of seaming to ensure that they are as specified. Gages and dials on seaming equipment shall be checked and readings recorded.

d2.9 Observe that the geomembrane is not damaged by equipment or personnel during the seaming process.

d2.10 Observe that no solvents or adhesives are used.

e. Anchorage at Existing Penetrations and Concrete Structures:

e1. Where shown on the Design Drawings, CQA Geosynthetics Inspector shall ensure that the seals around existing penetrations and the anchorage to existing concrete structures are of sufficient strength and are impermeable.

e2. Specific inspections that shall be made on all seals and anchors include:

e2.1 Observations and tests to ensure that the sealing systems (i.e., pipe boots) have been installed as specified (are leak free) and in the proper location(s).

e2.2 Observations to ensure that all objects that are placed adjacent to the geomembrane (i.e., batten bars) are smooth and free of objects or conditions that may damage the geomembrane.

e2.3 Observations to ensure that all seals and anchors are complete:

e2.3.1 Batten bars of the specified material, width, and thickness and prepunched at the specified spacing.

e2.3.2 Anchor bolts of the specified size and material.

e2.3.3 Anchor bolts spaced as specified.

e2.4 Observations to confirm that all geomembrane liner penetrations and connections are installed as specified. Liner penetrations shall be verified for appropriate clamp and caulking use, for appropriate material, for good seaming, and for good housekeeping practices. No sharp bends on concrete surfaces shall be allowed.

f. Geomembrane Production Seam Testing:

f1. Non-Destructive: Activities to be observed and documented include the following:

f1.1 Observe that 100 percent of the seam lengths are tested using non-destructive procedures.

f1.2 Observe that testing is performed as seaming progresses.

f1.3 Observe that the correct procedures are used for testing each type of seam.

f1.4 Observe all non-destructive test procedures.

f1.5 For air pressure testing, observe that the equipment, procedures, and air pressure meet specified requirements. Observe that all testing is properly documented.

f1.6 For vacuum box testing, observe that testing is being performed correctly.

f1.7 For inaccessible seams, observe that a procedure acceptable to the Owner is used to test the seams.

f1.8 Observe that all leaks are marked, recorded as to location, and repaired.

f1.9 Observe that repairs are made in accordance with approved techniques.

f1.10 Observe that all repairs are re-tested and that no leakage is present.

f1.11 Review leakage data for possible patterns. Make suggestions to the Geosynthetics Contractor if data shows a consistent pattern of failure of a particular machine or crew.

f1.12 Audit documentation of testing prepared by the Geosynthetics Contractor to make sure that the location of leaks is identified on the drawings.

f2. Destructive:

f2.1 Destructive seam testing shall be performed at the frequencies specified in Specification P-1402 Section 319020.

f2.2 The CQA Geosynthetics Inspector shall specify the location where each sample shall be taken and record data for each sample.

f2.3 The CQA Geosynthetics Inspector shall designate any additional test locations that may be necessary. These locations may be based on the suspicion of contamination by dirt or moisture, change in seaming materials, increase in failed nondestructive tests, and other causes that could result in unacceptable seams.

f2.4 Laboratory testing shall be performed in accordance with Specification P-1402 Section 319020. Predetermined pass/fail values are specified in that section.

f2.5 Audit and document the results of laboratory testing on seam samples. Note any sample that does not pass and identify the location on the geomembrane liner for repair in the field and on the drawings.

f3. Repair of Failed Seams:

f3.1 For field seams that fail, the seam can either be reconstructed between the failed and any previous passed seam location, or the installer can go on either side of the failed seam location (10-foot minimum), take another sample, and test it. If that sample passes, reconstruct the seam between the two locations. If it fails, the process shall be continued. In all cases, acceptable seams must be bounded by two passed test locations. The CQA Geosynthetics Inspector shall document the procedure used and results of tests.

f3.2 Document that repairs are made. Documentation shall include location, type, and method of repair.

306. CQA TESTING AND INSPECTION REQUIREMENTS FOR DRAINAGE GEOCOMPOSITE OF LEACHATE COLLECTION AND REMOVAL SYSTEM

306.1 Initial Material Certification:

a. The CQA Contractor shall assemble, document the receipt of, and audit the GM/GC Manufacturer's submittals listed below for conformance with Specification P-1402, Section 319020.

a1. Copies of the raw material producers' certificates describing the origin and identification of the raw materials.

a2. Copies of the raw material producers' QA/QC certificates.

a3. Certification stating that the manufactured drainage geocomposite is free of per- and polyfluoroalkyl substances (PFAS).

a4. Copies of the GM/GC Manufacturer's QA/QC certificates on tests performed on the geonet core, geotextile cap and carrier, and double-sided laminated geocomposite as specified in Specification P-1402 Table 319020-2 and a summary of the results of the tests.

a5. Certification that the properties of the manufactured drainage geocomposite material meets the requirements of Specification P-1402 and are guaranteed by the GM/GC Manufacturer.

b. Third-Party Quality Assurance Conformance Testing:

b1. Document receipt of copies of test reports prepared by the third-party, independent testing laboratory that performed conformance tests on representative samples provided by the GM/GC Manufacturer in accordance with Specification P-1402.

b2. Audit test reports to verify the third-party quality assurance conformance tests and test results meet the requirements of Specification P-1402.

306.2 Transportation, Handling, and Storage:

a. Documentation of Delivery:

a1. Document rolls of drainage geocomposite delivered to the site.

a2. Document that each roll is labeled and that each label identifies the following information:

a2.1 Name of GM/GC Manufacturer.

a2.2 Product identification (e.g., brand name, product code).

a2.3 Order number.

a2.4 Date of manufacture.

a2.5 Manufacturing lot number.

a2.6 Drainage geocomposite thickness and type.

a2.7 Roll identification number.

a2.8 Roll dimensions (i.e., length and width) and weight.

a3. Check the QA/QC certificates on each roll to verify that the rolls received onsite meet the requirements of Specification P-1402. Take the identifying labels from each roll or pallet and save them for future reference.

a4. Recommend rejection of rolls which do not have the required documentation and ensure that those rolls are removed from the site.

b. Inspection of Manufactured Rolls:

b1. Inspect all manufactured rolls at the site.

b2. Ensure that packaging is secure and that no damage has occurred.

b3. If damage to packaging has occurred, inspect exposed roll surfaces, and note and identify any damage or repairable flaws. Note: This visual observation shall be conducted without unrolling rolls unless the extent of surface damage indicates that internal damage may be present.

b4. If damage to just the packaging has occurred, document repair of the packaging.

b5. If damage to the product has occurred, document that the damage or flaws are repaired or that the damaged material is wasted and removed from the site.

b6. Report all damage to the Owner.

c. Handling:

c1. Inspect the onsite handling equipment being used to move materials to ensure that it is adequate to minimize the risk of damage to materials.

c2. Inspect the handling of materials by installing personnel to ensure that care is used.

d. Storage:

d1. Inspect the storage facility.

d2. Inspect the ground surface to ensure that it is dry, relatively level, smooth, and free of rocks, holes, and debris.

d3. Document unsafe or improper storage conditions, and report conditions to the Owner.

306.3 Inspections During Construction:

a. CQA activities during placement of the drainage geocomposite component of the Bypass Basin's new LCRS shall include visual observations and field testing to ensure that the drainage geocomposite is installed in accordance with the requirements of Specification P-1402. Field observations and tests shall be performed in accordance with the requirements specified in Table 014362-6 and the following paragraphs.

b. Weather Conditions for Placement:

b1. Observe and document the weather conditions (i.e., temperature, precipitation, and wind) to ensure they are acceptable for placement. Specification P-1402 describes correct weather conditions.

b2. If the weather becomes unacceptable for installation of the drainage geocomposite, recommend stopping the installation until conditions again become favorable, thus minimizing the potential for unacceptable installation.

c. Drainage Geocomposite Placement:

c1. Prior to placement of the drainage geocomposite, the HDPE geomembrane component of the composite liner system in the area to be lined shall have been installed, seamed, and inspected and all necessary repairs made in accordance with Specification P-1402 Section 319020.

c2. Inspect all materials as they are unrolled to ensure that there are no flaws or damage.

c3. Observe and document that drainage geocomposite coverage is as specified on the Design Drawings, that joining of the geonet cores is as specified in Specification P-1402 Section 319020, and sewing of the geotextile caps is as specified in Specification P-1402 Section 319020.

c4. Make measurements to ensure that the specified material overlap is achieved.

c5. Observe and document that all materials are free from wrinkles and folds.

c6. Observe and document that the material is not damaged during the installation process.

c7. Document any material damage from adverse weather conditions, equipment, inadequate temporary anchoring, or rough handling. Mark the location of damage on the drainage geocomposite for repair and on a drawing.

c8. Document repair of damage. Documentation shall include location, type, and method of repair.

307. CQA TESTING AND INSPECTION REQUIREMENTS FOR COARSE AGGREGATE BEDDING, SAND FILTER LAYER, PROTECTIVE WARNING LAYER, RIPRAP BEDDING LAYER, AND RIPRAP MATERIALS

307.1 Initial Material Certification:

a. Prior to shipment of any Coarse Aggregate Bedding, Sand Filter Layer, Protective Warning Layer, Riprap Bedding Layer, or riprap materials, the CQA Contractor shall

assemble, document the receipt of, and audit the material suppliers' test results and certifications that the properties of the materials meet the requirements of Specification P-1400 Section 319050.

307.2 Inspections and Testing During Construction:

a. CQA activities during the placement of Coarse Aggregate Bedding, Sand Filter Layer, Protective Warning Layer, Riprap Bedding Layer, and riprap materials shall include visual observations and laboratory and field testing to ensure that the materials are installed in accordance with the requirements of Specification P-1400 Section 319050. Field observations and tests shall be performed in accordance with the requirements specified in Table 014362-2 and the following paragraphs.

b. Visual Observations of Material Placement:

b1. Upon delivery of the material to the site, inspect the material to ensure that it has not been contaminated during transportation and handling. Observe and document rejection of contaminated materials and replacement of suitable materials.

b2. Record the placement method(s) the Earthwork Contractor is utilizing for installing the material.

b3. In instances where the Earthwork Contractor is transporting material into the basin, then the CQA Contractor shall:

b3.1 Verify no equipment (wheeled or tracked) is traversing the Bypass Basin area when less than 10 inches of earthen material are above geosynthetic materials (i.e., drainage geocomposite, geomembrane liner, GCL).

b3.2 Verify the Protective Warning and Sand Filter Layers have been installed along the basin's ramp as detailed on the Design Drawings before the Earthwork Contractor's equipment uses the ramp to transport fill material into the basin.

b3.3 Document the receipt of and audit the Earthwork Contractor's demonstration(s) that equipment entering the basin will not exert a ground pressure greater than 8 psi.

b3.4 Verify equipment operating within the basin does not hard brake on the ramp, make sharp turns, nor make quick stops that could pinch or tear geosynthetic materials.

b4. Observe placement procedures to provide proper thickness.

b5. Observe placement procedures to prevent segregation and degradation of material.

b6. Observe placement procedures to:

b6.1 Ensure pipes and underlying geosynthetic materials are not damaged during the installation process (Note: Side slope cover installation must be observed at all times to assure appropriate placement technique and equipment are used and to detect any damage to geosynthetic materials).

b6.2 Ensure that placement of the Coarse Aggregate Bedding material did not damage or displace the leachate collection pipe.

c. With the use of the Earthwork Contractor's surveyor, make thickness measurements not more than 50 feet on a grid pattern to ensure that the thickness and coverage of each material is in compliance with the Design Drawings.

d. Audit surveys of each completed layer to ensure that specified slopes and elevations specified on the Design Drawings are obtained.

e. Laboratory and Field Tests:

e1. Laboratory and field testing shall be performed in accordance with the requirements specified in Table 014362-2.

f. Test Acceptance Criteria:

f1. Acceptance criteria shall be as specified in Specification P-1400 Section 319050.

308. CQA TESTING AND INSPECTION REQUIREMENTS FOR LEACHATE COLLECTION PIPING AND SIDESLOPE RISERS

308.1 Initial Material Certification:

a. Prior to shipment of any HDPE piping, the CQA Contractor shall assemble, document the receipt of, and audit the Pipe Manufacturer's submittals listed below for conformance with Specification P-1400 Section 319050:

a1. Certification that the manufactured pipe meets the requirements of Specification P-1400 Section 319050.

a2. Statement that no reclaimed polymer has been added to the resin.

a3. Copies of the Pipe Manufacturer's QA/QC certificates on tests performed during fabrication.

308.2 Transportation, Handling, and Storage:

a. Documentation of Delivery and Inspection of HDPE Pipe:

a1. Document the arrival of pipe.

a2. Check the Quality Control certificates and marking on each pipe to verify that the pipe received meets the requirements of Specification P-1400 Section 319050.

a3. Document that each length of pipe is marked with the following information:

a3.1 Name of Pipe Manufacturer.

a3.2 Pipe type (ASTM designation).

a3.3 Pipe size (diameter).

a3.4 Standard Dimension Ratio (SDR).

a4. Document that all fittings are fabricated and manufactured by the same manufacturer.

a5. Measure and document the spacing and diameter of perforations for perforated pipe and that perforations are predrilled prior to shipment.

a6. Recommended rejection of pipe that does not have the required documentation; that is of the incorrect size, type, or strength; or that is incorrectly fabricated. Ensure that this pipe is removed from the site.

b. Handling:

b1. Inspect the onsite handling equipment being used to move materials to ensure that it is adequate to minimize the risk of damage to materials.

b2. Inspect the handling of materials by installing personnel to ensure that care is used.

c. Storage:

c1. Inspect the storage facility.

c2. Inspect the ground surface to ensure that it is dry, relatively level, smooth, and free of rocks, holes, and debris.

c3. Document unsafe or improper storage conditions, and report conditions to the Owner.

308.3 Preconstruction Testing:

a. Observe and document that the pipes are of the specified size and strength and are constructed of the specified material.

b. Observe and document that pipe perforations for perforated pipe are as specified.

c. Observe and document that the material is not damaged during the installation process and that underlying geosynthetic materials are not damaged.

308.4 Inspections and Testing During Construction:

a. Inspection activities that shall be performed during pipe placement and joining include:

a1. Location:

a1.1 Observations and measurements to ensure that the specified pipe sizes are placed at the specified locations.

a1.2 Observations to ensure that perforated pipe is placed correctly.

a1.3 Measurements to ensure that the horizontal and vertical position and slope are within tolerances required by Specification P-1400 Section 391050.

a1.4 Document the as-built locations of all pipes.

a2. Pipe Joining:

a2.1 Observations to ensure that the pipe is joined by using the hot plate thermal butt fusion method as required by Specification P-1400 Section 319050 and that the equipment used for welding is as recommended by the Pipe Manufacturer.

a2.2 Observations to ensure that the joining method described in Specification P-1400 Section 319050 is followed.

a3. Joint Quality Control:

a3.1 Observations and documentation that the test joints required by Specification P-1400 Section 319050 are made.

a3.2 Observations and documentation that the quality of the test joints meet the requirements of Specification P-1400 Section 319050.

a4. Miscellaneous:

a4.1 Observations to ensure that cleanouts are installed as specified.

a4.2 Observations to ensure that the placement of the Coarse Aggregate Bedding material under, around, and over the pipe is as specified on the Design Drawings.

a4.3 Observations to ensure that the pipe network is not damaged during backfilling.

a5. Cleaning:

a5.1 Observe that all the pipes are cleaned by jet cleaning after installation is complete and document that all pipes are intact and not obstructed.

a5.2 Document the location of defective or clogged pipe.

a5.3 Document repair by the Earthwork Contractor and re-cleaning.

a6. Testing:

a6.1 Observe and document that visual observations on pipe joints have been performed and the results of observations documented.

a6.2 Document the location of failed joints.

a6.3 Document the repair and retesting of failed joints by the Earthwork Contractor and the results of testing.

309. CQA TESTING AND INSPECTION REQUIREMENTS FOR CREST ANCHOR TRENCH

309.1 Inspections and Testing During Construction:

a. CQA activities during excavation, formation, and backfilling of the crest anchor trench for the retrofitted Bypass Basin's geosynthetic materials shall include visual observations and field testing to ensure that the crest anchor trench is constructed in accordance with the requirements of Specification P-1400 Section 319005. Field observations and tests shall be performed in accordance with the requirements specified in Table 014362-4 and the following paragraphs.

b. Measurements:

b1. Perform measurements of the crest anchor trench to ensure that the trench width, depth, and location is as specified on the Design Drawings.

c. Observations:

c1. Observe that the trench corners are rounded as specified.

c2. Observe that good housekeeping practices are followed in the trenching operation by not allowing soil to fall back into the trench or down the slope and not allowing water to pond in the trench.

c3. Observe that the trench is backfilled as soon as possible and compacted such that the geosynthetic materials are not damaged.

310. SAMPLING PATTERN

310.1 The CQA Officer shall establish a completely random sampling pattern for determining the choice of sampling points for field tests. Each block of work shall be subdivided into a

sampling grid with at least 10 times as many grids as samples or tests to be taken or as directed by the Owner. The grid shall have a numeric identification system devised to distinguish each set of tests for a specific area from all other sets of tests. Each lift shall have a separate grid.

310.2 Sampling points shall be chosen by a random number generator or other acceptable method to obtain uniform coverage. Tests shall be numbered beginning with test number one (1) and no numbers shall be skipped. In areas where a test of any type fails to meet specification criteria and a retest is performed, the retest shall have the same test number as the original test except that an "R" shall follow the test designation.

311. VERIFICATION AND CALIBRATION

311.1 Verification of Selected Field Tests:

a. The following tests shall be verified at the following frequency:

Test Requiring Verification	Frequency of Verification Test
Nuclear In-Place Density and Nuclear In-Place Moisture Content, ASTM D6938	Note 1
"Quick" Moisture Content Test Using Microwave, (ASTM D4643) or Gas Stove, Frying Pan, or Infrared Oven, (ASTM D4959), etc.	One standard oven-dry moisture content (ASTM D2216) test per 20 quick tests.
Lift Thickness Measured Using a Shaft or Shovel	One lift thickness verified by measurement every two acre-lifts.

Notes:

1 – A standard block test as required by ASTM D6938 shall be performed at the start of each day on each Nuclear apparatus that will be used that day. At the start of earthwork construction, a series of five Nuclear tests and five sand cone or rubber balloon tests shall be performed in the borrow area, or area to be excavated, on a compacted test strip to calibrate the Nuclear apparatus. During construction, one of the last Nuclear readings performed at the end of each day shall be verified using a sand cone (ASTM D1556) or rubber balloon (ASTM D2167) density and moisture content test for each apparatus used that day. The average wet density and moisture content for each apparatus shall be computed for every ten tests. If variations greater than those permitted by the ASTMs occur, corrections shall be applied to all future tests for the apparatus until the next set of 10 tests is performed.

311.2 Calibration. Procedures for calibration of field and laboratory testing equipment shall be submitted by the CQA Contractor prior to the start of testing. These procedures shall meet ASTM requirements.

312. CORRECTIVE ACTION PROCEDURES

312.1 Failure of Material Quality Tests. The Earthwork Contractor and the Owner shall be notified immediately if gradation or Atterberg limits tests do not meet Specification P-1400 acceptance criteria. Failure to meet acceptance criteria of one or more of these groups of tests may indicate problems with the quality of soil materials. The Earthwork Contractor shall cease all construction activities until the source of the problem or "out-of-specification" materials is identified. Construction shall not begin again until materials and installation procedures meeting Specification P-1400 acceptance criteria are identified for use.

312.2 Failure of Field Density or Moisture Content Tests. If the results of field density or moisture content tests fail to meet Earthwork Specification acceptance criteria, those tests shall be re-run after recompaction. Judgment shall be used to select re-test locations suspected of having lower than specified density or moisture content. If the results of the re-test meet Specification P-1400 requirements, the compaction can be considered acceptable. If the results of the re-tests show out-of-specification densities or moisture contents, the CQA Officer shall immediately inform the Owner of the extent of the defective area. The defective area shall be removed and reconstructed or recompacted by the Earthwork Contractor.

TABLE 014362-1

CQA FOR STRUCTURAL FILL MATERIAL

No.	Characteristic to be Monitored	Test		
		Monitoring / Testing Method	Test Method Reference	Minimum Test Frequency
1	In-Situ Moisture Content	Laboratory Moisture Content	ASTM D2216	One per 500 cubic yards, and for each moisture density curve sample.
2	Moisture Density Curve	Proctor	ASTM D1557	One per 500 cubic yards, and for all changes in material.
3	Soil Index Properties	Atterberg Limits	ASTM D4318	One per 500 cubic yards, and for each moisture density curve sample.
4	Soil Index Properties	Grain Size	ASTM D422	One per 500 cubic yards, and for each moisture density curve sample.
5	Soil Classification	Unified Soil Classification System	ASTM D2487	One per 500 cubic yards, and for each moisture density curve sample.
6	Field Density / Soil Compaction	Nuclear Density Gauge, Sand Cone or Rubber Balloon Method	ASTM D6938(1), ASTM D2167, or ASTM D1556	Four per lift. One per 500 cubic yards.
7	Field Moisture Content	Nuclear Density Gauge or Direct Heat Method	ASTM D6938(1) or ASTM D4959	At each field density test location.
8	Uncompacted and Compacted Thickness of Each Lift	Direct Measurement		Four per acre per lift.
9	Surface Lines and Grades	Surveying		One per 50-foot grid and at grade breaks (i.e., toe and top of slopes).

Notes:

(1) ASTM D6938 Procedure B (backscatter) shall be used to measure the as-compacted density of Structural Fill material.

TABLE 014362-2

CQA FOR COARSE AGGREGATE BEDDING, SAND FILTER LAYER, PROTECTIVE WARNING LAYER, RIPRAP BEDDING, AND RIPRAP MATERIALS

No.	Characteristic to be Monitored	Test		
		Monitoring / Testing Method	Test Method Reference	Minimum Test Frequency
Coarse Aggregate Bedding, Protective Warning Layer, Road Surfacing, Riprap Bedding, and Riprap Materials				
1	Soil Index Properties	Grain Size	ITP 27	One per 500 cubic yards.
2	Uncompacted and Compacted Thickness of Each Lift	Direct Measurement		Four per lift. One per 250 linear feet of road for material to be used as road surfacing.
3	Certification of Final Thickness and Grade	Surveying		One per 50-foot grid spacing.
Sand Filter Layer Material				
1	Hydraulic Conductivity	Hydraulic Conductivity	ASTM D2434	One per 500 cubic yards.
2	Soil Index Properties	Grain Size	ITP 27	One per 500 cubic yards.
3	Uncompacted and Compacted Thickness of Each Lift	Direct Measurement		Four per lift. One per 250 linear feet of road for material to be used as road subgrade.
4	Certification of Final Thickness and Grade	Surveying		One per 50-foot grid spacing.

TABLE 014362-3

CQA FOR AREAS TO RECEIVE GEOSYNTHETIC MATERIALS

No.	Characteristic to be Monitored	Test		
		Monitoring / Testing Method	Test Method Reference	Minimum Test Frequency
1	Certification of Surface Elevation Prior to Geomembrane	Surveying		One per 50-foot grid and at grade breaks (toe and top of slopes).
2	Subgrade Firm and Unyielding	Observe and Document Proofroll		Continuous on Structural Fill surface.
3	Subgrade Free of Deleterious Conditions	Observe and document exposed subgrade is free from • Irregularities • Protrusions • Loose soil or soft spots • Abrupt changes in grade • Debris • Clods • Stones • Roots • Organic material • Moisture seeps, puddling, or ponding • Frozen material		Continuous

TABLE 014362-4

CQA FOR ANCHOR TRENCHES

No.	Characteristic to be Monitored	Test		
		Monitoring / Testing Method	Test Method Reference	Minimum Test Frequency
1	Trench Geometry	Measurement		1 location per 100 ft of trench
2	Trench Condition	Observe and Document • Trench free of sloughed material • Trench free from ponded water • Absence of loose material below geosynthetics		Continuous
3	Trench Backfill	Observe and document prompt backfill of trenches		Continuous
4	Field Density / Soil Compaction	Nuclear Density Gauge, Sand Cone or Rubber Balloon Method	ASTM D6938, ASTM D2167, or ASTM D1556	One per 200 ft of trench per lift

TABLE 014362-5

CQA FOR HDPE GEOMEMBRANE

No.	Characteristic to be Monitored	Test		
		Monitoring / Testing Method	Test Method Reference	Minimum Test Frequency
1	Documentation of Delivery	Observe and document: • Name of GM/GC Manufacturer • Product identification • Date of manufacture of the geomembrane • Roll identification number • Geomembrane thickness and type • Physical dimensions (length, width) • Manufacturing lot number • Panel number and weight • Order number	Visual	Each Roll
2	Inspection of Rolls	Lack of uniformity	Visual	Each Roll
		Damage, Tears, Punctures	Visual	Each Roll
		Imperfections, Blisters, Excessive Folding	Visual	Each Roll
3	Weather and Site Conditions at Time of HDPE Geomembrane Deployment and Seaming	Observe and document weather and site conditions		Continuous

No.	Characteristic to be Monitored	Test		
		Monitoring / Testing Method	Test Method Reference	Minimum Test Frequency
4	Panel Deployment	Observe and document: • Relaxed deployment • Damage prevention • Wrinkles minimized • Temporary anchorage • Protected from damage • Proper overlap • Seam location	Visual	Continuous
5	Trial Welds	Observe and document Geosynthetics Contractor staff performing and testing trial welds		• Prior to each seaming period. • Every 4 hours of continuous seaming. • Whenever personnel or equipment are changed. • When climatic conditions result in wide changes in geomembrane temperature. • When requested by the CQA Geosynthetics Inspector(s) for any seaming crew or piece of welding equipment if problems are suspected.
6	Preparation for Seaming	Observe and document: • HDPE geomembrane is clean • Minimum wrinkles and fish mouths • Fish mouths cut as necessary to lay flat • Film surface for seaming	Visual	Continuous

No.	Characteristic to be Monitored	Test		
		Monitoring / Testing Method	Test Method Reference	Minimum Test Frequency
7	Seaming	Observe and document: • Materials • Equipment • Staff • Acceptable procedures • Weather • Pressure • Speed • Damage • Absence of solvents	Visual	Continuous
8	Non-Destructive Seam Tests	Observe and document: • Equipment • Methods • Pressures • Leaks marked • Repairs made • Repairs retested	Various as applicable to seam type	100 percent of seam lengths shall be tested.
9	Destructive Seam Samples and Testing	Observe and document • Removal of all destructive test samples • Repair of sampled areas • Testing of repairs Label all samples Ship all samples to CQA Contractor's testing laboratory	Shear strength and peel adhesion	• One test per every 500 linear feet of seam length if the seam is welded with a fusion weld. • One test per every 400 linear feet of seam length if the seam is welded with an extrusion weld. • One test for each seaming machine

TABLE 014362-6

CQA FOR DRAINAGE GEOCOMPOSITE

No.	Characteristic to be Monitored	Test		
		Monitoring / Testing Method	Test Method Reference	Minimum Test Frequency
1	Documentation of Delivery	Observe and document: • Name of GM/GC Manufacturer • Product identification • Roll identification number • Product thickness or composition • Manufacturing batch code or lot code • Date of manufacture • Order number • Roll dimensions (i.e., length, width, and total weight)	Visual	Each Roll
2	Inspection of Rolls	Lack of uniformity	Visual	Each Roll
		Damage, Tears, Punctures	Visual	Each Roll
		Imperfections,	Visual	Each Roll
3	Weather and Site Conditions at Time of Deployment and Seaming	Observe and document weather and site conditions.		Continuous
4	Panel Deployment	Observe and document: • No debris or rocks below geotextile or geonet • Anchorage • Cutting • Damage prevention • Proper overlap and seaming	Visual	Continuous

No.	Characteristic to be Monitored	Test		
		Monitoring / Testing Method	Test Method Reference	Minimum Test Frequency
5	Seaming	Observe and document: • Seam orientation • Seaming method • Thread material • Stitching type • Stitch length • Sweep for broken needles	Visual	Continuous
6	Repair Areas	Identify areas to be patched Document patching method and location	Visual	Continuous

END OF SECTION 014362

DOCUMENT 42

From: Hunt, Lauren
To: Logan-Pugh, Joey L.; LeCrone, Darin
Cc: Dunaway, Lynn; Liska, Mark; Bierwagen, Justin
Subject: DRAFT Powerton GWS Opening Statement.docx
Date: Tuesday, April 23, 2024 10:35:07 AM
Attachments: DRAFT Powerton GWS Opening Statement.docx

Hi Joey and Darin.
Here is my draft opening statement for Power ton's public hearing. Also is a canned remark on the GWPS we approved in the draft permit but that will only be used in the event that we are questioned about it.
Let me know if you have questions or comments.
Thanks,
Lauren

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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397
JB PRITZKER, GOVERNOR JOHN J. KIM, DIRECTOR

TO: Mark Liska, Permits Section

CC: Joey Logan-Pugh, Lynn Dunaway, Darin LeCrone

FROM: Groundwater Section, Hydrogeologic Compliance Unit

DATE: April 3, 2025

SUBJECT: W1798010008, Powerton Generating Station, Initial Operating Permit, Groundwater Section Opening Statement

The Groundwater Section reviewed the Powerton Initial Operating Permit Application for the Bypass Basin, Former Ash Basin, Ash Surge Basin and Metal Cleaning Basin and the Retrofit Construction Permit Application for the Bypass Basin. The Groundwater Section determined that the MidWest Generation submittal required further investigation of the surface water/groundwater interaction and fill material characteristics as laid out in the special conditions in the draft permit for public review.

Note for further questions on the statistically derived boron GWPS (not to be stated in the opening statement):

The Groundwater Section also provided conditional approval of a statistically derived groundwater protection standard for boron with the intention to verify the statistical value after further groundwater monitoring and analysis.

DOCUMENT 43

MWG
Midwest Generation, LLC
Powerton Generation Station
13082 E. Manito Rd.
Pekin, IL 61554

May 16, 2024

Via electronic mail

Mr. Jeff Guy
IEPA Hearing Officer
P.O. Box 19276
1021 North Grand avenue East
Springfield, IL 62794
Epa.publichearingcom@illinois.gov

Re: Midwest Generation, LLC – Powerton Generating Station CCR
2024-CO-100030

Dear Mr. Guy:

Thank you and the Illinois Environmental Protection Agency ("Illinois EPA" or "Agency") team for drafting the retrofit construction permit for the Bypass Basin at Midwest Generation, LLC's ("MWG") Powerton Generating Station in Pekin, IL. The specific comments on the Draft Permit for Retrofit Construction of a Coal Combustion Residual Surface Impoundment (2024-CO-100030) are attached and correspond to each Special Condition of the draft permit.

Sincerely,

Sharene Shealey
Director, Environmental

ECC: David Bacher
Jill Buckley
Todd Mundorf
Walter Stone
EPA.CCR.Part845.Coordinator@Illinois.gov

MIDWEST GENERATION LLC'S COMMENTS ON DRAFT CONSTRUCTION PERMIT FOR MWG POWERTON STATION (2024-CO-100030)

Comment on Special Condition 11

There appears to be an inadvertent error because the condition includes "leachate monitoring data." The Illinois CCR rule does not require leachate monitoring data, so this term should be deleted.

Comment on Special Condition 15

Special Condition 15 is not relevant and should be stricken. There are no "sludges" associated with the Bypass Basin and none will be generated through the operation of the CCR surface impoundments.

Additional Comments

The Agency's Location Restriction Determinations Were Correct

The Agency was correct to determine that the Bypass Basin meets placement above the uppermost aquifer location restriction and is a minimum of five feet from the uppermost aquifer. 35 Ill. Adm. Code 845.300(a).

The Agency was also correct to measure the base of the Bypass Basin from the HDPE geomembrane liner. The statements made at the Public Hearing that the base of the Bypass Basin was below the poz-o-pac were incorrect because there is no poz-o-pac below the Bypass Basin's HDPE geomembrane liner. As stated in Section 1.7.2.2 of the Operating Permit Application, the poz-o-pac was removed in 2010 when the Bypass Basin's original liner was replaced with the current HDPE geomembrane liner. Because the Bypass Basin's liner system is the "waste boundary" of the CCR surface impoundment, consideration of the material beyond the boundary is not relevant. Further, the recently finalized USEPA rule regarding Coal Combustion Residual Management Units ("CCRMUs") regulates any CCR that may be present outside the Bypass Basin, further supporting the conclusion that the CCR outside the unit is *not* part of the CCR surface impoundment. *Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Legacy CCR Surface Impoundments*, 89 Fed. Reg. 38950 (May 8, 2024).

The MWG Surface Impoundments are Not Causing Harm to Drinking Water or the Illinois River

Many Public Commenters made the mistaken claim that the constituents in the groundwater at the Powerton Station could be harming drinking water or the Illinois River. To clarify, MWG conducted an investigation of all potential potable water wells within a 2,500 feet radius of the Station. No potable wells were identified downgradient of the CCR surface impoundments. MWG described its investigation in Section 9.1.2 of the Operating Permit Applications for the CCR surface impoundments. The Illinois Pollution Control Board ("Board") agreed with MWG's evaluation finding that none of the potable wells identified within the 2,500-foot radius "are

located downgradient from the ash ponds." *Sierra Club et al. v. Midwest Generation, LLC*, PCB13-15 (June 20, 2019) *slip-op*, p. 43. MWG also conducted a study of the potential risks posed by the groundwater conditions at the Station to the Illinois River, which showed no risk. Indeed, the Board found that the Former Ash Basin, the closest basin to the Illinois River, was not a source of contamination at the Station. *Id*., p. 41.

MWG is Collecting Monthly Groundwater Elevations

There was also a Public Comment that seemed to mistakenly state that MWG was not collecting monthly groundwater elevations. As MWG stated in Section 9.3.1 of the Operating Permit Application for the Ash Surge Basin, Ash Bypass Basin, and Former Ash Basin, following passage of the Illinois CCR Rule MWG began "the initial rounds of monthly groundwater level measurements…" Similarly, in Section 9.3.1 of the Metal Cleaning Basin Operating Permit Application, MWG stated that groundwater level measurements from all designated CCR monitoring wells are obtained and recorded on a monthly basis. MWG includes the monthly elevations in the Annual Groundwater Monitoring and Corrective Action Reports included as part of the Annual Consolidated Reports.

The Illinois CCR Rule Requires Two Websites

There was a Public Comment seeming to allege that MWG confuses the public by having two different CCR websites. MWG presumes that the commenter was describing CCR website MWG established pursuant to the Illinois CCR Rule and the website MWG established pursuant to the Federal CCR rule (40 CFR Part 257 Subpart D). To clarify, during the rulemaking of the Illinois CCR Rule, MWG requested that the rule allow for the Illinois specific information to be included in the Federal CCR website to prevent confusion. Illinois EPA refused the accommodation and insisted that the Illinois CCR compliance information be on a separate website.

DOCUMENT 44

From: Hunt, Lauren <Lauren.Hunt@Illinois.gov>
Sent: Wednesday, June 5, 2024 3:07 PM
To: LeCrone, Darin
Cc: Liska, Mark; Bierwagen, Justin
Subject: Draft Powerton Geotech Memo for permit record
Attachments: DRAFT Powerton Geotech Memo.docx

For review. Resending because it is likely lost in the mass amount of emails we receive each day. 😊
I still need to add more recent references to this and will do so when I get comments.
Thanks. Lauren

Lauren I. Hunt, M.S. (she/they/he)
Environmental Protection Geologist III
Illinois Environmental Protection Agency
Bureau of Water
Groundwater Section
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Mondays off.

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DOCUMENT 45

Midwest Generation LLC
Powerton

Coal Combustion Residual (CCR) Permit
Responsiveness Summary

Regarding

May 8, 2024, Public Hearing

Illinois Environmental Protection Agency
Office of Community Relations
July 3, 2024



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July 3, 2024
Illinois Environmental Protection Agency

ILLINOIS EPA PERMIT DECISIONS

Construction Permit
On July 3, 2024, the Illinois Environmental Protection Agency (Illinois EPA) Bureau of Water issued a construction permit to Midwest Generation LLC – Powerton for the coal ash residual surface impoundment as described in application 2021-100029. The construction permit includes conditions governing the compliance and monitoring of groundwater from the facility. This construction permit includes the retrofitting of the Ash Bypass Basin with a new composite liner and a new leachate collection and removal system in accordance with 35 Ill. Adm. Code 845.420 . The permits and additional copies of this document can also be obtained from the Illinois EPA website https://epa.illinois.gov/public-notices/ccr-public-notices.html

The following changes were made to the Powerton CCRSI Retrofit Construction Permit:

1. Special Condition 7 now notes that financial assurance information was submitted both in their initial application received October 21, 2021 and in a separate submission dated June 21, 2021.

2. Special Condition 9 now correctly references the Annual Consolidated Report in Special Condition 17.

3. Special Condition 13 now requires that the permittee shall notify the Agency within 7 days of construction being completed.

4. Reference to leachate monitoring data has been removed from Special Condition 11.

5. Special Condition 15 has been revised to not include CCR.

6. Various spelling and grammar mistakes have been corrected.

Operating Permit
On July 3, 2024, the Illinois EPA Buraus of Water issued an operating permit to Midwest Generation LLC – Powerton for the coal combustion residual surface impoundment as described in application 2024-100030. The operating permit establishes the conditions for operation of the Ash Bypass Basin, Ash Surge Basin, Former Ash Basin, and Metal Cleaning

Basin. The permits and additional copies of this document can also be obtained from the Illinois EPA website https://epa.illinois.gov/public-notices/ccr-public-notices.html

The following changes were made to the Powerton CCRSI Operating Permit:

1. Special Condition 10 corrected references the Annual Consolidated Report in Special Condition 29.

2. Special Condition 12 now states that there are two migration pathways.

3. Special Condition 13 now states that there are two migration pathways and updates the monitoring wells.

4. Special Condition 19 requires horizontal and vertical extent of structural components in all basins and explains the sampling of each material type used as a structural component and how they are to be compliant.

5. Special Conditions 21 and 22 now also note steps MWG must implement pursuant to 35 Ill. Admin. Code 845.650(d) or (e) if there is an exceedance at one or more downgradient monitoring wells.

6. Reference to leachate monitoring data has been removed from Special Condition 28.

7. Special Condition 30 has been revised to not include CCR.

8. Various spelling and grammar mistakes have been corrected.

PUBLIC OUTREACH

On April 4, 2024, the Illinois EPA published a notice of public hearing and public comment period for both the construction and the operating permits. The public comment period began on April 4, 2024, and ended on May 17, 2024.

A hearting notice was posted on April 4, 2024. Notification for the public comment period and public hearing was sent to individuals on the CCR listserv, elected officials, and environmental advocacy groups via email and mail. The hearing notice included instructions for participation in the public hearing and how to submit comments.

PUBLIC HEARING

A public hearing was conducted at 6:00 pm on May 8, 2024, at the Miller Center in Pekin to accept oral comments from the public on the operating and construction permit drafts for Midwest Generation LLC-Powerton. There were fifty- one people in attendance and of these,

eighteen gave public comments. A recording of the public hearing is posted on the Illinois EPA website https://epa.illinois.gov/public-notices/ccr-public-notices.html

BACKGROUND

On July 15, 2022, the Illinois EPA, Bureau of Water received a construction permit application from Midwest Generation LLC- Powerton, requesting a permit for Retrofit construction including all pipes, pumps, and appurtenances of the Ash Bypass Basin at their facility located at 13082 East Manito Road in Pekin. This permit is pursuant to 35 Ill. Adm. Code Part 845. The retrofit construction of the Ash Bypass Basin including the removal of the gravel warning and sand cushion layers over the existing geomembrane liner consists of decontaminating the basin's existing geomembrane liner for re-use as a supplemental liner, decontaminating the basin's appurtenant structures, installing a new basin floor and slopes, installing a composite liner system consisting of a 60-mil HDPE geomembrane over a geosynthetic clay liner, installing a leachate collection and removal system consisting of a drainage geo-composite, leachate collection pipe, and submersible sump pump, installing a sand filter layer over the leachate collection and removal system, and installing a protective warning layer over the sand filter layer. The application for Retrofit Construction Permit application is dated July 15, 2022, and the Amended Written Retrofit Plan Revision 1 dated March 5, 2024.

On October 29, 2021 the Illinois EPA, Bureau of Water received an operating permit application from Midwest Generation LLC- Powerton, requesting authorization for the operation of the Ash Surge Basin, the Former Ash Basin, the Ash Bypass Basin, and or the Metal Cleaning Basin. This permit is pursuant to 35 Ill. Adm. Code Part 845. Midwest Generation – Powerton Generating has an active NPDES Permit IL0002232 that regulates the discharges of wastewater from the property to waters of the United States.

RESPONSES TO COMMENTS, QUESTIONS AND CONCERNS

Comments, Questions and Concerns are in regular text. The Agency's responses are in bold.

CCR Permit

1) There appears to be an inadvertent error because the condition includes "leachate monitoring data." The Illinois CCR rule does not require leachate monitoring data, so this term should be deleted.

While leachate that has contact with CCR must be characterized, its discharge must be covered under an NPDES permit. Therefore, the leachate monitoring data listed in the permits will be deleted.

2) Because the Illinois CCR rule does not require leachate monitoring data, the reference to it in the first sentence should be stricken in Special Condition 28.

While leachate that has contact with CCR must be characterized, its discharge must be covered under an NPDES permit. Therefore, the leachate monitoring data listed in the permits will be deleted.

GROUND WATER

3) have questions about the historic and future monitoring of the ground surface water. Ms. Hunt, you mentioned something about some concerns about the mixing between the groundwater and the source water. Could you address that issue and talk about the number of wells that are being monitored and they are historic compliance with the standards that IEPA has?

While the Agency has implemented enforcement actions under Part 620 in the past for Powerton, the Agency is reviewing and updating procedures to be consistent with groundwater monitoring requirements of Part 845 for evaluating aquifers and migration pathways. As such, the Agency is requiring evaluation of the groundwater consistent with Part 845 at MW-16 as the background well. Additionally, the monitoring wells for evaluating downgradient compliance are limited to down gradient of each of the CCRSIs unless the specific geologic unit does not exist at the downgradient locations. The wells monitored for groundwater elevation are expanded to ensure that characterization of the groundwater elevation is adequate for both geologic units that are migration pathways.

Mixing between the groundwater and surface water has not been fully investigated. Special Condition 14 requires the installation and monitoring of surface water (staff gauge) and groundwater (piezometers) gauges to determine the existence of any data gaps in the current monitoring network.

4) The boron is clearly already in those wells that is caused by coal ash. So how can we use that as your standard for justifying a higher boron standard?

Special Condition 18 requires that the groundwater protection standard for boron and the remaining constituents in 35 Ill. Adm. Code Part 845.600(a) be evaluated from data collected at MW-16 after adequate time has been allowed for the collection and analysis of eight rounds of sampling. At this time, the boron standard will be reevaluated and updated. The Boron groundwater protection standard listed in the operating permit is based on statistical procedures found in Part 845, using wells on the upgradient side of the CCRSI. However, as discussed in Response 3, the Agency is requiring groundwater monitoring consistent with 845.640 at MW-16. The Agency is requiring in Special Condition No. 12 that MW-16 will be the background well for the monitoring network for both geologic units at Powerton. Once eight samples of total metals are collected and analyzed, a new groundwater protection

standard for boron be evaluated in accordance with 35 Ill. Adm. Code Part 845.640(f) and (g).

5) Who is involved and who's going to be responsible?

Midwest Generation (MWG) must comply with the conditions and requirements of both the construction and operating permits in accordance with 35 Ill. Adm. Code Part 845. The Agency will be monitoring and evaluating compliance with the groundwater protection standards.

6) Who is responsible for monitoring these wells for the presence of heavy metals?

Per Special Conditions 21 and 22, MWG is responsible for groundwater monitoring for all constituents listed in 35 Ill. Adm. Code Part 845.600(a). Also see Response 5.

7) If Midwest Generation were to detect elevated levels of boron, or any of the pollutants mentioned in special conditions 21 and 22 at one of their regular tests, will private well owners and any other properties that may drink water from said wells be notified?

In accordance with Special Conditions 21 and 22, MWG must follow the process of investigation and corrective action in accordance with 35 Ill. Adm. Code Part Subpart F. This process, when implemented, in accordance with 35 Ill. Adm. Code Part 845.680(a)(3) will require interim corrective action in the event that exceedances are crossing a property boundary and potentially impacting a private water well. Special Conditions 21 and 22 have been revised to better explain these requirements. The corrective actions will include private well owner notification if necessary.

8) Will that trigger the testing of other nearby private wells for elevated pollutant concentrations?

In accordance with Special Conditions 21 and 22, groundwater monitoring results and/or additional hydrogeologic investigation, in accordance with 35 Ill. Adm. Code Part 845.650(d) that identifies offsite migration, will require further investigation of the groundwater offsite and corrective action under 35 Ill. Adm. Code Part 845 Subpart F. Special Conditions 21 and 22 have been expanded to better explain these requirements.

9) If contamination is detected in nearby private wells, who will be financially responsible for the affected wells' remediation?

The final permit and 35 Ill. Admin. Code 845 require compliance if the contamination is related to the Powerton CCRSIs. If there is offsite contamination, the permittee must undertake corrective actions pursuant to 35 Ill. Adm. Code Part 845 Subpart F. MWG would be responsible for any corrective actions either on-site or off-site.

10) How will IEPA hold Midwest Generation accountable to these standards and ensure the remediation takes place?

The Agency monitors compliance with the requirements of the construction and operating permits and may also conduct site inspections. If the permittee fails to implement any aspect of either permit, the Agency can initiate enforcement action, including violations notice under Section 31 of the Act.

11) I live near the Illinois River, and I am here to ask IEPA to not approve this draft permit for retrofit construction at Powerton. I am here to urge you to strengthen the permit. I want you to show that IEPA is very serious about these permits. I want to see that the corporations involved meet established regulations. Both the ash surge basin and the coal ash bypass basin fail to meet the five-foot separation between coal ash and the highest measured groundwater level. The old liner should be removed and especially the ash below that liner also removed and up to date. The boron standard permit is no more than double the existing limit requirements for protecting groundwater. My hope is that you will seriously strengthen this draft permit and make it clear NRG and the Powerton Plant must meet requirements.

In order to show that the structure meets the five-foot separation between the coal ash and the highest measured groundwater level or implements groundwater corrective action, the Agency issued the operating permit with special conditions to address further environmental data requirements necessary to address the extent of the CCRSI. Special Condition 19 requires the permittee to provide an analysis of the coal combustion residuals and horizontal and vertical extent of structural components in and around the Former Ash Basin, Ash Surge Basin, Metal Cleaning Basin, and Ash Bypass Basin. Special Condition 11 requires further investigation of the groundwater levels in the fill. Data from these two conditions will ensure that compliance with the five-foot separation will be achieved or closure and groundwater corrective action will be implemented.

Under Part 845, the permittee is not required to remove the old liner because this is a retrofit of a CCR impoundment and not part of a closure plan as the facility and basin is not closing at this time. The Agency issued the operating permit with specific groundwater protection standards (GWPS) for each constituent monitored in the groundwater, the Silty Clay/Silt Unit and the Sand/Gravel Unit, in Special Conditions 21 and 22, respectively. MWG is required to investigate, plan, and complete groundwater corrective action in accordance with 35 Ill. Adm. Code Part 845 Subpart F (Special Conditions 21 and 22) including a Corrective Action Plan if necessary.

Special Condition 18 requires that the groundwater protection standard for boron and the remaining constituents in 35 Ill. Adm. Code Part 845.600(a) be evaluated from data collected at MW-16 after adequate time has been allowed for the collection and analysis of eight rounds of sampling. After sufficient data has been collected, the boron groundwater protection standard will be updated.

12) I have been going door to door and talking to people in places like South Pekin and

Normandale mainly in regard the safety of our groundwater. Many of these people are very low income unfortunately, that is the community that gets targeted the most by dangerous polluting industries. We absolutely must protect that there are people who rely on well water to drink, farmers, people who just understand the importance of water in our ecosystem.

We are asking if you can please just make sure that the operating permit is amended to make sure that that 5 feet of separation between the coal ash and where the groundwater can get to for the ash surge basin and the ash bypass basin is met. Set stronger protection for boron and to deny the construction permit because the retrofit plan proposes to leave that highly toxic coal ash outside of the liner so it would be exposed to the groundwater. Also make sure these permits are amended to make sure it uses binding language that keeps NRG committed to not be able to change the plans in their permit application and to be bound to the plans that were submitted.

Regarding the five-foot separation question, please see the first paragraph in the answer to Question #11. Data collected in accordance with Special Conditions 11 and 19 will ensure that the 5-foot separation will be reached.

Regarding the Boron question, please see the answer to Question #4 and the third paragraph in the answer to Question #11.

Regarding the question about ash outside the liner, please see the second paragraph in the answer to Question #11. Data collected in accordance with Special Conditions 21 and 22 will be required in the area.

The Agency will enforce this permit as they would any other permit issued.

13) I represent the Illinois Alliance for Retired Americans and I am a Veteran of Vietnam. I am here just to see to it that you guys do the best you can and do not let outside forces force you into doing something that you know is not ethically right. I care about clean water and am concerned about coal ash, heavy metals and pollutants getting into groundwater. Possibly connecting the Illinois River and area aquifers. The IEPA needs to require Powerton to meet state standards and keep a five -foot separation between coal ash and the groundwaters high point. Boron is a problem. I think you should deny the permit. I expect the IEPA to redo this permit. If you do not deny it, I expect you to redo it.

Regarding the five-foot separation question, please see the first paragraph in the answer to Question #11. Data collected in accordance with Special Conditions 11 and 19 will ensure that the 5-foot separation will be reached.

Regarding the Boron question, please see the answer to Question #4 and the third paragraph in the answer to Question #11.

14) The Mahomet Aquifer covers a lot of Tazwell County and southern Tazewell County onto

the river. Our groundwater connects in many ways with aquifers whether it is Mahomet and its unconfined area which means there is no caprock or no definite layers that keep that a certain level. Millions of people depend on the Mahomet this area on east. Sand Cody Aquifer is all part of the very historic what was the Mississippi River. I ask the Illinois EPA in your groundwater assessments to consider the larger area at risk because coal ash and heavy metal toxins are nothing to ignore or discount. To the IEPA, please do not take their request for a much higher boron standard than what you know is your standard to protect water because what you decide as you know is not just for a short amount of time. Lost Creek is clearly remarkably close to the Powerton ponds, and the flood plain stops before Lost Creek. The five-foot separation is essential, 4.5 ft is not good enough. Leaving an old liner and a new one put on top is a band aid. The coal ash that is under that liner should be taken out and put in a higher standard hazardous waste landfill. Please IEPA put the strongest language that does not leave loopholes in your permit. The operating permit should be amended to ensure that five-foot separation and the construction permit for the ash bypass basin, it really should be denied because putting that new liner on top is not adequate.

Regarding the five-foot separation question, please see the first paragraph in the answer to Question #11. Data collected in accordance with Special Conditions 11 and 19 will ensure that the 5-foot separation will be reached.

Regarding the question about leaving the old liner, please see the second paragraph in the answer to Question #11. Data collected in accordance with Special Conditions 21 and 22 will be required in the area of the old liner.

15) You must do everything possible to protect the water resources. I ask you to fix the weaknesses and problems in the IEPA draft permit. The permit makes it clear that ash surge basin and the ash bypass basin failed to meet the required 5 ft separation of coal ash from highest groundwater level. It is not right to leave the old liner in the ash basin with layers of coal ash below it. The liner should be removed, and a new liner system should be put in that meets or exceeds current regulations and ensures the five feet of separation from the highest groundwater. If not, then the ash pond permit for construction should be denied. The same problem of failing at the required five feet of coal ash separation from the highest level of groundwater. It also fails to meet the requirements. The operating permit should be amended. The IEPA should set the right course with the Powerton Plant and use a boron standard that is protective. Stronger language that requires the company to do things correctly must be in the permit.

Regarding the five-foot separation question, please see the first paragraph in the answer to Question #11. Data in accordance with Special Conditions 11 and 19 will ensure that the 5-foot separation will be reached.

Regarding the Boron question, please see the answer to Question #4 and the third paragraph in the answer to Question #11.

Regarding the question about ash outside the liner, please see the second paragraph in the answer to Question #11. Data collected in accordance with Special Conditions 21 and 22 will be required in the area.

16) I am speaking on behalf of Sierra Club, and I wanted to point out a couple of things about the permit. The ash surge basin, in the HDPE liner is located at an elevation of 450.5 ft there is a layer of Poz-o-Pac beneath that which is made of ash. The Poz-o-Pac is part of the liner system so if you look at what the base is logically it is the Poz-o-Pac as part of the liner system. The upper limit of the uppermost aquifer based on groundwater elevations is located at 452 feet or higher. That is the highest elevation measured but those elevations are only taken quarterly. Chances are they do not catch peak flooding the highest point but even though even then it is at 452 ft. So that gives you an overlap of one 1.5 ft to 2.5 ft that is not a five-foot separation. That is an overlap where groundwater is coming up higher than the base of the pond and coming in encountering with the liners that are there. This does not meet the requirement of a five-foot separation. The bypass basin is the same as the ash surge basin beneath the HDPE liner there is Poz-o-Pac. There is a four and a half-foot separation by law again the location restrictions require a five-foot separation. I want to ask IEPA to take a close look at those elevations and make your own determinations about whether the five-foot standard is met.

The Poz-o-Pac was removed when the liner was replaced in 2010.

Regarding the five-foot separation question, please see the first paragraph in the answer to Question #11. Data collected in accordance with Special Conditions 11 and 19 will ensure that the 5-foot separation will be reached.

17) I do urge you to reconsider the plans and deny the retrofit construction permit. Amend the plan for the liners coal ash and containment of heavy metals. I think you have heard a lot of comments this evening about how important that is not just to the people living here now but for generations to come. That they have to safe environment and that we have followed the regulations that have been made. That we take proper action for everyone's safety.

Regarding the five-foot separation question, please see the first paragraph in the answer to Question #11. Data collected in accordance with Special Conditions 11 and 19 will ensure that the 5-foot separation will be reached.

The new liner and leachate collection system is designed to contain the heavy metals in the CCR.

18) Overall, the proposed retrofit in the permit to construct is acceptable. However, it does not make sense that only the ash bypass basin is being retrofitted with a new liner, when none of the other basins have proper liners. Once the ash bypass basin is retrofitted with a new liner, it should be used as the primary surge basin until the ash surge basin can be retrofitted with an appropriate liner. In the draft permit to construct, it states that the ash bypass basin "has not been in use since April 11, 2021." However, the draft permit to operate states that the ash

bypass basin "was taken out of service in 2020 and has not been used for managing CCR or non-CCR waste streams since 2020." This significant discrepancy calls into question the accuracy of other information in the draft permits. It is recommended that the draft permits be rechecked for accuracy. The permit indicates that the former ash basin will be put back into use but does not specify how the Former ash basin will be used or what materials they plan to place in it. It is not acceptable to put the former ash basin back into use, given that it is almost certainly unlined, the standard proposed for boron in the draft permit is 4.7 mg/L at the waste boundary, which is more than double the Illinois Groundwater Standard for boron (2.0 mg/L). The cumulative effect of the listed pollutants even within the concentration limits, collectively, at a chronic exposure, have the potential to cause cancer, cardiovascular disease, respiratory disease, kidney disease, mental health problems, adverse birth outcomes, and impaired child development in humans. An additional point of concern is the testing requirements and monitoring of privately owned wells that could be directly impacted by these elevated standards. The permit should require Powerton to have nearby private wells tested for heavy metals and the other analytes on the groundwater protection standards list in the permit.

The Ash Bypass Basin will be used as the primary basin for all ash collected from coal combustion activities after it is retrofitted. The bypass basin, as configured previously, has not been in use since April 11, 2021.

The Former Ash Basin will not be put back into any use. The fact sheet and permit from both the construction and operating permits do not state that the Former Ash Basin will be put back into any use.

The Retrofit Construction permit is not a closure permit. A separate closure permit is required for closure at each CCRSI.

Regarding the Boron question, please see the answer to Question #4 and the third paragraph in the answer to Question #11.

Should groundwater testing data show that parameters have migrated off-site, MWG will be required to conduct a groundwater investigation, corrective action assessment, and corrective action planning which will include an off-site groundwater investigation and possibly interim corrective action in accordance with 35 Ill. Admin. Code 845.650(d) and 35 Ill. Admin. Code 845.680(a)(3). After an adequate corrective action plan has been approved by the Agency, corrective action implementation will be conducted.

19) The Mahomet Aquifer is unconfined in western Tazwell County and current and future potentials for water quality impacts should be reviewed. Towns west, south, and north of Powerton use wells accessing Mahomet aquifer groundwater The Aquifer Sensitivity Map of Tazewell County 2003 gives the area of the Powerton Plant an A-1 rating (Very High Sensitivity). Please take into consideration the potential for the Illinois River to flood and Lost creek which is on the east side of the ash ponds. Consider in 2019 The Illinois Pollution Control Board ruled NRG was responsible for groundwater contamination at Powerton. Please do not leave the

Powerton site as aa environmental sacrifice zone for generations to come. This permit needs to be denied as it is now. The boron standard needs to be set so aquatic life is protected. Please do not allow language of the permit to provide loopholes allowing the companies to avoid compliance.

The Agency issued this permit in accordance with Part 845 to ensure that adequate groundwater monitoring and surface water monitoring are implemented at the Powerton Generating Station. The additional groundwater and surface water monitoring required by the draft permit are designed to assure that the groundwater resources, including the Mahomet Aquifer, are protected. If the groundwater monitoring demonstrates a threat to groundwater resources with exceedances of groundwater protection standards, the permittee must perform corrective actions in a manner consistent with the law. The Agency is mindful that the Former Ash Basin lies within the Federal Emergency Management Agency (FEMA) flood zone for the Illinois River. Special Condition 11 requires a staff gauge and two piezometers installed in Lost Creek and fill material, respectively, to monitor for water levels along with the monitoring wells for purposes of determining the interaction between groundwater and surface water in Lost Creek and due to flooding. The Agency is aware of the Illinois Pollution Control Board decision regarding the groundwater pollution at Powerton. The Agency is implementing this permit in a manner consistent with 35 Ill. Admin. Code 845 and believes that implementation will address groundwater pollution originating from the CCRSIs. Special Condition 19 addresses characterization of CCR within the structure of the CCRSI, as the CCR placed below the liner is a "structural component" as defined by 35 Ill. Adm. Code 845.120. The Agency understands that Tazewell County is a Priority Regional Groundwater Protection area.

20) Illinois EPA must amend Powerton's operating draft permit. The method for setting the groundwater protection standard of 4.7 mg/L was improper. This is more than double the Illinois Part 845 standard of 2.0 mg/L. This is unreasonably high and poses a risk of masking boron exceedances and statistically significant increases in boron. Wells impacted by CCR units were improperly used to set the boron GWPS. The use of MW-09 and MW-19 to establish background for upgradient monitoring violated Illinois Coal Ash rules and Federal Coal Ash rule. This permit must be amended to require proper background monitoring wells for both groundwater units. IEPA must require two different upgradient background monitoring wells, one installed in each ground water unit. Illinois IEPA must deny the retrofit permit and amend the operating permit drafts. The ash surge basin and the bypass basin were improperly certified. They are not in compliance with the location restriction for placement above the uppermost aquifer. Please make changes to special conditions 3,5,6,14,12, 13,15, and 7. (For details see exhibit 20)

Please see response to question #11 and #4. Special Condition 18 requires that groundwater protection standard for boron and the remaining constituents in 35 Ill. Adm. Code Part 845.600(a) be evaluated from data collected at MW-16 after adequate time has been allowed for the collection and analysis of 8 rounds of sampling. Once eight rounds of groundwater sampling and analysis have been conducted at MW-16, the boron standard will be reevaluated and updated. The Agency is requiring in Special Condition No. 12 that MW-16,

not MW-09 and MW-19, will be the background well for the monitoring network at Powerton. Once eight samples of total metals are collected and analyzed, a new the groundwater protection standard for boron will be evaluated in accordance with 35 Ill. Adm. Code Part 845.640(f) and (g).

In accordance with 35 Ill. Adm. Code Part 845.640(d), MW-16 is not installed in or through CCR that is associated with the CCRSIs and is hydraulically upgradient in the Sand and Gravel Unit. The Agency maintains that MW-16 is an adequate background well for the purposes of this permit.

Because MWG used CCR for structural components of the Ash Surge Basin and Ash Bypass Basin and these CCRSIs are sitting on top of the Silty Clay unit, the Agency maintains that corrective action and closure implementation must include prevention of flood waters influx into the fill material in a manner that prevent leaching from the structural components of the CCRSIs to the Illinois River or outside of the waste boundary. While the CCR placed on top of the Silty Clay Unit to the geomembrane liner of the Ash Surge Basin and Ash Bypass Basin is included in the structural components, at this time the lateral extent of the structural components of the Ash Surge Basin and Ash Bypass Basin is not defined. Until calculations exhibiting the lateral extent of the CCRSIs in the fill material has been adequately presented, the Agency is taking the position that all the CCR placed as fill material in, under and laterally around the CCRSIs at Powerton are in fact structural components of one of more of the CCRSIs covered by this permit. Additionally, the Poz-O-Pac is a CCR material and is a structural component of the CCRSIs where present because it was used in the construction and design of the CCRSI in accordance with the definition of structural components in 35 35 Ill. Adm. Code Part 845.120.

The Retrofit construction permit allows for the retrofit construction and not closure. The Ash Bypass Basin (ABB) remains required to close in accordance with Part 845. In addition, during the time in which the ABB is used after the retrofit, groundwater corrective action must be conducted in accordance with 35 Ill. Adm. Code Part 845 Subpart F. The Retrofit construction permit does not negate the groundwater corrective action requirements of Part 845.

21) Special Condition 15 is not relevant and should be stricken. There are no "sludges" associated with the Bypass Basin and none will be generated through the operation of the CCR surface impoundments.

The special condition has been revised such that it is only referring to sludges which are not defined as CCR under 35 Ill. Adm. Code 845. Since this sludge can include such material as filtrate or other debris, it is necessary require that it be disposed of correctly.

22) Special Condition 6 is incorrect. MWG submitted a preliminary written closure plan as part of its Permit Application Log No. 2021-100029, pursuant to Section 845.230(d)(2)(J) of the

Illinois Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments ("Illinois CCR Rule) ("The initial operating permit application for existing or inactive CCR surface impoundments... must contain...[a] Preliminary written closure plan" (emphasis added). 35 Ill. Adm. Code 845.230. To precisely describe the information submitted to Illinois EPA, MWG suggests that Illinois EPA modify Special Condition 6 to state: "The preliminary written closure plan has been submitted ..."

The Agency agrees and changes have been made to state preliminary written closure plan.

23) MWG suggests a correction to the description of MW-23. MWG drilled the wells described in Special Condition 11 after Illinois EPA issued the draft operating permit and found that at well location MW-23 the Silty Clay/Silt Unit was not present and therefore, the well was completed within the Sand and Gravel Unit. The condition should be modified to describe MW-23 correctly. The spelling error should be corrected to "...elevations of one staff gauge in the Lost Creek."

The Agency will use the term "gauge" although both spellings are correct. Also, the list of wells and Special Condition 11 have been updated.

24) There appears to be a typographical error. Special Condition 12 identifies two migration pathways: the Silty Clay/Silt Unit and the Sand and Gravel Unit. However, Special Condition 12 states that the "background wells for the 'three migration pathways' are..." MWG suggests correction of the t typographical error to state "two" migration pathways.

MW-16 should not be identified as the background well for the Silty Clay/Silt Unit and Sand and Gravel unit because it was not included in the groundwater monitoring system established for the CCR surface impoundments in Sections 9 of both Operating Permit Applications. Instead, as discussed with the Illinois EPA, MWG agreed to include MW-16 in the groundwater monitoring network in 2024. Accordingly, per Special Conditions 17 and 18, MWG is collecting the background data and conducting the statistical calculations in MW-16 and other agreed additional wells pursuant to Subpart F of the Illinois CCR Rule. Because there is insufficient background data to date for MW-16, it is improper to identify MW-16 as the background well.

The Agency agrees to the change of "three" to "two". MW-16 is the background well for the groundwater monitoring because it is not located in CCR materials that may or may not be associated with the structural components of the CCRSIs at Powerton. Pursuant to Special Condition 15 of the operating permit, MWG must begin monitoring for total metals and then perform the statistical evaluations required in 35 Ill. Adm. Code 845.640(f) and (g).

25) Special Condition 13 should state "The downgradient wells for the two migration pathways..." After Illinois EPA issued the draft operating permit, MWG drilled MW-23 and found that it is located in the Sand and Gravel Unit (see response to Special Condition 11). To reflect its proper location, MW-23 should be listed as a downgradient well for the Sand and Gravel Unit.

The Agency agrees to the change from "three" to "two". The Agency does not agree that MW-23 was to be installed in the Sand and Gravel unit. The Permit requires two additional wells in the Silty Clay Unit. MWG is required to better characterize and monitor the Silty Clay Unit. MW-18 appears to be cross installed between the fill and silty clay unit. While monitoring two units with one screen is not acceptable, MWG can install a well next to MW-18 that monitors only the Silty Clay Unit. The Agency did not direct MWG to install an additional well in the Sand and Gravel unit at the MW-23 location. Because of the complex nature of the Bypass Basin, Ash Surge Basin and Former Ash Basin structural components, MW-23 cannot be recognized as a downgradient well for monitoring under Part 845.

26) In Special Condition 14, there appears to be a typographical error in the second paragraph on page 3. As agreed with Illinois EPA, MWG will install one staff gauge in Lost Creek (see Special Condition 11). MWG suggests modifying this condition to "...and a staff gauge within..."

The Agency will use the term "gauge" although both spellings are correct.

27) Special Condition 15 is incorrect. MWG has been sampling the wells identified in the groundwater monitoring network in its Operating Permit Application since the Illinois CCR Rule passed in 2021. Accordingly, the statement in that MWG must "initiate groundwater sampling and analysis" within 30 days of the effective date of the operating permit is inaccurate and should be deleted.

There are other groundwater wells at the Powerton Station installed and sampled under different programs and are not a part of the groundwater monitoring network for the CCR surface impoundments specified in this Permit. To avoid confusion, Special Condition 15 should state: "MWG must conduct the groundwater sampling and analysis in accordance with 35 Ill. Adm. Code Section 845.640 at each well identified in Special Conditions 12 and 13."

The Agency agrees and has clarified to state wells listed in Special Conditions 12 and 13.

28) Special Condition 16 is incorrect. Pursuant to Section 845.220(d)(2)(I)(iii), MWG selected a statistical method for evaluating the groundwater data pursuant to Section 845.640(f)(1) in Section 9 of the Operating Permit Application in Attachment 9-5. Thus, MWG has notified the Agency that the chosen statistical method is the prediction interval procedure identified in Section 845.640(f)(1)(C). See MWG Operating Permit Application, Attachment 9-5, p. 2. Illinois EPA should correct Special Condition 16 to identify the procedure used by MWG.
The Attachment identified in Special Condition 16 is incorrect. Attachment 9-4 referenced by the Agency is the PE Stamp dated Oct. 30, 2021. Attachment 9-5 is the correct attachment.

As written, MWG's statistical analysis in Attachment 9-5 adheres and is consistent to the statement included in paragraph (a)(1) of Special Condition 16. Because no outliers were removed from any background dataset as part of statistical prediction limit calculations and is consistent with the noted statement in the permit, the outlier analysis need not be struck or

revised. MWG confirmed that its input data sets are in accordance with SW-846.

The Agency's limitation of the data sets for statistical analysis of background to the last eight consecutive quarterly sampling events in paragraph (c) is incorrect and should be modified. Section 845.650(b)(1)(A) states that a "minimum of eight independent samples" from each well must be collected, but there is no maximum limit and nor is there a limit to the most recent eight samples. It is universally recognized that the larger the background dataset, the more representative and statistically robust it is. Unless some statistical reason (such as an increasing trend) can be provided, it makes no sense to limit background dataset calculations to only the most recent eight quarters when there currently is over eight years of available quarterly CCR monitoring data available. There is no scientific basis to limit data sets for statistical evaluations. Illinois EPA could be attempting to ensure that the statistical analysis includes the most recent data. Assuming that is true, the sentence should be modified to state: "All data sets used for statistical analysis of background, must include the last eight consecutive quarterly sampling events in order ....". It is noted, however, that once a GWPS is established based on statistical background, this background should not be recalculated after each sampling event. Revisiting background calculations should only be considered after at least three to five years of subsequent sampling, which would be in accordance with guidelines provided in USEPA's Unified Guidance.

The Agency's statement in paragraph (d) that non-parametric statistical analysis must be provided to the Agency for review and approval each time a non-parametric data set occurs is not required by the rule. Section 845.640(g)(1) is the only applicable section related to non-parametric data sets and does not require submission of the data. A requirement of submission and approval of a statistical analysis for every non-parametric data set would be unduly burdensome, because it is common to have data sets that are not normal distributions. This requirement should be stricken.

The Agency agrees with the item regarding the reference to Attachment 9-5. The Agency does not agree with the other portions of this comment, and therefore has not revised Special Condition 16 because MW-16 is the background well that will be used for establishing background values for the CCRSIs for the Operating Permit. The Agency has determined that the other proposed wells are too close to the CCRSIs to be definitively determined to be outside of the structural components of the CCRSIs.

29) MWG conducts each of the requirements in Condition 17 in compliance in 35 Ill. Adm. Code 845.650. Also, as stated in the Comment on Special Condition 15, there are other groundwater wells at the Powerton Station installed and sampled under different programs and are not a part of the groundwater monitoring network for the CCR surface impoundments specified in the Permit. To avoid confusion, Special Condition 17 should state: "The groundwater monitoring program must be in compliance with 35 Ill. Adm. Code 845.650 at each well identified Special Conditions 12 and 13."

The Agency agrees and has revised the language to include wells included in Special Condition

12 and 13, and wells added for monitoring of corrective action implementation as a part of 35 Ill. Adm. Code 845.680 and additional groundwater plume delineation under 35 Ill. Adm. Code 845.650(d).

30) MWG provided an analysis of the CCR in the Ash Surge Basin and Former Ash Basin in the Operating Permit Application for the Ash Surge Basin, Ash Bypass Basin, and Former Ash Basin. The results of the analysis are in Tables 2-1 and 2-2 of the application, and the laboratory data package is in Attachment 2. As MWG stated in the application, the Bypass Basin did not contain CCR at the time of permit application completion and that any CCR that would be stored within that unit would be the same as that within the Ash Surge Basin. Similarly, MWG provided an analysis of the CCR in the Metal Cleaning Basin in Table 2 and Attachment 2 of the Metal Cleaning Basin Operating Permit Application. The request for a second analysis is unduly burdensome and unnecessary because the operations at the Powerton Station have not changed. The Illinois EPA should modify Special Condition 19 to state that analysis of the CCR in the Former Ash Basin, Ash Surge Basin, and Metal Cleaning Basin were submitted as part of the Operating Permit Applications, and that the Bypass Basin does not contain CCR.

MWG has not provided characterization of all the CCR used in the CCRSIs, especially CCR used as structural components of the CCRSIs. Structural components are defined in 35 Ill. Adm. Code 845.150 definitions section. The Agency is requiring that these structural components be sampled and analyzed to determine the contribution to the groundwater plume. Without the structural components characterized as stated previously, the Agency is unable to evaluate Closure Construction Applications and Corrective Action Construction Applications directly related to 35 Ill. Adm. Code 845.220(d)(3) and 35 Ill. Adm. Code 845.220(c)(2), respectively.

31) MWG cannot provide an analysis of all waste streams entering the Former Ash Basin or the Ash Bypass Basin because neither basin accepts any waste stream. Sampling of the waste streams that enter the surface impoundments prior to entering the units is redundant and unnecessary. The CCR within the waste streams settles and is contained within the unit. The constituents in the CCR are located in Tables 2-1 and 2-2 of the Operating Permit Application for the Ash Surge Basin, Bypass Basin, and Former Ash Basin, and Table 2 of the Operating Permit Application for the Metal Cleaning Basin. Any constituents within the wastewater that enters the CCR surface impoundment is identified by the current NPDES sampling that occurs. All the water that enters and leaves the CCR surface impoundments is discharged through a NPDES permitted outfall and sampled on a regular basis.

Alternatively, MWG seeks clarity. If the Agency is demanding that MWG sample each individual waste stream (such as each plant drain), that is unduly burdensome and not required by Section 845.230(d)(2)(C). However, MWG could sample the water entering the Ash Surge Basin and Metal Cleaning Basin if that is the Agency's demand.

"Waste streams" to be characterized for the purpose of the initial operating permit includes

waste streams "contained" in the CCRSI in accordance with 35 Ill. Adm. Code 845.230(d)(2)(C). The water entering and leaving the Ash Surge Basin and the Metal Cleaning Basin must be characterized.

32) Special Condition 21 should be modified for clarity. The condition states: "The groundwater standards at the waste boundary for the Silty Clay/Silt Unit...," incorrectly implying that the Silty Clay/Silt Unit has a waste boundary. The "at the waste boundary" should be stricken and the sentence should state: "The groundwater standards for the Silty Clay/Silt unit..."MWG agrees with the Agency's acceptance of the proposed boron standard for the CCR surface impoundments. The purpose of the groundwater monitoring program is to evaluate the groundwater "at the waste boundary" of a CCR surface impoundment to determine whether the CCR surface impoundment is releasing CCR constituents. Because the Illinois CCR Rule recognizes that there may be constituents at the historically operated facilities that are unrelated to the CCR surface impoundments, the rule allows for alternative standards proposed pursuant to Section 845.600(a)(2). At the Powerton Station, the boron standard was established because of an upgradient source unrelated to the CCR surface impoundments. The first paragraph after the table of standards has a typographical error. It should state "...as part of Special Condition 18..."

The first and second paragraphs after the table of standards are in conflict. The first paragraph states that if the statistical analysis performed pursuant to Special Condition 18 results in a higher groundwater protection standard than the current permit limits, MWG may submit a permit application modification to modify the standards in the table of standards. The second paragraph states that background concentrations will only be evaluated for changes during permit renewal or after completion of construction permits. Also, the second paragraph violates the express statements in the Illinois CCR rule. Section 845.280(c) states that an owner/operator "may initiate modification to its permit by application to the Agency at any time after the permit is approved and before the permit expires. 35 Ill. Adm. Code 845.280(c). To resolve the internal conflict and violation of the Illinois CCR rule, the second paragraph should be stricken.

The groundwater standards for the Silty Clay Unit do include "at the waste boundary" because there are some portions of the Silty Clay Unit that are not at the waste boundary. Due to the discontinuous nature of the Silty Clay Unit as it extends towards the Illinois River, it is not continuous along the top of the Sand and Gravel Unit thereby allowing for mixing between the Fill Sand with the Sand and Gravel Unit.

The groundwater protection standards, after collection of 8 rounds of samples from MW-16, must be adjusted accordingly. After the collection of the first 8 rounds of groundwater samples from MW-16, additional groundwater samples and background calculations will only be considered during the permit renewal.

The typographical error has been corrected.

33) Special Condition 22 should be modified for clarity. The condition states: "The groundwater standards at the waste boundary for the Sand and Gravel unit...," incorrectly implying that the Sand & Gravel Unit has a waste boundary. The "at the waste boundary" should be stricken and the sentence should state: "The groundwater standards for the Sand and Gravel unit..."
The first paragraph after the table of standards has a typographical error. It should state "...as part of Special Condition 18..."
The first and second paragraphs after the table of standards are in conflict. The first paragraph states that if the statistical analysis performed pursuant to Special Condition 18 results in a higher groundwater protection standard than the current permit limits, MWG may submit a permit application modification to modify the standards in the table of standards. The second paragraph states that background concentrations will only be evaluated for changes during permit renewal or after completion of construction permits. Also, the second paragraph violates the express statements in the Illinois CCR rule. Section 845.280(c) states that an owner/operator "may initiate modification to its permit by application to the Agency at any time after the permit is approved and before the permit expires. 35 Ill. Adm. Code 845.280(c). To resolve the internal conflict and violation of the Illinois CCR rule, the second paragraph should be stricken.

Compliance with Part 845 is required at the waste boundary. The Agency has not revised the text of the Special Condition. The groundwater protection standards, after collection of 8 rounds of samples from MW-16, must be adjusted accordingly. After the collection of the first 8 rounds of groundwater samples from MW-16, additional groundwater samples and background calculations will only be considered during the permit renewal.

34) Special Condition 24(g) this paragraph is regarding a "remedy." Because there is no remedy in the operating permit, the paragraph should be deleted.

The Agency has not removed this requirement, as a remedy, in accordance with 35 Ill. Admin. Code 845 Subpart F and Special Conditions 21 and 22, will be required to be reported on prior to the approval of a corrective action construction.

35) Special Condition 26(c) mistakenly includes a requirement for a potentiometric map for the "Fill Unit", which is a misnomer and does not exist. Pursuant to Special Condition 14, MWG is evaluating the surface water and groundwater interactions which will include consideration of water levels recorded from the two piezometers that have been installed. The piezometric maps for the Silty Clay/Silt Units and the Sand and Gravel Unit will sufficiently define the horizontal flow system. Furthermore, a flow map cannot be developed based on only two data points. The requirement for a flow map within the fill should be stricken. Also, "Silty/Clay-Silt Unit" is spelled differently than in other Special Conditions and suggest modifying it for consistency to "Silty Clay/Silt Unit.

Special Condition 26(d) requires that MWG include the documentation of field sampling

procedures in the Annual Report. To date and per the Illinois EPA's request, MWG provides the documentation of field sampling procedures in the groundwater data reports submitted to the Agency pursuant to Section 845.610(b)(3)(D) (i.e., the "60-day reports"). It is unduly burdensome and unnecessary to also require hard copy submittal of field data sheets and analytical laboratory reports in both the 60-day reports and the Annual Report. Double submission of this documentation would also unnecessarily increase the size of the reports and double the volume of the permit record (i.e. – number of pages). MWG has understood from the Illinois EPA that the documentation of the field sampling sheets, and analytical laboratory reports should continue to be in the 60-day report. Accordingly, the requirement to include this documentation in the Annual Report should be stricken.

In Responses 24 and 25 the Agency acknowledges that there are two geologic units, the "sand and gravel unit" and the "silty clay/silt unit". Therefore, the Agency agrees a potentiometric surface map of the "fill unit" cannot be required by this permit.

Once lab reports, field documentation and other reporting requirements have been submitted to the Agency, further reporting that references that documentation must have a reference to the report that it was included in.

36) Special Condition 30 is not relevant and should be stricken. There are no "sludges" associated with the CCR surface impoundments and none will be generated through the operation of the CCR surface impoundments.

The special condition has been revised such that it is only referring to sludges which are not defined as CCR under 35 Ill. Adm. Code 845. Since this sludge can include such material as filtrate or other debris, it is necessary require that it be disposed of correctly.

ACRONYMS AND INITIALS

ABB	Ash Bypass Basin
CCR	Coal Combustion Residuals
CCRSI	Coal Combustion Residual Surface Impoundment
FEMA	Federal Emergency Management Agency
GWPS	Groundwater Protection Standard
Illinois EPA	Environmental Protection Agency
Ill. Adm. Code	Illinois Administrative Code
MWG	Midwest Generation
NPDES	National Pollutant Discharge Elimination System

DISTRIBUTION OF RESPONSIVENESS SUMMARY

An announcement that the CCR surface impoundment permit decision and accompanying responsiveness summary is available on the Illinois EPA website, was mailed or e-mailed to all who registered at the hearing and to all who sent in written comments. Printed copies of this responsiveness summary are available from Sabrina Bailey, 312-832-2162, e-mail: sabrina.bailey@illinois.gov.

WHO CAN ANSWER YOUR QUESTIONS ILLINOIS EPA CCR PERMIT:

CCR Permit ..... Mark Liska.....217-782-1599
Legal Questions .....Charles Matoesian.....217-524-9453
Legal Questions.....Rebecca Strauss.....217-557-1451
Groundwater Unit .....Lauren Hunt.....217-524-9048
Public Hearing of May 8, 2024..... Jeff Guy.....217-785-8724

The public hearing notice, fact sheets, the hearing recording, the CCR permits and the responsiveness summary are available on the Illinois EPA website https://epa.illinois.gov/public-notices/ccr-public-notices.html

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 · (217) 782-3397
JB PRITZKER, GOVERNOR JOHN J. KIM, DIRECTOR

217/782-0610

July 3, 2024

Midwest Generation, LLC
13082 East Manito Road
Pekin, Illinois 61554

Re: Midwest Generation, LLC
Powerton Generating Station
Coal Combustion Residual Surface Impoundment Permit No. 2024-CC-100030
Bureau ID: W1798010008

Dear Permittee:

Attached is the final Coal Combustion Residual Surface Impoundment Retrofit Construction Permit for your facility. The Permit as issued covers monitoring and related reporting requirements. Failure to meet any portion of the Permit could result in civil and/or criminal penalties. The Illinois Environmental Protection Agency is ready and willing to assist you in interpreting any of the conditions of the Permit as they relate specifically to your discharge. Since the public notice of your permit, the following changes have been made:

1. Special Condition 7 now notes that financial assurance information was submitted both in their initial application received October 21, 2021 and in a separate submission dated June 21, 2021.

2. Special Condition 9 now correctly references the Annual Consolidated Report in Special Condition 17.

3. Special Condition 13 now requires that the permittee shall notify the Agency within 7 days of construction being completed.

4. Reference to leachate monitoring data has been removed from Special Condition 11.

5. Special Condition 15 has been revised to not include CCR.

6. Various spelling and grammar mistakes have been corrected.

The attached Permit is effective as of the date indicated on the first page of the Permit. Until the effective date of any re-issued Permit, the limitations and conditions of the previously issued Permit remain in full effect. You have the right to appeal any condition of the Permit to the Illinois Pollution Control Board within a 35 day period following the issuance date.

Should you have questions concerning the Permit, please contact Mark E. Liska at 217/782-0610.

Sincerely,

Darin E. LeCrone, P.E.
Manager, Permit Section
Division of Water Pollution Control

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Attachment: Final Permit

cc: Records
Compliance Assurance Section
Peoria Region
Billing
USEPA

Coal Combustion Residual Surface Impoundment Permit No. 2024-CC-100030

Illinois Environmental Protection Agency

Division of Water Pollution Control

1021 North Grand Avenue East

Post Office Box 19276

Springfield, Illinois 62794-9276

Coal Combustion Residual Surface Impoundment Retrofit Construction Permit

Expiration Date: June 30, 2029

Issue Date: July 3, 2024

Name and Address of Permittee:

Midwest Generation, LLC
13082 East Manito Rd.
Pekin, IL 61554

Name and Address of Facility:

Midwest Generation, LLC
Powerton Generating Station
13082 East Manito Rd.
Pekin, IL 61554
(Tazewell County)

CCR Impoundment:

W1798010008-04 Ash Bypass Basin

In compliance with the provisions of the Illinois Environmental Protection Act, Title 35 of Ill. Adm. Code, Subtitle C and/or Subtitle D, Chapter 1, and the Clean Water Act (CWA), the above-named permittee is hereby authorized to retrofit construct a coal combustion residual (CCR) surface impoundment, at the above location in accordance with the standard conditions and attachments herein.

Coal Combustion Residual Surface Impoundment Permit No. 2024-CC-100030 authorizes the retrofit construction of the Ash Bypass Basin in accordance with 35 Illinois Administrative Code Part 845 as described below.

Coal Combustion Residual Surface Impoundment Permit No. 2024-CC-100030 does not authorize the operation of the Ash Surge Basin, the Metal Cleaning Basin, the Ash Bypass Basin, or the Former Ash Basin.

Coal Combustion Residual Surface Impoundment Permit No. 2024-CC-100030 does not authorize the closure of the Ash Bypass Basin, corrective action for the Ash Bypass Basin, or any construction activities associated with the closure of the Ash Bypass Basin.

Coal Combustion Residual Surface Impoundment Permit No. 2024-CC-100030 does not authorize the closure, corrective action, or any construction for the Ash Surge Basin, the Former Ash Basin, or the Metal Cleaning Basin.

Coal Combustion Residual Surface Impoundment Permit No. 2024-CC-100030 does not authorize the discharge of any wastewater to waters of the United States. NPDES Permit No. IL0002232 authorizes this facility to discharge wastewater to waters of the United States.

Coal combustion residuals, consisting of bottom ash discharged from the station's dewatering bins and other process waste streams related to electric power-generating operations when the Ash Surge Basin was being cleaned. The Ash Bypass Basin covers approximately 0.83 acres and has a storage capacity of approximately 6,700 cubic yards.

Permit is hereby granted to the above designated permittee(s) to construct facilities described as follows:

The retrofit construction of the Ash Bypass Basin including the removal of the gravel warning and sand cushion layers over the existing

geomembrane liner, decontaminating the basin's existing geomembrane liner for re-use as a supplemental liner, decontaminating the basin's appurtenant structures, installing a new basin floor and slopes, installing a composite liner system consisting of a 60-mil HDPE geomembrane over a geosynthetic clay liner, installing a leachate collection and removal system consisting of a drainage geocomposite, leachate collection pipe, and submersible sump pump, installing a sand filter layer over the leachate collection and removal system, and installing a protective warning layer over the sand filter layer. Retrofit construction includes all pipes, pumps, and appurtenances as specified in the Application for Retrofit Construction Permit application dated July 15, 2022 and the Amended Written Retrofit Plan Revision 1 dated March 5, 2024.

Permittee is not authorized to operate after the above expiration date. In order to receive authorization to operate beyond the expiration date, the permittee shall submit the proper application as required by the Illinois Environmental Protection Agency (IEPA) not later than 180 days prior to the expiration date.

Darin E. LeCrone P.E.
Manager, Permit Section
Division of Water Pollution Control

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CCR Impoundment Permit No. 2021-CO-100029

Special Conditions

SPECIAL CONDITION 1: This permit does not relieve the Permittee of the responsibility of complying with the provisions of the State of Illinois Rules and Regulations, 35 Ill. Adm. Code Subtitle B, Air Pollution Control, Chapter 1 and 35 Ill. Adm. Code Subtitle G, Land Pollution Control, Chapter 1. The Permittee may be required to file reports and/or obtain applicable permits through the Illinois EPA's Bureau of Air (BOA) - Division of Air Pollution Control (DAPC) and/or Illinois EPA's Bureau of Land (BOL) – Division of Land Pollution Control (DLPC).

SPECIAL CONDTION 2: This construction permit is for Retrofitting of the Ash Bypass Basin and does not cover any closure construction or post-closure care of the Ash Bypass Basin. This permit does not authorize any construction activities necessary for closure and/or corrective action of the Ash Bypass Basin.

SPECIAL CONDITION 3: The operator shall implement methods for controlling dust, including the Fugitive Dust Control Plan included in Application Log No. 2021-100029, so as to prevent wind dispersal of particulate matter off-site.

SPECIAL CONDITION 4: A permanent sign shall be maintained at each CCR impoundment that contains the information required under 35 IAC, Section 845.130.

SPECIAL CONDITION 5: The written Emergency Action Plan (EAP), shall be maintained by the facility. The EAP and all amendments must be placed in the facility's operating record. Upon activation of the EAP, the facility must notify Illinois EPA in writing within 30 days of activation and place all corresponding documentation in the facility operating record. The permittee may amend the EAP at any time but must amend the EAP when there is a change in conditions that would substantially affect the EAP.

SPECIAL CONDITION 6: The Safety and Health Plan and accompanying certification has been submitted as part of Permit Application Log No. 2021-100029 and must be maintained by the facility. The plan must be updated annually and on an as needed basis. The Safety and Health Plan and all amendments must be placed in the facility operating record.

SPECIAL CONDITION 7: The permittee submitted financial assurance in accordance with Part 845 Subpart I in their application and in a separate submission dated June 21, 2021. The permittee shall provide and maintain financial assurance in accordance with Part 845 Subpart I.

SPECIAL CONDITION 8: All CCR impoundments and any lateral expansion of a CCR surface impoundment must be inspected by a qualified person on a weekly basis and after each 25-year, 24-hour storm event. All CCR surface impoundment instrumentation must be inspected at least every 30 days. A report for each inspection shall be generated and placed into the facility operating record.

SPECIAL CONDITION 9: Each CCR Surface impoundment must be inspected on an annual basis by a qualified Professional Engineer, in accordance with 35 IAC 845.540. An inspection report must be completed and included with the Annual Consolidated Report, as specified in Special Condition 17.

SPECIAL CONDITION 10: Within 60 days of the effective date of this construction permit, the facility must install and begin to monitor at least two additional down gradient wells in the Silty Clay/Silt Unit, two piezometers in the fill unit, and two staff gages in the intermittent stream and standing water within the wetlands north of the service road splitting up the Former Ash Basin.

SPECIAL CONDITION 11: All certifications, logs, reports, plan sheets, notices, and groundwater monitoring data required to be submitted to the Illinois EPA by the permittee shall be mailed to the following address:

Illinois Environmental Protection Agency
Compliance Assurance Section
Bureau of Water
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

Information submittals transmitted by FedEX or UPS shall be mailed to the following address:

Illinois Environmental Protection Agency
Compliance Assurance Section
Bureau of Water
1021 North Grand Avenue East
Springfield, Illinois 62702

CCR Impoundment Permit No. 2021-CO-100029

Special Conditions

Electronic groundwater monitoring data shall be emailed to Illinois EPA at the following email address: EPA.BOW.GWS.CCR@illinois.gov

Except for electronic groundwater, the operator shall provide the Illinois EPA with the original and two (2) copies of all certifications, logs, reports, and plan sheets required by this permit.

SPECIAL CONDITION 12: The permittee will commence construction in accordance with the specifications listed in the Application for Retrofit Construction Permit application dated July 15, 2022 and the Amended Written Retrofit Plan Revision 1 dated March 5, 2024. Any changes made to the construction plans must be approved by the Agency.

SPECIAL CONDITION 13: The permittee shall notify the Agency within 7 days of construction being completed.

SPECIAL CONDITION 14: Issuance of this permit does not release the Permittees from any liability for prior violations of the Act or Rules and Regulations promulgated thereunder.

SPECIAL CONDITION 15: All sludges not considered Coal Combustion Residual as defined under 35 Ill. Adm. Code Part 845, if generated, shall be disposed of at a site and in a manner acceptable to the Agency, including obtaining required state construction and/or operating permits from the Agency.

SPECIAL CONDITION 16: All discharges to a Water of the United States shall be governed by NPDES Permit No. IL0002232.

SPECIAL CONDITION 17: All certifications, logs, reports, plan sheets, notices, and groundwater monitoring data generated as a part of the construction quality assurance program must be reported in the retrofit construction completion report in accordance with 35 IAC 845.770(g) and is required to be submitted to the Illinois EPA prior to termination of the retrofit construction permit by the permittee. The permittee shall mail the retrofit construction completion report to the following address:

Illinois Environmental Protection Agency
Compliance Assurance Section
Bureau of Water
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

Information submittals transmitted by FedEX or UPS shall be mailed to the following address:

Illinois Environmental Protection Agency
Compliance Assurance Section
Bureau of Water
1021 North Grand Avenue East
Springfield, Illinois 62702

DOCUMENT 46

MWG
Midwest Generation, LLC

Midwest Generation, LLC
Powerton Generating Station
13082 E. Manito Road
Pekin, Illinois 60087

September 26, 2024

Illinois Environmental Protection Agency
Compliance Assurance Section
Bureau of Water
1021 North Grand Avenue East
Springfield, Illinois 62702

RE: Midwest Generation LLC—Powerton Generating Station W1798010008
CCR Permit No. 2024-CC-100030
Special Condition 13

To Whom It May Concern:

In accordance with Special Condition 13 of CCR Permit No. 2024-CC-100030, Midwest Generation (MWG) is hereby notifying the Illinois Environmental Protection Agency (Agency) that the retrofit construction of the Bypass Basin was completed as of September 25, 2024. A Retrofit Completion Report and Certification will be submitted to the Agency in accordance with 35 IAC 845.770(g).

Please contact me at jill.buckley@nrg.com or 724-448-9732 with any questions.

Sincerely,

Todd Mundorf
Powerton Plant Manager

cc: Mark Liska—Illinois EPA (via e-mail)
Darin LeCrone – Illinois EPA (via e-mail)
Lauren Hunt – Illinois EPA (via e-mail)
Joe Kotas – Powerton Station (via e-mail)
Jill Buckley – Midwest Generation (via e-mail)

RECEIVED
SEP 30 2024
IEPA
BOW/WPC/PERMIT SECTION