MIDWEST
GENERATION EME, LLC
An EDISON INTERNATIONAL® Company

Maria Race
Environmental Program
Director

June 30, 2010

Mr. Jaime Rabins
Illinois Environmental Protection Agency
Division of Water Pollution Control
1021 North Grand Avenue East
Springfield, Illinois 62702

RE: Application for Permit or Construction Approval
Bypass Basin Liner Replacement
Midwest Generation Powerton Power Station - 13082 East Manito Road, Pekin, IL
NPDES Permit No. IL0002232

Dear Mr. Rabins:

Midwest Generation, LLC (MWG) is requesting a construction permit for liner replacement in the Bypass Basin at the Powerton Generating Station. This activity is part of MWG's routine maintenance program for the facility; no significant modifications will be made to the basin's operation or treatment process. Please find enclosed a copy of the Application for Permit or Construction Approval WPC-PS-1 and supporting documents.

The following information is attached:

- A site location map is included in the "Figure" tab;
- A plan view of existing conditions, liner replacement plan, cross section and details drawings are included in the "Sheets" tab;
- Form WPC-PS-1 "Application for Permit or Construction Approval", and Schedules G "Sludge Disposal & Utilization", J "Industrial Treatment Works Construction or Pretreatment Works", and N "Waste Characteristics" are provided in Appendix A;
- Representative photographs of the Bypass Basin are provided in Appendix B; and
- Specification Section 02600 for installation of high-density polyethylene (HDPE) geomembrane liner is provided in Appendix C.

FACILITY DESCRIPTION

The Bypass Basin is for settling of solid/coal ash waste associated with electrical power generation when the Primary Ash Settling Basin is temporarily out-of-service for maintenance. Currently, the basin is lined with chlorosulfonated polyethylene (Hypalon®) liner on the side slopes, and a 12-inch thick layer of Poz-o-pac[1] at the base. The basin only operates during maintenance of the Primary Ash Settling Basin, which generally occurs for a few weeks every 6 years. The total depth of the basin is 8 feet with a working volume of approximately 1.7 million gallons and a design maximum flow (DMF) of 32.4 million gallons per day (MGD). Typically, the basin freeboard is 2 feet during operation. Photographs of the current condition of the basin are provided in Appendix B.

[1] A stabilized subgrade that is comprised of lime, fly ash and aggregate. Compressive strength could be between 500 to 1,000 psi.

235 Remington Blvd.
Suite A
Bolingbrook, Il 60440
Tel: 630 771 7862
Fax: 312 788 5526
mracc@mwgen.com

EXHIBIT 704

MWG13-15_9783

PROJECT DESCRIPTION

The Bypass Basin at the Powerton Power Station will undergo a liner replacement by the addition of a 60 mil HDPE geomembrane liner. Liner replacement activities for the Bypass Basin are anticipated to occur Fall 2010, following scheduled dredging activities (dewatering followed by dry excavation). This schedule may change based upon plant operation needs. Liner replacement activities will include:

- Subgrade preparation for HDPE geomembrane liner (Sheet C020) , including removal of the existing Poz-o-Pac layer (12-inches thick) and 6-inches of the Poz-o-Pac subgrade material at the base of the basin to accommodate a warning layer above the replacement liner, as described below.
  - MWG, depending on budget constraint and project schedule, may increase the capacity of the basin by 200,000 gallons by relocating the southern bank 40 feet to the south, as indicated on Sheet C020. Reconstructed bank will maintain a 3 horizontal to 1 vertical slope with a 10 foot wide access road at the top similar to existing condition. Material removed from the bank would be placed and compacted in lifts along the bank's southern face.
- Deployment and seaming of the HDPE geomembrane replacement liner. The permeability[2] of geomembrane is typically between $2x10^{-13}$ and $4x10^{-13}$ centimeters per second; and
- Placement of cushion and warning layers over the replacement liner.

The warning layer will consist of dense-graded aggregate, grade no. CA6 conforming to Section 1004.01, Coarse Aggregate of State of Illinois, Department of Transportation (IDOT), Standard Specifications for Road and Bridge Construction, or other easily-identifiable material.

The cushion layer will consist of sand, or limestone screenings grade no. FA 1, FA 2, FA3 or FA5 conforming to Section 1003.01 Fine Aggregate of IDOT Standard Specifications for Road and Bridge Construction.

The proposed HDPE geomembrane replacement liner, associated anchor trenches, and cushion and warning layers are shown on Sheet C030. Cross sections and details associated with the liner and cushion/warning layers are shown on Sheets C031 and C032.

[2] Koerner, Robert M., and David E. Daniel, *Final Covers for Solid Waste Landfills and Abandoned Dumps*, ASCE Press, 1997

If you have any questions or require additional information as you review this application, please call me at 630 771 7862.

Sincerely,

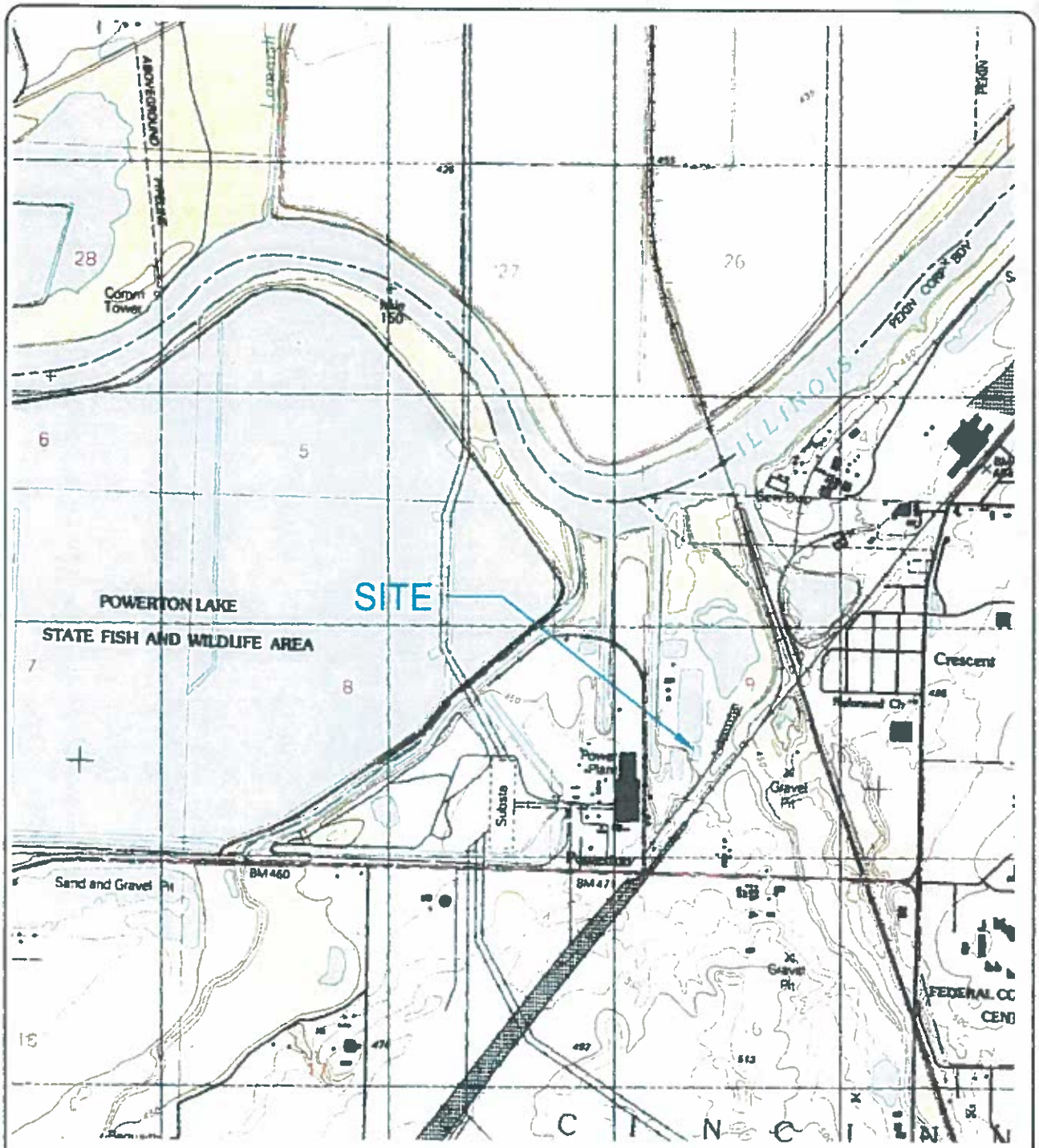
Maria Race
Environmental Program Director

Attachments: Figure 1 – Site Location Map
Appendix A – WPC-PS-1 and Schedules G, J and N
Appendix B – Site Photographs
Appendix C – Specification Section 02600, HDPE Geomembrane
Sheet C010 – Existing Conditions
Sheet C020 – Liner Subgrade Preparation
Sheet C030 – Warning Layer Plan
Sheet C031 – Details and Sections
Sheet C032 – Details and Sections

cc: Mr. Mark Kelly, MWG-Powerton
Ms. Heather Simon, Natural Resource Technology, Inc.

FIGURES

FIGURE



SOURCE: USGS 7.5 MINUTE QUADRANGLE, PEKIN, ILLINOIS. DATED 1996.

QUADRANGLE LOCATION

N

0 2000 4000

SCALE IN FEET

CONTOUR INTERVAL 10 FEET

SITE LOCATION MAP

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

DRAWN BY: KNW 06/30/10 APP'D BY: HMS DATE: 06/30/10

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1965/5.2

DRAWING NO. 1965-52-A01C

FIGURE NO. 1

MWG13-15_9788

APPENDIX A

APPENDIX A

WPC-PS-1 AND SCHEDULES G, J AND N

Illinois Environmental Protection Agency
Permit Section, Division of Water Pollution Control
P.O. Box 19276
Springfield, Illinois 62794-9276

For IEPA Use:

Application for Permit or Construction Approval
WPC-PS-1

1. Owner Name: Midwest Generation EME, LLC

   Name of Project: Powerton Bypass Basin Liner Replacement

   Township: T24N County: Tazewell

2. Brief Description of Project:

   Maintenance on Bypass Basin includes replacement of the basin liner with 60 mil HDPE geomembrane. There will be no significant changes to current operation of the pond. MWG may increase the capacity of the basin by 200,000 gallons by relocating the southern bank 40 feet to the south.

3. Documents Being Submitted: If the Project involves any of the items listed below, submit the corresponding schedule, and check the appropriate boxes.

	Schedule		Schedule
Private Sewer Connection/Extension	A/B ☐	Spray Irrigation	H ☐
Sewer Extension Construct Only	C ☐	Septic Tanks	I ☐
Sewage Treatment Works	D ☐	Industrial Treatment/Pretreatment	J ☑
Excess Flow Treatment	E ☐	Waste Characteristics	N ☑
Lift Station/Force Main	F ☐	Erosion Control	P ☐
Fast Track Service Connection	FTP ☐	Trust Disclosure	T ☐
Sludge Disposal	G ☑		

   Plans: Title Bypass Basin Liner Replacement, Midwest Generation, Powerton Power Station,

   Pekin, IL No. of Pages: 5

   Specifications: Title Section 02600, High Density Polyethylene (HDPE) Geomembrane

   No. of Books/Pages: 21

   Other Documents: Facility photos (see attached)
   (Please Specify)

3.1 Illinois Historic Preservation Agency approval letter: Yes ☐ No ☑

4. Land Trust: Is the project identified in item number 1 herein, for which a permit is requested, to be constructed on land which is the subject of a trust? Yes ☐ No ☑

   If yes, Schedule T (Trust Disclosure) must be completed and item number 7.1.1 must be signed by a beneficiary, trustee or trust officer.

5. This is an Application for (Check Appropriate Line):

   ☐ A. Joint Construction and Operating Permit
   ☑ B. Authorization to Construct (See Instructions) NPDES Permit No. IL00 02232
   ☐ C. Construct Only Permit (Does Not Include Operations)
   ☐ D. Operate Only Permit (Does Not Include Construction)

MWG13-15_9791

6. Certifications and Approval:

6.1 Certificate by Design Engineer (When required: refer to instructions)
I hereby certify that I am familiar with the information contained in this application, including the attached schedules indicated above, and that to the best of my knowledge and belief such information is true, complete and accurate. The plans and specifications (specifications other than Standard Specifications or local specifications on file with this Agency) as described above were prepared by me or under my direction.

Engineer Name: Heather M. Simon

Registration Number: 062 (3 digits) - 060491 (6 digits)

Firm: Natural Resource Technology, Inc.

Address: 23713 W. Paul Rd, Suite D

City: Pewaukee State: WI Zip: 53072 Phone No:

Signature X Heather M Simon Date: 7/1/10

7. Certifications and Approvals for Permits:

7.1 Certificate by Applicant(s)
I/We hereby certify that I/we have read and thoroughly understand the conditions and requirements of this Application, and am/are authorized to sign this application in accordance with the Rules and Regulations of the Illinois Pollution Control Board. I/We hereby agree to conform with the Standard Conditions and with any other Special Conditions made part of this Permit.

7.1.1 Name of Applicant for Permit to Construct: Midwest Generation EME, LLC

Address: 13082 E Manito Road

City: Pekin State: IL Zip Code: 61554

Signature X M B Hanrahan Date: 8-7-6-10

Printed Name: Mike Hanrahan Phone No:

Title:

Organization:

7.1.2 Name of Applicant for Permit to Own and Operate: Same as above

Address:

City: State: Zip Code:

Signature X Date:

Printed Name: Phone No:

Title:

MWG13-15_9792

7.2 Attested (Required When Applicant is a Unit of Government) N/A

Signature X _____ Date: _____

Title: _____
(City Clerk, Village Clerk, Sanitary District Clerk, Etc.)

7.3 Applications from non-governmental applicants which are not signed by the owner, must be signed by a principal executive officer of at least the level of vice president, or a duly authorized representative.

7.4 Certificate By Intermediate Sewer Owner N/A

I hereby certify that (Please check one):

☐ 1. The sewers to which this project will be tributary have adequate reserve capacity to transport the wastewater that will be added by this project without causing a violation of the environmental Protection Act or Subtitle C. Chapter I, or

☐ 2. The Illinois Pollution Control Board, in PCB _____ dated _____ granted a variance from Subtitle C, Chapter I to allow construction of facilities that are the subject of this application.

Name and location of sewer system to which this project will be tributary:

_____

Sewer System Owner: _____

Address: _____

City: _____ State: _____ Zip Code: _____

Signature X _____ Date: _____

Printed Name: _____ Phone No: _____

Title: _____

7.4.1 Additional Certificate By Intermediate Sewer Owner N/A

I hereby certify that (Please check one):

☐ 1. The sewers to which this project will be tributary have adequate reserve capacity to transport the wastewater that will be added by this project without causing a violation of the environmental Protection Act or Subtitle C. Chapter I, or

☐ 2. The Illinois Pollution Control Board, in PCB _____ dated _____ granted a variance from Subtitle C, Chapter I to allow construction facilities that are the subject of this application.

☐ 3. Not applicable

Name and location of sewer system to which this project will be tributary:

_____

Sewer System Owner: _____

Address: _____

City: _____ State: _____ Zip Code: _____

Signature X _____ Date: _____

Printed Name: _____ Phone No: _____

Title: _____

7.5 Certificate By Waste Treatment Works Owner N/A

I hereby certify that (Please check one):

☐ 1. The waste treatment plant to which this project will be tributary has adequate reserve capacity to treat the wastewater that will be added by this project without causing a violation of the Environmental Protection Act or Subtitle C, Chapter I, or

☐ 2. The Illinois Pollution Control Board, in PCB _____ dated _____ granted a variance from Subtitle C, Chapter I to allow construction and operation of the facilities that are the subject of this application.

☐ 3. Not applicable

I also certify that, if applicable, the industrial waste discharges described in the application are capable of being treated by the treatment works.

Name of Waste Treatment Works: _____

Waste Treatment Works Owner: _____

Address: _____

City: _____ State: _____ Zip Code: _____

Signature X _____ Date: _____

Printed Name: _____ Phone No: _____

Title: _____

Please return completed form to the following address:

Illinois Environmental Protection Agency
Permit Section, Division of Water Pollution Control
P.O. Box 19276
Springfield, Illinois 62794-9276

This Agency is authorized to require this information under Illinois Revised Statues, 1979, Chapter 111 ½, Section 1039. Disclosure of this information is required under that Section. Failure to do so may prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms Management Center.

IL 532-0010
WPC 150

MWG13-15_9794

This Agency is authorized to require this information under Illinois Revised Statutes, 1979, Chapter 111 1/2, Section 1039. Disclosure of this information is required under that section. Failure to do so may prevent this form from being processed and could result in your application being denied.

For IEPA Use:

LOG #

DATE RECEIVED:

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF WATER POLLUTION CONTROL
PERMIT SECTION
Springfield, Illinois 62794-9276

SCHEDULE G SLUDGE DISPOSAL & UTILIZATION

1. Name of Project Powerton Bypass Basin Liner Replacement

2. General Information

   2.1 Source(s) Coal Ash from power generation station

   2.2 Production Volume per 6 years 1000 tons Dry Tons per year NA

   2.3 Sludge to be disposed of is: Liquid NA Dry Tons NA

   2.4 Sludge is: Aerobically digested ☐, Anaerobically digested ☐, Heat Anaerobically digested ☐, Raw ☐, Chemically Stabilized ☐, Composted ☐, Wastewater Lagoon ☐, WTP Lime ☐, WTP Alum ☐, WTP Iron ☐, Other ☒,
   If other, describe Coal Ash. Mixture ☐, If mixture, describe _____

   2.5 Is the sludge defined as hazardous by State or Federal Law? YES ☐ NO ☒. If yes, basis.
   _____

   2.6 Is sludge to be stored on the STP site? YES ☐ NO ☒ If yes, type of storage, lagoon ☐, storage tank ☐, Other ☐. If other, describe _____ capacity of storage, _____ cu. ft.

   2.7 Sludge Hauling

   2.7.1 Name(s), address(es) and Illinois Transporters I.D. Numbers
   Dave Clinard Trucking - DOT# 280869
   Route 24 West; Mt. Sterling, IL 62353

   2.7.2 For industrial generators, has Illinois Generator ID Number and Authorization Number been issued? YES ☒ NO ☐
   If no, contact the Division of Land Pollution Control.

   Illinois Generator ID Number ILD000665471

   Authorization Number 9290-99

3. Methods of Sludge Disposal and/or Utilization

   3.1 Land Application

   3.1.1 Indicate the number of dry tons of sludge per year to be disposed by each of the following methods:
   Agricultural land ☐, Commercial Fertilizer Production ☐, Dedicated Land Disposal ☐, Disturbed Land Reclamation ☒, Silviculture ☐, Horticultural Lands ☐, Public Distribution ☐, Other ☐,
   If other, specify _____

   3.1.2 Sludge Disposal Site Location. Provide a map (USGS Quadrangle map or plat map) showing location.
   Name of USGS Quadrangle Map (7.5 or 15 minute) or plat map _____

   3.1.3 Provide soil survey map and soil description for disposal site. Identify name of soil survey and map sheet number for each soil survey map provided.

3.1.4 Is sludge to be stored at disposal site? YES ☐ NO ☐ . If yes, describe and state the storage volume NA cubic feet.

3.1.5 Provide a copy of sludge user information sheet and completed, signed copies for any known users.

3.1.6 In a narrative description provide operating practices and design features to prevent ground and/or surface water pollution, potable water supply wellhead protection and other buffer distances, calculations supporting storage capacity, total acres available, soil characteristics, operational contingencies, etc.

Disposed at Coal Mine once every 6 years at:
Buckheart Mine
22116 E County 6 Hwy
Canton, IL 61520

3.1.7 Submit calculations of sludge application rate for agronomic rate, organic loading and metal loading rate.

3.2 Landfilling ☐ on-site ☐ off-site

3.2.1 Sanitary Landfill ☐ Special Waste Landfill ☐ Hazardous Waste Landfill ☐ Other ☐

If other, specify _____

3.2.2 Name and Location of Landfill(s)

3.2.3 IEPA Permit Number(s) _____ ; _____ ;

3.3 Incineration

3.3.1 Name and Location NA

3.3.2 IEPA Permit Number(s) _____ ; _____ ;

3.3.3 Ultimate Disposal of Incinerator residue

4. Sludge Characteristics

Submit complete analyses of sludge characteristics in mg/kg dry wt. basis unless otherwise indicated. The analyses shall be performed unless the sludge is disposed of by incineration or at an off-site landfill. Analyses performed shall include but not be limited to parameters below:

Parameter	Parameter
% TS	Sulfur
% VS	Aluminum (total)
COD mg/l	Arsenic (total)
pH	Barium (total)
BOD_5 mg/l	Cadmium (total)
Acidity meq of CaCO3 at pH	Cobalt (total)
Alkalinity meq of CaCO3 at pH	Chromium, hex (total)
Oil and Grease mg/l	Chromium (total)
Phenols mg/l	Copper (total)
Cyanide	Iron (total)
Sulfate (total) mg/l	Mercury (total)
Sulfide (total) mg/l	Manganese (total)
Sodium	Molybdenum (total)
EC mmhos/cm	Nickel (total)
TOC	Lead (total)

Ammonia mg/l	Selenium (total)
Total Kjeldahl Nitrogen mg/l	Vanadium (total)
Phosphorus	Zinc (total)
Potassium	Radium 226 pCi/g
% Volatile Acids, if anaerobically digested	Radium 228 pCi/g
	Other*

*Include results of any hazardous waste characteristics tests performed for: 1) EP Toxicity, 2) Corrosivity, 3) Ignitability, and 4) Reactivity.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

Job Number: 500-22894-1

Job Description: Powerton Basin Sampling

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

Attention: Mr. Joe Heredia

Cindy Pritchard

Approved for release
Cindy R Pritchard
Project Mgmt. Assistant
12/14/2009 12:35 PM

Designee for
Bonnie M Stadelmann
Project Manager II
bonnie.stadelmann@testamericainc.com
12/14/2009

cc: Mark Kelly
Ms. Maria Race

These test results meet all the requirements of NELAC for accredited parameters.

The Lab Certification ID# is 100201.
TestAmerica Portland OR00040

All questions regarding this test report should be directed to the TestAmerica Project Manager whose signature appears on this report. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

TestAmerica Laboratories, Inc.
TestAmerica Chicago 2417 Bond Street, University Park, IL 60484
Tel (708) 534-5200 Fax (708) 534-5211 www.testamericainc.com

ACCREDITED IN ACCORDANCE WITH nelac

MWG13-15_9798

SAMPLE RESULTS

Mr. Joe Heredia
Midwest Generation EME LLC
13082 E Manito Road
Pekin, IL 61554

Job Number: 500-22894-1

Client Sample ID: BY-PASS BASIN
Lab Sample ID: 500-22894-3

Date Sampled: 12/02/2009 1330
Date Received: 12/04/2009 1030
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: TCLP-6010B		Date Analyzed:	12/08/2009 1708	
Prep Method: 3010A		Date Prepared:	12/08/2009 0931	
Arsenic	<0.050	mg/L	0.050	1.0
Barium	0.85	mg/L	0.50	1.0
Cadmium	<0.0050	mg/L	0.0050	1.0
Chromium	<0.025	mg/L	0.025	1.0
Lead	<0.050	mg/L	0.050	1.0
Selenium	<0.050	mg/L	0.050	1.0
Silver	<0.025	mg/L	0.025	1.0
Method: 6010B		Date Analyzed:	12/07/2009 2340	
Prep Method: 3050B		Date Prepared:	12/07/2009 0758	
Potassium	3200	mg/Kg	49	1.0
Method: 6010B		Date Analyzed:	12/08/2009 1005	
Prep Method: 3050B		Date Prepared:	12/07/2009 0758	
Sodium	7900	mg/Kg	99	1.0
Method: TCLP-7470A		Date Analyzed:	12/09/2009 1107	
Prep Method: 7470A		Date Prepared:	12/09/2009 0710	
Mercury	<0.0020	mg/L	0.0020	1.0
Method: Soluble-305.1		Date Analyzed:	12/09/2009 0749	
Acidity	<200	mg/Kg	200	1.0
Method: 9014		Date Analyzed:	12/09/2009 1448	
Prep Method: 9010B		Date Prepared:	12/09/2009 1100	
Cyanide, Total	<0.43	mg/Kg	0.43	1.0
Method: 9034		Date Analyzed:	12/11/2009 1403	
Prep Method: 9030B		Date Prepared:	12/11/2009 0925	
Sulfide	<25	mg/Kg	25	1.0
Method: 9038		Date Analyzed:	12/08/2009 0002	
Prep Method: 300_Prep		Date Prepared:	12/06/2009 2231	
Sulfate	62	mg/Kg	51	1.0
Method: 9045C		Date Analyzed:	12/08/2009 1437	
pH	6.86	SU	0.200	1.0
Method: 9066		Date Analyzed:	12/10/2009 0755	
Prep Method: Distill/Phenol		Date Prepared:	12/09/2009 1430	
Phenolics, Total Recoverable	7.8	mg/Kg	0.49	1.0
Method: 9071B		Date Analyzed:	12/09/2009 1426	

Mr. Joe Heredia
Midwest Generation EME LLC
13082 E Manito Road
Pekin, IL 61554

Job Number: 500-22894-1

Client Sample ID: BY-PASS BASIN
Lab Sample ID: 500-22894-3

Date Sampled: 12/02/2009 1330
Date Received: 12/04/2009 1030
Client Matrix: Solid
Percent Solids: 97

Analyte	Result/Qualifier	Unit	RL	Dilution
Prep Method: 9071B		Date Prepared:	12/09/2009 0825	
HEM (Oil & Grease)	<510	mg/Kg	510	1.0
Method: Lloyd Kahn		Date Analyzed:	12/11/2009 1021	
TOC Dup	2300	mg/Kg	120	1.0
Method: Moisture		Date Analyzed:	12/06/2009 2340	
Percent Moisture	3.1	%	0.10	1.0
Method: Soluble-SM 2320B		Date Analyzed:	12/08/2009 1009	
Alkalinity	<430	mg/Kg	430	1.0
Method: SM 4500 NH3 C		Date Analyzed:	12/10/2009 1150	
Prep Method: SM 4500 NH3 B		Date Prepared:	12/09/2009 1120	
Ammonia	<20	mg/Kg	20	1.0
Method: SM 4500 Norg C		Date Analyzed:	12/07/2009 1637	
Prep Method: 351.3_Prep		Date Prepared:	12/07/2009 1405	
Nitrogen, Kjeldahl	42	mg/Kg	40	1.0
Method: SM 4500 P E		Date Analyzed:	12/10/2009 1404	
Prep Method: SM 4500 P B		Date Prepared:	12/08/2009 1100	
Phosphorus as P	1200	mg/Kg	230	25
Method: SM 5210B		Date Analyzed:	12/04/2009 1610	
Biochemical Oxygen Demand	<21	mg/Kg	21	10
Method: SM 5220C		Date Analyzed:	12/08/2009 1107	
Prep Method: SM 5220		Date Prepared:	12/07/2009 1520	
Chemical Oxygen Demand	27000	mg/Kg	1700	10

FOR IEPA USE:
LOG #
DATE RECEIVED:

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF WATER POLLUTION CONTROL
PERMIT SECTION

Springfield, Illinois 62706

SCHEDULE J INDUSTRIAL TREATMENT WORKS CONSTRUCTION OR PRETREATMENT WORKS

1. NAME AND LOCATION:
   1.1 Name of project Powerton Bypass Basin Liner Replacement
   1.2 Plant Location
   1.2.1 SW (Quarter Section) 9 (Section) T24N (Township) R5W (Range) _____ (P.M.)
   1.2.2 Latitude 40 deg. 32 min. 80 sec. "NORTH
   1.2.3 Longitude 89 deg. 40 min. 90 sec. "WEST
   1.2.3 Name of USGS Quadrangle Map (7.5 or 15 minute) _____
2. NARRATIVE DESCRIPTION AND SCHEMATIC WASTE FLOW DIAGRAM: (see instructions)

   Water flows to the By-Pass Basin every 6 years or so, for a few weeks during maintenance/off-line of the Primary Ash Settling Basin, as shown on attached waste flow diagram.

   2.1 PRINCIPAL PRODUCTS:

   electrical power

   2.2 PRINCIPAL RAW MATERIALS:

   coal

3. DESCRIPTION OF TREATMENT FACILITIES:
   3.1 Submit a flow diagram through all treatment units showing size, volumes, detention times, organic loadings, surface settling rate, weir overflow rate, and other pertinent design data. Include hydraulic profiles and description of monitoring systems.
   3.2 Waste Treatment Works is: Batch ☐ , Continuous ☒ , No. of Batches/day _____ , No. of Shifts/day _____
   3.3 Submit plans and specifications for proposed construction.
   3.4 Discharge is: Existing ☒ ; Will begin on _____.
4. DIRECT DISCHARGE IS TO: Receiving Stream ☒ Municipal Sanitary Sewer ☐ Municipal storm or municipal combined sewer ☐
   If receiving stream or storm sewer are indicated complete the following:
   Name of receiving stream Old Intake Channel ; tributary to Illinois River ;
   tributary to _____ ; tributary to _____ ;
5. Is the treatment works subject to flooding? Yes ☐ No ☒ If so, what is the maximum flood elevation of record (in reference to the treatment works datum) and what provisions have been made to eliminate the flooding hazard?

   _____

6. APPROXIMATE TIME SCHEDULE: Estimated construction schedule:
   Start of Construction 09/01/10 Date of Completion 11/30/10
   Operation Schedule NA ; Date Operation Begins NA
   100% design load to be reached by year _____.
7. DESIGN LOADINGS
   7.1 Design population equivalent (one population equivalent is 100 gallons of wastewater per day, containing 0.17 pounds of BOD_5 and 0.20 pounds of suspended solids;
   BOD NA ; Suspended Solids NA ; Flow NA .
   7.2 Design Average Flow Rate 21.6 MGD.

MWG13-15_9802

7.3 Design Maximum Flow Rate 32.4 MGD.

7.4 Design Minimum Flow Rate 10.6 MGD.

7.5 Minimum 7-day, 10-year low flow NA cfs NA MGD.

Minimum 7-day, 10-year flow obtained from NA

7.6 Dilution Ratio NA : .

8. FLOW TO TREATMENT WORKS (if existing):

8.1 Flow every 6 to 7 years

8.1.1 Average Flow 13.13 MGD

8.1.2 Maximum Flow 32.4 MGD

8.2 Equipment used in determining above flows

9. Has a preliminary engineering report for this project been submitted to this Agency for Approval?

Yes ☐ No ☒ . If so, when was it submitted and approved. Date Submitted _____

Certification # _____

Dated _____

10. List Permits previously issued for the facility:

NPDES Permit No. IL0002232

11. Describe provisions for operation during contingencies such as power failures, flooding, peak loads, equipment failure, maintenance shut downs and other emergencies.

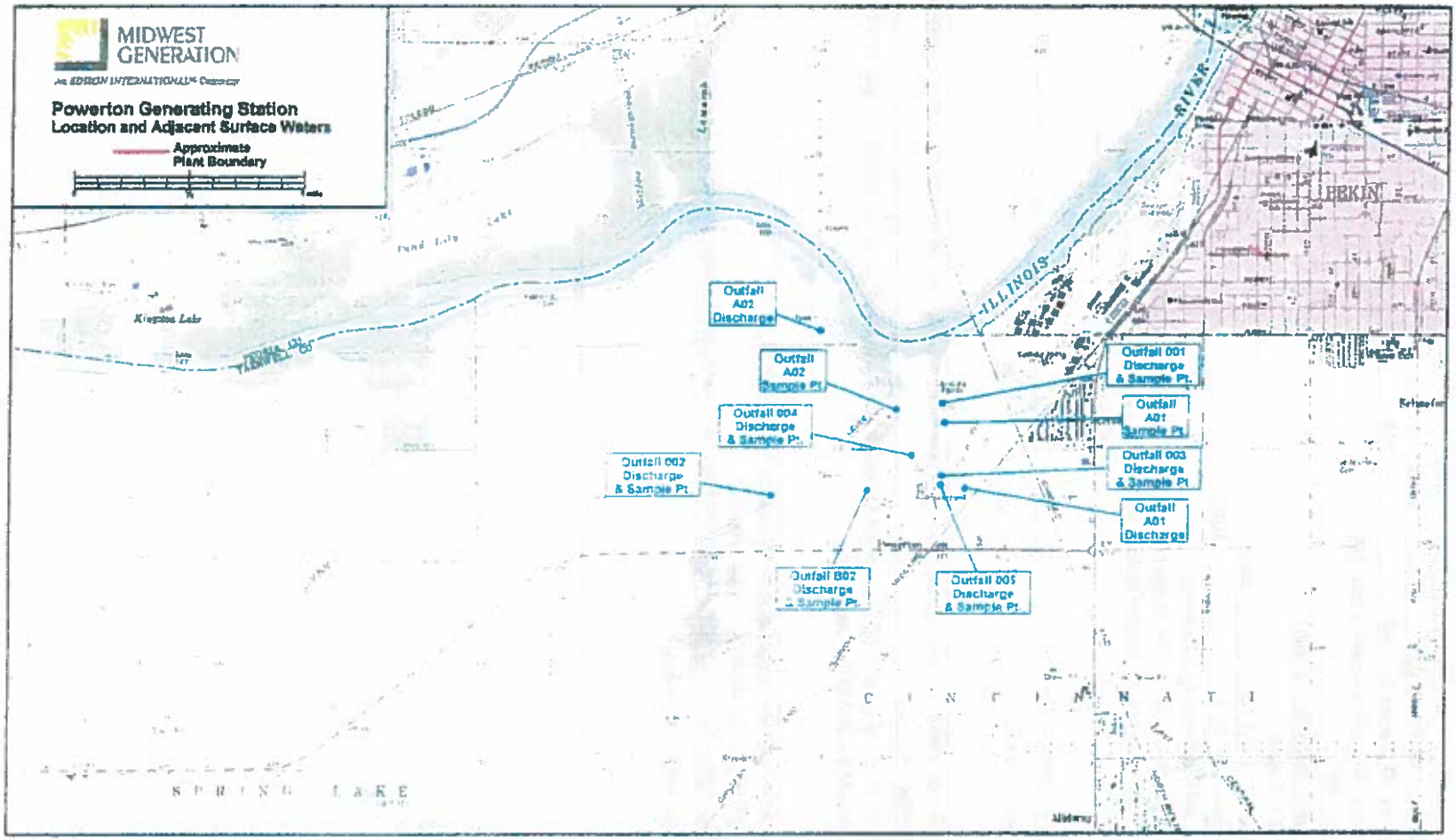
There is no equipment in the basin. Influent pumped to basin, so in the event of power failure or equipment malfunction, the flow of influent to the basin stops.

12. Complete and submit Schedule G if sludge disposal will be required by this facility.

13. WASTE CHARACTERISTICS: Schedule N must be submitted.

14. TREATMENT WORKS OPERATOR CERTIFICATION: List names and certification numbers of certified operators:

Mark Kelly (see attached certification)



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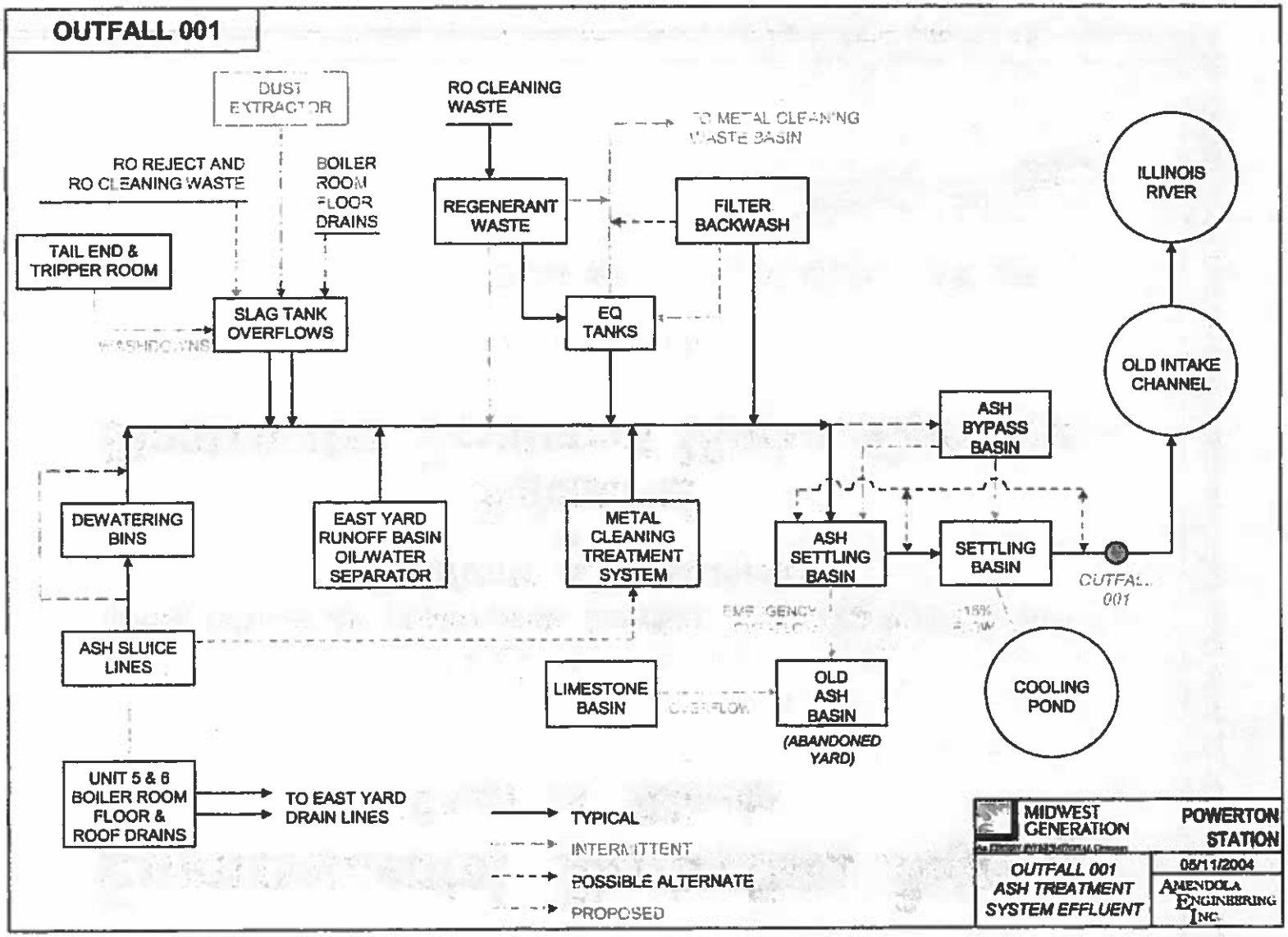

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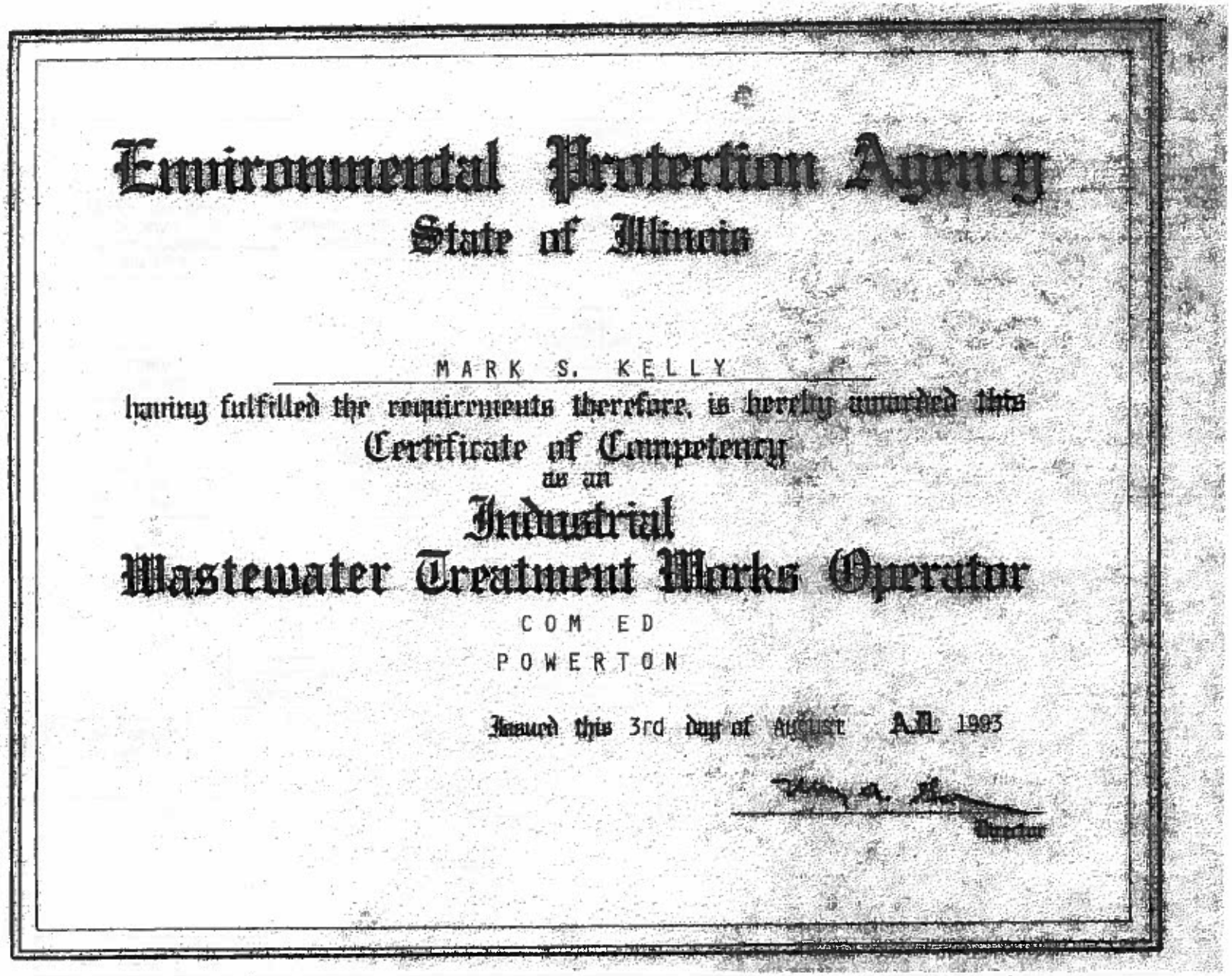


Environmental Protection Agency

State of Illinois

MARK S. KELLY

having fulfilled the requirements therefore, is hereby awarded this

Certificate of Competency

as an

Industrial Wastewater Treatment Works Operator

COM ED

POWERTON

Issued this 3rd day of August A.D. 1993

Director

MWG13-15_9806

This Agency is authorized to require this information under Illinois Revised Statutes, 1979, Chapter 111 1/2, Section 1039. Disclosure of this information is required under that section. Failure to do so may prevent this form from being processed and could result in your application being denied.

For IEPA Use:

LOG #

DATE RECEIVED:

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF WATER POLLUTION CONTROL
PERMIT SECTION
Springfield, Illinois 62794-9276

SCHEDULE N WASTE CHARACTERISTICS

1. Name of Project Powerton Bypass Basin Liner Replacement

2. FLOW DATA

	EXISTING	PROPOSED-DESIGN
2.1	21,600,000	same
2.2 Maximum Daily Flow (gpd)	32,400,000	same

2.3 TEMPERATURE

Time of Year	Avg. Intake Temp. F	Avg. Effluent Temp. F	Max. Intake Temp F.	Max. Effluent Temp F.	Max. Temp. Outside Mixing Zone F
SUMMER	NA	NA	NA	NA	NA
WINTER	NA	NA	NA	NA	NA

2.4 Minimum 7-day, 10-year flow: NA cfs NA MGD.

2.5 Dilution Ratio: NA :

2.6 Stream flow rate at time of sampling NA cfs NA MGD.

3. CHEMICAL CONSTITUENT Existing Permitted Conditions ☒ ; Existing conditions ☐ ; Proposed Permitted Conditions ☐

Type of sample: ☐ grab (time of collection); ☒ composite (Number of samples per day NA)

(see instructions for analyses required)

CONSTITUENT	RAW WASTE (mg/l)	TREATED EFFLUENT Avg. (mg/l) Max.	UPSTREAM (mg/l)	DOWNSTREAM SAMPLES (mg/l)
Ammonia Nitrogen (as N)	NA	NA	NA	NA
Arsenic (total)	NA	NA	NA	NA
Barium	NA	NA	NA	NA
Boron	NA	NA	NA	NA
BOD_5	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA
Carbon Chloroform Extract	NA	NA	NA	NA
Chloride	NA	NA	NA	NA
Chromium (total hexavalent)	NA	NA	NA	NA
Chromium (total trivalent)	NA	NA	NA	NA

CONSTITUENT	RAW WASTE (mg/l)	TREATED EFFLUENT Avg. (mg/l) Max.	UPSTREAM (mg/l)	DOWNSTREAM SAMPLES (mg/l)
Copper	NA	NA	NA	NA
Cyanide (total)	NA	NA	NA	NA
Cyanide (readily released @ 150° F & pH 4.5)	NA	NA	NA	NA
Dissolved Oxygen	NA	NA	NA	NA
Fecal Coliform	NA	NA	NA	NA
Fluoride	NA	NA	NA	NA
Hardness (as Ca CO_3)	NA	NA	NA	NA
Iron (total)	NA	NA	NA	NA
Lead	NA	NA	NA	NA
Manganese	NA	NA	NA	NA
MBAS	NA	NA	NA	NA
Mercury	NA	NA	NA	NA
Nickel	NA	NA	NA	NA
Nitrates (as N)	NA	NA	NA	NA
Oil & Grease (hexane solubles or equivalent)	NA	NA	NA	NA
Organic Nitrogen (as N)	NA	NA	NA	NA
pH	NA	NA	NA	NA
Phenols	NA	NA	NA	NA
Phosphorous (as P)	NA	NA	NA	NA
Radioactivity	NA	NA	NA	NA
Selenium	NA	NA	NA	NA
Silver	NA	NA	NA	NA
Sulfate	NA	NA	NA	NA
Suspended Solids	NA	NA	NA	NA
Total Dissolved Solids	NA	NA	NA	NA
Zinc	NA	NA	NA	NA
Others				

APPENDIX B

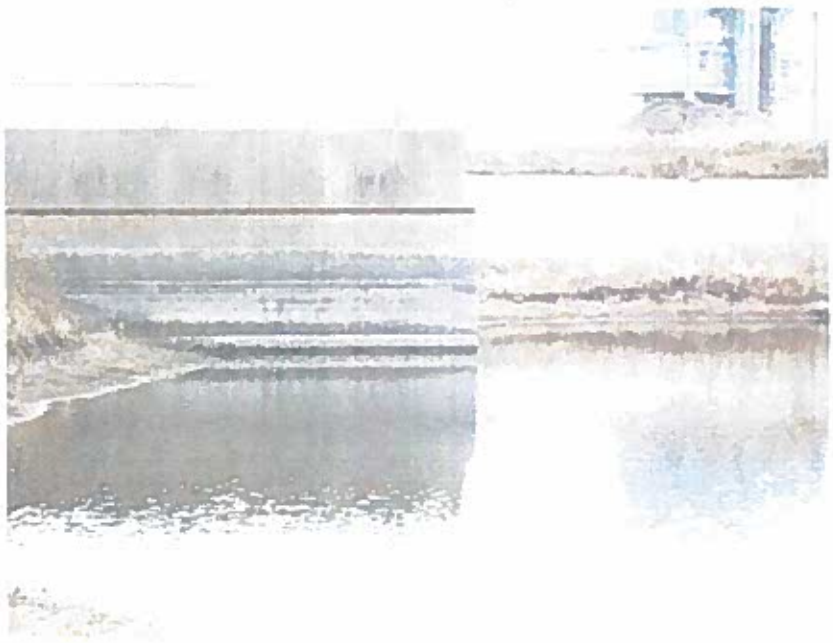
APPENDIX B

SITE PHOTOGRAPHS

Northeast corner of basin looking south along access ramp on October 20, 2009

South end of basin looking north on October 20, 2009

Inlet structure



Looking south at discharge structure on October 20, 2009

Looking southwest at discharge structure on October 20, 2009

Looking northwest at discharge structure on October 20, 2009

Looking west at overflow corrugated metal pipe on October 20, 2009

APPENDIX C

APPENDIX C

SPECIFICATION SECTION 02600, HDPE GEOMEMBRANE

SECTION 02600
HIGH DENSITY POLYETHYLENE (HDPE) GEOMEMBRANE

PART 1 - GENERAL

1.01 WORK INCLUDES

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

1.02 REFERENCE STANDARDS

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

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

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

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

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

1.03 DEFINITIONS

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

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

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

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

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

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

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

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

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

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

1.04 QUALITY ASSURANCE

A. Qualifications:

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

2. Geomembrane Installer:

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

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

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

3. Leak Location Contractor:

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

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

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

B. Quality Assurance Program:

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

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

1.05 SUBMITTALS

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

1. Raw Materials:

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

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

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

2. Geomembrane Manufacturer's Certification:

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

3. Geomembrane Installer's Seaming Personnel

a. Training completed by personnel.

b. Seaming experience for each personnel.

4. Geomembrane Manufacturer Production Information:

a. Corporate background information indicating compliance with qualification requirements.

b. Quality control plan for manufacturing.

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

5. Geomembrane Installer's Information:

a. Corporate background information indicating compliance with qualification requirements.

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

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

d. Installation quality control plan.

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

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

8. Description of seaming apparatus to be used.

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

1. Leak Location Contractor's Work Plan:

a. Corporate background information indicating compliance with qualification requirements.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

1.06 DELIVERY, STORAGE, AND HANDLING

A. Transportation:

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

B. On-site Storage:

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

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

a. Equipment;

b. Strong oxidizing chemicals, acids, or bases;

c. Flames, including welding sparks;

d. Temperatures in excess of 160 deg. F;

e. Dust;

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

g. Inclement weather.

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

4. Containers/rolls shall not be stacked.

C. On-Site Handling:

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

PART 2 - PRODUCTS

2.01 MATERIALS

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

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

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

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

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

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

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

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

B. Seaming Apparatus

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

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

C. Field Test Equipment

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

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

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

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

2.02. CONFORMANCE TESTING REQUIREMENTS

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

B. Conformance Test Methods

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

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

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

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

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

C. Role of Testing Laboratories

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

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

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

D. Procedures for Determining Conformance Test Failures

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

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

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

PART 3 - EXECUTION

3.01 PRE-CONSTRUCTION MEETING

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

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

1. Responsibilities of each party.

2. Lines of authority and communication.

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

4. Procedures for packaging and storing archive samples.

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

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

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

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

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

10. Deployment techniques including allowable subgrade for geomembrane.

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

12. Plan for minimizing wrinkles in the geomembrane.

13. Measurement and payment schedules.

14. Site health and safety procedures/protocols.

3.02 SUBGRADE PREPARATION

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

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

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

3.03 GEOMEMBRANE DEPLOYMENT

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

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

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

D. Geomembrane shall not be deployed if:

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

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

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

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

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

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

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

3. Method of deployment does not damage geomembrane.

4. Method of deployment minimizes wrinkles.

5. Temporary loading or anchoring does not damage geomembrane.

6. Direct contact with geomembrane is minimized.

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

3.04 FIELD SEAMS

A. Seam Layout

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

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

C. Field Test Methods

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

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

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

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

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

D. Laboratory Test Methods

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

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

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

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

   a. Maximum tension in pounds per square inch.

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

   c. Locus of failure using ASTM D6392 designations.

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

   a. Maximum tension in pounds per square inch.

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

c. Locus of failure.

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

E. Destructive Seam Test Failure

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

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

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

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

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

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

3.07 ELECTRONIC LEAK LOCATION SURVEY

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

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

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

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

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

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

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

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

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

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

3.08 DEFECTS AND REPAIRS

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

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

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

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

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

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

C. Patches or caps.

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

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

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

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

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

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

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

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

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

3.09 PROTRUSIONS AND CONNECTIONS TO GEOMEMBRANE

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

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

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

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

3.10 SURVEY DOCUMENTATION

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

3.11 DAILY FIELD INSTALLATION REPORTS

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

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

1. The total amount and location of geomembrane placed.

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

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

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

5. Results of non-destructive testing.

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

3.12 MATERIAL ABOVE GEOMEMBRANE

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

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

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

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

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

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

5. Do not compact soils placed directly on geomembrane.

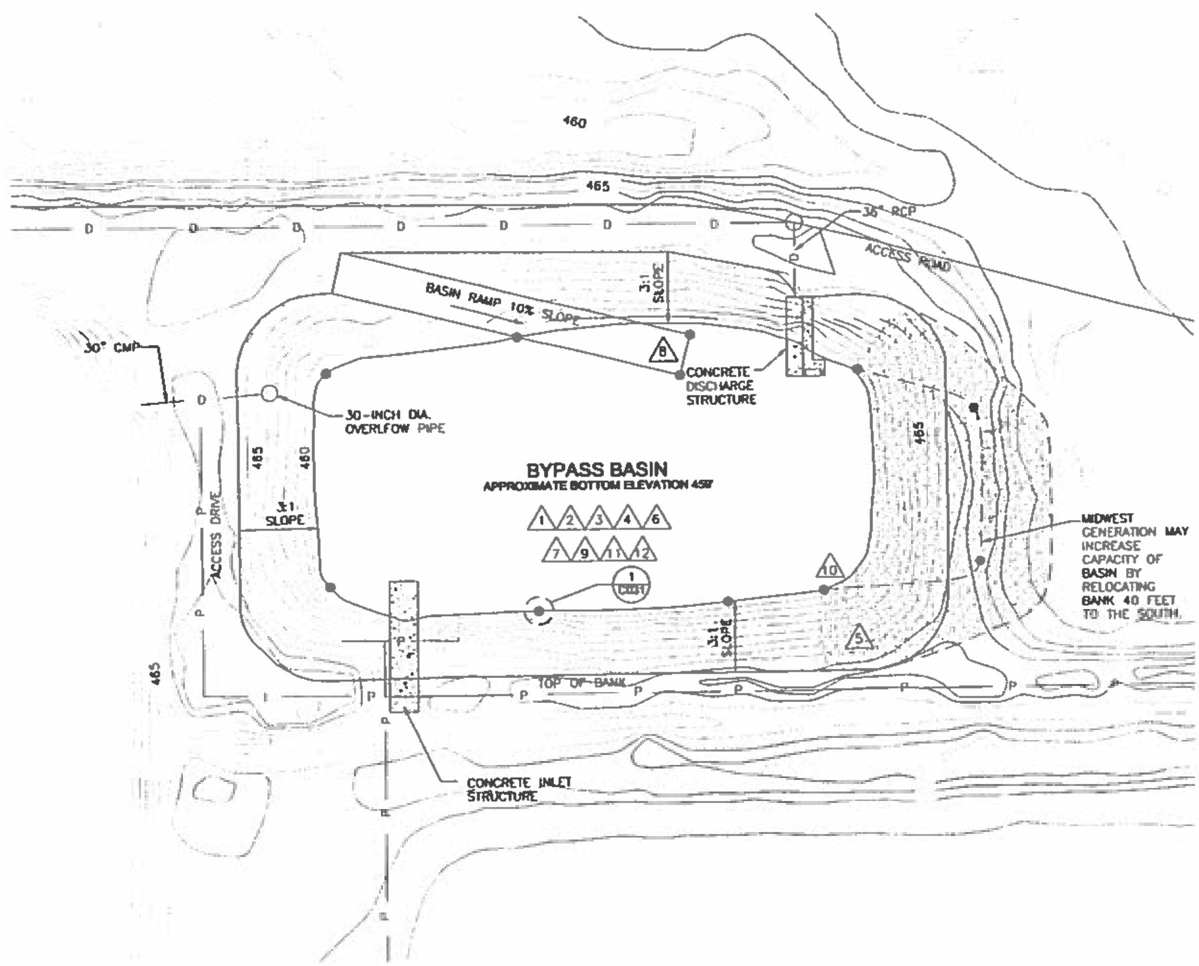
6. Damage to the geomembrane resulting from placement of cover soils shall be repaired in accordance with Part 3.08 by the Geomembrane Installer at the Contractor's expense.

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

END OF SECTION

SHEETS

SHEETS



LEGEND

— D —	UNDERGROUND DISCHARGE PIPE
— P —	ABOVEGROUND INTAKE PIPE
— I —	UNDERGROUND INLET PIPE
460	EXISTING GROUND SURFACE CONTOUR
(shaded)	BANK/AREA FOR POSSIBLE RELOCATION

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 INSTALL MARKER POSTS ALONG THE TOE OF SLOPE AS SHOWN AND IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS AND DETAIL 1 ON SHEET C031.
11. CONTRACTOR SHALL PLACE 16 OZ. NONWOVEN GEOTEXTILE OVER THE PREPARED SUBGRADE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
12. SUBGRADE SHALL BE APPROVED BY OWNER AND/OR ENGINEER PRIOR TO INSTALLATION OF GEOMEMBRANE.
13. 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

SOURCE NOTES:
THIS DRAWING WAS DEVELOPED FROM A SURVEY BY AERO-METRIC, INC. DATED 6-19-2008, PROJECT NO. 1080611, PROVIDED BY MIDWEST GENERATION.
LOCATION OF BASIN AND ACCESS RAMP TAKEN FROM MIDWEST GENERATION DRAWING NO. 5293 C9001-2, DATED 8-28-1980.

N

0 10 20 40
SCALE IN FEET

NOT FOR CONSTRUCTION

REV.	REVISION	DATE	APP'D BY
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5			
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2			
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0	ISSUED FOR PERMIT	08/30/10	HMS

NATURAL RESOURCE TECHNOLOGY

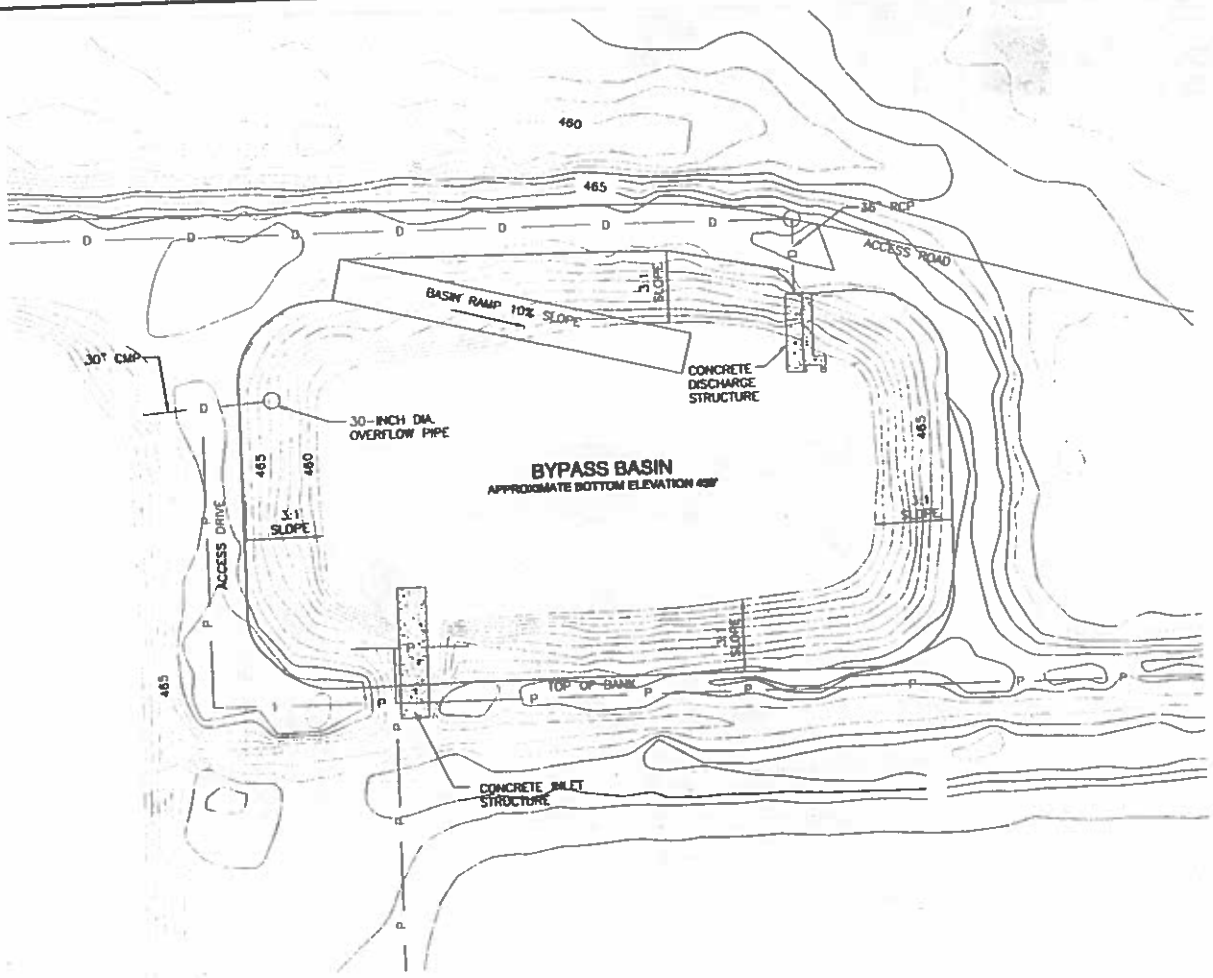
PROJECT NO. 1965/3.3
DRAWN BY: 08/30/10
CHECKED BY: HMS 08/30/10
APPROVED BY: HMS 08/30/10

LINER SUBGRADE PREPARATION

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

DRAWING NO. [illegible]
REFERENCE: \BYPASS BASIN
SHEET NO. C020

MWG13-15_9836



LEGEND

- D — UNDERGROUND DISCHARGE PIPE
- P — ABOVEGROUND INTAKE PIPE
- I — UNDERGROUND INLET PIPE
- 460 — EXISTING GROUND SURFACE CONTOUR

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

VERTICAL DATUM:
LOCAL PLANT DATUM

SOURCE NOTES:
THIS DRAWING WAS DEVELOPED FROM A SURVEY BY AERO-METRIC, INC. DATED 8-19-2008, PROJECT NO. 10808811, PROVIDED BY MIDWEST GENERATION.
LOCATION OF BASIN AND ACCESS RAMP TAKEN FROM MIDWEST GENERATION DRAWING NO. 5295 C5001-2, DATED 8-26-1980.

N

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SCALE IN FEET

REVISION	DATE	APP'D BY
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0 ISSUED FOR PERMIT	06/30/10	HNS

NATURAL RESOURCE TECHNOLOGY

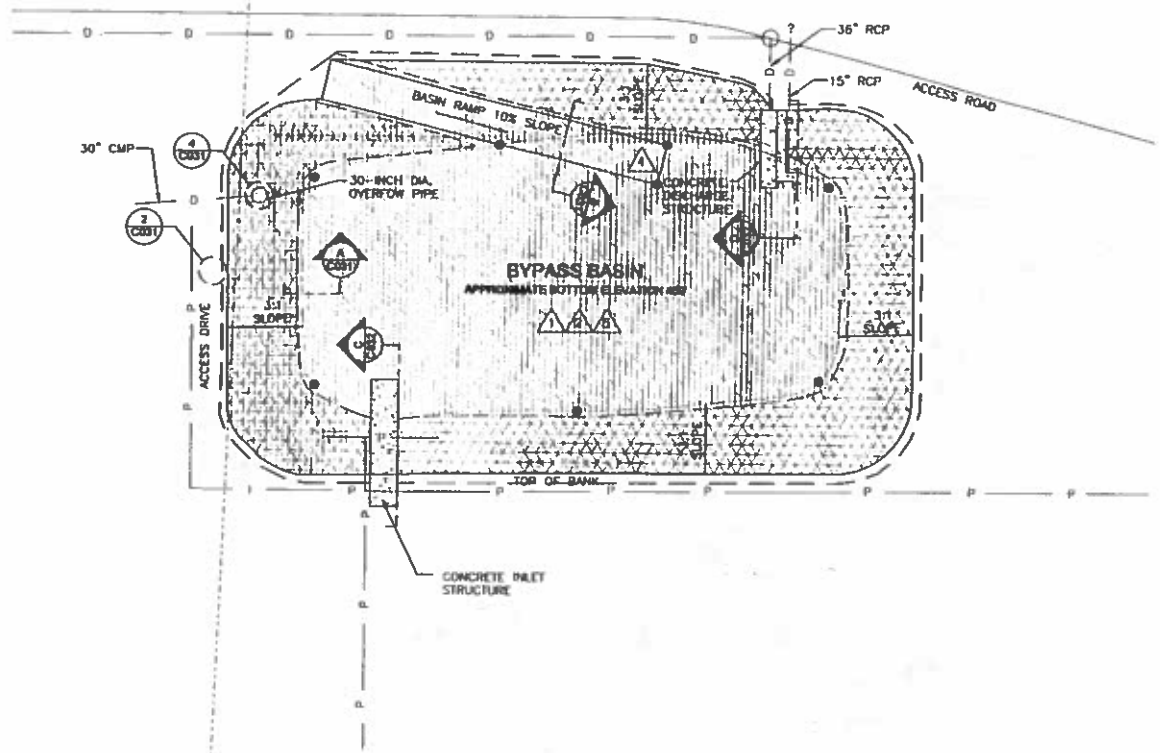
PROJECT NO. 1998/5.2
DRAWN BY: HNS 06/30/10
CHECKED BY: RJS 06/30/10
APPROVED BY: HNS 06/30/10
DRAWING NO: 81998CP10-00
REFERENCE: \BYPASS BASIN

EXISTING CONDITIONS

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

SHEET NO. CD10

MWG13-15_9837



LEGEND

- D — UNDERGROUND DISCHARGE PIPE
- P — ABOVEGROUND INTAKE PIPE
- I — UNDERGROUND INLET PIPE
- ANCHOR TRENCH
- 12 OZ. NON-WOVEN GEOTEXTILE
- MARKER POST LOCATION
- WARNING LAYER
- HDPE GEOMEMBRANE

CONTRACTOR NOTES:
1. CONTRACTOR SHALL INSTALL 60 MIL HDPE, SMOOTH, TEXTURED GEOMEMBRANE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS 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 REPAIRS 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 BY AERO-METRIC, INC. DATED 8-19-2008, PROJECT NO. 1008011, PROVIDED BY MIDWEST GENERATION.
LOCATION OF BASIN AND ACCESS RAMP TAKEN FROM MIDWEST GENERATION DRAWING NO. 3295 C3001-2, DATED 8-26-1988.

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SCALE IN FEET

NO.	REVISION	DATE	APP'D BY
0	ISSUED FOR PERMIT	06/30/10	HMS

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1008/3.2
DRAWN BY: BMR 06/30/10
CHECKED BY: RJS 06/30/10
APPROVED BY: HMS 06/30/10

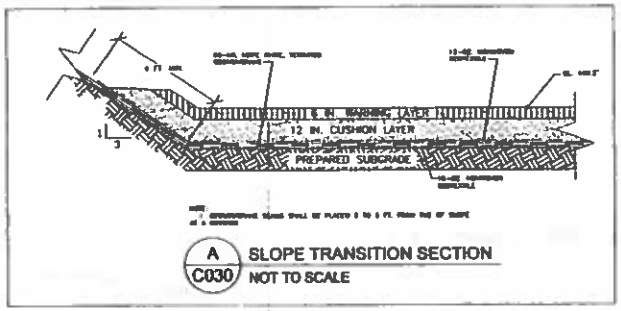
WARNING LAYER PLAN

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

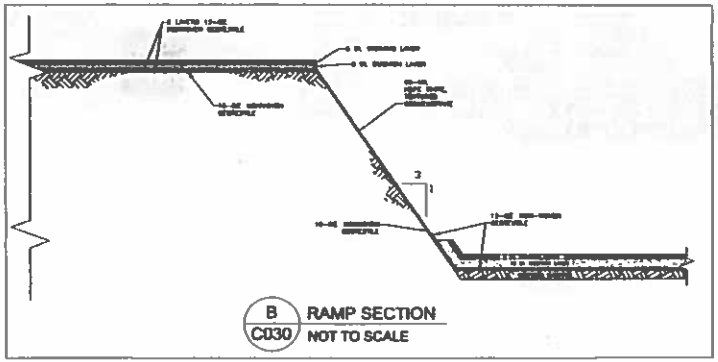
DRAWING NO. 01008C030-00
REFERENCE: \BYPASS BASIN

SHEET NO. C030

MWG13-16_0038



A C030 SLOPE TRANSITION SECTION
NOT TO SCALE



B C030 RAMP SECTION
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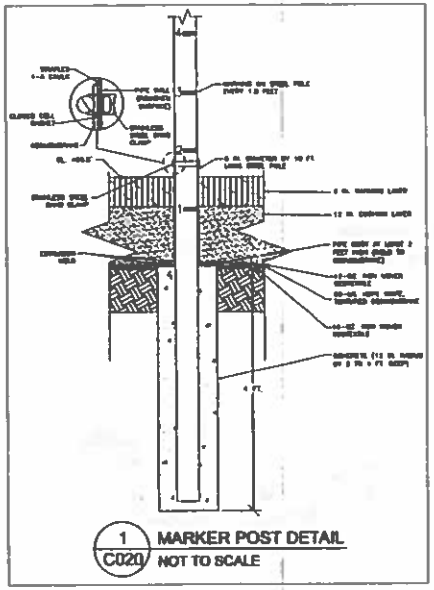
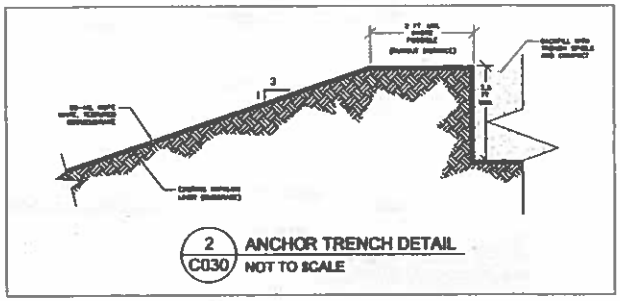
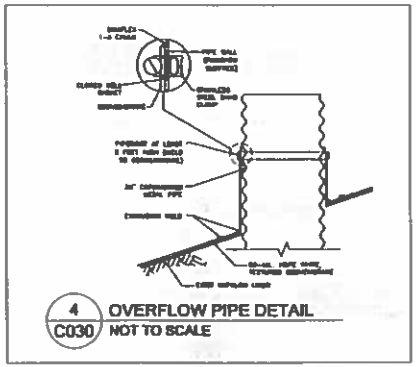


1 C020 MARKER POST DETAIL
NOT TO SCALE



2 C030 ANCHOR TRENCH DETAIL
NOT TO SCALE



4 C030 OVERFLOW PIPE DETAIL
NOT TO SCALE

NOT FOR CONSTRUCTION

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REVISION	DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1965/3.3
DRAWN BY: MWD 06/30/10
CHECKED BY: AJS 06/30/10
APPROVED BY: HMS 06/30/10

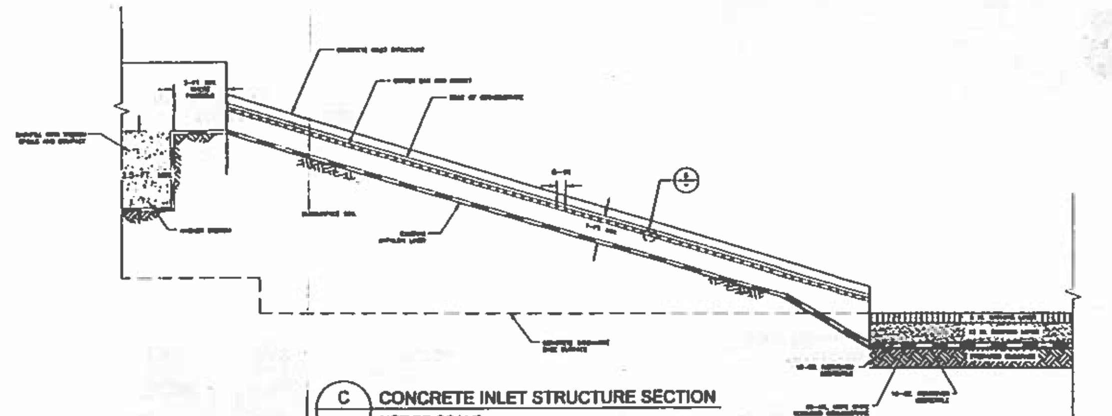
DETAILS AND SECTIONS

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

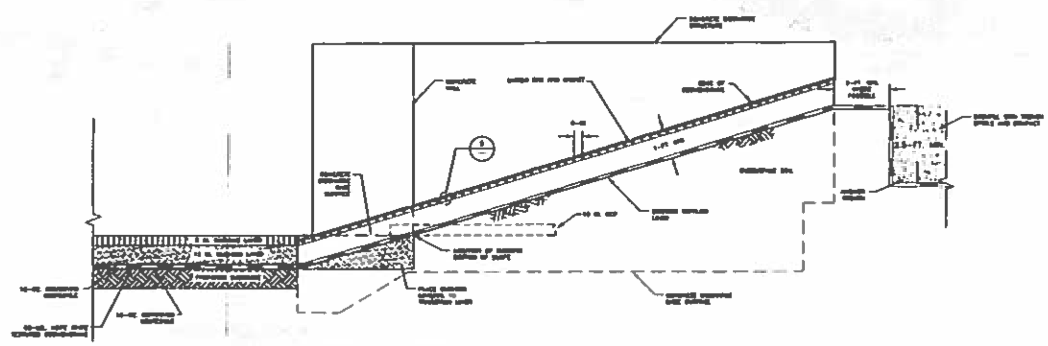
DRAWING NO: 01965C031-00
REFERENCE: BYPASS BASIN

SHEET NO. C031

MWG13-16_9639



C CONCRETE INLET STRUCTURE SECTION
NOT TO SCALE



D CONCRETE DISCHARGE STRUCTURE SECTION
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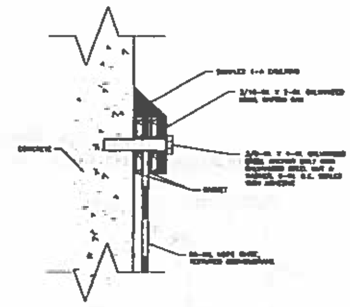

NOTE:
1. ANCHOR BOLTS 6 IN. ON CENTER.

5 BATTEN BAR ATTACHMENT
NOT TO SCALE

NOT FOR CONSTRUCTION

DETAILS AND SECTIONS

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

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REVISION		DATE	APP'D BY

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1985/3.2
DRAWN BY: 06/30/10
CHECKED BY: RJG 06/30/10
APPROVED BY: HMS 06/30/10
DRAWING NO. 01985C032-00
REFERENCE: \BYPASS BASIN
SHEET NO. C032

MWG13-15_9640