BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

MIDWEST GENERATION, LLC	)	
	)	
Petitioner,	)	
	)	
v.	)	**PCB**
	)	**(Variance - Land)**
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY	)	
	)	
Respondents.	)	

NOTICE OF FILING

To: Division of Legal Counsel
Illinois Environmental Protection Agency
1021 N. Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276
Epa.dlc@illinois.gov

Don Brown, Assistant Clerk
Illinois Pollution Control Board
James R. Thompson Center
100 West Randolph Street, Suite 11-500
Chicago, IL 60601

PLEASE TAKE NOTICE that I have today electronically filed with the Office of the Clerk of the Pollution Control Board Midwest Generation LLC's Motion for Expedited Review and supporting affidavit, its Petition for a Variance for the Powerton Station with supporting documents, and the Appearances of Susan M. Franzetti, Kristen L. Gale, and Molly Snittjer, a copy of which are herewith served upon you.

Dated: May 11, 2021

MIDWEST GENERATION, L.L.C.

By: /s/ Kristen L. Gale
One of Its Attorneys

Kristen L. Gale
Susan M. Franzetti
Molly Snittjer
Nijman Franzetti LLP
10 S. LaSalle St, Suite 3600
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CERTIFICATE OF SERVICE

The undersigned, an attorney, certifies that a true copy of the foregoing Midwest Generation LLC's Motion for Expedited Review and supporting affidavit, its Petition for a Variance for the Powerton Station with supporting documents, and the Appearances of Susan M. Franzetti, Kristen L. Gale, and Molly Snittjer, on May, 11, 2021 with the following:

Division of Legal Counsel
Illinois Environmental Protection Agency
1021 N. Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276
Epa.dlc@illinois.gov

Don Brown, Assistant Clerk
Illinois Pollution Control Board
James R. Thompson Center
100 West Randolph Street, Suite 11-500
Chicago, IL 60601

and that true copies were filed to the Agency by FedEx, delivery charge prepaid, and electronic mail, and the Board electronically on May 11, 2021 to the parties listed above.

/s/ Kristen L. Gale

Kristen L. Gale
Susan M. Franzetti
Molly Snittjer
Nijman Franzetti LLP
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Chicago, Illinois 60603
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BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

MIDWEST GENERATION, LLC	)	
Petitioner,	)	
	)	PCB
v.	)	(Variance - Land)
	)	
ILLINOIS ENVIRONMENTAL	)	
PROTECTION AGENCY	)	
Respondent.	)	

ENTRY OF APPEARANCE OF SUSAN M. FRANZETTI

NOW COMES Susan M. Franzetti, of Midwest Generation, LLC, and hereby enters her appearance as counsel in this matter on behalf of Midwest Generation, LLC. This appearance shall also serve as consent to service via email.

Respectfully submitted,

__/s/Susan M. Franzetti________________

Susan M. Franzetti
Attorney
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BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

MIDWEST GENERATION, LLC	)	
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	)	PCB
v.	)	(Variance - Land)
	)	
ILLINOIS ENVIRONMENTAL	)	
PROTECTION AGENCY	)	
Respondent.	)	

ENTRY OF APPEARANCE OF KRISTEN L. GALE

NOW COMES Kristen L. Gale, of Midwest Generation, LLC, and hereby enters her appearance as counsel in this matter on behalf of Midwest Generation, LLC. This appearance shall also serve as consent to service via email.

Respectfully submitted,

__/s/Kristin L. Gale

Kristen L. Gale
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BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

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ILLINOIS ENVIRONMENTAL	)	
PROTECTION AGENCY	)	
Respondent.	)	

ENTRY OF APPEARANCE OF MOLLY SNITTJER

NOW COMES Molly Snittjer, of Midwest Generation, LLC, and hereby enters her appearance as counsel in this matter on behalf of Midwest Generation, LLC. This appearance shall also serve as consent to service via email.

Respectfully submitted,

__/s/Molly Snittjer________________

Molly Snittjer
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BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

MIDWEST GENERATION, LLC	)	
	)	
Petitioner,	)	
	)	
v.	)	**PCB**
	)	
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY	)	**(Variance-Land)**
	)	
	)	
Respondent.	)	

MIDWEST GENERATION LLC'S MOTION FOR EXPEDITED REVIEW OF ITS PETITION FOR VARIANCE FOR THE POWERTON STATION

NOW COMES Midwest Generation, LLC ("MWG"), by its attorneys, and pursuant to 35 Ill. Adm. Code §101.512, requests that the Illinois Pollution Control Board (the "Board") expedite its review and determination of the Petition for Variance ("Petition") filed in the above-captioned matter for the Powerton Generating Station ("Powerton Station"), and further states as follows:

1. As set forth in the Petition, filed contemporaneously, MWG is seeking a variance authorizing deadline extensions for certain data collection and information submission requirements under the new Title 35 of the Illinois Administrative Code Part 845 rules regulating the Disposal of Coal Combustion Residuals in Surface Impoundments (the "Illinois CCR Rule") for the Metal Cleaning Basin at the Powerton Station.

2. The Metal Cleaning Basin is not a federal CCR surface impoundment, but is an Illinois CCR surface impoundment. Accordingly, MWG did not, until March 2021, have the necessary monitoring infrastructure in place for the Metal Cleaning Basin in order to collect the eight groundwater samples required under 35 Ill. Adm. Code §845.650(b)(1)(A). Similarly,

MWG does not have any of the historical groundwater data or other technical information that is needed to complete an operating permit application.

3. MWG is seeking a variance to extend the following deadlines in the Illinois CCR Rule:

- the 180-day deadline (October 18, 2021) for the requirement under 35 Ill. Adm. Code §845.650(b)(1)(A) to collect and analyze eight independent samples from each background and downgradient well at the Metal Cleaning Basin that will be representative of background groundwater quality;
- the October 30, 2021 deadline to submit an operating permit application for the Metal Cleaning Basin that must contain 22 extensive, technical submissions (including the analysis of groundwater monitoring data) pursuant to 35 Ill. Adm. Code §845.230(d)
- the deadline to prepare the Initial Emergency Action Plan and the Fugitive Dust Plan pursuant to §§845.520(c) and 845.500(b)(4), which must be submitted as a part of the operation permit application;
- the deadline to designate the closure priority category of the Metal Cleaning Basin pursuant to §845.700(c), and;
- the deadline for submission of the construction permit application pursuant to §845.700(h)(2) if the Metal Cleaning Basin is designated as a Category 5 CCR Surface Impoundment pursuant to §845.700(g).

4. To collect and analyze eight independent groundwater samples by October 18, 2021, and complete the operating permit application by October 30, 2021, MWG would have to try to complete this work in such a condensed time period that the limited data it could collect would not be complete and representative of groundwater conditions for the Metal Cleaning Basin. (Exhibits L and N to the Petition set forth this expedited time schedule). Collection of accurate, representative groundwater data, including consideration of seasonal variations, for the Metal Cleaning Basin, is integral to developing a sound groundwater monitoring program. Submission of a complete and accurate operating permit application is also dependent upon the collection of accurate, representative groundwater data. Thus, MWG cannot submit a complete application until after the groundwater data is collected. Moreover, because the operating

permit application requires multiple extensive reports and analysis, it is not feasible to prepare compete and accurate reports within a limited deadline.

5. Pursuant to Section 104.232 of the Board's Rules, the Board has 120 days, or until September 8, 2021, to render a decision on this Petition. However, because the deadline in the Illinois CCR Rule to conduct eight rounds of groundwater sampling is 180-days (October 18, 2021), even the relatively short 120-day deadline for a decision by the Board on MWG's petition for a variance is insufficient to provide timely relief.

6. Without an expedited review of MWG's Petition, MWG will suffer material prejudice. If the Board takes its allowed 120 days to render a decision, there will not be enough time for MWG to comply with the CCR Rule should the Board decide not to grant the requested variance. While awaiting the Board's decision, MWG will need to collect limited data on a compressed timeline that will neither be "independent" as required by the CCR Rule nor provide a reliable basis on which to design its groundwater monitoring program. Simultaneously, MWG will have insufficient data on which to start preparing the reports and studies required for an operating permit application. Without expedited variance relief, MWG will have to rush to take what should be unnecessary steps to try to comply with unreasonably tight compliance deadlines that should not be applicable to CCR surface impoundments like the Metal Cleaning Basin that have never before been subject to these types of requirements.

7. Attached as Exhibit A is the affidavit of Sharene Shealey, attesting to the truth of the facts cited herein, submitted pursuant to 35 Ill. Adm. Code §101.512(a).

WHEREFORE, MWG respectfully requests that the Board expedite its review and determination of the Petition for Variance for Powerton Station, and grant MWG such other and further relief as is deemed appropriate under the circumstances.

Dated: May 11, 2021

Respectfully submitted,
Midwest Generation, LLC

By: /s/Kristen L. Gale________________
One of its Attorneys

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BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

MIDWEST GENERATION, LLC	)	
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Petitioner,	)	
v.	)	**PCB**
ILLINOIS ENVIRONMENTAL	)	**(Variance)**
PROTECTION AGENCY	)	
	)	
Respondents.	)	

AFFIDAVIT OF SHARENE SHEALEY

I, Sharene Shealey, being first duly sworn on oath, depose and state as follows:

1. I am Director of Environmental with NRG Energy, Inc., which in turn indirectly owns Midwest Generation, LLC ("MWG").

2. I have been personally involved in matters related to initiating and conducting the activities required under new Title 35 of the Illinois Administrative Code Part 845 rules regulating the Disposal of Coal Combustion Residuals in Surface Impoundments ("Illinois CCR Rule") at the MWG Stations. I have also been personally involved in matters related to conducting the requirements under the federal Coal Combustion Residual Rule, 40 C.F.R. §257 ("federal CCR Rule"). At the MWG Powerton Station, the Metal Cleaning Basin is not subject to the federal CCR Rule, but is subject to the Illinois CCR Rule. I have been personally involved with conducting the additional requirements under the Illinois CCR Rule applicable to the Metal Cleaning Basin, and am familiar with the deadlines set forth in the Illinois CCR Rule.

3. I have read the Motion for Expedited Review of the Variance Petition for the Powerton Station dated May 11, 2021, and based upon my personal knowledge and belief, the facts stated relating to MWG are true and correct.

4. If called upon to testify in this matter, I could competently testify to the facts stated herein.

FURTHER AFFIANT SAYETH NOT.

Sharene Shealey

Subscribed and Sworn to before me

On 11th MAY, 2021.

Kian A Krashesky

Notary Public

My Commission Expires: 09/09/2023

Official Seal
Kian A. Krashesky
Notary Public State of Illinois
My Commission Expires 09/09/2023

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

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PROTECTION AGENCY	**)**	
	)	
Respondent.	**)**	

MIDWEST GENERATION LLC'S PETITION FOR VARIANCE FOR POWERTON STATION

Pursuant to Sections 35(a) and (b) of the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/35(a) and (b), and Part 104 of Title 35 of the Illinois Administrative Code, 35 Ill. Adm. Code §104.100 *et seq.*, Midwest Generation, LLC ("Midwest Generation" or "MWG") petitions the Illinois Pollution Control Board ("Board") for a variance authorizing deadline extensions for certain data collection and information submission requirements under the new Title 35 of the Illinois Administrative Code Part 845 rules regulating the Disposal of Coal Combustion Residuals in Surface Impoundments (the "Illinois CCR Rule"). Specifically, MWG is seeking a variance for the Metal Cleaning Basin at MWG's Powerton Generating Station ("Powerton Station") authorizing an extension until March 31, 2022 of:

(i) the October 18, 2021 deadline to collect and submit background groundwater monitoring data pursuant to 35 Ill. Adm. Code §845.650(b)(1)(A);

(ii) the October 30, 2021 deadline to submit operating permit application pursuant 35 Ill. Adm. Code §845.230(d)(1).

Because §§845.520(c) and 845.500(b)(4) of the Illinois CCR Rule specify the same October 30, 2021 operating permit application deadline for preparing the Initial Emergency Action Plan and the Fugitive Dust Plan, MWG seeks an extension to March 31, 2022 to submit these plans as well.

MWG also seeks a variance to March 31, 2022 of the §845.700(c) thirty-day deadline for designating the closure priority category of the Metal Cleaning Basin. MWG cannot accurately designate the closure priority category of the pond without groundwater monitoring data, and it needs additional time to collect that data. Additionally, if the Metal Cleaning Basin is designated as a Category 5 CCR Surface Impoundment pursuant to §845.700(g), which is an existing CCR surface impoundment that has exceeded a groundwater protection standard, MWG requests a variance authorizing an extension of the August 1, 2022 construction permit application deadline to December 1, 2022, which is commensurate with the time interval for submission of the construction permit application after the operating permit application that is otherwise established by the Illinois CCR Rule. 35 Ill. Adm. Code §845.700(h)(2).

MWG is seeking this variance because compliance with the Illinois CCR Rule deadlines would result in an arbitrary or unreasonable hardship upon MWG. MWG is not requesting a variance from any substantive aspect of the Illinois CCR Rule. It intends to fully comply with the substantive requirements of the rule. But to do so, it needs the reasonable amount of time requested in this variance petition to gather the relevant data needed to submit complete and accurate information in compliance with the substantive requirements of the Illinois CCR Rule. Concurrent with this Petition, MWG has also filed a Motion for Expedited Review. If it is not afforded expedited variance relief, MWG will be required to take unnecessary steps to try to comply with unreasonably tight compliance deadlines that should not be applicable to CCR surface impoundments like the Metal Cleaning Basin that have never before been subject to these types of requirements.

I. INTRODUCTION

The Board's April 15, 2021 adoption of the Illinois CCR Rule regulating CCR surface impoundments in Illinois for the first time subjected the Metal Cleaning Basin to significant regulatory requirements. Because the Metal Cleaning Basin is not part of the ash sluice system at Powerton Station and does not receive commingled ash and process water, it was not regulated by the 2015 federal CCR rule which established the first national regulations specific to CCR surface impoundments. (*See* "Disposal of Coal Combustion Residuals from Electric Utilities" 80 Fed. Reg. 21,301 (April 17, 2015), as amended and codified at 40 CFR Part 257 ("the federal CCR rule")). The Illinois CCR Rule replicates many of the requirements of the federal CCR rule. But because the Metal Cleaning Basin was not subject to the federal CCR rule, it did not, prior to March 2021, have the necessary monitoring infrastructure in place, let alone years of accumulated groundwater data and other technical information that is required to satisfy requirements of the Illinois CCR Rule.

MWG and its environmental consultant, KPRG and Associates, Inc. ("KPRG") have conducted a thorough evaluation of the time and effort that would be required to comply with the deadlines in the Illinois CCR Rule. Based on the results of that evaluation, there is simply not enough time to thoroughly and adequately comply with the Illinois CCR Rule's six-month deadline for:

(i) collecting and analyzing eight independent samples from each background and downgradient well (some of which did not exist until March 2021) that will be representative of background groundwater quality; and

(ii) compiling the information needed to submit an operating permit application that must contain 22 extensive, technical submissions (including the analysis of groundwater monitoring data referenced above).[1]

To qualify as "independent samples", the eight groundwater monitoring events must be conducted at not less than one-month intervals, which requires a minimum of 8 months to complete after the monitoring wells are installed. These same eight independent groundwater samples are also necessary to make a "Closure Prioritization" designation for the Metal Cleaning Basin under Section 845.700(g) of the new rule. MWG cannot submit this designation by the imminent May 21, 2021 deadline for this requirement because the eight independent groundwater monitoring events simply cannot be completed by this deadline. Absent this groundwater monitoring data, MWG's only potential compliance option would be to guess at what the correct closure priority category designation should be for this pond based on underdeveloped or incomplete information for the sake of making a timely submission.

As described in more detail below, the requested variance will permit MWG to continue to collect the groundwater samples required under 35 Ill. Adm. Code §845.650(b)(1)(A) over a period of time that ensures representative data. With both the necessary groundwater data in hand and reasonable time to analyze it, MWG can make an accurate closure priority category designation for the Metal Cleaning Basin pursuant to 35 Ill. Adm. Code §845.700(g). Because the closure

[1] The full list of technical documents required under Section 845.230(d) are the following: History of Construction; CCR Chemical Constituents Analysis; All Waste Streams Chemical Analysis ; Location Standards Demonstrations; Permanent Markers Procurement, Installation and Evidence; Slope Protection/Incised Documentation; Emergency Action Plan; Fugitive Dust Control Plan; Groundwater Monitoring Information; Closure Design; Preliminary Written Closure Plan; Initial Written Closure Plan; Liner Certification; history of GWPS Known Exceedances; Financial Assurance Certification; Hazard Potential Classification; Structural Stability Assessment; Safety Factor Assessment; Inflow Design Flood Control System Plan; Health and Safety Plan; Closure priority Category Designation.

priority designation determines the applicable construction permit application deadline under 35 Ill. Adm. Code §845.700(h), only then can MWG identify the construction permit application deadline for the Metal Cleaning Basin.

The requested variance will also permit MWG to continue to develop the information necessary to submit a complete operating permit application, including the groundwater monitoring data, the Initial Emergency Action Plan and the Fugitive Dust Plan as required under §§845.520(c), 845.500(b)(4).[2]

The requested variance will not adversely impact human health or the environment because it will not affect implementation of any substantive aspect of the Illinois CCR Rule. This is not a situation that threatens either human health or the environment. The Metal Cleaning Basin is already regulated by the terms of Powerton Station's NPDES Permit, is only used on intermittent basis, and there are no potable downgradient wells that could potentially have an impact to human health. Thus, granting the additional time requested is warranted to enable MWG to provide thorough and accurate information, which will ensure that its efforts to protect human health and the environment are directed where they will be most effective.

II. REGULATIONS FROM WHICH THE VARIANCE IS SOUGHT

A. Regulatory Background

The deadlines at issue here for the background and downgradient well samples, permit applications and associated plans, and closure prioritization category designation were set by the Illinois Environmental Protection Agency and adopted by the Board on April 15, 2021 after a rulemaking for the Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments. *In the Matter of: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed New 35 Ill. Adm. Code 845, PCB 20-19* ("rulemaking"). The rulemaking was mandated by Section 22.59(g) of the Coal Ash Pollution Prevention Act ("CAPP Act") which was enacted in Illinois on July 30, 2019 to regulate CCR surface impoundments at the State level. Public Act 101-0171, 415 ILCS 5/22.59(g). Illinois EPA filed proposed new

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[2] The Initial Emergency Action Plan and Fugitive Dust Control Plan are included in this variance request because they are required to be submitted with the operating permit application but have separately stated, yet identical deadlines as the operating permit application deadline (*i.e.* October 30, 2021). MWG is seeking a variance for these components of the operating permit application to avoid submitting a piecemeal operating permit application.

standards for the permitting, operation, maintenance, and closure of CCR surface impoundments as the new Part 845 of the Board's Rules on March 30, 2020. *Illinois EPA Statement of Reasons, In the Matter of: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed New 35 Ill. Adm. Code 845, PCB R20-19*, March 30, 2020 ("Statement of Reasons"). The Statement of Reasons is provided here as Exhibit A.

Prior to the enactment of the CAPP Act and the adoption of the Illinois CCR Rule, CCR surface impoundments were regulated by the federal CCR rule. In its Statement of Reasons, Illinois EPA stated that one of the purposes of the proposed Illinois CCR rule was to "adopt the federal CCR rules in Illinois." Ex. A, p. 10. The Illinois EPA's proposed Illinois CCR Rule closely mirrors the federal CCR rule, but deviates from it in several critical areas. In particular, the definition of "CCR Surface Impoundment" is applied more broadly to encompass ponds that are not regulated as CCR surface impoundments under the federal CCR rule.[3]

For those CCR Surface Impoundments identified by Illinois EPA that were already regulated by the same or similar requirements in the 2015 federal CCR rule, regulated parties had begun (or completed) collecting the relevant data and information necessary to meet the tight deadlines provided in the Illinois CCR Rule. But this is not the case for the Metal Cleaning Basin and other previously unregulated ponds which were not regulated by the federal CCR rule. In the rulemaking, Illinois EPA acknowledged both that this "unregulated" subset of ponds existed, and that it created a disparity in the level of initial effort necessary to comply with the rules based on the information and data available to the regulated parties. (*See* Exhibit B, 8/11/20 Hearing Transcript p. 74:1-24; Exhibit C 8/13/20 Hearing Transcript p. 140:21-141:17). Illinois EPA admitted that "[f]or the disputed [*i.e.* previously unregulated] CCR surface impoundments, the data may not be there." *Id.*

During the rulemaking, MWG proposed an extension of the deadline to collect and analyze the groundwater monitoring data specifically for ponds like the Metal Cleaning Basin because of

[3] CCR Surface 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; 40 C.F.R. 257.53; "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 unit treats, stores, or disposes of CCR."

the subset of existing CCR surface impoundments that were not subject to the federal CCR rule.[4] MWG sought an extension of the groundwater sample collection deadline so that it would be possible to obtain independent data that captured seasonal groundwater variability, and hence, was truly representative of groundwater conditions. MWG proposed a longer deadline, similar to the federal CCR rule to collect the same number of independent samples as has been required for existing CCR surface impoundments regulated by the federal CCR rule.[5] (*See* 40 CFR 257.94(b)).

On February 4, 2021, the Board issued its Second Notice Order and Opinion ("Second Notice") for the Illinois CCR Rule accepting both the Illinois EPA's proposed 180-day deadline for collecting the eight groundwater samples, and the six-month deadline for submission of the operating permit application. (*See In the Matter of: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed New 35 Ill. Adm. Code 845,* PCB 20-19, Order (February 4, 2021), p. 24, 71). Importantly, the Board recognized that site-specific data may warrant an extension of these deadlines and invited parties like MWG with site-specific circumstances to seek a variance. *Id*., p. 25.

B. Initial Deadlines from which a Variance is Sought.

Based on the site-specific circumstances for the Metal Cleaning Basin at Powerton Station, MWG is requesting a variance allowing additional time to comply with the following Illinois CCR Rule deadlines:

(1) 35 Ill. Adm. Code §845.650(b)(1)(A): The deadline to collect, analyze, and statistically evaluate the eight independent samples from each background and downgradient well that determine the background levels is October 18, 2021. MWG seeks a variance to extend the deadline to January 31, 2022.

(2) 35 Ill. Adm. Code §§845.230(d)(1), 845.520(c), 845.500(b)(4): The deadline to submit an initial operating permit application, the initial emergency action plan and fugitive dust control plan is October 30, 2021. MWG seeks a variance to extend the deadline to March 31, 2022.

[4] *In the Matter of: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed New 35 Ill. Adm. Code 845*, PCB R20-19, MWG Post-Hearing Brief, pp. 4-6.

[5] MWG was not alone in expressing concerns about this Proposed CCR Rule requirement. Dynegy's expert witness, Cynthia Vodopivec, also testified that 180 days to collect 8 independent samples is not sufficient to gather a representative sample of groundwater conditions and recommended at least 18-24 months to conduct the sampling effort. *In the Matter of: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed New 35 Ill. Adm. Code 845*, PCB R20-19, Cynthia Vodopivec prefiled testimony (Aug. 27, 2020), p. 16.

(3) 35 Ill. Adm. Code §845.700(c): The deadline to submit the category designation of Metal Cleaning Basin's Closure Prioritization under Section 845.700(g) is May 21, 2021. MWG seeks a variance to extend the deadline to March 31, 2022, concurrent with the initial operating permit application.

(4) 35 Ill. Adm. Code §845.700(h)(2): If the Metal Cleaning Basin is designated a Category 5 CCR surface impoundment, the deadline to submit a construction permit application for a CCR Surface Impoundment in Category 5 is August 1, 2022. MWG seeks a variance of the deadline to submit the construction permit application to December 1, 2022, which would allow the same amount of time for submission after the initial operating permit application deadline as in the current rule.

The compliance deadlines requested above will permit MWG to continue to collect representative and accurate background groundwater monitoring data as required under 35 Ill. Adm. Code §845.650(d) and to develop the accurate information necessary to complete the operating permit application, Initial Emergency Action Plan, and Fugitive Dust Control Plan as required under §§845.230(d), 845.520(c), 845.500(b)(4). These extended compliance deadlines build in adequate time for MWG to analyze the relevant monitoring data and to make an accurate pond closure prioritization category designation pursuant to 35 Ill. Adm. Code §845.700(g). This additional time is also necessary to determine the appropriate construction permit application deadline under §845.700(h).

C. Automatic Stay of Variance Provisions

Section 38(b) of the Illinois Environmental Protection Act, 415 ILCS 5/38(b), provides that if a variance is sought within 20 days of the effective date of a rule or regulation, the operation of the rule or regulations is stayed as to such person pending disposition of the petition. This variance request has been timely filed within 20 days of the effective date of the rule, April 21, 2021. Therefore, the deadlines stated in Section I.B. above are stayed for the Metal Cleaning Basin at Powerton Station until a decision is made with respect to this request.

III. NATURE OF THE ACTIVITY THAT IS THE SUBJECT OF THIS VARIANCE

A. Description of Powerton Station

Powerton Station is a power plant located near Pekin, Tazewell County, Illinois. (Exhibit D, Affidavit of Dale Green, ¶3). The Station began operations as a coal-fired power-plant in the

1920s. *Id.* at ¶4. It has been owned and operated by MWG since 1999, and currently employs approximately 88 people. *Id.* at ¶¶5, 6.

The Metal Cleaning Basin at Powerton Station was constructed in 1978. *Id.* at ¶7. It is not part of the ash sluice system and instead is used during outages at the Station as a temporary lay-down area for dry ash cleaned out during maintenance activities. *Id.* at ¶8. In addition to use for the temporary lay-down of ash, the Metal Cleaning Basin occasionally holds process water when the boilers are washed. *Id*. The process water from the boiler wash goes into the Metal Cleaning Basin from the boiler, then is treated and discharged according to Powerton Station's NPDES permit into the Ash Surge Basin. *Id.* at ¶9; Exhibit E, (NPDES Process Flow Diagram). When ash is removed from the basins, the CCR is generally beneficially used for mine reclamation. *Id*. at ¶10. The Metal Cleaning Basin does not receive commingled ash and process water, and therefore is not regulated by the federal CCR rule. *Id*. at ¶11, 17. Due to the intermittent nature of its operation, the Metal Cleaning Basin is often empty. *Id*. at ¶11.

B. Description of Pollution Control Equipment at the Powerton Metal Cleaning Basin.

The Metal Cleaning Basin was originally constructed in 1978 with a 12-inch poz-o-pac liner on the bottom and a plastic liner on the sides. *Id.* at ¶7. In 2010, the Metal Cleaning Basin was relined with a 60 mil high-density polyethylene ("HDPE") liner, which is the least permeable type of liner, is resistant to chemicals, and is the same liner use for hazardous waste landfills. *Id*. at ¶12.[6] The full liner system for the Metal Cleaning Basin consists of six layers of materials (from bottom to top): the original poz-o-pac, a geotextile cushion, the HDPE liner, a geotextile cushion, a 12-inch thick sand cushion layer, and a 6-inch limestone warning layer. *Id*. at ¶13. Each layer has a purpose. The purpose of the sand cushion layer is to avoid punctures on the geomembrane when equipment is on the liner, and the purpose of the limestone warning layer, which is white and contrasts with the dark color of coal ash, is to act as a warning to the operators when the operators are removing the ash so that they do not reach the liner. *Id*. at ¶14. MWG retained the poz-o-pac because it served as an additional barrier and provided additional support for the overall

[6] Illinois EPA issued a permit for relining the Metal Cleaning Basin on November 13, 2009. Ex. F, (Illinois EPA Construction Permit for the Metal Cleaning Basin Liner). On June 27, 2011, relining of the Metal Cleaning Basin was complete. Ex. G (Construction Documentation for the Metal Cleaning Basin and Bypass Basin Liner Replacement).

life of the liner. *Id*. at ¶15. Finally, as part of the measures to protect the liner from damage, MWG installed marker posts along the edge of the base of the ponds to mark the sides for the operators when the ponds are being dredged. *Id*. at ¶16. The Metal Cleaning Basin is typically dredged once per year. *Id*.

C. MWG Prior Variances/ Permits Affected

Powerton Station is regulated by NPDES Permit No. IL0002232, and the ponds, including the Metal Cleaning Basin, are operated pursuant to the limits, terms, and conditions in the NPDES permit. Ex. H.[7] If this variance is granted, MWG's NPDES Permit would not be impacted. MWG has not previously petitioned the Board for a variance concerning an extension of time to collect monitoring data or to submit a permit application.

IV. COMPLIANCE WITH DEADLINES CANNOT BE ACHIEVED BY THE REGULATORY REQUIRED DATES.

A. Nature and Extent of the Anticipated Failure to Meet the Deadlines in the Illinois CCR Rule and the Efforts Necessary to Achieve Immediate Compliance

Without the requested variance, MWG will not be able to comply with the deadlines for the submission of the eight independent and representative samples from each background and downgradient well and a complete operating permit application. Until MWG collects and analyzes these samples it cannot properly designate a closure priority category, which in turn determines the required compliance date for the construction permit application.

1. <u>The Anticipated Inability to Meet Groundwater Monitoring Schedule Pursuant to Section 845.650(b) and the Scientifically and Technically Reasonable Efforts to Comply</u>.

The anticipated failure to meet the groundwater sample collection deadline has no impact on MWG's compliance with the substantive requirements of the Illinois CCR rule for the Metal Cleaning Basin, it only reasonably extends the initial data submission requirements. To collect and

[7] Powerton's existing NPDES permit expired in May 2020 and is administratively extended by MWG's timely permit renewal application that was submitted in November 2019. MWG received a draft NPDES permit renewal from the Illinois EPA dated April 27, 2021.

analyze the eight independent samples from each of the background and downgradient monitoring wells to comply with §845.650(b), the following steps are required:

(1) install a groundwater monitoring network for the Metal Cleaning Basin that complies with the requirements in §845.630;
(2) collect eight independent samples to establish the representative background concentrations;
(3) analyze the sample results for all constituents listed in §845.600; and
(4) complete a statistical evaluation based on all monitoring results and develop site specific groundwater protection standards for subsequent data comparisons and evaluations.

Because the Metal Cleaning Basin was not subject to the federal CCR rule, before March 2021, MWG did not have an existing monitoring well system for the Metal Cleaning Basin that complies with §845.630(c) of the Illinois CCR Rule. (*See* Exhibit I, KPRG Affidavit, ¶4). Three groundwater monitoring wells were installed around the Metal Cleaning Basin back in 2010, but only one is downgradient of the Metal Cleaning Basin. *Id.* at ¶3. Section 845.630(c) requires that there be at least three downgradient monitoring wells for each pond. Based on MWG consultant KPRG's evaluation, two new monitoring wells were needed to meet Section 845.630's requirements. (*See* the monitoring wells location map attached as Exhibit J).

Although MWG moved forward to install the additional two wells before the Illinois CCR Rule became final, it still took time to do so. MWG needed to clear the area and construct an access road for the drilling equipment to install wells on the west side of the Metal Cleaning Basin. After the new wells are installed, they had to be developed and surveyed by a licensed surveyor. Ex. I, ¶6. Two dedicated bladder pump sampling systems were also installed. *Id*. The well installation was completed on March 11-12, 2021. *Id*. at ¶7.

MWG collected the first of eight rounds of independent samples at the Metal Cleaning Basin monitoring wells on March 11-13, 2021 using bailers. *Id*. at ¶8. Dedicated sampling pumps were installed on April 8, 2021 and another round of samples were collected at that time. *Id*. at ¶9. KPRG developed a schedule to meet the Illinois CCR Rule deadlines ("Regulation Schedule") that shows the level of effort and associated timeline necessary to meet the October 18, 2020 deadline for sample collection and analysis.[8] This Regulation Schedule is attached as Exhibit K. It shows

[8] Because MWG was diligent in starting its compliance with the requirements of the rule, it calculated the Regulation Schedule based on the 219 days to complete the sampling requirement from the date of the first sampling.

that meeting the deadline would require taking a sample about every 20 days. It typically takes 14 to 21 days to receive the laboratory analytical results for the required parameters, depending upon the type of analytical work being performed, although radium data generally takes on the order of 30 days or more. Ex. I, ¶10. The statistical analysis required after all analytical results are received is estimated to take approximately two months in order to ensure a quality evaluation. Ex. L, Ex. I, ¶14. According to the Regulation Schedule, all eight samples would need to be collected by August 13, 2021, and the results received by September 17, 2021. *Id.* Even if this extremely expedited sample collection and analysis schedule were followed, the statistical analysis must be completed in just over one month. *Id.* It is questionable whether a statistical analysis performed in such a short amount of time would be adequate to evaluate the full scope of groundwater data collected.

But even putting aside the issue of the infeasibility of doing the full extent of sampling and analysis that the rule contemplates and requires, this expedited approach does not make good technical or scientific sense. It does not allow MWG to obtain accurately representative background data for the Metal Cleaning Basin, which is integral to developing a sound groundwater monitoring program. Background data establishes the baseline against which subsequently collected groundwater data is compared. It is used in the statistical analysis of groundwater data as the monitoring progresses. Accordingly, it is critically important that the development of background concentration data accurately reflects the actual groundwater passing below the waste boundary, so that the groundwater monitoring program can reliably detect a potential release from a CCR surface impoundment. (*See* Ex. M, Testimony of Richard Gnat 8/27/20, p. 10).

The Regulation Schedule forces compliance without the quality of data that should be gathered to inform the subsequent, substantive requirements of the Illinois CCR Rule. It does not allow for the collection of data that captures seasonal variations in groundwater or eight truly "independent" sets of groundwater data, both of which are integral to fully understanding groundwater conditions. Ex. I, ¶12. The Regulation Schedule condenses the sampling period so that only spring and summer (March through August) seasonal conditions will be monitored. (*See* Exhibit L). As MWG's expert, Richard Gnat, testified in the rulemaking, "limiting the timeframe to 180-days completely eliminates addressing seasonal or temporal fluctuations within the statistical program for analysis of the monitoring results" and this remains true for the 219 day time interval between the date of the first sampling and the compliance deadline in the Illinois CCR Rule. Ex. M, p. 11, Ex. I, ¶¶8, 12. The Board and Illinois EPA have acknowledged that a longer monitoring period would allow the consideration of seasonal and temporal changes in establishing background groundwater quality, and "yield a better statistical estimation of true constituent concentrations." (Second Notice Order, p. 24, 71).

The Illinois CCR Rule requires eight "independent" groundwater samples. An "independent sample" is one that is spaced in time far enough apart from another sample to ensure that the groundwater sampled by both is not, in effect, the same groundwater. USEPA guidance recommends collecting a minimum of at least 8 to 10 independent background samples before conducting a statistical analysis. (*See* Unified Guidance on the Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities ("USEPA Unified Guidance"), Attachment 4 to Exhibit M at p. 5 3.1 and p. 11). When sampling events are spaced too close together, it can result in "autocorrelated data" – meaning data that is similar between measurements as a function of time between the measurements. Ex. M at p. 12, citing Attachment 4, p. 3-4. Autocorrelated data is contrary to the USEPA Unified Guidance, which states that a background sample should satisfy the key statistical assumptions, including statistical independence by the lack of autocorrelation. *Id.*, Attachment 4, p. 5-4. As USEPA recommends, "practically speaking, the best way to ensure some degree of statistical independence is to allow as much time as possible to elapse between sampling events." *Id.*

The Regulation Schedule shows that in order to take eight samples, they would have to be taken every 20 days in order to receive the results in time to perform the statistical analysis which would still need to be completed on a reduced timeline. Ex. L. This is not enough time to ensure that the groundwater sampled is truly "independent" and not autocorrelated. Ex. M, p. 11; Ex. I, ¶12.

2. <u>The Anticipated Inability to Complete the Operating Permit Application by October 30, 2021 and the Efforts to Comply are not Logistically Possible.</u>

The Illinois CCR Rule operating permit application must contain a substantial amount of information, with over twenty-two different technical documents included. 35 Ill. Adm. 845.230(d)(1). The application must also contain the proposed groundwater monitoring program that "includes a minimum of eight independent samples for each background and downgradient well as required by Section 845.650(b)." 35 Ill. Adm. Code. 845.230(d)(2)(I)(iv). The operating permit application cannot be complete without the completed groundwater monitoring data, which as described above, cannot be collected and analyzed in time to meet the deadline and result in a truly representative dataset for background.

After careful consideration of the amount of time needed to develop all of the data required for a complete operating permit application, KPRG concluded it cannot be accomplished by the October 30, 2021 deadline. *Id*. at ¶17. To support this conclusion, KPRG prepared the attached Operating Permit Application Schedule to Meet Current Regulation Deadlines (*see* Exhibit N). The schedule shows that it is not logistically possible to complete the operating permit application without working on multiple aspects of the application every day between now and the October 30, 2021 deadline, which is an infeasible task especially for owners/operators of multiple CCR surface impoundments.

3. <u>It is not Feasible to Meet the Pond Priority Closure Category Deadline for the Metal Cleaning Basin Because the Designation Relies Upon the Groundwater Monitoring Results.</u>

MWG cannot comply with the May 21, 2021 deadline to designate a priority closure category under Section 845.700(c). Under Section 845.700(c), an owner or operator must identify which of the seven priority categories described in Section 845.700(g) apply to the Metal Cleaning Basin. These categories are dependent upon the status of the groundwater monitoring results. Depending on the groundwater monitoring results, the Metal Cleaning Basin may fall within Category 5, existing CCR surface impoundments that have exceeded groundwater protection standards. Alternatively, Category 7, existing CCR surface impoundments that are in compliance with the groundwater protection standards, may instead apply.[9] KPRG's proposed timelines for the groundwater monitoring data and operating permit application in Exhibits L and N make it clear that this information simply cannot and will not be available by May 21, 2021. Because there is not sufficient groundwater data, MWG cannot identify whether the Metal Cleaning Basin is in

[9] Because there are no potable wells downgradient of the Metal Cleaning Basin, it is not a Category 1 pond. Similarly, there is currently no evidence to suggest that the Metal Cleaning Basin falls within Category 2. Also, the Metal Cleaning Basin is not a Category 3 pond because it is not located in areas of environmental justice concern and is not a Category 4 or 6 pond because it is not an "inactive" CCR surface impoundment. *See* Ex. D, ¶18-19.

compliance with the groundwater protection standards or not, thus MWG cannot identify whether the Metal Cleaning Basin is a Category 5 or Category 7 CCR Surface Impoundment.

4. Depending Upon the Groundwater Monitoring Results and the Category Designation, MWG May Not Be Able to Timely Submit the Construction Permit Application for the Metal Cleaning Basin.

Because the construction permit application deadline is determined by the pond category designation, the deadline for the Metal Cleaning Basin construction permit application is unknown at this time. It is only if the accurate designation of the Metal Cleaning Basin turns out to be a Category 5 existing CCR surface impoundment, which has an August 1, 2022 deadline, that MWG will need an extension of the construction permit application deadline. (*See* 35 Ill. Adm. Code §845.700(h)). Whether Category 5 applies to the Metal Cleaning Basin cannot be determined until after analyzing the groundwater data to be collected pursuant to the rule. The Category 5 CCR surface impoundment August 1, 2022 deadline is approximately nine months after the Illinois CCR Rule's October 30, 2021 operating permit application deadline. As described above, MWG is unable to meet the October 30, 2021 operating permit application deadline. If MWG determines that the Metal Cleaning Basin falls within Category 5, it will also need more time to complete the construction permit application because that application's content requirements build on the information presented in the operating permit application. (*See* 35 Ill. Adm. Code §845.220(a)). MWG is requesting a variance of the construction permit application deadline to December 1, 2022, which is commensurate with the time interval otherwise established by the Illinois CCR Rule. However, if alternatively, MWG determines that the Metal Cleaning Basin falls within Category 7, then MWG does not need an extension of the construction permit application deadline. Thus, MWG's request for a variance is limited to the scenario where the Metal Cleaning Basin is a Category 5 CCR surface impoundment. Including this prospective variance request here will serve to save time and resources of the Board instead of initiating an additional variance petition proceeding in the future.

V. DENYING THIS VARIANCE WOULD IMPOSE AN ARBITRARY AND UNREASONABLE HARDSHIP ON MWG

Denying this variance would impose an arbitrary and unreasonable hardship on MWG for the following reasons: (1) compliance is not logistically possible without sacrificing the sufficiency and quality of the data to be relied upon to satisfy the substantive requirements of the Illinois CCR Rule; and (2) the requested variance will have no environmental impacts.

A. Compliance with the Illinois CCR Rule Deadlines is Logistically not possible.

Simply stated, there is not enough time for MWG to comply with the initial data collection and information submission deadlines required under the Illinois CCR Rule for the Metal Cleaning Basin. MWG's only potential alternatives to comply with these deadlines would be to submit incomplete or inadequate and incompletely analyzed information to meet the permit application deadline, to make a potentially inaccurate designation of the closure priority for this pond based on guesswork as to potential groundwater conditions. A regulated party should not have to "guess" at what the correct closure priority designation is for a CCR surface impoundment or be forced to assume the highest priority category for a pond without having the opportunity to collect and analyze the necessary groundwater data on which to accurately make that designation. A wrong "guess" may result in noncompliance with the priority designation requirements of the Illinois CCR Rule and an overly conservative guess would subject MWG to regulatory obligations that should not apply.

1. <u>Collecting and Analyzing Accurate and Reliable Groundwater Monitoring Data Is Not Feasible</u>

Constraining the required eight samples of groundwater data for this existing CCR surface impoundment to a six-month collection period imposes an arbitrary and unreasonable hardship upon MWG because it arbitrarily and unreliably shortens the time period allowed for the establishment of background groundwater concentrations. It is not feasible to collect and analyze samples that comply with the well-established principles concerning seasonal variability or truly "independent" samples within the proscribed 180-day deadline. Ex. L, Ex. I, ¶12. Even with the extra 39 days MWG gained by starting to comply early, and a timeline that spaces out the samples as far as possible within the allowed period, there is no way to avoid having to submit potentially inaccurate data in order to achieve deadline compliance.

As recognized by both the Board and Illinois EPA, a longer monitoring period would allow the consideration of seasonal and temporal changes in establishing background groundwater quality, and "yield a better statistical estimation of true constituent concentrations." (Second Notice Order, p. 24, 71). MWG does not have the ability to rely on and simply supplement, groundwater data collected earlier under the federal CCR rule as both the Board and Illinois EPA thought would typically justify the 180-day groundwater sampling period. The Metal Cleaning Basin was not regulated by the federal CCR rule so there is no existing data to supplement the data to be collected, and the additional wells required by Section 845.630 were only just installed in March 2021 and properly outfitted with dedicated sampling systems in early April 2021. Ex. I, ¶¶3, 4. Nor can MWG reasonably be accused of not starting this groundwater monitoring before the Board adopted the Illinois CCR Rule because the law did not and could not reach backward to start the "clock" on the deadline.

It would impose an arbitrary and unreasonable hardship upon MWG to comply with the deadline for the Metal Cleaning Basin because it cannot obtain quality information within this time period, despite taking all reasonable efforts to do so. The generally applicable deadline in the rule may be sufficient for previously regulated CCR surface impoundments that have years of existing data upon which to rely to establish the background groundwater quality, but this is not the case for the Metal Cleaning Basin. Requiring MWG to rely on data developed solely in a significantly limited time period when other federally regulated ponds do not have the same restrictions is contrary to the CAPP Act's purpose to ensure "consistent, responsible regulation of all existing CCR Surface Impoundments." 415 ILCS 5/22.59(a)(4).

2. Meeting the Operating Permit Application October 30, 2021 Deadline Is Not Possible.

Because the §845.650(b) groundwater data cannot be fully and reliably developed in the 180-day period the rule allows, it follows that requiring compliance with the October 30, 2021 deadline for the operating permit application would be arbitrary and unreasonable. It will not be possible for MWG to submit a complete application for the reasons stated above. Submitting an operating permit application without complete and reliable groundwater information would make the rest of the submission essentially meaningless. For much of the remaining 21 technical submissions required to be submitted with the operating permit application, MWG also does not have the benefit of existing data and must develop it. As the timeline developed by KPRG in Exhibit N shows, there is not enough time allowed under the Illinois CCR Rule to develop this amount of information. Thus the rule's deadline provides no "breathing room" whatsoever, such as to accommodate interruptions or delays caused by adverse weather, laboratory errors/issues, the unavailability of equipment or resources, or restrictions due to the Covid-19 pandemic.

The Agency's preference for an early submission of operating permit applications should not apply in a way that denies the owner or operator a reasonable amount of time to collect quality data, prepare accurate reports, and submit accurate information. An owner or operator reasonably should be afforded the time necessary to "get it right the first time" by submitting a complete, accurate, and reliable application to the Agency. The Illinois CCR Rule should not impose an unavoidable risk of failure to submit a complete operating permit application created by an unreasonably short deadline that leads to information gaps or inadvertent errors. The public and the environment both benefit from a complete and accurate permit application where the additional time requested, as here, is not unreasonable. The Agency also benefits because a complete and accurate application reduces the administrative time necessary to review and approve it.[10]

As MWG noted in the rulemaking, the six-month deadline is in stark contrast to other Illinois regulations that created new permitting programs. When the Board adopted the rule for existing solid waste landfills, it provided those owners/operators up to 48 months to file permit applications. 35 Ill. Adm Code 814.104(c). Yet, even with a deadline that was eight times as long as the operating permit application deadline here, the Board granted at least eight variances from this application deadline due to site specific circumstances that necessitated additional time.[11] MWG only found one instance in which the Board denied a variance request for an extension of the permit application deadline related to that rulemaking, and it was only because the party failed to file a variance petition until 22 months after the deadline and requested it be applied retroactively. *Community Landfill Corp. v. Illinois EPA*, PCB 95-137, 1995 Ill. ENV LEXIS 899 (Sept. 21, 1995).

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[10] *Envirite Corp. v. Illinois EPA*, PCB 94-161, 1994 Ill. ENV. LEXIS *8-9 (Aug. 11, 1994). "Requiring Envirite to file an application prior to completion of the siting process for its proposed expansion would result in petitioner subsequently filing a second, largely duplicative application, and would unnecessarily waste the time and resources of petitioner and the Agency.")

[11] *See Id.* (granting a 12 month deadline extension for the permit application); *Atkinson Landfill Company, Inc v. Illinois EPA*, PCB No. 94-259, 1995 Ill. ENV LEXIS 28 (granting a sixteen month variance for same); *Waste Management of Illinois Inc. v. Illinois EPA*, 94-212 1994 Ill. ENV LEXIS 1273 (Oct. 6, 1994)(granting a six month deadline extension for same); *USA Waste Services, Inc. v. Illinois EPA*, PCB 94-92 Ill. ENV LEXIS 928 (July 21, 1994) (granting a six month deadline extension for same); *Illinois Landfill Inc. v. Illinois EPA*, PCB 94-200 1994 ENV LEXIS 1512 (Dec. 1, 1994)(granting a 12 month deadline extension for same); *Macon County Landfill Corp v. Illinois EPA*, PCB 94-158 1994 Ill. ENV LEXIS 993 (Aug. 11, 1994) (granting a 12 month deadline extension for same): *Land and Lakes company v. Illinois EPA*, PCB 96-198 1996 ENV LEXIS 609 (Sept. 5, 1996) (granting a 6 month deadline extension for same).

With respect to the Initial Emergency Action Plan and Fugitive Dust Control Plan preparations for which a variance is requested, both of these plans are required to be submitted with the operating permit application. These plans have separately stated but identical deadlines to the operating permit application deadline. While separately stated, the clear intent is that both of these plans accompany the submission of the operating permit application. It would be arbitrary and unreasonable here to require MWG to submit these two plans before it can complete the rest of the operating permit application. Such a piecemeal approach to an operating permit application serves no valid purpose. Further, the Metal Cleaning Basin has been and will continue to be operated pursuant to the Station's operating procedures and safety and health procedures which comply with the Occupational Safety and Health Act ("OSHA") regulations. As such, it would be an arbitrary and unreasonable hardship to require these two plans at an earlier date than the operating permit application deadline.

3. Because the Groundwater Monitoring Data is Insufficient, MWG Cannot Provide the Priority Category Designation for the Metal Cleaning Basin

It would be an arbitrary and unreasonable hardship on MWG to require a priority categorization designation for the Metal Cleaning Basin by the May 21, 2021 deadline in Section 845.700(c) because of the lack of sufficient data on which to make that designation. If MWG were to make this designation without the underlying groundwater data, it would defeat the purpose of prioritization entirely. Section 22.59(g)(9) of the CAPP Act requires the Board to adopt rules to prioritize closure of those impoundments which "pose the greatest risk to public health, the environment, and those located in environmental justice communities." 415 ILCS 22.59(g)(9). In the Statement of Reasons, Illinois EPA said that the "the proposed prioritization scheme assists owners and operators in determining where and how to spend their resources." Ex. A, p. 26. The purposes of the rule are best served if MWG allocates its time and efforts to where they are needed most for the ponds at its four stations, which includes making an accurate priority designation for the Metal Cleaning Basin. MWG is filing this variance request because it does not have the information it needs to make this critically important categorization. To require MWG to make an arbitrary designation based on incomplete information would effectively make the prioritization process not just arbitrary, but also meaningless.

4. <u>If the Metal Cleaning Basin is a Category 5 Pond, the August 1, 2022 Deadline to Submit the Construction Permit Application is not Feasible.</u>

MWG is only requesting the amount of time commensurate with what is already in the rule to complete this requirement. Because MWG cannot ascertain the priority closure category designation of the Metal Cleaning Basin until approximately March of 2022, it will not know what the applicable construction permit application deadline would be until then. Additionally, as stated in the previous section, the purpose of separate priority categories is to allow parties to focus resources whether they are most needed, therefore, it would be arbitrary and unreasonable to require MWG to rush to comply with a construction permit deadline that is significantly shortened from what the rule intends to provide. Since the construction permit application builds upon the information submitted with the operating permit application, MWG should be allowed the same amount of time after the submission of the operating permit application as the current rule provides.

B. Compelling Compliance with a Deadline Where Minimal or No Environmental Benefit is Conferred Justifies Granting Variance Relief

There is no potential environmental benefit to require MWG to meet the subject Illinois CCR Rule deadlines under the circumstances presented here. The requested variance relief is limited to the timing of representative data collection and initial information submission requirements. The substantive requirements of the Illinois CCR Rule will be fully maintained if this relief is granted, as those requirements are not part of this variance request. The unreasonably hurried pace of these deadlines confers no additional environmental benefit here because the Metal Cleaning Basin is used only in infrequent circumstances, is lined, and its processes are already regulated by the Powerton Station's NPDES Permit. There is no comingled water and ash, or "head" in the Metal Cleaning Basin that could cause a release of ash constituents to groundwater. It would be arbitrary to impose the strict deadlines that would result in submission of underdeveloped or potentially inaccurate information that does not reasonably inform or guide future permitting decisions. The environment is better served by allowing MWG the time it reasonably needs to collect the required information.

VI. MWG's COMPLIANCE PLAN FOR THE METAL CLEANING BASIN

The proposed compliance plan will allow MWG to collect and analyze independent groundwater data upgradient and downgradient of the Metal Cleaning Basin, thus providing accurate and reliable background data to support operating permit applications, including a proposed the groundwater monitoring program, and also to provide an accurate category designation. Further, because of the extensive information required to be developed to prepare the operating permit application for the Metal Cleaning Basin, MWG's compliance plan provides a reasonable opportunity to submit a complete and more accurate operating permit application.

A. Groundwater Monitoring Compliance Schedule

MWG estimates that it will take until January 2022 to comply with the §845.650(b) requirements to obtain the eight groundwater samples and complete adequate statistical evaluations based on the timeline prepared by KPRG. (*see* Exhibit O). MWG is not trying to delay its compliance with these deadlines. It already has started collecting the new rule's required groundwater data, with the first two groundwater sampling events already having taken place, on March 18-19 and April 8-9, 2021. The KPRG timeline accounts for the completed sampling events and for the collection of the additional six remaining monthly samples from each of the background and downgradient wells to establish the background concentrations. Consistent with the previously discussed USEPA sampling guidance, the sampling events are adequately spaced in time so that they will be independent, and account for seasonal variability. Ex. I, ¶13. The timeline also builds in sufficient time to complete the necessary statistical analysis of all eight sampling events and to develop site specific applications of groundwater protection standards for subsequent data comparisons and evaluations. *Id.* at ¶13, 14.

B. Modified Operating Permit Application Deadline

MWG estimates that it will take until March 31, 2022 to submit a completed operating permit application pursuant to §845.230(d), including the Initial Emergency Action Plan and the Fugitive Dust Plan. KPRG's attached timeline shows the proposed, feasible deadlines to meet the operating permit application requirements, including all required 22 technical components (*see* Exhibit P). The timeline is based on the resources available, and level of effort required to complete each task. Ex. I, ¶18.

C. Modified Deadline for Designation of the Prioritization Category

MWG expects to comply with the requirement to designate the closure priority category for the Metal Cleaning Basin in §845.700(g) at the time of its submission of the operating permit application by March 31, 2022. KPRG's proposed timelines in Exhibits O and P show that the necessary groundwater data and operating permit application technical documents will be collected by the end of March 2022, and at that time, MWG will have the information needed to make a designation of a closure priority category to include with the operating permit application.

D. Potential Modified Construction Permit Application Deadline

If the Metal Cleaning Basin is designated as a Category 5 CCR surface impoundment, MWG estimates that it can submit the construction permit application by December 1, 2022, which would be nine months after the March 31, 2022 operating permit application deadline also being requested in this variance petition. This is simply a request for the same amount of time to complete the construction permit application after the operating permit application that is provided in the Illinois CCR Rule.

E. Compliance Costs

The total cost of executing the proposed compliance plan for the groundwater sampling is \$61,900. This includes the total cost of drilling, constructing, developing, and surveying the new wells, the eight rounds of groundwater sampling, and the statistical data evaluations and final reports, which is approximately \$55,520, as well as the total cost of building the access road, which is approximately \$6,380. Ex. I, ¶20, Ex. D, ¶20; See also, Exhibit K (KPRG Cost Estimate). The estimated total cost of the operating permit application's preparation (not including the groundwater monitoring costs), is approximately \$50,000, and the estimated total cost of preparing a construction permit application is approximately \$150,000. *Id.* at ¶21. There are no increased costs associated with immediate compliance by the deadline for the information requirements. The cost to MWG is in the quality and thoroughness of data collected and information submitted.[12] *Id.* at ¶19.

[12] The cost estimate for groundwater monitoring does not include a cost estimate for the analytical results because these results would be part of a larger package of costs for Powerton Station.

VII. THERE ARE NO ENVIRONMENTAL IMPACTS OF THE VARIANCE

As has been stated above, the requested variance will have no adverse effect on human health or the environment primarily because it does not seek to change in any way the substantive requirements of the Illinois CCR Rule – just to provide a reasonable amount of time to satisfy those requirements. Moreover, although this is the first regulatory program applicable specifically to the CCR in the Metal Cleaning Basin, it is not the only regulation that applies to it. The Metal Cleaning Basin has been subject to multiple federal and state statutes and regulations for decades, including the Station's NPDES permit, which are intended to protect human health and the environment.

Public health will not be jeopardized by the requested variance relief. As the evidence presented in the rulemaking demonstrated, there are no active potable water supply wells or surface water intakes that are at risk from any CCR surface impoundment in Illinois, including the Metal Cleaning Basin. More specifically, there are no potable wells located downgradient of the Powerton ponds. *See* Ex. Q (2009 Hydrogeological Assessment of MWG Electric Generating Stations). For these reasons, the requested variance relief will not result in any adverse impacts to public health or the environment.

VIII. PROPOSED VARIANCE CONDITIONS

MWG proposes that the requested variance from the deadlines imposed by the Illinois CCR Rule be granted subject to the following conditions:

a. The variance applies only to the Metal Cleaning Basin at MWG's Powerton Station.

b. MWG shall collect and analyze eight independent samples from each background and downgradient well for all constituents with a groundwater protection standard listed in Section 845.600(a) and also for Calcium, and Turbidity by January 31, 2022.

c. MWG shall submit the operating permit application required by Section 845.230 for the Metal Cleaning Basin by March 31, 2022.

d. MWG shall submit the closure category designation required by Section 845.700(c) for the Metal Cleaning Basin to the Illinois EPA by March 31, 2022.

e. If MWG designates the Metal Cleaning Basin as a Category 5 CCR surface impoundment, then it shall submit the construction permit application pursuant to

Section 845.220 by December 1, 2022.

f. If the Metal Cleaning Basin is not designated as a Category 5 CCR surface impoundment, no variance relief from the construction permit application deadline has been requested or granted.

g. The variance shall begin on May 11, 2021.

h. The variance ends on March 31, 2022 if the Metal Cleaning Basin is not designated as a Category 5 CCR Surface Impoundment pursuant to Section 845.700(g). The variance ends on December 1, 2022 if the Metal Cleaning Basin is instead designated as Category 5 CCR Surface Impoundment.

IX. CONSISTENCY WITH FEDERAL LAW

The requested variance is consistent with federal law. Section 104.208(d) of the Board's rules specify that petitions for variances from the Board's waste disposal regulations "must indicate whether the Board may grant the requested relief consistent with the Resource Conservation and Recovery Act ("RCRA") (42 USC 6902 *et seq.*) and the federal regulations adopted under RCRA (40 CFR 256 through 258, 260 through 268, 273, 279, and 280." 35 Ill. Adm. Code §104.208(d). The variance would be consistent with 40 CFR 257 because the Metal Cleaning Basin is not federally regulated as a CCR surface impoundment, thus any regulation of the Metal Cleaning Basin is beyond the requirements in the federal CCR rule. In any case, this variance requests less than 1 year to collect the eight groundwater samples required by Section 845.650(b)(1)(A), which is less than the two years permitted by the federal CCR rule. For collecting the groundwater monitoring data, granting this variance will actually be more consistent with federal requirements because it will allow MWG to collect truly "independent" samples in accordance with USEPA Unified Guidance. Ex. M, Attachment 4.

X. AFFIDAVITS VERIFYING FACTS

As required by Section 104.204(m), two affidavits are attached as Exhibits D and I to verify the facts submitted in this petition. These affidavits include: the affidavit of MWG Employee Dale Green verifying both that the facts stated in this petition relating to MWG are accurate and the attached exhibits are true and accurate copies (Exhibit D); and the Affidavit of Richard Gnat, of KPRG and Associates Inc. verifying that the facts stated in this petition relating to the compliance plan, the associated estimated compliance plan timetable and costs, and the conclusions regarding environmental impacts drawn therefrom are accurate (Exhibit I).

XI. HEARING

Midwest Generation requests a hearing regarding this petition.

XII. CONCLUSION

This petition for variance should be granted by the Board because it satisfies the requirements of both Section 35(a) of the Act and the regulatory requirements of Part 104, Subpart B of the Board rules. The Petition demonstrates that it would cause MWG an arbitrary or unreasonable hardship if it is required to comply with the new Illinois CCR Rule deadlines. MWG respectfully requests that the Board grant the requested variance from provisions of Sections 845.230(d)(2), 845.650(b)(1)(A), 845.700(c), and 845.770(a)(3) beginning May 11, 2021 through March 31, 2022, or if a variance from Section 845.700(h)(2) is necessary, through December 1, 2022.

Respectfully submitted,

Midwest Generation, LLC

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MIDWEST GENERATION LLC INDEX OF EXHIBITS FOR ITS PETITION FOR A VARIANCE FOR THE POWERTON STATION

Ex. A: Illinois EPA Statement of Reasons, *In the Matter of: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed New 35 Ill. Adm. Code 845, PCB R20-19,* March 30, 2020.

Ex B: Excerpt of Aug. 11, 2020 Hearing Transcript, *In the Matter of: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed New 35 Ill. Adm. Code 845*, PCB 20-19

Ex. C: Excerpt of Aug. 13, 2020 Hearing Transcript, *In the Matter of: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed New 35 Ill. Adm. Code 845*, PCB 20-19

Ex. D; Affidavit of Dale Green, Powerton Station Manager

Ex. E: Powerton General Flow Diagram with NPDES Outfalls

Ex. F: Illinois EPA Construction Permit for the Metal Cleaning Basin Liner

Ex. G: Construction Documentation for the Metal Cleaning Basin and Bypass Basin Liner Replacement

Ex. H: NPDES Permit for the Powerton Station

Ex. I: Affidavit of Richard Gnat, KPRG & Associates, Inc. (KPRG)

Ex. J: KPRG Map of Well Locations

Ex. K: KPRG Cost Estimates (Feb. 2, 2021)

Ex. L: KPRG Regulation Compliance Timeline (GW Monitoring)

Ex. M: Richard Gnat prefiled testimony, *In the Matter of: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed New 35 Ill. Adm. Code 845*, PCB 20-19 (Aug. 27, 2020)

Ex. N: KPRG Regulation Compliance Timeline (Operating Permit)

Ex. O: KPRG Proposed Compliance Schedule (GW Monitoring)

Ex. P: KPRG Proposed Compliance Schedule (Operating Permit)

Ex. Q: 2009 Hydrogeological Assessment of MWG Electric Generating Stations

EXHIBIT A

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	R 2020-019
STANDARDS FOR THE DISPOSAL	)	
OF COAL COMBUSTION RESIDUALS	)	(Rulemaking - Water)
IN SURFACE IMPOUNDMENTS:	)	
PROPOSED NEW 35 ILL. ADM.	)	
CODE 845	)	

NOTICE OF FILING

PLEASE TAKE NOTICE that I have today filed with the Office of the Clerk of the Illinois Pollution Control Board a **NOTICE OF FILING**; **APPEARANCE**; **STATEMENT OF REASONS**; and **ATTACHMENTS: PROPOSED NEW 35 ILL. ADM. CODE PART 845**; and a **MOTION FOR ACCEPTANCE** on behalf of the Illinois Environmental Protection Agency, a copy of which is herewith served upon you.

Respectfully submitted,

Dated: March 30, 2020

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,

Petitioner,

BY: /s/ Rex L. Gradeless
Rex L. Gradeless

Rex L. Gradeless, #6303411
Division of Legal Counsel
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THIS FILING IS SUBMITTED ELECTRONICALLY

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Matt Dunn, Division Chief Environmental
69 W. Washington, Suite 1800,
Chicago, IL 60602

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	R 2020-019
STANDARDS FOR THE DISPOSAL	)	
OF COAL COMBUSTION RESIDUALS	)	(Rulemaking - Water)
IN SURFACE IMPOUNDMENTS:	)	
PROPOSED NEW 35 ILL. ADM.	)	
CODE 845	)	

APPEARANCE

The undersigned hereby enters his appearance as an attorney on behalf of the Illinois Environmental Protection Agency.

Respectfully submitted,

Dated: March 30, 2020

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,

Petitioner,

BY: /s/ Rex L. Gradeless
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IN SURFACE IMPOUNDMENTS:	)	
PROPOSED NEW 35 ILL. ADM.	)	
CODE 845	)	

STATEMENT OF REASONS

NOW COMES the Illinois Environmental Protection Agency ("Illinois EPA"), by and through its counsel, and hereby submits this Statement of Reasons to the Illinois Pollution Control Board ("Board") pursuant to Sections 13, 22, 27 and 28 of the Environmental Protection Act ("Act") (415 ILCS 5/13, 22, 27 and 28) and 35 Ill. Adm. Code 102.202 in support of the attached proposed regulations.

I. INTRODUCTION

The Illinois EPA has developed a rule of general applicability for coal combustion residual ("CCR") surface impoundments at power generating facilities. The proposal contains comprehensive rules for the design, construction, operation, corrective action, closure and post-closure care of surface impoundments containing CCR. CCR is commonly referred to as coal ash, and CCR surface impoundments are commonly referred to as coal ash ponds or coal ash pits. This proposed rule includes groundwater protection standards applicable to each CCR surface impoundment at the waste boundary and requires each owner or operator to monitor groundwater. Illinois EPA's proposed rule will include a permitting program as well as all federal standards for CCR surface impoundments promulgated by the United States Environmental Protection Agency ("USEPA") under the Solid Waste Disposal Act of 1970, as amended by the Resource Conservation and Recovery Act of 1976 (RCRA), 42 U.S.C. 6901. In addition, the proposed rules include procedures for public participation, closure alternatives analyses, and closure prioritization. The proposal also includes financial assurance requirements for CCR surface impoundments.

The Illinois EPA has prepared these draft rules as directed by a statutory mandate found in Public Act 101-171[1], which requires Illinois EPA to file the draft rule with the Board no later than March 30, 2020, and the Board to adopt the rules no later than one year after receipt.

II. BACKGROUND

Based upon information and belief, Illinois has 23 power plants which have used coal as a fuel source and may be impacted by this rule. *See* listing in Section VI. Ten of these plants are currently burning coal. Five of these plants have been converted to use natural gas as a fuel source and eight of these plants are no longer generating electricity. When coal is burned at power plants CCR is formed. CCR consists of fly ash, bottom ash, boiler slag, flue gas or fluid bed boiler desulfurization by-products. Fly ash is removed from exhaust gases, and is very fine, powdery, and made mostly of silica. Bottom ash is collected at the bottom of the furnaces, and is coarse, fine gravel sized, and angular. Boiler slag is molten bottom ash quenched with water. Flue gas desulfurization material is a by-product of removing sulfur dioxide from the air emissions of a coal fired power plant. It can be either wet sludge or dry powder. Disposal of CCR can be either a wet or dry system. Wet CCR is generally sluiced by pipe to an on-site surface impoundment. Dry CCR can be disposed in a landfill.

As noted above, in wet CCR handling systems, a piping system transports CCR to the impound system. The impound system can be composed of one or more surface impoundments. Typically, a CCR surface impoundment will have a primary cell where the majority of the solid

[1] *See* Public Act 101-171, eff. 7-30-19 attached as Attachment D.

particles settle out of the waste water. In addition to the primary cell, an impound system may have one or two secondary cells, often referred to as polishing ponds for the settlement of very fine suspended solids. In some instances, the CCR surface impoundments have a constructed liner which allows the owner or operator to utilize heavy equipment to remove ash from the surface impoundment and dispose it off-site.

Historically, CCR may have been discharged to low lying areas or borrow pits at some locations. A borrow pit is an excavation where earth materials have been removed for site development. Borrow pits are usually incised, and the CCR and liquid is not contained by a dam, but contained in a depression or hole in the ground where earth materials have been removed. To increase storage capacity, owners or operators would sometimes build a CCR surface impoundment by constructing a diked enclosure. These structures are considered dams and are required to comply with Illinois' dam safety regulations. *See* 17 Ill. Adm. Code 3702.20. The size of the diked enclosure units ranges from less than an acre to over 300 acres.

The Illinois EPA has identified 73 CCR surface impoundments at power generating facilities. *See* Section VI. Some of surface impoundments are lined with impermeable materials, while others are not. Illinois EPA believes there are up to 6 CCR surface impoundments with liners that comply with the federal liner standards in 40 CFR 257.

The chemical make-up of CCR depends on the type of coal used, as well as the combustion technology and pollution control technology used at a facility. CCR can contain constituents such as antimony, arsenic, barium, beryllium, boron, cadmium, chloride, chromium, cobalt, fluoride, lead, lithium, mercury, molybdenum, radium 226 and 228, selenium, sulfate, and thallium. The presence of these contaminants threatens groundwater as these contaminants are soluble and mobile. When the CCR surface impoundments are not lined with impermeable material, these contaminants may leach into the groundwater, affecting the potential use of the groundwater. While some of these contaminants affect the safety of drinking water, others affect taste and odor, and other potential uses such as irrigation.

Regulatory Development

Until the adoption of Section 22.59 of the Act in P.A. 101-171 on July 30, 2019, the Illinois EPA had generally permitted the construction and operation of CCR surface impoundments as a waste water treatment unit under Title III of the Act Subtitle C of the Board's administrative rules. Many of these impoundments are permitted through a National Pollutant Discharge Elimination System (NPDES) permit or state operating permit issued under Section 12(b) of the Act.

The regulation of CCR surface impoundments became a national focus on December 22, 2008, after a dike ruptured at the Kingston Fossil Plant in Kingston Tennessee and approximately 1.1 billion gallons of CCR was released to the Emory River. In response, USEPA began developing rules for coal ash ponds and coal ash landfills under RCRA. *See* 75 Fed. Reg. 35137 (June 21, 2010). Illinois EPA responded by developing a coal ash impoundment strategy that required groundwater monitoring at all power plants in Illinois that use coal as a fuel source.

Under the ash impoundment strategy, the Illinois EPA identified facilities with CCR surface impoundments, requested groundwater monitoring well data, requested potable water system surveys, requested hydrogeologic site assessments, required the installation of groundwater monitoring and conferred with the Illinois Department of Natural Resources on dam safety. The information gathered under Illinois EPA's ash impoundment strategy showed that 14 facilities had violations of the numerical groundwater quality standards on-site.

In 2009, the Board held that coal ash ponds should not be regulated under the existing on-site landfill regulations, and instead the ash ponds required their own regulations, either site-specific or generally applicable. *In Re: Ameren (Hutsonville Power Station)*, AS 2009-01, Order (March 5, 2009). The Board's rules governing waste disposal in Subtitle G are not applicable to surface impoundments because surface impoundments are excluded from the definition of landfill. 35 Ill. Adm. Code 720.110; 35 Ill. Adm. Code 810.103. Therefore, the closure provisions for landfills are inapplicable to surface impoundments.

In response to the Board's holding in Hutsonville Power Station's petition for an adjusted standard, Ameren Energy Generating Company closed ash pond D at Hutsonville through a site-specific rulemaking. *Ameren Ashpond Closure Rules*, R 2009-21, Order (Jan. 20, 2011); *See* 35 Ill. Adm. Code 840, Subpart A. In 2013, Ameren filed another site-specific rule to close 16 ash ponds at 8 other facilities. *In Re: Site-Specific Rule for the Closure of Ameren Energy Resources Ash Ponds*, R2013-19. Shortly thereafter, the Illinois EPA filed a rule of general applicability for all coal ash ponds located at power plants. *In re: CCW Ash Ponds, R2014-10* (CCW rulemaking). The Illinois EPA was motivated to file a rule of general applicability because Illinois has 23 coal burning facilities, each with multiple ash ponds. The Illinois EPA wanted to avoid a piece-meal process of numerous site-specific rules for each pond or facility. Additionally, the groundwater monitoring results the Illinois EPA received under the ash impoundment strategy revealed widespread groundwater contamination at these power plants.

After completion of the hearings and post-hearing comment process in the CCW rulemaking before the Board, USEPA issued a final rule regulating CCR surface impoundments under Subtitle D of RCRA. 80 Fed. Reg. 21302 (April 17, 2015); *See* 40 C.F.R. Part 257. The federal CCR rule, as initially adopted, created a self-implementing program. Power plants were required to independently conduct groundwater monitoring and corrective action in response to exceedances of the federally designated groundwater quality standards. The rule contained location restrictions, stability requirements, design criteria, and operating, closure and post closure care requirements. Clay-lined ponds were initially considered lined ponds. Unlined ponds could continue operation so long as the federal groundwater quality standards were not violated. The federal rule did not apply to legacy ponds—ponds located at sites no longer generating power. As initially adopted, USEPA would not issue permits to these CCR surface impoundments or enforce compliance with the federal rules. The federal rule was appealed by both environmental groups and industrial groups. *See Util. Solid Waste Activities Group v. Envtl. Prot. Agency*, 901 F.3d 414 (D.C. Cir. 2018), judgment entered, 15-1219, 2018 WL 4158384 (D.C. Cir. Aug. 21, 2018). In June 2016, USEPA, the environmental groups and industrial groups agreed to remand certain provisions of the federal rule back to USEPA. *Id*.

In July 2016, the Illinois EPA amended its proposal in the CCW rulemaking, eliminating most of the substantive requirements. Instead, the Illinois EPA proposed to permit the closure and post-closure of these facilities through water construction and operating permits under Section 12(b) of the Act. Under the amended proposal any permit issued by the Illinois EPA would have to be as stringent as the federal rule.

In December 2016, the President signed the Water Infrastructure Improvements for the Nation (WIIN) Act, P.L. No 114-322. This act amended RCRA, allowing USEPA to enforce violations of the federal CCR rules and required USEPA to develop a federal permitting program for CCR surface impoundments. 42 U.S.C. 6945(d)(2)(B). The WIIN Act also provided for state program delegation if a state's program is at least as stringent as the federal rule. 42 U.S.C. 6945(d)(1)(B).

In August 2018, the United States Court of Appeals issued its opinion on the portions of the federal CCR rule appeal that had not been remanded. *Utility Solid Waste Activities Group, et* *al., v. Environmental Protection Agency*, 901 F.3d 414 (D.C. Cir. 2018). The court's decision in *Utility Solid Waste Activities Group* (*USWAG*) expanded the scope of the federal rule by finding that USEPA acted arbitrarily and capriciously when it exempted legacy ponds. The court held that USEPA acted contrary to RCRA in failing to require the closure of unlined CCR surface impoundments and classifying clay-lined CCR surface impoundments as lined. *Id.* at 449. The court vacated certain provisions in the rule and remanded the rule back to USEPA. The appellate court's decision was not appealed. *See* USWAG decision attached as Attachment C.

On July 30, 2019, Governor JB Pritzker signed into law Public Act 101-171, which amended the Act to create a new Section 22.59. The new state law prohibits the discharge of contaminants from a CCR surface impoundment into the environment and the placement of CCR on the land so as to cause a violation of Section 22.59 or the Board's Rules. 415 ILCS 5/22.59(b). It also prohibits the construction, installation, operation, modification, or closure of a CCR surface impoundment without a permit granted by the Illinois EPA. *Id.* Before any CCR surface impoundment is closed, the owner or operator must conduct a closure alternatives analysis that considers closure by removal in addition to other closure methods. 415 ILCS 5/22.59(d). Section 22.59 includes a permitting exception for those facilities that have obtained a permit from the USEPA under the federal CCR rule. 415 ILCS 5/22.59(c). Further, those facilities that have submitted a closure plan to the Illinois EPA before May 1, 2019, and have completed closure by July 30, 2021, are not required to obtain a construction permit for closure, and therefore, they are not required to conduct the closure alternatives analysis required by Section 22.59(d). 415 ILCS 5/22.59(e).

Public Act 101-171 contains a rulemaking mandate in Section 22.59(g) directing the Board to adopt rules "establishing construction permit requirements, operating permit requirements,

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design standards, reporting, financial assurance, and closure and post-closure care requirements for CCR surface impoundments". 415 ILCS 5/22/59(g). Board's rules must (1) be as protective and comprehensive as the federal CCR rule in Subpart D of 40 CFR 257, (2) specify the permitting requirements and procedures, (3) specify meaningful public participation procedures, (4) prescribe the types and amounts of financial assurance, (5) specify procedures to identify areas of environmental justice concern in relation to CCR surface impoundments, (6) specify a method to prioritize CCR surface impoundments required to close under the federal CCR rule, (7) define when complete removal is achieved, and (8) describe the process and standards for identifying alternative sources of groundwater pollution.

Proposed Amendments to the Federal CCR Rule

USEPA has three pending regulatory proposals to amend the federal CCR rule that have not yet been finalized.[2, 3]

The first proposed amendment was published in the Federal Register on March 15, 2018. *See* 83 Fed. Reg. 11584 (March 15, 2018). On July 30, 2018, USEPA finalized certain provisions of the March 2018 proposal, including the proposed revision of the groundwater protection standard for constituents that do not have an established maximum contaminant level (MCL). 83 Fed. Reg. 36435 (July 18, 2018). The July 30, 2018 final rule also extended the deadline to initiate closure to close to October 31, 2020, for certain facilities that are required to close under the federal rule. 83 Fed. Reg. 36454. The environmental groups appealed this final rule, challenging the deadline extension. *Waterkeeper Alliance, Inc., et a. v. USEPA* (D.C. Cir. 2019), *See* Order No 18-

[2] On February 19, 2020, USEPA submitted a pre-publication proposal that proposes to allow facilities to use an alternate liner and CCR during closure, an additional closure option for removal, and annual closure progress reports. USEPA seeks public comments for 45-days (April 4, 2020) *See* USEPA Docket No. EPA-HQ-OLEM-2019-0173.

[3] On February 20, 2020, USEPA proposed a federal permitting program under 40 CFR 257, Subtitle E for nonparticipating states. However, Illinois intends to become a participating state under 40 CFR 257 and obtain partial federal program delegation from the USEPA.

1289. The court remanded the rule back to USEPA without vacatur on March 19, 2019. *Id*. The remaining portions of the March 2018 proposal have not been finalized.

The second proposed amendment was published in the Federal Register on August 14, 2019. 84 Fed. Reg. 40353. In this rulemaking, USEPA's revision addresses annual groundwater monitoring and corrective action reporting requirements, alternative risk-based groundwater protection standard for boron, and revisions to the publicly accessible CCR website. This proposed rule also addresses the two issues remanded back to USEPA during the *USWAG* appeal: the definition of beneficial use of CCR (84 Fed. Reg. 40355-40361) and the definition of a CCR storage pile (84 Fed. Reg. 40361-40364).

The third proposed amendment was published in the Federal Register on December 2, 2019. 84 Fed. Reg. 65941. Here, USEPA proposes to amend the federal CCR rule to reflect the *USWAG* decision and address the *Waterkeeper* remand. *Id*. Specifically, USEPA proposes to remove the provision classifying clay lined CCR surface impoundments as lined and the provision allowing unlined CCR surface impoundments to continue operation unless they leak. *Id*. at 65944-65958. This proposal also addresses the deadline extension to cease accepting CCR and commence closure by proposing an August 31, 2020 deadline. The proposed rule includes procedures for facilities to extend the August 31, 2020, deadline to November 30, 2020, under the short term self-implementing alternative or a longer USEPA-approved extension for lack of alternative capacity or permanent cessation of the coal-fired boilers. *Id*. at 65953-65954.

III. REGULATORY PROPOSAL: PURPOSE AND EFFECT

The Illinois EPA's regulatory proposal for CCR surface impoundments is expansive, creating an entirely new permitting and regulatory structure. The Illinois EPA's stated purpose and effect encapsulated within this section of the Statement of Reasons is intended to highlight with broad strokes Illinois EPA's goals. A more detailed explanation of the proposed rules' purpose and effect is set forth in the Section IV: Regulatory Proposal: Language.

As noted above, Section 22.59(g) of the Act requires the Illinois EPA to propose CCR rules to the Board no later than March 30, 2020. The foremost purpose and effect of this regulatory proposal is to fulfill Illinois EPA's statutory obligation to propose CCR rules consistent with the requirements in Section 22.59(g).

The second purpose and effect of this regulatory proposal is to protect the groundwater within the state of Illinois. The proposed rule contains a program for groundwater monitoring and the remediation of contaminated groundwater resulting from leaking CCR surface impoundments. Groundwater has an essential and pervasive role in the social and economic well-being of Illinois, and is important to the vitality, health, safety, and welfare of its citizens. This rule has been developed based on the goals above and the principle that groundwater resources should be utilized for beneficial and legitimate purposes. *See* 415 ILCS 55/1 *et seq*. Its purpose is to prevent waste and degradation of Illinois' groundwater. The proposed rule establishes a framework to manage the underground water resource to allow for maximum benefit of the State.

The third purpose and effect of this proposed rule is to adopt the federal CCR rules in Illinois and obtain federal approval of Illinois' CCR surface impoundment program. The federal CCR rules provide a framework for Illinois to fill the regulatory gap that exists when CCR surface impoundments are no longer operating as waste water treatment units. With the adoption of these proposed rules, Illinois will have a program that covers the design, construction, operation, corrective action and closure of CCR surface impoundments. The proposed rules contain groundwater protection standards that apply in addition to the groundwater quality standards in Part 620. Owners or operators of CCR surface impoundments will be required to conduct groundwater monitoring to detect exceedances of the groundwater protection standards at the CCR surface impoundment's waste boundary.

The fourth purpose and effect of this regulatory proposal is to adopt procedures to ensure CCR surface impoundments are closed in an environmentally protective way. Under the federal CCR rule, several CCR surface impoundments must cease receiving CCR and close by quickly-approaching federal deadlines. The proposed prioritization scheme assists owners and operators in determining where and how to spend their resources by categorizing impoundments based on risk to health and the environment and the impoundment's proximity to areas of environmental justice concern. In addition to a closure prioritization scheme, the proposed rule includes a closure alternatives analysis of the long-term and short-term effectiveness of the closure methods, whether the closure methods will control future releases, the ease or difficulty in implementation, and the degree to which community concerns are addressed. This analysis must be conducted prior to submitting a construction permit application for closure and must be presented to the public for review and comment.

The fifth purpose and effect of this proposed rule is to ensure meaningful public participation. Illinois EPA proposes that public participation begins before the owner or operator applies for a permit. Under the proposed rule, owners and operators of CCR surface impoundments will be required to hold at least two public meetings before the submission of any construction permit application. Before an owner or operator submits a construction permit to build, modify, retrofit or close a CCR surface impoundment or submits a construction permit to perform corrective action of a release from the CCR surface impoundment, the owner or operator must share with the public its intended plan, including any alternatives analyses required by the rule. The Illinois EPA believes early and sustained public participation is vital to assisting owners and operators in developing corrective action and closure plans that account for impacts to individuals living in communities where CCR will be generated, handled, transported and disposed. After the submission of a permit application and the Illinois EPA has reached a tentative determination, the Illinois EPA will circulate the draft permit with the public and hold a public meeting whenever a significant degree of public interest exits. The proposed post-application public participation process is modeled after the NDPES permit program, which provides an opportunity to ask questions, and to provide comments and other information which the Illinois EPA uses in reaching its final permitting decisions.

The sixth purpose and effect of this proposed rule is to set forth clear permitting requirements and procedures. In Illinois, most regulatory programs require a construction permit before a facility or equipment capable of causing or designed to prevent pollution is built or installed; once built, an operating permit must be obtained before operation of the facility or equipment commences. Consistent with the other permitting programs administered by the Illinois EPA, this regulatory proposal envisions the same two types of permits: construction and operating permits. Before the construction of new CCR surface impoundments or the modification, retrofit or closure of CCR surface impoundments, an owner or operator must obtain a construction permit. Once the facility or equipment is built, and before receipt of CCR, the owner or operator must obtain an operating permit. If a facility must perform corrective action, a construction permit must be obtained for the installation of any new equipment, monitoring wells or modifications to the surface impoundment. The owner or operator will have to modify the facility's operating permit to account for the planned corrective action. A construction permit is necessary before closure may commence.

The last purpose and effect of the proposed rule is to ensure that owners and operators of

CCR surface impoundments provide adequate financial assurance for the completion of closure, post-closure care, and remediation of releases also referred to as corrective action. The Illinois EPA proposes that financial assurance be provided within specified timeframes; based on detailed written cost estimates and, in the case of corrective action, an additional preliminary cost estimate updated regularly for approved plan changes and for inflation; and maintained continuously until an Illinois EPA release is obtained. Available financial assurance mechanisms include a trust fund, a surety bond guaranteeing payment, a surety bond guaranteeing performance, or an irrevocable letter of credit.

The proposed rules do not prescribe how all CCR surface impoundments must be closed, or how each site with groundwater contamination must be remediated. Instead, the rule provides a process. If the groundwater monitoring shows statistically significant increasing constituent concentration over the groundwater protection standards, the owner or operator must perform corrective action. The preventive response, corrective action plan or closure plan is site-specific. The proposed rule also provides a framework for closing surface impoundments that have not caused groundwater contamination.

IV. REGULATORY PROPOSAL: LANGUAGE

The following is a section-by-section summary of the Illinois EPA's proposal.

Subpart A: General Provisions

Proposed Subpart A sets forth who is subject to these rules as well as generally applicable provisions.

Section 845.100: Scope and Purpose

This Section states the purpose of Part 845 is to establish criteria for determining which CCR surface impoundments do not pose a reasonable probability of adverse effects on health or the environment. The requirements of Part 845 apply to owners and operators of new and existing CCR surface impoundments (including any lateral expansions of CCR surface impoundments that dispose or otherwise engage in solid waste management of CCR generated from the combustion of coal at electric utilities and independent power producers), inactive CCR surface impoundments at active and inactive electric utilities or independent power producers (regardless of the fuel currently used at the facility to produce electricity), and, subject to Section 845.170, inactive CCR surface impoundments. Further, this Section provides that this Part does not apply to wastes consistent with 40 CFR 257.50(f), beneficial use of CCR, CCR placement at active or abandoned underground or surface coal mines, and landfills that receive CCR.

Section 845.110: Applicability of Other Regulations

This Section denotes that compliance with Part 845 does not affect the need for the owner or operator of a CCR surface impoundment or lateral expansion of a CCR surface impoundment, to comply with all other applicable federal, state, tribal, or local laws or other requirements. This Section further expressly delineates that any CCR surface impoundment or lateral expansion of a CCR surface impoundment continues to be subject to floodplain requirements, the Illinois Endangered Species Protection Act, the federal requirements within 40 CFR 257.3-2, federal surface water requirements, and the Rivers, Lakes and Streams Act.

Section 845.120: Definitions

In addition to definitions contained within the Act, the Illinois EPA proposes adding definitions from 40 CFR 257.53.

Section 845.130: Surface Impoundment Identification

This Section prescribes how owners or operators of CCR surface impoundments identify CCR surface impoundments.

Section 845.140: Right of Inspection

This Section provides the requirement for owners or operators to allow the Illinois EPA and duly authorized representatives to perform inspections within its authority under the Act.

Section 845.150: Incorporations by Reference

This Section sets forth the material to be incorporated by reference in the proposed rule, in accordance with 1 Ill. Adm. Code 100.385.

Section 845.160: Severability

This severability clause Section provides that if any provision of the Part 845, or its application to any person or under any circumstances is adjudged invalid, such adjudication shall not affect the validity of this Part as a whole or of any portion not adjudged invalid.

Section 845.170: Inactive Closed CCR Surface Impoundments

This Section outlines the provisions of Part 845 that apply to inactive closed CCR surface impoundments.

Subpart B: Permitting

Proposed Subpart B contains provisions, process, and requirements for the permitting of CCR surface impoundments and the public participation within that process.

Section 845.200: Permit Requirements and Standards of Issuance

This Section establishes that an owner or operator must obtain a construction permit to install or modify a CCR surface impoundment and to perform a corrective action. This Section requires owners or operators to obtain an operating permit before receiving CCR and includes the standards for issuance of such permits.

Section 845.210: General Provisions

This Section describes the application process to obtain a permit from the Illinois EPA and allows the applicant to submit previously completed demonstrations and assessments for some of the requirements in Part 845.

Section 845.220: Construction Permits

In this Section the Illinois EPA specifies what information and documentation a construction permit application must contain for building a new CCR surface impoundment, construction related to corrective actions, and construction related to closure activities.

Section 845.230: Operating Permits

In this Section the Illinois EPA specifies what information and documentation an operating permit application must contain to obtain an initial and renewal operating permit for a CCR surface impoundment, a post-closure care operating permit, and an initial operating permit for existing, inactive and inactive closed CCR surface impoundments. Operating permits shall be issued for fixed terms not to exceed five years.

Section 845.240: Pre-Application Public Notification and Public Meeting

This Section specifies the public notification requirements for owners or operators to conduct at least two public meetings prior to submitting a construction permit application to the Illinois EPA. In this meeting the owner operator must outline the decision-making process for the project, including, where applicable, the corrective action alternatives and the closure alternatives considered.

Section 845.250: Tentative Determination and Draft Permit

Once a complete application for a construction permit, operating permit or a joint construction and operating permit has been received and reviewed, the Illinois EPA will provide either a tentative determination to issue or deny the permit to the applicant. The Illinois EPA will also notify the applicant of its intent to circulate pubic notice of its tentative decision.

Section 845.260: Draft Permit Public Notice and Participation

This Section contains the requirements for notifying the public of a tentative Illinois EPA decision on a permit, provides the opportunity for the public to comment on the tentative permit and request a public hearing on the tentative permit. It specifies the process and requirements the Illinois EPA must follow to provide public notice of the hearing, allow for public commenting, hold a public hearing, and requires the Illinois EPA to prepare a responsiveness summary addressing issues raised by the public.

Section 845.270: Final Permit Determination and Appeal

This Section lays out the procedures for notification by the Illinois EPA of its final decision on a permit and species the process for appealing an Illinois EPA determination.

Section 845.280: Transfer, Modification and Renewal

This Section establishes process and criteria for the transfer, modification, or renewal of a permit. This Section includes criteria for an Illinois EPA -initiated modification, an owner or operator-initiated modification, an Illinois EPA minor modification, and the timeframes and requirements for filing an application for renewal of a permit.

Section 845.290: Construction Quality Assurance Program

This Section establishes the requirement to develop and implement a Construction Quality Assurance Program, and what such a program must include.

Subpart C: Location Restrictions

Proposed Subpart C provides the location restrictions for existing, new, and laterally expanded CCR surface impoundments. The owner or operator of the CCR surface impoundment must obtain a certification from a qualified professional engineer stating that the location demonstrations meet the location requirements of each respective location restriction.

Section 845.300: Placement Above the Uppermost Aquifer

This Section requires that the base of a CCR surface impoundment must not be within five (5) feet of the top of the uppermost aquifer, including during seasonally high periods. This requirement must be demonstrated and provided in both the initial operating permit application and in a construction permit application. This Section is consistent with 40 CFR 257.60.

Section 845.310: Wetlands

This Section provides the location restrictions relative to wetlands consistent with 40 CFR 257. Requirements of this Section require that protection of wetlands will occur. This Section is consistent with 40 CFR 257.61.

Section 845.320: Fault Areas

The purpose of this Section is to provide location restrictions and determine proximity to fault areas. This Section is consistent with 40 CFR 257.62.

Section 845.330: Seismic Impact Zones

This Section restricts the location of CCR surface impoundments regarding seismic impact zones as provided in Part 257. Requirements of this Section pertain to liners and other structural components of the CCR surface impoundment. This Section is consistent with 40 CFR 257.63.

Section 845.340: Unstable Areas

This Section provides what is considered an unstable area and precludes the location of a CCR surface impoundment in an unstable area. This Section is consistent with 40 CFR 257.64.

Section 845.350: Failure to Meet Location Standards

This Section provides that the owner or operator of an existing CCR surface impoundment who fails to demonstrate compliance with the requirements Subpart C are subject to the closure or retrofit provisions of Section 845.700 and are precluded from placing CCR in the CCR surface impoundment.

Subpart D: Design Criteria

Proposed Subpart D contains the proposed design criteria for CCR surface impoundments.

Section 845.400: Liner Design Criteria for Existing CCR Surface Impoundments

In this Section, the Illinois EPA lays out the specifications and requirements for a composite liner and an alternative composite liner consistent with 40 CFR 257. The owner or operator must demonstrate whether or not existing CCR surface impoundments, that have not completed an Illinois EPA-approved closure prior to July 30, 2021, have been constructed with federally compliant liners. All unlined CCR surface impoundments are subject to the closure or retrofit provisions of Section 845.700.

Section 845.410: Liner Design Criteria for New CCR Surface Impoundments and Any Lateral Expansion of a CCR Surface Impoundment

This Section of the proposal specifies requirements for new, and lateral expansions of, CCR surface impoundments and refers to the design criteria contained in Section 845.400.

Section 845.420: Leachate Collection and Removal System

A new CCR surface impoundment must be designed, constructed, operated and maintained with a leachate collection and removal system. The purpose of this Section is to minimize the amount of head on the liner system which will decrease the potential for the movement of fluids through the liner. The system is similar to leachate collection systems required for solid waste landfills.

Section 845.430: Slope Maintenance

The slopes, and pertinent surrounding areas of the CCR surface impoundment, must be designed, constructed, operated, and maintained with one of the forms of slope protection specified in Subsection (a) of this Section. Further, this Section provides requirements on the final cover system that generally require the cover system be properly maintained to protect it from erosion, be mowed on a regular basis, and kept free of woody vegetation.

Section 845.440: Hazard Potential Classification Assessment

This Section provides the requirements for the owner or operator of the CCR surface impoundment to complete and document a hazard potential classification assessment of each CCR surface impoundment. The owner or operator must document the hazard potential classification of each CCR surface impoundment as either a Class 1 or Class 2 CCR surface impoundment. The owner or operator must also document the basis for each hazard potential classification.

Section 845.450: Structural Stability Assessment

This Section provides the requirements for the owner or operator to conduct an initial and annual structural stability assessment and document whether the design, construction, operation, and maintenance of the CCR surface impoundment is consistent with recognized and generally accepted engineering practices for the maximum volume of CCR and CCR wastewater which can be impounded.

Section 845.460: Safety Factor Assessment

This Section provides the requirements for the owner or operator to conduct an initial and annual safety factor assessment for each CCR surface impoundment and document whether the calculated factors of safety for each CCR surface impoundment achieve the minimum safety factors specified for the critical cross section of the embankment.

Subpart E: Operating Criteria

Proposed Subpart E contains the criteria for operating CCR surface impoundments.

845.500 Air Criteria

This Section provides the requirements for the owner or operator to provide dust control measures for activities related to the CCR surface impoundments. Dust control measures will be documented in a Fugitive Dust Control Plan and an Annual Fugitive Dust Control Report. This Section is consistent with 40 CFR 257.80.

<u>845.510 Hydrologic and Hydraulic Capacity Requirements for CCR Surface Impoundments</u>

This Section specifies the requirements for inflow flood control system for CCR surface impoundments. The requirements for the inflow flood control system include design, construction, operation, maintenance and submission of plan and amendments to the plan to Illinois EPA. This Section is consistent with 40 CFR 257.82.

<u>845.520 Emergency Action Plan</u>

This Section provides that the owner or operator of a CCR surface impoundment must prepare and maintain a written Emergency Action Plan ("EAP") and defines the minimum requirements for the EAP. Illinois EPA proposes measures that include, *inter alia*, notification and annual meetings with local first responders.

<u>845.530 Safety and Health Plan</u>

This Section provides that the owner or operator of the CCR surface impoundment must develop a Safety and Health Plan ("SHP"), ensure that employees, contract workers, and third-party contractors are informed regarding the SHP, and defines the minimum requirements for the SHP including a personnel training program with minimum requirements. For worker exposure safety, the owners and operators must implement The United States Department of Labor's Occupational Safety and Health Administration ("OSHA") standards in 29 CFR 1910.120 and 29 CFR 1926.65. Owners and operators must provide Safety Data Sheets (SDSs) or a specific SDS created for impoundment specific CCR. Finally, this Section provides minimum requirements for hazard communications.

845.540 Inspection Requirements for CCR Surface Impoundments

This Section details the minimum requirements for inspections conducted by a qualified person and the annual inspections by a qualified professional engineer. Documented inspections are required of CCR surface impoundments after storms for deterioration of the CCR surface impoundment structure. Additionally, weekly inspections of discharge flow mechanisms within and around the CCR surface impoundment require inspection. Finally, a qualified professional engineer will perform a detailed annual inspection of the CCR surface impoundment to document the integrity of the structure and supporting structures. Annual inspection reports and proposed corrective actions will be provided to the Illinois EPA.

845.550 Annual Consolidated Report

This Section details the requirements of an Annual Consolidated Report to include the Annual CCR Fugitive Dust Control Report, Annual Inspection Report, and Annual Groundwater Monitoring and Correction Action Report by January 31st of each year.

Subpart F: Groundwater Monitoring and Corrective Action

Proposed Subpart F contains the provisions of Part 845 that concern groundwater monitoring and corrective action.

Section 845.600: Groundwater Protection Standards

In this proposed Section, the Illinois EPA establishes the groundwater protection standards that are applicable to new, existing and inactive CCR surface impoundments. This Section also establishes the point of compliance relative to groundwater monitoring at CCR surface impoundments. The groundwater protection standards proposed in this Section correspond to 40 CFR 257, Appendix III and Appendix IV. Additionally, this proposed Section includes some elements of 40 CFR 257.94 and 40 CFR 257.95 including the requirement for the groundwater protection standards to meet background at the waste boundary.

Section 845.610: General Requirements

In this proposed Section, the Illinois EPA establishes the requirements for groundwater monitoring for all CCR surface impoundments subject to Subpart F during the entire active life of the CCR surface impoundment which include operation, closure, post-closure care and any required corrective action. These requirements include hydrogeologic site characterization to establish the basis for the required groundwater monitoring system, and groundwater sampling and analysis requirements, including appropriate statistical analysis. This Section also establishes the requirement to initiate corrective action based on the analysis of groundwater monitoring and establishes the requirement for annual reporting along with the required contents of the annual reports. The proposed Section generally corresponds to the applicability requirements of 40 CFR 257.90.

Section 845.620: Hydrogeologic Site Characterization

In this proposed Section, the Illinois EPA requires all owners or operators to conduct a comprehensive site investigation and evaluation to determine potential contamination migration pathways and to develop other hydrogeologic information for the facility. In addition to the establishment of a groundwater monitoring system, the data from the hydrogeologic site investigation will be useful when evaluating corrective action and closure options.

Section 845.630: Groundwater Monitoring Systems

In this proposed Section, the Illinois EPA establishes the specific design requirements of the groundwater monitoring system including the number of monitoring wells, their location and construction for each CCR surface impoundment, or if appropriate a combination of CCR surface impoundments. The proposed Section generally corresponds to the groundwater monitoring systems requirements of 40 CFR 257.91.

Section 845.640: Groundwater Sampling and Analysis Requirements

In this proposed Section, the Illinois EPA establishes the requirements for sample collection, preservation and chain of custody. Requirements to use appropriate data collection, sampling and analytical methods are included along with general guidance on the types of statistical methods which are acceptable for the analysis of the groundwater monitoring data collected, and how those statistical methods are used in compliance determination. This proposed Section generally corresponds with elements of the groundwater sampling and analysis requirements of 40 CFR 257.93; the detection monitoring program requirements of 40 CFR 257.94; and the assessment monitoring program requirements of 40 CFR 257.95.

Section 845.650: Groundwater Monitoring Program

In this proposed Section, the Illinois EPA establishes the constituents that must be monitored, the frequency of groundwater monitoring and the requirements for the monitoring program to fit with the selected statistical methods. This proposed Section also establishes the process by which owners and operators determine if they must initiate corrective action or are able to provide an alternative source demonstration. The proposed Section contains elements of the detection monitoring program requirements of 40 CFR 257.94 and the assessment monitoring program requirements of 40 CFR 257.95.

Section 845.660: Assessment of Corrective Measures

In this proposed Section, the Illinois EPA establishes the mechanism by which the assessment of corrective measures is initiated. It also sets forth the time frames for initiating and completing the corrective measures assessment, lists general criteria for consideration during the corrective measures assessment, confirms the requirement to continue groundwater monitoring during the corrective measures assessment and establishes a requirement for public participation as part of the corrective measures assessment. This proposed Section contains elements of the assessment of corrective measures requirements found in 40 CFR 257.96.

Section 845.670: Corrective Action Plan

In this proposed Section, the Illinois EPA establishes the schedule for submission of a corrective action plan to the Illinois EPA. It also sets forth a list of the requirements that must be fulfilled by the corrective action plan. The corrective measures incorporated into the corrective action plan must be protective of human health and the environment, meet the groundwater protection standards of Part 845.600, control to the extent feasible further releases to the environment, remove from the environment as much released material as feasible and comply with the management of waste requirements of Part 845.680. This proposed Section requires the submission of data supporting the selected remedy which is detailed in the corrective action alternatives analysis. The owner or operator must also provide a schedule for implementing and completing the corrective action, taking into consideration facility specific details such as the character and extent of contamination, the availability of treatment and disposal capacity, risks posed to human health and the environment, local groundwater use with regard to quality and quantity including possible impacts on the groundwater and the availability of alternative water supplies. The proposed Section generally corresponds to the selection of remedy requirements found in 40 CFR 257.97.

Section 845.680: Implementation of the Corrective Action Plan

In this proposed Section, the Illinois EPA establishes the timeframe for implementing the Illinois EPA approved corrective action, which must meet applicable groundwater monitoring requirements, document the effectiveness of the remedial action and demonstrate compliance with groundwater protection standards. The proposed Section also requires that owners and operators take interim measures to prevent further releases while the final corrective action measures are being implemented, along with requirements to amend the corrective action plan if it is determined that the approved corrective action will not be successful in meeting the requirements of the corrective action. This proposed Section also sets forth the criteria for determining when corrective action has been completed and the steps owners and operators must take to verify completion of corrective action. The proposed Section generally corresponds to the implementation of the corrective action program found in 40 CFR 257.98.

Subpart G: Closure and Post-Closure Care

Proposed Subpart G contains provisions for closure and post-closure care of CCR surface impoundments.

Section 845.700: Required Closure or Retrofit of CCR Surface Impoundments

As this proposal requires Illinois EPA's review and approval of proposed closures, the owners and operators of CCR surface impoundments and the Illinois EPA must prioritize which CCR surface impoundments close first. The proposed prioritization scheme assists owners and operators in determining where and how to spend their resources by categorizing impoundments based on risk to health and the environment and the impoundment's proximity to areas of environmental justice concern, requiring those with the highest risk and those located in areas of environmental justice concern to submit a closure application first, approximately nine months after the proposed rules will become effective. The impoundments posing a slightly lower risk would be required to submit closure permit applications six months later, and those with the least amount of risk would be required to submit permit applications 18 months later.

Section 845.710: Closure Alternatives

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This Section provides the requirements and factors required when considering closure of a CCR surface impoundment and evaluating closure alternatives. For closure of a CCR surface impoundment, or closure of any lateral expansion of a CCR surface impoundment, the Illinois EPA requires that closure alternatives be considered including, but not limited to, closure by removal. Before selecting a closure method, the owner or operator of each CCR surface impoundment must complete a closure alternatives analysis that considers the long and short term effectiveness and protectiveness of the closure method, the effectiveness of the closure method in controlling future releases, the ease or difficulty of implementing a potential closure method, and the degree to which the concerns of the residents living within communities where the CCR will be handled, transported and disposed are addressed by the closure method. A closure alternatives analysis must be included in the closure plan submitted to the Illinois EPA and must ensure the protection of human health and the environment and achieve compliance with the groundwater protection standards. The alternatives analysis must also meet or exceed a class 4 estimate under the AACE Classification Standard, contain the results of groundwater modeling showing how the closure alternative will achieve compliance with the applicable groundwater protection standards, including seasonal variations, and assess impacts to waters of the State. The analysis must also identify whether the facility has an onsite landfill with remaining capacity that can accept CCR or the ability to construct an onsite landfill. At least 30 days before submission of a construction permit application for closure, the owner or operator must hold a public meeting concerning the closure alternatives.

<u>Section 845.720: Closure Plan</u>

The purpose of this Section is to specify what must be included within closure plans. This Section provides the requirements of a closure plan with submission of a preliminary written closure plan, amendments to the preliminary written closure plan, and final closure plan. The closure plan is required prior to initiation of the closure activities. The final closure plan must also detail characteristics of the closure activities, CCR surface impoundment, closure alternatives, design of the closure, and any amendments to the preliminary written closure plan.

Section 845.730: Initiation of Closure

This Section provides the requirements for how closure activities must be initiated and when closure is required due to completion of the use of the CCR surface impoundment as an active CCR surface impoundment. The owner or operator must initiate closure of a CCR surface impoundment no later than the timeframes specified if the owner or operator has ceased placing waste in the CCR surface impoundment. Owners and operators of temporarily idled CCR surface impoundments may obtain two year extensions on for initiation of closure with documentation that the impoundment has remaining storage or disposal capacity or that the impoundment can have CCR removed for the purpose of beneficial use and that there is a reasonable likelihood the that impoundment will resume receiving waste or CCR will be removed for the purpose of beneficial reuse. The documentation must be submitted for Illinois EPA review and approval.

Section 845.740: Closure by Removal

This Section provides the requirements for closure by removal. An owner or operator may elect to close a CCR surface impoundment by removing and decontaminating all areas affected by releases from the impoundment. Once closure by removal is completed, groundwater monitoring must continue for three years after closure or for three years after groundwater monitoring does not show an exceedance of the groundwater protection standards. The owner or operator must responsibly handle and transport the CCR, including manifests, transportation plans, onsite dust controls, public notices, and prevent contamination of surface water, groundwater, soil and sediments. Upon completion of CCR removal and decontamination of the CCR surface impoundment, a completion of CCR removal and decontamination report and a certification from a qualified professional engineer that CCR removal and decontamination of the CCR surface impoundment has been completed must be placed in the facility's operating record pursuant to Section 845.800. Upon completion of groundwater monitoring, the owner or operator of the CCR surface impoundment must complete a groundwater monitoring report and a certification from a qualified professional engineer that groundwater monitoring has been completed and place this report in the facility's operating record.

Section 845.750: Closure with a Final Cover System

This Section provides the technical requirements for the final cover system when closure is not by complete removal. The Illinois EPA consulted 35 Ill. Adm. Code 811.204 and Ill. Adm. Code 840.126 when drafting this proposed language. This Section details the closure performance standard for the final cover system when closing by leaving CCR in place. The performance standard will help prevent contamination release through design, optimize drainage, stabilization, minimize infiltration and erosion, and support vegetation. CCR may be placed in the surface impoundment, but only for the purposes of grading and contouring in the design and construction of the final cover.

Section 845.760: Completion of Closure Activities

This Section provides the requirements for the owner or operator to complete closure of existing and new CCR surface impoundments, and any lateral expansion of a CCR surface impoundment, within the timeframe approved by the Illinois EPA in the final closure plan, or within five years of obtaining a construction permit for closure, whichever is less. The Section details the timeframe requirements in which closure is to occur, timeframe extensions for closure by removal and associated demonstrations, maximum time extensions, closure report requirements, and property deed notations for future use.

Section 845.770: Retrofitting

Retrofit of a CCR surface impoundment must be completed in accordance with the requirements of this Section. Retrofitting requires removal of CCR, including any liners, contaminated soils and sediments, conduct any necessary corrective action, and an installation of a compliant liner and leachate collection system. Information about the plan to retrofit must be included in a written retrofit plan submitted with a construction permit before retrofitting begins. The retrofit plan may be amended as needed. Handling and removal of CCR must be consistent with Section 845.740. A retrofit completion report is required after completion of the retrofit activities. At any time after the initiation of a CCR surface impoundment retrofit, the owner or operator may cease the retrofit and seek to initiate closure of the surface impoundment.

Section 845.780: Post-Closure Care Requirements

This Section provides the post-closure care requirements and applies to the owners or operators of CCR surface impoundments who have completed an Illinois EPA-approved closure. However, an owner or operator of a CCR surface impoundment that elects to close by removal is not subject to the post-closure care requirement under this Section. The owner or operator must conduct post-closure care consisting of maintaining the integrity and effectiveness of the final cover system, maintaining the integrity and effectiveness of and operating the leachate collection and removal system and maintaining and operating the groundwater monitoring system. Post closure care must continue for 30 years. At the end of 30 years, the owner or operator must continue to conduct post-closure care until the groundwater monitoring shows concentrations are below the groundwater protection standards, and not increasing for those constituents over background provided concentrations have been reduced to the maximum extent feasible and concentrations are protective of human health and the environment. This Section includes the requirements for a written post-closure care plan and amendments to the plan that may be submitted via an operating permit modification application.

Subpart H: Recordkeeping

In order to show compliance with the proposed rules, records must be kept by the owner or operator. Subpart H provides the requirements for recordkeeping.

Section 845.800: Facility Operating Record

This Section provides the requirements for each owner or operator of a CCR surface impoundment to maintain files of information required by this Part in a written operating record at the facility and maintain that record for given timeframes.

Section 845.810: Publicly Accessible Internet Site Requirements

This Section requires the owner or operator to provide a website entitled, "CCR Rule Compliance Data and Information" for each CCR surface impoundment. The section provides dates for website content and determines length of time for information to be stored on the required website. Further, this Section requires the owner or operator to notify and provide any updates to location of website. The Illinois EPA will maintain a list of these web addresses for public access.

Subpart I: Financial Assurance

Proposed Subpart I provides procedures by which the owner or operator of a CCR surface impoundment provides financial assurance satisfying the requirements of Section 22.59(f) of the Act.

Section 845.900: General Provisions

This Section outlines a number of general provisions regarding financial assurance, including applicability, exemptions, available mechanisms, Illinois EPA authority and enforcement rights, and procedures for appealing certain Illinois EPA actions.

Section 845.910: Upgrading Financial Assurance

This Section details when financial assurance cost estimates must be upgraded and adjusted. The Illinois EPA proposes that, in addition to annually adjusting for inflation, owners and operators must increase the total amount of financial assurance provided in response to increases in the current cost estimate or decreases in the value of a trust fund.

Section 845.920: Release of Financial Institution and Owner or Operator

This Section describes the instances and manner by which the Illinois EPA will release financial institutions, such as trustees and sureties, and owners or operators from the financial assurance requirements of Subpart I. The Illinois EPA proposes that financial institutions be released when the owner or operator obtains alternative financial assurance, or when the Illinois EPA releases the owner or operator from the financial assurance requirements. Owners or operators would be released from the financial assurance requirements only after the Illinois EPA verified completion of closure, post-closure care, and corrective action pursuant to this Part.

Section 845.930: Cost Estimates

This Section details the cost estimate procedures and requirements for closure and post-closure care, and for corrective action. Regarding cost estimates for corrective action, the Illinois EPA proposes delineating and requiring a "preliminary" cost estimate that would later be replaced by a cost estimate based on an Illinois EPA-approved corrective action plan.

Section 845.940: Revision of Cost Estimates

This Section provides the procedures for annually adjusting cost estimates for inflation, and this Section also requires revisions to cost estimates in certain instances of plan modifications and cost increases.

Section 845.950: Mechanisms for Financial Assurance

This Section generally describes the available financial assurance mechanisms and sets forth timeframes within which owners or operators must provide financial assurance. Further, this Section describes instances when owners or operators may use multiple mechanisms for a single CCR surface impoundment or when a single mechanism may be utilized for multiple CCR surface impoundments in Illinois.

Section 845.960: Trust Fund

This Section details the requirements applicable to the use of a Trust Fund for financial assurance pursuant to Subpart I.

Section 845.970: Surety Bond Guaranteeing Payment

This Section details the requirements applicable to the use of a Surety Bond Guaranteeing Payment for financial assurance pursuant to Subpart I.

Section 845.980: Surety Bond Guaranteeing Performance

This Section details the requirements applicable to the use of a Surety Bond Guaranteeing Performance for financial assurance pursuant to Subpart I.

Section 845.990: Letter of Credit

This Section details the requirements applicable to the use of a Letter of Credit for financial assurance pursuant to Subpart I.

V. TECHNICAL FEASIBILITY AND ECONOMIC REASONABLENESS

As mandated by P.A. 101-171, the proposed regulation must be as protective and comprehensive as Subpart D of 40 CFR 257.[4] Since owners and operators of CCR surface impoundments are already subject to 40 CFR 257, many of the technical and economic requirements applicable to owners and operators in the proposed Part 845 are already required

[4] 415 ILCS 5/22.59(g)(1).

under federal law. For example, both 40 CFR 257 and the proposed Part 845 require groundwater monitoring systems and periodic groundwater monitoring, closure and post-closure care plans, corrective action, if necessary, to achieve groundwater protection standards, design criteria for any newly constructed CCR surface impoundments and the maintenance of publicly available records. The proposed regulation requires the owner or operator of CCR surface impoundments to complete a thorough alternatives analysis for corrective action and closure, the technical feasibility and economical reasonableness of which, will be a facility-specific determination based on multiple factors, including constructability, long and short term effectiveness, reliability and protection of human health and the environment. Therefore, the Illinois EPA believes proposed Part 845 is technically feasible and economically reasonable.

Public Act 101-171 also mandated fees and financial assurance for all CCR surface impoundments regulated by the proposed regulations.[5] Unlike P.A. 101-171, 40 CFR 257 is a self-implementing program. Therefore, documentation to demonstrate compliance are certified by a professional engineer and posted on a public website, relying on citizen lawsuits for enforcement. In contrast, the Illinois EPA, through the mandate of P.A. 101-171, proposes a permitting program administered by the Illinois EPA. As such, the documentation submitted to the Illinois EPA by the owners and operators of CCR surface impoundments is reviewed and approved by Illinois EPA staff during the operation, corrective action, and, if necessary, closure and post-closure care of every CCR surface impoundment in the state. The fees are set in P.A. 101-171, with higher initial fees for CCR surface impoundments that have not completed closure and lower fees for CCR surface impoundments that have completed closure.

In addition to the initial fee, annual fees are required by P.A. 101-171, again with CCR

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[5] 415 ILCS 5/22.59 (f); (g); (j)(1).

surface impoundments that have not completed closure paying a higher annual fee than those that have completed closure. CCR surface impoundments that close with the CCR left in place have a 30-year minimum post-closure care period, which may be longer if the groundwater protection standards that are protective of human health and the environment have not been achieved. However, CCR surface impoundments that close by removing CCR do not have a specified post-closure care period. Once the owner or operator of a CCR surface impoundment that has closed by removing CCR demonstrates that they have achieved the groundwater protection standards, which will assure protection of human health and the environment, annual fees cease, since all work required by the proposed rule will be completed. While the time required to achieve the groundwater protection standards will vary depending on hydrogeologic conditions at each facility, the potentially reduced post-closure care period when closure is by removal of CCR, offsets to some extent the potentially higher costs associated with closure by removal. Because the fee system is designed to support the Illinois EPA's administrative work for the review of documents and permitting associated with CCR surface impoundment operation, corrective action, and, if necessary, closure and post-closure care, the fees are reduced as work progresses and the potential higher costs associated with closing CCR surface impoundments may be offset by a shorter period over which fees are collected, the proposed regulations are economically reasonable.

The financial assurance requirements of P.A. 101-171 also create economic considerations in the proposed regulation that do not exist in 40 CFR 257. Each CCR surface impoundment must have and maintain financial assurance to cover the costs of corrective action, and, if necessary, closure and the post-closure care period. The proposed regulations allow the use of several different financial instruments, or combinations thereof, to provide financial assurance. Because CCR surface impoundments that close with the CCR left in place have a 30-year minimum post-closure care period, financial assurance must necessarily extend at least 30 years past closure. The period for which financial assurance must be maintained is longer if the corrective action to meet groundwater protection standards is still ongoing at the end of the 30-year post-closure care period. However, CCR surface impoundments that close by removing CCR do not have a specified post-closure care period. Once the owner or operator of a CCR surface impoundment that has closed by removing CCR demonstrates that they have achieved the groundwater protection standards, the requirement for financial assurance ends. While the time required to achieve the groundwater protection standards will vary depending on hydrogeologic conditions at each facility, the potentially reduced post-closure care period when closure is by removal of CCR, offsets to some extent the costs associated with maintaining financial assurance. Financial assurance is required to guarantee that in the event of financial default by the owner or operator of a CCR surface impoundment, adequate funds will be available to complete corrective action, and, if necessary, closure and post-closure care, and the burden of those costs do not fall on the State, the local citizenry, or worse, the facilities set derelict for many years. Because financial assurance is designed to guarantee that corrective action, if necessary, closure and post-closure care will be completed in the event of financial default of an owner or operator and the term of financial assurance may be shorter when closure is by removal of CCR, the proposed regulations are economically reasonable.

VI. AFFECTED FACILITIES

Power generating facilities with CCR surface impoundments may be affected by the Illinois EPA's proposed rule. These facilities include:

NAME OF FACILITY	CCR SURFACE IMPOUNDMENTS
Ameren MO /UE	
Venice	2
Ameren Energy Generating	
Hutsonville	5
Meredosia	3
City Water Light and Power	
City Water Light and Power	2
Commercial Liability Partners, LLC	
Wood River Station	4
Grand Tower Energy Center, LLC	
Grand Tower	1
NRG	
Will County Station	4
Waukegan Station	3
Lincoln Stone Quarry	1
Joliet 29	3
Powerton	5
Prairie Power Inc	
Prairie Power	1
Southern Illinois Power Co-op	
Southern Illinois Power Co-op	9
Vistra	
Baldwin Energy Center	4
Coffeen Station	4
Duck Creek Station	5
Edwards Station	1
Havana Station	3
Hennepin Station	6
Joppa Station	2

Kincaid Generation	1
Newton Station	1
Vermilion Station	3

VII. PUBLIC OUTREACH

After the passage of Public Act 101-171, the Illinois EPA began creating a list of the email addresses of persons wishing to be kept apprised of developments in the Illinois EPA's rulemaking process. The Illinois EPA informed all interested persons on the email list of public informational meetings, public commenting periods, stakeholder meetings, and the filing of this regulatory proposal with the Board.

Prior to proposing draft rules, the Illinois EPA hosted in-person listening sessions, including a webinar, across the State to receive public input. The locations were chosen for geographic diversity and to emphasize coal ash impoundments located in areas of environmental justice concern. These listening sessions included the following times and locations:

Peoria	September 10, 2019	Gateway Building 200 Northeast Water Street	2 pm to 4 pm & 6 pm to 8 pm
Granite City	September 11, 2019	Granite City Township Hall 2060A Delmar Avenue	2 pm to 4 pm & 6 pm to 8 pm
Danville	September 17, 2019	Bremer Auditorium 2000 E. Main Street	2 pm to 4 pm & 6 pm to 8 pm
Webinar	September 24, 2019	Web login	10 am
Mt. Vernon	September 26, 2019	Rolland Lewis Community Building 800 S 27th Street	2 pm to 4 pm & 6 pm to 8 pm
Springfield	October 1, 2019	Zion Missionary Baptist Church, 1601 E. Laurel Street	6 pm to 8 pm
Joliet	October 8, 2019	Joliet Jr. College Weitendorf Agriculture Center 17840 Laraway Road	2 pm to 4 pm & 6 pm to 8 pm
Waukegan	October 9, 2019	Whittier Elementary School 901 N. Lewis Avenue	2 pm to 4 pm & 6 pm to 8 pm

After the above-referenced listening sessions, the Illinois EPA, on December 11, 2019, released a draft of the proposed Part 845 regulations for Coal Combustion Residual (CCR) surface impoundments at power generating facilities. After releasing this public draft, the Illinois EPA hosted a stakeholder meeting on January 6, 2020, in Springfield, Illinois, and accepted written comments on these draft rules until January 13, 2020. The Illinois EPA considered the public comments received at the listening sessions, the stakeholder meeting, and the submissions of written comments when drafting the instant proposed Part 845.

Additionally, since on or about July 2019, Illinois EPA has worked cooperatively with USEPA to provide this proposal to the Board. *See* Attachment B. Illinois EPA discussed the public draft distributed on December 11, 2019, with USEPA and from these discussions, and upon further information and belief, Illinois EPA believes this rulemaking meets the requirements for partial program delegation as proposed.

VIII. SYNOPSIS OF TESTIMONY

The Illinois EPA anticipates presenting six witnesses during the Board's hearings on this proposal. The witnesses are Illinois EPA employees within the Division of Public Water Supplies, Division of Water Pollution Control and the Office of Community Relations. They are (1) Bill Buscher, manager of the Hydrogeology and Compliance Unit; (2) Lynn Dunaway, Environmental Protection Specialist IV; (3) Amy Zimmer, Environmental Protection Geologist III; (4) Darin LeCrone, manager of the Industrial Unit; (5) Lauren Martin, Environmental Protection Geologist I; (6) Chris Pressnall, Environmental Justice Coordinator; (7) Bob Mathis, Accountant Advanced; and (8) Melinda Shaw, Environmental Protection Geologist I.

Bill Buscher graduated from the University of Missouri-Rolla with a Bachelor of Science in Geological Engineering and is a licensed professional geologist. He has worked in Bureau of

Water since April of 1988. His primary responsibilities include application of the Illinois Environmental Protection Act and Board's rules which pertain to groundwater. Mr. Buscher may testify about, *inter alia*, operating and design criteria.

Lynn Dunaway graduated from the Bradley University with a Bachelor of Science, in Geology. Mr. Dunaway has been an Illinois Licensed Professional Geologist since 1998. He has worked in the Groundwater Section, Bureau of Water, since February of 1988. In addition to implementation of programs under the Groundwater Protection Act, he has experience with groundwater standards compliance issues, including implementation of protective measures at the time of permitting and regulatory development. Mr. Dunaway may testify about, *inter alia*, design criteria, groundwater protection standards, groundwater monitoring systems, groundwater monitoring programs including statistical methods for their evaluation, corrective action and corrective action implementation.

Amy Zimmer has worked in the Groundwater Section of the Division of Public Water Supplies since 1998. Before joining the Illinois EPA, she graduated from Northern Illinois University with a Bachelor of Science in Geology. Ms. Zimmer's job duties include conducting geologic investigations and hydrogeologic characterization of aquifers utilized by community water supplies, developing conceptual and mathematical models of flow systems, identifying groundwater flowpaths, evaluating groundwater models and hydrogeologic data received from regulated sites and community water supplies, providing technical input for special projects requiring geologic expertise, and assisting in the preparation of routine reports concerning various aspects of the state's groundwater protection programs. Ms. Zimmer may testify about, *inter alia*, hydrogeologic site characterization, closure, and post-closure care.

Darin LeCrone is the manager of the Industrial Unit, Permit Section, Division of Water

Pollution Control. Mr. LeCrone has worked in the Permit Section since 1992. Before joining the Illinois EPA, he graduated from Southern Illinois University Carbondale with a Bachelor of Science degree in Mechanical Engineering. Mr. LeCrone is a licensed professional engineer in Illinois. His job duties include managing a staff of engineers responsible for implementing the state construction and operating permit programs, the NPDES program, and other related permitting programs for a variety of non-municipal sources including industrial, agriculture, dredge and fill and coal and non-coal mining. Mr. LeCrone may testify about, *inter alia*, permitting CCR surface impoundments.

Lauren Martin graduated from Western Illinois University with a Bachelor of Science in Geology in 2002 and Illinois State University with a Master of Science in Hydrogeology in 2006. Ms. Martin was trained and utilized professionally her OSHA 10-hour Construction Safety Awareness training beginning in 2005 and OSHA 30-hour Construction Safety Training in 2015. Ms. Martin has maintained 40-hour OSHA HAZWOPER/8-hour Refresher and supervisor training beginning since 2005. Ms. Martin has also retained USACE Construction Quality Manager Training since 2015. Ms. Martin has worked in geotechnical engineering and general construction since 2001 and the environmental industry since 2005. At Jacobs Engineering (2018-2020) Ms. Martin held supervisory roles including within transportation and environmental industry projects. At CH2M (2005-2018), Ms. Martin held supervisory roles including Site Superintendent, Construction Quality Manager, Subject Matter Expert, Project Manager, and Task Lead for transportation, water infrastructure, nuclear siting and licensing and environmental projects. At CH2M Ms. Martin was the Site Superintendent, Construction Quality Manager and Site Safety and Health Officer for a coal remediation project, removing coal from underneath railroad tracks at a railyard in rural Illinois. At Nicor (2003-2005), Ms. Martin worked under a Research Grant through Illinois State University and interned as a Reservoir Engineer. Ms. Martin is published in the World of Environmental Engineering for a portion of her master's thesis, Identification of Potential Vertical as Migration Pathways above Gas Storage Reservoirs (2015). At Whitney and Associates (2001-2003), Ms. Martin performed construction inspections including compaction of beneficially used fly ash and batch plant mixing of beneficially used fly ash. Ms. Martin started at the Illinois EPA as an Environmental Protection Geologist I in February of 2020. Ms. Martin may testify about, *inter alia*, operating criteria, the safety and health plan, emergency action plan and general construction, environmental and transportation site practices and implementation.

Chris Pressnall graduated from Southern Illinois University with a Bachelor of Arts in Zoology and the University of Illinois College of Law with a Juris Doctorate. He has worked for the Illinois EPA since 1998. He worked in the Illinois EPA Division of Legal Counsel until 2017. In 2017 he became the Environmental Justice Coordinator for the Illinois EPA. Mr. Pressnall is responsible for administering the Illinois EPA's Environmental Justice program and may testify about, *inter alia*, the environmental justice portions of the proposed rule.

Bob Mathis is an Accountant Advanced with the Illinois EPA. He has worked in Bureau of Land since 1989. His primary responsibilities include application of the Act and Board's rules which pertain to auditing financial assurance for hazardous waste, solid waste, used tire, UIC and compost facilities. He currently serves as lead accountant in the unit along with being the technical advisor to management for financial assurance issues. Mr. Mathis may present testimony and answer questions related to, *inter alia*, the financial assurance process.

Melinda Shaw graduated from Western Illinois University with a Bachelor of Science in Geology. Cumulatively, she has worked for the Illinois EPA for six years in various remediation programs. Ms. Shaw now works as an Environmental Protection Geologist I in the Groundwater

Section of the Bureau of Water. Ms. Shaw may present testimony about, *inter alia*, location restrictions, manifesting requirements, and recordkeeping.

IX. SUPPORTING DOCUMENTS

A. Documents Relied Upon

The Illinois Administrative Procedure Act provides that all proposed rulemakings must include:

> a descriptive title or other description of any published study or research report used in developing the rule, the identity of the person who performed such study, and a description of where the public may obtain a copy of any such study or research report. If the study was performed by an agency or by a person or entity that contracted with the agency for the performance of the study, the agency shall also make copies of the underlying data available to members of the public upon request if the data are not protected from disclosure under the Freedom of Information Act.

5 ILCS 100/5-40(b)(3.5). The Board's procedural rules require the same information to be included with any rulemaking proposal filed with the Board in 35 Ill. Adm. Code 102.202(e). A list of the documents relied upon by the Illinois EPA in developing this proposal, excluding the documents incorporated by reference, is provided below.

List of Documents Relied Upon
Public Act 101-171, eff. 7-30-19; revised 10-22-19
35 Ill. Adm Code Sections 164, 166, 309, 620, 720, 810, 811, 840, and 3702.
20 CFR 1910 *et seq*. and 29 CFR 1926 *et seq*.
40 CFR 257 *et seq*. (2019)
80 Fed. Reg. 74, 21302-21501 (April 17, 2015) (to be codified at 40 C.F.R. pt. 257 and 261).
81 Fed. Reg. 151, 51802-51808 (August 5, 2016)
83 Fed. Reg. 51, 11584-11616 (March 15, 2018)
83 Fed. Reg. 146, 36435-36456 (July 30, 2018)
84 Fed. Reg. 157, 40353-40371 (August 14, 2019)
84 Fed. Reg. 231, 65941-65964 (December 2, 2019)

Util. Solid Waste Activities Group v. Envtl. Prot. Agency, 901 F.3d 414 (D.C. Cir. 2018), judgment entered, 15-1219, 2018 WL 4158384 (D.C. Cir. Aug. 21, 2018)

The Illinois EPA did not perform any new studies, nor did the Illinois EPA contract with any outside entities to perform any studies for the development of this rulemaking proposal. Because no studies were conducted, there is no underlying data meeting the requirements of 5 ILCS 100/5-40(b)(3.5).

B. Incorporations by Reference and Attachments

This section of the Statement of Reasons provides a list of documents the Illinois EPA proposes to incorporate by reference. Section 102.202(d) requires the Illinois EPA to submit "[a]ny material to be incorporated by reference within the proposed rule pursuant to Section 5-75 of the IAPA [5 ILCS 100/5-75]." The Illinois EPA proposes incorporating the following documents by reference:

Documents Incorporated By Reference
"Cost Estimate Classification System—As Applied in Engineering, Procurement, and Construction for the Process Industries" TCM Framework: 7.3 – Cost Estimating and Budgeting. March 6, 2009, AACE International Recommended Practice No. 18R-97. (not filed)
"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," USEPA Publication No. SW-846, as amended by Updates I, II, IIA, IIB, III, IIIA, and IIIB (Doc. No. 955-001-00000-1) (available online at https://www.epa.gov/hw-sw846/sw-846-compendium).

Under the Board's procedural rules, the Illinois EPA may not file copyrighted material electronically through the Clerk's Office On Line ("COOL"). 35 Ill. Adm. Code 101.302(h)(4). Instead, the Illinois EPA must either 1) file a paper original and the copyright owner's authorization for the board to make 2 copies, or 2) a license or other document that allows the Board to access the document electronically and potentially print three copies. *Id*. The Illinois EPA elects to submit one paper original as submitted to Illinois EPA and a letter from the copyright holder that Board may make copies of the original.

C. Attachments

This section of the Statement of Reasons provides list of documents attached to this rulemaking proposal.

Letter	**Attachments**
A1	Copyright Waiver from AACE International (not filed on COOL)
A2	"Cost Estimate Classification System—As Applied in Engineering, Procurement, and Construction for the Process Industries" TCM Framework: 7.3 – Cost Estimating and Budgeting. March 6, 2009, AACE International Recommended Practice No. 18R-97. (not filed on COOL)
B	March 9, 2020, USEPA, Region 5 Letter
C	*Util. Solid Waste Activities Group v. Envtl. Prot. Agency*, 901 F.3d 414 (D.C. Cir. 2018)
D	Public Act 101-171, eff. 7-30-19

X. CONCLUSION

WHEREFORE, the Illinois EPA respectfully requests the Board to adopt the Illinois EPA's proposed regulation in its entirety as submitted.

SPECIAL NOTE: Undersigned would be remiss not to mention the significant contributions, and tireless efforts, made by Joanne Olson, former Deputy General Counsel for Illinois EPA, and Gabe Neibergall, Illinois EPA Division of Legal Counsel, in preparing this proposed regulation.

Respectfully submitted,

Dated: March 30, 2020

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,

Petitioner,

BY: /s/ Rex L. Gradeless
Rex L. Gradeless

Rex L. Gradeless, #6303411
Division of Legal Counsel
Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276
(217) 782-5544
Rex.Gradeless@Illinois.gov

THIS FILING IS SUBMITTED ELECTRONICALLY

EXHIBIT B

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:)
) No. R20-19
) (Rulemaking-Land)
Standards for the Disposal)
of Coal Combustion)
Residuals in Surface)
Impoundments: Proposed new)
35 Ill. Adm. Code 845)

REPORT OF THE PROCEEDINGS held in the above entitled cause before Hearing Officer Vanessa Horton, called by the Illinois Pollution Control Board, taken by Steven Brickey, CSR, RMR, for the State of Illinois, 1021 North Grand Avenue East, Springfield, Illinois, on the 11th day of August, 2020, commencing at the hour of 9:03 a.m.

amounts of CCR should be subject to regulation under Part 845?

MS. ZEIVEL: Objection. The witness already provided his answer. It's been asked and answered.

HEARING OFFICER HORTON: Sustained.

MR. BONEBRAKE: I'd like to refer to Exhibit 2 and if we go to the back of that exhibit and these are IEPA's first response to questions.

Specifically, looking at a table at the back that has -- excuse me -- 74 rows. It appears to identify a number of different ponds and I will give IEPA a chance to look at that table. It's at Page's 181 and 182 of that exhibit.

MS. ZEIVEL: We have the table if you'd like to proceed with your question.

MR. BONEBRAKE: Can IEPA tell us what information is contained on this table?

MR. BUSCHER: These are -- this information is responsive to the Board's questions. I don't recall the number that it was. The first few, Exhibit 1 through 10, or so. Something like that.

MR. BONEBRAKE: Does this table purport to list surface impoundments that IEPA views to be subject to 845 requirements?

MR. DUNAWAY: Lynn Dunaway. Yes, it does.

MR. BONEBRAKE: Okay. So then since there's -- it looks like there's 73 ponds identified, is that correct?

MR. DUNAWAY: Lynn Dunaway. That's correct.

MR. BONEBRAKE: And is it correct that some of these ponds are subject to current dispute about whether they are regulated CCR surface impoundments?

MR. DUNAWAY: Lynn Dunaway. Yes, some of these have been disputed.

MR. BONEBRAKE: And these disputes involve legal arguments and factual arguments, correct?

MR. DUNAWAY: Lynn Dunaway. Yes.

MR. BONEBRAKE: And does the list with 73 ponds include some ponds that were not designed to be direct recipients of CCR?

MR. DUNAWAY: Lynn Dunaway. Yes.

EXHIBIT C

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:)
) No. R20-19
) (Rulemaking-Land)
Standards for the Disposal)
of Coal Combustion)
Residuals in Surface)
Impoundments: Proposed new)
35 Ill. Adm. Code 845)

REPORT OF THE PROCEEDINGS held in the above entitled cause before Hearing Officer Vanessa Horton, called by the Illinois Pollution Control Board, taken by Steven Brickey, CSR, RMR, for the State of Illinois, 1021 North Grand Avenue East, Springfield, Illinois, on the 13th day of August, 2020, commencing at the hour of 8:02 a.m.

Electronic Filing: Received, Clerk's Office 08/27/2020

boy?

MS. GALE: B as in boy. Yes. Thank you.

Actually, I'm looking at the top right corner or the top right column and I will read it "For new CCR landfills and new CCR surface impoundments and all lateral expansions of CCR units, a minimum of eight independent samples for each background must be collected during the first six months of sampling," is that the Agency's citation for the 180 days?

MR. DUNAWAY: Lynn Dunaway. Yes, that would be an appropriate section for new CCR surface impoundments.

MS. GALE: Okay. And I guess that's what you were citing to for the 180 days in your answer to Question 69?

MR. DUNAWAY: Correct.

MS. GALE: But looking at that same section just before it, it states "For existing CCR landfills and existing CCR surface impoundments, a minimum of eight independent samples from each background and down gradient well must be collected and analyzed for the constituents listed in Appendix 3 and Appendix 4 to this part no later than October 17th, 2017," and this rule was passed on October 15th, 2015.

So the Agency would agree that existing CCR surface impoundments received two years to conduct the eight independent samples, right?

MR. DUNAWAY: From the time that the rule was passed, yes.

MS. GALE: So I guess my broad question in answer to our Question 69(a) if the Agency can explain to me how it thinks that 180 days for existing CCR surface impoundments is consistent with Part 257?

MR. DUNAWAY: For a few CCR surface impoundments which might also include those that have never done any monitoring in Part 257, that would be consistent with a new one. For existing ones, the monitoring is already out there and Part 845 doesn't prohibit the use of existing data.

MS. GALE: Agree. But the Agency also agrees that there are some units that are in dispute, right, and may not have been considered CCR surface impoundments under the Federal Rules?

MR. DUNAWAY: The owners or operators may not have considered them CCR surface impoundments.

MS. GALE: Right. So I guess my question is your reference to data that may already be there may not be there, right?

MR. DUNAWAY: For the disputed CCR surface impoundments, the data may not be there.

MS. GALE: So 180 days for existing CCR surface impoundments is not consistent with Part 257, right?

MR. DUNAWAY: The consistency would be -- if we had a new CCR surface impoundment, it would have to conduct that monitoring within 180 days. Those that have not done any monitoring would have to conduct the monitoring within 180 days the way 845 is written.

MS. GALE: And moving on to the same question -- Question 69(b)(2). So it's on Page 25.

MR. DUNAWAY: Okay.

MS. GALE: I'm sorry. I should have said (b)(1). The Agency states in its answer "Independent samples can be collected even if they

EXHIBIT D

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

MIDWEST GENERATION, LLC	)	
	)	
Petitioner,	)	
v.	)	**PCB**
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY	)	**(Variance)**
	)	
Respondents.	)	

AFFIDAVIT OF DALE GREEN

I, Dale Green, being first duly sworn on oath, depose and state as follows:

1. I am over the age of 18 years and am a resident of Illinois.

2. The information in this Affidavit is based on my personal knowledge or belief in my capacity as Station Manager of Midwest Generation's ("MWG") Powerton Generating Station ("Powerton Station") and I would testify to such matters if called as a witness.

3. The Powerton Station is a power plant located near Pekin, Tazewell County, Illinois.

4. The Powerton Station began operations as a coal-fired power-plant in the 1920s.

5. MWG began operating the Powerton Station in 1999.

6. Approximately 88 people are currently employed at the Powerton Station.

7. The Metal Cleaning Basin at Powerton Station was constructed in 1978 with a 12-inch poz-o-pac liner on the bottom and a hypalon liner on the sides.

8. The Metal Cleaning Basin is not part of the ash sluice system and instead is used during outages at the Station as a temporary lay-down area for dry ash during maintenance. In addition to use for the temporary lay-down of ash, the Metal Cleaning Basin occasionally holds process water.

9. The process water from the boiler wash goes into the Metal Cleaning Basin from the boiler then is treated and discharged according to the NPDES permit into the Ash Surge Basin.

10. When the ash is removed from the Metal Cleaning Basin, the CCR is beneficially used for mine reclamation.

11. The Metal Cleaning Basin does not receive commingled ash and process water, and due to the intermittent nature of its operation, the Metal Cleaning Basin is often empty.

12. In 2010, the Metal Cleaning Basin was relined with a 60 mil high-density polyethylene ("HDPE") liner.

13. The full liner system for the Metal Cleaning Basin consists of six layers of materials (from bottom to top): the original poz-o-pac, a geotextile cushion, the HDPE liner, a geotextile cushion, a 12-inch thick sand cushion layer, and a 6-inch limestone warning layer.

14. The purpose of the sand cushion layer is to avoid punctures on the geomembrane when equipment is on the liner, and the purpose of the limestone warning layer, which is white and contrasts with the dark color of coal ash, is to act as a warning to the operators when the operators are removing the ash so that they do not reach the liner.

15. MWG retained the poz-o-pac layer during the 2010 relining because it served as an additional barrier and provided additional support for the overall life of the liner.

16. MWG also installed marker posts along the edge of the base of the ponds to mark the sides for the operators when the ponds are being dredged, which occurs about once per year.

17. The Metal Cleaning Basin at Powerton Station is not regulated as a CCR surface impoundment under the 2015 federal rule "Disposal of Coal Combustion Residuals from Electric Utilities" 80 Fed. Reg. 21,301 (April 17, 2015), as amended and codified at 40 CFR Part 257.

18. The Metal Cleaning Basin is not located in areas of environmental justice concern.

19. There are no potable wells downgradient of the Metal Cleaning Basin.

20. The cost of the roadway constructed in order to facilitate drilling and groundwater sampling at the Metal Cleaning Basin was $6,380.00.

FURTHER AFFIANT SAYETH NOT.

Subscribed and Sworn to before me

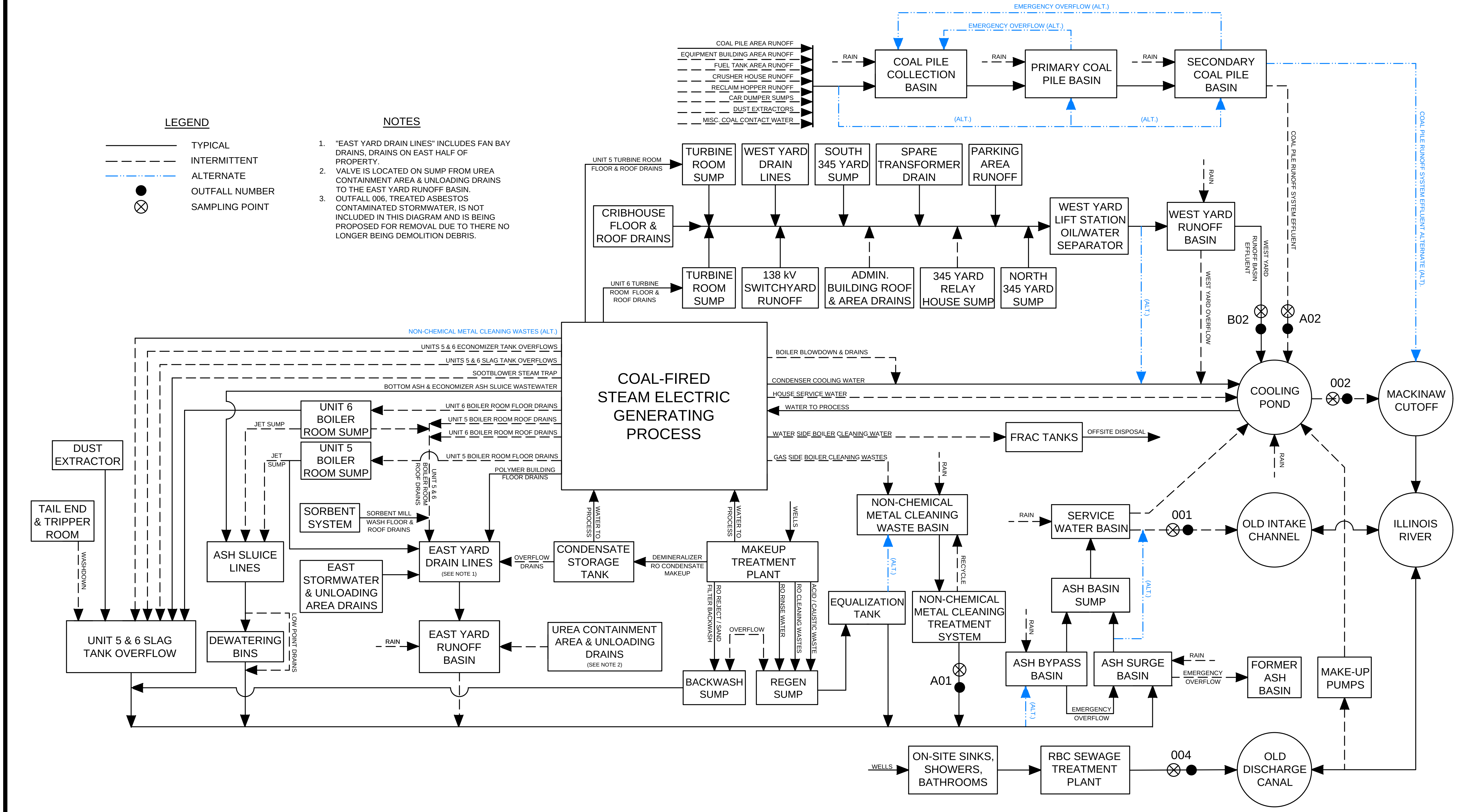
On May 6, 2021.

Notary Public

My Commission Expires: 7/5/2021

"OFFICIAL SEAL"
KIMBERLY M MARRON
Notary Public, State of Illinois
My Commission Expires 7/5/2021

EXHIBIT E



NOTES

1. "EAST YARD DRAIN LINES" INCLUDES FAN BAY DRAINS, DRAINS ON EAST HALF OF PROPERTY.
2. VALVE IS LOCATED ON SUMP FROM UREA CONTAINMENT AREA & UNLOADING DRAINS TO THE EAST YARD RUNOFF BASIN.
3. 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.

REV. NO.	DATE	DESCRIPTION

DRAFT

APTIM

APTIM Environmental & Infrastructure, LLC

MIDWEST GENERATION, LLC
POWERTON GENERATING STATION

GENERAL FLOW DIAGRAM WITH NPDES OUTFALLS
NPDES PERMIT NO. IL0002232

DRAWN BY:	ORC	APPROVED BY:	SZF	PROJ. NO.:	631003864	DATE:	AUGUST 2019

EXHIBIT F

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
WATER POLLUTION CONTROL PERMIT

LOG NUMBERS: 2748-09

PERMIT NO.: 2009-EB-2748

FINAL PLANS, SPECIFICATIONS, APPLICATION AND SUPPORTING DOCUMENTS
PREPARED BY: Natural Resource Technology Group

DATE ISSUED: NOV 13 2009

SUBJECT: MIDWEST GENERATION LLC - Powerton Generating Station - Metal Cleaning Basin Liner Replacement - Discharge Tributary to the Illinois River

PERMITTEE TO CONSTRUCT AND OPERATE

Midwest Generation, LLC
235 Remington Blvd., Suite A
Bolingbrook, IL 60440

Permit is hereby granted to the above designated permittee(s) to construct and operate water pollution control facilities described as follows:

The Metal Cleaning Basin at the Powerton Generating Station located at 13082 East Manito Rd. in Pekin, Illinois will undergo a liner upgrade by the addition of a 60 mil HDPE geomembrane liner. At the base, a 12 inch thick sand or limestone cushion layer and a 6 inch coarse aggregate warning layer will be placed on top of the new HDPE liner.

Once complete the liner system will consist of the existing chlorosulfonated polyethylene liner and the new 60 mil HDPE geomembrane liner. The DMF of 1.19 MGD and working volume of 5.4 million gallons at 3 to 6 feet of freeboard for the Metal Cleaning Basin will remain unchanged.

This operating permit expires on September 30, 2014.

This Permit is issued subject to the following Special Condition(s). If such Special Condition(s) require(s) additional or revised facilities, satisfactory engineering plan documents must be submitted to this Agency for review and approval for issuance of a Supplemental Permit.

SPECIAL CONDITION 1: The Permittee to Construct shall be responsible for obtaining an NPDES Storm Water Permit prior to initiating construction if the construction activities associated with this project will result in the disturbance of one (1) or more acres total land area.

An NPDES Storm Water Permit may be obtained by submitting a properly completed Notice of Intent (NOI) form by certified mail to the Agency's Division of Water Pollution Control - Permit Section.")

SPECIAL CONDITION 2: The operational portion of this permit shall be governed by NPDES Permit No. IL0002232.

SPECIAL CONDITION 3: All sludges generated on site shall be disposed of at a site and in a manner acceptable to the Agency.

SPECIAL CONDITION 4: The existing Midwest Generation waste storage lagoon shall adhere to the following groundwater protection elements:

THE STANDARD CONDITIONS OF ISSUANCE INDICATED ON THE REVERSE SIDE MUST BE COMPLIED WITH IN FULL. READ ALL CONDITIONS CAREFULLY.

SAK:JAR:2748-09.docx

DIVISION OF WATER POLLUTION CONTROL

Alan Keller by AEL

Alan Keller, P.E.
Manager, Permit Section

cc: EPA-Peoria FOS
Natural Resource Technology Group
Records - Industrial
Binds

LOG NUMBERS: 2748-09 **PERMIT NO.:** 2009-EB-2748

FINAL PLANS, SPECIFICATIONS, APPLICATION AND SUPPORTING DOCUMENTS
PREPARED BY: Natural Resource Technology Group

DATE ISSUED: NOV 13 2009

SUBJECT: MIDWEST GENERATION LLC - Powerton Generating Station - Metal Cleaning Basin Liner Replacement - Discharge Tributary to the Illinois River

1. A minimum of three monitoring wells must be installed around the waste storage lagoon, no more than 25 feet from the outermost edge of the waste storage lagoon. At least one of the monitoring wells must be located down gradient of the waste storage lagoon. The monitoring wells should be screened in the upper most water bearing materials. Provide drillers logs and well completion reports, and an updated monitoring well location map after well completion.

2. At least six groundwater samples must be collected from each monitoring well within one year, to establish a statistically valid representation of existing (background) concentrations.

3. Sample monitoring wells for the chemical parameters listed in 35 IAC 620.410(a) and (d). The sampling plan will be required as part of the permit. The following parameters listed below should also be sampled.

    Specific Conductance
    Temperature
    Depth to Water (bls)
    Depth to Water (bmp)
    Elevation of MP
    Elevation of GW Surface

4. After a background concentration for each constituent is determined, monitoring will be conducted and reported monthly during waste storage lagoon use.

5. In the event that any Class I: Potable Resource Groundwater Quality Standards are exceeded in any potable water supply well, and is attributable to the operation of the waste storage lagoon, an alternative water supply shall be supplied with all costs of providing the alternative supply being borne by the owner of waste storage lagoon.

6. A corrective action plan is required, if monitoring well analysis indicates impacted groundwater from the waste storage lagoon.

7. The liner must be protected from degradation.

8. Copies of the groundwater monitoring well sample analysis shall be submitted to the following addresses:

Illinois EPA
Division of Water Pollution Control
Compliance Assurance Section
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

Illinois EPA
DWPC - Peoria Region
5415 North University Ave.
Peoria, Illinois 61614

Illinois EPA
Hydrogeology and Compliance Unit
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

READ ALL CONDITIONS CAREFULLY:
STANDARD CONDITIONS

The Illinois Environmental Protection Act (Illinois Revised Statutes Chapter 111-12. Section 1039) grants the Environmental Protection Agency authority to impose conditions on permits which it issues.

1. Unless the construction for which this permit is issued has been completed, this permit will expire (1) two years after the date of issuance for permits to construct sewers or wastewater sources or (2) three years after the date of issuance for permits to construct treatment works or pretreatment works.

2. The construction or development of facilities covered by this permit shall be done in compliance with applicable provisions of Federal laws and regulations, the Illinois Environmental Protection Act, and Rules and Regulations adopted by the Illinois Pollution Control Board.

3. There shall be no deviations from the approved plans and specifications unless a written request for modification of the project, along with plans and specifications as required, shall have been submitted to the Agency and a supplemental written permit issued.

4. The permittee shall allow any agent duly authorized by the Agency upon the presentations of credentials:

   a. to enter at reasonable times, the permittee's premises where actual or potential effluent, emission or noise sources are located or where any activity is to be conducted pursuant to this permit;

   b. to have access to and copy at reasonable times any records required to be kept under the terms and conditions of this permit;

   c. to inspect at reasonable times, including during any hours of operation of equipment constructed or operated under this permit, such equipment or monitoring methodology or equipment required to be kept, used, operated, calibrated and maintained under this permit;

   d. to obtain and remove at reasonable times samples of any discharge or emission of pollutants;

   e. to enter at reasonable times and utilize any photographic, recording, testing, monitoring or other equipment for the purpose of preserving, testing, monitoring, or recording any activity, discharge, or emission authorized by this permit.

5. The issuance of this permit:

   a. shall not be considered as in any manner affecting the title of the premises upon which the permitted facilities are to be located;

   b. does not release the permittee from any liability for damage to person or property caused by or resulting from the construction, maintenance, or operation of the proposed facilities;

   c. does not release the permittee from compliance with other applicable statutes and regulations of the United States, of the State of Illinois, or with applicable local laws, ordinances and regulations;

   d. does not take into consideration or attest to the structural stability of any units or parts of the project;

   e. in no manner implies or suggests that the Agency (or its officers, agents or employees) assumes any liability, directly or indirectly, for any loss due to damage, installation, maintenance, or operation of the proposed equipment or facility.

6. Unless a joint construction/operation permit has been issued, a permit for operating shall be obtained from the agency before the facility or equipment covered by this permit is placed into operation.

7. These standard conditions shall prevail unless modified by special conditions.

8. The Agency may file a complaint with the Board for suspension or revocation of a permit:

   a. upon discovery that the permit application contained misrepresentations, misinformation or false statement or that all relevant facts were not disclosed; or

   b. upon finding that any standard or special conditions have been violated; or

   c. upon any violation of the Environmental Protection Act or any Rules or Regulation effective thereunder as a result of the construction or development authorized by this permit.

EXHIBIT G

NATURAL RESOURCE TECHNOLOGY
ENVIRONMENTAL CONSULTANTS

23713 W. PAUL ROAD, SUITE D
PEWAUKEE, WI 53072
(P) 262.523.9000
(F) 262.523.9001

June 27, 2011
(1965)

Mr. Mark Kelly
Midwest Generation, LLC
Powerton Station
13082 East Manito Road
Pekin, IL 61554

RE: Construction Documentation Transmittal
Metal Cleaning Basin and Bypass Basin Liner Replacement

Dear Mr. Kelly:

Natural Resource Technology, Inc., (NRT) has prepared this correspondence to transmit construction record documents for the liner replacement of the Metal Cleaning Basin and the Bypass Basin at the Powerton Station. The following information is enclosed:

- Select submittals from Contractor:

Attachment	**Table 2 Submittal Item[a]**		**Submittal Description**
	Bypass Basin	**Metal Cleaning Basin**	
A1	6&12	6&11	Warning Layer and Cushion Layer Gradation Reports
A2	14	12	Geomembrane Resin Test Results
A3	NA	19	Reinforcement Steel Shop Drawings
A4	NA	20	Concrete Accessories and Admixtures Manufacturer’s Certificate and Literature
A5	NA	21&22	Concrete Quality Control Tests
A6	20-22	23-25	Geosynthetic Product Information
A7	24	27	Geomembrane Installer’s Daily Logs and QC Documentation
A8	25	28	Geomembrane Installer’s Subgrade Acceptance
A9	26	29	Geomembrane Installation Certificate
A10	26	29	Geomembrane Installation Warranties
A11	26	29	Geomembrane As-Built Panel Layout
A12	31	34	Leak Location Survey Report

- Drawings updated to reflect Contractor’s documentation survey of the liner subgrade and warning layer topography (Attachment B); and
- NRT Construction Quality Assurance (CQA) Daily Field Reports (Attachment C).

[a] Refer to Table 2 from the respective Technical Specifications for the metals cleaning basin and bypass basin.

NATURAL RESOURCE TECHNOLOGY

Please contact NRT if you have any questions or comments regarding this transmittal. It has been a pleasure working with Midwest Generation on this project, and we look forward to working with you again in the future.

Sincerely,

NATURAL RESOURCE TECHNOLOGY, INC.

Heather M. Simon

Heather M. Simon, PE
Project Manager

Encls.: Attachment A: Contractor Submittals
Attachment B: Documentation Survey
Attachment C: NRT CQA Daily Field Reports

[1965 Construction Documentation 110627.doc]

ATTACHMENT A

CONTRACTOR SUBMITTALS

Table 2 - List of Submittals
Metal Cleaning Basin Liner Replacement Specifications
Midwest Generation – Powerton Power Station

	Submittal	From	To	Time Frame	Reviewer	Technical Specification	
						Section	Part
1	Subcontractor List	Contractor	Owner and/or Engineer	**With bid documents**	Owner		
2	Baseline Construction Schedule	Contractor	Owner and/or Engineer	**With bid documents** and update within 10 calendar days of the date of the Contract award	Owner and/or Engineer		
3	Name and Location of Recycling / Disposal Facility	Contractor	Owner and/or Engineer	**With bid documents**	Owner and/or Engineer	02300	1.06B
4	Leak Location Contractor's Work Plan	Contractor	Owner and/or Engineer	**With bid documents**	Owner and/or Engineer	02600	1.05B
5	Supplier and Location of Cushion Material Source	Contractor	Owner and/or Engineer	**With bid documents**	Owner and/or Engineer	02300	1.06C
6	Cushion Material Grain Size Distribution Test Results	Contractor	Owner and/or Engineer	**With bid documents**	Owner and/or Engineer	02300	1.06E
7	Construction Start Date	Contractor	Owner and/or Engineer	5 Working days prior to construction start	Owner and/or Engineer	02300	1.06D
8	IEPA Water Pollution Control Construciton Permit	Owner through Engineer	Contractor	Prior to project start	Contractor		
9	Site Superintendant/Foreman's Name & Phone Number	Contractor	Owner and/or Engineer	Prior to project start	Owner and/or Engineer		
10	Location of Off-site Fill Material Sources	Contractor	Owner and/or Engineer	Prior to project start	Owner and/or Engineer	02300	1.06C
11	Off-site Fill Material Certificates/Test Results	Contractor	Owner and/or Engineer	Prior to project start	Owner and/or Engineer	02300	1.06E
12	Resin Supplier, Address, Brand Name, Product Number and Test Results	Contractor	Owner and/or Engineer	Prior to project start	Owner and/or Engineer	02600	1.05A
13	Source and nature of additives	Contractor	Owner and/or Engineer	Prior to project start	Owner and/or Engineer	02600	1.05A

Table 2 - List of Submittals
Metal Cleaning Basin Liner Replacement Specifications
Midwest Generation – Powerton Power Station

	Submittal	From	To	Time Frame	Reviewer	Technical Specification	
						Section	Part
14	Geomembrane Installer's Information, Layout Diagram, Schedule, Seaming Equipment	Contractor	Owner and/or Engineer	Prior to project start	Owner and/or Engineer	02600	1.05A
15	Accident Reports, Work Stoppage/Dispute Records, Contractor Invoices, Schedule of Values, Test Report Records, and Equipment Check Records	Contractor	Owner and/or Engineer	As Necessary	Owner and/or Engineer		
16	Proposed Concrete Mix	Contractor	Owner and/or Engineer	At least 35 days prior to placing of concrete	Owner and/or Engineer	03300	1.04E
17	Cushion Material Representative Sample	Contractor	Owner and/or Engineer	Two weeks prior to delivery	Owner and/or Engineer	02300	2.03
18	Warning Layer Representative Sample	Contractor	Owner and/or Engineer	Two weeks prior to delivery	Owner and/or Engineer	02300	2.04
19	Reinforcement Steel Shop Drawings	Contractor	Owner and/or Engineer	Two weeks prior to delivery	Owner and/or Engineer	03300	1.04A
20	Concrete Accessories and Admixtures Manufacturere's Certificate and Literature	Contractor	Owner and/or Engineer	Two weeks prior to delivery	Owner and/or Engineer	03300	1.04B
21	Concrete Delivery Tickets	Contractor	Owner and/or Engineer	Each day of delivery	Owner and/or Engineer	03300	1.04C
22	Concrete Quality Control Tests	Contractor	Owner and/or Engineer	As Necessary	Owner and/or Engineer	03300	1.04D
23	Geomembrane Manufacture's Certification-PGI Standards	Contractor	Owner and/or Engineer	5 working days prior to delivery to site	Owner and/or Engineer	02600	1.05A
24	Geotextile - Product Information	Contractor	Owner and/or Engineer	5 working days prior to delivery to site	Owner and/or Engineer	02600	1.05A

Table 2 - List of Submittals
Metal Cleaning Basin Liner Replacement Specifications
Midwest Generation – Powerton Power Station

	Submittal	From	To	Time Frame	Reviewer	Technical Specification	
						Section	Part
25	Geomembrane Manufacturer's Certification - Product Information	Contractor	Owner and/or Engineer	5 working days prior to delivery to site	Owner and/or Engineer	02600	1.05A
26	Certification of Geomembrane Manufacturer's Quality Control Plan	Contractor	Owner and/or Engineer	5 working days prior to delivery to site	Owner and/or Engineer	02600	1.05A
27	Geomembrane Installer's Daily Logs and Quality Control Documentation	Contractor	Owner and/or Engineer	During geomembrane installation	Owner and/or Engineer	02600	1.05C
28	Geomembrane Installer's Subgrade Acceptance	Contractor	Owner and/or Engineer	Each day prior to geomembrane installation	Owner and/or Engineer	02600	1.05C 3.02A
29	Geomembrane Installation Certificate, As-Builts, and Warranties	Contractor	Owner and/or Engineer	Within 10 working days of geomembrane installation completion	Owner and/or Engineer	02600	1.05D
30	Written Certification for Project	Contractor	Owner and/or Engineer	Upon completion of work	Owner and/or Engineer	01700	1.03B & C
31	Conditional and/or Final Geomembrane Installation Acceptance	Owner and/or Engineer	Contractor	Upon completion of geomembrane installation and submittals	Contractor	2600	1.05F
32	Record Documents	Contractor	Owner and/or Engineer	Prior to submittal of final invoice	Owner and/or Engineer	01700	1.04
33	Survey Data	Contractor	Owner and/or Engineer	Within 4 days following completion of survey	Owner and/or Engineer	01050	1.05
34	Final Leak Location Survey Report	Contractor	Owner and/or Engineer	Within 14 days following completion of leak location survey	Owner and/or Engineer	02600	1.05G

Table 2 - List of Submittals
Bypass Basin Liner Replacement Specifications
Midwest Generation – Powerton Power Station

	Submittal	From	To	Time Frame	Reviewer	Technical Specification	
						Section	**Part**
1	Subcontractor List	Contractor	Owner and/or Engineer	**With bid documents**	Owner		
2	Baseline Construction Schedule	Contractor	Owner and/or Engineer	**With bid documents** and update within 10 calendar days of the date of the Contract award	Owner and/or Engineer		
3	Name and Location of Recycling / Disposal Facility	Contractor	Owner and/or Engineer	**With bid documents**	Owner and/or Engineer	02300	1.06B
4	Leak Location Contractor's Work Plan	Contractor	Owner and/or Engineer	**With bid documents**	Owner and/or Engineer	02600	1.05B
5	Supplier and Location of Cushion Material Source	Contractor	Owner and/or Engineer	**With bid documents**	Owner and/or Engineer	02300	1.06C
6	Cushion Material Grain Size Distribution Test Results	Contractor	Owner and/or Engineer	**With bid documents**	Owner and/or Engineer	02300	1.06E
7	Construction Start Date	Contractor	Owner and/or Engineer	5 Working days prior to construction start	Owner and/or Engineer	02300	1.06D
8	IEPA Water Pollution Control Construciton Permit	Owner through Engineer	Contractor	Prior to project start	Contractor		
9	General Permit for Storm Water Discharges from Construction Site Activities	Owner through Engineer	Contractor	Prior to project start	Contractor		
10	Site Superintendant/Foreman's Name & Phone Number	Contractor	Owner and/or Engineer	Prior to project start	Owner and/or Engineer		
11	Location of Off-site Fill Material Sources	Contractor	Owner and/or Engineer	Prior to project start	Owner and/or Engineer	02300	1.06C
12	Off-site Fill Material Certificates/Test Results	Contractor	Owner and/or Engineer	Prior to project start	Owner and/or Engineer	02300	1.06E
13	Laboratory Test Results - Excavated Bank Soils	Contractor	Owner and/or Engineer	14 days prior to start of bank reconstruction	Owner and/or Engineer	02300	1.06F

Table 2 - List of Submittals
Bypass Basin Liner Replacement Specifications
Midwest Generation – Powerton Power Station

	Submittal	From	To	Time Frame	Reviewer	Technical Specification	
						Section	Part
14	Resin Supplier, Address, Brand Name, Product Number, and Test Results	Contractor	Owner and/or Engineer	Prior to project start	Owner and/or Engineer	02600	1.05A1
15	Geomembrane Installer's Personnel and Information	Contractor	Owner and/or Engineer	Prior to project start	Owner and/or Engineer	02600	1.05A5 & A6
16	Geomembrane Panel Layout Drawing	Contractor	Owner and/or Engineer	Prior to project start	Owner and/or Engineer	02600	1.05A7
17	Cushion Material Representative Sample	Contractor	Owner and/or Engineer	Two weeks prior to delivery	Owner and/or Engineer	02300	2.03
18	Warning Layer Representative Sample	Contractor	Owner and/or Engineer	Two weeks prior to delivery	Owner and/or Engineer	02300	2.04
19	Field Test Results	Contractor and/or Field Technician	Engineer	Within 24 hours of test completion	Engineer	02300	1.06G
20	Geomembrane Manufacture's Certification-PGI Standards	Contractor	Owner and/or Engineer	5 working days prior to delivery to site	Owner and/or Engineer	02600	1.05A2
21	Geotextile Manufacture's Certification	Contractor	Owner and/or Engineer	5 working days prior to delivery to site	Owner and/or Engineer	02600	1.05A4
22	Geomembrane Manufacturer's Certification - Production Information includes QC Plan	Contractor	Owner and/or Engineer	5 working days prior to delivery to site	Owner and/or Engineer	02600	1.05A3
23	Seed mix and application rate	Contractor	Owner and/or Engineer	5 days prior to delivery to site	Owner and/or Engineer	02930	1.03
24	Geomembrane Installer's Daily Logs and Quality Control Documentation	Contractor	Owner and/or Engineer	During geomembrane installation	Owner and/or Engineer	02600	1.05C1
25	Geomembrane Installer's Subgrade Acceptance	Contractor	Owner and/or Engineer	Each day prior to geomembrane installation	Owner and/or Engineer	02600	1.05C2 3.02A

Table 2 - List of Submittals
Bypass Basin Liner Replacement Specifications
Midwest Generation – Powerton Power Station

	Submittal	From	To	Time Frame	Reviewer	Technical Specification	
						Section	Part
26	Geomembrane Installation Certificate, As-Builts, and Warranties	Contractor	Owner and/or Engineer	Within 10 working days of geomembrane installation completion	Owner and/or Engineer	02600	1.05D
27	Written Certification for Project	Contractor	Owner and/or Engineer	Upon completion of work	Owner and/or Engineer	01700	1.03B & C
28	Conditional and/or Final Geomembrane Installation Acceptance	Owner and/or Engineer	Contractor	Upon completion of geomembrane installation and submittals	Contractor	2600	1.05F
29	Record Documents	Contractor	Owner and/or Engineer	Prior to submittal of final invoice	Owner and/or Engineer	01700	1.04
30	Survey Data	Contractor	Owner and/or Engineer	Within 4 days following completion of survey	Owner and/or Engineer	01050	1.05
31	Final Leak Location Survey Report	Contractor	Owner and/or Engineer	Within 14 days following completion of leak location survey	Owner and/or Engineer	02600	1.05G

ATTACHMENT A1

WARNING LAYER AND CUSHION LAYER GRADATION REPORTS

ILLINOIS DEPARTMENT OF TRANSPORTATION

MISTIC ID

AGGREGATE GRADATION REPORT

FA-6 - Cushion Layer

Inspector No.: 940000000	Insp. Name: Sara Kacir	Date Sampled: 10/14/2010		Sequence No.: 4	
Mix Plant No.:	Mix Plant:				
Resp. Loc.: 94	Contract No.:	Job Number:		Source Name:	Cam Scharf Materials
Lab: PP	Lab Name: Scharf			Source Location:	Pekin, IL

Source Number	Material Code	Type Insp.	Original Test ID	Spec.	Article	Sampled From	Wash Dry
51790-39	016FA06 Gradation #1	PRO		Standard		SP	W

CA	3	2.5	2	1.75	1.5	1	3/4	5/8	1/2	3/8	1/4	#4	#8	#16	#30	#40	#50	#100	#200
Percent Passing						100			100	100		93	71	48	30		17	12	9.8

Wash 200	Test Results	Remarks
8.7	APPR	

Sieve (English)	12" Overload	Individual Weight Retained	Cumul. Weight Retained	Cumul. Percent Retained	Percent Passing	Spec. Range % Pass	In/Out	Overload
3	12600							
2.5	10600							
2	8400							
1.75	7500							
1.5	6300							
1	4200	0.0	0.0	0.0	100.0	100		
3/4	3200							
5/8	2700							
1/2	2100	0.0	0.0	0.0	100.0			
3/8	1600	1.0	1.0	0.1	99.9			
1/4	1100							
#4	800	49.0	50.0	6.9	93.1	50-100		
#8	470	159.5	209.5	29.1	70.9			
#16	470	168.8	378.3	52.5	47.5			
#30	470	126.4	504.7	70.1	29.9			
#40	470							
#50	470	95.4	600.1	83.4	16.6			
#100	470	33.1	633.2	88.0	12.0	0-40		
#200	470	16.2	649.4	90.2	9.8	0-12		
Pan		7.3	656.7					
Total Dry Weight:		719.9						
Total Washed Weight:		657.3						
Diff. (-#200):		62.6						

Master Band Target: #N/A

Orig. Wet Weight: grams | Moisture %:

Plasticity Index Ratio (#200/#40):
Plasticity Index Test Results:

% Washed - #200: 8.7

Mix Plant Only
Lot:
Bin:

Authorized By: Sara Kacir

Tested By: Sara Kacir

Agency/Company: Cam Scharf Materials

Copies to: Materials Inspector
District Materials
Producer

Validity Check OK
/FOR DTY03504
MI504QC
(This is a Field/Laboratory Report for MISTIC Input)

Signature

Date

ILLINOIS DEPARTMENT OF TRANSPORTATION

AGGREGATE GRADATION REPORT

MISTIC ID

Inspector No.:	930000000	Insp. Name:	JOSH RICH	Date Sampled:	4/23/2010	Sequence No.:	
Mix Plant No.:		Mix Plant:					
Resp. Loc.:	93	Contract No.:		Job Number:		Source Name:	Prairie Material
Lab:	PP	Lab Name:	Prairie			Source Location:	Ocoya, IL

Source Number	Material Code	Type Insp.	Original Test ID	Spec.	Article	Sampled From	Wash Dry	
51052-09	042CM06 Gradation #1	PRO		Standard		SP	W	

CA	3	2.5	2	1.75	1.5	1	3/4	5/8	1/2	3/8	1/4	#4	#8	#16	#30	#40	#50	#100	#200
Percent Passing					100	100	97	87	75	58	54	47	31	22		15			10.1

Wash 200	Test Results	Remarks	
8.5	APPR		overloads, if any, were split and hand-shaken.. JER

Sieve (English)	12" Overload	Individual Weight Retained	Cumul. Weight Retained	Cumul. Percent Retained	Percent Passing	Spec. Range % Pass	In/Out	Overload
3	12600							
2.5	10600							
2	8400							
1.75	7500							
1.5	6300	0.0	0.0	0.0	100.0	100		
1	4200	0.0	0.0	0.0	100.0	90-100		
3/4	3200	151.0	151.0	3.2	96.8			
5/8	2700	455.0	606.0	13.0	87.0			
1/2	2100	559.0	1165.0	24.9	75.1	60-90		
3/8	1600	811.0	1976.0	42.3	57.7			
1/4	1100	181.0	2157.0	46.2	53.8			
#4	800	331.0	2488.0	53.3	46.7	30-56		
#8	470	755.0	3243.0	69.4	30.6			OVERLOAD
#16	470	411.0	3654.0	78.2	21.8	10-40		
#30	470							
#40	470	300.0	3954.0	84.6	15.4			
#50	470							
#100	470							
#200	470	244.0	4198.0	89.9	10.1	4-12		
Pan		72.0	4270.0					
Total Dry Weight:		4671.0						
Total Washed Weight:		4272.0						
Diff. (-#200):		399.0						

Master Band Target: N/A

Orig. Wet Weight: grams | Moisture %:

Plasticity Index Ratio (#200/#40): 0.66
Plasticity Index Test Results:

% Washed - #200: 8.5

Mix Plant Only
Lot:
Bin:

Authorized By: Josh Rich
Tested By: Josh Rich
Agency/Company: Prairie Group

Copies to: Materials Inspector
District Materials
Producer

Validity Check OK
/FOR DTY03504
MI504QC
(This is a Field/Laboratory Report for MISTIC Input)

josh rich
Signature

23-Apr
Date

ATTACHMENT A2

GEOMEMBRANE RESIN TEST RESULTS

Appendix A: Minimum Testing Frequencies and Properties for GSE Raw Materials

TABLE 1. MINIMUM TESTING FREQUENCIES

Property	Test Method[1]	Natural Resin
Density	ASTM D 1505	once per rail car compartment
Melt Flow Index	ASTM D 1238 (190/2.16)	once per rail car compartment
OIT	ASTM D 3895 (1 ATM at 200° C)	once per resin lot[2]
Carbon Black Content	ASTM D 1603, modified	N/A
Carbon Black Dispersion	ASTM D 5996	NA

NOTES:

[1]GSE utilizes test equipment and procedures that enable effective and economical confirmation that the product will conform to specifications based on the noted procedures. Some test procedures have been modified for application to geosynthetics. All procedures and values are subject to change without prior notification.

[2]OIT for LLDPE/VFPE resin is performed on a representative finished product for each lot of resin rather than on the natural (without carbon black) resin.

TABLE 2. MINIMUM PROPERTIES FOR GSE RAW MATERIALS

Property	Test Method[1]	HDPE	LLDPE/VFPE
Density [g/cm³]	ASTM D 1505	0.932	0.915
Melt Flow Index [g/10 min]	ASTM D 1238 (190/2.16)	≤ 1.0	≤ 1.0
OIT [minutes]	ASTM D 3895 (1 ATM at 200° C)	100	100[2]

NOTES:

[1]GSE utilizes test equipment and procedures that enable effective and economical confirmation that the product will conform to specifications based on the noted procedures. Some test procedures have been modified for application to geosynthetics. All procedures and values are subject to change without prior notification.

[2]OIT for LLDPE/VFPE resin is performed on a representative finished product for each lot of resin rather than on the natural (without carbon black) resin.

MQA GEO R01/18/10

Chevron Phillips Chemical Company LP

Certificate of Analysis

Shipped To: CHEVRON PHILLIPS CHEM. CO LP: GSE
19103 GUNDLE ROAD
WESTFIELD TX 77090
USA

Recipient: UP TRACK 14732 Phouangsavanh
Fax:

CPC Delivery #: 87945749
PO #: 46822
Weight: 188300 LB
Ship Date: 10/27/2009
Package: BULK
Mode: Hopper Car
Car #: GOCX058228
Seal No: 270565

Product:
MARLEX POLYETHYLENE K306 BULK

Lot Number: 8290673

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.1	g/10mi
HLMI Flow Rate	ASTM D1238	12.1	g/10mi
Density	D1505 or D4883	0.937	g/cm3
Production Date		09/01/2009	

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP.
However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.

Troy Griffin
Troy Griffin
Quality Systems Coordinator

For CoA questions contact Customer Service Representative at 800-231-1212

Certificate of Analysis

Shipped To: CHEVRON PHILLIPS CHEM. CO LP: GSE
19103 GUNDLE ROAD
WESTFIELD TX 77090
USA

Recipient: UP TRACK 14732 Phouangsavanh
Fax:

CPC Delivery #: 87945750
PO #: 46822
Weight: 190000 LB
Ship Date: 10/27/2009
Package: BULK
Mode: Hopper Car
Car #: PSPX002022
Seal No: 270697

Product:
MARLEX POLYETHYLENE K306 BULK

Lot Number: 8290674

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.1	g/10mi
HLMI Flow Rate	ASTM D1238	12.0	g/10mi
Density	D1505 or D4883	0.937	g/cm3
Production Date		09/01/2009	

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP.
However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.

Troy Griffin
Quality Systems Coordinator

For CoA questions contact Customer Service Representative at 800-231-1212

ATTACHMENT A3

REINFORCEMENT STEEL SHOP DRAWINGS

OTTO BAUM COMPANY, INC.
CONTRACTORS

866 N. Main Street / PO Box 161
Morton, IL 61550-0161
(309) 266-7114
FAX (309) 263-1050

LETTER OF TRANSMITTAL

Date: **10/21/10**

TO: **Midwest Generation LLC, Powerton Station**
13082 E Manito Rd
Pekin, IL 61554-8527

RE: **Install Metal Claning Basin Liner**
PO No. 4500067825
OBCI Proj. #10-211

ATTN: **Mark Kelly** **309.477.5240** **fax 312.788.5215**

WE ARE SENDING YOU:

- [ ] plans
- [ ] specifications
- [ ] shop drawings
- [ ] addendum
- [X] submittal
- [ ] other ______
- [ ] via regular mail
- [ ] via overnight

Copies	Date	No,	Description
1			**Weir Extension Rebar**

THESE ARE TRANSMITTED as checked below:

- [X] for approval
- [ ] for your use
- [ ] as requested
- [ ] for review and comment
- [ ] for pricing
- [ ] approval as submitted
- [ ] approved as noted
- [ ] returned as noted
- [ ] resubmit with corrections
- [ ] other ______

REMARKS:

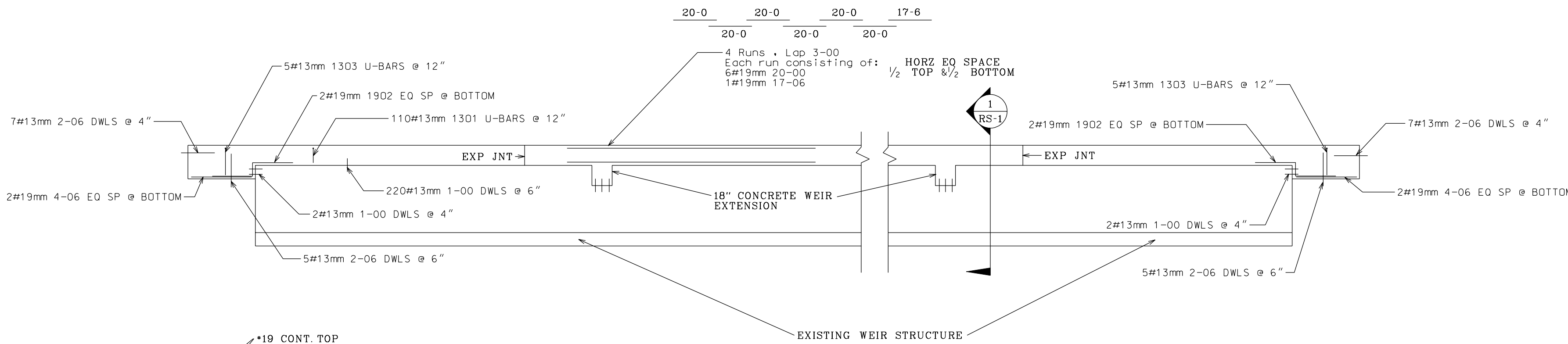
cc:

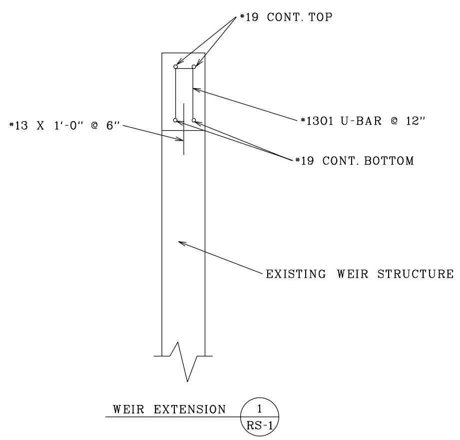
Craig Holthaus

Install Metal Claning Basin Liner
PO No. 4500067825
OBCI Proj. #10-211

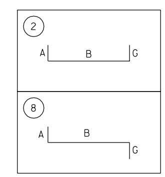
Material	**Weir Extension Rebar**
Spec. Section	03300
Submittal No.	3
Prev. Submittal No.	
Manufacturer	**Mathis Kelly**
Supplier	**Mathis Kelly**

REVIEWED
By Craig Holthaus at 9:19 am, Oct 21, 2010





SIZE	EP	BAR MARK	V	BND TYP	CD	A	B	C	D	E	F/R	G	H	J	K	O
#19mm		1902		8		3-00	1-00					3-00				
#13mm		1301		2		0-112	0-04					0-112				
#13mm		1303		2		1-112	0-04					1-112				



REBAR SIZE CONVERSION TABLE

SOFT METRIC	INCH-POUND SYSTEM
*10	*3
*13	*4
*16	*5
*19	*6
*22	*7
*25	*8
*29	*9

* This Drawing Is In Soft Metric *

BAR LENGTH DIMENSION CONVERSION TABLE

EXAMPLE:

5-05 = 5'-5"
5-051 = 5'-5¼"
5-052 = 5'-5½"
5-053 = 5'-5¾"

REINFORCING STEEL FOR:
WEIR EXTENSION

REINFORCING BAR FABRICATORS
SINCE 1972

MATHIS - KELLEY
CONSTRUCTION SUPPLY COMPANY
P.O. BOX 5138 1046 W. JEFFERSON
MORTON, IL 61550
TELEPHONE: (309) 266-9733

CONTRACTOR: OTTO BAUM

PROJECT: MIDWEST GENERATION

SCALE: N/A
DRAWN BY: BAM
DATE: 10-18-10
REVISED:
DATE:
DRAWING NUMBER
RS-1

ATTACHMENT A4

CONCRETE ACCESSORIES AND ADMIXTURE MANUFACTURER’S CERTIFICATE AND LITERATURE

OTTO BAUM COMPANY, INC.
CONTRACTORS

866 N. Main Street / PO Box 161
Morton, IL 61550-0161
(309) 266-7114
FAX (309) 263-1050

LETTER OF TRANSMITTAL

Date: **10/15/10**

TO: **Midwest Generation LLC, Powerton Station**
13082 E Manito Rd
Pekin, IL 61554-8527

RE: **Install Metal Claning Basin Liner**
PO No. 4500067825
OBCI Proj. #10-211

ATTN: **Mark Kelly** **309.477.5240** **fax 312.788.5215**

WE ARE SENDING YOU:

- [ ] plans
- [ ] specifications
- [ ] shop drawings
- [ ] addendum
- [X] submittal
- [ ] other ____________
- [ ] via regular mail
- [ ] via overnight

Copies	Date	No,	Description
1			3,000 PSI Concrete Mix Design (Inlet Aprons)
1			4,000 PSI Concrete Mix Design (Weir Extensions)

THESE ARE TRANSMITTED as checked below:

- [X] for approval
- [ ] for your use
- [ ] as requested
- [ ] for review and comment
- [ ] for pricing
- [ ] approval as submitted
- [ ] approved as noted
- [ ] returned as noted
- [ ] resubmit with corrections
- [ ] other ____________

REMARKS:

cc:

Craig Holthaus

Install Metal Claning Basin Liner
PO No. 4500067825
OBCI Proj. #10-211

Material	**3,000 PSI Mix Design**
Spec. Section	03300
Submittal No.	1
Prev. Submittal No.	
Manufacturer	**Roanoke Concrete Products**
Supplier	**Roanoke Concrete Products**

REVIEWED
By Craig Holthaus at 1:27 pm, Oct 15, 2010

Roanoke Concrete Products - Mix Design

(For 3/8", 1/2", 3/4", 1", and 1 1/2" maximum size aggregate, 1" to 7" slumps)

RCW3020 - 3000 PSI White Rock

Input:

Mix Performance Requirements		
Strength Req., f'c	3000 PSI	
Min.Cementitious Content	423 lbs. per cy	
Max. W/C Ratio	0.45 Will calculate cementitious based on W/C ratio if W/C > 0	
Theoretical Initial Water Content (Calculated from ACI Table)	295 lbs. per cy	35.4 Gals./cy
User Inputed Water Content (Overides water from ACI table if >0)	190 lbs. per cy (Final SSD Water Content If > 0)	22.8 Gals./cy
Total Cementitious Content	423 lbs. per cy	
Desired Yield	27.10 cu. ft.	
Slump (whole numbers only)	4.00 in.	
Target Air Content	5.00 %	

Input:

Fine Aggregate		Coarse Aggregate		Aggregate #3	
Peoria Concrete Sand		Mining International CM11		Peoria Concrete Gravel	
FM	2.80	Nom Max. Size	1 in.	Nom Max. Size	3/8 in.
Sp. Gravity (SSD)	2.67	Sp. Gravity(SSD)	2.65	Sp. Gravity(SSD)	2.61
		Unit Wt. * (Dry Rodded)	100.0 pcf Req'd to use ACI table	SSD Wt.	0 #/cy
		Absorption *	0.75 %	Req'd unless user Inputs coarse wt.	
* Coarse agg. dry rodded unit wt. and absorption is required if coarse aggregate wt. is to be calculated from the ACI aggregate table.		Workability Adjustment	0.0 %	Coarse aggregate content from ACI aggregate table reduced	
		User Inputed SSD Coarse Agg	1790 #/cy	If > 0, over-rides coarse agg. content from ACI aggregate table	

Input:

Cementitious				
Material	Source / Description	Sp. Gravity	Replacement %	Replacement lb.
Cement	Illinois Cement Type I Portland	3.15		
Cementitious #1	Headwaters Class C Fly Ash	2.68	15.0	63
Cementitious #2		2.88		0
		Total Replacement	15.0	63
Water Reduction due to pozzolan	0.0 gals./cy	Total Cementitious = 423 lb. (360+63)		
(Water reduced only if intitial water content from ACI table is used, no effect if user imputs SSD water content)				

Input:

Admixtures		
Material	Source / Description	Dosage
Water Reducer	Mira 110 Water Reducer	3.00 oz./cwt.
Superplasticizer	Daracem 19 Superplasticizer	As Required for slump oz./cwt.
Admix #3		0.00 oz./cwt.
Admix #4		0.00 oz./cwt.
Air-Entraining Agent	Daravair 1400 Air entrainment	0.71 oz./cwt.
(Zero or leave blank Air dose oz /cwt to list "As Required" on SSD mix design)		3.00 oz./cu. yd.
Water Reduction due to Admixtures (Water reduced only If intitial water content from ACI table is used)		0.00 %

RCW3020 - 3000 PSI White Rock

SSD Weights per Cubic Yard				
Materials	Sp. Gravity	Weight	Abs. Vol. Ft.^{3}	% of Total Cementitious
Illinois Cement Type I Portland	3.15	360 lbs.	1.83	
Headwaters Class C Fly Ash	2.68	63 lbs.	0.38	15.0
Cementitious #2	2.88	0 lbs.	0.00	0.0
Mining International CM11	2.65	1790 lbs.	10.82	-
Peoria Concrete Gravel	2.61	0 lbs.	0.00	-
Peoria Concrete Sand	2.67	1611 lbs.	9.67	-
Total Water	1.00	190 lbs.	3.04	-
Daravair 1400 Air entrainment	-	3.0 oz.	1.36	-
Mira 110 Water Reducer	-	12.7 oz.	-	-
Daracem 19 Superplasticizer	-	#VALUE! oz.	-	-
Admix #3	-	-	-	-
Admix #4	-	-	-	-
			27.10	

Design Strength	**3000 PSI**
Total Cementitious	**423 lb.**
Water/Cementitious Ratio	**0.449**
Target Slump	**4.00 in.**
Target Air Content	**5.00 %**
% Fine Aggregate to Total Aggregate, by volume	**47.17 %**
Theoretical Unit Weight	**148.10 pcf**
Yield	**27.10 cu. ft.**

Actual Batch Weights Per Cubic Yard	
Surface Moisture Content of Coarse Agg.	1.0 %
Surface Moisture Content of Intermediate Agg.	1.0 %
Surface Moisture Content of Fine Agg.	3.5 %
Illinois Cement Type I Portland	360 lbs.
Headwaters Class C Fly Ash	63 lbs.
Cementitious #2	0
Mining International CM11	1808 lbs.
Peoria Concrete Gravel	0 lbs.
Peoria Concrete Sand	1667 lbs.
Total Water	13.9 Gals.
Daravair 1400 Air entrainment	3.0 oz.
Mira 110 Water Reducer	12.7 oz.
Daracem 19 Superplasticizer	#VALUE! oz.
Admix #3	-
Admix #4	-

Note: This is a theoretical mix design based on data generated by ACI for average material properties Actual material properties may vary, and it is therefore essential that the performance criteria of this mix design be checked by trial mixes.

Slump, in.	Water, lbs. per cy for indicated max. sizes of agg.				
	3/8	1/2	3/4	1	1 1/2
	Non Air-Entrained Concrete				
1	345	330	310	295	270
2	350	335	315	300	275
3	367	350	323	312	287
4	385	365	340	325	300
5	393	371	347	330	305
6	401	378	354	335	310
7	410	385	360	340	315
Slump, in.	Air-Entrained Concrete				
1	300	290	275	265	245
2	305	295	280	270	250
3	322	310	292	282	262
4	340	325	305	295	275
5	348	332	312	300	280
6	356	339	319	305	285
7	365	345	325	310	290

Max. Size	Ratio	Entrapped/ Entrained Air	
3/8	0	0.0	
1/2	0	0.0	
3/4	0	0.0	
1	0.67	5.0	
1 1/2	0	0.0	
	0.670	5.0	%

3/8	1/2	3/4	1	1 1/2
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	295	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

Total Water Content:	295	lbs. per cy

Default Water Content	190	lbs. per cy

Install Metal Claning Basin Liner
PO No. 4500067825
OBCI Proj. #10-211

Material	**4,000 PSI Mix Design**
Spec. Section	03300
Submittal No.	2
Prev. Submittal No.	
Manufacturer	**Roanoke Concrete Products**
Supplier	**Roanoke Concrete Products**

REVIEWED
By Craig Holthaus at 1:27 pm, Oct 15, 2010

Roanoke Concrete Products - Mix Design

(For 3/8", 1/2", 3/4", 1", and 1 1/2" maximum size aggregate, 1" to 7" slumps)

RCW4020 - 4000 psi CONC WHITE ROCK

Input:

Mix Performance Requirements		
Strength Req., f'c	4000 PSI	
Min.Cementitious Content	517 lbs. per cy	
Max. W/C Ratio	0.45 Will calculate cementitious based on W/C ratio if W/C > 0	
Theoretical Initial Water Content (Calculated from ACI Table)	295 lbs. per cy	35.4 Gals./cy
User Inputed Water Content (Overides water from ACI table if >0)	232 lbs. per cy (Final SSD Water Content if > 0)	27.9 Gals./cy
Total Cementitious Content	517 lbs. per cy	
Desired Yield	27.00 cu. ft.	
Slump (whole numbers only)	4.00 in.	
Target Air Content	5.00 %	

Input:

Fine Aggregate		Coarse Aggregate		Aggregate #3	
Peoria Concrete Sand .27asr		Mining International CM11			
FM	2.80	Nom Max. Size	1 in.	Nom Max. Size	0 in.
Sp. Gravity (SSD)	2.64	Sp. Gravity(SSD)	2.65	Sp. Gravity(SSD)	2.65
		Unit Wt. * (Dry Rodded)	100.0 pcf Req'd to use ACI table	SSD Wt.	0 #/cy
		Absorption *	0.75 %	Req'd unless user inputs coarse wt.	
* Coarse agg. dry rodded unit wt. and absorption is required if coarse aggregate wt. is to be calculated from the ACI aggregate table.		Workability Adjustment	0.0 %	Coarse aggregate content from ACI aggregate table reduced	
		User Inputed SSD Coarse Agg	1750 #/cy	If > 0, over-rides coarse agg. content from ACI aggregate table	

Input:

Cementitious				
Material	Source / Description	Sp. Gravity	Replacement %	Replacement lb.
Cement	Illinois Cement Type I Portland	3.15		
Cementitious #1	Class C Fly Ash	2.68	15.0	78
Cementitious #2				0
		Total Replacement	15.0	78
Water Reduction due to pozzolan	0.0 gals./cy	Total Cementitious = 517 lb. (439+78)		
(Water reduced only if intitial water content from ACI table is used, no effect if user imputs SSD water content)				

Input:

Admixtures		
Material	Source / Description	Dosage
Water Reducer	Mira 110 Water Reducer	3.50 oz./cwt.
Superplasticizer	Daracem 19 Superplasticizer	As Required oz./cwt.
Admix #3		0.00 oz./cwt.
Admix #4		0.00 oz./cwt.
Air-Entraining Agent	Daravair 1400 Air entrainment	0.78 oz./cwt.
(Zero or leave blank Air dose oz /cwt to list "As Required" on SSD mix design)		4.03 oz./cu. yd.
Water Reduction due to Admixtures (Water reduced only if intitial water content from ACI table is used)		0.00 %

RCW4020 - 4000 psi CONC WHITE ROCK

SSD Weights per Cubic Yard				
Materials	Sp. Gravity	Weight	Abs. Vol. Ft.^{3}	% of Total Cementitious
Illinois Cement Type I Portland	3.15	439 lbs.	2.23	
Class C Fly Ash	2.68	78 lbs.	0.47	15.0
Cementitious #2	0.00	0 lbs.	0.00	0.0
Mining International CM11	2.65	1750 lbs.	10.58	-
Aggregate #3	2.65	0 lbs.	0.00	-
Peoria Concrete Sand .27asr	2.64	1425 lbs.	8.65	-
Total Water	1.00	232 lbs.	3.72	-
Daravair 1400 Air entrainment	-	4.0 oz.	1.35	-
Mira 110 Water Reducer	-	18.1 oz.	-	-
Daracem 19 Superplasticizer	-	#VALUE! oz.	-	-
Admix #3	-	-	-	-
Admix #4	-	-	-	-
			27.00	

Design Strength	**4000 PSI**
Total Cementitious	**517 lb.**
Water/Cementitious Ratio	**0.449**
Target Slump	**4.00 in.**
Target Air Content	**5.00 %**
% Fine Aggregate to Total Aggregate, by volume	**44.97 %**
Theoretical Unit Weight	**145.33 pcf**
Yield	**27.00 cu. ft.**

Actual Batch Weights Per Cubic Yard	
Surface Moisture Content of Coarse Agg.	1.0 %
Surface Moisture Content of Intermediate Agg.	1.0 %
Surface Moisture Content of Fine Agg.	3.5 %
Illinois Cement Type I Portland	439 lbs.
Class C Fly Ash	78 lbs.
Cementitious #2	0
Mining International CM11	1768 lbs.
Aggregate #3	0 lbs.
Peoria Concrete Sand .27asr	1475 lbs.
Total Water	19.8 Gals.
Daravair 1400 Air entrainment	4.0 oz.
Mira 110 Water Reducer	18.1 oz.
Daracem 19 Superplasticizer	#VALUE! oz.
Admix #3	-
Admix #4	-

Note: This is a theoretical mix design based on data generated by ACI for average material properties Actual material properties may vary, and it is therefore essential that the performance criteria of this mix design be checked by trial mixes.

Slump, in.	Water, lbs. per cy for indicated max. sizes of agg.				
	3/8	1/2	3/4	1	1 1/2
	Non Air-Entrained Concrete				
1	345	330	310	295	270
2	350	335	315	300	275
3	367	350	323	312	287
4	385	365	340	325	300
5	393	371	347	330	305
6	401	378	354	335	310
7	410	385	360	340	315
Slump, in.	Air-Entrained Concrete				
1	300	290	275	265	245
2	305	295	280	270	250
3	322	310	292	282	262
4	340	325	305	295	275
5	348	332	312	300	280
6	356	339	319	305	285
7	365	345	325	310	290

Max. Size	Ratio	Entrapped/ Entrained Air	
3/8	0	0.0	
1/2	0	0.0	
3/4	0	0.0	
1	0.67	5.0	
1 1/2	0	0.0	
	0.670	5.0	%

3/8	1/2	3/4	1	1 1/2
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	295	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

Total Water Content:	295	lbs. per cy
Default Water Content	232	lbs. per cy

ATTACHMENT A5

CONCRETE QUALITY CONTROL TESTS

TELEPHONE
309-673-2131

TESTS * INVESTIGATIONS
ANALYSIS * DESIGN * EVALUATIONS
CONSULTATION * REPORTS * INSPECTIONS
ARBITRATION * EXPERT WITNESS TESTIMONY

SOILS * PORTLAND CEMENT CONCRETE
BITUMINOUS CONCRETE * STEEL
ASPHALT * AGGREGATES * EMULSIONS
POZOLANIC MATERIALS * LIME

GEOTECHNICAL ENGINEERING MATERIALS TESTING

WHITNEY & ASSOCIATES
INCORPORATED

2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604

TELEFAX
309-673-3050

GEOTECHNICAL ENGINEERING
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ENVIROMENTAL INVESTIGATIONS

MONITORING WELL INSTALLATIONS
BUILT-UP ROOF INVESTIGATIONS
WELDER CERTIFICATIONS
INSURANCE INVESTIGATIONS

CLIENT:
Mr. Craig Holthaus
Otto Baum Company, Inc.
P. O. Box 161
Morton, Illinois 61550

W. & A. FILE NO 5486001
DATE 11/05/10
SHEET 1 OF 1

PROJECT:
Midwest Generation Powerton Station
Metal Cleaning Basin Liner Replacement
Pekin, Illinois

REPORT OF OBSERVATIONS AND TESTS OF CONCRETE

CONCRETE BATCH PLANT Roanoke Concrete **CONCRETE OBSERVER** Armstrong

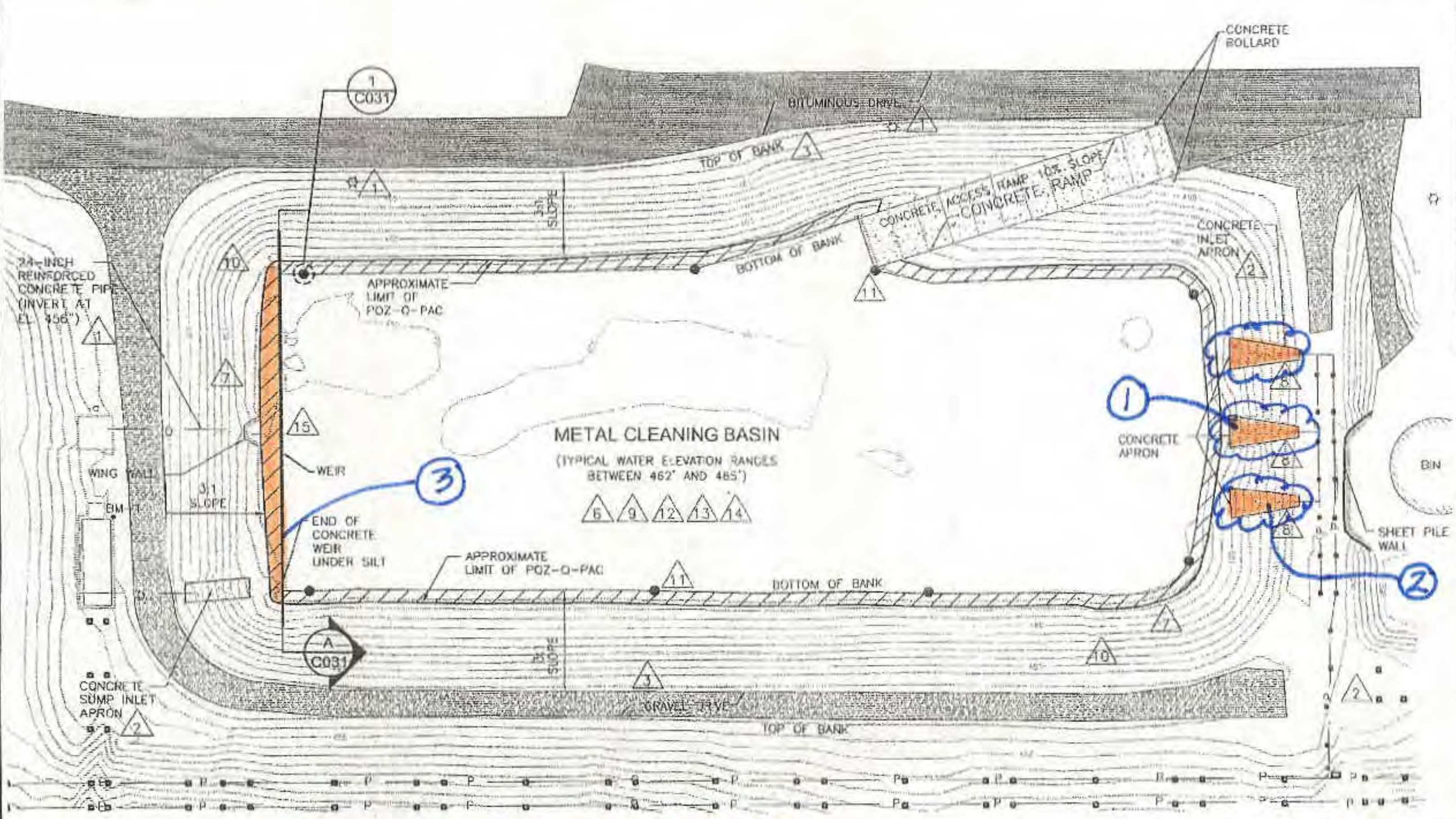
DATE	CONCRETE SUPPLIER TICKET NUMBER	TIME TRUCK DISPATCHED	TIME TRUCK UNLOADED	YARDS OF CONCRETE	SLUMP - IN	AIR CONTENT - %	CONCRETE TEMP - °F	AIR TEMP - °F	MIX DESIGN NO.	CONCRETE TYPE
11/05/10	2007042	9:03	9:53	9.00	3.75	5.6	68	33	3000#	Stone
11/05/10	2007043	9:24	10:27	9.00	3.00	--	69	34	3000#	Stone
11/05/10	2007044 *	9:36	11:16	9.00	2.50	--	67	37	3000#	Stone
11/05/10	2007045	10:38	11:38	9.00	3.00	--	68	38	3000#	Stone
11/05/10	2007047	11:25	12:14	9.00	--	5.2	67	40	3000#	Stone
11/05/10	2007048	11:50	12:42	9.00	3.50	--	62	41	3000#	Stone
11/05/10	2007049 *	12:54	1:14	4.50	4.00	--	71	42	3000#	Stone
11/05/10	2007050 *	12:59	2:09	9.00	5.00	--	70	43	4000#	Stone

DATE	MIX DESIGN NO.	LOCATIONS OF POURS
11/05/10	3000#	Ticket No. 2007044 - Pavement for spillway aprons on the south side of the metal cleaning
		basin - north end of the center apron
11/05/10	3000#	Ticket No. 2007049 - Pavement for spillway aprons on the south side of the metal cleaning
		basin - center of the west apron
11/05/10	4000#	Ticket No. 2007050 - Weir at the north end of the metal cleaning basin - west end of the
		pour

* CONCRETE CYLINDERS WERE MOLDED FROM THIS TRUCK LOAD.

REMARKS:
The locations of the concrete pours are also shown on the attached plan sheet. All tests were performed and cylinders were molded at the hopper end of the pump truck.

DISTRIBUTION :



LEGEND

- UNDERGROUND DISCHARGE PIPE
- ABOVEGROUND PIPE RACK
- LIGHT POLE
- 400 EXISTING GROUND SURFACE CONTOUR
- MARKER POST LOCATION
- POZ-O-PAC REMOVAL AREA

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. 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 TO REMAIN IN PLACE 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. CONTRACTOR SHALL REMOVE AN ADDITIONAL 6 INCHES OF SUBGRADE MATERIAL LOCATED BETWEEN THE WEIR AND THE WING WALL ALONG THE NORTH BOTTOM OF BANK, AS SHOWN ON SECTION B, SHEET C031.
8. CONTRACTOR SHALL REMOVE INLET APRONS AND HAUL MATERIAL TO RECYCLING FACILITY.
9. CONTRACTOR SHALL REMOVE ALL VEGETATION, ROCKS, AND OTHER DEBRIS FROM EXISTING LINER AND DISPOSE OF IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
10. CONTRACTOR SHALL REMOVE "SOFT" SUBGRADE MATERIAL BENEATH EXISTING HYPALON LINER, AS DIRECTED BY OWNER AND/OR ENGINEER. BACKFILL AREAS WITH FILL IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS. CUT HYPALON LINER AS NEEDED TO REPAIR THE "SOFT" SUBGRADE AREAS.
11. 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.
12. SUBGRADE MUST BE APPROVED BY OWNER AND/OR ENGINEER PRIOR TO INSTALLATION OF GEOMEMBRANE.
13. CONTRACTOR SHALL PLACE 16 OZ. NONWOVEN GEOTEXTILE OVER THE SUBGRADE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
14. 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.
15. CONTRACTOR SHALL EXTEND CONCRETE WEIR UP BY 18" IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS AND SECTION A ON SHEET C031.

0 10 20 40
SCALE IN FEET

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

VERTICAL DATUM:
LOCAL PLANT DATUM

BENCHMARK-1:
SE CORNER TOP CONCRETE WALL
ELEVATION = 468.09 FT.

SOURCE NOTES:

THIS DRAWING WAS DEVELOPED FROM A SURVEY BY MAURER-STUTZ, INC. DATED 10/20/09, DRAWING NO. 23209009.

LOCATION OF EXISTING LINER TAKEN FROM MIDWEST GENERATION DRAWING NO. 5060 C5008, DATED 12-19-1978.

CONCRETE FOR THE WEIR

CONCRETE FOR THE SLOPED APRONS

11-5-10

6.			
5.			
4.			
3.			
2.	ISSUED FOR CONSTRUCTION	10/22/10	HMS
1.	ISSUED FOR BID	10/05/09	HMS
0.	ISSUED FOR PERMIT	07/27/09	HMS
REVISION:		DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1065/1.0
DRAWN BY: 08/25/09
CHECKED BY: AJG 10/05/09
APPROVED BY: HMS 10/05/09
DRAWING NO: 01065C020-02
REFERENCE:

LINER SUBGRADE PREPARATION

METAL CLEANING BASIN LINER REPLACEMENT
MIDWEST GENERATION
POWERTON POWER STATION
PEKIN, ILLINOIS

SHEET NO. C020

TELEPHONE
309-673-2131

TESTS * INVESTIGATIONS
ANALYSIS * DESIGN * EVALUATIONS
CONSULTATION * REPORTS * INSPECTIONS
ARBITRATION * EXPERT WITNESS TESTIMONY
* * * * * * * * * *
SOILS * PORTLAND CEMENT CONCRETE
BITUMINOUS CONCRETE * STEEL
ASPHALT * AGGREGATES * EMULSIONS
POZOLANIC MATERIALS * LIME

GEOTECHNICAL ENGINEERING MATERIALS TESTING PEORIA

WHITNEY & ASSOCIATES
INCORPORATED

2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604

TELEFAX
309-673-3050

GEOTECHNICAL ENGINEERING
CONSTRUCTION QUALITY CONTROL
SUBSURFACE EXPLORATIONS
ENVIROMENTAL INVESTIGATIONS
* * * * * * * * * *
MONITORING WELL INSTALLATIONS
BUILT-UP ROOF INVESTIGATIONS
WELDER CERTIFICATIONS
INSURANCE INVESTIGATIONS

W. & A. FILE NO 5486002

DATES 11/12/10
12/03/10

CLIENT:
Mr. Craig Holthaus
Otto Baum Company, Inc.
P. O. Box 161
Morton, Illinois 61550

PROJECT:
Midwest Generation Powerton Station
Metal Cleaning Basin Liner Replacement
Pekin, Illinois

CONCRETE COMPRESSION TEST REPORT

(6 X 12 INCH) NOMINAL CYLINDER SIZE: AREA=28.27 SQ. IN.

COMPRESSIVE STRENGTH TEST RESULTS

CYLINDER NO.	1A	1B	1C	1D		
AGE-DAYS	7	7	28	28		
FIELD CURE-DAYS	3	3	3	3		
STANDARD CURE-DAYS	4	4	25	25		
UNIT LOAD PSI	3970	3770	4460	4630		
DATE MOLDED	11/05/10	11/05/10	11/05/10	11/05/10		
DATE RECIEVED	11/08/10	11/08/10	11/08/10	11/08/10		
DATE TESTED	11/12/10	11/12/10	12/03/10	12/03/10		
SPECIFICATIONS						
AGE-DAYS	28	28	28	28		
STRENGTH-PSI	3000	3000	3000	3000		

- ◉ CYLINDERS MOLDED BY WHITNEY & ASSOCIATES REPRESENTATIVE.
- ○ CYLINDERS MOLDED BY ARCHITECT'S OR CONTRACTOR'S REPRESENTATIVE.
- ◉ CYLINDERS PICKED UP BY WHITNEY & ASSOCIATES REPRESENTATIVE.
- ○ CYLINDERS DELIVERED TO WHITNEY & ASSOCIATES
- ◉ TEST RESULTS COMPLY WITH APPLICABLE SPECIFICATIONS.
- ○ TEST RESULTS DO NOT COMPLY WITH APPLICABLE SPECIFICATIONS.

POUR LOCATION:
Pavement for spillway aprons on the south side of the metal cleaning basin - north end of the center apron

COMMENTS:

FIELD DATA

CYLINDER NO.	1
MIX DESIGN NO.	3000#
SLUMP. IN.	2.50
AIR CONTENT %	-
AIR TEMP. -°F.	37
CONCRETE TEMP. -°F.	67
FIELD DATA SUBMITTED BY:	Whitney & Associates
MIX DATA SUBMITTED BY:	-
TIME :	11:00 a.m.
POUR SIZE :	58.50 cu. yds.

CONCRETE BATCH PLANT	Roanoke Concrete	
DELIVERY TICKET NO.	2007044	
MIX PROPORTIONS (SSD):		
CEMENT (TYPE)		lbs.
FINE AGGREGATE		lbs.
COARSE AGGREGATE		lbs.
WATER		gals.
ADDITIVES		

DISTRIBUTION:

Respectfully submitted,
WHITNEY & ASSOCIATES

TELEPHONE
309-673-2131

TESTS * INVESTIGATIONS
ANALYSIS * DESIGN * EVALUATIONS
CONSULTATION * REPORTS * INSPECTIONS
ARBITRATION * EXPERT WITNESS TESTIMONY
* * * * * * * * * *
SOILS * PORTLAND CEMENT CONCRETE
BITUMINOUS CONCRETE * STEEL
ASPHALT * AGGREGATES * EMULSIONS
POZOLANIC MATERIALS * LIME

GEOTECHNICAL ENGINEERING MATERIALS TESTING PEORIA

WHITNEY & ASSOCIATES
INCORPORATED

2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604

TELEFAX
309-673-3050

GEOTECHNICAL ENGINEERING
CONSTRUCTION QUALITY CONTROL
SUBSURFACE EXPLORATIONS
ENVIROMENTAL INVESTIGATIONS
* * * * * * * * * *
MONITORING WELL INSTALLATIONS
BUILT-UP ROOF INVESTIGATIONS
WELDER CERTIFICATIONS
INSURANCE INVESTIGATIONS

W. & A. FILE NO 5486003

DATES 11/12/10
12/03/10

CLIENT:
Mr. Craig Holthaus
Otto Baum Company, Inc.
P. O. Box 161
Morton, Illinois 61550

PROJECT:
Midwest Generation Powerton Station
Metal Cleaning Basin Liner Replacement
Pekin, Illinois

CONCRETE COMPRESSION TEST REPORT

(6 X 12 INCH) NOMINAL CYLINDER SIZE: AREA=28.27 SQ. IN.

COMPRESSIVE STRENGTH TEST RESULTS

CYLINDER NO.	2A	2B	2C	2D		
AGE-DAYS	7	7	28	28		
FIELD CURE-DAYS	3	3	3	3		
STANDARD CURE-DAYS	4	4	25	25		
UNIT LOAD PSI	4250	3960	4920	4810		
DATE MOLDED	11/05/10	11/05/10	11/05/10	11/05/10		
DATE RECIEVED	11/08/10	11/08/10	11/08/10	11/08/10		
DATE TESTED	11/12/10	11/12/10	12/03/10	12/03/10		
SPECIFICATIONS						
AGE-DAYS	28	28	28	28		
STRENGTH-PSI	3000	3000	3000	3000		

- [x] CYLINDERS MOLDED BY WHITNEY & ASSOCIATES REPRESENTATIVE.
- [ ] CYLINDERS MOLDED BY ARCHITECT'S OR CONTRACTOR'S REPRESENTATIVE.
- [x] CYLINDERS PICKED UP BY WHITNEY & ASSOCIATES REPRESENTATIVE.
- [ ] CYLINDERS DELIVERED TO WHITNEY & ASSOCIATES
- [x] TEST RESULTS COMPLY WITH APPLICABLE SPECIFICATIONS.
- [ ] TEST RESULTS DO NOT COMPLY WITH APPLICABLE SPECIFICATIONS.

POUR LOCATION:
Pavement for spillway aprons on the south side of the metal cleaning basin - center of the west apron

COMMENTS:

FIELD DATA

CYLINDER NO.	2
MIX DESIGN NO.	3000#
SLUMP. IN.	4.00
AIR CONTENT %	-
AIR TEMP. -°F.	42
CONCRETE TEMP. -°F.	71
FIELD DATA SUBMITTED BY:	Whitney & Associates
MIX DATA SUBMITTED BY:	-
TIME :	1:15 p.m.
POUR SIZE :	58.50 cu. yds.

CONCRETE BATCH PLANT	Roanoke Concrete	
DELIVERY TICKET NO.	2007049	
MIX PROPORTIONS (SSD):		
CEMENT (TYPE)		lbs.
FINE AGGREGATE		lbs.
COARSE AGGREGATE		lbs.
WATER		gals.
ADDITIVES		

DISTRIBUTION:

Respectfully submitted,
WHITNEY & ASSOCIATES

WHITNEY & ASSOCIATES
PEORIA, ILLINOIS

TELEPHONE
309-673-2131

TESTS * INVESTIGATIONS
ANALYSIS * DESIGN * EVALUATIONS
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ASPHALT * AGGREGATES * EMULSIONS
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GEOTECHNICAL ENGINEERING MATERIALS TESTING PEORIA

WHITNEY & ASSOCIATES
INCORPORATED

2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604

TELEFAX
309-673-3050

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MONITORING WELL INSTALLATIONS
BUILT-UP ROOF INVESTIGATIONS
WELDER CERTIFICATIONS
INSURANCE INVESTIGATIONS

W. & A. FILE NO 5486004

DATES 11/12/10
12/03/10

CLIENT:
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Morton, Illinois 61550

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Midwest Generation Powerton Station
Metal Cleaning Basin Liner Replacement
Pekin, Illinois

CONCRETE COMPRESSION TEST REPORT

(6 X 12 INCH) NOMINAL CYLINDER SIZE: AREA=28.27 SQ. IN.

COMPRESSIVE STRENGTH TEST RESULTS

CYLINDER NO.	3A	3B	3C	3D		
AGE-DAYS	7	7	28	28		
FIELD CURE-DAYS	3	3	3	3		
STANDARD CURE-DAYS	4	4	25	25		
UNIT LOAD PSI	3850	4030	4720	4620		
DATE MOLDED	11/05/10	11/05/10	11/05/10	11/05/10		
DATE RECIEVED	11/08/10	11/08/10	11/08/10	11/08/10		
DATE TESTED	11/12/10	11/12/10	12/03/10	12/03/10		
SPECIFICATIONS						
AGE-DAYS	28	28	28	28		
STRENGTH-PSI	4000	4000	4000	4000		

- (●) CYLINDERS MOLDED BY WHITNEY & ASSOCIATES REPRESENTATIVE.
- ( ) CYLINDERS MOLDED BY ARCHITECT'S OR CONTRACTOR'S REPRESENTATIVE.
- (●) CYLINDERS PICKED UP BY WHITNEY & ASSOCIATES REPRESENTATIVE.
- ( ) CYLINDERS DELIVERED TO WHITNEY & ASSOCIATES
- (●) TEST RESULTS COMPLY WITH APPLICABLE SPECIFICATIONS.
- ( ) TEST RESULTS DO NOT COMPLY WITH APPLICABLE SPECIFICATIONS.

POUR LOCATION:
Weir at the north end of the metal cleaning basin - west end of the pour

COMMENTS:

FIELD DATA

CYLINDER NO.	3
MIX DESIGN NO.	4000#
SLUMP. IN.	5.00
AIR CONTENT %	-
AIR TEMP. -°F.	45
CONCRETE TEMP. -°F.	70
FIELD DATA SUBMITTED BY:	Whitney & Associates
MIX DATA SUBMITTED BY:	-
TIME :	1:45 p.m.
POUR SIZE :	9.00 cu. yds.

CONCRETE BATCH PLANT	Roanoke Concrete	
DELIVERY TICKET NO.	2007050	
MIX PROPORTIONS (SSD):		
CEMENT (TYPE)		lbs.
FINE AGGREGATE		lbs.
COARSE AGGREGATE		lbs.
WATER		gals.
ADDITIVES		

DISTRIBUTION:

Respectfully submitted,
WHITNEY & ASSOCIATES

WHITNEY & ASSOCIATES
PEORIA, ILLINOIS

ATTACHMENT A6

GEOSYNTHETIC PRODUCT INFORMATION

GSE

The Pioneer Of Geosynthetics

S I N C E 1 9 7 2

Product Data Sheet

GSE Nonwoven Geotextile

GSE Nonwoven Geotextile is a family of staple fiber needlepunched geotextiles. The geotextile is manufactured using an advanced manufacturing and quality system, to produce the most uniform and consistent nonwoven needlepunched geotextile currently available in the industry. GSE combines a fiber selection and approval system with in-line quality control and a state-of-the-art laboratory to ensure that every roll shipped meets customer specifications and for various applications.

Product Specifications *These product specifications meet or exceed GRI GT12, GRI GT13 and AASHTO M288.*

TESTED PROPERTY	TEST METHOD	FREQUENCY	MINIMUM AVERAGE VALUE					
			NW4	NW6	NW8	NW10	NW12	NW16
AASHTO M288 Class			3	2	1	>1	>>1	>>>1
Mass per Unit Area, oz/yd² (g/m²)	ASTM D 5261	90,000 ft²	4 (135)	6 (200)	8 (270)	10 (335)	12 (405)	16 (540)
Grab Tensile Strength, lb (N)	ASTM D 4632	90,000 ft²	120 (530)	160 (710)	220 (975)	260 (1,155)	320 (1,420)	390 (1,735)
Grab Elongation, %	ASTM D 4632	90,000 ft²	50	50	50	50	50	50
Puncture Strength, lb (N)	ASTM D 4833	90,000 ft²	60 (265)	90 (395)	120 (525)	165 (725)	190 (835)	240 (1,055)
Trapezoidal Tear Strength, lb (N)	ASTM D 4533	90,000 ft²	50 (220)	65 (290)	90 (395)	100 (445)	125 (555)	150 (665)
Apparent Opening Size, Sieve No. (mm)	ASTM D 4751	540,000 ft²	70 (0.212)	70 (0.212)	80 (0.180)	100 (0.150)	100 (0.150)	100 (0.150)
Permittivity, sec⁻¹	ASTM D 4491	540,000 ft²	1.80	1.50	1.30	1.00	0.80	0.60
Water Flow Rate, gpm/ft² (l/min/m²)	ASTM D 4491	540,000 ft²	135 (5,495)	110 (4,480)	95 (3,865)	75 (3,050)	60 (2,440)	45 (1,830)
UV Resistance (% retained after 500 hours)	ASTM D 4355	per formulation	70	70	70	70	70	70
NOMINAL ROLL DIMENSIONS								
Roll Length[(1)], ft (m)			850 (259)	850 (259)	600 (182)	500 (152)	400 (122)	300 (91)
Roll Width[(1)], ft (m)			15 (4.5)	15 (4.5)	15 (4.5)	15 (4.5)	15 (4.5)	15 (4.5)
Roll Area, ft² (m²)			12,750 (1,185)	12,750 (1,185)	9,000 (836)	7,500 (698)	6,000 (557)	4,500 (418)

NOTES:

- The property values listed are in weaker principal direction. All values listed are Minimum Average Values except apparent opening size in mm and UV resistance. Apparent opening size (mm) is a Maximum Value. UV is a typical value.
- [(1)]Roll lengths and widths have a tolerance of ±1%.

DS12NW R10/11/10

GSE Roll Allocation

Order 60728
Customer Clean Air and Water
Site NWG- Powerton Station

Roll#	Product Code	Description	Mfg. Date	Length
130342464	GEO-120E-EBC-E-	NW12	6/5/2009	400
130342467	GEO-120E-EBC-E-	NW12	6/5/2009	400
130342469	GEO-120E-EBC-E-	NW12	6/5/2009	400
130342471	GEO-120E-EBC-E-	NW12	6/5/2009	400
130342473	GEO-120E-EBC-E-	NW12	6/5/2009	400
130342474	GEO-120E-EBC-E-	NW12	6/5/2009	400
130342475	GEO-120E-EBC-E-	NW12	6/5/2009	400
130342476	GEO-120E-EBC-E-	NW12	6/5/2009	400
130342477	GEO-120E-EBC-E-	NW12	6/5/2009	400
130342478	GEO-120E-EBC-E-	NW12	6/5/2009	400
130342480	GEO-120E-EBC-E-	NW12	6/5/2009	400
130342481	GEO-120E-EBC-E-	NW12	6/5/2009	400
130342484	GEO-120E-EBC-E-	NW12	6/5/2009	400
130342485	GEO-120E-EBC-E-	NW12	6/5/2009	400

GSE Roll Allocation

Order 60728
Customer Clean Air and Water
Site NWG- Powerton Station

Roll#	Product Code	Description	Mfg. Date	Length
130355977	GEO-160E-EBC-E-	NW16	12/4/2009	300
130355978	GEO-160E-EBC-E-	NW16	12/4/2009	300
130355979	GEO-160E-EBC-E-	NW16	12/4/2009	300
130355980	GEO-160E-EBC-E-	NW16	12/4/2009	300
130355981	GEO-160E-EBC-E-	NW16	12/4/2009	300
130355982	GEO-160E-EBC-E-	NW16	12/4/2009	300
130355983	GEO-160E-EBC-E-	NW16	12/4/2009	300
130355984	GEO-160E-EBC-E-	NW16	12/4/2009	300
130355985	GEO-160E-EBC-E-	NW16	12/4/2009	300
130355986	GEO-160E-EBC-E-	NW16	12/4/2009	300
130355987	GEO-160E-EBC-E-	NW16	12/4/2009	300
130355988	GEO-160E-EBC-E-	NW16	12/4/2009	300
130355989	GEO-160E-EBC-E-	NW16	12/4/2009	300
130355990	GEO-160E-EBC-E-	NW16	12/4/2009	300
130355991	GEO-160E-EBC-E-	NW16	12/4/2009	300
130355992	GEO-160E-EBC-E-	NW16	12/4/2009	300
130355993	GEO-160E-EBC-E-	NW16	12/4/2009	300
130355994	GEO-160E-EBC-E-	NW16	12/4/2009	300
130355995	GEO-160E-EBC-E-	NW16	12/4/2009	300
130355996	GEO-160E-EBC-E-	NW16	12/4/2009	300
130355997	GEO-160E-EBC-E-	NW16	12/4/2009	300
130355998	GEO-160E-EBC-E-	NW16	12/4/2009	300
130355999	GEO-160E-EBC-E-	NW16	12/4/2009	300
130356000	GEO-160E-EBC-E-	NW16	12/4/2009	300
130356001	GEO-160E-EBC-E-	NW16	12/4/2009	300
130356002	GEO-160E-EBC-E-	NW16	12/4/2009	300
130356003	GEO-160E-EBC-E-	NW16	12/4/2009	300
130356004	GEO-160E-EBC-E-	NW16	12/4/2009	300
130356005	GEO-160E-EBC-E-	NW16	12/4/2009	300
130356006	GEO-160E-EBC-E-	NW16	12/4/2009	300
130356007	GEO-160E-EBC-E-	NW16	12/4/2009	300
130356008	GEO-160E-EBC-E-	NW16	12/4/2009	300
130356009	GEO-160E-EBC-E-	NW16	12/4/2009	300
130356010	GEO-160E-EBC-E-	NW16	12/4/2009	300

Order 60728
Customer Clean Air and Water
Site NWG- Powerton Station

Roll#	*Product Code*	*Description*	*Mfg. Date*	*Length*
130356011	GEO-160E-EBC-E-	NW16	12/4/2009	300
130356012	GEO-160E-EBC-E-	NW16	12/4/2009	300

Roll Test Data Report

Sales Order No.	Project Number	Customer Name	Project Location	Product Name	Report Date
60728		Clean Air and Water	Pekin, IL	GEO-160E-EBC-E-00	12/16/2009 *Modified

QC APPROVED

Roll No.	ASTM D 4491 Average Sample Flow Rate (gallon/min/ft2) every 20th	Permittivity (Sec-1)	ASTM D 4751 Apparent Opening Size (mm) every roll	ASTM D 4833 Puncture Resistance (lbs) every 20th	ASTM D 4533 Trap Tear Strength CD (lbs) every 20th	Trap Tear Strength MD (lbs)	Grab Elongation CD (%)	ASTM D 4632 Grab Elongation MD (%) every 20th	Grab Strength CD (lbs)	Grab Strength MD (lbs)	ASTM D 5261 Mass per Unit Area (oz./yd2) every 20th
130355977	71	1.00	0.150	287	431	267	111	138	769	471	16.9
130355978	73	1.00	0.150	262	292	199	98	127	769	470	16.4
130355979	73	1.00	0.150	262	292	199	98	127	769	470	16.4
130355980	73	1.00	0.150	262	292	199	98	127	769	470	16.4
130355981	73	1.00	0.150	262	292	199	98	127	769	470	16.4
130355982	73	1.00	0.150	262	292	199	98	127	769	470	16.4
130355983	73	1.00	0.150	262	292	199	98	127	769	470	16.4
130355984	73	1.00	0.150	262	292	199	98	127	769	470	16.4
130355985	73	1.00	0.150	262	292	199	98	127	769	470	16.4
130355986	73	1.00	0.150	262	292	199	98	127	769	470	16.4
130355987	73	1.00	0.150	262	292	199	98	127	769	470	16.4
130355988	73	1.00	0.150	262	292	199	98	127	769	470	16.4
130355989	73	1.00	0.150	262	292	199	98	127	769	470	16.4
130355990	73	1.00	0.150	262	292	199	98	127	769	470	16.4
130355991	73	1.00	0.150	262	292	199	98	127	769	470	16.4
130355992	73	1.00	0.150	262	292	199	98	127	769	470	16.4
130355993	73	1.00	0.150	262	292	199	98	127	769	470	16.4
130355994	73	1.00	0.150	262	292	199	98	127	769	470	16.4
130355995	73	1.00	0.150	262	292	199	98	127	769	470	16.4
130355996	73	1.00	0.150	262	292	199	98	127	769	470	16.4
130355997	73	1.00	0.150	262	292	199	98	127	769	470	16.4
130355998	73	1.00	0.150	269	491	264	101	126	643	462	16.5
130355999	73	1.00	0.150	269	491	264	101	126	643	462	16.5
130356000	73	1.00	0.150	269	491	264	101	126	643	462	16.5
130356001	73	1.00	0.150	269	491	264	101	126	643	462	16.5
130356002	73	1.00	0.150	269	491	264	101	126	643	462	16.5
130356003	73	1.00	0.150	269	491	264	101	126	643	462	16.5
130356004	73	1.00	0.150	269	491	264	101	126	643	462	16.5
130356005	73	1.00	0.150	269	491	264	101	126	643	462	16.5
130356006	73	1.00	0.150	269	491	264	101	126	643	462	16.5
130356007	73	1.00	0.150	269	491	264	101	126	643	462	16.5
130356008	73	1.00	0.150	269	491	264	101	126	643	462	16.5

Roll Test Data Report

Sales Order No.	Project Number	Customer Name	Project Location	Product Name	Report Date
60728		Clean Air and Water	Pekin, IL	GEO-160E-EBC-E-00	12/16/2009 *Modified

Roll No.	ASTM D 4491 Average Sample Flow Rate (gallon/min/ft2) every 20th	Permittivity (Sec-1)	ASTM D 4751 Apparent Opening Size (mm) every roll	ASTM D 4833 Puncture Resistance (lbs) every 20th	ASTM D 4533 Trap Tear Strength CD (lbs) every 20th	Trap Tear Strength MD (lbs)	ASTM D 4632 Grab Elongation CD (%) every 20th	Grab Elongation MD (%)	Grab Strength CD (lbs)	Grab Strength MD (lbs)	ASTM D 5261 Mass per Unit Area (oz./yd2) every 20th
130356009	73	1.00	0.150	269	491	264	101	126	643	462	16.5
130356010	73	1.00	0.150	269	491	264	101	126	643	462	16.5
130356011	73	1.00	0.150	269	491	264	101	126	643	462	16.5
130356012	73	1.00	0.150	269	491	264	101	126	643	462	16.5

Laboratory Manager: Vicky T. Parrott

GSE-8.2.4-029 Rev -- 03/05

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Kingstree Lab - US

GSE

Lining Technology, Inc

Roll Test Data Report

Sales Order No.	*Project Number*	*Customer Name*	*Project Location*	*Product Name*	*Report Date*
60728		Clean Air and Water Systems, LLC	Pekin, IL	HDT-060AE-WBB-B-00	12/15/2009

GSE QC APPROVED

	ASTM D 5994		ASTM D638,Type IV / D6693								ASTM D 1004		ASTM D 4833	ASTM D 1505	ASTM D 4218/1603	ASTM D 5596	GRI GM 12	
	Average Thickness (mils)	Minimum Thickness (mils)	TD Strength @ Yield (ppi)	MD Strength @ Yield (ppi)	TD Strength @ Break (ppi)	MD Strength @ Break (ppi)	TD Elongation @ Yield (%)	MD Elongation @ Yield (%)	TD Elongation @ Break (%)	MD Elongation @ Break (%)	TD Tear Resistance (lbs)	MD Tear Resistance (lbs)	Puncture Resistance (lbs)	Density (g/cc)	Carbon Black Content (%)	Carbon Black Dispersion Views in Cat1 - Cat2	Asperity Height Side A (mils)	Asperity Height Side B (mils)
Roll No.	every roll		every 4th								every 4th		every 4th	every 4th	every 4th	every 4th	every 2nd	
103176435	61	59	156	156	202	233	16	18	575	610	54	56	148	0.945	2.26	10	23	21
103176439	61	59	157	155	205	212	15	18	584	609	55	57	149	0.945	2.26	10	23	21
103176440	61	59	157	155	205	212	15	18	584	609	55	57	149	0.945	2.26	10	23	21
103176442	61	58	132	134	203	226	18	19	648	675	49	52	138	0.945	2.66	10	23	20
103176443	61	57	132	134	203	226	18	19	648	675	49	52	138	0.945	2.66	10	23	21
103176444	61	57	132	134	203	226	18	19	648	675	49	52	138	0.945	2.66	10	23	21
103176445	61	56	132	134	203	226	18	19	648	675	49	52	138	0.945	2.66	10	22	21
103176446	61	56	150	150	223	218	18	19	605	555	54	57	145	0.945	2.79	10	22	21
103176448	61	56	150	150	223	218	18	19	605	555	54	57	145	0.945	2.79	10	21	22
103176449	61	56	150	150	223	218	18	19	605	555	54	57	145	0.945	2.79	10	22	23
103176450	61	56	151	142	208	226	18	20	567	581	52	55	149	0.945	2.70	10	22	23
103176451	61	59	151	142	208	226	18	20	567	581	52	55	149	0.945	2.70	10	21	21
103176452	61	58	151	142	208	226	18	20	567	581	52	55	149	0.945	2.70	10	21	21
103176453	61	59	151	142	208	226	18	20	567	581	52	55	149	0.945	2.70	10	20	20
103176454	61	59	144	144	202	237	16	18	579	630	52	54	146	0.945	2.31	10	20	20
103176455	61	58	144	144	202	237	16	18	579	630	52	54	146	0.945	2.31	10	21	22
103176456	61	58	144	144	202	237	16	18	579	630	52	54	146	0.945	2.31	10	21	22

Laboratory Manager: Jane Allen

GSE-8.2.4-029 Rev -- 03/05

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19103 Gundle Road - Houston, Texas 77073

GSE Lining Technology, Inc

Roll Test Data Report

Sales Order No.	Project Number	Customer Name	Project Location	Product Name	Report Date
60728		Clean Air and Water Systems, LLC	Pekin, IL	HDT-060AE-WBB-B-00	12/16/2009

GSE QC APPROVED

	ASTM D 5994		ASTM D638,Type IV / D6693								ASTM D 1004		ASTM D 4833	ASTM D 1505	ASTM D 4218/1603	ASTM D 5596	GRI GM 12	
	Average Thickness (mils)	Minimum Thickness (mils)	TD Strength @ Yield (ppi)	MD Strength @ Yield (ppi)	TD Strength @ Break (ppi)	MD Strength @ Break (ppi)	TD Elongation @ Yield (%)	MD Elongation @ Yield (%)	TD Elongation @ Break (%)	MD Elongation @ Break (%)	TD Tear Resistance (lbs)	MD Tear Resistance (lbs)	Puncture Resistance (lbs)	Density (g/cc)	Carbon Black Content (%)	Carbon Black Dispersion Views in Cat1 - Cat2	Asperity Height Side A (mils)	Asperity Height Side B (mils)
Roll No.	every roll		every 4th								every 4th		every 4th	every 4th	every 4th	every 4th	every 2nd	
103176435	61	59	156	156	202	233	16	18	575	610	54	56	148	0.945	2.26	10	23	21
103176439	61	59	157	155	205	212	15	18	584	609	55	57	149	0.945	2.26	10	23	21
103176440	61	59	157	155	205	212	15	18	584	609	55	57	149	0.945	2.26	10	23	21
103176442	61	58	132	134	203	226	18	19	648	675	49	52	138	0.945	2.66	10	23	20
103176443	61	57	132	134	203	226	18	19	648	675	49	52	138	0.945	2.66	10	23	21
103176444	61	57	132	134	203	226	18	19	648	675	49	52	138	0.945	2.66	10	23	21
103176445	61	56	132	134	203	226	18	19	648	675	49	52	138	0.945	2.66	10	22	21
103176446	61	56	150	150	223	218	18	19	605	555	54	57	145	0.945	2.79	10	22	21
103176448	61	56	150	150	223	218	18	19	605	555	54	57	145	0.945	2.79	10	21	22
103176449	61	56	150	150	223	218	18	19	605	555	54	57	145	0.945	2.79	10	22	23
103176450	61	56	151	142	208	226	18	20	567	581	52	55	149	0.945	2.70	10	22	23
103176451	61	59	151	142	208	226	18	20	567	581	52	55	149	0.945	2.70	10	21	21
103176452	61	58	151	142	208	226	18	20	567	581	52	55	149	0.945	2.70	10	21	21
103176453	61	59	151	142	208	226	18	20	567	581	52	55	149	0.945	2.70	10	20	20
103176454	61	59	144	144	202	237	16	18	579	630	52	54	146	0.945	2.31	10	20	20
103176455	61	58	144	144	202	237	16	18	579	630	52	54	146	0.945	2.31	10	21	22
103176456	61	58	144	144	202	237	16	18	579	630	52	54	146	0.945	2.31	10	21	22
103176458	61	57	144	142	191	208	17	18	584	592	54	54	144	0.945	2.63	10	20	20
103176459	62	58	144	142	191	208	17	18	584	592	54	54	144	0.945	2.63	10	20	20
103176460	63	59	144	142	191	208	17	18	584	592	54	54	144	0.945	2.63	10	20	20
103176461	62	60	144	142	191	208	17	18	584	592	54	54	144	0.945	2.63	10	20	20
103176462	62	59	145	154	216	234	17	18	601	608	55	56	146	0.945	2.62	10	20	20
103176463	62	60	145	154	216	234	17	18	601	608	55	56	146	0.945	2.62	10	21	21

Laboratory Manager: Jane Allen

GSE-8.2.4-029 Rev -- 03/05

19103 Gundle Road - Houston, Texas 77073

GSE

The Pioneer Of Geosynthetics

S I N C E 1 9 7 2

Product Data Sheet

GSE White Textured Geomembrane

GSE White Textured is a co-extruded textured high density polyethylene (HDPE) geomembrane available on one or both sides. It is manufactured with the highest quality resin specifically formulated for flexible geomembranes. GSE White Textured has a U.V. stabilized upper white surface that reflects light, improves damage detection, reduces wrinkles and subgrade desiccation. This product provides increased frictional resistance, excellent chemical resistance, and endurance properties. It is used in applications that require enhanced quality assurance measures over standard geomembranes.

Product Specifications *These product specifications meet or exceed GRI GM13.*

TESTED PROPERTY	TEST METHOD	FREQUENCY	MINIMUM AVERAGE VALUE				
			30 mil	40 mil	60 mil	80 mil	100 mil
Thickness, (minimum average) mil (mm)	ASTM D 5994	every roll	30 (0.75)	40 (1.00)	60 (1.50)	80 (2.00)	100 (2.50)
Lowest individual reading (-10%)			27 (0.69)	36 (0.91)	54 (1.40)	72 (1.80)	90 (2.30)
Density, g/cm³	ASTM D 1505	200,000 lb	0.94	0.94	0.94	0.94	0.94
Tensile Properties (each direction)	ASTM D 6693, Type IV	20,000 lb					
Strength at Break, lb/in-width (N/mm)	Dumbell, 2 ipm		66 (11)	75 (13)	115 (20)	155 (27)	230 (40)
Strength at Yield, lb/in-width (N/mm)			68 (11)	90 (15)	132 (23)	177 (31)	225 (39)
Elongation at Break, %	G.L. 2.0 in (51 mm)		100	100	100	100	100
Elongation at Yield, %	G.L. 1.3 in (33 mm)		12	12	12	12	12
Tear Resistance, lb (N)	ASTM D 1004	45,000 lb	24 (106)	32 (142)	45 (200)	60 (266)	75 (333)
Puncture Resistance, lb (N)	ASTM D 4833	45,000 lb	65 (289)	95 (422)	130 (578)	160 (711)	190 (845)
Carbon Black Content[1], % (Range)	ASTM D 1603*/4218	20,000 lb	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	45,000 lb	Note[2]	Note[2]	Note[2]	Note[2]	Note[2]
Asperity Height, mil (mm)	ASTM D 7466	second roll	16 (0.40)	18 (0.45)	18 (0.45)	18 (0.45)	18 (0.45)
Notched Constant Tensile Load[3], hr	ASTM D 5397, Appendix	200,000 lb	1,000	1,000	1,000	1,000	1,000
Oxidative Induction Time, min	ASTM D 3895, 200° C; O_2, 1 atm	200,000 lb	>140	>140	>140	>140	>140
TYPICAL ROLL DIMENSIONS							
Roll Length[4], ft (m)	Double-Sided Textured		830 (253)	700 (213)	520 (158)	400 (122)	330 (101)
	Single-Sided Textured		840 (256)	650 (198)	420 (128)	320 (98)	250 (76)
Roll Width[4], ft (m)			22.5 (6.9)	22.5 (6.9)	22.5 (6.9)	22.5 (6.9)	22.5 (6.9)
Roll Area, ft² (m²)	Double-Sided Textured		18,675 (1,735)	15,750 (1,463)	11,700 (1,087)	9,000 (836)	7,425 (690)
	Single-Sided Textured		18,900 (1,755)	14,625 (1,359)	9,450 (878)	7,200 (669)	5,625 (523)

NOTES:
- [1]GSE White may have an overall ash content greater than 3.0% due to the white layer. These values apply to the black layer only.
- [2]Dispersion only applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.
- [3]NCTL for GSE White Textured is conducted on representative smooth membrane samples.
- [4]Roll lengths and widths have a tolerance of ± 1%.
- GSE White Textured Double-Sided is available in rolls weighing approximately 4,000 lb (1,800 kg) and Single-Sided weighing approximately 3,000 lb (1,360 kg).
- All GSE geomembranes have dimensional stability of ±2% when tested according to ASTM D 1204 and LTB of <-77° C when tested according to ASTM D 746.
- *Modified.

GSE Roll Allocation

Order 60728
Customer Clean Air and Water Systems, LLC
Site MWG-Powerton Station Metal Cleaning

Roll#	Resin Lot	Product Code	Description	Mfg. Date	Length
103176435	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/13/2009	520
103176439	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/13/2009	520
103176440	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176442	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176443	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176444	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176445	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176446	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176448	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176449	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176450	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176451	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176452	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176453	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176454	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176455	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176456	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/15/2009	520
103176458	8290674	HDT-060AE-WBB-B-00	HDT060A010	12/15/2009	520
103176459	8290674	HDT-060AE-WBB-B-00	HDT060A010	12/15/2009	520
103176460	8290674	HDT-060AE-WBB-B-00	HDT060A010	12/15/2009	520
103176461	8290674	HDT-060AE-WBB-B-00	HDT060A010	12/15/2009	520
103176462	8290674	HDT-060AE-WBB-B-00	HDT060A010	12/15/2009	520
103176463	8290674	HDT-060AE-WBB-B-00	HDT060A010	12/15/2009	520

GSE 8.2.4-020 Rev - - 02/03

GSE Roll Allocation

Order 60728
Customer Clean Air and Water Systems, LLC
Site MWG-Powerton Station Metal Cleaning

Roll#	Resin Lot	Product Code	Description	Mfg. Date	Length
103176435	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/13/2009	520
103176439	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/13/2009	520
103176440	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176442	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176443	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176444	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176445	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176446	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176448	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176449	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176450	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176451	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176452	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176453	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176454	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176455	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/14/2009	520
103176456	8290673	HDT-060AE-WBB-B-00	HDT060A010	12/15/2009	520

Report Date
1/17/2011

Quality Assurance Laboratory Test Results

Job Name: MWG - Powerton Station Metal Cleaning Basin
Sales Order: 60728

Required Testing: ASTM D 5397 - Standard Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test

Custom Frequency: 1/Resin Lot

Custom Criteria: 1000 hours

Product Code	Resin Lot Number	Test Results
HDT-060AE-WBB-B-00	8290673	PASS

Approved By:	Debra Gortemiller
Date Approved:	December 15, 2009

The above stated data shall not be reproduced except in full, without the written approval of the laboratory.

Report Date
1/17/2011

Quality Assurance Laboratory Test Results

Job Name: MWG - Powerton Station Metal Cleaning Basin
Sales Order: 60728

Required Testing: ASTM D 3895 -- Standard Test Method for Oxidative Induction Time of Polyolefins by Differential Scanning Calorimetry

Custom Frequency: 1/200,000 lbs.

Custom Criteria: 140 Minutes

Product Code	Resin Lot Number	Test Results
HDT-060AE-WBB-B-00	8290673	PASS

Approved By:	Debra Gortemiller
Date Approved:	December 15, 2009

The above stated data shall not be reproduced except in full, without the written approval of the laboratory.

Report Date
1/17/2011

GSE

Quality Assurance Laboratory Test Results

Job Name: MWG - Powerton Station Metal Cleaning Basin
SO Number: 60728

The table below summarizes additive performance of GSE Houston products as perceived by OIT retention after Oven and UV Aging per GRI Test Method GM13:

		Oven Aging @ 85° C (ASTM D 5721)				UV Resistance per GRI GM11			
		90 days per ASTM D 5885				1600 hours UV Aging per ASTM D 5885			
Product Type	**Formulation**	Initial HP OIT (min)	Final HP OIT (min)	Retained (%)	GRI Criteria (%)	Initial HP OIT (min)	Final HP OIT (min)	Retained (%)	GRI Criteria (%)
HDPE Geomembrane	Chevron Phillips Marlex® K306 + Carbon Black	697	661	94	80	697	565	81	50

Approved By: Debra Gortemiller
Date: December 15, 2009

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1245 Eastland Avenue
Kingstree, SC 29556
Phone 843-382-4603
Fax 843-382-4604

Date: December 16, 2009

Project: #60728 MWG – Powerton Station

Ref: Ultraviolet (UV) Resistance and Test Frequency of GSE Geotextiles

To Whom It May Concern:

The resistance of nonwoven needle punched geotextiles to ultraviolet light depends primarily on antioxident and carbon black package mixed with resin to prepare a formulation for fiber extrusion. As long as this formulation remains the same the UV resistance of a geotextiles does not change. Therefore, GSE performs UV testing only once per resin formulation. The testing is performed according to ASTM Test Method D 4355 and results are included on GSE geotextile specification sheet. Currently, all GSE geotextiles meet or exceed a value of 70% strength retained after 500 hours of UV exposure. GSE will meet or exceed this value for the referenced project.

Although GSE geotextiles are manufactured using one of the best available antioxident packages, we recommend covering the geotextiles within 15 days of exposure to direct Sunlight. This period does not include time during which geotextiles rolls remain on site covered in black shrink-wrap. Our recommendation is based on UV performance data published in technical literature indicating geotextile strength can decrease sharply after prolonged exposure to Sunlight.

Actual data from an independent laboratory can be supplied upon request.

Vicky T. Parrott

Vicky T. Parrott
Laboratory Manager - Kingstree

ATTACHMENT A7

GEOMEMBRANE INSTALLER'S DAILY LOGS AND QC DOCUMENTATION

Appendix D

Table 1. HDPE Seam Strength Properties

Material (Mil)	Shear Strength (PPI)	Fusion Peel (PPI)	Extrusion Peel (PPI)
40	81	65	52
60	121	98	78
80	162	130	104
100	203	162	130

Table 2. LLDPE Seam Strength Properties

Material (Mil)	Shear Strength (PPI)	Fusion Peel (PPI)	Extrusion Peel (PPI)
40	60	50	48
60	90	75	72
80	120	100	96
100	150	125	120

IQA GEO 03/22/11

CAAW Systems Field QC Information

Project Name:	Powerton - Metal Cleaning Pond
Project Number:	201044
Location:	Pekin, Il
QC Monitor:	Seng
Mat	60 mil HDTW

CAAW Systems

Trial Weld Testing Summary

Project Name: Powerton - Metal Cleaning Pond　　QC Monitor: Seng

Project Number: 201044　　Material: 60 mil HDTW

Sample TW#	Date	Ambient Temp	Time (AM/PM)	Machine Number	Seamer Initials	Extrusion Temp	Fusion Temp/Speed	Peel (ppi)		Shear (ppi)	Results (P/F)	Comments
								Inside	Outside			
						Barrel	Wedge	140	136	151		
							850	114	124	149		
1	11/9/10	59	12:50	1	KS	Preheat	Speed	127	133		P	
							300					
						Barrel	Wedge	129	122	145		
							850	123	116	148		
2	11/9/10	59	12:50	427	KK	Preheat	Speed	129	133		P	
							500					
						Barrel	Wedge	136	135	132		
							850	129	131	147		
3	11/9/10	59	12:50	428	HN	Preheat	Speed	135	117		P	
							500					
						Barrel	Wedge	100		180		
						525		114		182		
1	11/10/10	58	7:30	43	VK	Preheat	Speed	116			P	
						485						
						Barrel	Wedge	96		180		
						550		125		178		
2	11/10/10	58	9:00	13	VP	Preheat	Speed	98			P	
						500						

CAAW Systems

Trial Weld Testing Summary

Project Name: Powerton - Metal Cleaning Pond | QC Monitor: Seng

Project Number: 201044 | Material: 60 mil HDTW

Sample TW#	Date	Ambient Temp	Time (AM/PM)	Machine Number	Seamer Initials	Extrusion Temp	Fusion Temp/Speed	Peel (ppi)		Shear (ppi)	Results (P/F)	Comments
								Inside	Outside			
3	11/10/10	58	11:00	1	KS	Barrel	Wedge	136	132	168	P	
							850	135	130	177		
						Preheat	Speed	127	124			
							500					
4	11/10/10	58	13:10	43	VK	Barrel	Wedge	124		179	P	
						525		118		188		
						Preheat	Speed	120				
						485						
5	11/10/10	58	13:10	13	VP	Barrel	Wedge	104		180	P	
						550		112		177		
						Preheat	Speed	115				
						500						
6	11/10/10	58	13:05	1	KS	Barrel	Wedge	121	128	180	P	
							850	133	127	177		
						Preheat	Speed	129	130			
							300					
7	11/10/10	58	13:15	427	KK	Barrel	Wedge	114	122	169	P	
							850	118	129	174		
						Preheat	Speed	112	118			
							500					

CAAW Systems

Trial Weld Testing Summary

Project Name: Powerton - Metal Cleaning Pond

QC Monitor: Seng

Project Number: 201044

Material: 60 mil HDTW

Sample TW#	Date	Ambient Temp	Time (AM/PM)	Machine Number	Seamer Initials	Extrusion Temp	Fusion Temp/Speed	Peel (ppi) Inside	Peel (ppi) Outside	Shear (ppi)	Results (P/F)	Comments
1	11/11/10	62	7:15	13	VP	Barrel	Wedge	110		187	P	
						550		132		183		
						Preheat	Speed	110				
						500						
2	11/11/10	62	7:30	43	VK	Barrel	Wedge	131		178	P	
						525		106		184		
						Preheat	Speed	137				
						485						
3	11/11/10	62	9:30	427	KK	Barrel	Wedge	139	148	180	P	
							850	147	163	184		
						Preheat	Speed	153	151			
							500					
4	11/11/10	62	9:30	1	KS	Barrel	Wedge	135	143	168	P	
							850	148	136	169		
						Preheat	Speed	143	136			
							300					
5	11/11/10	62	13:15	427	KK	Barrel	Wedge	132	141	171	P	
							850	133	140	168		
						Preheat	Speed	133	129			
							500					

CAAW Systems

Trial Weld Testing Summary

Project Name: Powerton - Metal Cleaning Pond QC Monitor: Seng

Project Number: 201044 Material: 60 mil HDTW

Sample TW#	Date	Ambient Temp	Time (AM/PM)	Machine Number	Seamer Initials	Extrusion Temp	Fusion Temp/Speed	Peel (ppi)		Shear (ppi)	Results (P/F)	Comments
								Inside	Outside			
6	11/11/10	62	13:00	1	KS	Barrel	Wedge	133	121	178	P	
							850	138	126	177		
						Preheat	Speed	130	124			
							300					
1	11/12/10	59	7:30	43	VK	Barrel	Wedge	102		152	P	
						525		120		162		
						Preheat	Speed	97				
						485						
2	11/12/10	59	7:30	239	KS	Barrel	Wedge	114		152	P	
						550		117		149		
						Preheat	Speed	116				
						500						
3	11/12/10	59	7:20	13	VP	Barrel	Wedge	116		158	P	
						550		125		145		
						Preheat	Speed	128				
						500						
4	11/12/10	59	7:30	427	KK	Barrel	Wedge	118	120	181	P	
							850	121	127	177		
						Preheat	Speed	119	126			
							500					

CAAW Systems

Trial Weld Testing Summary

Project Name: Powerton - Metal Cleaning Pond QC Monitor: Seng

Project Number: 201044 Material: 60 mil HDTW

Sample TW#	Date	Ambient Temp	Time (AM/PM)	Machine Number	Seamer Initials	Extrusion Temp	Fusion Temp/Speed	Peel (ppi) Inside	Peel (ppi) Outside	Shear (ppi)	Results (P/F)	Comments
5	11/12/10	59	13:10	43	VK	Barrel	Wedge	100		161	P	
						525		104		177		
						Preheat	Speed	110				
						485						
6	11/12/10	59	13:10	13	VP	Barrel	Wedge	118		177	P	
						550		122		180		
						Preheat	Speed	116				
						500						
7	11/12/10	59	13:15	239	KS	Barrel	Wedge	110		162	P	
						550		108		157		
						Preheat	Speed	114				
						500						
1	11/15/10	53	7:30	43	VK	Barrel	Wedge	109		169	P	
						525		118		180		
						Preheat	Speed	110		189		
						485						
2	11/15/10	53	7:30	13	VP	Barrel	Wedge	118		179	P	
						550		120		181		
						Preheat	Speed	114		188		
						500						

CAAW Systems

Trial Weld Testing Summary

Project Name: Powerton - Metal Cleaning Pond

QC Monitor: Seng

Project Number: 201044

Material: 60 mil HDTW

Sample TW#	Date	Ambient Temp	Time (AM/PM)	Machine Number	Seamer Initials	Extrusion Temp	Fusion Temp/Speed	Peel (ppi) Inside	Peel (ppi) Outside	Shear (ppi)	Results (P/F)	Comments
3	11/15/10	53	13:10	43	VK	Barrel	Wedge	128		199	P	
						525		122		191		
						Preheat	Speed	133		194		
						485						
4	11/15/10	53	13:10	13	VP	Barrel	Wedge	119		189	P	
						550		116		180		
						Preheat	Speed	124		184		
						500						
						Barrel	Wedge					
						Preheat	Speed					
						Barrel	Wedge					
						Preheat	Speed					
						Barrel	Wedge					
						Preheat	Speed					

CAAW Systems

Panel Placement Summary

Project Name: Powerton - Metal Cleaning Pond

QC Monitor: Seng

Project Number: 201044

Material: 60 mil HDTW

Panel Number	Date	Time (am/pm)	Roll Number	Type S or T	Final Width (Feet)	Final Length (Feet)	Final Area (Sq. Ft.)	Comments
P1	11/9/10		6549	T	22	120	2,640	
P2	11/9/10		6549	T	22	120	2,640	
P3	11/9/10		6549	T	22	120	2,640	
P4	11/9/10		6549	T	22	120	2,640	
P5	11/9/10		6460	T	22	120	2,640	
P6	11/9/10		6460	T	22	120	2,640	
P7	11/9/10		6460	T	22	120	2,640	
P8	11/9/10		6460	T	22	120	2,640	
P9	11/9/10		6462	T	22	120	2,640	
P10	11/9/10		6462	T	22	120	2,640	
P11	11/9/10		6462	T	22	120	2,640	
P12	11/9/10		6462	T	22	120	2,640	
P13	11/9/10		6461	T	22	120	2,640	
P14	11/9/10		6461	T	17	48	696	
P15	11/9/10		6461	T	22	25	276	
P16	11/9/10		6461	T	22	35	650	
P17	11/9/10		6461	T	22	46	918	
P18	11/9/10		6461	T	25	46	787	
P19	11/9/10		6461	T	22	48	748	
P20	11/9/10		6461	T	22	52	1,080	

CAAW Systems

Panel Placement Summary

Project Name: Powerton - Metal Cleaning Pond

QC Monitor: Seng

Project Number: 201044

Material: 60 mil HDTW

Panel Number	Date	Time (am/pm)	Roll Number	Type S or T	Final Width (Feet)	Final Length (Feet)	Final Area (Sq. Ft.)	Comments
P21	11/9/10		6461	T	22	46	748	
P22	11/9/10		6461	T	18	22	160	
P23	11/9/10		6463	T	11	18	100	
P24	11/9/10		6463	T	22	46	781	
P25	11/9/10		6463	T	22	76	1,595	
P26	11/9/10		6463	T	22	69	1,441	
P27	11/9/10		6463	T	22	62	1,287	
P28	11/10/10		6451	T	22	154	3,234	
P29	11/10/10		6451	T	22	140	3,080	
P30	11/10/10		6458	T	22	39	858	
P31	11/10/10		6463	T	18	16	232	
P32	11/10/10		6463	T	11	10	55	
P33	11/10/10		6463	T	22	46	746	
P34	11/10/10		6463	T	22	48	1,056	
P35	11/10/10		6463	T	22	48	1,056	
P36	11/10/10		6463	T	22	48	1,056	
P37	11/10/10		6451	T	22	48	1,056	
P38	11/10/10		6451	T	22	48	1,056	
P39	11/10/10		6451	T	22	48	857	
P40	11/10/10		6451	T	24	22	528	

CAAW Systems

Panel Placement Summary

Project Name: Powerton - Metal Cleaning Pond QC Monitor: Seng

Project Number: 201044 Material: 60 mil HDTW

Panel Number	Date	Time (am/pm)	Roll Number	Type S or T	Final Width (Feet)	Final Length (Feet)	Final Area (Sq. Ft.)	Comments
P41	11/10/10		6451	T	22	44	741	
P42	11/10/10		6458	T	22	69	1,518	
P43	11/11/10		6458	T	22	67	1,330	
P44	11/11/10		6458	T	22	67	1,474	
P45	11/11/10		6458	T	22	67	1,474	
P46	11/11/10		6458	T	22	67	1,474	
P47	11/11/10		6458	T	22	67	1,474	
P48	11/11/10		6458	T	22	67	1,474	
P49	11/11/10		6458	T	22	71	1,562	
P50	11/11/10		6452	T	22	74	1,628	
P51	11/11/10		6452	T	22	74	1,628	
P52	11/11/10		6452	T	22	220	4,840	
P53	11/11/10		6452	T	22	36	715	
P54	11/11/10		6449	T	22	26	492	
P55	11/11/10		6449	T	22	33	649	
P56	11/11/10		6449	T	22	29	561	
P57	11/11/10		6449	T	22	22	407	
P58	11/11/10		6449	T	22	15	253	
P59	11/11/10		6449	T	20	8	88	
P60	11/12/10		6449	T	8	110	880	

CAAW Systems

Panel Placement Summary

Project Name: Powerton - Metal Cleaning Pond

QC Monitor: Seng

Project Number: 201044

Material: 60 mil HDTW

Panel Number	Date	Time (am/pm)	Roll Number	Type S or T	Final Width (Feet)	Final Length (Feet)	Final Area (Sq. Ft.)	Comments
P61	11/12/10		6449	T	6	110	660	

CAAW Systems

Panel Seaming Summary

Project Name: Powerton - Metal Cleaning Pond
QC Monitor: Seng
Project Number: 201044
Material: 60 mil HDTW

Seam Number	Date Seamed	Final Seam Length (feet)	Welder Initials	Weld Type Ext / Wedge	Machine Number	Machine Temp/ Speed/ Preheat	Time		Ambient Temp (°F)	End of Seam Destructive Test (P/F)	Comments
							Start	Stop			
P1-P2	11/9/10	120	KS	W	1	850/300	13:02		59		
P2-P3	11/9/10	120	KK	W	427	850/500	13:10		59		
P3-P4	11/9/10	120	HN	W	428	850/500	13:18		59		
P4-P5	11/9/10	120	KS	W	1	850/300	13:26		59		
P5-P6	11/9/10	120	KK	W	427	850/500	13:40		59		
P6-P7	11/9/10	120	HN	W	428	850/500	13:49		59		
P7-P8	11/9/10	120	KS	W	1	850/300	13:59		59		
P8-P9	11/9/10	120	KK	W	427	850/500	14:15		59		
P9-P10	11/9/10	120	HN	W	428	850/500	14:21		59		
P10-P11	11/9/10	120	KS	W	1	850/300	14:16		59		
P11-P12	11/9/10	120	KK	W	427	850/500	14:40		59		
P12-P13	11/9/10	120	KS	W	1	850/300	15:24		59		
P13-P14	11/9/10	46	HN	W	428	850/500	15:44		59		
P17-P13	11/9/10	22	KK	W	427	850/500	15:40		59		
P14-P15	11/9/10	19	KK	W	427	850/500	15:40		59		
P14-P16	11/9/10	23	KK	W	427	850/500	15:40		59		
P17-P14	11/9/10	11	KK	W	427	850/500	15:40		59		
P15-P16	11/9/10	22	KK	W	427	850/500	15:30		59		
P16-P17	11/9/10	35	HN	W	428	850/500	15:26		59		

CAAW Systems

Panel Seaming Summary

Project Name: Powerton - Metal Cleaning Pond
QC Monitor: Seng
Project Number: 201044
Material: 60 mil HDTW

Seam Number	Date Seamed	Final Seam Length (feet)	Welder Initials	Weld Type Ext / Wedge	Machine Number	Machine Temp/ Speed/ Preheat	Time		Ambient Temp (°F)	End of Seam Destructive Test (P/F)	Comments
							Start	Stop			
P17-POLYL	11/10/10	78	VK	E	43	525/485	8:40		58		
P18-P17	11/10/10	12	VK	E	43	525/485	8:40		58		
P18-POLYL	11/10/10	74	VK	E	43	525/485	9:40		58		
P18-P19	11/10/10	16	VP	E	13	550/525	9:00		58		
P19-POLYL	11/10/10	51	VP	E	13	550/525	9:00		58		
P19-P20	11/10/10	52	KS	W	1	850?300	10:40		58		
P20-P21	11/10/10	48	KS	W	1	850?300	11:05		58		
P20-P24	11/10/10	6	KS	W	1	850?300	11:05		58		
P21-P22	11/10/10	22	KS	W	1	850?300	11:15		58		
P22-P23	11/10/10	18	KS	W	1	850?300	11:30		58		
P23-P24	11/10/10	19	KS	W	1	850?300	11:24		58		
P24-P25	11/10/10	46	KS	W	1	850?300	11:40		58		
P20-P25	11/10/10	22	KS	W	1	850?300	11:40		58		
P21-P24	11/10/10	24	KS	W	1	850?300	11:30		58		
P25-P26	11/10/10	65	KS	W	1	850?300	11:55		58		
P26-P27	11/10/10	60	KS	W	1	850?300	13:10		58		
P13-P25	11/10/10	22	KS	W	1	850?300	13:23		58		
P12-P26	11/10/10	22	KS	W	1	850?300	13:26		58		
P11-P27	11/10/10	22	KS	W	1	850?300	13:29		58		

CAAW Systems

Panel Seaming Summary

Project Name: Powerton - Metal Cleaning Pond QC Monitor: Seng

Project Number: 201044 Material: 60 mil HDTW

Seam Number	Date Seamed	Final Seam Length (feet)	Welder Initials	Weld Type Ext / Wedge	Machine Number	Machine Temp/ Speed/ Preheat	Time		Ambient Temp (°F)	End of Seam Destructive Test (P/F)	Comments
							Start	Stop			
P1-P28	11/10/10	120	KS	W	1	850?300	15:20		58		
P28-P29	10/10/10	141	KK	W	427	850/500	15:30		58		
P29-P30	11/11/10	38	KS	W	1	850?300	9:40		58		
P30-P31	11/11/10	18	KK	W	427	850/500	9:50		58		
P31-P32	11/10/10	10	KS	W	1	850?300	13:50		58		
P30-P33	11/11/10	21	KK	W	427	850/500	9:50		58		
P31-P33	11/10/10	16	KS	W	1	850?300	13:35		58		
P32-P33	11/10/10	11	KS	W	1	850?300	13:36		58		
P34-P35	11/10/10	48	KK	W	427	850/500	13:50		58		
P35-P36	11/10/10	48	KS	W	1	850/300	14:10		58		
P36-P37	11/10/10	48	KK	W	427	850/500	14:35		58		
P37-P38	11/10/10	48	KS	W	1	850/300	14:40		58		
P38-P39	11/10/10	48	KK	W	427	850/500	14:50		58		
P39-P40	11/10/10	24	KS	W	1	850/300	15:14		58		
P40-P41	11/10/10	21	KS	W	1	850/300	15:00		58		
P41-P42	11/11/10	34	KS	W	1	850/300	9:55		58		
P39-P41	11/10/10	24	KS	W	1	850/300	15:10		58		
P42-P43	11/11/10	64	KK	W	427	850/500	10:10		62		
P42-P29	11/11/10	22	KS	W	1	850/300	10:11		62		

CAAW Systems

Panel Seaming Summary

Project Name: Powerton - Metal Cleaning Pond QC Monitor: Seng

Project Number: 201044 Material: 60 mil HDTW

Seam Number	Date Seamed	Final Seam Length (feet)	Welder Initials	Weld Type Ext / Wedge	Machine Number	Machine Temp/ Speed/ Preheat	Time Start	Time Stop	Ambient Temp (°F)	End of Seam Destructive Test (P/F)	Comments
P43--P28	11/11/10	23	KS	W	1	850/300	10:04		62		
P43-P44	11/11/10	55	KK	W	427	850/500	10:15		62		
P44-P28	11/11/10	12	KK	W	427	850/500	10:15		62		
P44-P45	11/11/10	67	KS	W	1	850/300	10:15		62		
P45-P46	11/11/10	67	KS	W	1	850/300	10:25		62		
P46-P47	11/11/10	67	KK	W	427	850/500	10:30		62		
P47-P48	11/11/10	67	KS	W	1	850/300	10:36		62		
P48-P49	11/11/10	71	KK	W	427	850/500	10:45		62		
P49-P50	11/11/10	72	KS	W	1	850/300	10:49		62		
P50-P51	11/11/10	74	KS	W	1	850/300	11:05		62		
P51-P53	11/11/10	36	KK	W	427	850/500	13:20		62		
P53-P56	11/11/10	31	KK	W	427	850/500	13:35		62		
P56-P57	11/11/10	24	KK	W	427	850/500	13:45		62		
P57-P58	11/11/10	18	KK	W	427	850/500	13:50		62		
P58-P59	11/11/10	11	KK	W	427	850/500	13:55		62		
P54-P55	11/11/10	26	KS	W	1	850/300	11:05		62		
P55-P27	11/11/10	33	KS	W	1	850/300	11:10		62		
P28-P52	11/11/10	22	KK	W	427	850/500	11:30		62		
P44-P52	11/11/10	22	KK	W	427	850/500	11:34		62		

CAAW Systems

Panel Seaming Summary

Project Name: Powerton - Metal Cleaning Pond | QC Monitor: Seng

Project Number: 201044 | Material: 60 mil HDTW

Seam Number	Date Seamed	Final Seam Length (feet)	Welder Initials	Weld Type Ext / Wedge	Machine Number	Machine Temp/ Speed/ Preheat	Time		Ambient Temp (°F)	End of Seam Destructive Test (P/F)	Comments
							Start	Stop			
P45-P52	11/11/10	22	KK	W	427	850/500	11:38		62		
P46-P52	11/11/10	22	KK	W	427	850/500	11:41		62		
P47-P52	11/11/10	22	KK	W	427	850/500	11:44		62		
P48-P52	11/11/10	22	KK	W	427	850/500	11:47		62		
P49-P52	11/11/10	22	KK	W	427	850/500	11:50		62		
P50-P52	11/11/10	22	KK	W	427	850/500	11:53		62		
P51-P52	11/11/10	22	KK	W	427	850/500	11:56		62		
P54-P52	11/11/10	22	KS	W	1	850/300	13:35		62		
P55-P52	11/11/10	22	KS	W	1	850/300	13:36		62		
P52-P27	11/11/10	22	KS	W	1	850/300	13:48		62		
P1-P52	11/11/10	22	KS	W	1	850/300	13:55		62		
P2-P52	11/11/10	22	KS	W	1	850/300	13:58		62		
P3-P52	11/11/10	22	KS	W	1	850/300	14:01		62		
P4-P52	11/11/10	22	KS	W	1	850/300	14:04		62		
P5-P52	11/11/10	22	KS	W	1	850/300	14:07		62		
P6-P52	11/11/10	22	KS	W	1	850/300	14:10		62		
P7-P52	11/11/10	22	KS	W	1	850/300	14:13		62		
P8-P52	11/11/10	22	KS	W	1	850/300	14:16		62		
P9-P52	11/11/10	22	KS	W	1	850/300	14:19		62		

CAAW Systems

Panel Seaming Summary

Project Name: Powerton - Metal Cleaning Pond

QC Monitor: Seng

Project Number: 201044

Material: 60 mil HDTW

Seam Number	Date Seamed	Final Seam Length (feet)	Welder Initials	Weld Type Ext / Wedge	Machine Number	Machine Temp/ Speed/ Preheat	Time Start	Time Stop	Ambient Temp (°F)	End of Seam Destructive Test (P/F)	Comments
P10-P52	11/11/10	22	KS	W	1	850/300	14:22		62		
P60-P29	11/12/10	97	KK	W	427	850/500	9:10		62		
P60-42	11/12/10	24	KK	W	427	850/500	9:10		62		
P61-P34	11/12/10	22	KK	W	427	850/500	10:20		62		
P61-P35	11/12/10	22	KK	W	427	850/500	10:20		62		
P61-P36	11/12/10	22	KK	W	427	850/500	10:20		62		
P61-P37	11/12/10	22	KK	W	427	850/500	10:20		62		
P61-P38	11/12/10	22	KK	W	427	850/500	10:20		62		
P61-P39	11/12/10	9	KK	W	427	850/500	10:20		62		

CAAW Systems

Non-Destructive Test Summary

Project Name: Powerton - Metal Cleaning Pond

QC Monitor: Seng

Project Number: 201044

Material: 60 mil HDTW

Seam Number	Date Tested	Location / Seam Length Tested	Air					Vacuum	Comments
			Air Pressure				Air Test Results (P/F)	Vac. Test Results (P/F)	
			Start		End				
			PSI	Time	PSI	Time			
P1-P2	11/10/10	120	30	8:10	30	8:15	P		
P2-P3	11/10/10	120	30	8:08	30	8:13	P		
P3-P4	11/10/10	120	30	8:07	30	8:12	P		
P4-P5	11/10/10	120	30	7:59	30	8:04	P		
P5-P6	11/10/10	120	30	7:58	30	8:03	P		
P6-P7	11/10/10	120	30	7:57	30	8:02	P		
P7-P8	11/10/10	120	30	7:56	30	8:01	P		
P8-P9	11/10/10	120	30	7:55	30	8:00	P		
P9-P10	11/10/10	120	30	8:30	30	8:35	P		
P10-P11	11/10/10	120	30	8:25	30	8:30	P		
P11-P12	11/10/10	120	30	8:26	30	8:31	P		
P12-P13	11/10/10	120	30	8:29	30	8:34	P		
P13-P14	11/10/10	46	30	9:03	29	9:08	P		
P17-P13	11/10/10	22	30	9:11	30	9:16	P		
P14-P15	11/10/10	19	30	9:19	28	9:24	P		
P14-P16	11/10/10	23	30	8:57	30	9:02	P		
P17-P14	11/10/10	11	30	9:12	30	9:17	P		
P15-P16	11/10/10	22	30	9:20	30	9:25	P		
P16-P17	11/10/10	35	30	8:58	30	9:03	P		
P19-P20	11/11/10	52	30	14:02	30	14:07	P		
P20-P21	11/11/10	48	30	14:03	30	14:08	P		

CAAW Systems

Non-Destructive Test Summary

Project Name: Powerton - Metal Cleaning Pond

QC Monitor: Seng

Project Number: 201044

Material: 60 mil HDTW

Seam Number	Date Tested	Location / Seam Length Tested	Air					Vacuum	Comments
			Air Pressure				Air Test Results (P/F)	Vac. Test Results (P/F)	
			Start		End				
			PSI	Time	PSI	Time			
P20-P24	11/11/10	6	30	14:05	30	14:10	P		
P21-P22	11/11/10	22	30	14:06	30	14:11	P		
P22-P23	11/11/10	18	30	14:15	30	14:20	P		
P23-P24	11/11/10	19	30	14:16	30	14:21	P		
P24-P25	11/11/10	46	30	14:17	30	14:22	P		
P20-P25	11/11/10	22	30	14:18	30	14:23	P		
P21-P24	11/11/10	24	30	14:25	30	14:30	P		
P25-P26	11/11/10	65	30	14:26	30	14:31	P		
P26-P27	11/11/10	60	30	14:27	30	14:32	P		
P13-P25	11/11/10	22	30	14:28	30	14:33	P		
P12-P26	11/11/10	22	30	14:34	30	14:39	P		
P11-P27	11/11/10	22	30	14:35	30	14:40	P		
P1-P28	11/11/10	120	30	14:36	30	14:41	P		
P28-P29	11/12/10	141	30	14:38	30	14:43	P		
P30-P31	11/12/10	18	30	10:19	29	10:24	P		
P31-P32	11/12/10	10	30	8:48	30	8:53	P		
P30-P33	11/12/10	21	30	10:18	30	10:23	P		
P31-P33	11/12/10	16	30	8:46	30	8:51	P		
P32-P33	11/12/10	11	30	8:49	30	8:54	P		
P34-P35	11/12/10	48	30	8:55	30	9:00	P		
P35-P36	11/12/10	48	30	8:56	30	9:01	P		

CAAW Systems

Non-Destructive Test Summary

Project Name: Powerton - Metal Cleaning Pond

QC Monitor: Seng

Project Number: 201044

Material: 60 mil HDTW

Seam Number	Date Tested	Location / Seam Length Tested	Air					Vacuum	Comments
			Air Pressure				Air Test Results (P/F)	Vac. Test Results (P/F)	
			Start		End				
			PSI	Time	PSI	Time			
P36-P37	11/12/10	48	30	8:59	30	9:04	P		
P37-P38	11/12/10	48	30	9:00	30	9:05	P		
P38-P39	11/12/10	48	30	9:05	30	9:10	P		
P39-P40	11/12/10	24	30	9:09	29	9:14	P		
P40-P41	11/12/10	21	30	9-:08	30	9:13	P		
P41-P42	11/12/10	34	30	10:58	30	11:03	P		
P39-P41	11/12/10	24	30	9:06	30	9:11	P		
P42-P43	11/12/10	64	30	10:57	29	11:02	P		
P42-P29	11/12/10	22	30	10:47	30	10:52	P		
P43--P28	11/12/10	23	30	10:49	30	10:54	P		
P43-P44	11/12/10	55	30	11:00	30	11:05	P		
P44-P28	11/12/10	12	30	11:06	30	11:11	P		
P44-P45	11/12/10	67	30	11:25	30	11:30	P		
P45-P46	11/12/10	67	30	11:26	30	11:31	P		
P46-P47	11/12/10	67	30	11:27	30	11:32	P		
P47-P48	11/12/10	67	30	11:50	30	11:55	P		
P48-P49	11/12/10	71	30	11:51	30	11:56	P		
P49-P50	11/12/10	72	30	11:53	30	11:58	P		
P50-P51	11/12/10	74	30	13:09	29	13:14	P		
P51-P53	11/12/10	36	30	8:36	30	8:41	P		
P53-P56	11/12/10	31	30	8:51	30	8:56	P		

CAAW Systems

Non-Destructive Test Summary

Project Name: Powerton - Metal Cleaning Pond

QC Monitor: Seng

Project Number: 201044

Material: 60 mil HDTW

Seam Number	Date Tested	Location / Seam Length Tested	Air					Vacuum	Comments
			Air Pressure				Air Test Results (P/F)	Vac. Test Results (P/F)	
			Start		End				
			PSI	Time	PSI	Time			
P56-P57	11/12/10	24	30	8:52	30	8:57	P		
P57-P58	11/12/10	18	30	8:53	30	8:58	P		
P58-P59	11/12/10	11	30	8:54	30	8:59	P		
P54-P55	11/12/10	26	30	7:49	30	7:54	P		
P55-P27	11/12/10	33	30	7:47	30	7:52	P		
P28-P52	11/12/10	22	30	8:21	30	8:26	P		
P44-P52	11/12/10	22	30	8:22	30	8:27	P		
P45-P52	11/12/10	22	30	8:23	30	8:28	P		
P46-P52	11/12/10	22	30	8:24	30	8:29	P		
P47-P52	11/12/10	22	30	8:33	30	8:38	P		
P48-P52	11/12/10	22	30	8:34	30	8:39	P		
P49-P52	11/12/10	22	30	8:35	30	8:40	P		
P50-P52	11/12/10	22	30	7:59	30	8:04	P		
P51-P52	11/12/10	22	30	7:58	30	8:03	P		
P54-P52	11/12/10	22	30	7:57	30	8:02	P		
P55-P52	11/12/10	22	30	7:46	30	7:51	P		
P52-P27	11/12/10	22	30	7:45	30	7:50	P		
P1-P52	11/12/10	22	30	7:15	30	7:20	P		
P2-P52	11/12/10	22	30	7:16	30	7:21	P		
P3-P52	11/12/10	22	30	7:17	30	7:22	P		
P4-P52	11/12/10	22	30	7:18	30	7:23	P		

CAAW Systems

Non-Destructive Test Summary

Project Name: Powerton - Metal Cleaning Pond

QC Monitor: Seng

Project Number: 201044

Material: 60 mil HDTW

Seam Number	Date Tested	Location / Seam Length Tested	Air					Vacuum	Comments
			Air Pressure				Air Test Results (P/F)	Vac. Test Results (P/F)	
			Start		End				
			PSI	Time	PSI	Time			
P5-P52	11/12/10	22	30	7:19	30	7:24	P		
P6-P52	11/12/10	22	30	7:26	30	7:31	P		
P7-P52	11/12/10	22	30	7:27	30	7:32	P		
P8-P52	11/12/10	22	30	7:28	30	7:33	P		
P9-P52	11/12/10	22	30	7:29	30	7:34	P		
P10-P52	11/12/10	22	30	7:30	30	7:35	P		
P60-42	11/12/10	20	30	7:33	30	7:38	P		
P61-P34	11/12/10	22	30	7:34	30	7:39	P		
P61-P35	11/12/10	22	30	7:36	30	7:41	P		
P61-P36	11/12/10	22	30	7:37	30	7:42	P		
P61-P37	11/12/10	22	30	7:40	30	7:45	P		
P61-P38	11/12/10	22	30	7:41	30	7:46	P		
P61-P39	11/12/10	9	30	7:43	30	7:48	P		
P60-P29	11/12/10	7	30	13:40	29	13:45	P		
P60-P29	11/12/10	12	30	13:41	30	13:46	P		
P60-P29	11/12/10	15	30	13:42	29	13:47	P		
P60-P29	11/12/10	6	30	13:43	30	13:48	P		
P60-P29	11/12/10	11	30	13:50	30	13:55	P		
P60-P29	11/12/10	28	30	13:51	30	13:56	P		
P60-P29	11/12/10	23	30	13:52	30	13:57	P		
P60-P42	11/12/10	4	30	1353	29	13:58	P		

CAAW Systems

Seam Destructive Test Summary - Field

Project Name: Powerton - Metal Cleaning Pond

QC Monitor: Seng

Project Number: 201044

Material: 60 mil HDTW

Sample DT#	Seam Number	Date	Mach #/ Welder ID	Description of Sample Location	Peel (ppi) Inside	Peel (ppi) Outside	Shear (ppi)	Results (P/F)	Comments
DS1	P5-P6	11/9/10	KK/427	WEOS - 85	144	129	189	P	
					126	135	191		
					130	133	187		
DS2	P10-P9	11/10/10	KK/427	EEOS - 22	125	119	197	P	
					133	122	186		
					125	129	190		
DS3	P27-P26	11/10/10	KS/1	WEOS - 13	124	136	182	P	
					118	128	169		
					129	122	188		
DS4	P44-P45	11/11/10	KS/1	WEOS - 10	128	136	178	P	
					122	118	189		
					123	131	180		
DS5	P9-P52	11/11/10	KS/1	SEOS - 5	134	128	182	P	
					125	134	182		
					136	127	188		

CAAW Systems

Repair Summary

Project Name: Powerton - Metal Cleaning Pond

QC Monitor: Seng

Project Number: 201044

Material: 60 mil HDTW

Repair Number	Repair Date	Operator/ Mach #	Seam # OR Panel #	Repair Location	Description (patch, bead, ext weld, cap, DT, boot)	Size of Repair	Date Vacuum Tested	Vac. Test Results
1	11/10/10	VK/43	P14	NEOP - 2 X EEOP - 6	BOOT	4X4	11/12/10	P
2	11/10/10	VK/43	P14-P13	INT OF 13-14-17	PATCH	2X2	11/12/10	P
3	11/10/10	VK/43	P16-P17	INT OF 16-17-14	PATCH	2X2	11/12/10	P
4	11/10/10	VK/43	P15-P16	INT OF 15-16-14	PATCH	2X2	11/12/10	P
5	11/10/10	VK/43	P17-P18	SEOS - 0	PATCH	7X4	11/12/10	P
6	11/10/10	VK/43	P18-P17	NEOS - 0	PATCH	5X10	11/12/10	P
7	11/10/10	VK/43	P18-P19	SEOS - 0	PATCH	6X4	11/12/10	P
8	11/10/10	VP/13	P19-P13	EEOS - 0	PATCH	37X3	11/12/10	P
9	11/10/10	VP/13	P22-P21	INT OF 21-22-23-24	PATCH	2X2	11/12/10	P
10	11/10/10	VP/13	P20-P21	INT OF 21-20-24	PATCH	2X2	11/12/10	P
11	11/10/10	VP/13	P24-P25	INT OF 24-25-20	PATCH	2X2	11/12/10	P
12	11/10/10	VP/13	P25-P26	INT OF 25-26-13-12	PATCH	2X2	11/12/10	P
13	11/10/10	VP/13	P26-P27	INT OF 26-27-11-12	PATCH	2X2	11/12/10	P
14	11/11/10	VK/43	P9	WEOP - 41 X NEOP - 3	BOOT	4X4	11/12/10	P
15	11/11/10	VK/43	P5	WEOP - 41 X SEOP - 3	BOOT	4X4	11/12/10	P
16	11/11/10	VK/43	P33-P34	NEOS - 0	BOOT	4X7	11/12/10	P
17	11/11/10	VK/43	P34-P35	INT OF 34-35-61	PATCH	1X1	11/12/10	P
18	11/11/10	VK/43	P35-P36	INT OF 35-36-61	PATCH	1X1	11/12/10	P
19	11/12/10	KS/239	P51-P54	WEOS - 0	PATCH	2X20	11/15/10	P
20	11/12/10	KS/239	P9-P52	SEOS - 5 DS5	DT	2X4	11/15/10	P
21	11/12/10	KS/239	P26-P27	WEOS - 13 DS3	DT	2X4	11/15/10	P
22	11/12/10	KS/239	P51-P50	INT OF 51-50-52	PATCH	2X2	11/15/10	P

CAAW Systems

Repair Summary

Project Name: Powerton - Metal Cleaning Pond
QC Monitor: Seng
Project Number: 201044
Material: 60 mil HDTW

Repair Number	Repair Date	Operator/ Mach #	Seam # OR Panel #	Repair Location	Description (patch, bead, ext weld, cap, DT, boot)	Size of Repair	Date Vacuum Tested	Vac. Test Results
23	11/12/10	VP/13	P33-P32	INT OF 33-32-31	PATCH	2X2	11/15/10	P
24	11/12/10	VP/13	P31-P30	INT OF 30-31-33	PATCH	2X2	11/15/10	P
25	11/12/10	VP/13	P30-P31	WEOS - 4	PATCH	2X2	11/15/10	P
26	11/12/10	VP/13	P29	WEOP - 41 X SEOP - 3	BOOT	4X4	11/15/10	P
27	11/12/10	VP/13	P29-P30	INT OF 29-30-60	PATCH	2X2	11/15/10	P
28	11/12/10	VP/13	P60-P29	WEOS - 7	PATCH	2X2	11/15/10	P
29	11/12/10	VP/13	P60-P29	WEOS - 19	PATCH	2X2	11/15/10	P
30	11/12/10	VP/13	P60-P29	WEOS - 39	PATCH	2X2	11/15/10	P
31	11/12/10	VP/13	P60-P29	WEOS - 45	PATCH	2X2	11/15/10	P
32	11/12/10	VP/13	P33-P34	SEOS - 0	PATCH	4X15	11/15/10	P
33	11/12/10	VK/43	P30-P33	INT OF R32-30-33	PATCH	2X2	11/15/10	P
34	11/12/10	VK/43	P61-P34	INT OF 60-34-R32	PATCH	2X2	11/15/10	P
35	11/12/10	VK/43	P36-P37	INT OF 36-37-61	PATCH	2X2	11/15/10	P
36	11/12/10	VK/43	P37-P60	WEOS - 5	PATCH	2X2	11/15/10	P
37	11/12/10	VK/43	P37-P38	INT OF 37-38-61	PATCH	2X2	11/15/10	P
38	11/12/10	VK/43	P38-P61	WEOS - 9	PATCH	2X2	11/15/10	P
39	11/12/10	VK/43	P38-P39	INT OF 38-39-61	PATCH	2X2	11/15/10	P
40	11/12/10	VK/43	P38-P61	WEOS - 4	PATCH	2X2	11/15/10	P
41	11/15/10	VK/43	P39-P40	INT OF 39-40-41	PATCH	2X2	11/15/10	P
42	11/15/10	VK/43	P39-P41	INT OF 39-41-61	PATCH	2X2	11/15/10	P
43	11/15/10	VP/13	P1-P2	INT OF 1-2-52	PATCH	2X2	11/15/10	P
44	11/15/10	VP/13	P2-P3	INT OF 2-3-52	PATCH	2X2	11/15/10	P

CAAW Systems

Repair Summary

Project Name: Powerton - Metal Cleaning Pond

QC Monitor: Seng

Project Number: 201044

Material: 60 mil HDTW

Repair Number	Repair Date	Operator/ Mach #	Seam # OR Panel #	Repair Location	Description (patch, bead, ext weld, cap, DT, boot)	Size of Repair	Date Vacuum Tested	Vac. Test Results
45	11/15/10	VP/13	P3-P4	INT OF 3-4-52	PATCH	2X2	11/15/10	P
46	11/15/10	VP/13	P4-P5	INT OF 4-5-52	PATCH	2X2	11/15/10	P
47	11/15/10	VP/13	P5-P6	INT OF 5-6-52	PATCH	2X2	11/15/10	P
48	11/15/10	VP/13	P6-P7	INT OF 6-7-52	PATCH	2X2	11/15/10	P
49	11/15/10	VP/13	P7-P8	INT OF 7-8-52	PATCH	2X2	11/15/10	P
50	11/15/10	VP/13	P8-P9	INT OF 8-9-52	PATCH	2X2	11/15/10	P
51	11/15/10	VP/13	P9-P10	INT OF 9-10-52	PATCH	2X2	11/15/10	P
52	11/15/10	VP/13	P10-P11	INT OF 10-11-52-27	PATCH	2X2	11/15/10	P
53	11/15/10	VP/13	P5-P6	WEOS - 85 DS1	DT	2X4	11/15/10	P
54	11/15/10	VP/13	P9-P10	EEOS - 22 DS2	DT	2X4	11/15/10	P
55	11/15/10	VK/43	P35	NEOP - 11	PATCH	11X2	11/15/10	P
56	11/15/10	VK/43	P42	EEOP - 44 X SEOP - 3	BOOT	4X4	11/15/10	P
57	11/15/10	VK/43	P43	NEOP - 8 X EEOP - 6	BOOT	5X6	11/15/10	P
58	11/15/10	VK/43	P60-P29	INT OF 29-60-42	PATCH	2X2	11/15/10	P
59	11/15/10	VK/43	P60-P29	EEOS - 23	PATCH	2X2	11/15/10	P
60	11/15/10	VK/43	P60-P42	WEOS - 4	PATCH	2X2	11/15/10	P
61	11/15/10	VK/43	P60-P42	WEOS - 24	PATCH	2X2	11/15/10	P
62	11/15/10	VK/43	P42-P43	INT OF 42-43-29-28	PATCH	2X2	11/15/10	P
63	11/15/10	VK/43	P43-P44	INT OF 43-44-28	PATCH	2X2	11/15/10	P
64	11/15/10	VK/43	P44-P28	INT OF 44-28-52	PATCH	2X2	11/15/10	P
65	11/15/10	VK/43	P44-P45	INT OF 44-45-52	PATCH	2X2	11/15/10	P
66	11/15/10	VK/43	P44-P45	WEOS - 10 DS4	DT	2X4	11/15/10	P

CAAW Systems

Repair Summary

Project Name: Powerton - Metal Cleaning Pond

QC Monitor: Seng

Project Number: 201044

Material: 60 mil HDTW

Repair Number	Repair Date	Operator/ Mach #	Seam # OR Panel #	Repair Location	Description (patch, bead, ext weld, cap, DT, boot)	Size of Repair	Date Vacuum Tested	Vac. Test Results
67	11/15/10	VK/43	P45-P46	INT OF 45-46-52	PATCH	2X2	11/15/10	P
68	11/15/10	VK/43	P46-P47	INT OF 46-47-52	PATCH	2X2	11/15/10	P
69	11/15/10	VK/43	P47-P48	INT OF 47-48-52	PATCH	2X2	11/15/10	P
70	11/15/10	VK/43	P48-P49	INT OF 48-49-52	PATCH	2X2	11/15/10	P
71	11/15/10	VK/43	P49	EEOP - 41 X SEOP - 3	BOOT	4X4	11/15/10	P
72	11/15/10	VK/43	P49-P50	INT OF 49-50-52	PATCH	2X2	11/15/10	P
73	11/15/10	VK/43	P51-P53	EEOS - 3	PATCH	1X1	11/15/10	P
74	11/15/10	VK/43	P53-P56	WEOS - 0	PATCH	1X1	11/15/10	P
75	11/15/10	VK/43	P56-P57	WEOS - 0	PATCH	1X1	11/15/10	P
76	11/15/10	VK/43	P54-P51	WEOS - 18	BOOT	4X4	11/15/10	P
77	11/15/10	VK/43	P27-P26	EEOS - 0	PATCH	2X2	11/15/10	P
78	11/15/10	VK/43	P26-P25	EEOS - 0	PATCH	1X1	11/15/10	P
79	11/15/10	VP/13	P1-P2	WEOS - 4	PATCH	1X1	11/15/10	P
80	11/15/10	VP/13	P2-P3	WEOS - 4	PATCH	2X2	11/15/10	P
81	11/15/10	VP/13	P5-P6	WEOS - 5	PATCH	1X1	11/15/10	P

CAAW Systems Field QC Information

Project Name:	Powerton - Bypass Pond
Project Number:	201044
Location:	Pekin, Il
QC Monitor:	Seng
Mat	60 mil HDTW

CAAW Systems

Trial Weld Testing Summary

Project Name: Powerton - Bypass Pond QC Monitor: Seng

Project Number: 201044 Material: 60 mil HDTW

Sample TW#	Date	Ambient Temp	Time (AM/PM)	Machine Number	Seamer Initials	Extrusion Temp	Fusion Temp/Speed	Peel (ppi) Inside	Peel (ppi) Outside	Shear (ppi)	Results (P/F)	Comments
1	11/17/10	52	8:45	428	HN	Barrel	Wedge	124	131	178	P	
							850	119	129	185		
						Preheat	Speed	122	126	192		
							500					
2	11/17/10	52	8:48	1	KS	Barrel	Wedge	133	125	178	P	
							850	121	132	188		
						Preheat	Speed	129	139	185		
							300					
3	11/17/10	52	8:42	427	KK	Barrel	Wedge	121	138	192	P	
							850	123	132	186		
						Preheat	Speed	119	111	194		
							500					
4	11/17/10	52	13:15	428	HN	Barrel	Wedge	120	128	177	P	
							850	115	136	182		
						Preheat	Speed	129	121	175		
							500					
5	11/17/10	52	13:08	427	KK	Barrel	Wedge	118	128	189	P	
							850	126	130	184		
						Preheat	Speed	122	128	181		
							500					

CAAW Systems

Trial Weld Testing Summary

Project Name: Powerton - Bypass Pond QC Monitor: Seng

Project Number: 201044 Material: 60 mil HDTW

Sample TW#	Date	Ambient Temp	Time (AM/PM)	Machine Number	Seamer Initials	Extrusion Temp	Fusion Temp/Speed	Peel (ppi) Inside	Peel (ppi) Outside	Shear (ppi)	Results (P/F)	Comments
6	11/17/10	52	13:11	1	KS	Barrel	Wedge	125	125	186	P	
							850	129	138	186		
						Preheat	Speed	133	124	190		
							300					
1	11/18/10	48	7:30	13	VP	Barrel	Wedge	115		168	P	
						550		98		177		
						Preheat	Speed	105		168		
						500						
2	11/18/10	48	7:35	43	VK	Barrel	Wedge	127		158	P	
						525		115		167		
						Preheat	Speed	115		166		
						485						
3	11/18/10	48	13:15	43	VK	Barrel	Wedge	118		172	P	
						525		108		178		
						Preheat	Speed	120		174		
						485						
4	11/18/10	48	13:21	13	VP	Barrel	Wedge	116		175	P	
						550		105		171		
						Preheat	Speed	102		174		
						500						

CAAW Systems

Trial Weld Testing Summary

Project Name: Powerton - Bypass Pond   QC Monitor: Seng

Project Number: 201044   Material: 60 mil HDTW

Sample TW#	Date	Ambient Temp	Time (AM/PM)	Machine Number	Seamer Initials	Extrusion Temp	Fusion Temp/Speed	Peel (ppi)		Shear (ppi)	Results (P/F)	Comments
								Inside	Outside			
5	11/18/10	48	13:10	428	HN	Barrel	Wedge	124		168	P	
							850	122		170		
						Preheat	Speed	130		170		
							500					
						Barrel	Wedge					
						Preheat	Speed					
						Barrel	Wedge					
						Preheat	Speed					
						Barrel	Wedge					
						Preheat	Speed					
						Barrel	Wedge					
						Preheat	Speed					

CAAW Systems

Panel Placement Summary

Project Name: Powerton - Bypass Pond

QC Monitor: Seng

Project Number: 201044

Material: 60 mil HDTW

Panel Number	Date	Time (am/pm)	Roll Number	Type S or T	Final Width (Feet)	Final Length (Feet)	Final Area (Sq. Ft.)	Comments
P1	11/17/10		6449	T	22	51	1,122	
P2	11/17/10		6449	T	22	51	1,122	
P3	11/17/10		6449	T	22	51	1,122	
P4	11/17/10		6449	T	22	51	1,122	
P5	11/17/10		6449	T	22	51	1,122	
P6	11/17/10		6449	T	22	51	1,122	
P7	11/17/10		6449	T	22	51	1,122	
P8	11/17/10		6446	T	22	48	537	
P9	11/17/10		6446	T	15	30	177	
P10	11/17/10		6446	T	22	43	773	
P11	11/17/10		6446	T	6	12	32	
P12	11/17/10		6446	T	22	199	4,378	
P13	11/17/10		6446	T	22	221	4,862	
P14	11/17/10		6445	T	22	46	865	
P15	11/17/10		6445	T	22	32	521	
P16	11/17/10		6445	T	22	61	1,342	
P17	11/17/10		6445	T	16	17	122	
P18	11/17/10		6445	T	22	44	968	
P19	11/17/10		6445	T	18	44	394	
P20	11/17/10		6445	T	10	24	240	

CAAW Systems

Panel Placement Summary

Project Name: Powerton - Bypass Pond QC Monitor: Seng

Project Number: 201044 Material: 60 mil HDTW

Panel Number	Date	Time (am/pm)	Roll Number	Type S or T	Final Width (Feet)	Final Length (Feet)	Final Area (Sq. Ft.)	Comments
P21	11/17/10		6445	T	22	35	649	
P22	11/17/10		6445	T	22	47	1,034	
P23	11/17/10		6445	T	22	51	1,122	
P24	11/17/10		6445	T	22	31	668	
P25	11/17/10		6445	T	4	14	56	
P26	11/17/10		6445	T	22	79	1,738	
P27	11/17/10		6448	T	22	130	2,860	
P28	11/17/10		6448	T	22	48	1,056	
P29	11/17/10		6448	T	22	53	1,166	
P30	11/17/10		6448	T	22	56	1,232	
P31	11/17/10		6448	T	22	57	1,254	
P32	11/17/10		6448	T	22	60	1,320	
P33	11/17/10		6448	T	22	60	1,320	
P34	11/17/10		6448	T	22	27	594	
P35	11/17/10		6450	T	22	33	726	
P36	11/17/10		6450	T	22	57	1,254	
P37	11/17/10		6450	T	22	23	506	
P38	11/17/10		6445	T	22	23	393	
P39	11/17/10		6445	T	9	11	99	

CAAW Systems

Panel Seaming Summary

Project Name: Powerton - Bypass Pond QC Monitor: Seng

Project Number: 201044 Material: 60 mil HDTW

Seam Number	Date Seamed	Final Seam Length (feet)	Welder Initials	Weld Type Ext / Wedge	Machine Number	Machine Temp/ Speed/ Preheat	Time		Ambient Temp (°F)	End of Seam Destructive Test (P/F)	Comments
							Start	Stop			
P1-P2	11/17/10	51	KS	W	1	850/300	9:30				
P2-P3	11/17/10	51	HN	W	428	850/500	9:32				
P3-P4	11/17/10	51	KK	W	427	850/500	9:35				
P4-P5	11/17/10	51	KS	W	1	850/300	9:45				
P5-P6	11/17/10	50	KK	W	427	850/500	9:45				
P6-P7	11/17/10	49	HN	W	428	850/500	9:43				
P7-P8	11/17/10	48	KK	W	427	850/500	10:10				
P8-P9	11/17/10	30	HN	W	428	850/500	10:10				
P9-P10	11/17/10	17	HN	W	428	850/500	10:35				
P10-P11	11/17/10	12	HN	W	428	850/500	10:35				
P10-P12	11/17/10	43	KS	W	1	850/300	11:06				
P9-P11	11/17/10	11	HN	W	428	850/500	10:35				
P10-P8	11/17/10	13	HN	W	428	850/500	10:35				
P12-P13	11/17/10	199	HN	W	428	850/500	10:38				
P12-P1	11/17/10	22	KS	W	1	850/300	10:45				
P12-P2	11/17/10	P	KS	W	1	850/300	10:48				
P12-P3	11/17/10	22	KS	W	1	850/300	10:51				
P12-P4	11/17/10	22	KS	W	1	850/300	10:54				
P12-P5	11/17/10	22	KS	W	1	850/300	10:57				

CAAW Systems

Panel Seaming Summary

Project Name: Powerton - Bypass Pond

QC Monitor: Seng

Project Number: 201044

Material: 60 mil HDTW

Seam Number	Date Seamed	Final Seam Length (feet)	Welder Initials	Weld Type Ext / Wedge	Machine Number	Machine Temp/ Speed/ Preheat	Time		Ambient Temp (°F)	End of Seam Destructive Test (P/F)	Comments
							Start	Stop			
P12-P6	11/17/10	22	KS	W	1	850/300	11:00				
P12-P7	11/17/10	22	KS	W	1	850/300	11:03				
P16-P13	11/17/10	61	KS	W	1	850/300	11:19				
P16-P27	11/17/10	22	KK	W	427	850/500	14:25				
P27-P13	11/17/10	130	KK	W	427	850/500	14:29				
P13-P26	11/17/10	29	KK	W	427	850/500	14:29				
P26-P27	11/17/10	22	KS	W	1	850/300	14:05				
P28-P29	11/17/10	48	HN	W	428	850/500	14:34				
P29-P30	11/17/10	53	HN	W	428	850/500	14:26				
P30-P31	11/17/10	56	HN	W	428	850/500	15:00				
P31-P32	11/17/10	57	KK	W	427	850/500	15:00				
P32-P33	11/17/10	60	KK	W	427	850/500	15:10				
P34-P33	11/17/10	27	HN	W	428	850/500	15:16				
P33-P35	11/17/10	33	HN	W	428	850/500	15:16				
P34-P35	11/17/10	22	HN	W	428	850/500	15:13				
P36-P34	11/17/10	24	HN	W	428	850/500	15:33				
P35-P36	11/17/10	33	HN	W	428	850/500	15:33				
P25-P16	11/17/10	14	KK	W	427	850/500	16:02				
P28-P27	11/17/10	19	KK	W	427	850/500	15:30				

CAAW Systems

Panel Seaming Summary

Project Name: Powerton - Bypass Pond

QC Monitor: Seng

Project Number: 201044

Material: 60 mil HDTW

Seam Number	Date Seamed	Final Seam Length (feet)	Welder Initials	Weld Type Ext / Wedge	Machine Number	Machine Temp/ Speed/ Preheat	Time		Ambient Temp (°F)	End of Seam Destructive Test (P/F)	Comments
							Start	Stop			
P29-P27	11/17/10	22	KK	W	427	850/500	15:33				
P30-P27	11/17/10	22	KK	W	427	850/500	15:36				
P31-P27	11/17/10	22	KK	W	427	850/500	15:39				
P32-P27	11/17/10	22	KK	W	427	850/500	15:42				
P33-P27	11/17/10	22	KK	W	427	850/500	15:45				
P35-P26	11/17/10	19	KK	W	427	850/500	15:48				
P36-P26	11/17/10	22	KK	W	427	850/500	15:51				
P37-P26	11/17/10	27	KK	W	427	850/500	15:56				
P16-P15	11/17/10	32	HN	W	428	850/500	11:21				
P15-P17	11/17/10	17	KS	W	1	850/300	11:35				
P15-P14	11/17/10	22	HN	W	428	850/500	11:38				
P14-P17	11/17/10	16	HN	W	428	850/500	11:38				
P26-P23	11/17/10	51	KK	W	427	850/500					
P23-P22	11/17/10	51	KK	W	427	850/500	13:35				
P22-P21	11/17/10	35	HN	W	428	850/500	13:47				
P22-P18	11/17/10	12	HN	W	428	850/500	13:47				
P21-P20	11/17/10	24	HN	W	428	850/500	13:32				
P20-P19	11/17/10	20	KS	W	1	850/300	13:39				
P18-P19	11/17/10	44	KS	W	1	850/300	13:25				

CAAW Systems

Panel Seaming Summary

Project Name: Powerton - Bypass Pond QC Monitor: Seng

Project Number: 201044 Material: 60 mil HDTW

Seam Number	Date Seamed	Final Seam Length (feet)	Welder Initials	Weld Type Ext / Wedge	Machine Number	Machine Temp/ Speed/ Preheat	Time Start	Time Stop	Ambient Temp (°F)	End of Seam Destructive Test (P/F)	Comments
P21-P19	11/17/10	23	KS	W	1	850/300	13:29				
P18-P24	11/17/10	13	KK	W	427	850/500	14:10				
P22-P24	11/17/10	22	KS	W	1	850/300	13:50				
P23-P13	11/17/10	22	KS	W	1	850/300	13:50				
P24-P13	11/17/10	22	KS	W	1	850/300	13:50				
P24-P12	11/17/10	22	KS	W	1	850/300	13:50				
P24-P1	11/17/10	9	KS	W	1	850/300	13:50				
P37-P38	11/18/10	23	HN	W	428	850/500	13:27				
P38-P39	11/18/10	11	HN	W	428	850/500	13:30				
P38-P36	11/18/10	22	HN	W	428	850/500	1333				
P39-P36	11/18/10	9	HN	W	428	850/500	13:36				

CAAW Systems

Non-Destructive Test Summary

Project Name: Powerton - Bypass Pond QC Monitor: Seng

Project Number: 201044 Material: 60 mil HDTW

Seam Number	Date Tested	Location / Seam Length Tested	Air					Vacuum	Comments
			Air Pressure				Air Test Results (P/F)	Vac. Test Results (P/F)	
			Start		End				
			PSI	Time	PSI	Time			
P1-P2	11/17/10	51	30	10:00	30	10:05	P		
P2-P3	11/17/10	51	30	10:01	30	10:06	P		
P3-P4	11/17/10	51	30	10:02	30	10:07	P		
P4-P5	11/17/10	51	30	10:07	30	10:12	P		
P5-P6	11/17/10	50	30	10:10	30	10:15	P		
P6-P7	11/17/10	49	30	10:11	30	10:16	P		
P7-P8	11/17/10	48	30	11:00	30	11:05	P		
P8-P9	11/17/10	30	30	11:02	30	11:07	P		
P9-P10	11/17/10	17	30	11:01	30	11:06	P		
P10-P11	11/17/10	12	30	11:03	30	11:08	P		
P10-P12	11/17/10	43	30	11:43	30	11:48	P		
P9-P11	11/17/10	11	30	11:04	30	11:09	P		
P10-P8	11/17/10	13	30	11:01	30	11:06	P		
P12-P13	11/17/10	199	30	11:30	30	11:35	P		
P12-P1	11/17/10	22	30	11:31	30	11:36	P		
P12-P2	11/17/10	P	30	11:32	29	11:37	P		
P12-P3	11/17/10	22	30	11:33	30	11:38	P		
P12-P4	11/17/10	22	30	11:34	30	11:39	P		
P12-P5	11/17/10	22	30	11:40	29	11:45	P		
P12-P6	11/17/10	22	30	11:41	30	11:46	P		
P12-P7	11/17/10	22	30	11:42	30	11:47	P		

CAAW Systems

Non-Destructive Test Summary

Project Name: Powerton - Bypass Pond QC Monitor: Seng

Project Number: 201044 Material: 60 mil HDTW

Seam Number	Date Tested	Location / Seam Length Tested	Air					Vacuum	Comments
			Air Pressure				Air Test Results (P/F)	Vac. Test Results (P/F)	
			Start		End				
			PSI	Time	PSI	Time			
P16-P13	11/18/10	61	30	9:29	30	9:34	P		
P16-P27	11/18/10	22	30	9:29	29	9:34	P		
P27-P13	11/18/10	130	30	9:27	30	9:32	P		
P13-P26	11/18/10	29	30	9:28	30	9:33	P		
P26-P27	11/18/10	22	30	9:28	30	9:33	P		
P28-P29	11/18/10	48	30	9:42	28	9:47	P		
P29-P30	11/18/10	53	30	9:46	30	9:51	P		
P30-P31	11/18/10	56	30	9:50	30	9:55	P		
P31-P32	11/18/10	57	30	9:51	30	9:56	P		
P32-P33	11/18/10	60	30	10:09	30	10:14	P		
P34-P33	11/18/10	27	30	10:11	29	10:16	P		
P33-P35	11/18/10	33	30	10:10	30	10:15	P		
P34-P35	11/18/10	22	30	10:12	30	10:17	P		
P36-P34	11/18/10	24	30	10:18	29	10:23	P		
P35-P36	11/18/10	33	30	10:17	30	10:22	P		
P25-P16	11/18/10	14	30	13:12	30	13:17	P		
P28-P27	11/18/10	19	30	9:40	29	9:45	P		
P29-P27	11/18/10	22	30	9:42	29	9:47	P		
P30-P27	11/18/10	22	30	9:47	30	9:52	P		
P31-P27	11/18/10	22	30	9:51	28	9:56	P		
P32-P27	11/18/10	22	30	9:54	30	9:59	P		

CAAW Systems

Non-Destructive Test Summary

Project Name: Powerton - Bypass Pond

QC Monitor: Seng

Project Number: 201044

Material: 60 mil HDTW

Seam Number	Date Tested	Location / Seam Length Tested	Air					Vacuum	Comments
			Air Pressure				Air Test Results (P/F)	Vac. Test Results (P/F)	
			Start		End				
			PSI	Time	PSI	Time			
P33-P27	11/18/10	22	30	10:09	30	10:14	P		
P35-P26	11/18/10	19	30	10:22	30	10:27	P		
P36-P26	11/18/10	22	30	10:23	30	10:28	P		
P37-P26	11/18/10	27	30	10:24	30	10:29	P		
P16-P15	11/18/10	32	30	9:33	29	9:38	P		
P15-P17	11/18/10	17	30	9:34	30	9:39	P		
P15-P14	11/18/10	22	30	9:35	30	9:40	P		
P14-P17	11/18/10	16	30	9:36	30	9:41	P		
P26-P23	11/18/10	51	30	9:28	30	9:33	P		
P23-P22	11/18/10	51	30	9:08	29	9:13	P		
P22-P21	11/17/10	35	30	14:26	30	14:31	P		
P22-P18	11/17/10	12	30	14:27	30	14:32	P		
P21-P20	11/17/10	24	30	14:28	29	14:33	P		
P20-P19	11/17/10	20	30	14:29	30	14:34	P		
P18-P19	11/17/10	44	30	14:35	30	14:39	P		
P21-P19	11/17/10	23	30	14:22	30	14:27	P		
P18-P24	11/17/10	13	30	14:36	30	14:31	P		
P22-P24	11/18/10	22	30	9:07	30	9:12	P		
P23-P13	11/18/10	22	30	9:27	30	9:32	P		
P24-P13	11/18/10	22	30	9:13	29	9:18	P		
P24-P12	11/18/10	22	30	9:15	30	9:20	P		

CAAW Systems

Non-Destructive Test Summary

Project Name: Powerton - Bypass Pond

QC Monitor: Seng

Project Number: 201044

Material: 60 mil HDTW

Seam Number	Date Tested	Location / Seam Length Tested	Air					Vacuum	Comments
			Air Pressure				Air Test Results (P/F)	Vac. Test Results (P/F)	
			Start		End				
			PSI	Time	PSI	Time			
P24-P1	11/18/10	9	30	9:16	30	9:21	P		
P37-P38	11/18/10	23	30	13:38	30	13:43	P		
P38-P39	11/18/10	11	30	13:40	30	13:45	P		
P38-P36	11/18/10	22	30	13:39	29	13:44	P		
P39-P36	11/18/10	9	30	13:44	30	13:49	P		

CAAW Systems

Seam Destructive Test Summary - Field

Project Name: Powerton - Bypass Pond

QC Monitor: Seng

Project Number: 201044

Material: 60 mil HDTW

Sample DT#	Seam Number	Date	Mach #/ Welder ID	Description of Sample Location	Peel (ppi)		Shear (ppi)	Results (P/F)	Comments
					Inside	Outside			
DS1	P12-P7	11/17/10	KS/1	WEOS - 11	124	135	185	P	
					129	133	188		
					127	138	182		
DS2	P35-P26	11/17/10	KK/427	WEOS 11	164	139	188	P	
					135	142	189		
					138	144	193		

CAAW Systems

Repair Summary

Project Name: Powerton - Bypass Pond

QC Monitor: Seng

Project Number: 201044

Material: 60 mil HDTW

Repair Number	Repair Date	Operator/ Mach #	Seam # OR Panel #	Repair Location	Description (patch, bead, ext weld, cap, DT, boot)	Size of Repair	Date Vacuum Tested	Vac. Test Results
1	11/18/10	VK/43	P1-P2	INT OF 1-2-12	PATCH	2X2	11/19/10	P
2	11/18/10	VK/43	P2-P3	INT OF 2-3-12	PATCH	2X2	11/19/10	P
3	11/18/10	VK/43	P3-P4	INT OF 3-4-12	PATCH	2X2	11/19/10	P
4	11/18/10	VK/43	P4-P5	INT OF 4-5-12	PATCH	2X2	11/19/10	P
5	11/18/10	VK/43	P5-P6	INT OF 5-6-12	PATCH	2X2	11/19/10	P
6	11/18/10	VK/43	P6-P7	INT OF 6-7-12	PATCH	2X2	11/19/10	P
7	11/18/10	VK/43	P7-P12	SEOS - 11 DS1	DT	2X3	11/19/10	P
8	11/18/10	VK/43	P10-P12	INT OF 7-10-12	PATCH	2X3	11/19/10	P
9	11/18/10	VK/43	P8-P9	INT OF 8-9-10	PATCH	2X2	11/19/10	P
10	11/18/10	VK/43	P9-P11	INT OF 9-10-11	PATCH	2X2	11/19/10	P
11	11/18/10	VK/43	P10	NEOP - 3 X EEOP - 4	BOOT	4X4	11/19/10	P
12	11/18/10	VK/43	P5	NEOP - 5 X EEOP - 10	BOOT	4X4	11/19/10	P
13	11/18/10	VK/43	P16-P15	INT OF 15-16-14	PATCH	2X2	11/19/10	P
14	11/18/10	VK/43	P15-P17	INT OF 14-15-17	PATCH	2X2	11/19/10	P
15	11/18/10	VK/43	P28-P14	EEOS - 0	PATCH	3X9	11/19/10	P
16	11/18/10	VK/43	P16	SEOP - 37 X EEOP - 3	BOOT	4X4	11/19/10	P
17	11/18/10	VK/43	P25-P16	INT OF 16-25-28-27	PATCH	2X2	11/19/10	P
18	11/18/10	VK/43	P16-P13	INT OF 13-16-27	PATCH	2X2	11/19/10	P
19	11/18/10	VK/43	P28-P29	INT OF 27-28-29	PATCH	2X2	11/19/10	P
20	11/18/10	VK/43	P29	WEOP - 11 X SEOP - 1	BOOT	4X4	11/19/10	P
21	11/18/10	VK/43	P28-P29	WEOS - 19	PATCH	2X2	11/19/10	P
22	11/18/10	VK/43	P28-P29	EEOS - 3	PATCH	2X2	11/19/10	P

CAAW Systems

Repair Summary

Project Name: Powerton - Bypass Pond

QC Monitor: Seng

Project Number: 201044

Material: 60 mil HDTW

Repair Number	Repair Date	Operator/ Mach #	Seam # OR Panel #	Repair Location	Description (patch, bead, ext weld, cap, DT, boot)	Size of Repair	Date Vacuum Tested	Vac. Test Results
23	11/18/10	VP/13	P29-P30	INT OF 29-30-27	PATCH	2X2	11/19/10	P
24	11/18/10	VP/13	P30	SEOP - 6 X WEOP - 2	BOOT	4X4	11/19/10	P
25	11/18/10	VP/13	P30-P31	INT OF 27-30-31	PATCH	2X2	11/19/10	P
26	11/18/10	VP/13	P31-P32	INT OF 27-31-32	PATCH	2X2	11/19/10	P
27	11/18/10	VP/13	P31	NEOP - 4 X WEOP - 11	BOOT	4X4	11/19/10	P
28	11/18/10	VP/13	P32-P33	INT OF 27-32-33	PATCH	2X2	11/19/10	P
29	11/18/10	VP/13	P33-P34	INT OF 33-34-35	PATCH	2X2	11/19/10	P
30	11/18/10	VP/13	P33-P35	INT OF 27-26-33-35	PATCH	4X2	11/19/10	P
31	11/18/10	VP/13	P35-P36	INT OF 26-35-36	PATCH	2X2	11/19/10	P
32	11/18/10	VP/13	P35-P36	INT OF 34-35-36	PATCH	2X2	11/19/10	P
33	11/18/10	VP/13	P36	WEOP - 4 X SEOP - 11	BOOT	4X4	11/19/10	P
34	11/18/10	VP/13	P36-P37	INT OF 26-36-37	PATCH	2X2	11/19/10	P
35	11/18/10	VP/13	P26-P37	SEOS - 27	BOOT	5X5	11/19/10	P
36	11/18/10	VP/13	P26-P35	SEOS - 11 DS2	DT	2X3	11/19/10	P
37	11/18/10	VP/13	P37-P38	INT OF 37-38-36	PATCH	2X2	11/19/10	P
38	11/18/10	VP/13	P38-P39	INT OF 38-39-36	PATCH	2X2	11/19/10	P
39	11/18/10	VP/13	P13-P26	INT OF 13-26-27	PATCH	2X2	11/19/10	P
40	11/18/10	VP/13	P23-P26	INT OF 26-23-13	PATCH	2X2	11/19/10	P
41	11/18/10	VP/13	P23-P22	INT OF 22-23-13-24	PATCH	2X2	11/19/10	P
42	11/18/10	VP/13	P13-P12	INT OF 12-13-24	PATCH	2X2	11/19/10	P
43	11/18/10	VP/13	P1-P12	INT OF 1-12-24	PATCH	2X2	11/19/10	P
44	11/18/10	VP/13	P18-P22	INT OF 18-22-24	PATCH	2X2	11/19/10	P

CAAW Systems

Repair Summary

Project Name: Powerton - Bypass Pond

QC Monitor: Seng

Project Number: 201044

Material: 60 mil HDTW

Repair Number	Repair Date	Operator/ Mach #	Seam # OR Panel #	Repair Location	Description (patch, bead, ext weld, cap, DT, boot)	Size of Repair	Date Vacuum Tested	Vac. Test Results
45	11/18/10	VP/13	P18-P19	INT OF 18-19-21-22	PATCH	2X2	11/19/10	P
46	11/18/10	VP/13	P19-P21	SWEOS - 11	PATCH	2X2	11/19/10	P
47	11/18/10	VP/13	P19-P20	INT OF 19-20-21	PATCH	2X2	11/19/10	P
48	11/18/10	VP/13	P18	EEOP - 1 X SEOP X 9	BOOT	4X4	11/19/10	P

ATTACHMENT A8

GEOMEMBRANE INSTALLER’S SUBGRADE ACCEPTANCE

CERTIFICATE OF ACCEPTANCE OF SUBGRADE SURFACE PREPARATION FOR GEOMEMBRANE INSTALLATION

PROJECT NAME: Powerton Generating Station

LOCATION: Pekin, IL

JOB NUMBER: 201044 CLIENT: Otto Baum Company, Inc.

AREA ACCEPTED: Entire area of the Metals Cleaning Pond

COMMENTS:

INSTALLER: The undersigned authorized representative of CAAW Systems certifies that he or she has visually inspected the subgrade surface of the area described above and has found the surface to be acceptable for installation of the geosynthetic materials.

CAAW Systems shall be responsible for the integrity of finished geosynthetic material until completion of the installation or demobilization from site.

This certification is based on observations of the subgrade surface conditions only. CAAW Systems has made no sub-terrain inspections or tests and makes no representations or warranties as to the conditions that may exist below the surface of the subgrade.

CERTIFICATE APPROVED BY:

	Installers Acceptance		Inspectors Acceptance
Company:	Clean Air And Water Systems, LLC	Company:	Otto Baum
By:	Thong Ingels	By:	Dave Stewart
Title:	Superintendent	Title:	Foreman
Date:	11/16/10	Date:	11/16/10

CERTIFICATE OF ACCEPTANCE OF SUBGRADE SURFACE PREPARATION FOR GEOMEMBRANE INSTALLATION

PROJECT NAME: Powerton Generating Station

LOCATION: Pekin, IL

JOB NUMBER: 201044 CLIENT: Otto Baum Company, Inc.

AREA ACCEPTED: Entire area of the Bypass Pond

COMMENTS:

INSTALLER: The undersigned authorized representative of CAAW Systems certifies that he or she has visually inspected the subgrade surface of the area described above and has found the surface to be acceptable for installation of the geosynthetic materials.

CAAW Systems shall be responsible for the integrity of finished geosynthetic material until completion of the installation or demobilization from site.

This certification is based on observations of the subgrade surface conditions only. CAAW Systems has made no sub-terrain inspections or tests and makes no representations or warranties as to the conditions that may exist below the surface of the subgrade.

CERTIFICATE APPROVED BY:

	Installers Acceptance		Inspectors Acceptance
Company:	Clean Air And Water Systems, LLC	Company:	Otto Baum
By:	Thong Ingels	By:	Dave Stewart
Title:	Superintendent	Title:	Foreman
Date:	11/19/10	Date:	11/19/10

ATTACHMENT A9

GEOMEMBRANE INSTALLATION CERTIFICATE

January 11, 2011

Midwest Generation, LLC
Powerton Generating Station
13082 East Manito Road
Pekin, IL 61554-8587

RE: Geosynthetic material installation certification

To Whom It May Concern

The HDPE geomembrane and geotextiles installed in the Metals Cleaning Basin and Bypass Pond were installed in accordance with the project specifications and manufactures recommendations.

Sincerely,

Matt Albert

Matt Albert
Project Estimator
CAAW Systems, LLC.

Corporate Office
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P.O. Box 337
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(262) 965-4366   Fax (262) 965-4369

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Regional Office
2727 W. 2nd St., Ste 235
Hastings, NE 68901
(402) 463-0857 Fax (402) 463-0858

ATTACHMENT A10

GEOMEMBRANE INSTALLATION WARRANTIES

INSTALLATION WARRANTY- GEOMEMBRANE LINERS

PROJECT NAME: Powerton Generating Station

Subject to the terms and conditions set forth below, Clean Air And Water Systems, LLC warrants to Purchaser, _Midwest Generation, LLC_, that the _60 mil HDPE White Textured Geomembrane_ installed in the _Metals Cleaning Basin and Bypass Pond_, was installed by Clean Air And Water Systems, LLC, in accordance with the specifications in a good and workmanlike manner and that the installation of the liner is free from defects in workmanship for a period of two (2) years from the date upon which the material was installed.

This warranty covers only defects in workmanship occurring during the installation of the liner. This warranty does not cover ay damage to, or defects in the liner found to have been a result of misuse, abuse or conditions existing after it was installed, including, but not limited to, rough handling; malicious mischief; vandalism; sabotage; fire; acts of God; acts of the public enemy; acts of war, public rebellion, severe weather conditions of all types; damage due to ice; excessive stress from any source; floating debris; damage due to machinery; foreign objects or animals. Nor does this warranty cover any defects which are found to have been a result of improper or defective design or engineering unless the design or engineering was performed by Clean Air And Water Systems, LLC. In the event circumstances are found to exist which purchaser believes may give rise to a claim under this warranty, the following procedure shall be followed:

a) Purchaser shall give Clean Air And Water Systems, LLC written notice of the facts and circumstances of said claim within ten (10) days of becoming aware of said facts and circumstances. Said notice shall be by registered or certified mail, return receipt requested, postage prepaid, addressed to Member, Clean Air And Water Systems, LLC, 123 Elm Street, PO Box 337, Dousman, Wisconsin 53118. The words "WARRANTY CLAIM" shall be clearly marked on the face of envelope in the lower right hand corner. Said notice shall contain, at a minimum, the name and address of the owner, the name and address of the installation, the name and address of the installer, the date upon which the material was purchased and the facts known to Purchaser upon which the claim is based. Failure to strictly comply with all the requirements of this paragraph shall void this warranty.
b) Within twenty days after receipt of the notice described in paragraph a., above, Clean Air And Water Systems, LLC shall notify Purchaser either that it will send a representative to inspect the allegedly defective liner or that it does not wish to do so. Purchaser shall pay the expenses incurred by Clean Air And Water Systems, LLC in making the inspection, including current per diem rates for personnel involved in making the inspection, in the event Clean Air And Water Systems, LLC determines that the claim is not covered by this warranty.
c) Purchaser SHALL NOT REPAIR, REPLACE, REMOVE, ALTER OR DISTURB ANY LINER, NOR SHALL Purchaser ALLOW ANYONE ELSE TO REPAIR, REPLACE, REMOVE, ALTER, OR DISTURB ANY LINER PRIOR TO SUCH INSPECTION OR RECEIPT OF CLEAN AIR AND WATER SYSTEMS, LLC.'S NOTICE THAT IT ELECTS NOT TO INSPECT. A FAILURE TO STRICTLY COMPLY WITH THIS PARAGRAPH SHALL VOID THIS WARRANTY OR MAY LEAD TO A DETERMINATION THAT THE ALLEGED DEFECTS ARE NOT WITHIN THE SCOPE OF THIS WARRANTY.
d) If Clean Air And Water Systems, LLC determines that the alleged defects are covered by this warranty, Clean Air And Water Systems, LLC shall, in its sole discretion, either repair the defective liner or provide Purchaser with replacement liner. THE REMEDIES PROVIDED HEREIN ARE THE EXCLUSIVE REMEDIES AVAILABLE UNDER THIS WARRANTY. Any determination as to whether a particular defect is covered by this warranty will be made by Clean Air And Water Systems, LLC in its sole and complete discretion.

e) Purchaser agrees that it shall provide Clean Air And Water Systems, LLC with clean, dry and unobstructed access to the liner in order for Clean Air And Water Systems, LLC to perform the inspections and warranty work which may be required pursuant to this warranty.

THE REMEDIES PROVIDED TO Purchaser HEREIN ARE THE EXCLUSIVE REMEDIES AVAILABLE UNDER THIS WARRANTY AND ARE INTENDED FOR THE SOLE BENEFIT OF Purchaser. NEITHER THIS WARRANTY NOR ANY RIGHTS HEREUNDER SHALL BE ASSIGNABLE. CLEAN AIR AND WATER SYSTEMS, LLC SHALL HAVE NO LIABILITY UNDER THIS WARRANTY TO THIRD PARTIES OR STRANGERS TO THIS AGREEMENT. THE WARRANTY SET FORTH ABOVE IS THE ONLY WARRANTY APPLICABLE TO THE LINER AND ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL CLEAN AIR AND WATER SYSTEMS, LLC BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES FOR, RESULTING FROM, OR IN CONNECTION WITH, ANY LOSS RESULTING FROM THE USE OF THE LINER. IN THE EVENT THE EXCLUSIVE REMEDY PROVIDED HEREIN FAILS IN ITS ESSENTIAL PURPOSE, AND IN THAT EVENT ONLY, Purchaser SHALL BE ENTITLED TO RETURN OF THE PURCHASE PRICE FOR SO MUCH OF THE MATERIAL AS CLEAN AIR AND WATER SYSTEMS, LLC DETERMINES IN ITS SOLE DISCRETION, TO HAVE VIOLATED THE WARRANTY PROVIDED HEREIN. EXCEPT FOR THE WARRANTY SET FORTH ABOVE, NO REPRESENTATION OR WARRANTY MADE BY ANY SALES OR OTHER REPRESENTATIVE CLEAN AIR AND WATER SYSTEMS, LLC, OR ANY OTHER PERSON, CONCERNING THE LINER SHALL BE BINDING UPON CLEAN AIR AND WATER SYSTEMS, LLC.

Any waiver of the terms and conditions of this warranty shall be in writing signed by CLEAN AIR AND WATER SYSTEMS, LLC the failure to insist upon strict compliance with any of the terms and conditions contained herein shall not act as a waiver of strict compliance with all of the remaining terms and conditions or this warranty and shall not operate as a waiver as to any of the terms and conditions of this warranty as to future claims under this warranty.

CLEAN AIR AND WATER SYSTEMS, LLC

Brian McKeown

BY:______________________________

Brian K. McKeown/ Member

I have read and agree to be bound by the terms and conditions of the foregoing warranty.

By: ______________________________

Title: ______________________________

Company: ____________________________

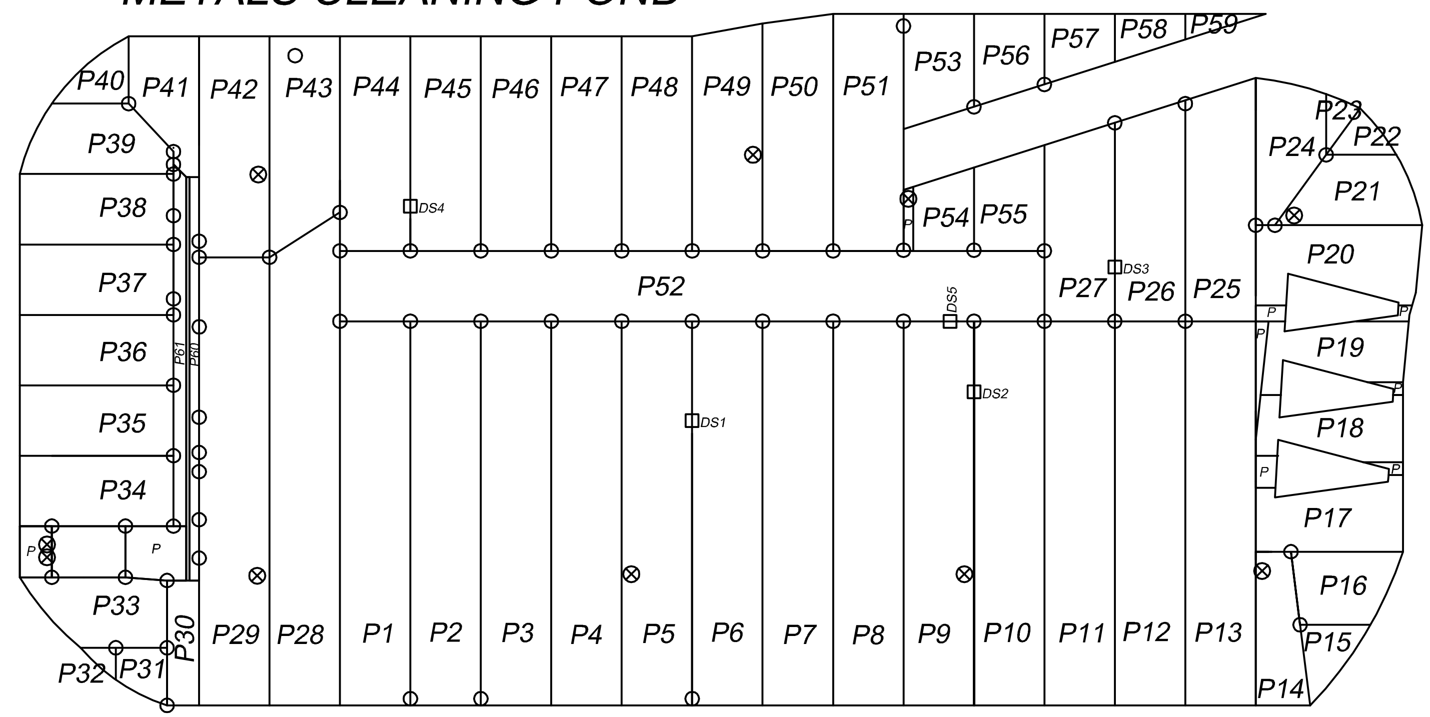
Date: ______________________________

ATTACHMENT A11

GEOMEMBRANE AS-BUILT PANEL LAYOUT

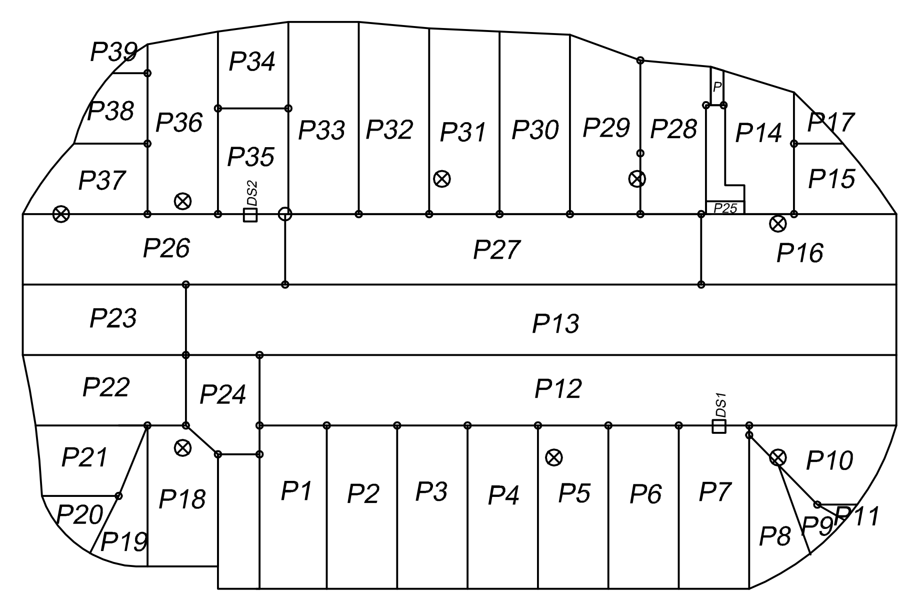
NORTH

METALS CLEANING POND



LEGEND

○	PATCH
□DS#	DESTRUCTIVE TEST
P	SMALL PANEL/PATCH WITH NO #
P#	PANEL NUMBER
⊗	PIPE BOOT
——	PANEL EDGE / FIELD SEAM



BY PASS POND

SCALE

0 30 60

DRAWN BY M.A.				WWW.CAAWSYSTEMS.COM
SCALE 1"=60'				CLEAN AIR AND WATER SYSTEMS, LLC
JOB # 201044				123 ELM STREET PO BOX 337
DATE 12-17-10	#	REVISIONS	DATE	DOUSMAN, WI 53118 262-965-4366 FAX: 262-965-4369

CLEAN AIR AND WATER SYSTEMS, LLC
123 ELM STREET PO BOX 337
DOUSMAN, WI 53118
262-965-4366
FAX: 262-965-4369

PROJECT NAME: POWERTON GENERATING STATION

DRAWING NAME: AS BUILT PANEL LAYOUT FOR BYPASS AND METAL CLEANING PONDS

LOCATION: PEKIN, IL

DRAWING NUMBER: AB-1

FILENAME: POWERTON

ATTACHMENT A12

LEAK LOCATION SURVEY REPORT

LEAK LOCATION SERVICES, INC.
16124 UNIVERSITY OAK ● SAN ANTONIO, TEXAS 78249 ● (210) 408-1241 / FAX (210) 408-1242

December 7, 2010

Mr. Craig Holthaus
Otto Baum Company, Inc.
866 N. Main Street
Morton, IL 61550

Email: craigholthaus@ottobaum.com

Subject: Report for "Geomembrane Leak Location Survey of Bypass Basin and Metal Basin at the Midwest Generation Powerton Plant in Pekin, Illinois"; LLSI Project 1337A

Dear Mr. Holthaus:

On December 2 and 3, of 2010, John Ortiz, of Leak Location Services, Inc. (LLSI) conducted a geomembrane leak location survey of the Bypass Basin at the Midwest Generation Powerton Plant in Pekin, Illinois. The Metal Basin could not be surveyed because the cover material was frozen. Only the floor area of the Bypass Basin was surveyed on this mobilization. The surveyed area was approximately 0.5 acres and is lined, from the top down, with a 6-inch warning layer of gravel, 12-inch cushion layer of sand, 12-oz non-woven geotextile, a single 60-mil geomembrane and a16-oz non-woven geotextile. This report documents the results of the survey. Appendix A contains the details of the survey and Appendix B contains photographs of the leak.

One leak was found during the survey. A 1 foot by 1 foot rip, was located approximately 45 feet from the south toe line and approximately 10 feet from the east toe line. The leak was exposed and documented for repair. Figure 1 shows the surveyed area and approximate location of the leak. The leak location survey was performed in accordance with the ASTM Standard 7007. The Metal Basin will be surveyed at a later date.

If there are any questions regarding the leak location survey or this report, please contact us at (210) 408-1241. We appreciate this opportunity to have been of service on this important project.

Approved by:

Glenn T. Darilek

Glenn T. Darilek
Principal Engineer

Very truly yours,

John Ortiz
Project Manager

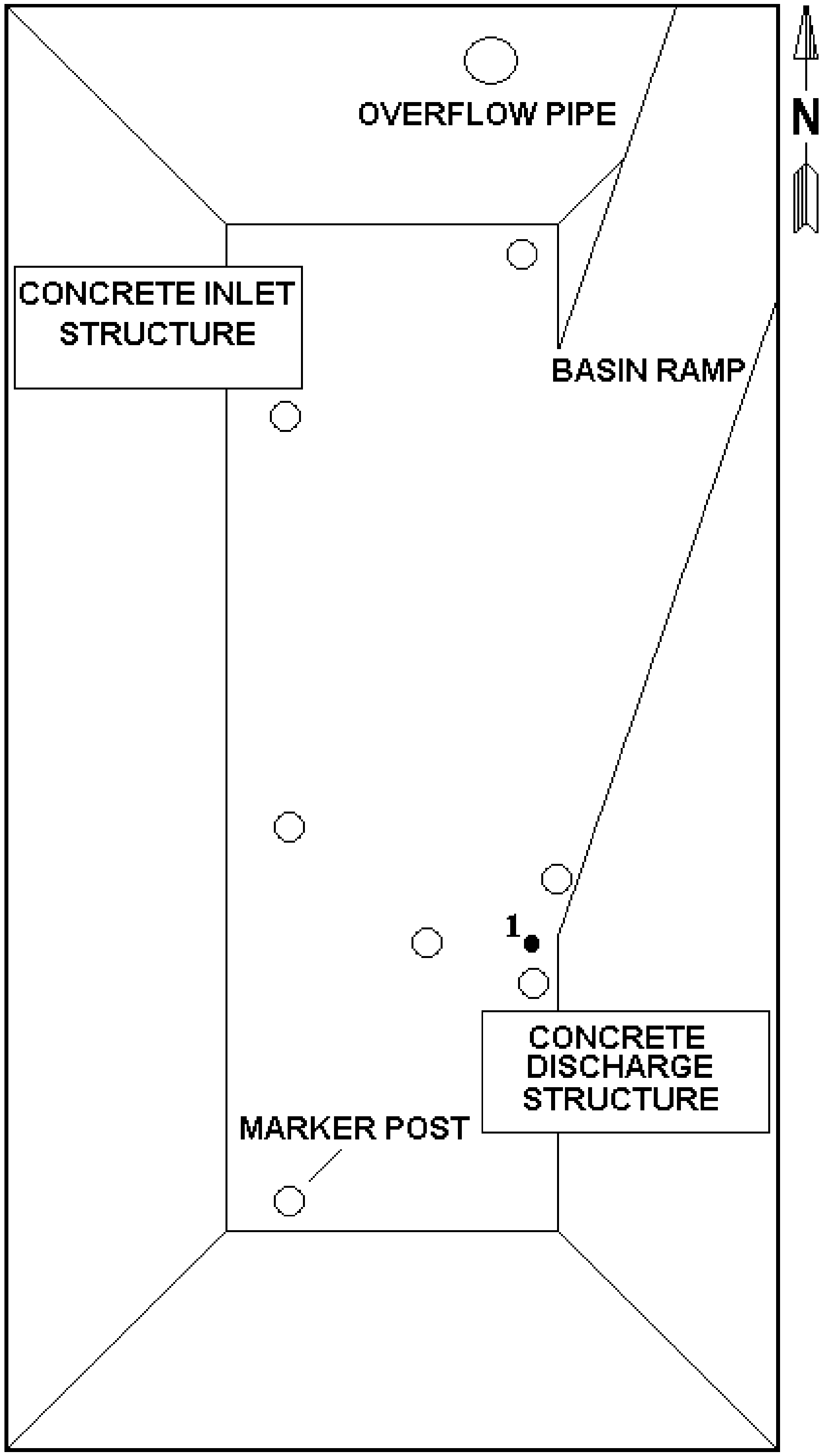


FIGURE 1. APPROXIMATE LOCATIONS OF LEAKS FOUND IN BYPASS BASIN

APPENDIX A

SURVEY DETAILS

APPENDIX A

SURVEY DETAILS

I. DESCRIPTION OF THE SURVEY SITE

The Bypass Basin contained two concrete inlet structures and eight marker post. A strip of the earth materials at the top of the ramp was removed to provide electrical isolation for the survey. Only the floor area and ramp were surveyed.

Facility Name - Midwest Generation Powerton Power Station
Location - Pekin, Illinois
Survey Area - Approximately 0.5 acres
Depth - Approximately 20 feet
Slopes - 3:1

II. SURVEY PARAMETERS

Date(s) - December 2 and 3, 2010
Climate - Cold with some snow flurries
Geomembrane - 60-mil HDPE geomembrane
Layering - From the top down, a 6-inch warning layer of gravel, 12-inch cushion layer of sand, 12-oz non-woven geotextile, a single 60-mil geomembrane and a 16-oz non-woven geotextile.
Specific Conditions of Survey - Near freezing conditions
Leak Detection Sensitivity Setting - 6 mm leak detection at an average distance of 7.5 feet
Operator - John Ortiz

III. LEAK LOCATION METHOD

A. <u>Principles of the Electrical Leak Location Method</u>

The electrical leak location method is to impress a high DC voltage across the geomembrane and measure the resulting potential gradients on or in the conducting material on the geomembrane. Leaks are indicated by a characteristic pattern in the potential measurements caused by electrical current flowing through the leaks.

B. <u>Surveys with Earth Materials on the Geomembrane</u>

A high voltage isolated DC power supply is used to impress a voltage across the geomembrane using one electrode placed in the earth material on top of geomembrane and a second electrode placed in the electrically conducting material located under the geomembrane. The leak survey is conducted by making potential gradient measurements on the moist earth material using a dipole probe using non-polarizing electrodes. These measurements were made along parallel survey lines. A portable digital data logger is used to collect the data. The data is then downloaded into a portable computer for display, plotting, and analysis. When a leak signal is detected, manual measurements are made to accurately locate the leak position between the survey lines. The locations of the leaks are marked for excavation.

C. Equipment

The leak location power supply provides an excitation signal of approximately 340 volts DC. The data acquisition system has an input resistance greater than 50 megohms and measures signals as low as 1 millivolt with an accuracy of about 1 millivolt.

D. Results of Artificial Leak Tests and Calibration Tests

Type of Test Leak - Artificial per D7007
Diameter - 6.4 mm
Depth - 18 inches under earth materials, on top of 12-oz non-woven geotextile

Date	**Time**	**Operator**	**Recorder**	**Distance from Leak**	**Signal/Noise**
12/2/10	10:35	J. Ortiz	7	-7.5 feet 10 feet	3.27 23.3
12/2/10	14:30	J. Ortiz	7	-10 feet 10 feet	15.62 9.16

APPENDIX B

PHOTOGRAPHS OF THE LEAK


5 6 7 8 9 10

LEAK LOCATION SERVICES, INC.
16124 UNIVERSITY OAK ● SAN ANTONIO, TEXAS 78249 ● (210) 408-1241 / FAX (210) 408-1242

March 21, 2011

Mr. Craig Holthaus
Otto Baum Company, Inc.
866 N. Main Street
Morton, IL 61550

Email: craigholthaus@ottobaum.com

Subject: Report for "Geomembrane Leak Location Survey of the Metal Cleaning Basin at the Midwest Generation Powerton Plant in Pekin, Illinois"; LLSI Project 1337A

Dear Mr. Holthaus:

On March 17, of 2011, John Ortiz, of Leak Location Services, Inc. (LLSI) conducted a geomembrane leak location survey on the floor area of the Metal Cleaning Basin at the Midwest Generation Powerton Plant in Pekin, Illinois. The Metal Basin has a single 60-mil geomembrane over a 16-oz non-woven geotextile. The geomembrane was covered with a 12-oz non-woven geotextile, 12-inch cushion layer and 6-inch warning layer. The Pond had an approximate survey area of 42,000 square feet. This report documents the results of the survey. The appendix contains the details of the survey.

One leak was found during the survey. A 3-inch diameter puncture was located approximately 265 feet from the south toe line and approximately 25 feet from the east toe line. The leak was exposed and documented for repair. However, due to standing water, the leak could not be electrically isolated. Additional measurements could not be taken to determine if any additional leaks existed in the near vicinity. Figure 1 shows the surveyed area and approximate location of the leak. The leak location survey was performed in accordance with the ASTM Standard D7007.

If there are any questions regarding the leak location survey or this report, please contact us at (210) 408-1241. We appreciate this opportunity to have been of service on this important project.

Approved by:

Glenn T. Darilek

Glenn T. Darilek
Principal Engineer

Very truly yours,

John Ortiz
Project Manager

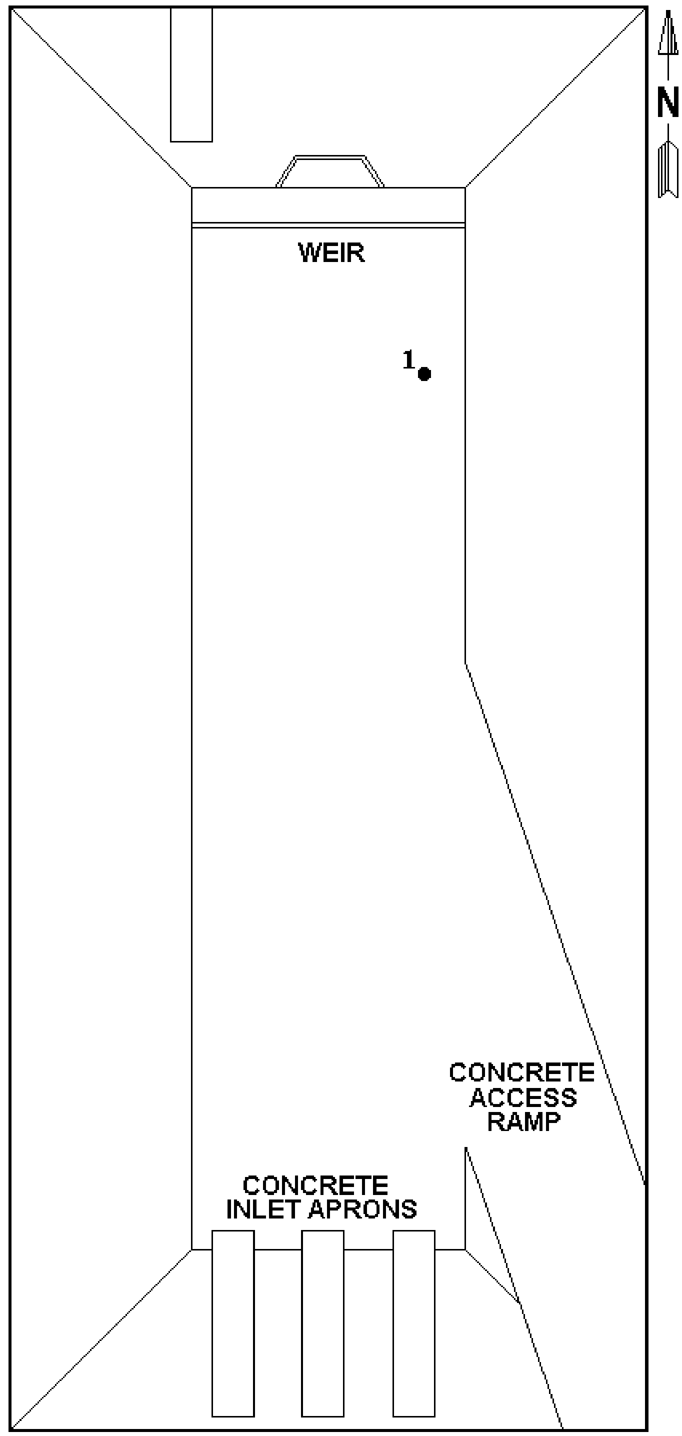


FIGURE 1. APPROXIMATE LOCATIONS OF LEAKS FOUND IN METAL CLEANING BASIN

APPENDIX

SURVEY DETAILS

APPENDIX

SURVEY DETAILS

I. DESCRIPTION OF THE SURVEY SITE

The Metal Cleaning Basin contains a concrete access ramp, four concrete inlet aprons and a weir. The concrete access ramp and three of the concrete inlet aprons could not be isolated because of standing water. Only the floor area was surveyed.

Facility Name - Midwest Generation Powerton Power Station
Location - Pekin, Illinois
Survey Area - Approximately 42,000 square feet
Depth - Approximately 20 feet
Slopes - 3:1

II. SURVEY PARAMETERS

Date(s) - March 17, 2011
Climate - Cool
Geomembrane - 60-mil HDPE geomembrane
Layering - From the top down, a 6-inch warning layer of gravel, 12-inch cushion layer of sand, 12-oz non-woven geotextile, a single 60-mil geomembrane and a 16-oz non-woven geotextile
Specific Conditions of Survey - Standing water, approximately 3-inches above the geomambrane at leak 1
Leak Detection Sensitivity Setting - 6 mm leak detection at an average distance of 10 feet
Operator - John Ortiz

III. LEAK LOCATION METHOD

A. Principles of the Electrical Leak Location Method

The electrical leak location method is to impress a high DC voltage across the geomembrane and measure the resulting potential gradients on or in the conducting material on the geomembrane. Leaks are indicated by a characteristic pattern in the potential measurements caused by electrical current flowing through the leaks.

B. Surveys with Earth Materials on the Geomembrane

A high voltage isolated DC power supply is used to impress a voltage across the geomembrane using one electrode placed in the earth material on top of geomembrane and a second electrode placed in the electrically conducting material located under the geomembrane. The leak survey is conducted by making potential gradient measurements on the moist earth material using a dipole probe using non-polarizing electrodes. These measurements were made along parallel survey lines. A portable digital data logger is used to collect the data. The data is then downloaded into a portable computer for display, plotting, and analysis. When a leak signal is detected, manual measurements are made to accurately locate the leak position between the survey lines. The locations of the leaks are marked for excavation.

C. Equipment

The leak location power supply provides an excitation signal of approximately 340 volts DC. The data acquisition system has an input resistance greater than 50 megohms and measures signals as low as 1 millivolt with an accuracy of about 1 millivolt.

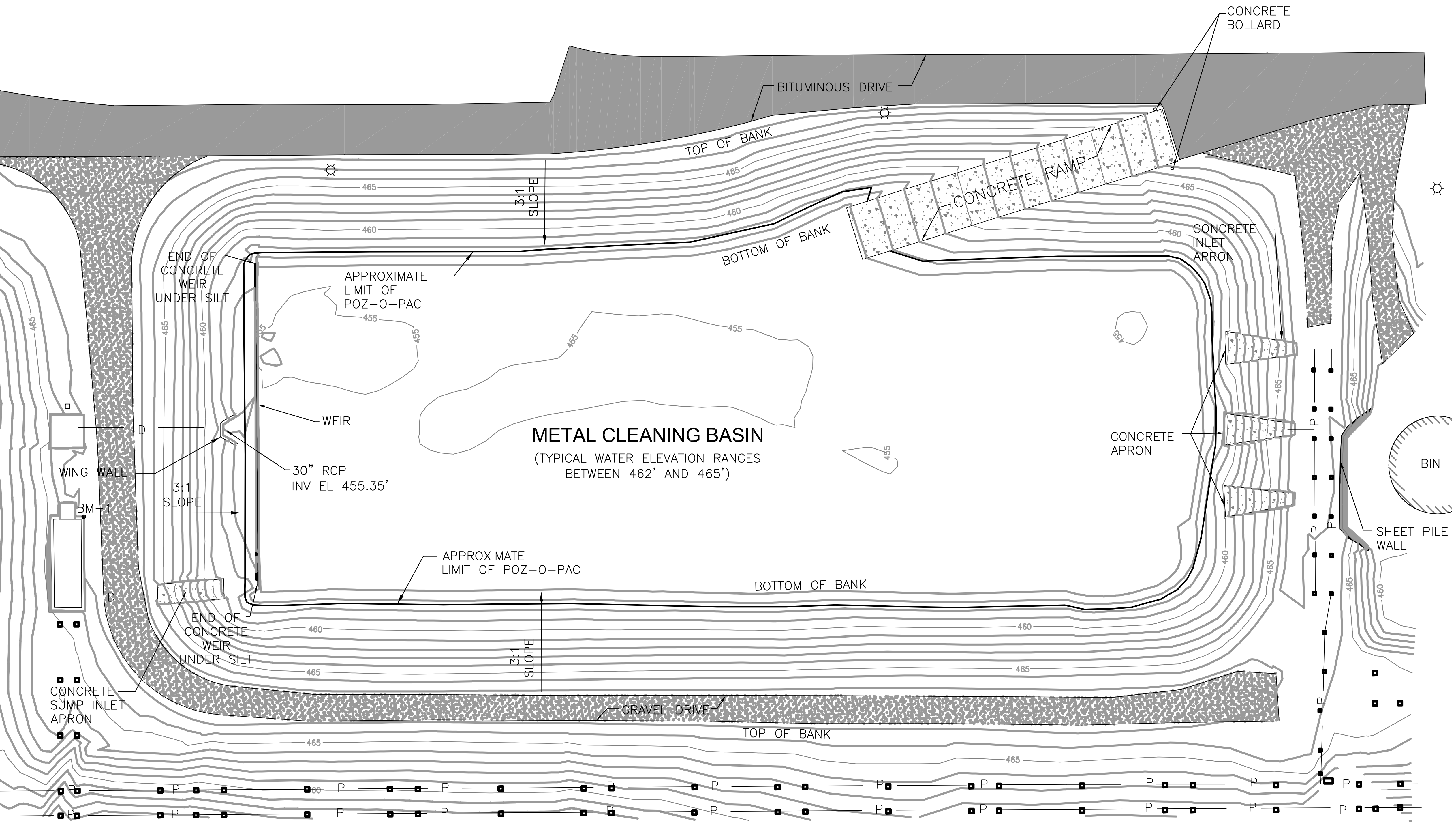
D. Results of Artificial Leak Tests and Calibration Tests

Type of Test Leak - Artificial per D7007
Diameter - 6.4 mm
Depth - 18 inches under earth materials, on top of 12-oz non-woven geotextile

Date	**Time**	**Operator**	**Recorder**	**Distance from Leak**	**Noise (N)**	**Signal + Noise (S + N)**	**(S + N) / N**
3/17/11	11:20	J. Ortiz	6	-10 feet 10 feet	48	1140 1112	24 23
3/17/11	14:00	J. Ortiz	6	-5 feet 5 feet	48	1632 2216	34 46

ATTACHMENT B

DOCUMENTATION SURVEY



LEGEND

—— D ——	UNDERGROUND DISCHARGE PIPE
—■—■ P —■—	ABOVEGROUND PIPE RACK
☼	LIGHT POLE
⌒ 460	GROUND SURFACE CONTOUR

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

VERTICAL DATUM:
LOCAL PLANT DATUM

BENCHMARK-1:
SE CORNER TOP CONCRETE WALL ELEVATION = 468.09 FT.

SOURCE NOTES:

THIS DRAWING WAS DEVELOPED FROM A SURVEY BY MAURER-STUTZ, INC. DATED 10/20/09, DRAWING NO. 23209009.

LOCATION OF EXISTING LINER TAKEN FROM MIDWEST GENERATION DRAWING NO. 5080 C5008, DATED 12-19-1978.

N

0 10 20 40
SCALE IN FEET

REVISION:		DATE:	APP'D BY:
6.			
5.			
4.	RECORD DOCUMENTATION	06/16/11	HMS
3.	ISSUED FOR CONSTRUCTION	10/22/10	HMS
2.	ADDENDUM 1	10/22/09	HMS
1.	ISSUED FOR BID	10/05/09	HMS
0.	ISSUED FOR PERMIT	07/27/09	HMS

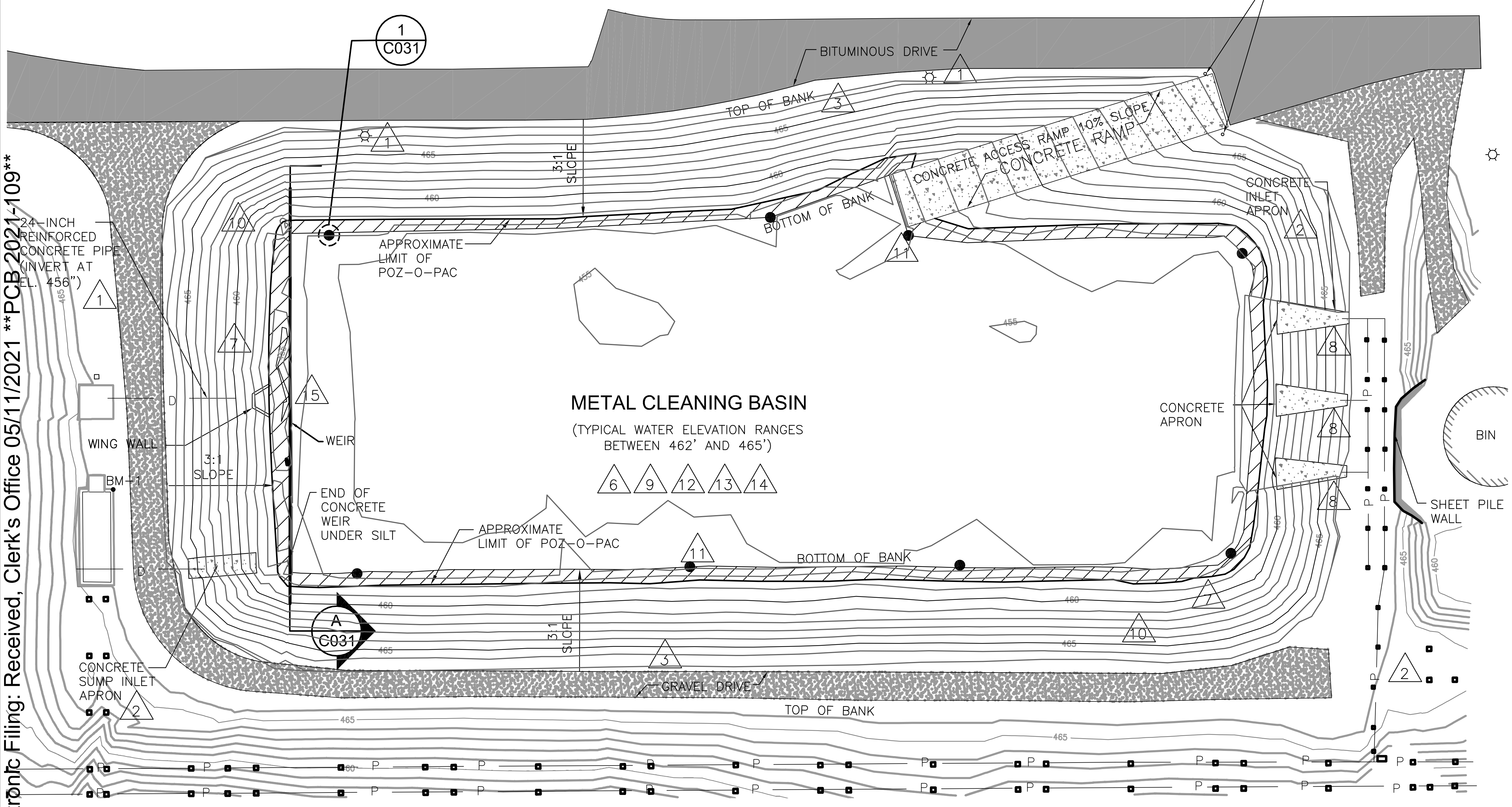
NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1965/4.0
DRAWN BY: RLH/KNW 07/17/09
CHECKED BY: RJG 07/17/09
APPROVED BY: HMS 07/27/09

PRE-CONSTRUCTION CONDITIONS

METAL CLEANING BASIN LINER REPLACEMENT
MIDWEST GENERATION
POWERTON POWER STATION
PEKIN, ILLINOIS

DRAWING NO: D1965C010-04
REFERENCE: .
SHEET NO. C010



LEGEND

- D — UNDERGROUND DISCHARGE PIPE
- P — ABOVEGROUND PIPE RACK
- LIGHT POLE
- 460 — PREPARED SUBGRADE SURFACE CONTOUR
- MARKER POST LOCATION
- POZ-O-PAC REMOVAL AREA

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. 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 TO REMAIN IN PLACE 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. CONTRACTOR SHALL REMOVE AN ADDITIONAL 6 INCHES OF SUBGRADE MATERIAL LOCATED BETWEEN THE WEIR AND THE WING WALL ALONG THE NORTH BOTTOM OF BANK, AS SHOWN ON SECTION B, SHEET C031.
8. CONTRACTOR SHALL REMOVE INLET APRONS AND HAUL MATERIAL TO RECYCLING FACILITY.
9. CONTRACTOR SHALL REMOVE ALL VEGETATION, ROCKS, AND OTHER DEBRIS FROM EXISTING LINER AND DISPOSE OF IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
10. CONTRACTOR SHALL REMOVE "SOFT" SUBGRADE MATERIAL BENEATH EXISTING HYPALON LINER, AS DIRECTED BY OWNER AND/OR ENGINEER. BACKFILL AREAS WITH FILL IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS. CUT HYPALON LINER AS NEEDED TO REPAIR THE "SOFT" SUBGRADE AREAS.
11. 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.
12. SUBGRADE MUST BE APPROVED BY OWNER AND/OR ENGINEER PRIOR TO INSTALLATION OF GEOMEMBRANE.
13. CONTRACTOR SHALL PLACE 16 OZ. NONWOVEN GEOTEXTILE OVER THE SUBGRADE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
14. 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.
15. CONTRACTOR SHALL EXTEND CONCRETE WEIR UP BY 18" IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS AND SECTION A ON SHEET C031.

N

0 10 20 40
SCALE IN FEET

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

VERTICAL DATUM:
LOCAL PLANT DATUM

BENCHMARK-1:
SE CORNER TOP CONCRETE WALL
ELEVATION = 468.09 FT.

SOURCE NOTES:

THIS DRAWING WAS DEVELOPED FROM A SURVEY BY MAURER-STUTZ, INC. DATED 10/20/09, DRAWING NO. 23209009.

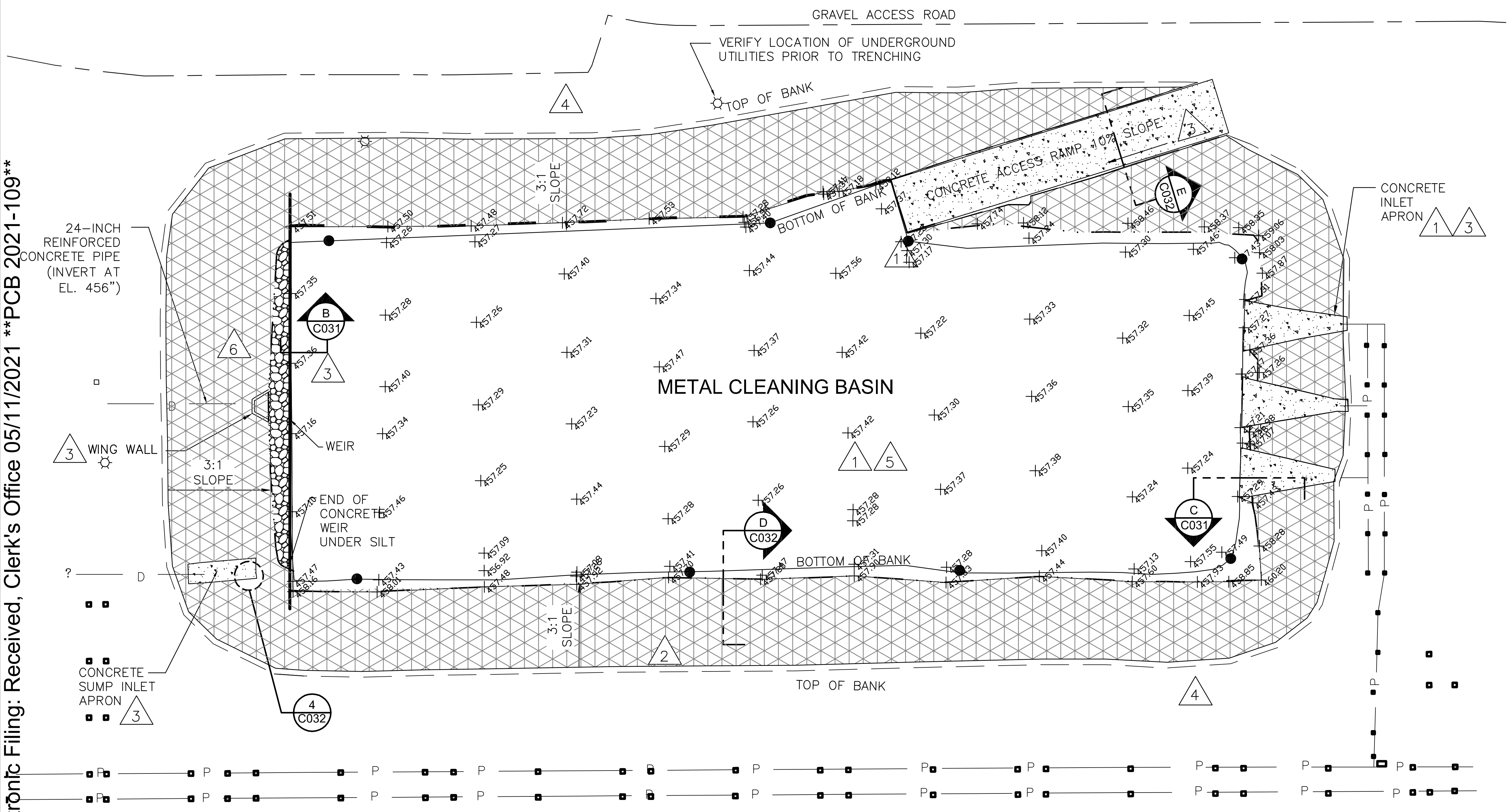
LOCATION OF EXISTING LINER TAKEN FROM MIDWEST GENERATION DRAWING NO. 5080 C5008, DATED 12-19-1978.

BASIN SUBGRADE AND SITE IMPROVEMENTS FROM A SURVEY PROVIDED BY MILLENNIA PROFESSIONAL SERVICES, MARCH 2011.

6.			
5.			
4.			
3.	RECORD DOCUMENTATION	06/08/11	HMS
2.	ISSUED FOR CONSTRUCTION	10/22/10	HMS
1.	ISSUED FOR BID	10/05/09	HMS
0.	ISSUED FOR PERMIT	07/27/09	HMS
	REVISION:	DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1965/4.0	LINER SUBGRADE PREPARATION
DRAWN BY: KNW 08/25/09	METAL CLEANING BASIN LINER REPLACEMENT
CHECKED BY: RJG 10/05/09	MIDWEST GENERATION POWERTON POWER STATION PEKIN, ILLINOIS
APPROVED BY: HMS 10/05/09	DRAWING NO: D1965C020-03 REFERENCE: -
	SHEET NO. C020



LEGEND

— D —	UNDERGROUND DISCHARGE PIPE
— P —	ABOVEGROUND PIPE RACK
— — —	ANCHOR TRENCH
— · · —	12 OZ. NON-WOVEN GEOTEXTILE
☼	LIGHT POLE
●	MARKER POST LOCATION
× 457.32	TOP OF WARNING LAYER (ELEVATION, FT.)
	HDPE GEOMEMBRANE
	CONCRETE
	RIPRAP

CONTRACTOR NOTES:
1. PRIOR TO GEOMEMBRANE INSTALLATION CONTRACTOR SHALL CONSTRUCT INLET APRONS WITH HDPE WELD STRIPS AROUND PERIMETER AND 12-INCH DEEP FOOTING AT TOP AND BOTTOM OF APRON TO MATCH PREEXISTING APRON CONSTRUCTION. APRON TO EXTEND AT MINIMUM 3 FEET BEYOND TOE OF BANK. SEE DETAIL.
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 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 ON SHEET C031. CONTRACTOR SHALL ADVISE OWNER AND/OR ENGINEER IF PROPOSED LOCATION FOR ANCHOR TRENCH IS NOT FEASIBLE.
5. 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).
6. CONTRACTOR SHALL PLACE RIPRAP 18 INCHES THICK, BETWEEN WEIR AND WING WALL ALONG THE BOTTOM OF BANK.
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.

N

0 10 20 40
SCALE IN FEET

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

VERTICAL DATUM:
LOCAL PLANT DATUM

BENCHMARK-1:
SE CORNER TOP CONCRETE WALL
ELEVATION = 468.09 FT.

SOURCE NOTES:

THIS DRAWING WAS DEVELOPED FROM A SURVEY BY MAURER-STUTZ, INC. DATED 10/20/09, DRAWING NO. 23209009.

LOCATION OF EXISTING LINER TAKEN FROM MIDWEST GENERATION DRAWING NO. 5080 C5008, DATED 12-19-1978. BASIN SUBGRADE AND SITE IMPROVEMENTS FROM A SURVEY PROVIDED BY MILLENNIA PROFESSIONAL SERVICES, MARCH 2011.

	REVISION:	DATE:	APP'D BY:
6.			
5.			
4.			
3.	RECORD DOCUMENTATION	06/08/11	HMS
2.	ISSUED FOR CONSTRUCTION	10/22/10	HMS
1.	ISSUED FOR BID	10/05/09	HMS
0.	ISSUED FOR PERMIT	07/27/09	HMS

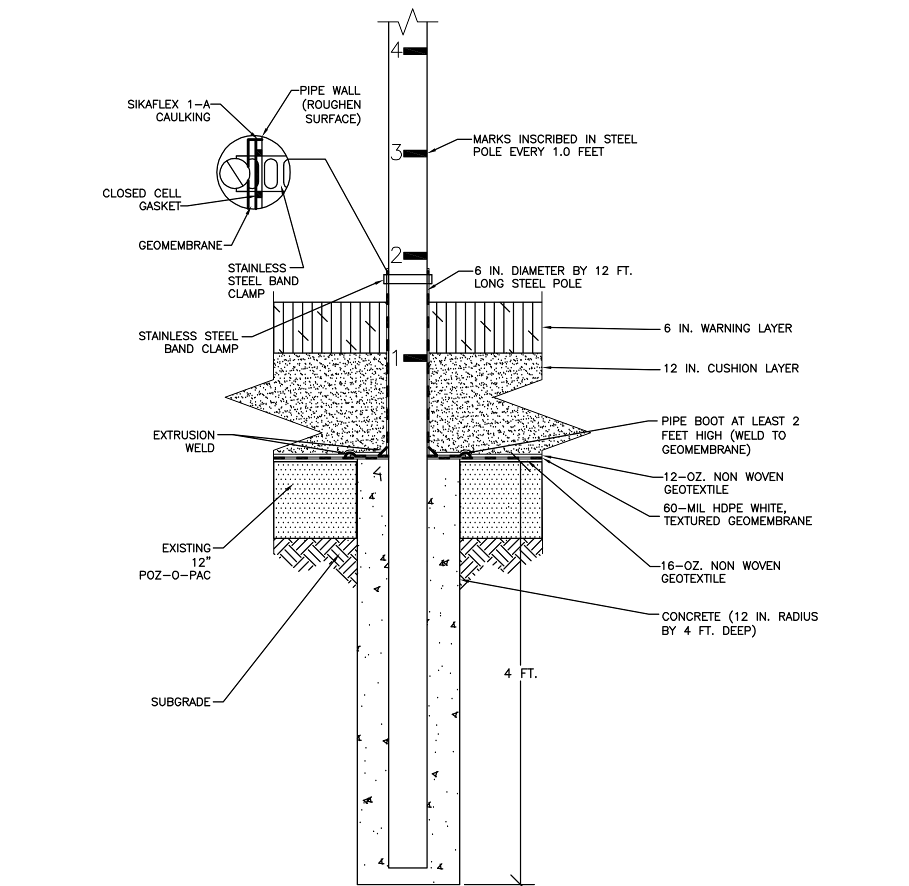
NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1965/4.0
DRAWN BY: KNW 08/25/09
CHECKED BY: RJG 10/05/09
APPROVED BY: HMS 10/05/09

WARNING LAYER

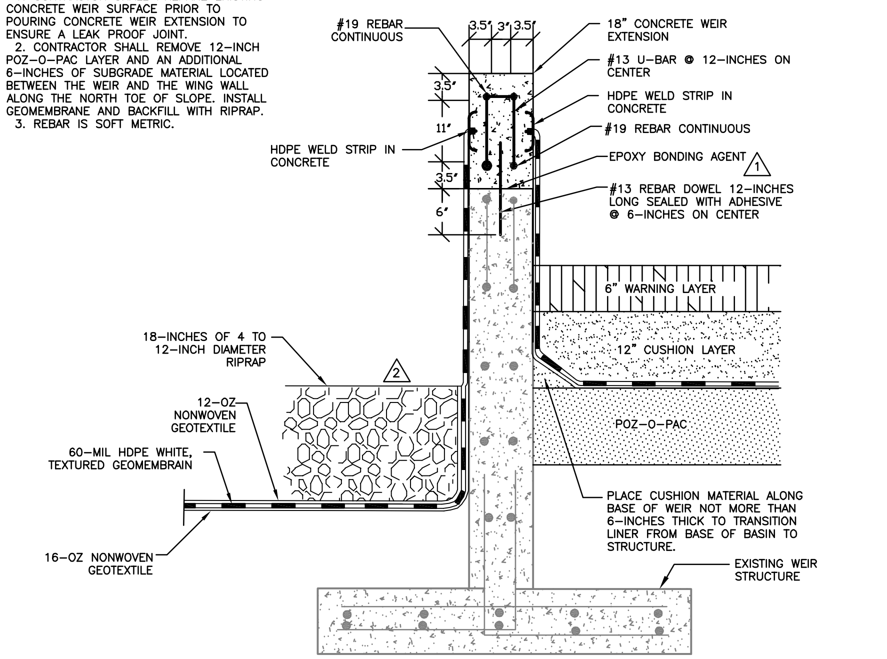
METAL CLEANING BASIN LINER REPLACEMENT
MIDWEST GENERATION
POWERTON POWER STATION
PEKIN, ILLINOIS

DRAWING NO: D1965C030-03
REFERENCE: .
SHEET NO. C030

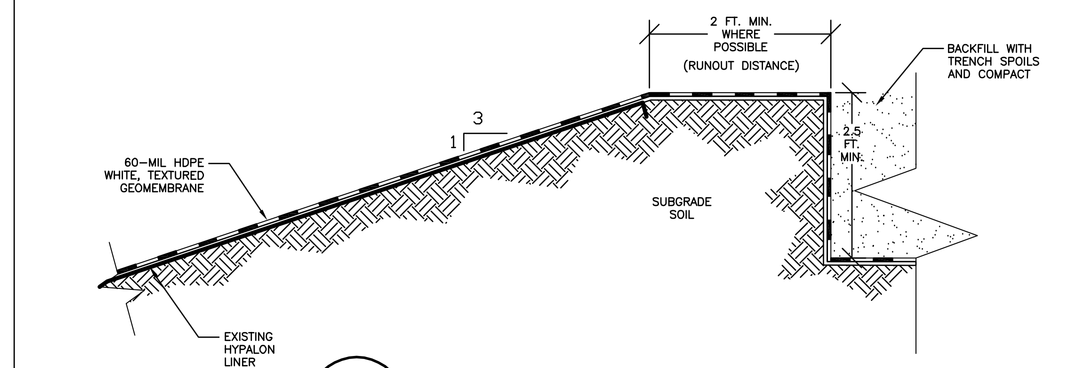


1 / C020 MARKER POST DETAIL
NOT TO SCALE

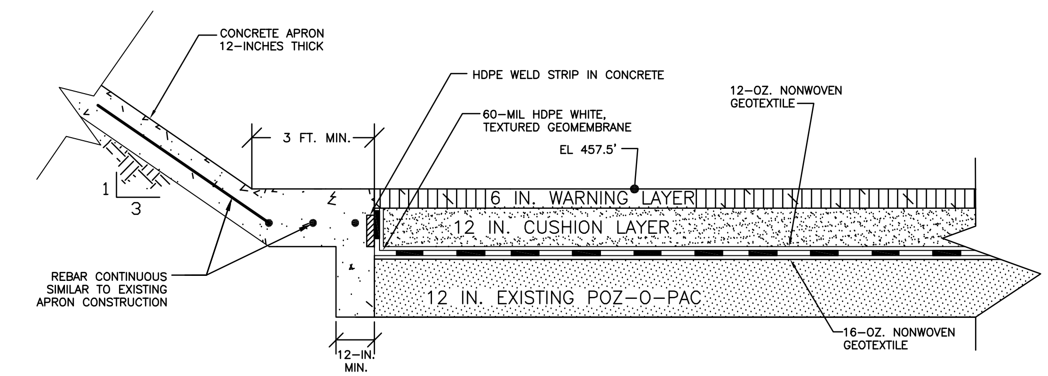
CONTRACTOR NOTES: 1
1. CONTRACTOR SHALL PREPARE EXISTING CONCRETE WEIR SURFACE PRIOR TO POURING CONCRETE WEIR EXTENSION TO ENSURE A LEAK PROOF JOINT.
2. CONTRACTOR SHALL REMOVE 12-INCH POZ-O-PAC LAYER AND AN ADDITIONAL 6-INCHES OF SUBGRADE MATERIAL LOCATED BETWEEN THE WEIR AND THE WING WALL ALONG THE NORTH TOE OF SLOPE. INSTALL GEOMEMBRANE AND BACKFILL WITH RIPRAP.
3. REBAR IS SOFT METRIC.



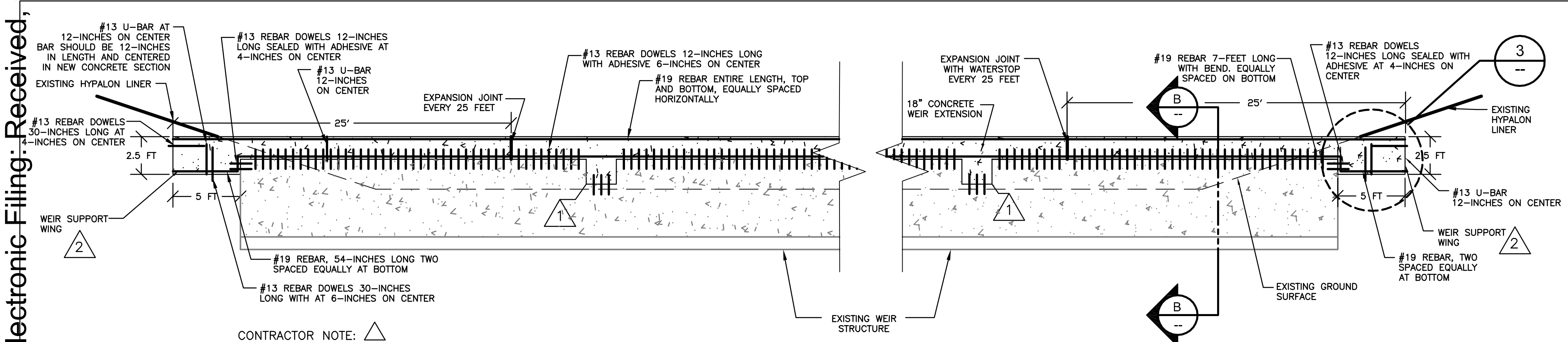
B / -- CONCRETE WEIR EXTENSION DETAIL
NOT TO SCALE



2 / C030 ANCHOR TRENCH SECTION
NOT TO SCALE



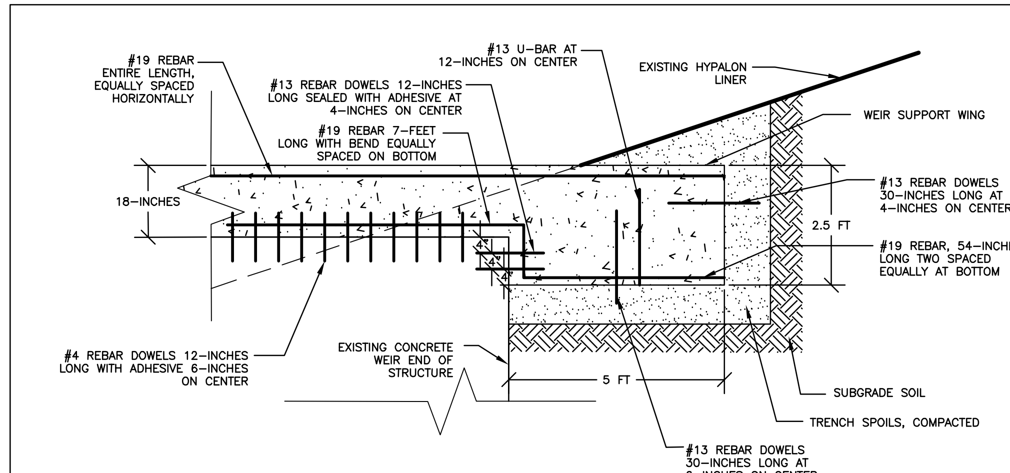
C / C030 CONCRETE INLET APRON SECTION
NOT TO SCALE



CONTRACTOR NOTE: 2

1. CONTRACTOR SHALL REMOVE METAL SLIDING GATES AND REPLACE WITH CONCRETE REBAR DOWELS AND ADHESIVE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION.
2. CONTRACTOR SHALL INSTALL WEIR SUPPORT WINGS AND BACKFILL WITH TRENCH SPOILS IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
3. REBAR IS SOFT METRIC.

A / C020 CONCRETE WEIR EXTENSION SECTION
NOT TO SCALE



3 / - WEIR SUPPORT WING DETAIL
NOT TO SCALE

6.			
5.			
4.			
3.	RECORD DOCUMENTATION	06/08/11	HMS
2.	ISSUED FOR CONSTRUCTION	10/22/10	HMS
1.	ISSUED FOR BID	10/05/09	HMS
0.	ISSUED FOR PERMIT	07/27/09	HMS
REVISION:		DATE:	APP'D BY:

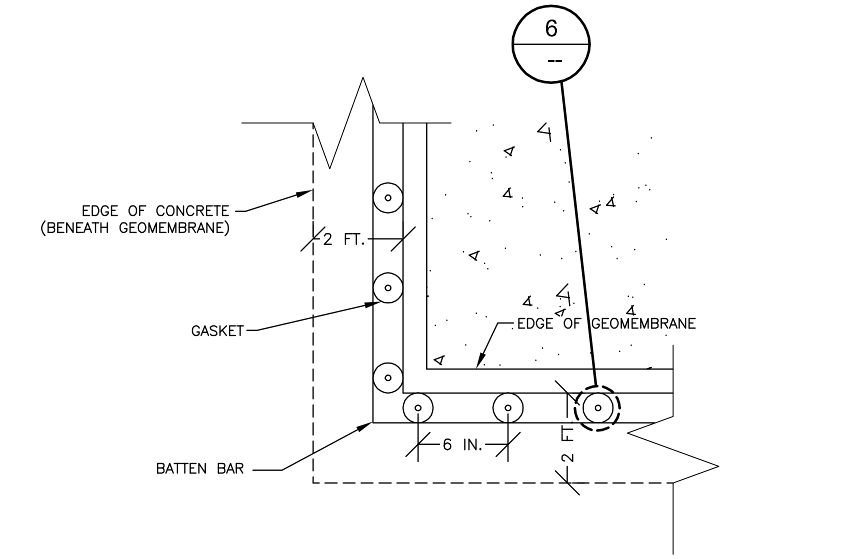
NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1965/4.0
DRAWN BY: KNW 08/12/09
CHECKED BY: RJG 10/05/09
APPROVED BY: HMS 10/05/09

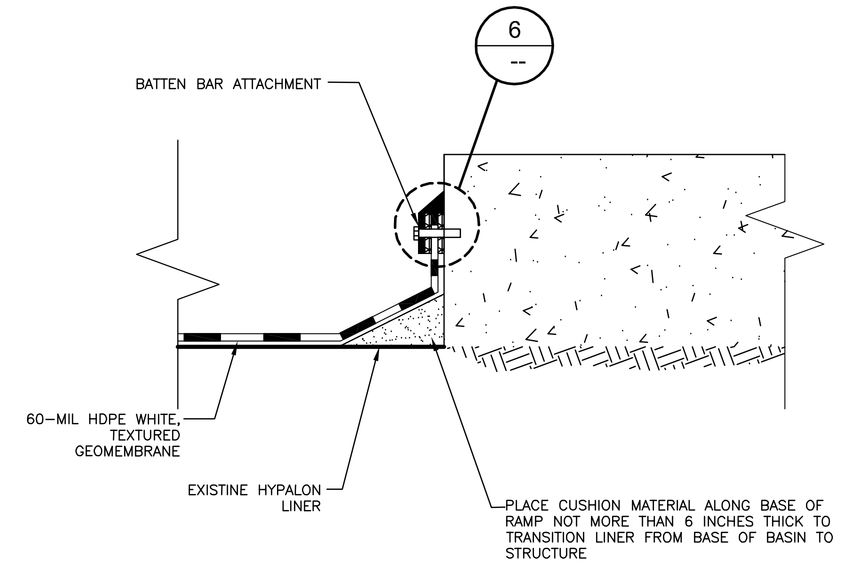
DETAILS AND SECTIONS

METAL CLEANING BASIN LINER REPLACEMENT
MIDWEST GENERATION
POWERTON POWER STATION
PEKIN, ILLINOIS

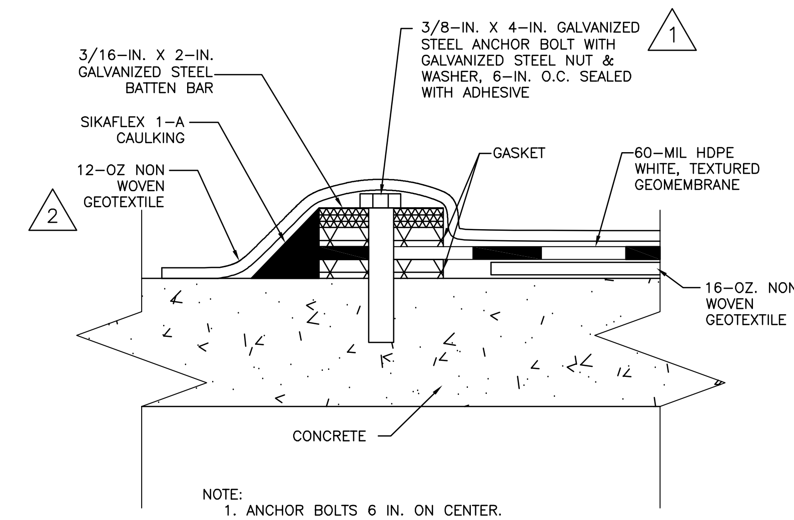
DRAWING NO: D1965C031-03
REFERENCE:.
SHEET NO. C031



4 / C030 **SUMP INLET APRON DETAIL**
NOT TO SCALE

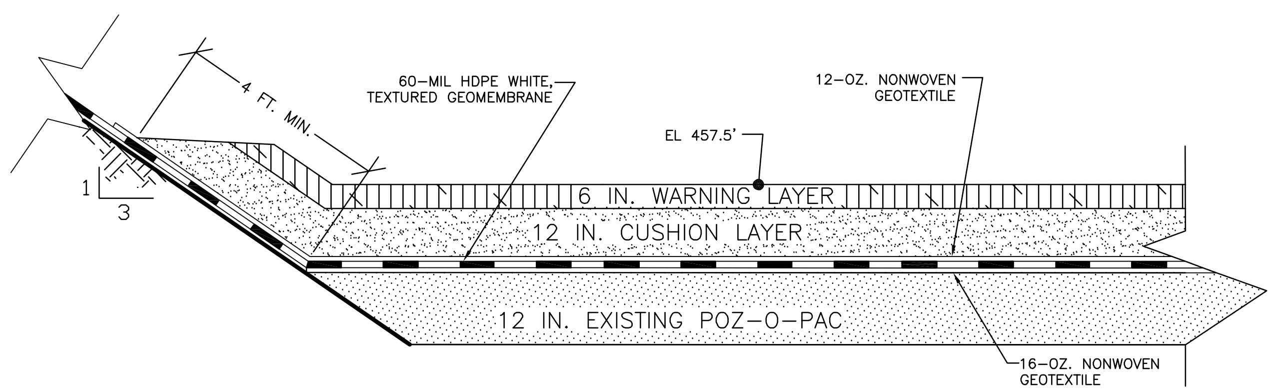


5 / ._. **CONCRETE RAMP CONNECTION DETAIL**
NOT TO SCALE



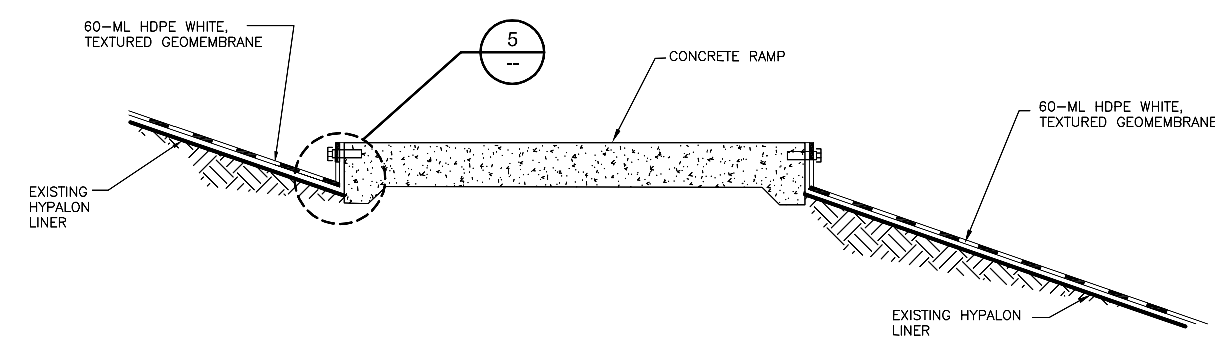
NOTE:
1. ANCHOR BOLTS 6 IN. ON CENTER.
2. 12-OZ. NONWOVEN GEOTEXTILE TO BE USED TO PROTECT GEOMEMBRANE BELOW CUSHION LAYER OR RIPRAP LAYER.

6 / -- **BATTEN BAR ATTACHMENT**
NOT TO SCALE



NOTE:
1. GEOMEMBRANE SEAMS SHALL BE PLACED 2 TO 5 FT. FROM TOE OF SLOPE AT A MINIMUM.

D / C030 **SLOPE TRANSITION SECTION**
NOT TO SCALE



E / C030 **CONCRETE RAMP SECTION**
NOT TO SCALE

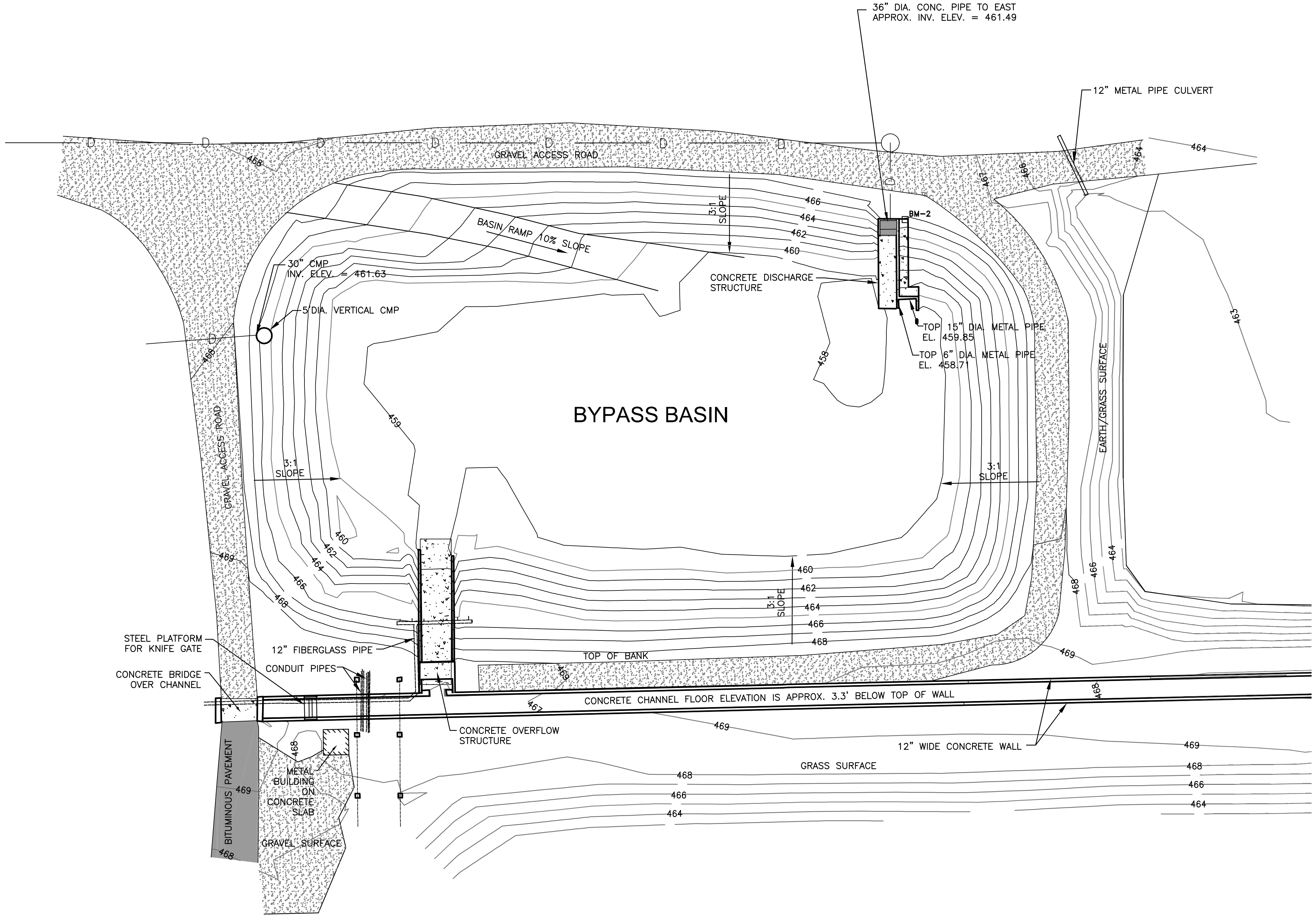
No.	Revision	Date	App'd By
6.			
5.			
4.			
3.	RECORD DOCUMENTATION	06/08/11	HMS
2.	ISSUED FOR CONSTRUCTION	10/22/10	HMS
1.	ISSUED FOR BID	10/05/09	HMS
0.	ISSUED FOR PERMIT	07/27/09	HMS
	REVISION:	DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1965/4.0
DRAWN BY: KNW 08/25/09
CHECKED BY: RJG 10/05/09
APPROVED BY: HMS 10/05/09

DETAILS AND SECTIONS
METAL CLEANING BASIN LINER REPLACEMENT
MIDWEST GENERATION
POWERTON POWER STATION
PEKIN, ILLINOIS

DRAWING NO: D1965C032-03
REFERENCE: 1965/4/
SHEET NO. C032



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.			
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3.			
2.	RECORD DOCUMENTATION	06/08/11	HMS
1.	ISSUED FOR BID	10/06/10	HMS
0.	ISSUED FOR PERMIT	06/30/10	HMS

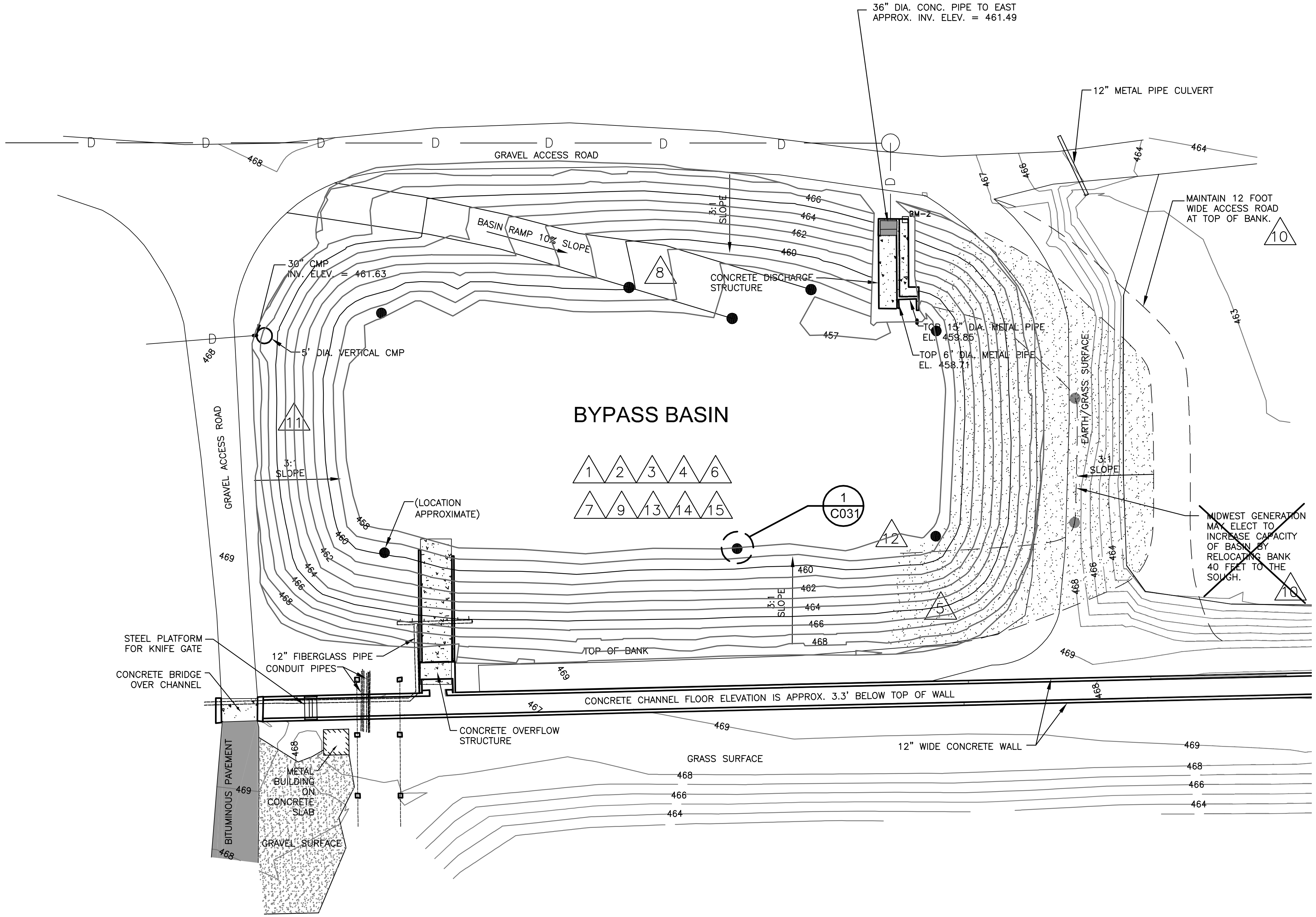
NATURAL RESOURCE TECHNOLOGY

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

- D — UNDERGROUND DISCHARGE PIPE
- ABOVEGROUND INTAKE PIPE
- 460 — 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 COURSE 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.

N

0 10 20 40
SCALE IN FEET

REV.	DESCRIPTION	DATE	APP'D BY
6.			
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3.			
2.	RECORD DOCUMENTATION	06/08/11	HMS
1.	ISSUED FOR BID	10/06/10	HMS
0.	ISSUED FOR PERMIT	06/30/10	HMS

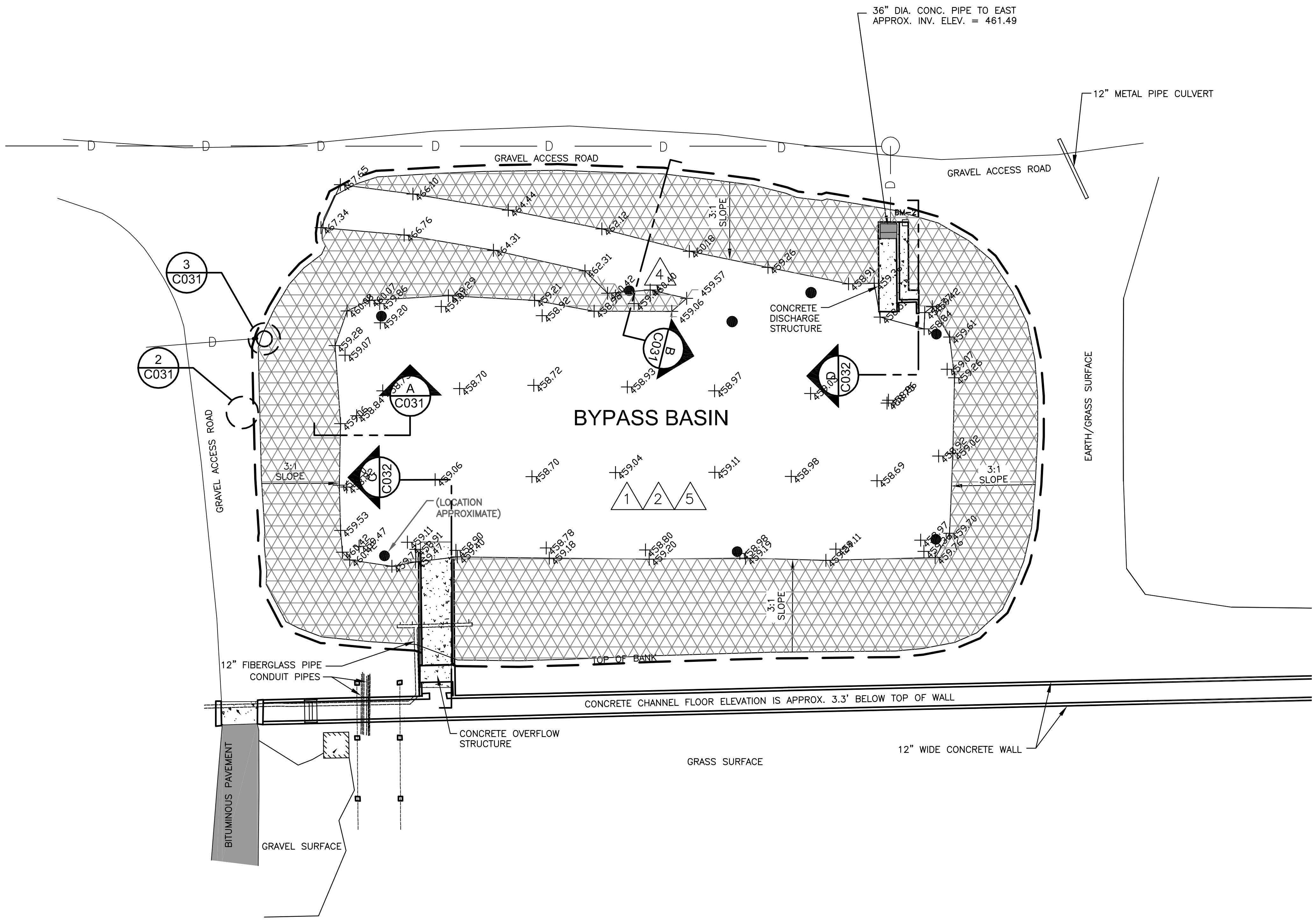
NATURAL RESOURCE TECHNOLOGY

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

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SCALE IN FEET

6.			
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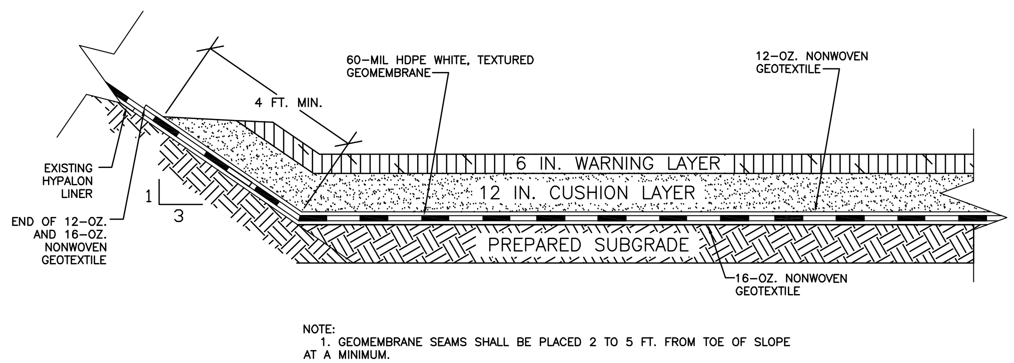
2.	RECORD DOCUMENTATION	06/08/11	HMS
1.	ISSUED FOR BID	10/06/10	HMS
0.	ISSUED FOR PERMIT	06/30/10	HMS
	REVISION:	DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

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

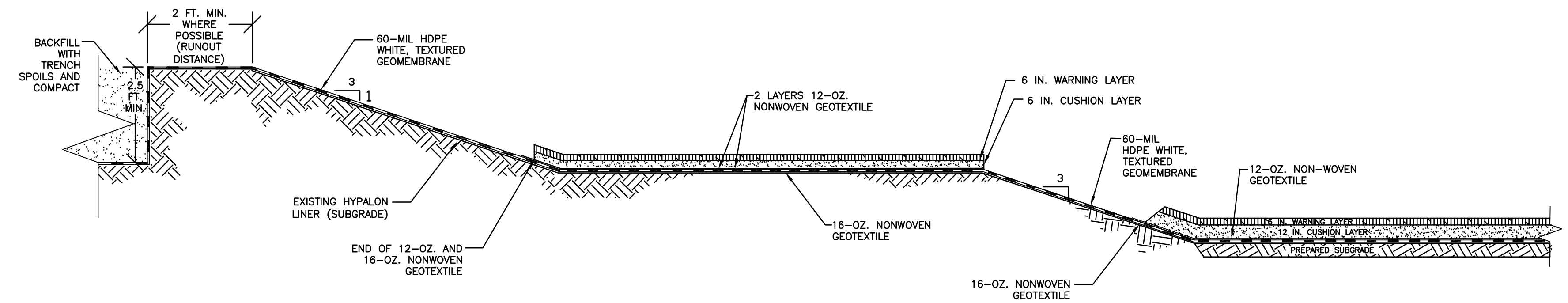
WARNING LAYER PLAN
BYPASS BASIN LINER REPLACEMENT
MIDWEST GENERATION
POWERTON POWER STATION
PEKIN, ILLINOIS

DRAWING NO: D1965C030-02
REFERENCE: -
SHEET NO. C030



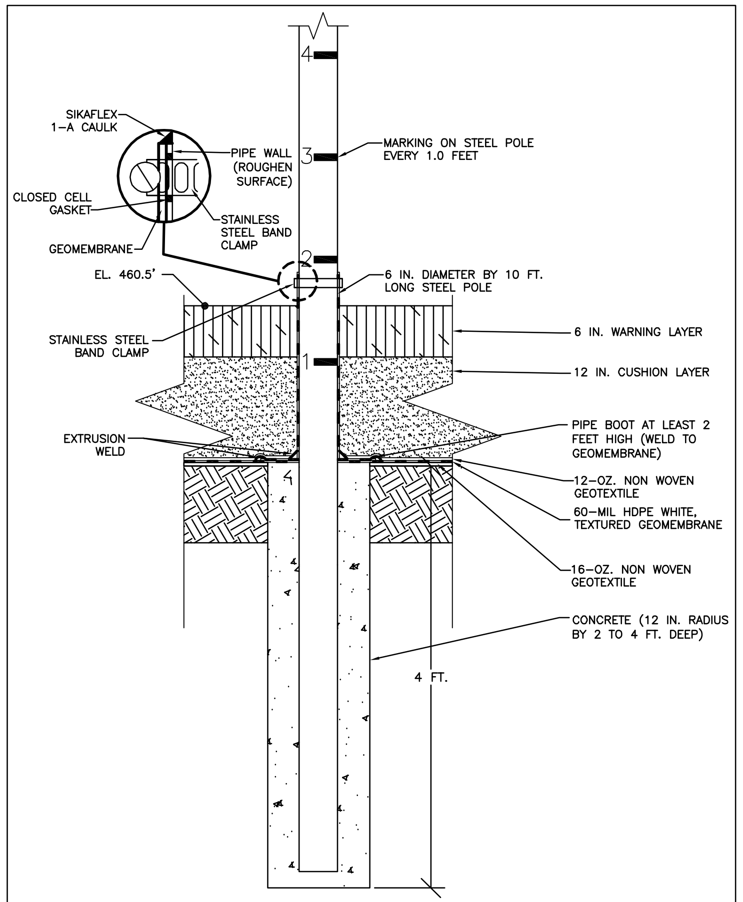
NOTE:
1. GEOMEMBRANE SEAMS SHALL BE PLACED 2 TO 5 FT. FROM TOE OF SLOPE AT A MINIMUM.

A / C030 SLOPE TRANSITION SECTION
NOT TO SCALE

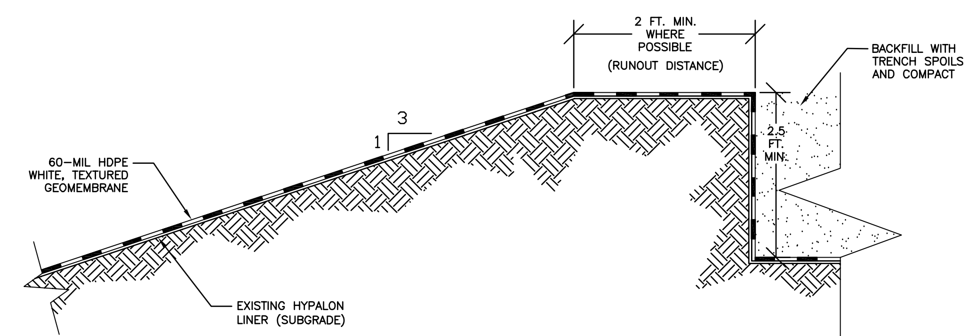


NOTE:
16-OZ. NONWOVEN GEOTEXTILE TO BE PLACED AT BASE OF BASIN AND WHERE HYPALON LINER DOES NOT EXIST OR WAS REMOVED OF PREPARED SUBGRADE

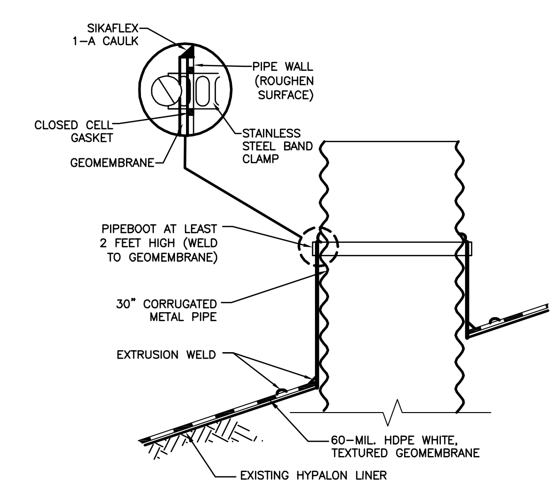
B / C030 RAMP SECTION
NOT TO SCALE



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

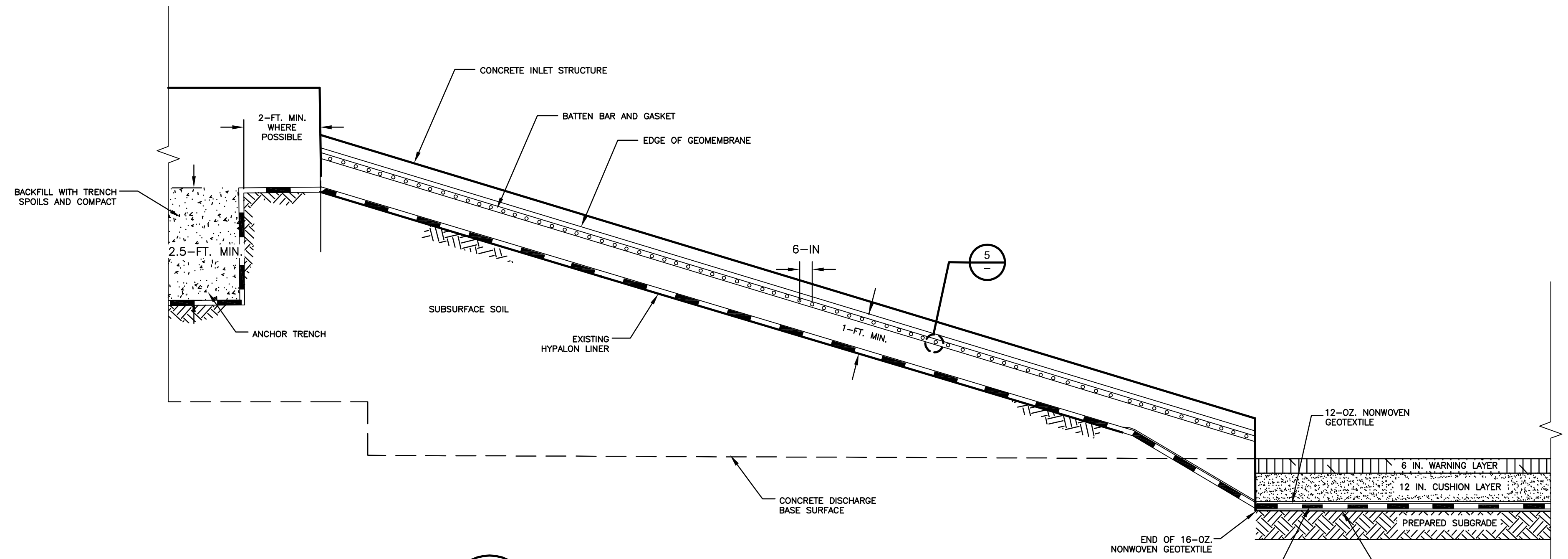
6.			
5.			
4.			
3.			
2.	RECORD DOCUMENTATION	06/16/11	HMS
1.	ISSUED FOR BID	10/06/10	HMS
0.	ISSUED FOR PERMIT	06/30/10	HMS
	REVISION:	DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

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

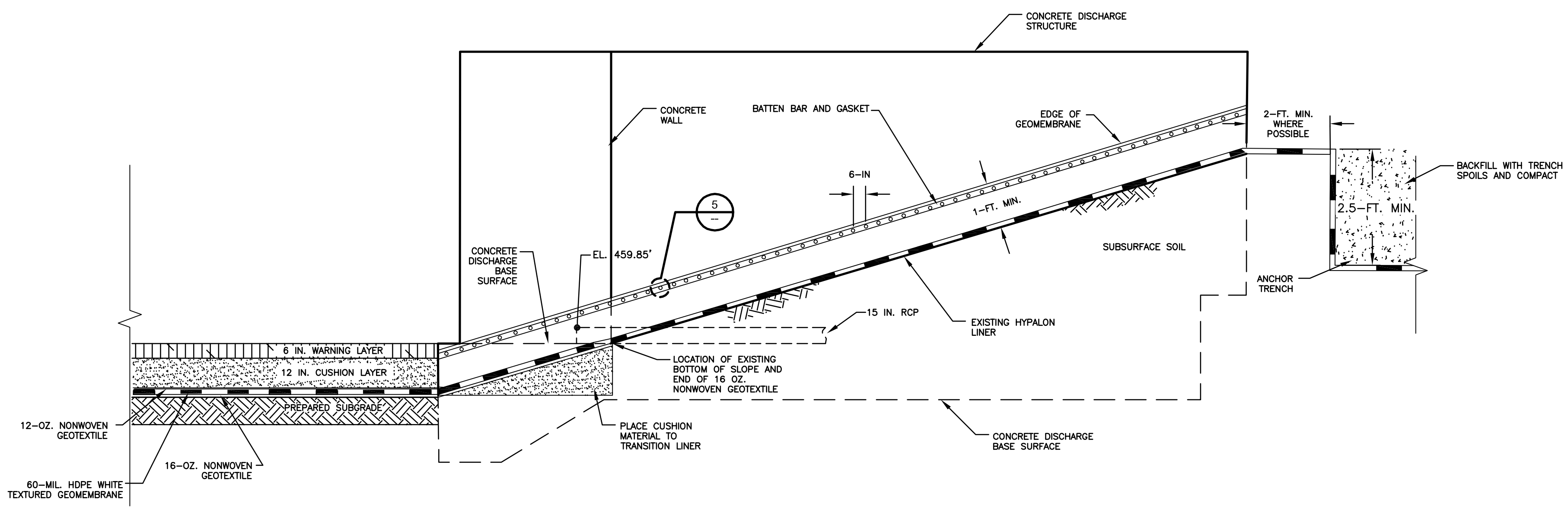
DETAILS AND SECTIONS
BYPASS BASIN LINER REPLACEMENT
MIDWEST GENERATION
POWERTON POWER STATION
PEKIN, ILLINOIS

DRAWING NO: D1965C031-02
REFERENCE:
SHEET NO. C031



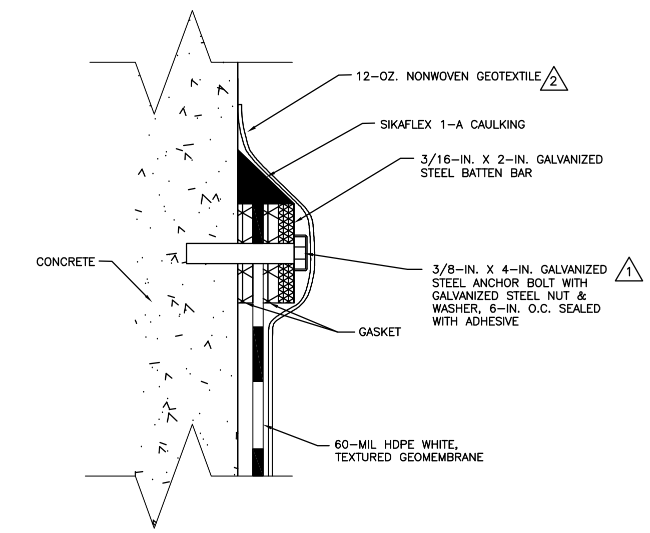
C/C030 CONCRETE INLET STRUCTURE SECTION

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

6.			
5.			
4.			
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 C

NRT CQA DAILY FIELD REPORTS

FIELD NOTE SUMMARY

Project Number / Task: 1965.0/4.0
Project Names: Metal Cleaning Basin Liner Replacement

Date:	November 1, 2010
Work Scope:	Subgrade Inspection – Metal Cleaning Basin
NRT Staff:	John Swanson
Contractors:	Otto Baum – Dave Stewart
Weather:	Partly Sunny 50s degree F
Equipment:	Digital camera
Field Comments:	11/1 • I arrive on site around 0830, checked in at gate house. • Completed contractor safety training with Mark Kelly of Midwest Gen • Otto Baum preparing weir wall, removing steel gates, exposed ends, northern side slope requires further grading/shaping. • Hypalon liner removed from all side slopes. • Additional material added to side slopes and base of basin, soft spots repaired, and rough grading and shaping complete. • Concrete inlet aprons on south end of basin demolished. • West side of concrete ramp to be exposed. • Question from Otto Baum regarding specific construction of joints and water stops in weir extension. Need clarification by 11/2 am. • Asked Dave Stewart to remove large pieces of hypalon under newly placed material on side slopes and further compact eastern side slope. • Concrete form layout and rebar over the next couple of days. Concrete pour likely Wednesday or Thursday according to Dave S. • Left site at 1400
Scope Changes:	• None
Site Conditions:	In good condition, compaction of eastern side slope and grading of northern side slope required.

Signature: Date: 11/1/10

John P. Swanson

View of basin subgrade from the northwest corner of the basin facing southeast. Note concrete aprons and hypalon removed.

View of excavated weir wall during steel gate removal.

FIELD NOTE SUMMARY

Project Number / Task: 1965.0/4.0
Project Names: Metal Cleaning Basin Liner Replacement

Date:	November 4-5, 2010
Work Scope:	Subgrade and Rebar Inspection – Metal Cleaning Basin
NRT Staff:	John Swanson
Contractors:	Otto Baum – Dave Stewart; CAAW – Brian McKeown
Weather:	Partly Sunny 40s-50s degree F
Equipment:	Digital camera
Field Comments:	<u>11/4</u> • I arrive on site around 1155, checked in at gate house. • CAAW inspected and approved subgrade with some general smoothing. Inspected and approved test anchor trench. • CAAW inspected and approved in place concrete structures. Plan to attach batten strips over the top of end of existing concrete ramp due to elevation of subgrade. • Inspected rebar in weir wall extension. Rebar installed and sealed with adhesive per rebar submittal except two pieces of bar in ends of existing walls. Requested that those to be installed on each end. • Bottom toes on apron could only be excavated ~12 inches due to poz-o-pac. Top toe increased to 3 feet except western apron which was 18 inches due to poz-o-pac. • Weld strips installed in concrete forms for aprons. Additional shipped overnight for weir wall. • Left site at 1700 <u>11/5</u> • I arrive on site around 0800, checked in at gate house. • Rebar added to ends of weir wall. Epoxy bonding agent added to top. Waterstops in place and weld strips installed. • Whitney Materials Testing onsite for air test, slump, and cylinders. • Pour began at 0915 and continued ~1415, covered concrete with plastic sheeting • Left site at 1430
Scope Changes:	• None
Site Conditions:	In good condition.

Signature: John P. Swanson

Date: 11/5/10

View of the concrete apron forms. Note HDPE weld strip.

View of the construction of the concrete apron.

FIELD NOTE SUMMARY

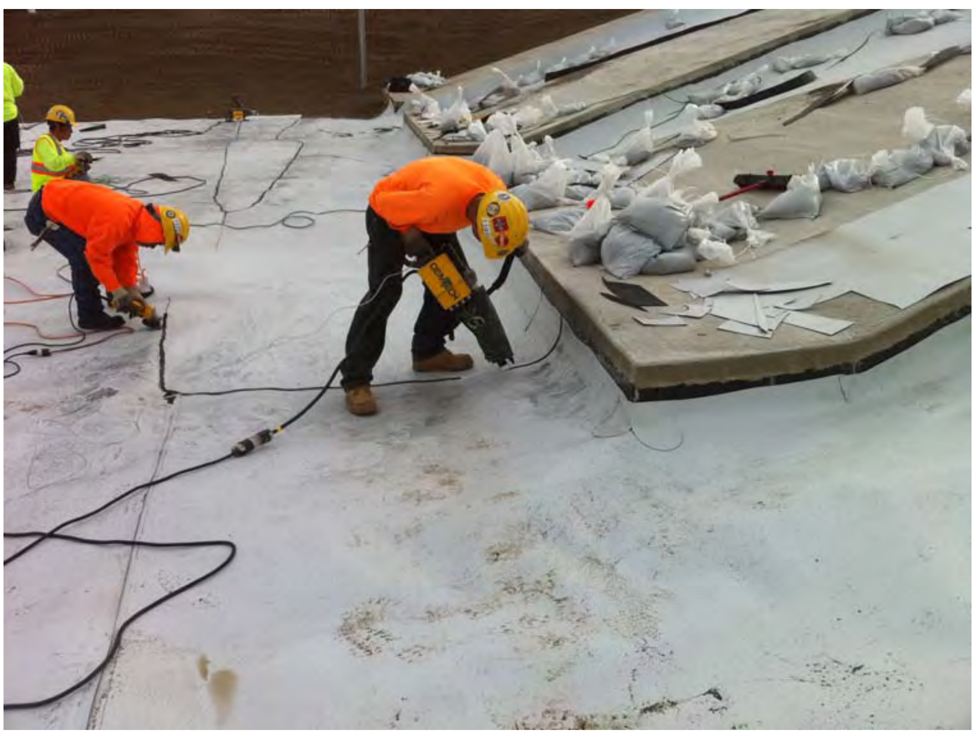
Project Number / Task: 1965.0/4.0
Project Names: Metal Cleaning Basin Liner Replacement

Date:	November 9-10, 2010
Work Scope:	Liner Installation – Metal Cleaning Basin
NRT Staff:	John Swanson
Contractors:	Otto Baum – Dave Stewart; CAAW
Weather:	Partly Sunny 60s-70s degree F
Equipment:	Digital camera
Field Comments:	11/9 • I arrive on site around 0730, checked in at gate house. • CAAW onsite filling sand bags. Began installing 16oz geotextile on western sidewall, thermally bonding the seams, and following with HDPE liner and double track seaming. • Otto Baum to cover wing wall with soil, clean out around ramp, cut protruding wings off the sides of aprons. • Otto Baum excavating anchor trench on east side of basin. • 16 oz geotextile and HPDE liner installed on southern half of western sidewall and placed on southern sidewall around aprons. • Pressure testing of seams tomorrow, destructive testing of seam samples completed. • Left site at 1630 11/10 • I arrive on site around 0745, checked in at gate house. • CAAW pressure testing seams, detailing/welding around aprons, and destructive testing of extrusion welding and seaming samples completed. • Otto Baum completed anchor trench, covered weir wing walls, and cleaned out around ramp. • CAAW finished 16oz geotextile and liner installation on the northern portion of the west sidewall and around aprons to the southeast corner. • Left site at 1430
Scope Changes:	• None
Site Conditions:	In good condition.

Signature: [signature] Date: 11/11/10

John P. Swanson

View of 16 oz geotextile being placed on the western slope and thermally bonded at the seams.



View of extrusion seaming around aprons.

FIELD NOTE SUMMARY

Project Number / Task: 1965.0/4.0
Project Names: Metal Cleaning Basin Liner Replacement

Date:	November 11-12, 2010
Work Scope:	Liner Installation – Metal Cleaning Basin
NRT Staff:	John Swanson
Contractors:	Otto Baum – Dave Stewart; CAAW
Weather:	Partly Sunny 60s-70s degree F
Equipment:	Digital camera
Field Comments:	11/11 • I arrive on site around 0730, checked in at gate house. • CAAW finished installing 16oz geotextile and HDPE liner on northern and eastern sidewalls. • CAAW seamed remaining panels, welded liner to weir wall, booted marker posts, pressure tested remaining seams, destructive tested sample seams. • Otto Baum backfilled and compacted the western and southern portions of the anchor trench in two lifts. • Left site at 1530 11/12 • I arrive on site around 0745, checked in at gate house. • CAAW finished welding liner to weir wall, repaired damaged areas and seam defects, vacuum tested extrusion seams, attached liner to existing concrete structures with batten strips and caulk, and placed 12oz geotextile over liner and ~4 feet up side walls.. • Otto Baum continued backfilling anchor trench. • Left site at 1230
Scope Changes:	• None
Site Conditions:	In good condition.

Signature: [signature] Date: 11/13/10

John P. Swanson

View of liner being attached to weir wall HDPE weld strip.

View of extrusion seaming vacuum testing.

FIELD NOTE SUMMARY

Project Number / Task: 1965.0/4.0
Project Names: Metal Cleaning Basin Liner Replacement

Date:	November 17-19, 2010
Work Scope:	Cushion and Warning Layer Placement – Metal Cleaning Basin
NRT Staff:	John Swanson
Contractors:	Otto Baum – Dave Stewart; CAAW
Weather:	Partly Sunny 40s-50s degree F
Equipment:	Digital camera
Field Comments:	11/17 • I arrive on site around 0745, checked in at gate house. • Cushion layer placement – dumped on concrete ramp and spread with skid loader keeping 1 ft between equipment and liner. • Cushion layer placed over approximately half of basin. • Left site at 1500 11/18 • I arrive on site around 0745, checked in at gate house. • Cushion layer placement continued. Laser guided grading box and laser level used for final elevation. • Left site at 1500 11/19 • I arrive on site around 0745, checked in at gate house. • Cushion layer placement completed and graded with laser guided grading box on skid loader. • Started placing white rock CA-6 as warning layer. • Left site at 1230
Scope Changes:	• None
Site Conditions:	In good condition.

Signature: [signature] Date: 11/20/10

John P. Swanson

View of liner placement of cushion layer sand.

View of finished cushion layer and beginning of warning layer.

FIELD NOTE SUMMARY

Project Number / Task: 1965.0/4.0
Project Names: Metal Cleaning Basin Liner Replacement

Date:	November 24, 2010
Work Scope:	Warning Layer Inspection – Metal Cleaning Basin
NRT Staff:	John Swanson
Contractors:	Offsite
Weather:	Rainy mid 30s degree F
Equipment:	Digital camera
Field Comments:	11/24 • I arrive on site around 1115, checked in at gate house. • Otto Baum left around 10:30 due to poor weather. • Warning layer placed and compacted. Some clean up and finishing required around ramp, aprons, and marker posts. Called Dave with Otto Baum, scheduled to be completed before leak detection survey. • Rip rap placed north of weir wall. • Left site at 1230
Scope Changes:	• None
Site Conditions:	In good condition. Some cleanup and finishing/smoothing of warning layer required around ramp, aprons, and marker posts.

Signature: Date: 11/25/10

John P. Swanson

View of warning layer in the southern end of basin where additional cleanup and finishing is required.

View of finished rip rap north of weir wall.

FIELD NOTE SUMMARY

Project Number / Task: 1965.0/4.0
Project Names: Metal Cleaning Basin Liner Replacement

Date:	March 17, 2011
Work Scope:	Leak Location Survey – Metal Cleaning Basin
NRT Staff:	Heather Simon
Contractors:	Otto Baum – Dave Stewart, Leak Location Services – John Ortiz
Weather:	
Equipment:	Digital camera
Field Comments:	<u>12/2</u> • I arrive on site around 0900, checked in at gate house. • I arrive at basins and meet with Dave Stewart and John Ortiz. • Otto Baum is exposing the liner at the toe of the ramp to isolate the weld strip. • Begin leak location survey at 1130. • False readings from the geotextile locked on aprons. Otto Baum removed the geotextile at the base of the aprons since it's not needed. • Survey completed at 1500. One 3-inch leak located under the warning layer ~100 ft from the weir wall. • Otto Baum will coordinate with Clean Air and Water to repair the leak.
Scope Changes:	• None
Site Conditions:	In good condition.

Signature: Heather M. Simon   Date: 3/18/11
Heather M. Simon

View Looking Northwest Along Ramp.

FIELD NOTE SUMMARY

Project Number / Task: 1965.5/5.3
Project Names: Bypass Basin Liner Replacement

Date:	November 11-12, 2010
Work Scope:	Subgrade Preparation – Bypass Basin
NRT Staff:	John Swanson
Contractors:	Otto Baum – Dave Stewart
Weather:	Partly Sunny 60s-70s degree F
Equipment:	Digital camera
Field Comments:	11/11 • I arrive on site around 0730, checked in at gate house. • Otto Baum removing 16 inches of pozopac from the base of the basin and removing existing hypalon liner. • Completed approximately 75% of gross removal of pozopac • Left site at 1530 11/12 • I arrive on site around 0745, checked in at gate house. • Otto Baum continuing removal of pozopac and hypalon liner. • Began final grading. • Left site at 1230
Scope Changes:	• None
Site Conditions:	In good condition.

Signature: Date: 11/12/10

John P. Swanson

View of pozopac removal and subgrade preparation.

View of pozopac load out and subgrade preparation.

FIELD NOTE SUMMARY

Project Number / Task: 1965.5/5.3
Project Names: Bypass Basin Liner Replacement

Date:	November 17-19, 2010
Work Scope:	Liner Installation – Bypass Basin
NRT Staff:	John Swanson
Contractors:	Otto Baum – Dave Stewart; CAAW
Weather:	Partly Sunny 40s-50s degree F
Equipment:	Digital camera
Field Comments:	11/17 • I arrive on site around 0745, checked in at gate house. • CAAW installed 16oz geotextile and HDPE liner in entire basin. • CAAW seamed remaining panels, began pressure testing seams, destructive tested sample seams. • Left site at 1500 11/18 • I arrive on site around 0745, checked in at gate house. • CAAW booted marker posts, installed batten strips and caulk on existing concrete structures, finished pressure testing, patched seams, vacuum tested patches. • Left site at 1500 11/19 • I arrive on site around 0745, checked in at gate house. • Liner surveyed including seams, anchor trench, repairs, patches, and marker posts • CAAW installed and thermally bonded 12 oz geotextile. A double layer was installed on the ramp. • Otto Baum backfilled anchor trench. • Left site at 1230
Scope Changes:	• None
Site Conditions:	In good condition.

Signature: John P. Swanson Date: 11/19/10

View of 16 oz geotextile in place and HDPE liner being placed.

View of finished liner with finished 12 oz goetextile .

FIELD NOTE SUMMARY

Project Number / Task: 1965.5/5.3
Project Names: Bypass Basin Liner Replacement

Date:	November 24, 2010
Work Scope:	Warning Layer Inspection – Bypass Basin
NRT Staff:	John Swanson
Contractors:	Offsite
Weather:	Rainy mid 30s degree F
Equipment:	Digital camera
Field Comments:	11/24 • I arrive on site around 1115, checked in at gate house. • Otto Baum left around 10:30 due to poor weather. • Ramp built with 6 in of cushion layer and 6 in of rolled warning layer. • Cushion layer partially placed in the southern portion of the basin. Remaining cushion and warning layers will be placed when weather allows. • Left site at 1230
Scope Changes:	• None
Site Conditions:	In good condition.

Signature:
John P. Swanson

Date: 11/24/10

View of partially placed cushion layer in southern portion of the basin.

View of finished ramp into bypass basin.

FIELD NOTE SUMMARY

Project Number / Task: 1965.5/5.3
Project Names: Bypass Basin Liner Replacement

Date:	December 1, 2010
Work Scope:	Subgrade and Warning Layer Inspection – Bypass Basin
NRT Staff:	John Swanson
Contractors:	Otto Baum
Weather:	Overcast 25 degrees F
Equipment:	Digital camera
Field Comments:	11/24 • I arrive on site around 0715, checked in at gate house. • Otto Baum onsite pumping water and placing warning layer on the southern portion of the basin. • Cushion layer is solid and holding up well to equipment with the exception of the a few areas in the northern portion of the basin. Otto Baum to continue pumping water out of basin. • Soft material will be removed and replaced with dry material before warning layer is placed over. • Left site at 1000
Scope Changes:	• None
Site Conditions:	In good condition. Pumping and material placement required in northern portion of basin.

Signature: Date: 12/1/10

John P. Swanson

View of soft spots and ponding in the northern portion of the basin.

View of placement of warning layer in the southern portion of the basin.

FIELD NOTE SUMMARY

Project Number / Task: 1965.0/5.3
Project Names: Bypass Basin Liner Replacement

Date:	December 2, 2010
Work Scope:	Leak Location Survey – Bypass Basin
NRT Staff:	Eric Tlachac
Contractors:	Otto Baum – Dave Stewart, Leak Location Services – John Ortiz
Weather:	Cloudy with flurries, 30s degree F
Equipment:	Digital camera
Field Comments:	12/2 • I arrive on site around 0900, checked in at gate house. • I arrive at basins and meet with Dave Stewart and John Ortiz. • Otto Baum is working on the metal cleaning basin warning layer, and the leak location survey is being prepared on the bypass basin. • The leak location survey cannot be performed on the metal cleaning basin because it is frozen. Wait until spring to perform. • Begin leak location survey calibration on bypass basin at 1030. Calibration is successful. • Begin leak location survey at 1100. • Survey completed at 1310. One leak located at the bottom of the ramp near the outer marker post. • Clean Air and Water scheduled to repair the leak on Monday (12/6) • Leak location survey calibration failed on the Metal Cleaning Basin. • Will flood the metal cleaning basin in attempt to melt ice and will attempt calibration again tomorrow. • Left site a 1615.
Scope Changes:	• None
Site Conditions:	In good condition. Metal cleaning basin has about 1 inch of ice on bottom preventing the leak location survey.

Signature: Eric J. Tlachac Date: 12/2/10
Eric J. Tlachac

View of the bypass basin during the leak location survey.

View of the uncovered leak in the bypass basin from the detection survey.

EXHIBIT H

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

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

BRUCE RAUNER, GOVERNOR — ALEC MESSINA, DIRECTOR

217/782-0610

April 10, 2017

Midwest Generation, LLC
13082 East Manito Rd.
Pekin, IL 61554

Re: Midwest Generation, LLC
Powerton Generating Station
NPDES Permit No. IL0002232
Modification of NPDES Permit (After Public Notice)

Gentlemen:

The Illinois Environmental Protection Agency has reviewed the request for modification of the above-referenced NPDES Permit and issued a public notice based on that request. The final decision of the Agency is to modify the Permit as follows:

1. RO Reject was rerouted from outfall 002 to outfall 001. RO Wastes was changed to read RO Reject and Cleaning Wastes, subwastestream 7 on page 2 of the permit. RO Reject, subwastestream 8, was removed from page 4 of the permit.

2. In special condition 16 the minimum reporting limit for chloride was changed from 0.1 mg/l to 1.0 mg/l and sulfate was changed from 0.1 mg/l to 10 mg/l to be consistent with the minimum reporting limits used at the IEPA lab.

3. Special Condition 11 was revised to reflect the new electronic reporting rule.

4. Special Condition 19 was removed as requested.

Enclosed is a copy of the modified Permit. 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 Jaime Rabins at 217/782-0610.

Sincerely,

Alan Keller

Alan Keller, P.E.
Manager, Permit Section
Division of Water Pollution Control

SAK:JAR:16070701

Attachments: Modified Permit

cc: Compliance Assurance Section
Records Unit
Peoria FOS
US EPA
Billing

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

Modified (NPDES) Permit

Expiration Date: May 31, 2020

Issue Date: May 22, 2015
Effective Date: June 1, 2015
Modification Date: April 10, 2017

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	
002 Cooling Pond Emergency Overflow	Unnamed tributary to the Illinois River
A02 Coal Pile Runoff Treatment System Effluent	
B02 West Yard Treatment System Effluent	
004 RBC Sewage Treatment Plant Effluent	Illinois River
006 Treated Asbestos Contaminated Stormwater	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.

Alan Keller

Alan Keller, P.E.
Manager, Permit Section
Division of Water Pollution Control

SAK:JAR:16070701

NPDES Permit No. IL0002232

Effluent Limitations and Monitoring

From the modification 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. Units 1-4 Roof and Yard Drains	Intermittent
c. Boiler Room Sump Wastes	0.3 MGD
d. Boiler Room Roof and Building Drains	Intermittent
e. Polymer Building Floor Drains	0.01 MGD
f. Scrubber and Limestone Building Area Drains	0.01 MGD
g. Condensate Storage Tank	Intermitten
h. Trona Mill Wash Water	1600 GPD
i. Trona Mill 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

PARAMETER	30 DAY AVERAGE	DAILY MAXIMUM	30 DAY AVERAGE	DAILY MAXIMUM	SAMPLE FREQUENCY	SAMPLE TYPE
Flow (MGD)	See Special Condition 1				1/Week	24 Hour Total
pH	See Special Condition 2				1/Week	Grab
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 modification 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: 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

PARAMETER	30 DAY AVERAGE (lbs/day)	DAILY MAXIMUM (lbs/day)	30 DAY AVERAGE (mg/l)	DAILY MAXIMUM (mg/l)	SAMPLE FREQUENCY	SAMPLE TYPE
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

Effluent Limitations and Monitoring

From the modification 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: 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

PARAMETER	LIMITS	SAMPLE FREQUENCY	SAMPLE TYPE
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

Effluent Limitations and Monitoring

From the modification 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
6. Treated Asbestos Contaminated Stormwater	1.44 MGD

PARAMETER	30 DAY AVERAGE (lbs/day)	DAILY MAXIMUM (lbs/day)	30 DAY AVERAGE (mg/l)	DAILY MAXIMUM (mg/l)	SAMPLE FREQUENCY	SAMPLE TYPE
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.

Effluent Limitations and Monitoring

From the modification 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: 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. Units 1-4 Area Runoff	0.115 MGD
7. 138kV Switchyard Area Runoff	0.176 MGD
8. Condenser Pit Oil Separator Effluents	Intermittent
9. Parking Area Runoff	0.39 MGD
10. Administration Building Roof and Area Drains	Intermittent

PARAMETER	LOAD 30 DAY AVERAGE	LOAD DAILY MAXIMUM	CONC. 30 DAY AVERAGE	CONC. DAILY MAXIMUM	SAMPLE FREQUENCY	SAMPLE TYPE
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

Effluent Limitations and Monitoring

From the modification 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				Daily When Chlorinating	Grab

NPDES Permit No. IL0002232

Effluent Limitations and Monitoring

From the modification 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: 006 Treated Asbestos Contaminated Stormwater (DAF = 1.44 MGD)						
Flow (MGD)	See Special Condition 1				Weekly When Discharging	Single Reading
Asbestos				7 million fibers/L	Weekly When Discharging	Grab

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.

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 river 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

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) 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 will be required to submit electronic DMRs (NetDMRs) instead of mailing paper DMRs to the IEPA beginning December 21, 2016 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, http://www.epa.state.il.us/water/net-dmr/index.html.

The completed Discharge Monitoring Report forms shall be submitted to IEPA no later than the 28th day of the following month, unless otherwise specified by the permitting authority.

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 under the now remanded rule of 40 CFR 125.94(a)(1)(i). Furthermore, the Illinois River intake structure design intake velocity is less than 0.5 feet per second which is considered the best technology available for minimizing adverse environmental impact. This permit may also be revised or modified in accordance with any laws, regulations, or judicial orders issued pursuant to Section 316(b) of the Clean Water Act.

However, the Permittee shall comply with the requirements of the Cooling Water Intake Structure Existing Facilities Rule as found at 40 CFR 122 and 125. Any application materials and submissions required for compliance with the Existing Facilities Rule, shall be submitted to the Agency no later than 4 years from the effective date of this permit.

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
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

Special Conditions

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. Mercury shall be monitored monthly for the first two years and quarterly thereafter. This Permit may be modified with public notice to establish effluent limitations if appropriate, based on information obtained through sampling. The quarterly monitoring results shall be submitted on the March, June, September and December DMRs.
***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.

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.

EXHIBIT I

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

MIDWEST GENERATION, LLC	)	
	)	
Petitioner,	)	
v.	)	**PCB**
ILLINOIS ENVIRONMENTAL	)	**(Variance)**
PROTECTION AGENCY	)	
	)	
Respondents.	)	

AFFIDAVIT OF RICHARD GNAT

I, Richard Gnat, being first duly sworn on oath, depose and state as follows:

1. I am over the age of 18 years and am a resident of Wisconsin.

2. The information in this Affidavit is based on my personal knowledge or belief in my capacity as a Professional Geologist with the State of Illinois and Principal of the environmental consulting firm KPRG and Associates, Inc. ("KPRG"), of which I am also part owner. KPRG has served as an environmental consultant to Midwest Generation, LLC ("MWG") since 2005 regarding the remediation and/or management of various coal combustion residual ("CCR") and coal combustion by-product issues, including at Powerton Station, and I would testify to such matters if called as a witness.

3. Before March 2021, the Powerton Station Metal Cleaning Basin had two groundwater monitoring wells upgradient, and one monitoring well downgradient.

4. The Powerton Station's Metal Cleaning Basin did not have an existing monitoring well system that was compliant under 35 Ill. Adm. Code 845.630 until March 2021.

5. In order to comply with the Section 845.630(c) of the Illinois CCR Rule, two new monitoring wells needed to be installed downgradient of the Metal Cleaning Basin.

6. Installation of the wells required first clearing/grubbing the site and installing an access road on the property to allow drilling equipment to access the area on the west side of the basin. After the new wells were installed, they needed to be developed and surveyed by a licensed surveyor and dedicated well pumps needed to be ordered based on the geometry of the final well construction.

7. The installation of the two new downgradient monitoring wells was completed on March 11-12, 2021.

8. The first of eight independent samples necessary to comply with the requirements in 35 Ill. Adm Code Section 845.650(b)(1)(A) were collected from the background and downgradient monitoring wells for the Metal Cleaning Basin on March 11 -13, 2021 using a bailer for the sampling.

9. Dedicated sampling pumps were installed on April 8, 2021 and another round of samples were collected at that time.

10. It typically takes 14 to 21 days to receive the laboratory analytical results, depending upon the type of analytical work being performed, although receipt of the radium data which is required to be sampled under the 35 Ill. Adm. Code §845.600 generally takes on the order of 30 days or more.

11. I have assisted in the preparation and review of the schedule to meet current regulation deadlines for compliance with the groundwater monitoring requirements that were prepared for and submitted with this variance petition as Ex. L, and the schedule is true and accurate to the best of my knowledge.

12. Based on the date that the first groundwater samples were collected from the Metal Cleaning Basin background and downgradient monitoring wells, it is not possible to obtain eight independent and seasonally variable representative groundwater samples by October 18, 2021.

13. Collecting eight independent and seasonably variable samples is only possible if samples are taken at least one month apart.

14. The timeline to collect groundwater monitoring data must include sufficient time to complete the necessary statistical analysis based on all monitoring results and develop site specific applications of groundwater protection standards for subsequent data comparisons and evaluations.

15. I assisted in the preparation and review of the Schedule to allow for Monthly Sampling and Statistical Data Evaluation/Incorporation into Permit that was prepared for and submitted with this variance petition as Ex. O, and the schedule is true and accurate to the best of my knowledge.

16. I have assisted in the preparation and review of the estimated timeline to comply with the regulatory deadline to collect the 22 technical documents required to be submitted as part of the initial operating permit application pursuant to Section 845.230 of the Illinois CCR rule, which is submitted with this variance petition as Ex. N.

17. Based on the estimated time necessary to complete each of the 22 technical aspects of the operating permit application, including the collection of the groundwater data, and based on the resources available and level effort required to complete each task, a complete operating permit application cannot be submitted by the October 30, 2021 deadline required by the Illinois CCR Rule.

18. I have assisted in the preparation and review of the preferred timeline to submit a complete operating permit application that was prepared for and submitted with this variance petition as Ex. P, and it is true and accurate to the best of my knowledge.

19. There would be no additional monetary cost to MWG to comply with the regulatory deadlines for the collection of groundwater data, submission of the operating permit application, submission of the construction permit application, or submission of the Preliminary Retrofit Plan. The only difference is in quality and thoroughness of the information.

20. The estimated total cost of executing the proposed compliance plan for groundwater monitoring, including the costs for the new well installation, clearing and grubbing, the eight rounds of groundwater sampling, and the statistical data evaluations is approximately $55,520.

21. The estimated total cost of the preparation of the operating permit application is approximately $50,000, and the estimated total cost of preparing a construction permit application is approximately $150,000.

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 instrument 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 he verily believes the same to be true.

FURTHER AFFIANT SAYETH NOT.

Richard R. Gnat

Subscribed and Sworn to before me

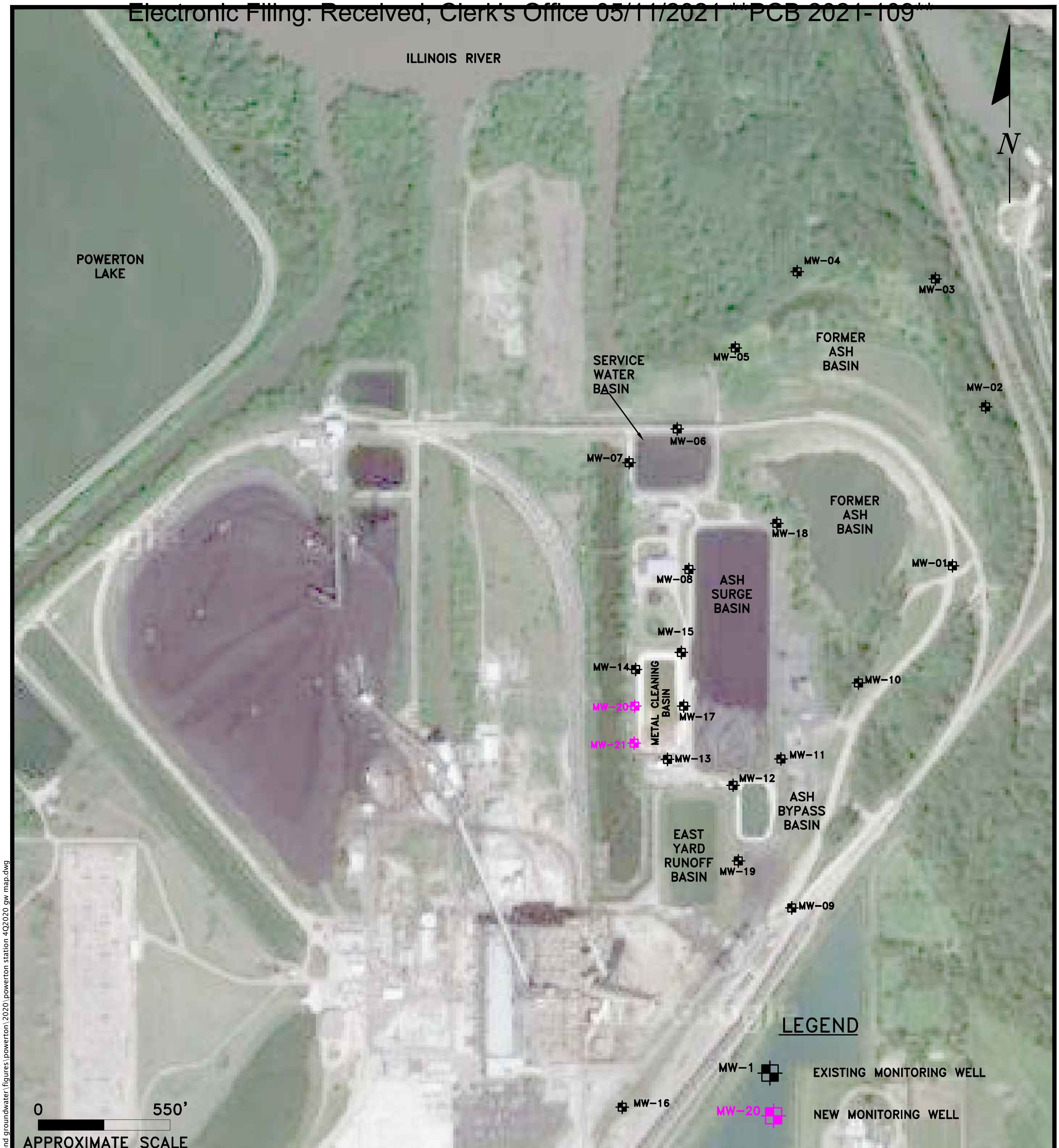
On May 6th, 2021.

Judith A. McCaigue
Notary Public

My Commission Expires: 4-7-2025

JUDITH A MCCAIGUE
Notary Public
State of Wisconsin

EXHIBIT J



ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG

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

NEW METAL CLEANING BASIN WELL LOCATIONS

POWERTON STATION
PEKIN, ILLINOIS

Scale: 1" = 550'	Date: March 15, 2021
KPRG Project No. 12313.5	FIGURE 1

W:\c-p&p\projects\midwest generation\12313 ash pond groundwater\figures\powerton\2020\powerton station 4Q2020 gw map.dwg

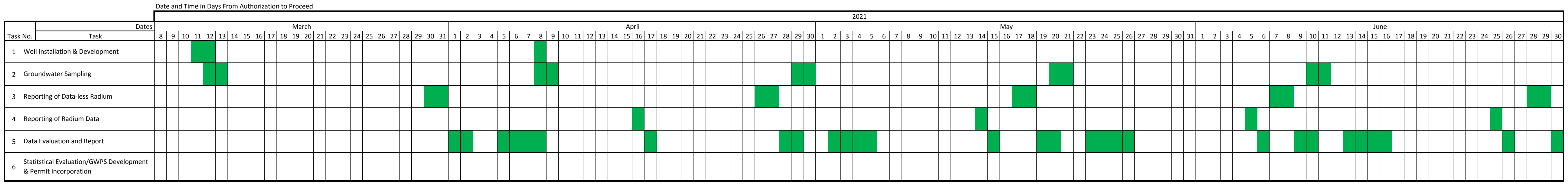
EXHIBIT K

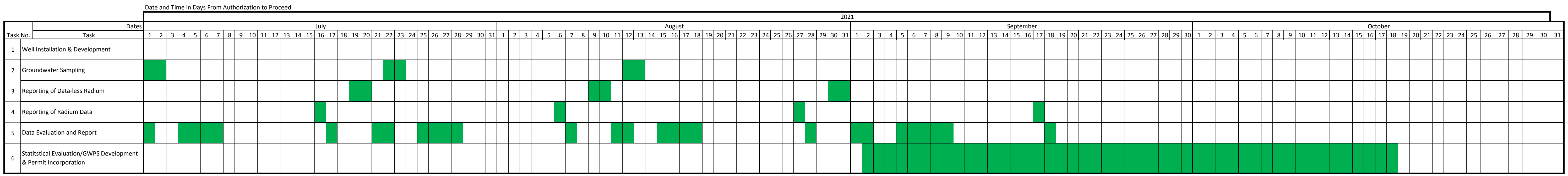
Table 1. Estimated Project Cost

Task	KPRG Labor	Expenses	Dedicated Pump Systems	CONTRACTORS Driller	CONTRACTORS Surveyor	Totals
1) Well Drilling, Construction, Development and Surveying	$3,440	$848	$2,420	$7,820	$1,955	$16,483
2) Groundwater Sampling (5 wells, 8 Rounds)	$18,080	$12,136	$0	$0	$0	$30,216
3) Data Statistical Evaluations/Groundwater Protection Standard Development	$5,600	$266	$0	$0	$0	$5,866
4) Metals Cleaning Basin Annual CCR Report	$2,820	$135	$0	$0	$0	$2,955
Totals	$29,940	$13,385	$2,420	$7,820	$1,955	$55,520

EXHIBIT L

Scedule to Meet Current Regulation Deadlines
Powerton Generating Station - Metals Cleaning Basin





Notes:

Time required to execute individual tasks

EXHIBIT M

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
STANDARDS FOR THE DISPOSAL OF	)	
COAL COMBUSTION RESIDUALS IN	)	R20-019
SURFACE IMPOUNDMENTS:	)	(Rulemaking - Water)
PROPOSED NEW TO 35 Ill. Adm. Code Parts 845	)	

PRE-FILED TESTIMONY OF RICHARD GNAT
ON BEHALF OF MIDWEST GENERATION, LLC

My name is Richard Gnat. I am a Principal of the environmental consulting firm KPRG and Associates, Inc. (KPRG), of which I am also part owner. I have been employed by KPRG since January 2002. Prior to KPRG, I worked with several other environmental consulting firms and have been working in this industry since 1984. I have a Bachelor of Science (B.S.) degree in Earth Science from Northeastern Illinois University, a Master of Science (M.S.) degree in Geosciences from the University of Illinois at Chicago and had subsequent additional course work in hydrogeology from Eastern Michigan University. My primary expertise is with subsurface soil and groundwater investigations and subsequent remediation. I am a registered Professional Geologist (P.G.) with the State of Illinois. My curriculum vitae is attached as Attachment 1.

Since 2005, KPRG has assisted Midwest Generation, LLC (Midwest Generation) with the investigation, remediation and/or management of various coal combustion residual (CCR) and coal combustion by-product (CCB) issues. I have been retained by Midwest Generation to provide this testimony with regard to the Illinois Environmental Protection Agency (Illinois EPA) proposed Part 845 Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments (Draft Rule) dated March 30, 2020.

Altogether, I believe the Illinois EPA has done a good and thorough job in preparing the Draft Rule and believe the Draft Rule effectively regulates CCR surface impoundments. My comments are limited to provisions of the Draft Rule relating to groundwater monitoring and assessment of corrective measures requirements in Sections 845.600 through 845.660. I also concur with the Agency's interpretation of the term "free liquids" as used in the Draft Rule and am providing further support for its interpretation.

I. Subpart F: Groundwater Monitoring and Corrective Action – Sections 845.600 through 845.660

Generally, I agree with Illinois EPA's overall approach in the groundwater monitoring program to statistically evaluate and assess the groundwater data generated at power generating stations (Stations), including those Stations with multiple CCR impoundments in close proximity to each other. I also agree with the Illinois EPA that the intent of the proposed groundwater monitoring program within Subpart F of the Draft Rule is to develop a monitoring approach to evaluate the groundwater that is passing the boundary of a regulated CCR surface impoundment. Accordingly, the Illinois EPA correctly defines a "landfill containing CCR" as a "CCR landfill" defined in the Federal Coal Combustion Residual Rule (Federal CCR Rule) in 40 CFR 257.53.

However, the groundwater monitoring program should be modified to both add clarity and time to collect representative data that reflects the unique circumstances at each Station. In various sections of the Draft Rule, the language is unclear concerning when a timeline starts, or the information required for submission of documents. Additionally, the Draft Rule provides only a "one-size fits all" approach to groundwater monitoring that does not take into account the site-specific characteristics of the CCR stored in the impoundment. The final rule should allow regulated entities to make a demonstration on a case-by-case basis for a targeted, site-specific groundwater monitoring program.

The Draft Rule's groundwater monitoring program has serious flaws that will not ensure development of accurate and representative data. Limiting the initial groundwater quality background groundwater sampling to 180 days for existing CCR surface impoundments will not result in the most representative groundwater data to establish the accurate background groundwater before the groundwater passes the boundary of the CCR surface impoundment. Instead, the Rule should have the same two-year timeline for establishing background groundwater as does the Federal Rule.

Also, the Draft Rule eliminates the initial detection monitoring tier of the Federal CCR Rule two-tiered approach outlined in 40 CFR 257.90 through 257.95, resulting in only a one-tier approach with groundwater protection standards (GWPSs) for all parameters. Eliminating the initial detection monitoring tier significantly reduced the timeframe from the initial detection of a "statistically significant increase" (SSI) to the start of an assessment of corrective measures from about 360 days, as allowed under the Federal CCR Rule, to just 90 days. Because deadlines relating to potential corrective measures in the Draft Rule are so tight, revising the Draft Rule to allow some additional time to complete further detection monitoring investigations and, where applicable, to potentially conduct a technically sound Alternate Source Demonstration (ASD), can be afforded while still maintaining consistency with but more stringent requirements than provided in the Federal CCR Rule. Allowing some additional time to complete these investigations will still result in a substantial reduction of the timeframe for initiation of potential corrective measures while providing a more robust and accurate basis on which to determine what corrective measures may need to be implemented. It is not prudent to "rush to judgment" on potential corrective measures when the end result may be that the measures selected are not appropriate or effective.

A. Section 845.610 – General Requirements

Overall, I agree with the Illinois EPA's proposed approach to the development of a groundwater monitoring program. However, the requirement in Section 845.610(b)(3)(D) to submit all groundwater monitoring data and any analysis performed within 60 days after "completion of sampling" may create confusion as to the required date for submission of the data to the Agency. The phrase "completion of sampling" is unclear. It is susceptible to various interpretations. It may be interpreted to mean the date the sample of groundwater is collected or alternatively, the date the laboratory analysis of the sample is received. If "completion of sampling" means the date of sample collection, then the 60-day clock for analysis of the data starts running even before any actual "sampling data" to be analyzed has been received from the laboratory. Such an interpretation would afford a very limited time to review and analyze the data upon receipt as it can typically take 14 to 21 days to receive the laboratory analytical results, depending upon the type of analytical work being performed (receipt of radium data generally takes on the order of 30 days or more). A 60-day deadline for both obtaining the sampling data and performing an analysis of that data is simply too short.

In response to MWG's questions, the Agency stated that "Part 845 requires, consistent with Part 257, that the assessment of corrective measures begin within 90 days of an exceedance of a GWPS." (Ex. 3, p. 22, Answer to Question 60.a). I am assuming the Agency means Section 257.95 of the Federal Rule, which is the section regarding Assessment Monitoring that triggers corrective action depending on the results. Section 257.95 uses language such as "after obtaining the results from the initial and subsequent sampling events…" and "within 90 days of finding that any of the constituents…" 40 CFR 257.95(d)(1), (f)(3). This language makes it clear that the trigger for a data and analytical submission deadline is the receipt of the sample results, not the completion of sample collection. I believe based upon the Agency's Answer to MWG Question 60.a, in addition to its Answer to MWG Question 71.e., that the Agency intended the phrase “completion of sampling” to mean “upon receipt of all analytical results”. The language of the Draft Rule should be clarified so that the activity (*i.e.,* the receipt of all sample analytical results) which triggers the start of the 60-day submission deadline is clear.

B. Section 845.620 Hydrogeologic Site Characterization

The requirements in Section 845.620 provide the basis for a good hydrogeologic assessment. However, there are several clarifications I suggest making to ensure a clearer understanding of what needs to be included in the assessment. Specifically, Subsections (b)(3) and (4) state that “nearby” surface bodies, drinking water intakes, and pumping wells must be identified. The term “nearby” is vague. Instead, the rule should include a definite distance or actual radius from the CCR surface impoundment. For example, Section 1600.210 of the Board rules defines a search radius for Community Water Systems (CWS) of 2,500 feet. Subsections 845.620(b)(3) and (4) should include a similar distance.

Also, it is unclear in Section 845.620(b)(13) whether the requirement to determine the vertical and horizontal extent of the geologic layers to a minimum depth of 100 feet can be fulfilled using available data and information without necessarily drilling to 100 feet as part of the study. Illinois EPA’s answer in Exhibit 3 suggests that the Agency may accept information from other site specific or regional data sources. (Ex. 3, p. 23, Answer to Question no. 64). To avoid confusion, Section 845.620(b)(13) should specifically state that the vertical and horizontal extent of the geologic layers may be determined by using other available site-specific and local stratigraphy information.

Similarly, the requirement to describe the chemical and physical properties of the geologic layers to a minimum depth of 100 feet in Section 845.620(b)(15) may be interpreted very broadly to include detailed mineralogical and whole rock chemistry analyses for each geologic layer to a minimum depth of 100 feet. It also can be interpreted more narrowly to require analysis of each geologic layer for those parameters specified in Section 845.600. But either of these types of detailed, geologic chemistry information are generally not required or necessary for the development of groundwater monitoring systems. Illinois EPA seems to agree with this and intended that Section 845.620 instead should require a more general description of the chemical and physical properties of the geologic layers based on available site-specific boring log observations and any available or applicable literature information on the mineralogical makeup of the geologic layers. While additional specific chemistry information may need to be developed in future evaluations to support potential numerical modeling of contaminant transport and chemical reactions between impacted groundwater and the aquifer matrix, that would be a very specific situational requirement that would warrant the development of more extensive chemical and physical properties of the geologic layers at that time. To avoid confusion, the language of Section 845.620(b)(15) should be clarified to more specifically describe the type of data that must be included as part of the site characterization.

C. Section 845.630 Groundwater Monitoring Systems

Section 845.630(a)(1) and (2) starts the discussion of requirements for development of proper background for the monitoring system. Both sections correctly state that background must "accurately represent the quality of background groundwater that has not been affected by leakage from a landfill containing CCR or CCR surface impoundment" and "accurately represent the quality of groundwater passing the waste boundary of the CCR surface impoundment." Accordingly, I agree with the Agency that a "landfill containing CCR" has the same meaning as

CCR landfill in Part 257 of the Federal Rule. (Ex. 2, pp. 35-36, Agency Answer to Question 22.a.; Ex. 3, pp. 23-24, Agency Answer to Question 66).

The Agency's approach is correct because it is critical to consider the actual groundwater quality immediately prior to its passing beneath the impoundment and to incorporate this background data/information into the statistical evaluations and interpretations of the data. Understanding the background groundwater quality prior to passing beneath a specific regulated unit boundary is important in developing an effective groundwater monitoring program for the regulated unit. Without this information, a source of groundwater impacts other than the regulated impoundment may be misunderstood or overlooked resulting in an incorrect conclusion on whether the subject regulated unit is actually the source. This situation may occur where there is another impoundment or other potential source that has impacted the groundwater upgradient of the subject impoundment that then passes beneath the subject impoundment. Without a monitoring program that can adequately distinguish between upgradient impoundment or non-impoundment sources and the subject impoundment caused impacts to groundwater, needless time and effort may be spent in evaluating and addressing an impoundment which is not the cause of the groundwater conditions that need to be addressed.

Moreover, while the purpose of the Draft Rule is to specifically regulate CCR surface impoundments, that does not mean that the other areas and the underlying groundwater of a Station are unregulated. The Stations have always been subject to the general groundwater rules in Part 620. In fact, Section 620.420 specifically addresses historic fill, including slag and ash. During the Part 620 rulemaking, the Illinois EPA explained that it drafted Section 620.420 to apply to sites that applied fill material before the effective date. *See* Excerpt of Illinois EPA Statement of Reasons, *In the Matter of: Groundwater Quality Standards (35 IAC 620)*, PCB R89-14(B), May

15, 1991, attached as Attachment 2. Similarly, Richard P. Cobb stated in his Part 620 rulemaking pre-filed testimony that as part of its evaluation, Illinois EPA acknowledged that extensive areas in Illinois were filled with slag or other fill. *See* Excerpt of R. Cobb Pre-filed Testimony, *In the Matter of: Groundwater Quality Standards (35 IAC 620)*, PCB R89-14(B), May 15, 1991 attached as Attachment 3. Additionally, Illinois EPA specifically stated in this CCR rulemaking that other potential CCR sources at a Station are subject to Section 12 of the Environmental Protection Act and Part 620 of the Board Rules. Ex. 3, p. 50, Agency Answer to Question 57. Illinois EPA also stated that the other areas at a Station do not evade any regulation by not being included in Part 845. Ex. 3, p. 50, Agency Answer to Question 58. There are also other regulatory remediation programs within the IPCB regulations under which any groundwater impacts associated with historic operational issues can and should be properly addressed. (e.g., the Site Remediation Program in 35 Ill. Admin. Code Parts 740 and 742).

D. Section 845.640 Groundwater Sampling and Analysis Requirements

The groundwater sampling and analysis requirements in the Draft Rule generally follow best practices to ensure consistent collection of accurate data. However, Section 845.640 states that all units at all Stations must analyze groundwater on a quarterly basis through post-closure care, and possibly longer, for *all* parameters listed in Section 845.600. This "one-size-fits-all approach" does not reflect the unique or special circumstances at each Station. For example, often the CCR stored in a CCR surface impoundment does not contain or release all of the parameters listed in Section 845.600. In fact, Section 845.220(a)(2)(A) of the Draft Rule requires analysis/characterization of the CCR as part of the construction permit requirements. During the Illinois Pollution Control Board (IPCB) hearings held on August 11 through 13, 2020, when the Agency was asked why such detailed information was necessary, it responded that this site-specific information and detail may be useful in the design and operation of the unit.[1] I believe that this type CCR characterization information would also be useful in developing a more targeted, site specific groundwater monitoring program. If it can be shown that the ash placed within a specific impoundment does not contain or leach a specific compound on the list of parameters provided in Section 845.600, then there is no reason to monitor for that parameter on a quarterly basis for 30-plus years.

Developing a site-specific monitoring program is consistent with other existing Illinois regulations that apply to groundwater assessments, such as in the Illinois landfill regulations under Section 811.319 of the Board regulations. It is also an accepted approach for Resource Conservation and Recovery Act (RCRA) units as discussed in the U.S.EPA Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities – Unified Guidance, EPA 530-R-09-007 (March 2009). Some portions of that guidance which note using waste specific characteristics in sampling program development are included in Attachment 4. The link to the full guidance document, which is over 800 pages, is https://archive.epa.gov/epawaste/hazard/web/html/index-12.html. Additionally, if the owner/operator would choose to develop such a site-specific approach to monitoring program development, the Rule should also require that the waste characterization be re-evaluated whenever there is a change in either the coal supply source or the combustion process equipment.

Accordingly, this section should also include a provision to allow an owner/operator the option to complete a representative waste characterization of the ash being placed into the regulated unit. The representative waste characterization would be required to include, at a minimum, sampling and analysis for all the parameters listed in Section 845.600. If the waste characterization sampling shows that some of the listed parameters are not associated with the ash being placed into the unit,

[1] *In the matter of Coal Combustion Residuals in Surface Impoundments: Proposed new 35 Ill. Adm. Code 845*, PCB R20-19, August 11, 2020 Transcript, p. 155.

then the monitoring program list of parameters can be narrowed to the relevant parameters of actual consequence.

Section 845.650 Groundwater Monitoring Program

As proposed, the groundwater monitoring program will likely not generate data that accurately reflects the constituents and their background concentrations in the groundwater before it passes the waste boundary of existing CCR surface impoundments because of the limited time to collect the background data set. Moreover, the Agency's decision to reduce the time to trigger an assessment of corrective measures from 360 days to 90 days is too stringent and is not founded in technically or scientifically sound basis.

a. 180 Days to Establish Background Groundwater Quality Will Not Provide Representative Data

Section 845.650(b)(1)(A) requires a minimum of eight independent samples from each background and downgradient monitoring well to be collected and analyzed for all constituents at all existing CCR surface impoundments within 180 days of the effective date of the Rule. The purpose of the initial sampling is to develop data to establish the background concentrations of the groundwater before it passes the waste boundary of the CCR surface impoundment. Under the Federal Rule, the timeline to conduct the initial groundwater monitoring for existing CCR surface impoundments was two years – from October 15, 2015 to October 17, 2017. 40 CFR 257.94(b). The Illinois EPA's proposal to require eight rounds of sampling for existing impoundments in only 180 days is not consistent with the Federal CCR Rule, may not develop data representative of true background given it covers a period of only 180 days, and may provide inaccurate and misleading monitoring results comparisons from the start of the groundwater monitoring program.[2]

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[2] While certain of the CCR surface impoundments in Illinois have already conducted groundwater monitoring pursuant to the Federal CCR program that may be used to establish the background data, the Illinois EPA has

The development of background groundwater quality should include understanding potential seasonal changes in constituent concentrations, particularly in Illinois where seasonal temperatures and precipitation fluctuate significantly. To understand potential seasonal changes, at least one full year of monitoring that covers all four seasons should be required. In some cases, even a year's worth of monitoring may still not provide the data needed to understand seasonal fluctuations, but it is certainly better than conducting the sampling over only a 180-day period. Limiting the timeframe to 180-days completely eliminates addressing seasonal or temporal fluctuations within the statistical program for analysis of the monitoring results. In other State of Illinois programs, such as the Standards for New Solid Waste Landfills in Part 811 of the Board Rules, Illinois EPA requires a minimum of four consecutive quarters of groundwater sampling to account for seasonal fluctuations. 35 IAC 811.320. This Rule should do the same.

Also, limiting the initial sampling to 180 days will likely not result in truly representative data. In order to obtain eight rounds of sampling within 180 days, the wells need to be sampled at least every 22.5 days or less. Standard analytical turnaround for most parameters is two to three weeks and longer for radium as previously discussed. To finish the monitoring within the 180-day period, the next round of samples must be collected before receiving and evaluating the previous round of analyses. Even more importantly, some impoundment sites within Illinois may be located in clayey, silty clay or silty aquifer matrix materials (*i.e.*, generally lower permeability) which impede groundwater flow velocities. For such sites, the required short timeframe between sampling events will likely result in sampling the same water, similar to a confirmation sampling event, as opposed to providing sampling results on potential water quality variability over time, which is one of the objectives of background development. The resulting data, although from independent sampling

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identified additional areas that are not a part of the Federal CCR program that may become existing CCR surface impoundments.

events, may be highly autocorrelated requiring some data manipulations/corrections to account for this shortcoming. See Excerpts from Unified Guidance provided Attachment 4. Autocorrelation is a similarity between measurements as a function of the time elapsed between those measurements. In other words, collecting this much data in such a relatively short time period may not provide a representative database on which to characterize the potential natural variability of groundwater quality conditions. The more potential database manipulations that are required to address this deficiency, the more uncertainty and hence, unreliability is introduced into the subsequent evaluations.

The Draft Rule should be modified to allow an owner/operator to conduct a longer background collection timeframe for existing surface impoundments consistent with the Federal CCR Rule. At a minimum, the Rule should allow at least one full year for the development of proper background data and that the background calculations based on the one-year of sampling data should be revisited after the second full year of quarterly sampling. This approach also would be consistent with groundwater monitoring requirements for Standards for New Solid Waste Landfills in Section 811.320(d) of the Board Rules.

b. The Timeline From Detection to Initiation of Assessment of Corrective Measures is Not Reasonable

Section 845.650(d)'s proposed requirement for a response if there is an exceedance of a standard for any of the parameters in Section 845.600 at any time following an "immediate resample" is not a technically sound strategy. The Illinois EPA shifted the groundwater monitoring program from the Federal CCR Rule two-tiered approach in 40 CFR 257.90 through 257.95 to a one-tier approach with groundwater protection standards (GWPSs) for all parameters. By switching to a one-tier approach, the Draft Rule is inconsistent with the Federal Rule. Specifically, the main differences are as follows:

- The Federal CCR Rule groundwater monitoring program has a "detection monitoring" tier and an "assessment monitoring" tier.
    - Detection monitoring is conducted semi-annually and includes seven screening parameters (Appendix III). If a monitoring event detects a statistically significant increase (SSI) over established background in one or more of the seven parameters, which is subsequently confirmed by a resampling, then a notification is made within the operating record documenting the SSI and either a successful Alternate Source Demonstration (ASD) is completed or the unit is transitioned into assessment monitoring. This process is allowed 90-days to complete from the time of detection of the SSI. 40 CFR 257.94.
    - Once triggered, assessment monitoring is to commence within 90 days (180 days cumulative from initial detection monitoring SSI documentation). 40 CFR 257.95. Assessment monitoring includes an initial round of groundwater sampling for 15 additional specific parameters (Appendix IV) that have an established Federal maximum contaminant limit (MCL) or, if an MCL is not available, risk-based comparison criteria as provided in Section 257.95, in addition to the seven Appendix III parameters. Once this data is available, within 90 days (270 days cumulative from initial detection monitoring SSI) a second round of assessment monitoring is completed analyzing only for those Appendix IV parameters detected in the first round of sampling plus the standard Appendix III parameters. Upon receipt of the second round of sampling data, GWPSs for the Appendix IV parameters are established and if there is a GWPS exceedance of an Appendix IV parameter, a notification is placed in the operating record and either a successful ASD is completed or work is to commence an assessment of corrective measures. This process allows for 90 days to complete that ASD and/or start on the assessment of corrective measures (360 days cumulative from initial detection monitoring SSI documentation).
- The Illinois EPA Draft Rule eliminates the detection monitoring tier and requires establishment of GWPSs for all parameters within the Federal CCR Rule Appendix III and IV based on Illinois Part 620 Class I groundwater standards as compared to statistical background (the higher of the two values becomes the GWPS for that parameter similar to the development of Appendix IV GWPSs under the Federal CCR Rule). Groundwater monitoring is then required on a quarterly basis (as opposed to semi-annual) and if a parameter is detected at a concentration above the GWPS for that parameter, a potential SSI is documented requiring a confirmatory resampling and, if appropriate, an ASD. If the resampling confirms the GWPS exceedance(s) and the ASD is not successful, an assessment of corrective measures must be initiated within 90-days of the initial GWPS exceedance(s). This 90-days includes up to 60 days for the operator to compete the ASD and 30 days for Illinois EPA to review the document.

In essence, the Draft Rule establishes a more rigid and unnecessarily shorter in that quarterly monitoring is required (as opposed to semi-annual), the detection monitoring tier was completely eliminated and instead the program starts the monitoring with established GWPSs for all Federal CCR Rule Appendix III and IV parameters (the Federal CCR Rule only has GWPSs established for Appendix IV parameters), and the timeframe from the initial detection of an SSI to the start of an assessment of corrective measures is reduced from up to 360 days to no more than 90 days. This approach is also inconsistent with the Board Rules for new landfills. *See* 35 IAC 811.319. The groundwater monitoring program for new landfills in Section 811.319 of the Board Rules has a two-tier approach, like the Federal CCR Rule. In Section 811.319(a) and (b), a new landfill must conduct detection monitoring and, if required, the operator must begin an assessment monitoring program to confirm that the landfill is the source of the impacts. 35 IAC 811.319(a), (b). Although I understand the driving force behind establishment of the GWPSs up front based on Illinois specific Part 620 Class I groundwater standards, and the desire to streamline the program to initiate potential corrective measures in a more expeditious manner, this should not be done on an unreasonably short schedule that sacrifices the timeframes required for an owner/operator to complete technically sound evaluations.

Moreover, the Draft Rule's requirement that one data point of one constituent, even with an immediate resample, requires an immediate assessment of corrective measures is meaningless and does not indicate a release has occurred from a CCR surface impoundment. In responses to comments regarding this issue, Illinois EPA stated that a confirmatory resample is also being collected which would provide two data points upon which that determination is being made. (Ex. 3, pp. 20-21, Answer to Question 55). That confirmatory resampling generally occurs very shortly after the initial data is received with the primary intent being to ensure that the detection is not an analytical or sampling aberration. The resampling does not provide any indication whether the exceedance may be a short-term, unrelated transient anomaly or whether the exceedance is truly reflective of a potential actual release from the subject impoundment. This concern is especially true for parameters that are usually "not detected". Under the Unified Guidance these instances should employ the Double Quantification Rule. *See* Attachment 4. Under the Double Quantification 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 (RL)) in two consecutive sample and resample events." This alone would be two quarters of data, but the current Draft Rule 90-day timeframe for initiating an assessment of corrective action allows for only one quarter of data thereby potentially inappropriately and unnecessarily triggering this response action.

Under the Federal CCR Rule and the Illinois landfill regulations, the two-tiered approach to monitoring allows for several additional quarterly rounds of groundwater sampling, which ensures sufficient data is available to make a determination regarding appropriate corrective action measures before triggering the initiation of an evaluation of corrective measures. With the shift in monitoring program philosophy to a single-tiered approach this whole decision process has been reduced to 90 days, which is based on a single quarter of sampling (*i.e.,* basically a single confirmed data point). Instead, similar to the Federal Rule and the Illinois landfill regulations, this Rule should require a targeted follow-up sampling of the well(s) displaying a potential exceedance for at least an additional quarter to document that the elevated detection was not an unrelated short-term occurrence prior to potentially triggering an assessment of corrective measures.

c. <u>The Rule Should Allow For Modifications Based Upon Site-Specific Conditions</u>

Also, similar to my comments on Section 845.640, Section 845.650 should allow for modifications of the groundwater monitoring program so that it reflects the site-specific groundwater at each Station. Specifically, Section 845.650(b)(1) identifies that the monitoring frequency for all constituents with a groundwater protection standard in Section 845.600 and Calcium shall be tested on at least a quarterly basis during the active life of the unit and the post-closure care period or that period specified if closure is completed by removal. Based on my experience, there may be compounds on the all-inclusive list that are never detected for a specific unit. If an owner/operator of a CCR surface impoundment is not allowed to develop a tailored monitoring list based on a characterization of the ash being placed into the unit as suggested above, this Section should allow an owner/operator to reduce the monitoring list if a compound is not detected after a set period of time (*e.g.,* 3 or 5 years). Otherwise, data is being generated at a substantial cost over time that is not useful in any way. This type of provision would be consistent with the monitoring requirements for existing landfill operational permits issued by Illinois EPA.

Further, I agree with the Agency's suggestion for alternative chemical and monthly elevation schedules. (Ex. 3, p. 48, Answer to Question 51). Relative to groundwater flow determination, in my experience, after the first few years of monitoring generally stable conditions are documented and the groundwater flow system beneath the regulated unit is sufficiently understood by the Professional Engineer to evaluate and assess the ongoing effectiveness of the monitoring system. Once the flow system is sufficiently understood, measuring water elevations on a monthly schedule only provides duplicative and unnecessary data. The Final Rule should also allow, if appropriate, the operator shift to a semi-annual monitoring frequency which would also be consistent with Section 811.319 of the Illinois landfill regulations. Coal ash impoundment monitoring need not be more stringent than a landfill, particularly because ash removed from an impoundment can be disposed of in a landfill that is regulated under Part 811. It is an arbitrary distinction to require more frequent monitoring of a CCR impoundment once stable conditions are documented than is required of a landfill in which CCR may be disposed.

d. Additional Time is Required to Prepare an Adequate Alternate Source Demonstration under Section 845.650(d)

I agree with the Illinois EPA's proposal to allow an Alternate Source Demonstration (ASD) (Section 845.650(d)(4)), however, the timeframe of 60 days from the detected exceedance to complete an ASD is too short for many reasons. First, the Draft Rule appears to require that the ASD is due 60 days from the date of the "initial sampling." Because Section 845.650(d) allows for a resample, the due date for the ASD should be based on the "date of receipt of the results of the confirmation sampling" and not the initial sampling date. Second, the 60-day timeframe is not sufficient to develop and complete a technically sound and meaningful ASD. For example, an ASD may need to look at various leaching characteristics/chemistry of the ash material within the impoundment to compare against the groundwater data. This information provides an understanding of what components of the ash chemistry may in fact be leaching out of the ash and potentially mobilize into the groundwater system. Some commonly accepted and used tests include Toxicity Characteristic Leaching Procedure (TCLP), Synthetic Precipitation Leaching Procedure (SPLP), and various Leaching Environmental Assessment Framework (LEAF) methods (EPA Methods 1313, 1314, 1315 and 1316; see Attachment 5). The LEAF methods provide for more definitive and insightful data for the purposes of an ASD for a CCR impoundment. LEAF is a leaching evaluation system, which includes four different leaching methods and scenario assessment approaches designed to work individually or integrated to provide a description of the release of inorganic constituents of potential concern for a wide range of solid materials. The LEAF methods have been designed to consider the effect of key environmental conditions and waste properties on leachate chemistry. LEAF sampling and testing are intended to provide a more robust dataset that can be used to evaluate CCR over a wider range of pH and site-specific conditions than TCLP or SPLP testing. The established LEAF analytical methods and procedures analytical turnarounds are from 28 days (EPA Methods 1313 and 1316), to 42 days (EPA Method 1314) and as long as 84 days (EPA Method 1315, See attachment 5). The various LEAF test methods provide data on leaching of constituents as a function of pH, liquid-solid ratios and/or information on mass transfer rates. Such information can provide valuable insight into the site-specific ash leachate conditions and characteristics. The above noted analytical timeframes do not include the time required for developing, scheduling and implementing a representative impoundment sampling plan or the backend data evaluation time which may require analytical modeling and/or other quantitative data assessment.

Accordingly, to allow for development of a scientifically and technically valid ASD, the deadline to submit an ASD should be longer than 60 days. For example, the Federal CCR Rule provides for 90 days to complete an ASD, and even that time allotment is tight. I would suggest that the ASD timeframe be 90 days, consistent with the Federal Rule, but an owner/operator should also be allowed to obtain an extension if a sufficiently justified technical and factual basis can be made for the extension.

E. Section 845.660 Assessment of Corrective Measures

Overall, the Draft Rule's provisions for the assessment of corrective measures will accurately develop the proper corrective measures to respond to confirmed releases. However, as described above, an assessment of corrective measures should not be triggered by any exceedance of a GWPS based on a single quarterly round of sampling. Section 845.660(a)(1) should be drafted to be consistent with my recommendation to facilitate at least an additional quarterly sampling to better understand the nature of the potential exceedance (see discussion under Section 845.650).

II. <u>"Free Liquids" are Liquids That Easily Separate From the CCR Solids and Not Groundwater</u>

The Illinois EPA is correct that "free liquids" are "the easily removed liquids that separate from the CCR solids under ambient temperature and pressure. This does not mean all groundwater flow into and out of the impoundment has been eliminated." (Ex. 2, p. 65, Answer to Question 24). In the case of CCR surface impoundments, the "free liquids" are the transport water used to move the CCR into the surface impoundment. Once this transport water reaches the impoundment, the ash settles and the water is decanted, however, at least some portion of the separated free liquid may remain in the impoundment over an extended period of time based on operational design such as using it as a protective measure to reduce the potential for dust emissions from the impoundment.

When the time comes for closure, if the closure plan provides for closure in place, then the "free liquids" must be removed to facilitate access to the ash to properly regrade and compact the material to allow for construction of the designed cover system. If closure is to be completed by removal, then the "free liquids" need to be removed from the ash to allow for proper landfill disposal. In both cases the removal of "free liquids" can be accomplished by separating or decanting the liquid portion of the CCR material and removing these "free liquids" from the impoundment. Accordingly, the Illinois EPA is correct. The free liquids required to be removed are those that are associated with the placement of the waste (in this case ash) and that separate from the solids under ambient temperature and pressure conditions. The term "free liquids" does not, and should not, include groundwater potentially in contact with the ash.

The Agency's conclusion and my concurring opinion are supported by several recognized sources. First, in a recent proposed modification to the Federal CCR Rule, 85 F.R. 12456-12478 (March 3, 2020), the U.S. EPA indicated that it interprets "free liquids" in this same way. The

U.S.EPA stated that "free liquids must be eliminated by removing liquid wastes …" *Id.* (emphasis added). It did not refer in any way to groundwater that comes into contact with the ash in a surface impoundment to describe what it means by the term "free liquids." It solely referenced "liquid wastes."

That "free liquids" is defined as liquid waste, is further supported by federal, state and local standards and guidance for other regulatory programs. As demonstrated below, the definition and concept of "free liquids" as only liquid waste has been consistent over time and across regulatory programs. In each guidance and standard set forth below, "free liquids" is always used to refer to a characteristic of the waste stream itself which needs to be considered and addressed, and not any groundwater that may come in contact with the waste.

1) EPA 40 CFR Part 265 [SW-FRL 1999-31 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities AGENCY: Environmental Protection Agency. ACTION: Proposed amendments to rule, 1982 https://www.epa.gov/sites/production/files/2016-03/documents/47fr8307.pdf

   "The Agency has not found compelling merit in the criticisms about the necessity of restricting the introduction of free liquids or liquid wastes into landfills. EPA strongly believes that introduction of containerized free liquids in landfills should be minimized to the extent possible, if not prohibited, for the reasons set forth in the preamble to the May 19, 1980 promulgation of the Part 265 standards."

2) Illinois Emergency Management Agency, Division of Nuclear Safety, 2011 http://public.iema.state.il.us/Applications/WaterTreatment/Documents/Guidance.pdf

   "Testing for free liquids Generators must ensure that the treatment residuals they are disposing of meet IEPA disposal requirements. Systems must perform the Paint Filter Liquids Test (or PFLT; EPA SW 846 Method 9095) to determine if the waste contains any "free liquids" because solid waste landfills cannot accept waste that contains free liquids. If free liquids are present, the system will need to employ an intermediate processing method and determine an appropriate method of disposal for the liquid residuals generated by dewatering."

3) TITLE 35: ENVIRONMENTAL PROTECTIONSUBTITLE G: WASTE DISPOSAL CHAPTER I: POLLUTION CONTROL BOARD SUBCHAPTER c: HAZARDOUS WASTE OPERATING REQUIREMENTS PART 720 HAZARDOUS WASTE MANAGEMENT SYSTEM: GENERALSECTION 720.110 DEFINITIONS http://www.ilga.gov/commission/jcar/admincode/035/035007200B01100R.html

"Free liquids" means liquids that readily separate from the solid portion of a waste under ambient temperature and pressure." [This is the same definition used in the Draft Rule].

"No free liquids", as used in 35 Ill. Adm. Code 721.104(a)(26) and (b)(18), means that solvent-contaminated wipes may not contain free liquids, as determined by Method 9095B (Paint Filter Liquids Test), included in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", incorporated by reference in Section 720.111, and that there is no free liquid in the container holding the wipes. No free liquids may also be determined using another standard or test method that the Agency has determined by permit condition is equivalent to Method 9095B."

4) RULES AND REGULATIONS FOR LANDFILLS, LIQUID WASTE HANDLING FACILITIES AND TRANSFER STATIONS OPERATED WITHIN THE CITY OF CHICAGO, 1998

"Liquid Waste" means any waste which maintains the physical state of continuous volume relatively independent of pressure and which takes the shape of its container at ambient temperature; or is determined to contain "free liquids" as defined by Method 9095 (Paint Filter Liquids Test), as described in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods" (EPA Pub. No. SW-846).

5) CHICAGO DEPARTMENT OF PUBLIC HEALTH: LIQUID WASTE FEE, 2020 https://www.chicago.gov/city/en/depts/cdph/provdrs/healthy_communities/svcs/pay_liquid_wastefee.html

"Liquid waste is special waste as defined by the Illinois Environmental Protection Agency which includes hazardous waste, industrial process waste, pollution control waste, and potentially infectious medical waste that has free liquids."

6) EPA: DEFINITION OF "LIQUID WASTE", 1981
"A liquid waste is any material that will pass through a 0.45 micron filter at a pressure differential of 75 psi. If the material to be evaluated consists of two or more phases, then the phases should be separated by centrifugation or other means prior to evaluating whether any of the phases meet the above definition. Free liquids as defined in 260.10 (a)(25) are defined as any liquid which passes through the Paint Filter Test (method 9095)."

7) IEPA>Topics>Waste Management>Waste Disposal>Special Waste DO I HAVE A SPECIAL WASTE?
"What is a Liquid Waste? Liquid waste is any waste material that is determined to contain "free liquids." Used cutting oil is a typical liquid waste. For sludges or other wastes that you cannot easily determine is liquid, you can use the paint filter test. The test requires pouring the waste through a specific filter to determine if the waste contains "free liquids."

8) TITLE 35: ENVIRONMENTAL PROTECTION SUBTITLE F: PUBLIC WATER SUPPLIES CHAPTER I: POLLUTION CONTROL BOARD PART 615 EXISTING ACTIVITIES IN A SETBACK ZONE OR REGULATED RECHARGE AREA SECTION 615.102 DEFINITIONS

> *"Free liquids" means liquids which readily separate from the solid portion of a waste under ambient temperature and pressure. To demonstrate the absence or presence of free liquids in either a containerized or a bulk waste, the following test must be used: Method 9095 (Paint Filter Liquids Test) as described in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods" (EPA Publication No. SW-846), incorporated by reference at Section 615-103."*

Section 845.750(b)(1) states that free liquids must be eliminated by removing liquid wastes or solidifying the remaining liquid wastes and waste residues. The "free liquids" are specific to the waste itself: the CCR and the transport water used to move the CCR into the CCR surface impoundment. It is my opinion that any potential groundwater in contact with CCR within unlined impoundment is not part of the initially placed waste stream.

Moreover, potentially impacted groundwater is correctly addressed on a site-specific basis under Draft Rule Section 845.710 coupled with Section 845.750(a)(1). Under 845.710, applicable closure alternatives are identified and evaluated based on a number of technical considerations including both short- and long-term effectiveness. The closure options to be evaluated must include complete removal as one of the alternatives. Under Section 845.750(a)(1), if the impoundment is to be closed in-place, the owner/operator must control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate or contaminated run-off to the ground or surface water or to the atmosphere. In addition, under 845.780(b)(3) Post-Closure Care groundwater monitoring is required in accordance with Subpart F until all GWPs are met, or at least 30-years if closure in-place is the selected alternative. That groundwater monitoring will determine whether additional corrective action measures must be considered and implemented or whether the selected closure alternative is performing as designed.

Thank you for your time and consideration in this matter.

Richard R Gnat

8/27/20

Richard Gnat, P.G. Date

ATTACHMENT 1

Curriculum Vitae of Richard Gnat

RICHARD R. GNAT, P.G.
KPRG & Associates, Inc.
14665 West Lisbon Road, Suite #2B
Brookfield, WI 53005
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(262) 781-0475--Phone
(262) 781-0478--Facsimile

Experience Summary:

Over 36 years of professional experience in the environmental site investigation and remediation. Impaired property transfer/transaction support includes over 100 Phase I/II ESAs for clients throughout the country, Central America and England. Acted as environmental due diligence support project manager for the acquisition of Union Texas Petroleum by Western Gas Resources which included the assessment of 108 properties across Texas, Nebraska and Louisiana.

Site investigation experience has included over 100 projects as the technical lead for the planning and implementation of CERCLA Remedial Investigations/Feasibility Studies (RI/FSs), RCRA Facility Investigations (RFIs), site investigations in support of industrial/brownfield property transactions, UST investigations and landfill studies. Investigation methods have included soil/bedrock drilling, monitoring well installation/sampling, use of field screening technologies and in-field analytical laboratories to guide real-time field decisions, well tests (single and multiple well) and geophysical surveys.

Soil remediation experience has included developing and managing a variety of large-scale projects including direct removals, in-situ treatment and stabilizations. Groundwater remediation projects have included interceptor trenches, augmentation of in-situ biodegradation, pump and treat systems, in-situ chemical oxidation and the use of natural attenuation to meet cleanup objectives. Managed a natural attenuation evaluation in support of the shut-down of a large scale pump and treat system for an industrial client in Puerto Rico. The study convinced the regulators to allow the shutdown and eventual decommissioning of the system after only 3 years of operation out of the originally designed 15-year groundwater recovery program.

Credentials:

M.S., Geosciences, University of Illinois at Chicago, 1984
B.S., Earth Sciences, Northeastern Illinois University, 1981
Additional Hydrogeology, Eastern Michigan University, 1985
Professional Geologist - Wisconsin (#G-149)
Professional Geologist - Illinois (#196-000900)
Professional Geologist - Minnesota (#30513), Inactive
Professional Geologist- Arkansas (#0259), Inactive

Employment History:

2001 - Present	KPRG and Associates, Inc.
1990 - 2000	Hydro-Search, Inc. / Geotrans
1989 - 1990	Versar Inc.
1984 - 1989	Roy F. Weston, Inc.

Publications:

Shestag, S., Gnat, R., et. al., 1994, Recovery, Evaluation and Decontamination of Landfilled Pentaborane Cylinders, Former Liquid Propellant Testing Facility, Washoe County, Nevada. Joint Army-Navy-NASA-Air Force Interagency Propulsion Committee

Gnat, R., Loch, M. et al., 1996. Machias Gravel Pit -Assessment through Remediation in Under Three Years. Hazardous and Industrial Wastes; Proceedings of the Twenty-Eighth Mid-Atlantic Industrial and Hazardous Waste Conference. Technomic Publishing Company, Inc., Lancaster, PA.

ATTACHMENT 2

Excerpt of Illinois EPA Statement of Reasons

PCB 89-04(B)

RPC
Copy
5/17/91

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
GROUNDWATER QUALITY STANDARDS	)	PCB R89-14 (B)
(35 ILL. ADM. CODE 620)	)	
	)	
	)	

NOTICE

To: Dorothy Gunn, Clerk
Illinois Pollution Control Board
SOIC, Suite 11-500
100 W. Randolph
Chicago, IL 60601

Michelle C. Dresdow
Hearing Office
Illinois Pollution Control Board
P.O. Box 505
DeKalb, IL 60115

SEE ATTACHED LIST

Please take notice that I have filed with the Clerk of the Illinois Pollution Control Board the Illinois Environmental Protection Agency's Statement of Reasons and Testimony of Richard P. Cobb, a copy of which is served upon you. This Testimony will be presented by Mr. Cobb at the Illinois Pollution Control Board hearing to be held in Chicago on May 30, 1991.

Illinois Environmental Protection
Agency

By: Stephen C. Ewart
Stephen C. Ewart
Deputy Counsel
Division of Public Water
Supplies

Date: May 15, 1991
2200 Churchill Road
P.O. Box 19276
Springfield, Illinois 62794-9276
(217)782-5544

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF: GROUNDWATER QUALITY STANDARDS (35 ILL. ADM. CODE 620)	)))))	PCB R89-14 (B)

STATEMENT OF REASONS

Pursuant to 35 Ill. Adm. Code 102.120(b), the Illinois Environmental Protection Agency ("Agency") hereby submits to the Illinois Pollution Control Board ("Board") a statement of reasons in support of the proposal of regulations which was submitted on February 15, 1991. The following statement of reasons provides a discussion of sections that are significantly different in First Notice, Docket B from previous Agency proposals. The sections not discussed in these comments have not been changed significantly from previous Agency testimony and statement of reasons. In addition, several sections have been amended since submission of the Agency's revised proposal on February 15, 1991 to the Board. These revisions were made as a result of public participation efforts to further narrow certain issues between interest groups. The amendments which are described in this Statement of Reasons are contained in the text of 35 Ill. Adm. Code 620 which is provided in Attachment 1.

I. STATUTORY AUTHORITY

Section 2(b) of the Illinois Groundwater Protection Act ("IGPA") (Ill. Rev. Stat. 1989, ch. 111 1/2, par. 7452(b)) sets forth that:

The Agency has eliminated the alternate on-site background level of earlier drafts and has incorporated a similar concept as an exception to certain Class II Inorganic Chemical Constituents for sites that have been filled with slag. As proposed, the Agency has limited the application of this exception to those inorganic constituents listed in Section 620.420(a)(2) because of comments that there was no basis for exempting the inorganics in Section 620.420(a)(1).

The Agency has proposed that the Board apply this exception to sites which have applied fill material before the effective date of this Part and for sites which are in the process of applying fill material on the effective date of this Part and are proceeding in a reasonably continuous manner. The latter provision is similar to those provisions provided for new potential sources and routes under the Act.

In response to recent comments, the Agency has provided a 10-foot zone within parent material to more adequately address the problem and has expanded the application of these provisions to sites other than just the industrial property class. However, the Agency recommends that the application not be extended to rural property classes.

Section 620.420(b)(2) recognizes existing use of pesticide chemicals in a controlled manner which are applied to cropland consistent with the Federal Insecticide and Fungicide, and Rodenticide Act ("FIFRA"), and the Illinois Pesticide Act ("IPA"). This section has also been amended after submission of the proposal to the Board, in response to comments received that

ATTACHMENT 3

Excerpt of Testimony of Richard P. Cobb

PCB 89-04(B)

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
GROUNDWATER QUALITY STANDARDS	)	PCB R89-14 (B)
(35 ILL. ADM. CODE 620)	)	
	)	
	)	

TESTIMONY OF RICHARD P. COBB

The Illinois Environmental Protection Agency hereby prefiles the attached TESTIMONY of RICHARD P. COBB. This testimony will be presented by Mr. Cobb at the Illinois Pollution Control Board hearings to be held in Chicago on May 30, 1991.

Illinois Environmental Protection Agency

By: Stephen C. Ewart
Stephen C. Ewart
Deputy Counsel
Division of Public Water Supplies

DATED: May 15, 1991
2200 Churchill Road
P.O. Box 19276
Springfield, IL 62794-9276
217/782-5544

TESTIMONY OF RICHARD P. COBB
ON R89-14 DOCKET (B)

My name is Richard P. Cobb and I am Manager of the Hydrogeology Unit of the Groundwater Section of the Illinois Environmental Protection Agency's Division of Public Water Supplies. The statement of reasons included with this testimony describes that following submission of the Agency's proposal, OK ok several additional comments were received through public participation efforts which merited revisions in the submission. The amendments made were as a result of trying to reach as much of a consensus as was possible between the various interest groups.

My testimony today will primarily focus upon the sections and concepts of the proposal that are new, and have not been discussed in previous extensive testimony presented by the Agency.

CARCINOGENS

The Agency has discussed in previous testimony as well as several other participants in this proceeding that the carcinogens regulated by the groundwater standards should be consistent with their regulation under the Safe Drinking Water Act ("SDWA"), and the guidelines and principles as mandated by Section 8(a) of the IGPA.

The SDWA regulates organic constituents as carcinogens if they are considered to be a Group A, B_1, or B_2 carcinogen. The SDWA does not regulate Group C carcinogens in the same manner.

received which prompted this amendment. The reason for including these additional parameters is that Class I waters should be able to be used for all uses. The constituents which were added to Class I were boron, cobalt, nickel, zinc, and phenols. The basis for the standards for these constituents are irrigation, livestock, MCL, and 35 Ill. Adm. Code 302.208, respectively.

The Agency has revised the applicability of the Class II groundwater standard for pH from 10 feet to a depth of 5 feet from the land surface. This amendment is necessary to ensure proper remedial response in the event of spill of caustic or acidic materials as well as to allow for sound land management and agricultural practices (e.g. lime, de-icing agents etc.) during the application of pH sensitive materials

The provisions for alternate on-site background, and the on-site exception have been deleted from this proposal. However, several comments have been made in this proceeding which discuss that extensive areas have been filled with slag and other fill material, and that these conditions may cause violations of the standards for certain constituents. Several examples have been provided which indicate that significant parts of southeastern Chicago and East St. Louis have been filled with such material. Therefore, to provide recognition for these prior conditions, a provision has been incorporated into the Class II standards in relation to the specific constituents of concern. To further accommodate these conditions a 10 foot buffer zone into parent material, and a exclusion for fill material, has been provided. This buffer zone should reasonably accommodate these conditions.

In addition, for sites which are in the process of applying fill material on the effective date of this Part and are proceeding in a reasonably continuous manner, the Agency has proposed a provision to allow for recognition of these situations. This was modeled after a similar provision provided for construction of new potential sources or routes in the Act.

To recognize existing uses of pesticide chemical constituents which have been applied in a manner consistent with the requirements of the Federal Insecticide Fungicide and Rodenticide Act ("FIFRA") and the Illinois Pesticide Act ("IPA"), the Agency has proposed the establishment of an attenuation zone for pesticide chemical constituents listed in Subsection 620.420(b)(1). This attenuation zone has been established at 10 feet to be consistent with the 10 foot zone of surficial interaction established for Class I groundwater. The Class I or II standards will apply below this depth. This provision was built into the Class II standards so that it could specifically be related to the constituents of concern.

Illinois is a highly agricultural state and these regulations must recognize pesticides that have been applied in compliance with federal and state regulations. The Illinois Department of Agriculture provided the following from page 2 of their comments of February 15, 1991 to the Board:

> "The Department fully supports the development and adoption of groundwater quality standards which will protect this valuable resource, however, these standards must provide this protection without having a disproportionately negative impact on other equally important resources. The use of agrichemicals is somewhat unique in that these compounds are

ATTACHMENT 4

Excerpts from U.S. EPA Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities – Unified Guidance March 2009 (EPA-530-R-09-007)

STATISTICAL ANALYSIS OF GROUNDWATER MONITORING DATA AT RCRA FACILITIES

UNIFIED GUIDANCE

OFFICE OF RESOURCE CONSERVATION AND RECOVERY

PROGRAM IMPLEMENTATION AND INFORMATION DIVISION

U.S. ENVIRONMENTAL PROTECTION AGENCY

MARCH 2009

The difficulties in identifying a valid statistical framework for groundwater monitoring highlight a fundamental assumption governing almost every statistical procedure and test. It is the presumption that sample data from a given population should be *independent* and *identically distributed*, commonly abbreviated as *i.i.d.* All of the mathematics and statistical formulas contained in this guidance are built on this basic assumption. If it is not satisfied, statistical conclusions and test results may be invalid or in error. The associated statistical uncertainty may be different than expected from a given test procedure.

Random sampling of a single, fixed, stationary population will guarantee independent, identically-distributed sample data. Routine groundwater sampling typically does not. Consequently, the Unified Guidance discusses both below and in later chapters what assumptions about the sample data must be routinely or periodically checked. Many but not all of these assumptions are a simple consequence of the *i.i.d.* presumption. The guidance also discusses how sampling ought to be conducted and designed to get as close as possible to the *i.i.d.* goal.

3.2 COMMON STATISTICAL ASSUMPTIONS

Every statistical test or procedure makes certain assumptions about the data used to compute the method. As noted above, many of these assumptions flow as a natural consequence of the presumption of *independent, identically-distributed* data (*i.i.d.*). The most common assumptions are briefly described below:

3.2.1 STATISTICAL INDEPENDENCE

A major advantage of truly random sampling of a population is that the measurements will be *statistically independent*. This means that observing or knowing the value of one measurement does not alter or influence the probability of observing any other measurement in the population. After one value is selected, the next value is sampled again at random without regard to the previous measurement, and so on. By contrast, groundwater samples are not chosen at random times or at random locations. The locations are fixed and typically few in number. The intervals between sampling events are fixed and fairly regular. While samples of independent data exhibit no *pairwise correlation* (*i.e.*, no statistical association of similarity or dissimilarity between pairs of sampled measurements), *non-independent* or *dependent* data *do* exhibit pairwise correlation and often other, more complex forms of correlation. Aliquot split sample pairs are generally not independent because of the *positive correlation* induced by the splitting of the same physical groundwater sample. Split measurements tend to be highly similar, much more so than the random pairings of data from distinct sampling events.

In a similar vein, measurements collected close together in time from the same well tend to be more highly correlated than pairs collected at longer intervals. This is especially true when the groundwater is so slow-moving that the same general volume of groundwater is being sampled on closely-spaced consecutive sampling events. Dependence may also be exhibited spatially across a well field. Wells located more closely in space and screened in the same hydrostratigraphic zone may show greater similarity in concentration patterns than wells that are farther apart. For both of these temporal or time-related and spatial dependencies, the observed correlations are a result not only of the non-random nature of the sampling but also the fact that many groundwater populations are not uniform throughout the subsurface. The aquifer may instead exhibit pockets or sub-zones of higher or lower concentration, perhaps due to location-specific differences in natural geochemistry or the dynamics of contaminant plume behavior over time.

chosen, and the frequency of background versus compliance well testing. The number of compliance wells and annual frequency of testing also affect overall costs, but are generally site-specific considerations. By limiting the number of constituents and ensuring adequate background sample sizes, it is possible to select certain statistical tests which help minimize future compliance (and total) sample requirements.

Selection of an appropriate number of detection monitoring constituents should be dictated by the knowledge of waste or waste leachate composition and the corresponding groundwater concentrations. When historical background data are available, constituent choices may be influenced by their statistical characteristics. A few representative constituents or analytes may serve to accurately assess the potential for a release. These constituents should stem from the regulated wastes, be sufficiently mobile, stable and occur at high enough concentrations to be readily detected in the groundwater. Depending on the waste composition, some non-hazardous organic or inorganic indicator analytes may serve the same purpose. The guidance suggests that between 10-15 formal detection monitoring constituents should be adequate for most site conditions. Other constituents can still be reported but not directly incorporated into formal detection monitoring, especially when large simultaneously analyzed suites like ICP-trace elements, volatile or semi-volatile organics data are run. The focus of adequate background and future compliance test sample sizes can then be limited to the selected monitoring constituents.

The RCRA regulations do not consistently specify how many observations must be collected in background. Under the Part 265 Interim Status regulations, four quarterly background measurements are required during the first year of monitoring. Recent modifications to Part 264 for Subtitle C facilities require a sequence of at least four observations to be collected in background during an interval approved by the Regional Administrator. On the other hand, at least four measurements must be collected from each background well during the first semi-annual period along with at least one additional observation during each subsequent period, for Subtitle D facilities under Part 258. Although these are minimum requirements in the regulations, are they adequate sample sizes for background definition and use?

Four observations from a population are rarely enough to adequately characterize its statistical features; statisticians generally consider sample sizes of $n \leq 4$ to be insufficient for good statistical analysis. A decent population survey, for example, requires several hundred and often a few to several thousand participants to generate accurate results. Clinical trials of medical treatments are usually conducted on dozens to hundreds of patients. In groundwater tests, such large sample sizes are a rare luxury. However, it is feasible to obtain small sample sets of up to $n = 20$ for individual background wells, and potentially larger sample sizes if the data characteristics allow for pooling of multiple well data.

The Unified Guidance recommends that a minimum of at least 8 to 10 independent background observations be collected before running most statistical tests. Although still a small sample size by statistical standards, these levels allow for minimally acceptable estimates of variability and evaluation of trend and goodness-of fit. However, this recommendation should be considered a temporary minimum until additional background sampling can be conducted and the background sample size enlarged (see further discussions below).

Small sample sizes in background can be particularly troublesome, especially in controlling statistical test false positive and negative rates. False negative rates in detection monitoring, *i.e.*, the statistical error of failing to identify a real concentration increase above background, are in part a function of sample size. For a fixed false positive test rate, a smaller sample size results in a higher false negative rate. This means a decreased probability (*i.e., statistical power*) that real increases above background will be detected. With certain parametric tests, control of the false positive rate using very small sample sets comes at the price of extremely low power. Power may be adequate using a non-parametric test, but control of the false positive can be lost. In both cases, increased background sample sizes result in better achievable false positive and false negative errors.

The overall recommendation of the guidance is to establish background sample sizes as large as feasible. The final tradeoff comes in the selection of the type of detection tests to be used. Prediction limit, control chart, and tolerance limit tests can utilize very small future sample sizes per compliance well (in some cases a single initial sample), but require larger background sample sizes to have sufficient power. Since background samples generally are obtained from historical data sets (plus future increments as needed), total annual sample sizes (and costs) can be somewhat minimized in the future.

5.2.2 BASIC ASSUMPTIONS ABOUT BACKGROUND

Any background sample should satisfy the key statistical assumptions described in **Chapter 3**. These include statistical independence of the background measurements, temporal and spatial stationarity, lack of statistical outliers, and correct distribution assumptions of the background sample when a parametric statistical approach is selected. How independence and autocorrelation impact the establishment of background is presented below, with additional discussions on outliers, spatial variability and trends in the following sections. Stationarity assumptions are considered both in the context of temporal and spatial variation.

Both the Part 264 and 258 groundwater regulations require statistically independent measurements (**Chapter 2**). Statistical *independence* is indicated by random data sets. But randomness is only demonstrated by the presence of mean and variance *stationarity* and the lack of evidence for effects such as *autocorrelation, trends, spatial and temporal variation*. These tests (described in **Part II** of this guidance) generally require at least 8 to 10 separate background measurements.

Depending on site groundwater velocity, too-frequent sampling at any given background well can result in highly *autocorrelated*, non-independent data. Current or proposed sampling frequencies can be tested for autocorrelation or other statistical dependence using the diagnostic procedures in **Chapter 14**. Practically speaking, the best way to ensure some degree of statistical independence is to allow as much time as possible to elapse between sampling events. But a balance must be drawn between collecting as many measurements as possible from a given well over a specified time period, and ensuring that the sample measurements are statistically independent. If significant dependence is identified in already collected background, the interval between sampling events may need to be lengthened to minimize further autocorrelation. With fewer sampling events per evaluation period, it is also possible that a change in statistical method may be needed, say from analysis of variance [ANOVA], which requires at least 4 new background measurements per evaluation, to prediction limits or control charts, which may require new background only periodically (*e.g.*, during a biennial update).

by eliminating historically non-detected constituents in background from the formal list of detction monitoring constituents (discussed further in the following section). These constituents are still analyzed and informally tested, but do not count against the SWFPR.

Results of waste and leachate testing and possibly soil gas analysis should serve as the initial basis for designating constituents that are reliable leak detection indicators. Such specific constituents actually present in, or derivable from, waste or soil gas samples, should be further evaluated to determine which can be analytically detected a reasonable proportion of the time. This evaluation should include considerations of how soluble and mobile a constituent may be in the underlying aquifer. Additionally, waste or leachate concentrations should be high enough relative to the groundwater levels to allow for adequate detection. By limiting monitoring and statistical tests to fewer parameters with reasonable detection frequencies and that are significant components of the facility's waste, unnecessary statistical tests can be avoided while focusing on the reliable identification of truly contaminated groundwater.

Initial leachate testing should not serve as the sole basis for designating monitoring parameters. At many active hazardous waste facilities and solid waste landfills, the composition of the waste may change over time. Contaminants that initially were all non-detect may not remain so. Because of this possibility, the Unified Guidance recommends that the list of monitoring parameters subject to formal statistical evaluation be periodically reviewed, for example, every three to five years. Additional leachate compositional analysis and testing may be necessary, along with the measurement of constituents not on the monitoring list but of potential health or environmental concern. If previously undetected parameters are discovered in this evaluation, the permit authority should consider revising the monitoring list to reflect those analytes that will best identify potentially contaminated groundwater in the future.

Further reductions are possible in the number of constituents used for formal detection monitoring tests, even among constituents periodically or always detected. EPA's experience at hazardous waste sites and landfills across the country has shown that VOCs and SVOCs detected in a release generally occur in clusters; it is less common to detect only a single constituent at a given location. Statistically, this implies that groups of detected VOCs or SVOCs are likely to be correlated. In effect, the correlated constituents are measuring a release in similar fashion and not providing fully independent measures. At petroleum refinery sites, benzene, toluene, ethylbenzene and xylenes measured in a VOC scan are likely to be detected together Similarly at sites having releases of 1,1,1-trichloroethane, perhaps 10-12 intermediate chlorinated hydrocarbon degradation compounds can form in the aquifer over time. Finally, among water quality indicators like common ions and TDS, there is a great deal of geochemical inter-relatedness. Again, two or three indicators from each of these analyte groups may suffice as detection monitoring constituents.

The overall goal should be to select only the most reliable monitoring constituents for detection monitoring test purposes. Perhaps 10-15 constituents may be a reasonable target, depending on site-specific needs. Those analytes not selected should still continue to be collected and evaluated. In addition to using the informal test to identify previously undetected constituents described in the next section, information on the remaining constituents (e.g., VOCs, SVOCs and trace elements) can still be important in assessing groundwater conditions, including additional confirmation of a detected release.

DOUBLE QUANTIFICATION RULE

From the previous discussion, a full set of site historical monitoring parameters can be split into three distinct groups: a) those reliable indicators and hazardous constituents selected for formal detection monitoring testing and contributing to the SWFPR; b) other analytes which may be occasionally or even frequently detected and will be monitored for general groundwater quality information but not tested; and c) those meeting the "never-detected" criteria. The last group may still be of considerable interest for eventual formal testing, should site or waste management conditions change and new compounds be detected. All background measurements in the "never-detected" group should be non-detects, whether the full historical set or a subgroup considered most representative (e.g., recently collected background measurements using an improved analytical method.[5]). The following rule is suggested to provide a means of evaluating "never-detected" constituents.

The Double Quantification rule implies that statistical tests should be designed for each of the constituents in the first group. Calculations involving the SWFPR should cover these constituents, but *not* include constituents in second and the third '100% non-detect' categories. Any constituent in this third group should be evaluated by the following simple, quasi-statistical rule[6]:

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 [RL]) in two consecutive sample and resample events.

It is assumed when estimating an SWFPR using the Bonferroni-type adjustment, that each well-constituent test is at *equal risk* for a *specific, definable* false positive error. As a justification for this Double Quantification rule, analytical procedures involved in identifying a reported non-detect value suggest that the error risk is probably much *lower* for most chemicals analyzed as "never-detected." Reporting limits are set high enough so that if a chemical is *not present at all* in the sample, a detected amount will rarely be recorded on the lab sheet. This is particularly the case since method detection limits [MDLs] are often intended as 99% upper prediction limits on the measured signal of an uncontaminated laboratory sample. These limits are then commonly multiplied by a factor of 3 to 10 to determine the RL.

Consequently, a series of measurements for VOCs or SVOCs on samples of uncontaminated groundwater will tend to be listed as a string of non-detects with possibly a very occasional low-level detection. Because the observed measurement levels (*i.e.*, instrument signal levels) are usually known only to the chemist, an approximate prediction limit for the chemical basically has to be set at the RL. However, the true measurement distribution is likely to be clustered much more closely around zero than the RL (**Figure 6-1**), meaning that the false positive rate associated with setting the RL as the prediction

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[5] Note: Early historical data for some constituents (e.g., certain filtered trace elements) may have indicated occasional and perhaps unusual detected values using older analytical techniques or elevated reporting limits. If more recent sampling exhibits no detections at lower reporting limits for a number of events, the background review discussed in **Chapter 5** may have determined that the newer, more reliable recent data should be used as background. These analytes could also be included in the '100% non-detect' group.

[6] The term "quasi-statistical" indicates that although the form is a statistical prediction limit test, only an approximate false positive error rate is implied for the reporting limit critical value. The test form follows 1-of-2 or 1-of-3 non-parametric prediction limit tests using the maximum value from a background data set (**Chapter 19**).

6.3 HOW KEY ASSUMPTIONS IMPACT STATISTICAL DESIGN

6.3.1 STATISTICAL INDEPENDENCE

IMPORTANCE OF INDEPENDENT, RANDOM MEASUREMENTS

Whether a facility is in detection monitoring, compliance/assessment, or corrective action, having an appropriate and valid sampling program is critical. All statistical procedures *infer* information about the underlying population from the observed sample measurements. Since these populations are only sampled a few times a year, observations should be carefully chosen to provide accurate information about the underlying population.

As discussed in **Chapter 3**, the mathematical theory behind standard statistical tests assumes that samples were *randomly* obtained from the underlying population. This is necessary to insure that the measurements are *independent* and *identically distributed* [i.i.d.]). Random sampling means that each possible concentration value in the population has an equal or known chance of being selected any time a measurement is taken. Only random sampling guarantees with sufficiently high probability that a set of measurements is adequately representative of the underlying population. It also ensures that human judgment will not bias the sample results, whether by intention or accident.

A number of factors make classical random sampling of groundwater virtually impossible. A typical small number of wells represent only a very small portion of an entire well-field. Wells are screened at specific depths and combine potentially different horizontal and vertical flow regimes. Only a minute portion of flow that passes a well is actually sampled. Sampling normally occurs at fixed schedules, not randomly.

Since a typical aquifer cannot be sampled at random, certain assumptions are made concerning the data from the available wells. It is first assumed that the selected well locations will generate concentration data similar to a randomly distributed set of wells. Secondly, it is assumed that groundwater flowing through the well screen(s) has a concentration distribution identical to the aquifer as a whole. This second assumption is unlikely to be valid unless groundwater is flowing through the aquifer at a pace fast enough and in such a way as to allow adequate mixing of the distinct water volumes over a relatively short (*e.g.*, every few months or so) period of time, so that groundwater concentrations seen at an existing well could also have been observed at other possible well locations.

Adequate sampling of aquifer concentration distributions cannot be accomplished unless enough time elapses between sampling events to allow different portions of the aquifer to pass through the well screen. Most closely-spaced sampling events will tend to exhibit a statistical dependence (*autocorrelation)*. This means that pairs of consecutive measurements taken in a series will be positively correlated, exhibiting a stronger similarity in concentration levels than expected from pairs collected at random times. This would be particularly true for overall water quality indicators which are continuous throughout an aquifer and only vary slowly with time.

Another form of statistical dependence is *spatial correlation*. Groundwater concentrations of certain constituents exhibit natural spatial variability, *i.e.*, a distribution that varies depending on the location of the sampling coordinates. Spatially variable constituents exhibit mean and occasionally

ATTACHMENT 5

Leaching Test Procedures and Turnaround Times

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Leaching Tests Supported by TestAmerica

Current Methods SW-846 1311 & 1312;

Low-level Radioactive Wastes ANSI/ANS-16.1;

LEAF EPA Methods 1313, 1314, 1315 & 1316

Leaching tests are tools to estimate the potential release of constituents of potential concern (COPC) from waste material after its disposal, or to assess the waste treatment, or to evaluate the material for beneficial use.

Overview of Leaching

In environmental testing, leaching is the process to transfer constituents from a solid (waste, soil, sludge, sediment, combustion residues, coal combustion residue (CCR), stabilized materials, construction materials, or mining wastes) to an aqueous phase or contact liquid. The extent to which constituents in the solid phase will transfer is dependent on site conditions and material specific physical, chemical, and biologic conditions and the length of time involved.

There are a variety of leaching tests and no one leachate test can be used to evaluate the leaching behavior of a wide variety of materials over a broad range of field scenarios. The following describes two current SW-846 leaching methods, ANSI/ANS 16.1 and four newer EPA methods to assess leaching characteristics.

Executive Methods Summary

CURRENT METHODS	
Method 1311 Toxicity Characteristic Leachate Procedure (TCLP)	This is a single point leachate test. Predicts the mobility of both organics and inorganics analytes in landfills. It is used to classify material as hazardous or non-hazardous for purposes of disposal in a landfill.
Method 1312 Synthetic Precipitation Leachate Procedure (SPLP)	This is a single point leachate test. Predicts the mobility of both organics and inorganics analytes into ground and surface waters. SPLP fluid simulates precipitation.
LOW-LEVEL RADIOACTIVE WASTES	
ANSI/ANS-16.1 Measurement of the Leachability of Solidified Low-Level Radioactive Wastes by a Short-Term Test Procedure	This standard was designed for low-level radioactive wastes to determine the leaching characteristics of the solidified material. This standard can be used to measure the leach resistance of any waste solidified into a well-defined geometric shape.
LEAF EPA METHODS	
LEAF EPA Method 1313 Liquid-Solid Partitioning as a Function of Extract pH for Constituents in Solid Materials using a Parallel Batch Extraction Procedure	This method is designed to provide aqueous extracts representing the liquid-solid partitioning (LSP) curve as a function of pH for inorganics and non-volatile organics in solid materials.
LEAF EPA Method 1314 Liquid-Solid Partitioning as a Function of Liquid-to-Solid Ratio for Constituents in Solid Materials using an Up-Flow Percolation Column Procedure	This method is designed to provide the liquid-solid partitioning (LSP) of inorganic constituents and non-volatile organics in granular solid material as a function of liquid-to-solid (L/S) ratio under percolation conditions.
LEAF EPA Method 1315 Mass Transfer Rates of Constituents in Monolithic or Compacted Granular Materials using a Semi-dynamic Tank Leaching Procedure	This method is designed to provide the mass transfer (release rates) of inorganic analytes contained in a monolith or compacted granular material. Under diffusion controlled release conditions, as a function of leaching time.
LEAF EPA Method 1316 Liquid-Solid Partitioning as a Function of Liquid-to-Solid Ratio for Constituents in Solid Materials using a Parallel Batch Extraction Procedure	This method is designed to provide the liquid-solid partitioning (LSP) of inorganic and non-volatile organics at the natural pH of the solid material as a function of liquid-to-solid ratio (L/S) under conditions that approach liquid-solid chemical equilibrium.

***See Back Cover for the Expanded Methods Summary.**

CURRENT METHODS

Method 1311

Toxicity Characterization Leaching Procedure (TCLP)

TCLP is designed to simulate the leaching a waste will undergo if disposed of in a sanitary landfill.

TCLP has a specific list of regulated compounds with regulatory levels based on health based concentration limits and dilution attenuation factors developed using a subsurface fate and transport model. Federal regulation for the use of TCLP can be found in 40 CFR 261.24. If the TCLP extract contains any one of the TC constituents in an amount equal to or exceeding the concentrations specified in 40 CFR 261.24, the waste possesses the characteristic of toxicity and is a hazardous waste.

TCLP is appropriate for its intended use as a screening test for wastes which may be disposed of in a solid waste landfill or similar conditions. TCLP does not simulate the release of contaminants to non-groundwater pathways.

Method 1312

Synthetic Precipitation Leaching Procedure (SPLP)

SPLP was designed to estimate the mobility/leachability of both organic and inorganic analytes in liquids, soils and wastes in a mono-disposal situation. The extraction fluid is based on the region of the country where the sample is located. The SPLP extraction fluid is intended to simulate precipitation. East of the Mississippi River the extraction fluid is at a pH of 4.2 and west of the river the pH is 5.0.The method indicates that the user compare constituents of concern concentrations in the 1312 extract with levels identified in the appropriate regulations. There are no federal regulations requiring the use of SPLP.

Since the 1990s, there has been concern that TCLP or SPLP would be used outside of their intended use or users may not be familiar with the resulting limitations of the data. TCLP and SPLP are single point batch leachate tests based on pH. Different factors can affect the leaching potential of constituents of concern. They include: pH, redox conditions, liquid-to-solid ratio (L/S), and solubility. Other factors which can affect the leaching potential of organic constituents of concern include: partitioning or solubility, presence of organic carbon, and non-aqueous phase extraction.

ANSI/ANS-16.1-2003 [R2008]

American National Standards Institute/America Nuclear Society Measurement of the Leachability of Solidified Low-Level Nuclear Wastes by a Short-Term Test Procedure.

This method is the American Nuclear Society's standardization of the International Atomic Energy Agency's 1971 standard leachate test. The goal is to have a standard leachate test for low level radioactive material to allow for data comparisons. The test provides a leachability index, which quantifies the leaching characteristics of a solidified material and the release of radioisotopes that come in contact with the material. It is a short-term exposure under controlled conditions with a well-defined leachant. This method can also be used to measure the leach resistance of any solidified waste in a well-defined geometric shape.

LEAF METHODS

Leaching Environmental Assessment Framework (LEAF)

U.S. EPA developed four additional non-regulatory leachate tests to better characterize and model the leachability of wastes. The sources of these methods are from published leaching methods and international standards with additional collaboration between Vanderbilt University and the Energy Research Centre of the Netherlands and DHI in Denmark.

The LEAF Methods are a suite of leaching tests which include batch, column, and tank tests which can be interpreted individually or integrated. They provide information on the leaching behavior of a solid material over a wide range of potential scenarios.

The central mechanism for the leachate tests are either equilibrium or mass transfer control. Equilibrium control release occurs for slow percolation through a porous or granular material. Mass transfer rate control release occurs when flow is at the external boundary of a monolith or percolation is very rapid relative to mass transfer of constituent release to the percolating waters.

These methods are applicable to a wide range of solid materials including combustion residues, coal combustion residues (CCR), soils, sediments, industrial process residues, and construction materials with the focus on disposal, beneficial use, waste delisting, and the evaluation of treatment effectiveness.

LEAF is a tiered testing approach which increases in detail and complexity depending on the purpose of the testing. Tier 1 testing is for screening purposes and can be a single batch extraction or modified versions of leaching tests. Tier 2 is equilibrium based testing to characterize the liquid solid portioning over a broad range of scenarios as a function of pH and liquid-to-solid ratio (L/S). The equilibrium testing for Tier 2 includes Methods 1313, 1314 and 1316. Tier 3 is the mass transfer testing using Method 1315.

LEAF Method 1313

Liquid-Solid Partitioning as a Function of Extract pH for Constituents in Solid Materials using a Parallel Batch Extraction

LEAF Method 1313 is a leaching method which requires particle-size reduced solids material. Using dilute acids and bases at pH values ranging from 2 to 13 and natural conditions, ten eluates are generated from the solid material in parallel extractions. The eluates are then analyzed for the constituents of concern as a function of pH. The constituents of concern can be inorganics and non-volatile organics. This data can be used to estimate the liquid-solid partitioning of the constituents of concern.

LEAF Method 1314

Liquid-Solid Partitioning as a Function of Liquid-to-Solid Ratio for Constituents in Solid Materials using an Up-flow Percolation Column Procedure

LEAF Method 1314 is a column leaching method which requires particle-size reduction to accommodate the column diameter. It is an equilibrium based up-flow percolation column test. The constituents of concern can be inorganics and non-volatile organics. This leaching test is used to characterize the liquid/solid partitioning between solid phase and the eluate as a function of the liquid to solid ratio. This method provides five options for the generation of the eluate and the subsequent preparation of the analytical samples based on the level of detailed data which is required.

LEAF Method 1315

Mass Transfer Rates of Constituents in Monolithic or Compacted Granular Materials using a Semi-dynamic Tank Leaching Procedure

LEAF Method 1315 is a flux based leachate method for the analysis of a monolith or compacted granular material. The material is continuously immersed in reagent water at a specified liquid to solid surface area. The constituents of concern are inorganics. This leaching test provides the mass transfer rates of the constituents of concern under diffusion controlled release conditions as a function of leaching time through the material.

LEAF Method 1316

Liquid-Solid Partitioning as a Function of Liquid-to-Solid Ratio for Constituents in Solid Materials using a Parallel Batch Extraction Procedure

LEAF Method 1316 is a leaching method which requires particle-size reduced solids material. Using natural pH of the solid material, five eluates are generated from the solid material in parallel extractions over a range of liquid to solid ratios. The eluates are then analyzed for the constituents of concern. The constituents of concern can be inorganics and non-volatile organics. This data can be used to estimate the liquid/solid partitioning of these constituents of concern.

Liquid-Solid Partitioning as a Function of Extract pH

using a Parallel Batch Extraction Procedure

This method is intended to be used as part of an environmental leaching assessment for the evaluation of disposal, beneficial use, treatment effectiveness and site remediation options.

Scope:
U.S. EPA Method 1313 is designed to provide aqueous extracts representing the liquid-solid partitioning (LSP) curve as a function of pH for inorganic constituents, semi-volatile organic constituents and non-volatile organic constituents in solid materials. The LSP curve is evaluated as a function of final extract pH at a liquid-to-solid ratio of 10 mL extractant/g dry sample and conditions that approach liquid-solid equilibrium. This method also yields the acid/base titration and buffering capacity of the tested material.

The method is a leaching characterization method that is used to provide values for intrinsic material parameters that control leaching of inorganic and some organic species under equilibrium conditions. The test is intended as a means for obtaining a series of extracts of a solid material, which may be used to estimate the LSP of constituents as a function of pH.

Summary of Method:
The method consists of nine parallel extractions of a particle-size reduced solid material in dilute acid or base and reagent water. The table below details the leaching time required based on the particle size of the sample. In addition, the table indicates the minimum dry sample mass required for leaching.

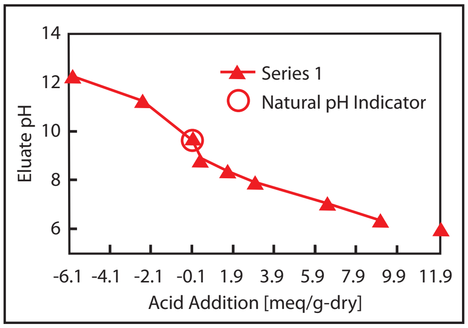
A schedule of acid and base additions is formulated from a pre-test titration curve or prior knowledge indicating the required equivalents/g acid or base to be added to the series of extraction vessels so as to yield a series of eluates having specified pH values in the range of 2-13 (2, 4, 5.5, 7, 8, 9, 12, 13, and natural). The pre-test titration curve is utilized to determine the actual amount of acid or base added to the samples to hit the method specified pH values or client driven pH values.

If the natural pH falls within the method subscribed pH values then a pH value of 10.5 will be performed. In addition to the nine test extractions, three method blanks without solid material are carried through the procedure in order to verify that analyte interferences are not introduced as a consequence of reagent impurities or equipment contamination.

The twelve bottles are tumbled in an end-over-end fashion for a specified contact time, which depends on the particle size of the sample. At the end of the specified contact interval, the liquid and solid phases are separated

Particle Size (85% wt less than) (mm)	US Sieve Size	Minimum Dry Mass (mass g-dry)	Contact Time (hrs)	Suggested Vessel Size (mL)
0.3	50	20 ± -0.02	24 ± 2	250
2	10	40 ± -0.02	48 ± 2	500
5	4	80 ± -0.02	72 ± 2	1,000

Extraction Parameters as Function of Max. Particle Size



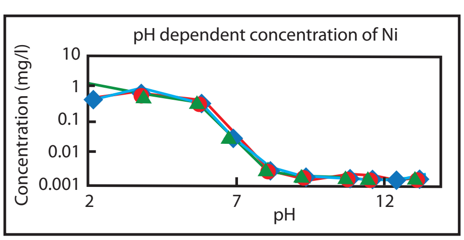
Pre-test Titration Curve

via centrifugation. Extract pH, conductivity, and ORP measurements are then made on an aliquot of the liquid phase and the remaining eluate is filtered thru a 0.45 micron filter. Analytical samples of the filtered eluate are collected and preserved as appropriate for the desired chemical analyses. The eluate concentrations contaminants of potential concern (COPC) are determined and reported.
Note: The end user can request specific pH ranges.

Data Results:
An LSP curve can be generated for each COPC following chemical analyses of all extracts by plotting the target analyte concentration in the liquid phase as a function of the measured extract pH for each extract.

The shape of the LSP curve is indicative of the speciation of the COPC in the solid phase with characteristic LSP curve shapes.

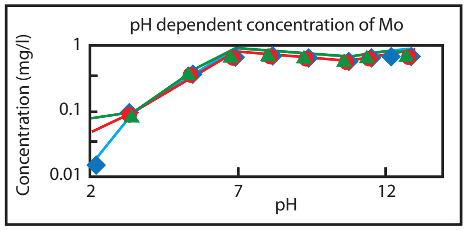
Cationic Species: The LSP curve typically has a maximum concentration in the acidic pH range that decreases to lower values at alkaline pH.



LSP Curve of Cationic Species

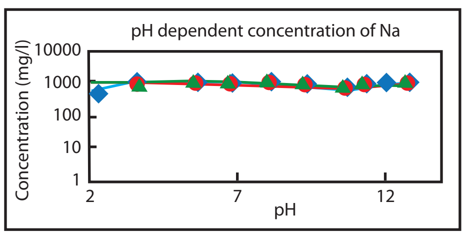
Amphoteric Species: The LSP curves tend to be similar in shape to cationic LSP curves with greater concentrations in the acidic pH range. However, the concentrations pass through a minimum in the near neutral to slightly acidic pH range only to increase again for alkaline pH values.

Oxyanionic Species: The LSP curve often show maximum in the neutral to slightly alkaline range



LSP Curve of Oxyanionic Species

Highly Soluble Species: The LSP curve is only a weak function of pH.



LSP Curve of Highly Soluable Species

In Summary:
The method provides solutions considered indicative of eluate under field conditions, only where the field leaching pH is the same as the final laboratory extract pH and the LSP is controlled by aqueous phase saturation of the constituent of interest.

The maximum mass of constituent released over the range of method pH conditions (2<pH<13) may be considered an estimate of the maximum mass of the constituent leachable under field leaching conditions for intermediate time frames and the domain of the laboratory tests.

References:
U.S. EPA. SW846 Method 1313
July 2017
https://www.epa.gov/hw-sw846/validated-test-methods-recommended-waste-testing

Leaching Environmental Assessment Framework (LEAF) How-To Guide, October 2017

Additional Information:

Recommend bottle type for samples: 32-ounce jar

Sample Size: Minimum 800 grams. Sample size will vary based on analysis requested

Preservation: None

Holding Time: Holding time for leachate generation is within 1 month of receipt. The analytical holding times do apply to the environmental samples generated and which are subsequently analyzed for COPCs

Constituents of Potential Concern: Inorganics and non-volatile organics

Approximate Turnaround for Leaching and Subsequent Analysis: 24 to 72 hours for leaching, depending on particles size of the material; 21 days for analysis, for a total of 28-day turnaround.

Liquid-Solid Partitioning as a Function of Liquid-to-Solid Ratio for Constituents in Solid Materials

using an Up-flow Percolation Column Procedure

1314

The method is intended to be used as part of an environmental leaching assessment for the evaluation of disposal, beneficial use, treatment effectiveness, and site remediation options.

Scope:
U.S. EPA Method 1314 is designed to provide the liquid-solid partitioning (LSP) of inorganic constituents and non-volatile organic constituents in a granular solid material as a function of liquid-to-solid ratio (L/S) under percolation conditions. The first eluates of the column test may provide insight into the composition of the pore solution either in a granular bed or in the pore space of low-permeability material.

The method is intended as a means for obtaining a series of extracts of a granular solid material which may be used to show eluate concentrations and/or cumulative release as a function of L/S which can be related to a time scale when data on mean infiltration rate, density, and height of application are available.

Summary of Method:
In preparation of solid materials for use in this method, particle-size reduction or exclusion of samples with large grain size is used to enhance approach toward liquid-solid equilibrium over the residence time of eluant in the column. A 30 cm, straight cylindrical column with an inner diameter of 5 cm is currently being used. The particle size of the material must be <1/20 of the column diameter. Based off of this information, the current particle size is 2.5 mm.
Eluant is introduced into a column of moderately-packed granular material in an up-flow pumping mode. The eluate collection performed as a function of the cumulative L/S. Up-flow pumping is used to minimize air entrainment and flow channeling. The default eluant for most material is reagent water. The flow rate is maintained between 0.5-1.0 L/S per day to increase the likelihood of local equilibrium between the solid and liquid phases, due to residence times longer than 1 day.

Eluate volumes are chemically analyzed for a combination of inorganic and non-volatile organic analytes depending on the constituents of potential concern (COPC). The entire eluant volume up to 10mL/g dry sample is collected in nine specific aliquots of varying

Multiple Columns for Method 1314

volume. A limited subset of eluants volumes within the same L/S range may be collected and analyzed for regulatory and compliance purposes. The table below reflects collection times of a sample.

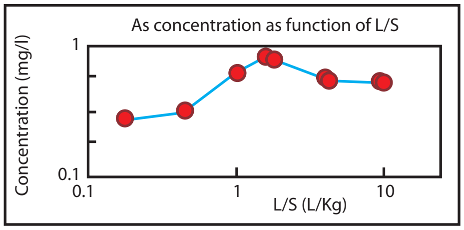
Data Results:
The method provides options for the preparation of analytical samples that provide flexibility based on the level of detail required:

Option A – Complete Characterization: Eluate concentrations may be used in conjunction with information regarding environmental management scenarios to estimate anticipated leaching concentrations, release rates, and extent of release for individual material constituents in the management scenarios evaluated. The nine eluate collections are analyzed and reported.

Option B – Limited Analysis: Under a limited analysis approach, nine eluate collections and analysis of six analytical samples are required. If evaluation is based on eluate concentrations, six eluate fractions are chemically analyzed. If evaluation is based on cumulative release, some eluate fractions are composited by volume-weighted averaging to create a set of six analytical samples. The concentrations of composited analytical samples cannot be interpreted along with eluate fractions on the basis of concentration.

Option C – Index Testing: For the determination of consistency between the subject material and previously characterized materials, nine eluate collections and analysis of three analytical samples are required. If consistency is to be determined by eluate concentrations, three discrete eluate fractions are chemically analyzed. If consistency is to be determined by cumulative release, some eluate fractions are composited by volume-weighted averaging to create a set of three analytical samples. The concentrations of composited analytical samples cannot be interpreted along with eluate fractions on the basis of concentration.

Eluate concentrations of contaminants of concern are then plotted versus the cumulative liquid-to-solid ratio.



Eluate Concentrations versus Cumulative L/S

In Summary:
The method provides eluate solutions considered indicative of leachate under field conditions only where the field leaching pH is controlled by the alkalinity or acidity of the solid material and the field leachate is not subject to dilution or other attenuation mechanisms. The cumulative mass of constituent released over an L/S range may be considered an estimate of the maximum mass of that constituent to be leached under field leaching over intermediate time frames and the domain of the laboratory test pH.

References:
U.S. EPA. SW846 Method 1314
July 2017
https://www.epa.gov/hw-sw846/validated-test-methods-recommended-waste-testing

Leaching Environmental Assessment Framework (LEAF) How-To Guide, October 2017

Additional Information:

Recommend bottle type for samples: 32-ounce jar

Sample Size: Minimum 1,200 grams. Sample size will vary based on analysis requested

Preservation: None

Holding Time: Holding time for leachate generation is within 1 month of receipt. The analytical holding times do apply to the environmental samples generated and which are subsequently analyzed for COPCs

Constituents of Potential Concern: Inorganics and non-volatile organics

Approximate Turnaround for Leaching and Subsequent Analysis: 14 days for leaching; 42 total days for leaching and analysis.

Fraction Label	Sum L/S Ratio (mL/g-dry)	Fraction Volume (mL)	Scheduled Collection (date/time)
–	0	10	11/28/12 8:20 AM
T01	0.20	164	11/28/12 2:02 PM
T02	0.50	260	11/28/12 11:05 PM
T03	1.00	434	11/29/12 2:11 PM
T04	1.50	434	11/30/12 5:16 AM
T05	2.00	434	11/30/12 8:22 PM
T06	4.50	2,170	12/3/12 11:50 PM
T07	5.00	434	12/4/12 2:56 PM
T08	9.50	3,906	12/10/12 6:47 AM
T09	10.00	434	12/10/12 9:53 PM

Collection Times of a Sample

Application Note

Mass Transfer Rates of Constituents in Monolithic or Compacted Granular Material

using a Semi-dynamic Tank Leaching Procedure

1315

The leaching characterization method provides intrinsic material parameters for release of inorganic species under mass transfer-controlled leaching conditions. The method is intended as a means for obtaining a series of eluants which may be used to estimate the diffusivity of constituents and physical retention parameter of the solid material under specified laboratory conditions.

Scope:
U.S. EPA Method 1315 is designed to provide the mass transfer rates of inorganic analytes contained in a monolithic or compacted granular material, under diffusion-controlled release conditions, as a function of leaching time.

The geometry of the monolithic samples may be rectangular, cubes, wafers, or cylinders. Samples may also have a variety of faces exposed to the eluant forming anything from 1-dimensional through 3-dimensional mass transfer cases. In all cases, a minimum sample size of 5 cm in the direction of mass transfer must be employed and the liquid-surface-area ratio (L/A) must be maintained at 9 +/- 1 mL/cm2. **Note:** *The surface area of the sample must be determined by the laboratory or an outside contractor.*

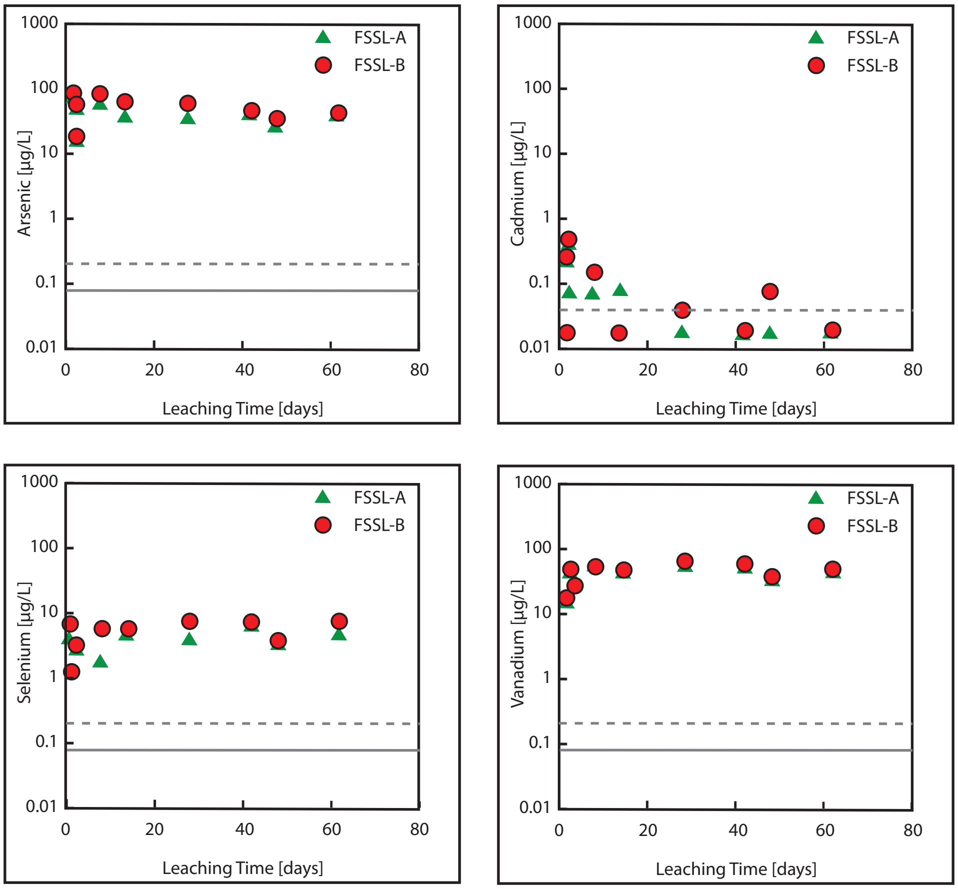
Monolith samples should be suspended or held in the leaching fluid such that at least 98% of the entire sample surface area is exposed to eluant and the bulk of the eluant is in contact with the exposed sample surface.

Summary of Method:
The method comprises leaching of continuously water-saturated monolithic or compacted granular material in an eluant-filled tank with periodic renewal of the leaching solution. Samples are contacted with reagent water at the specified L/A. The leaching solution is exchanged with fresh reagent water at nine pre-determined intervals listed below:

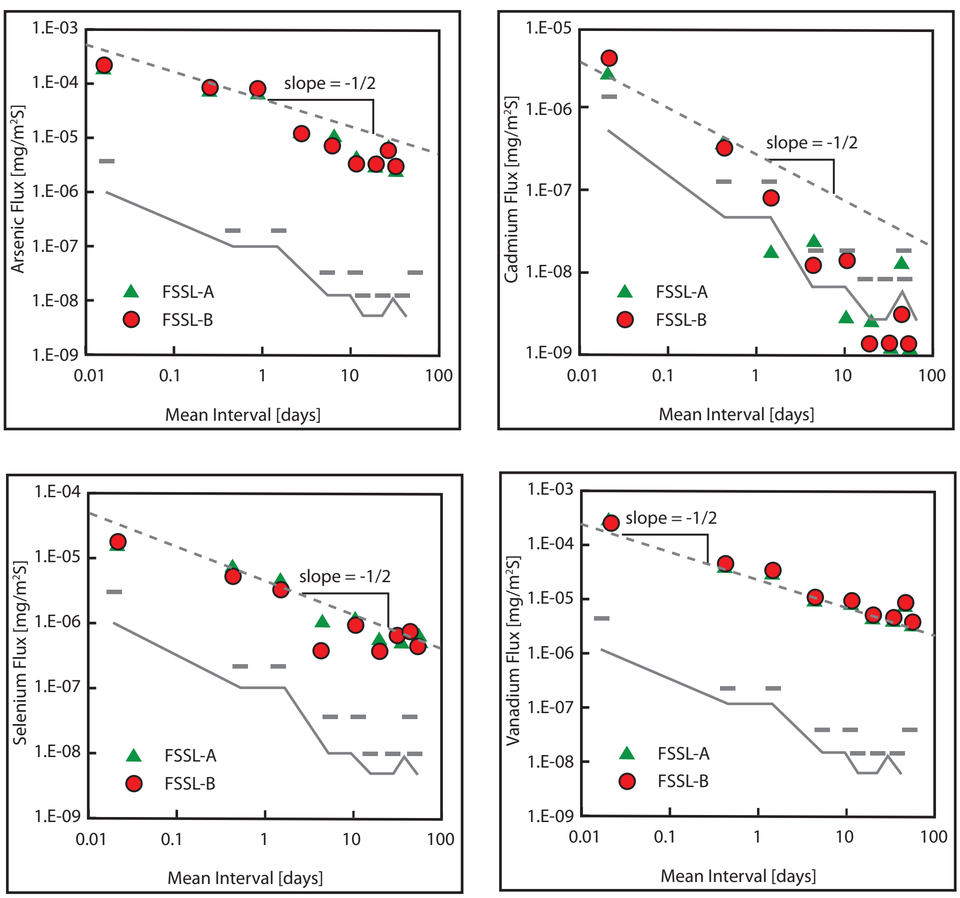
The sample is freely drained and the mass is recorded to monitor the amount of eluant absorbed into the solid matrix at the end of each leaching interval. The eluate pH, specific conductance, and ORP are measured for each time interval. Analytical samples are collected and preserved accordingly based on the determinative methods to be performed on the eluate. **Note:** *Though the method references analyzing for inorganic parameters, TestAmerica is licensed by Vanderbilt University to performa patented, modified version of the method for analyzing volatiles and semi volatiles.*

Fraction Label	Interval Duration (hrs)	Interval Duration (hrs)	Cumulative Leaching Time (d)
T01	2.0 ± 0.25	–	0.08
T02	23.0 ± 0.5	–	1.0
T03	23.0 ± 0.5	–	2.0
T04	–	5.0 ± 0.1	7.0
T05	–	7.0 ± 0.11	14.0
T06	–	14.0 ± 0.1	28.0
T07	–	14.0 ± 0.1	42.0
T08	–	7.0 ± 0.1	49.0
T09	–	14.0 ± 0.1	63.0

Pre-determined Intervals of Leaching Solution Exchange



Interval Concentration Graphs



Interval Flux Graphs

Data Results:

Eluate concentrations are plotted as a function of time, as a mean interval flux, and as cumulative release as a function of time.

In Summary:

The method is a characterization method and does not provide a solution considered to be representative of eluate under field conditions. This method is similar in structure and use to predecessor methods such as MT001.1, NEN 7345, ANSI 16.1, and ASTM C1308. However, this method differs from previous methods in that: (a) leaching intervals are modified to improve quality control, (b) sample preparation accounts for mass transfer from compacted granular samples, and (c) mass transfer may be interpreted by more complex release models that account for physical retention of the porous medium and chemical retention at the pore wall through geochemical speciation modeling.

References:

U.S. EPA. SW846 Method 1315
July 2017
https://www.epa.gov/hw-sw846/validated-test-methods-recommended-waste-testing

Leaching Environmental Assessment Framework (LEAF) How-To Guide, October 2017

Additional Information:

Recommend bottle type for samples: 32-ounce jar

Sample Size: Current method allows for varied shapes/sizes as long as the L/Area ratio is 9 ± 1 mL/cm2.

Preservation: None

Holding Time: There is no holding time defined to generate the leachate from the monolith. The analytical holding times do apply to the environmental samples generated and which are subsequently analyzed for COPCs

Constituents of Potential Concern: Inorganics and non-volatile organics

Approximate Turnaround for Leaching and Subsequent Analysis: 63 days for leaching; 84 days for analysis and leaching turnaround.

Application Note

Liquid-Solid Partitioning as a Function of Liquid-to-Solid Ratio in Solid Materials

using a Parallel Batch Procedure

L/S
1316

The method is intended to be used as part of an environmental leaching assessment for the evaluation of disposal, beneficial use, treatment effectiveness, and site remediation options.

Scope:
U.S. EPA Method 1316 is designed to provide the liquid-solid partitioning (LSP) of inorganic constituents and non-volatile organic constituents at the natural pH of the solid material as a function of liquid-to-solid ratio (L/S) under the conditions that approach liquid-solid chemical equilibrium.

The eluate concentrations at a low L/S provide insight into pore solution composition either in a granular bed (e.g., soil column) or in the pore space of low-permeability materials (e.g., solidified monolithic or compacted granular fill).

Summary of Method:
This method consists of five parallel extractions of a particle-size reduced solid material in reagent water over a range of L/S values from 0.5 to 10 mL eluant/g dry material. In addition to the five test extractions, a method blank without solid sample is carried through the procedure in order to verify that analyte interferences are not introduced as a consequence of reagent impurities or equipment contamination.

In total, six bottles (i.e., five test positions and one method blank) are tumbled in an end-over-end fashion for a specified contact time based on the maximum particle size of the solid. At the end of the contact interval, the liquid and solid phases are roughly separated via settling or centrifugation. Extract pH, ORP, and specific conductance measurements are then taken on an aliquot of the liquid phase. The bulk of the eluate is clarified by pressure or vacuum filtration in preparation for constituent analysis. Analytical aliquots of the extracts are collected and preserved accordingly based on the determinative methods to be performed. The eluate constituent concentrations are plotted as a function of L/S and compared to QC and assessment limits.

Data Results:
A constituent LSP curve can be generated for each COPC after chemical analysis of all extracts by plotting the constituent concentration in the liquid phase as a function of L/S used for each extraction. The curve indicates the equilibrium concentration of the COPC as a function of L/S at the natural pH.

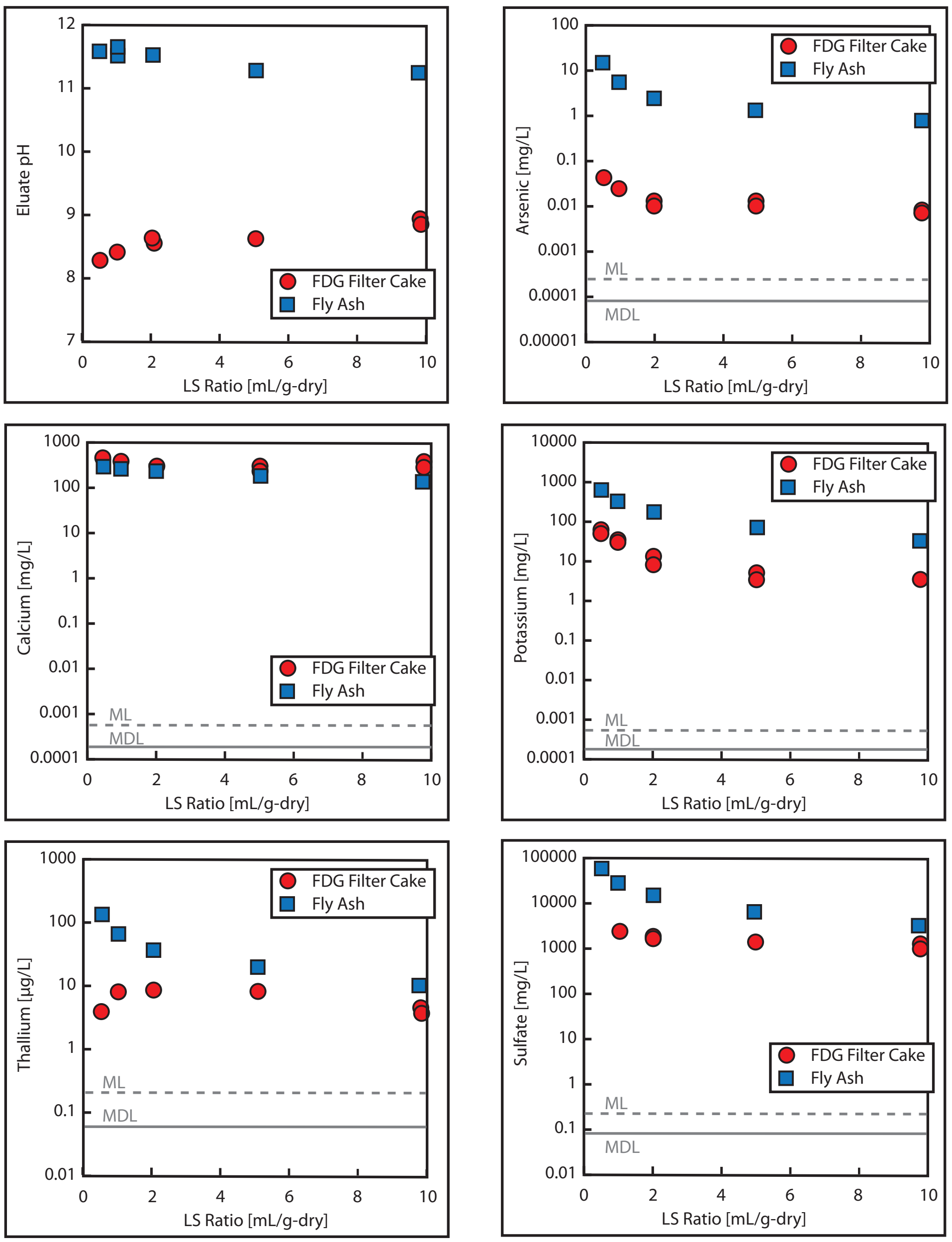
In Summary:
This method is a leaching characterization method used to provide intrinsic material parameters that control leaching of inorganic species under equilibrium conditions. This test method is intended as a means for obtaining an extract (i.e., the eluate) of a solid material which may be used to estimate the solubility and release of inorganic constituents under the laboratory conditions described in

Test Position	Target L/S	Minimum Dry Mass (g-dry)	Moisture "As Tested" Sample (g)	Moisture "As Tested" Sample (g)	Volume Reagent Water (mL)	Recommended Bottle Size (mL)
T01	10.0	20	22.2	2.2	198	250
T02	5.0	40	44.4	4.4	196	250
T03	2.0	100	111.1	11.1	189	500
T04	1.0	200	222.2	22.2	178	500
T05	0.5	400	444.4	44.4	156	1000
B03	QC				200	250
Total			844.4		1120	

Example Schedule for Extraction Setup

Particle Size (85% wt less than) (mm)	US Sieve Size	Min Dry Mass (mass g-dry)	Contact Time (hrs)	Suggested Vessel Size (mL)
0.3	50	20 ± 0.05	24 ± 2	250
2	10	40 ± 0.1	48 ± 2	500
5	4	80 ± 0.1	72 ± 2	1,000

Extraction Parameters as Function of Maximum Particle Size



Equilibrium Concentration as a Function of L/S at the Natural pH

this method. Extract concentrations may be used in conjunction with information regarding environmental management scenarios to estimate anticipated leaching concentrations, release rate and extent for individual material constituents in the management scenarios evaluated. Extract concentrations may also be used along with geochemical speciation modeling to infer the mineral phases that control the LSP in the pore structure of the solid material.

References:

U.S. EPA. SW846 Method 1316
July 2017
https://www.epa.gov/hw-sw846/validated-test-methods-recommended-waste-testing

Leaching Environmental Assessment Framework (LEAF) How-To Guide, October 2017

Additional Information:

Recommend bottle type for samples: 32-ounce jar

Sample Size: Minimum 1,000 grams. Sample size will vary based on analysis requested

Preservation: None

Holding Time: Holding time not applicable to the generation of the eluate. The analytical holding times do apply to the environmental samples generated and which are subsequently analyzed for COPCs

Constituents of Potential Concern: Inorganics and non-volatile organics

Approximate Turnaround for Leaching and Subsequent Analysis: 24 to 72 hours for leaching, depending on particle size of the material; 21 days for analysis, for a total of 28-day turnaround.

CURRENT METHODS

Method 1311
Toxicity Characteristic Leachate Procedure (TCLP)

This is a single point leachate test. Predicts the mobility of both organics and inorganics analytes in landfills. It is used to classify material as hazardous or non-hazardous for purposes of disposal in a landfill. **Summary Description:** Samples are preliminarily evaluated for solids and particle size. The liquid to solid ratio is 20:1. The sample is then leached with appropriate fluid. A pH 2.9 acetic acid is used for moderately to high alkaline material and pH 4.9 acetate buffer is used for all other materials. The total time for the leachate generation is 18 hours.

Method 1312
Synthetic Precipitation Leachate Procedure (SPLP)

This is a single point leachate test. Predicts the mobility of both organics and inorganics analytes into ground and surface waters. SPLP fluid simulates precipitation. **Summary Description:** Samples are preliminarily evaluated for solids and particle size. The liquid to solid ratio is 20:1 and the samples are then leached with appropriate fluid. The extraction fluid is based on the region of the country where the sample is located. For samples east of the Mississippi River the extraction fluid pH is 4.2 and for materials west the pH is 5.0. The total time for the leachate generation is 18 hours.

LOW-LEVEL RADIOACTIVE WASTES

ANSI/ANS-16.1-2003 [R2008]
Measurement of the Leachability of Solidified Low-Level Radioactive Wastes by a Short-Term Test Procedure

This standard was designed for low-level radioactive wastes to determine the leaching characteristics of the solidified material. This standard can be used to measure the leach resistance of any waste solidified into a well-defined geometric shape. **Summary Description:** Leaching of continuously water saturated monolithic or compacted granular material in an eluate-filled tank with periodic renewal of the leaching solution. L/S ratio of 10 mL eluate per cm2 of surface area. Eluate is collected at predetermined times and analyzed for COPCs. Eluate is centrifuged and filtered for COPCs. Total time of test can be as long as 43 days.

NEW LEAF METHODS

LEAF Method 1313
Liquid-Solid Partitioning as a Function of Extract pH for Constituents in Solid Materials using a Parallel Batch Extraction Procedure

This method is designed to provide aqueous extracts representing the liquid-solid partitioning (LSP) curve as a function of pH for inorganics and non-volatile organics in solid materials. **Summary Description:** This is a pH dependent batch leaching procedure. Ten parallel extractions of a particle sized reduced solid material in dilute acid or base and reagent water. Series of eluates having pH values ranging from 2-13 as well as natural condition. Liquid solid ratio is 10:1. Eluate is centrifuged and filtered and then analyzed for constituents of concern. Total time to generate the eluate is 5 days for material with 85% or greater solids or 8 days for material with less than 85% solids.

LEAF Method 1314
Liquid-Solid Partitioning as a Function of Liquid-to-Solid Ratio for Constituents in Solid Materials using an Up-Flow Percolation Column Procedure

This method is designed to provide the liquid-solid partitioning [LSP] of inorganic constituents and non-volatile organics in granular solid material as a function of liquid to solid (L/S) ratio under percolation conditions. **Summary Description:** This is a dynamic leaching procedure. Eluate is introduced into a column with packed particle sized reduced solid material in an up-flow pumping mode. Flow rate is maintained between 0.5-1.0 L/Day. Eluate is collected at predetermined times, filtered and analyzed for constituents of concern. Total time to generate the eluate is approximately 14 days.

LEAF Method 1315
Mass Transfer Rates of Constituents in Monolithic or Compacted Granular Materials using a Semi-dynamic Tank Leaching Procedure

This method is designed to provide the mass transfer (release rates) of inorganic analytes contained in a monolith or compacted granular material. Under diffusion controlled release conditions, as a function of leaching time. **Summary Description:** This is a hybrid batch and dynamic leaching procedure. Leaching of continuously water saturated monolithic or compacted granular material in an eluate-filled tank with periodic renewal of the leaching solution. L/S ratio of 9 mL eluate per cm2 of surface area is used. Eluate is collected at predetermined times and analyzed for constituents of concern. Eluate is centrifuged and filtered for constituents of concern. Total time to generate the eluate is approximately 63 days.

LEAF Method 1316
Liquid-Solid Partitioning as a Function of Liquid-to-Solid Ratio for Constituents in Solid Materials using a Parallel Batch Extraction Procedure

This method is designed to provide the liquid-solid partitioning (LSP) of inorganic and non-volatile organics at the natural pH of the solid material as a function of liquid-to-solid ratio (L/S) under conditions that approach liquid-solid chemical equilibrium. **Summary Description:** Five parallel extractions of a particle-size reduced solid material in reagent water over a range of L/S values from 0.5 to 10 mL eluate/g dry material. Depending on particle size, sample is tumbled between 24 and 72 hours. Eluate is centrifuged and filtered for constituents of concern. Total time to generate the eluate is between 1 and 3 days..

TestAmerica Locations Supporting LEAF:

TestAmerica - Pittsburgh
412.963.7058

TestAmerican - ASL
541.243.0980

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

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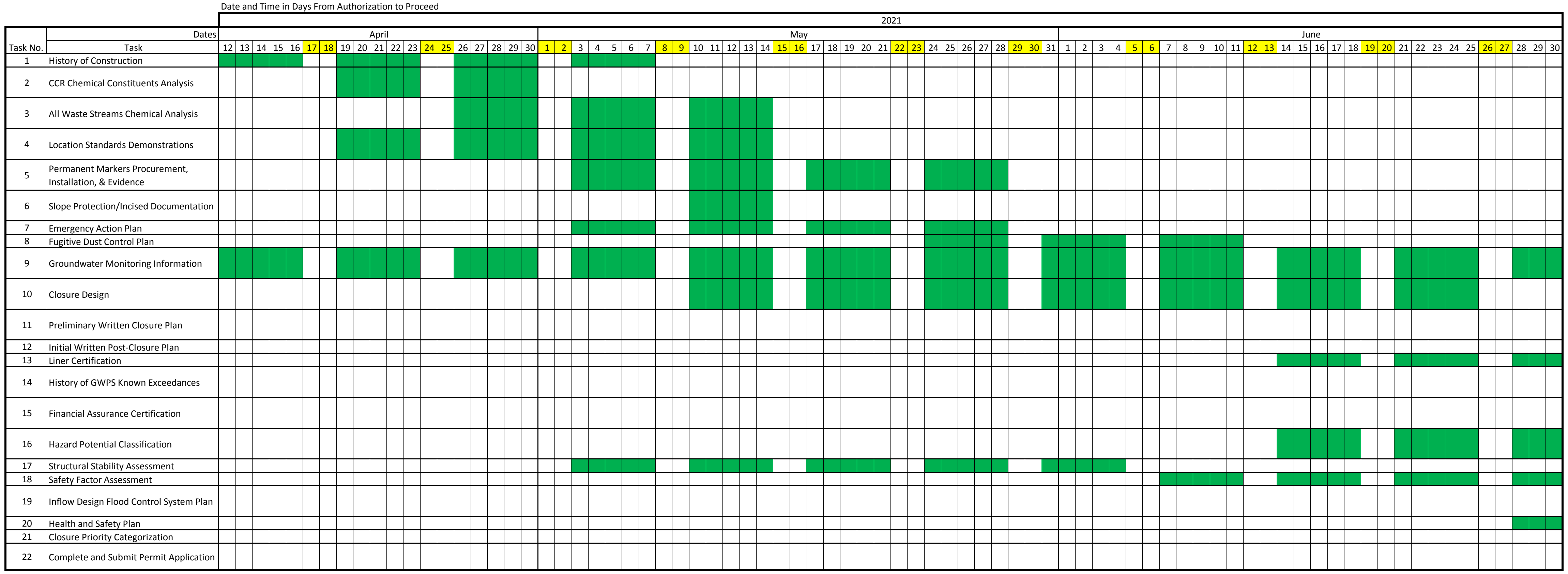
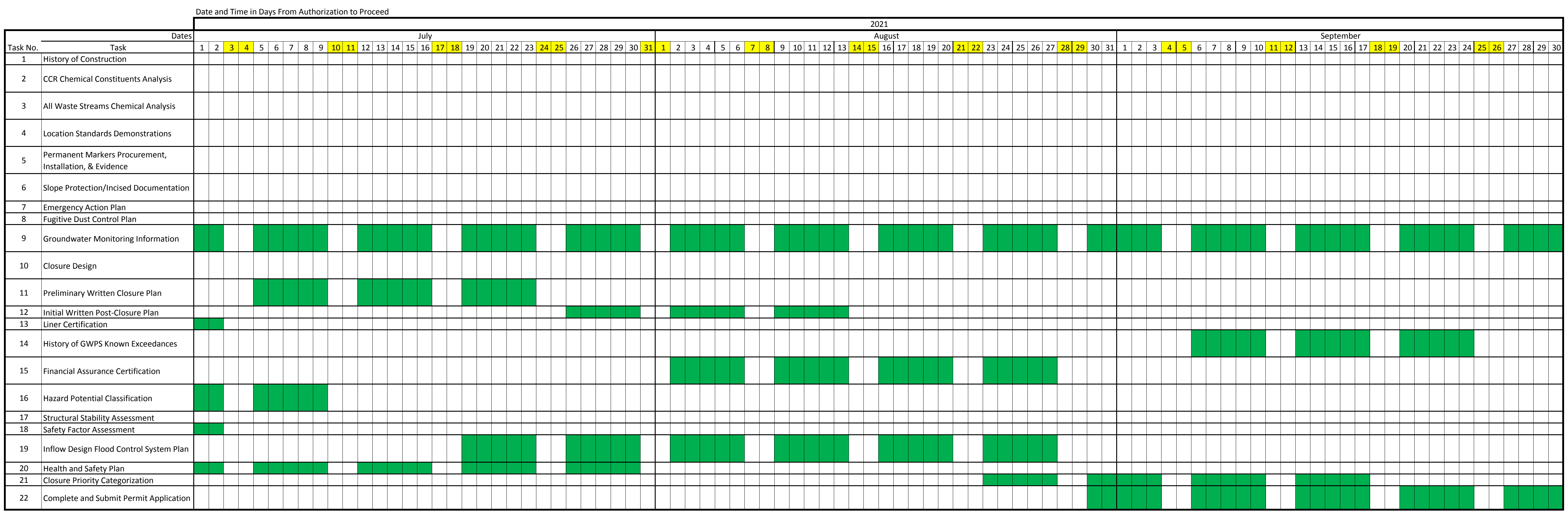
EXHIBIT N

Operating Permit Application Schedule to Meet Current Regulation Deadlines
Will County Ponds 1N and 1S and Powerton Metals Cleaning Basin





Notes:
Time required to execute individual tasks
Weekend Days

Operating Permit Application Schedule to Meet Current Regulation Deadlines
Will County Ponds 1N and 1S and Powerton Metals Cleaning Basin

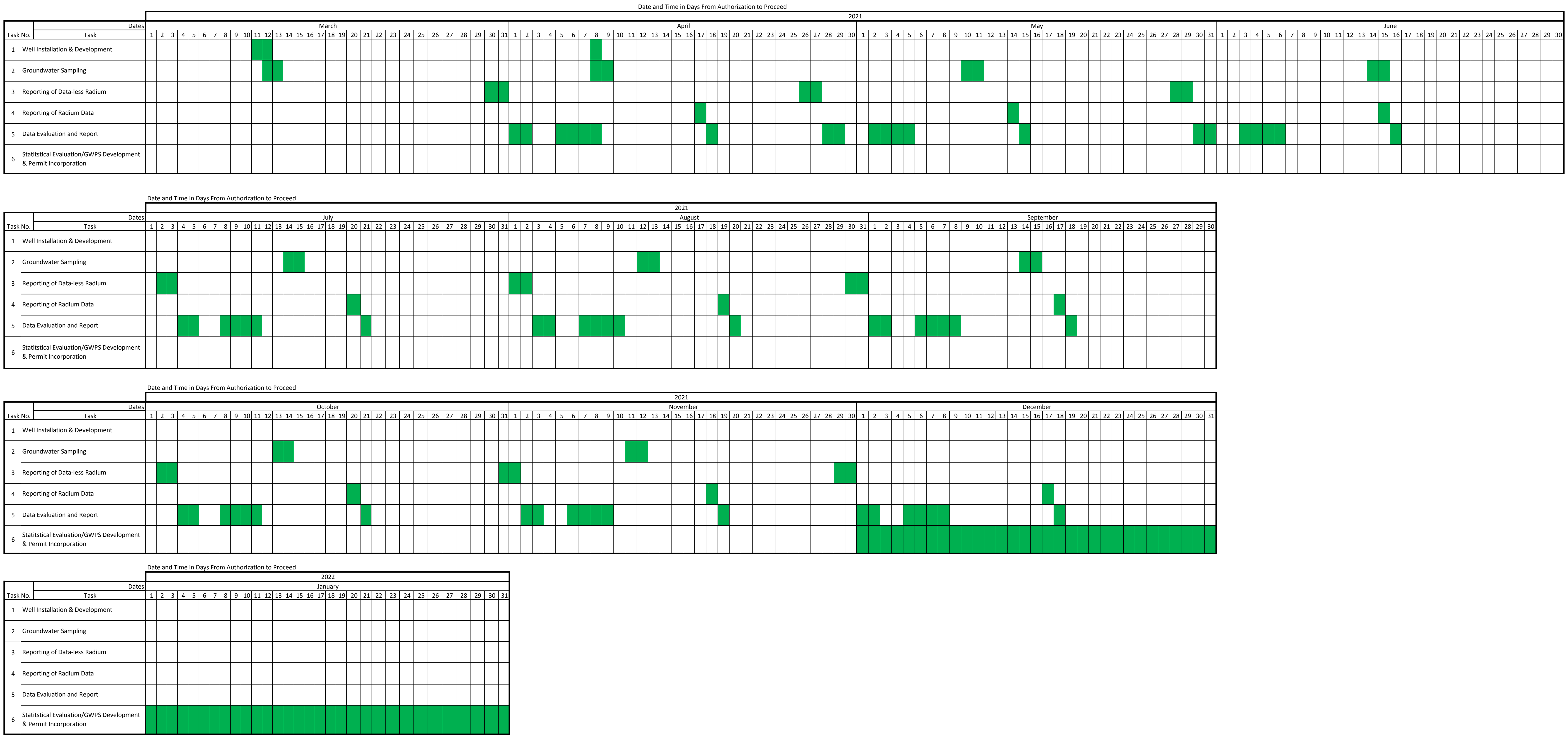
Date and Time in Days From Authorization to Proceed

		2021																														
	Dates	October																														
Task No.	Task	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1	History of Construction																															
2	CCR Chemical Constituents Analysis																															
3	All Waste Streams Chemical Analysis																															
4	Location Standards Demonstrations																															
5	Permanent Markers Procurement, Installation, & Evidence																															
6	Slope Protection/Incised Documentation																															
7	Emergency Action Plan																															
8	Fugitive Dust Control Plan																															
9	Groundwater Monitoring Information																															
10	Closure Design																															
11	Preliminary Written Closure Plan																															
12	Initial Written Post-Closure Plan																															
13	Liner Certification																															
14	History of GWPS Known Exceedances																															
15	Financial Assurance Certification																															
16	Hazard Potential Classification																															
17	Structural Stability Assessment																															
18	Safety Factor Assessment																															
19	Inflow Design Flood Control System Plan																															
20	Health and Safety Plan																															
21	Closure Priority Categorization																															
22	Complete and Submit Permit Application																															

Notes:
Time required to execute individual tasks
Weekend Days

EXHIBIT O

Schedule to Allow for Monthly Sampling and Statistical Data Evaluation/Incorporation into Permit
Powerton Generating Station - Metals Cleaning Basin

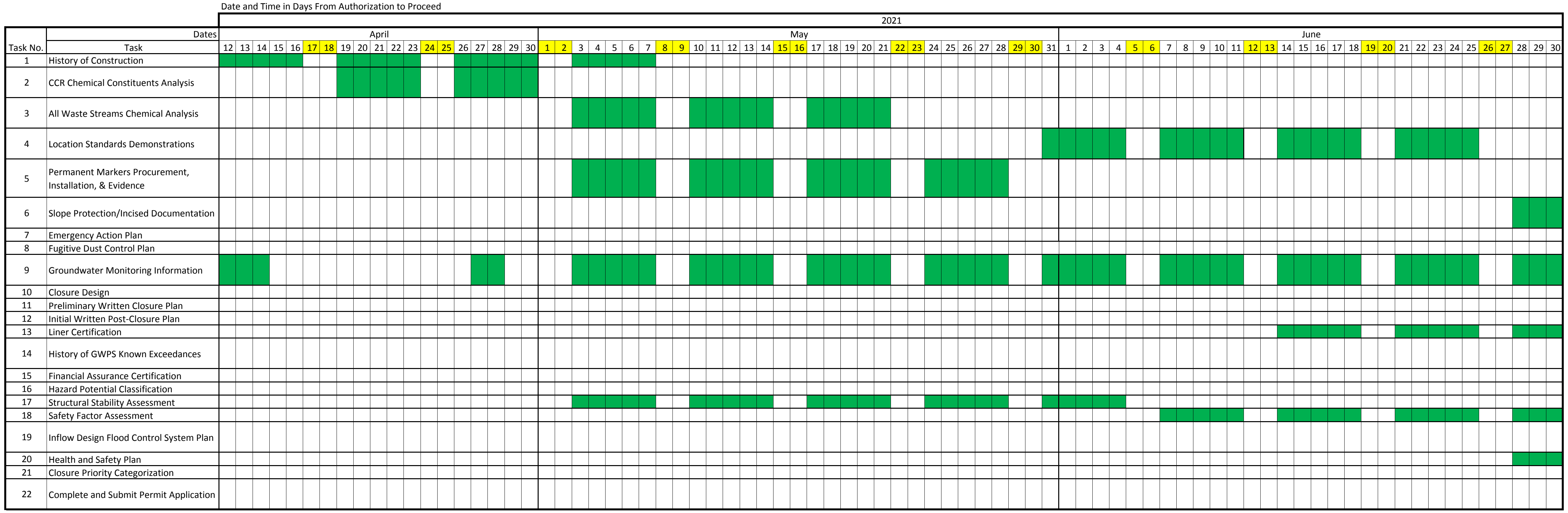


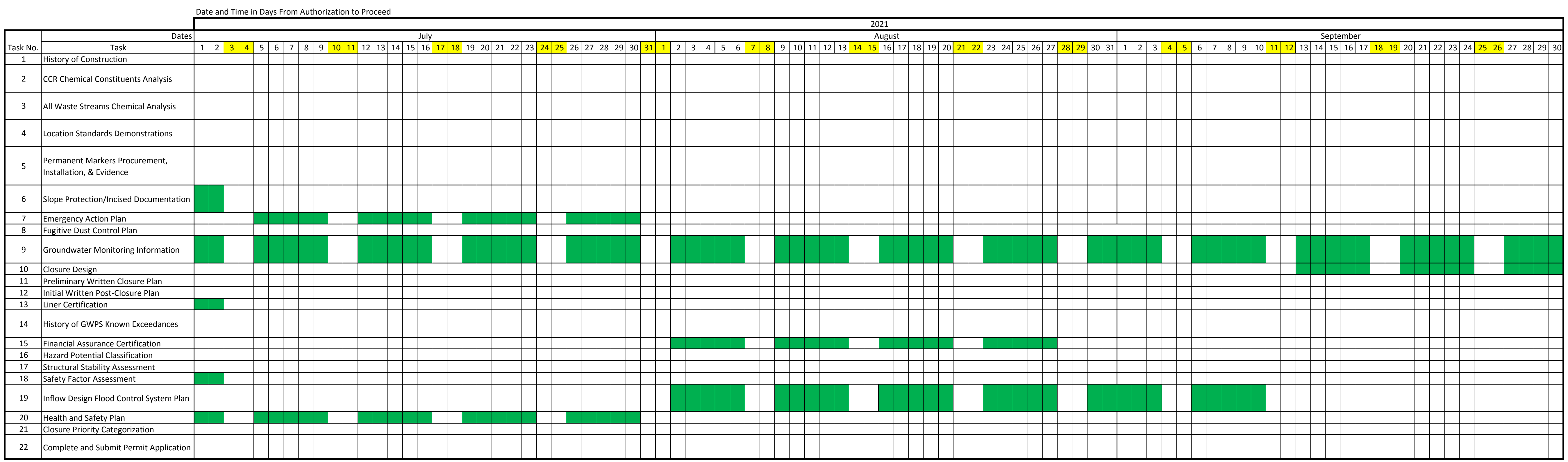
Notes:
Time required to execute individual tasks

EXHIBIT P

Preferred Operating Permit Application Schedule to Allow for Monthly Sampling and Statistical Data Evaluation/Incorporation

Will County Ponds 1N and 1S and Powerton Metals Cleaning Basin





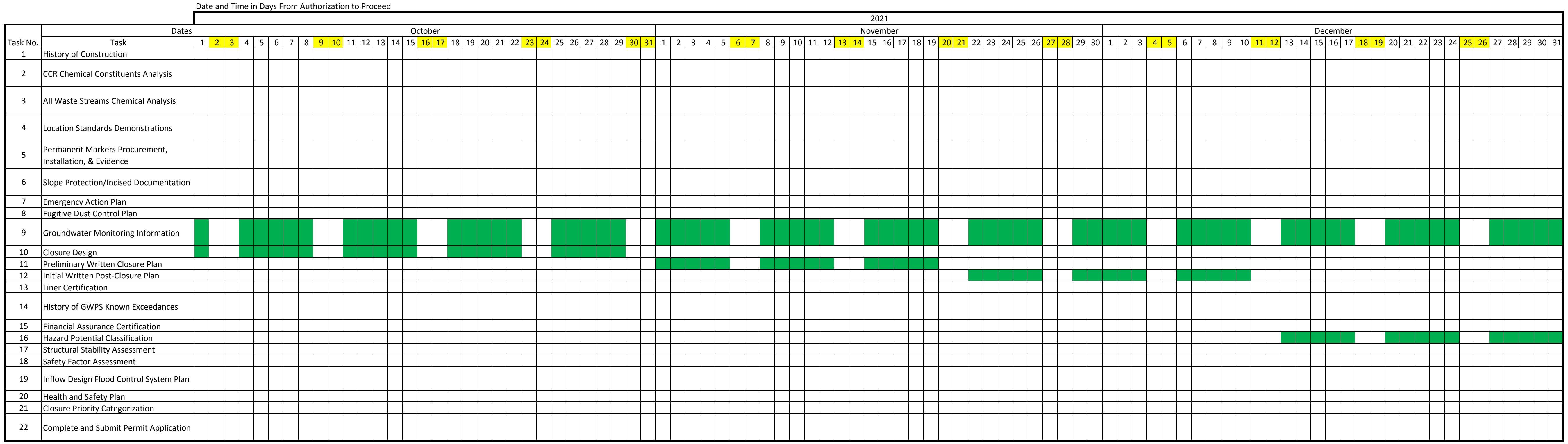
Notes:

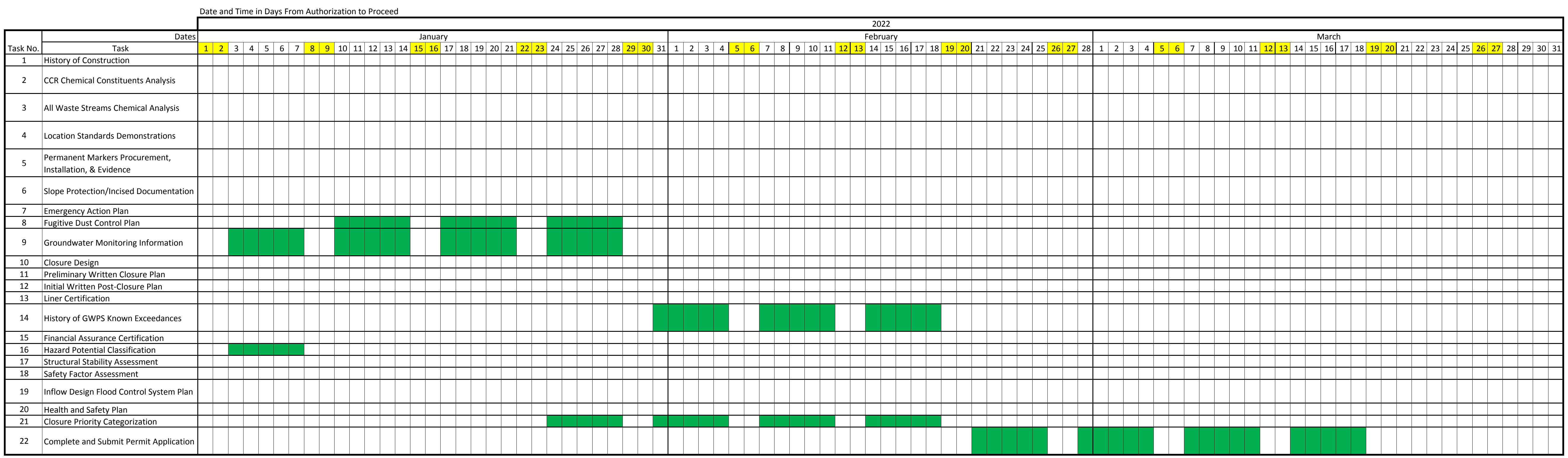
Time required to execute individual tasks

Weekend Days

Preferred Operating Permit Application Schedule to Allow for Monthly Sampling and Statistical Data Evaluation/Incorporation

Will County Ponds 1N and 1S and Powerton Metals Cleaning Basin





Notes:

- Time required to execute individual tasks (green)
- Weekend Days (yellow)

EXHIBIT Q

MIDWEST
GENERATION EME, LLC
An EDISON INTERNATIONAL Company

Basil G. Constantelos
Managing Director
Environmental Services

July 15, 2009

Mr. Allan Keller
Manager, Permits Section, Bureau of Water
Illinois Environmental Protection Agency
1021 North Grand Avenue East
Springfield, IL 62794-9276

Re: April 10, 2009 IEPA Letters: Ash Impoundment Groundwater Protection
Development of Groundwater Monitoring Plan
MWG Will County, Powerton and Joliet 29 Stations

May 15, 2009 IEPA Letters: Ash Impoundment Groundwater Protection
Hydrogeologic Assessment Plan
MWG Crawford and Waukegan Stations

Dear Mr. Keller:

This is Midwest Generation, LLC (MWG)'s further response to the Agency's April 10, 2009, letters regarding the hydrogeologic evaluation of ash impoundments at each of the following MWG electric generating stations: Will County, Powerton, Joliet 29, Crawford and Waukegan (collectively, the "MWG Stations"). In our prior May 4, 2009, letter to the Agency regarding the Will County, Powerton and Joliet Stations, we told you that we had begun the work necessary to respond to the Agency's requests but needed additional time to complete our review and to respond. We appreciate the Agency's extension of time to July 15, 2009, to submit this response. As you know, in the interim, the Agency also sent MWG two May 15, 2009, letters requesting a similar evaluation be performed for the Crawford and Waukegan Stations. This response also timely addresses the Agency's May 15, 2009, request regarding those two stations.

While MWG has performed the work necessary to evaluate the ash impoundments at the MWG Stations, MWG still questions the Agency's legal authority to make these requests. The Agency's April 10, 2009, letters state that these requests were issued pursuant to Sections 4 and 12 of the Illinois Environmental Protection Act (the "Act"). The Agency's May 15, 2009, letters instead claim that the absence of a groundwater monitoring program at the stations means that compliance with 35 Ill. Adm. Code Part 620 has not been demonstrated. MWG respectfully submits that neither of the Agency's alternative legal grounds for issuing these requests gives it the authority to do so. Sections 4 and 12 of the Act do not contain any language authorizing the Agency to require the submission of the requested hydrogeologic assessment plans. Section 4 speaks solely of the Agency's investigatory authority, not any authority to require others to conduct investigations. Section 12 of the Act requires proof that either water pollution or a water pollution hazard has been "created." There are no data or other facts to support any allegation, let alone a finding, that either water pollution or water pollution hazards under Section 12 of the Act have been created at any of the MWG stations. Therefore, there is no legal basis under the Act to authorize the Agency's demand for any investigative or corrective action.

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Similarly, the Part 620 groundwater regulations also do not contain any requirement that obligates MWG to prove compliance with the groundwater standards when there are no facts indicating or supporting an allegation of noncompliance. If this were a correct interpretation of the Part 620 regulations, which it is not, then every facility in the state which conducts on-site waste treatment operations would be required to conduct the hydrogeological assessment the Agency is demanding of MWG in order to affirmatively "demonstrate" to the Agency's satisfaction that it is maintaining compliance with the Part 620 groundwater regulations. To our knowledge, the Agency has not previously so broadly interpreted the Part 620 regulations. Moreover, we found no Illinois Pollution Control Board opinions so interpreting the Part 620 regulations.

As we have previously stated, the subject ash ponds at the MWG Stations are not disposal sites and the ash is routinely removed from the ash ponds. Rather, pursuant to the terms of the Stations' NPDES Permits, they are part of flow-through wastewater treatment processes at each of the stations. MWG's operation of the ash ponds has been carried out in accordance with the terms and conditions of the NPDES Permits. Under Section 12(f) of the Act, compliance with the terms and conditions of any permit issued under Section 39(b) of this Act is deemed compliance with this subsection. Further, the terms and conditions of the NPDES permit do not authorize the Agency to require the work addressed in its letters.

MWG is aware that the Agency has sent similar letters to other electric generating stations. In this regard, it appears that the Agency was not fully informed of relevant facts and circumstances that would distinguish the MWG stations and show the Agency that its request is not warranted or necessary. There are a number of site-specific facts that demonstrate there is no basis to conclude that the MWG ash ponds are causing violations of the Part 620 groundwater standards, including that each of the MWG ash ponds is lined and is regularly inspected by Midwest Gen to confirm that the integrity of the liners is maintained.

However, because MWG does wish to cooperate with the Agency by demonstrating that there is no reasonable basis for requiring groundwater monitoring at the MWG stations, we have proceeded to conduct a hydrogeologic assessment of each of the stations' ash ponds. The results of that assessment are reported in the enclosed report entitled "*Hydrogeological Assessment for Midwest Generation Stations: Will County, Waukegan, Joliet 29, Crawford and Powerton.*" We believe this evaluation should satisfy the Agency's concerns and needs regarding the MWG stations. We are, of course, willing to discuss and explain further any of the information contained in the enclosed report as well as answering any Agency questions concerning the enclosed report. Please contact the undersigned if you have any questions or wish to discuss the enclosed report.

Sincerely,

Basil G. Constantelos

Basil G. Constantelos
Managing Director
Environmental Services

cc: Bill Buscher, Illinois EPA, Bureau of Water, Hydrogeologic and Assessment Unit
Darin LeCrone, Illinois EPA, Bureau of Water, Industrial Unit

HYDROGEOLOGICAL ASSESSMENT OF MIDWEST GENERATION ELECTRIC GENERATING STATIONS:

Will County Station, Waukegan Station, Joliet 29 Station, Crawford Station, Powerton Station

July 14, 2009

I. Executive Summary

Midwest Generation (MWG) has reviewed existing data and newly developed data in order to perform a hydrogeologic assessment in response to the Illinois Environmental Protection Agency's (the "IEPA" or "Agency") April 10, 2009 and May 15, 2009 requests regarding the following MWG electric generating stations: Will County Station, Waukegan Station, Joliet 29 Station, Crawford Station and Powerton Station. The assessment included a review and evaluation of each of the subject wastewater treatment systems (collectively referred to as "ash ponds"), an evaluation of the hydrogeology in the vicinity of the ash ponds, a potable water well survey within a 2500 feet radius of the respective stations' ash ponds and an assessment of the potential, if any, for impacts to existing water wells identified in the survey. The results of the assessment are that there is no basis for finding either (i) that MWG's operation of the ash ponds is causing migration of contaminants from the ash ponds in violation of the 35 Ill. Adm. Code Part 620 regulations; or (ii) that there is any risk of impairing potable water sources or other endangerment to human health.

II. Station Ash Ponds and Hydrogeologic Assessment

As part of the assessment, each of the ash ponds at the MWGen stations were reviewed and evaluated. This section provides a description of each of the ash impoundments in use at the respective MWG stations, including their location and relevant construction details. For each of the stations, an assessment of the hydrogeology of the subsurface area in the vicinity of the ash ponds also was conducted. The results of the hydrogeological assessment for each station are also reported in this section.

A. Will County Station:

North Ash Pond
South Ash Pond 1
South Ash Pond 2
South Ash Pond 3

The four Will County Generating Station ash ponds are all located in the western half of Section 2, Township 36 North, Range 10 East, in the Village of Romeoville, Will County, Illinois. These ponds are currently lined with 36 inches of "Poz-o-Pac" pavement originally constructed in 6-inch lifts in the late 1970s. "Poz-o-pac" is a fly ash aggregate liner similar to concrete. The potential for a release from the ash ponds is low because these ponds are lined with Poz-o-pac liners. (The ponds also are scheduled to be relined in 2009 with high-density polyethylene geomembranes under Water Pollution Control Construction Permit #2008-EB-1166.)

Geology beneath the Will County ash ponds includes Silurian Dolomite from near the ground surface to a depth of approximately 55 feet, with shale (approximately 55-100 feet below ground surface) and limestone (approximately 100-145 feet below ground surface) underlying the dolomite. The ponds are situated between the Des Plaines River and the Chicago Sanitary and Ship Canal, and the probable direction of groundwater flow is to these surface waters.

B. Waukegan Station:

East Ash Pond
West Ash Pond

The two Waukegan Station ash ponds are located in the center of Section 15, Township 45 North, Range 12 East, in the City of Waukegan, Lake County, Illinois. These ponds are lined with high-density polyethylene (HDPE) geomembrane. Historically, these ponds have contained an impermeable liner. The potential for a release from the Waukegan ash ponds is low because these ponds are lined with HDPE liners.

The geology beneath the Waukegan ash ponds consists of fill to approximately 20 feet below ground surface, underlain by approximately 100 feet of lake-deposited sand. The area surrounding the ash ponds was reclaimed from Lake Michigan in the early twentieth century. The probable direction of groundwater flow is east towards Lake Michigan.

C. Joliet 29 Station:

Ash Pond 1
Ash Pond 2
Ash Pond 3

The three Joliet 29 ash ponds are located in the southeast ¼ of Section 19 and the southwest ¼ of Section 20, Township 35 North, Range 10 East, in the Village of Rockdale, Will County, Illinois, and include Ash Ponds 1, 2, and 3. Ash Ponds 1 and 2 are lined with high-density polyethylene (HDPE) geomembrane installed last year (2008) under Water Pollution Control Construction Permit #2007-EB-4091. Prior to 2008, they were lined with 12 inches of Poz-o-Pac pavement originally constructed in 6-inch lifts in the late 1970s. Ash Pond 3 is lined with 12 inches of Poz-o-Pac pavement originally constructed in 6-inch lifts. The potential for a release from the ash ponds is low because these ponds are lined with HDPE liners.

The geology beneath the Joliet 29 ash ponds includes approximately 5-30 feet of fine sandy loam, underlain by Silurian Dolomite to approximately 176 feet below ground surface, and Maquoketa shale from approximately 176 to 241 feet below ground surface. The shale is an effective confining unit separating the Silurian dolomite from deeper aquifers. Shallow groundwater likely flows south to the Des Plaines River.

D. Crawford Station:

One Equalization Basin

The Crawford Station equalization basin is located in the NW ¼ of Section 35, Township 39 North, Range 13 East, in the Town of Cicero, Cook County, Illinois. The basin is lined with concrete.

The geology beneath the Crawford ash pond includes silt and clay associated with Cahokia Alluvium and the Wedron Formation to a depth of approximately 20 feet below ground surface, underlain by Silurian Dolomite. Silt and clay, particularly those associated with the Wedron Formation, typically have low hydraulic conductivity. The likely groundwater flow direction is south to the Chicago Sanitary and Ship Canal.

The potential for groundwater migration from the Crawford ash pond is low due to the both the existence of the concrete liner and the low hydraulic conductivity of the underlying silt and clay.

E. Powerton Station

Ash Surge Basin
Secondary Ash Settling Basin
Bypass Basin

The three Powerton ash ponds are located in Section 9, Township 24 North, Range 5 West, near the City of Pekin, Tazewell County, Illinois. The Ash Surge Basin, Emergency Overflow Basin, and the Bypass basin are lined with 12 inches of Poz-o-Pac pavement constructed in 6-inch lifts at the bottom of the basin, and Hypalon geomembrane liner on the side slopes. The potential for groundwater migration from the the ash ponds is low due to the both the existence of the Poz-o-Pac/Hypalon geomembrane liner

The geology beneath the Powerton ash ponds includes sands and gravels of the Henry Formation to approximately 90 feet below ground surface. Groundwater flow is likely north towards the Illinois River.

III. Potable Water Survey and Assessment

A survey of all potable water sources within a 2500 feet radius of the respective stations' ash ponds was performed. The following databases and sources of information were utilized 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;

The survey results for each of the stations are set forth below.

A. Will County Station

The only identified potable wells, with associated structures, are located between the Des Plaines River and the Chicago Sanitary and Ship Canal. These wells are more than 1,500 feet deep (see wells 8 and 9 on attached Will County figure.) Based on this geologic profile, these wells are drawing groundwater from a deep aquifer below the Maquoketa confining unit. They do not draw groundwater from the shallow dolomite underlying the station's ash ponds.

Because there are no shallow potable wells between the ash ponds and the surface water bodies to which shallow groundwater discharges, there are no groundwater receptors between the ash ponds and the groundwater discharge point. As a result, there is no reasonable basis to expect that a release from this facility will pose any risk to human health.

B. Waukegan Station

There are eight potable/industrial use wells within 2500 feet of Waukegan's ash ponds (see attached Waukegan figure.) However, the ash ponds are located in close proximity to Lake Michigan and groundwater is believed to flow toward the lake. Further, there are no potable wells used for drinking water supplies to the east or south of the ash pond. Therefore, there is no reasonable basis to expect that a release from the ash ponds will pose any risk to human health.

C. Joliet 29

Seventeen potable/industrial use wells are within a 2500 foot radius of the Joliet 29 Station's ash ponds (see attached Joliet figure.) However, most of these wells are screened at the deeper area aquifers. Only 2 of the wells (Numbers 19 and 4 on figure) are downgradient from the ash impoundment. Both of these wells are drilled at 1525 feet below ground surface and screened below the Maquoketa shale. These wells both belong to MWG and have had a successful compliance record during sampling in accordance with the drinking water regulations.

The absence of shallow potable wells between the ash ponds and the Des Plaines River, where shallow groundwater will discharge, means that there are no groundwater receptors between the ash ponds and the groundwater discharge point. As a result, there is no reasonable basis to expect that a release from this facility will pose any risk to human health.

D. Crawford

No potable wells were identified within a 2,500-foot radius of the station's ash pond (see attached Crawford figure.) The surrounding communities of Cicero and Chicago are served by municipal water distribution systems. Given the low hydraulic conductivity of the silt and clay, likely direction of groundwater flow toward the Chicago Sanitary and Ship Canal, and lack of potable wells near the ash pond, as well as the concrete-lining of the pond, there is no reasonable basis to expect that a release from this facility will pose any risk to human health.

E. Powerton

The well survey identified six wells within a 2,500-foot radius of the ash ponds, each of which is screened below 50 feet (see attached Powerton figure.) None of these wells are located downgradient from the ash ponds. Two of these wells supply Powerton Station with water. They are regularly sampled and analyzed for potable water constituents. The sampling results consistently have been in compliance with potable water regulations.

III. Conclusion

The hydrogeologic assessment of the ash pond wastewater treatment systems at each of the five MWG station evaluated each of the ash ponds in use at the stations. All of the ash ponds are lined with impermeable materials, including concrete, HDPE and Poz-o-Pac materials, to prevent the release of wastewater to the environment. For certain of the stations, the geology of the underlying soils is characterized by low hydraulic conductivity of the underlying media which would prevent the migration of wastewater even in the event of a release. Further, all of the ash ponds are located in close proximity to surface waters and the probable direction of groundwater flow is towards the surface waters and not in the direction of potable water wells.

Existing water wells, if any, were identified as part of the potable water well survey conducted for the area within a 2500 feet radius of the respective stations' ash ponds. An assessment of the potential, if any, for impacts to existing water wells was performed for each of the stations. For each of the MWG stations, the assessment findings are that there

is no reasonable basis on which to conclude (i) that MWG's operation of the ash ponds is causing migration of contaminants from the ash ponds in violation of the 35 Ill. Adm. Code Part 620 regulations; or (ii) that there is any risk of impairing potable water sources or other endangerment to human health.

LEGEND

POTABLE WELL LOCATION (APPROXIMATE)

ASH POND

2,500 FOOT RADIUS OF ASH POND SYSTEMS

NOTE:
REFER TO SUMMARY TABLE FOR SPECIFIC WELL INFORMATION.

SOURCE:
2005 DIGITAL ORTHOPHOTO FROM ILLINOIS NATURAL RESOURCES GEOSPATIAL DATA CLEARINGHOUSE.
WELL LOCATIONS FROM ILLINOIS STATE GEOLOGICAL SURVEY, ILLINOIS ENVIRONMENTAL PROTECTION AGENCY, AND ILLINOIS STATE WATER SURVEY.

N

0 600 1200
SCALE IN FEET

NATURAL RESOURCE TECHNOLOGY

PROJECT NO

FIGURE NO 1

POTABLE WATER WELLS

CRAWFORD STATION
MIDWEST GENERATION
CHICAGO, COOK COUNTY, ILLINOIS

DRAWN BY:	KNW	DATE:	6/09/09
CHECKED BY:	HMS	DATE:	6/13/09
APPROVED BY:	HMS	DATE:	07/07/09
DRAWING NO: 1792-3-004			
REFERENCE:			

LEGEND

COMMUNITY WELL LOCATION

POTABLE WELL LOCATION (APPROXIMATE)

ASH POND

2,500 FOOT RADIUS ASH POND SYSTEMS

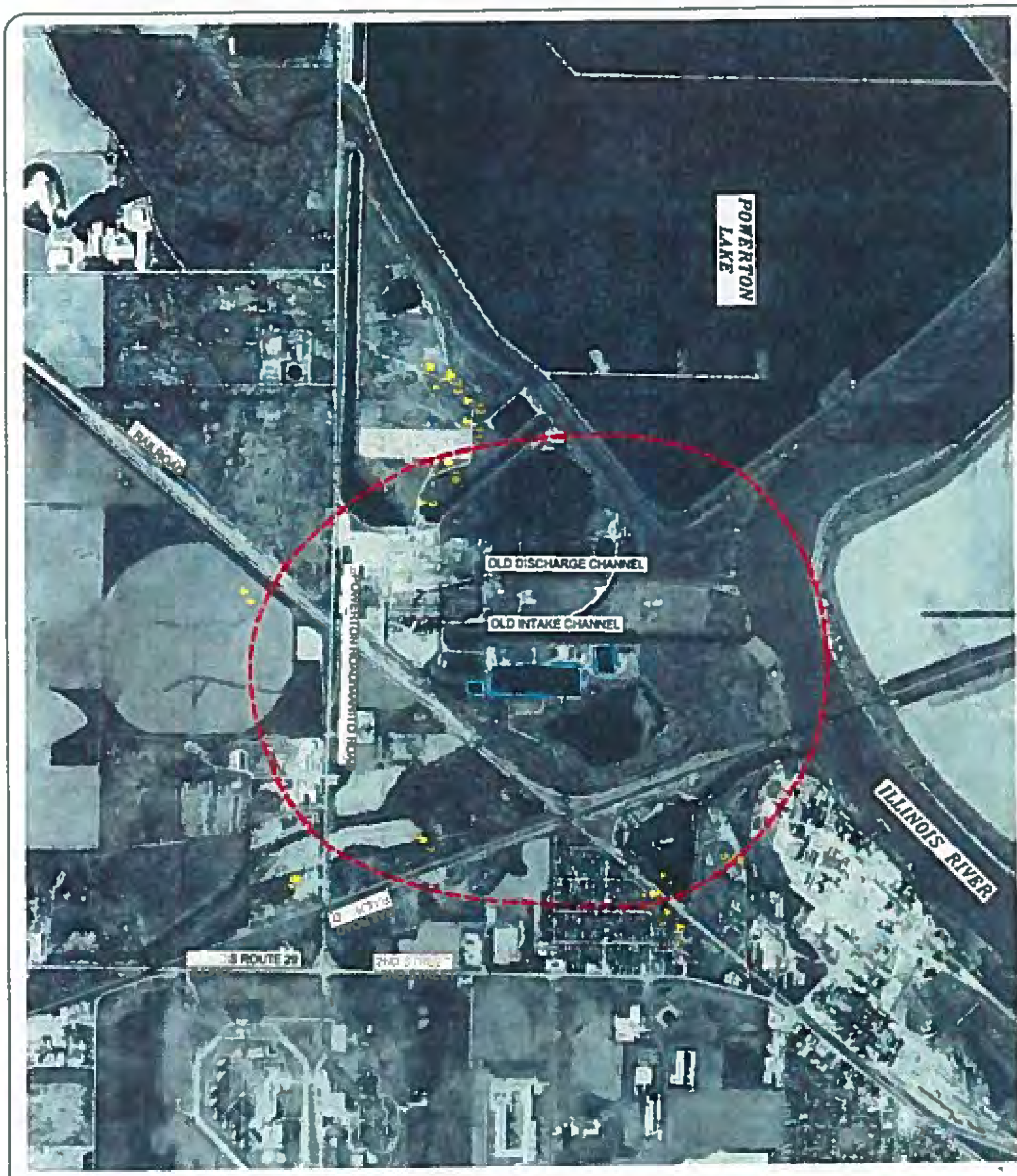
NOTE:
REFER TO SUMMARY TABLE FOR SPECIFIC WELL INFORMATION.

SOURCE:
2005 DIGITAL ORTHOPHOTO FROM ILLINOIS NATURAL RESOURCES GEOSPATIAL DATA CLEARINGHOUSE
WELL LOCATIONS FROM ILLINOIS STATE GEOLOGICAL SURVEY, ILLINOIS ENVIRONMENTAL PROTECTION AGENCY, AND ILLINOIS STATE WATER SURVEY

N

0 600 1200
SCALE IN FEET

FIGURE NO 1	PROJECT NO. 792/3.0	NATURAL RESOURCE TECHNOLOGY	POTABLE WATER WELLS JOLIET STATION NO 29 MIDWEST GENERATION ROCKDALE, WILL COUNTY, ILLINOIS	DRAWN BY: RLH/KHW CHECKED BY: HMS APPROVED BY: HMS DRAWING NO. 1792-3-B03 REFERENCE 16TDL050830.sid, 050945.sid, 065930.sid, 065945.sid	DATE 05/20/09 DATE: 05/22/09 DATE: 07/07/09



LEGEND

POTABLE WELL LOCATION (APPROXIMATE)

ASH POND

2,500 FOOT RADIUS OF ASH POND SYSTEMS

NOTE: REFER TO SUMMARY TABLE FOR SPECIFIC WELL INFORMATION.

SOURCE:
2005 DIGITAL ORTHOPHOTO
ILLINOIS NATURAL RESOURCES GEOSPATIAL DATA CLEARINGHOUSE
WELL LOCATIONS FROM ILLINOIS STATE GEOLOGICAL SURVEY, ILLINOIS ENVIRONMENTAL PROTECTION AGENCY AND ILLINOIS STATE WATER SURVEY

N

0 600 1200
SCALE IN FEET

DRAWN BY	KNW / MS	DATE	05/11/09
CHECKED BY	MS	DATE	05/22/09
APPROVED BY	H-	DATE	07/07/09
DRAWING NO	792 3-B02		
REFERENCE			

POTABLE WATER WELLS
O P TION
POWERT N GOWER STAN
MIDWEST ENERAT ILLINOIS
PEKIN, TAZ W L OUNTY,

NATURAL RESOURC TECHNO OGY

PROJECT NO 792/30

FIGURE NO 1

LEGEND

- POTABLE WELL LOCATION (APPROXIMATE)
- ASH POND
- 2,500 FOOT RADIUS OF ASH POND SYSTEMS

NOTE:
REFER TO SUMMARY TABLE FOR SPECIFIC WELL INFORMATION.

SOURCE:
2005 DIGITAL ORTHOPHOTO FROM ILLINOIS NATURAL RESOURCES GEOSPATIAL DATA CLEARINGHOUSE
WELL LOCATIONS FROM ILLINOIS STATE GEOLOGICAL SURVEY, ILLINOIS ENVIRONMENTAL PROTECTION AGENCY, AND ILLINOIS STATE WATER SURVEY.

N

0 600 1200
SCALE IN FEET

NATURAL RESOURCE TECHNOLOGY PROJECT NO. 1792/3.0 FIGURE NO. 1	POTABLE WATER WELLS WAUKEGAN STATION MIDWEST GENERATION WAUKEGAN, LAKE COUNTY, ILLINOIS	DRAWN BY: KNW	DATE: 6/09/09
		CHECKED BY: HMS	DATE: 6/15/09
		APPROVED BY: HMS	DATE: 07/07/09
		DRAWING NO: 1792-3-B05	
		REFERENCE:	

LEGEND

POTABLE WELL LOCATION (APPROXIMATE)

45+ POND

2,500 FOOT RADIUS OF 45 POND SYSTEMS

NOTE:
REFER TO SUMMARY TABLE FOR SPECIFIC WELL INFORMATION

SOURCE:
2005 DIGITAL ORTHOPHOTO FROM ILLINOIS NATURAL RESOURCES GEOSPATIAL DATA CLEARINGHOUSE
WELL LOCATIONS FROM ILLINOIS STATE GEOLOGICAL SURVEY, ILLINOIS ENVIRONMENTAL PROTECTION AGENCY, AND ILLINOIS STATE WATER SURVEY

N

0 300 1200
SCALE IN FEET

NATURAL RESOURCE TECHNOLOGY	POTABLE WATER WELLS WILL COUNTY GENERATING STATION MIDWEST GENERATION ROMEOVILLE, WILL COUNTY, ILLINOIS	DRAWN BY KNW	DATE 05/13/09
PROJECT NO 1792/3.3		CHECKED BY HMS	DATE 05/22/09
FIGURE NO 1		APPROVED BY HMS	DATE 07/07/09
		DRAWING NO. 1792-1-B01	
		REFERENCE	