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

Bureau of Water ID Number: CCR Permit Number: Facility Name:	For IEPA Use Only

SECTION 1: FACILITY, OPERATOR, AND OWNER INFORMATION (35 IAC 845.210(b))

Facility, Operator, and Owner Information

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

Facility, Operator, and Owner Info				
1.7	Owner/Operator Contact Information			
	Name (first and last) Dale Green	Title Plant Manager		Phone Number 309-477-5212
	Email address Dale.Green@NRG.com			
1.8	Owner/Operator Mailing Address			
	Street or P.O. box 804 Carnegie Center			
	City or town Princeton		State New Jersey	Zip Code 08540

SECTION 2: LEGAL DESCRIPTION (35 IAC 845.210(c))

Legal Description		
2.1	Legal Description of the facility boundary	
	SEC 9 T24N R5W LYING W OF RR IN W 1/2 & W 50 X 2220.46 OF ADJ RR (EXC 2.05 AC TRACT) NW 1/4 300.7 AC	

SECTION 3: PUBLICLY ACCESSIBLE INTERNET SITE REQUIREMENTS (35 IAC 845.810)

Internet Site		
3.1	Web Address(es) to publicly accessible internet site(s) (CCR website)	
	https://www.nrg.com/legal/coal-combustion-residuals.html	
3.2	Is/are the website(s) titled "Illinois CCR Rule Compliance Data and Information"	
	Yes (circled)	No

SECTION 4: IMPOUNDMENT IDENTIFICATION

Impoundment Identification			
4.1	List all the Impoundment Identification numbers for your facility and check the corresponding box to indicate that you have attached a written description for each impoundment.		
	W1798010008-03	☑	Attached written description
		☐	Attached written description
		☐	Attached written description
		☐	Attached written description
		☐	Attached written description
		☐	Attached written description
		☐	Attached written description

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

SECTION 5: CHECKLIST AND CERTIFICATION STATEMENT

Checklist and Certification Statement

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

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

5.2 **Certification Statement**

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

Name (print or type first and last name) of Owner/Operator	Official Title
Dale Green	Plant Manager
Signature	**Date Signed**
[signature]	3-30-22

Form CCR 2E

Illinois Environmental Protection Agency

CCR Surface Impoundment Permit Application

Form CCR 2E – Initial Operating Permit for Existing or Inactive CCR Surface Impoundments That Have Not Completed an Agency-approved Closure Before July 30, 2021

Bureau of Water ID Number: **CCR Permit Number:** **Facility Name:** Powerton Generating Station	For IEPA Use Only

SECTION 1: CONSTRUCTION HISTORY (35 Ill. Adm. Code 845.220 AND 35 Ill. Adm. Code 845.230)

Construction History

1.1	CCR surface impoundment name.	Metal Cleaning Basin
1.2	Identification number of the CCR surface impoundment (if one has been assigned by the Agency).	W1798010008-03
1.3	Description of the boundaries of the CCR surface impoundment (35 Ill. Adm. Code 845.210(c)).	SEC 8 T24N R5W E 1/2 OF NE 1/4 (EXC RIVER) & E 1/2 OF SE 1/4 (EXC RIVER & EXC TRACT) 111.65 AC
1.4	State the purpose for which the CCR surface impoundment is being used.	The basin is used to collect wash water and to occasionally receive dry bottom ash and fly ash from maintenance activities into the basin for temporary storage.
1.5	How long has the CCR surface impoundment been in operation?	43 years
1.6	List the types of CCR that have been placed in the CCR surface impoundment.	Bottom ash and fly ash along with wash water. The bottom ash and fly ash are removed as quickly as possible.

Construction History (Continued)			
	1.7	List name of the watershed within which the CCR surface impoundment is located.	
		Pekin Lake-Illinois River watershed	
	1.8	Size in acres of the watershed within which the CCR surface impoundment is located.	
		28,834 acres	
	1.9	Check the corresponding box to indicate that you have attached the following:	
		☑	Description of the physical and engineering properties of the foundation and abutment materials on which the CCR surface impoundment is constructed.
		☑	Description of the type, size, range, and physical and engineering properties of the materials used in constructing each zone or stage of the CCR surface impoundment.
		☑	Describe the method of site preparation and construction of each zone of the CCR surface impoundment.
		☑	A listing of the approximate dates of construction of each successive stage of construction of the CCR surface impoundment.
		☑	Drawing satisfying the requirements of 35 Ill. Adm. Code 845.220(a)(1)(F).
		☑	Description of the type, purpose, and location of existing instrumentation.
		☑	Area capacity curves for the CCR Impoundment.
		☑	Description of each spillway and diversion design features and capacities and provide the calculations used in their determination.
		☑	Construction specifications and provisions for surveillance, maintenance, and repair of the CCR surface impoundment.
	1.10.1	Is there any record or knowledge of structural instability of the CCR surface impoundment?	
		☐ Yes ☑ No	
	1.10.2	If you answered yes to Item 1.10.1, provide detailed explanation of the structural instability.	

SECTION 2: ANALYSIS OF CHEMICAL CONSTITUENTS (35 Ill. Adm. Code 845.230(d)(2)(B))

Constituents			
	2.1	Check the corresponding boxes to indicate you have attached the following:	
		☑	An analysis of the chemical constituents found within the CCR to be placed in the CCR surface impoundment.
		☑	An analysis of the chemical constituents of all waste streams, chemical additives and sorbent materials entering or contained in the CCR surface impoundment.

SECTION 3: DEMONSTRATIONS AND CERTIFICATIONS (35 Ill. Adm. Code 845.230(d)(2)(D))

Demonstrations

3.1 Indicate whether you have attached a demonstration that the CCR surface impoundment, as built, meets, or an explanation of how the CCR surface impoundments fails to meet, the location standards in the following sections:

35 Ill. Adm. Code 845.300 (Placement Above the Uppermost Aquifer)	☑	Demonstration	☐	Explanation
35 Ill. Adm. Code 845.310 (Wetlands)	☑	Demonstration	☐	Explanation
35 Ill. Adm. Code 845.320 (Fault Areas)	☑	Demonstration	☐	Explanation
35 Ill. Adm. Code 845.330 (Seismic Impact Zones)	☑	Demonstration	☐	Explanation
35 Ill. Adm. Code 845.340 (Unstable Areas and Floodplains)	☑	Demonstration	☐	Explanation

SECTION 4: ATTACHMENTS

Attachments

4.1 Check the corresponding boxes to indicate that you have attached the following:

☑	Evidence that the permanent markers required by 35 Ill. Adm. Code 845.130 have been installed.
☑	Documentation that the CCR surface impoundment, if not incised, will be operated and maintained with one of the forms of slope protection specified in 35 Ill. Adm. Code 845.430.
☑	Initial Emergency Action Plan and accompanying certification required by 35 Ill. Adm. Code 845.520(e).
☑	Fugitive dust control plan and accompanying certification required by 35 Ill. Adm. Code 845.500(b)(7).
☑	Preliminary written closure plan as specified in 35 Ill. Adm. Code 845.720(a).
☑	Initial written post-closure care plan as specified in 35 Ill. Adm. Code 845.780(d), if applicable.
☑	A certification as specified in 35 Ill. Adm. Code 845.400(h), or a statement that the CCR surface impoundment does not have a liner than meets the requirements of 35 Ill. Adm. Code 845.400(b) or (c).
☑	History of known exceedances of the groundwater protection standards in 35 Ill. Adm. Code 845.600, and any corrective action taken to remediate the groundwater.
☑	Safety and health plan, as required by 35 Ill. Adm. Code 845.530.
☑	For CCR surface impoundments required to close under 35 Ill. Adm. Code 845.700, the proposed closure priority categorization required by 35 Ill. Adm. Code 845.700(g).

SECTION 5: GROUNDWATER MONITORING

Groundwater

5.1 Check the corresponding boxes to indicate you have attached the following groundwater monitoring information:

☑	A hydrogeologic site characterization meeting the requirements of 35 Ill. Adm. Code 845.620.
☑	Design and construction plans of a groundwater monitoring system meeting the requirements of 35 Ill. Adm. Code 845.630.

		☑	A groundwater sampling and analysis program that includes section of the statistical procedures to be used for evaluating groundwater monitoring data, required by 35 Ill. Adm. Code 845.640.
		☑	Proposed groundwater monitoring program that includes a minimum of eight independent samples for each background and downgradient well, required by 35 Ill. Adm. Code 845.650(b).

SECTION 6: CERTIFICATIONS

Certifications	6.1	Check the corresponding boxes to indicate you have attached the following certifications:	
		☑	A certification that the owner or operator meets the financial assurance requirements of Subpart I, as required by 35 Ill. Adm. Code 845.230(d)(2)(N).
		☑	Hazard potential classification assessment and accompanying certifications required by 35 Ill. Adm. Code 845.440(a)(2).
		☑	Structural stability assessment and accompanying certification, required by 35 Ill. Adm. Code 845.450(c).
		☑	Safety factor assessment and accompanying certification, as required by 35 Ill. Adm. Code 845.460(b).
		☑	Inflow design flood control system plan and accompanying certification, as required by 35 Ill. Adm. Code 845.510(c)(3).

K P R G

ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG and Associates, Inc.

APPLICATION FOR INITIAL OPERATING PERMIT – METAL CLEANING BASIN

POWERTON GENERATING STATION
MIDWEST GENERATION, LLC
PEKIN, ILLINOIS

Illinois EPA Site No. 1798010008-03

March 31, 2022

Submitted To:

Illinois Environmental Protection Agency
1021 North Grand Avenue East
Springfield, Illinois 62702

Prepared For:

Midwest Generation, LLC
13082 East Manito Rd.
Pekin, IL 61554

Prepared By:

KPRG and Associates, Inc.
14665 West Lisbon Road, Suite 1A
Brookfield, WI 53005

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Introduction

Midwest Generation, LLC (Midwest Generation) currently operates the coal-fired generating station, referred to as Powerton Station, located in Pekin, Illinois ("site" or "generating station"). As part of generating electricity and managing the coal combustion residuals (CCR), the station operates two active CCR surface impoundments (the Ash Surge Basin (ASB) and Ash Bypass Basin (ABB)). As part of the earlier historical operations at the station, the Former Ash Basin (FAB) was used for the management/storage of CCR and has been identified as an inactive CCR surface impoundment subject to Federal and State regulation. The station also operates the Metal Cleaning Basin (MCB), a CCR surface impoundment subject to the state CCR regulations. The MCB was originally used to receive bottom ash via sluicing, it is now only used to receive boiler wash via sluicing with the resulting wastewater treated in the wastewater treatment plant. The MCB is also used to temporarily store dry bottom ash and fly ash delivered by end dumping into it.

The objective of this submittal is to apply for the initial operating permit for the MCB at the Powerton Generating Station. Per Variance Request PCB 21-109, Midwest Generation was granted an extension to submit the initial operating permit for the MCB until March 31, 2022 by the Illinois Pollution Control Board. Midwest Generation seeks to receive the operating permit to continue operating the existing CCR surface impoundment to manage CCR as part of operating the coal-fired generating station to generate electricity. An initial operating permit application was submitted in October 2021 for the ASB, ABB, and FAB.

This submittal provides the information as required in accordance 35 Ill. Adm. Code 845.230. This permit application is organized to discuss each section of 35 Ill. Adm. Code 845.230, as necessary.

This permit application is organized with supporting Tables and Figures that are referenced in the discussions being provided at the end of the full Permit text with the table numbers and figures tied to the Section number within which they are referenced with sequential numbering (e.g., Tables referenced in Section 9 are numbered 9-1, 9-2, etc. Figures referenced in Section 9 are numbered Figure 9-1, 9-2, etc.). Specific Attachments referenced within each Section are provided in a similar fashion (e.g., Attachment 1 information is tied to Section 1 of the Permit text, Attachment 2 information is tied to Section 2 of the Permit text, etc.). It should be noted that if a Section does not reference an Attachment, then that Attachment number is not included as part of the permit application. For example, Section 13 does not reference an Attachment; therefore, there is no Attachment 13 in this permit application.

1.0 History of Construction, 845.230(d)(2)(A)

The history of construction of the CCR surface impoundment as specified in Section 845.220(a)(1) is presented below.

1.1 CCR Surface Impoundment Identifying Information

The identifying information associated with the CCR surface impoundments at the generating station are listed in the table below.

Name	Owner/Operator	Impoundment ID Number
Metal Cleaning Basin	Midwest Generation 804 Carnegie Center Princeton, NJ 08540	W1798010008-03

1.2 Purpose of CCR Impoundment

The following description of the purpose of the MCB is from the MCB's History of Construction written by Civil & Environmental Consultants, Inc (CEC).

"The original operation of the Metal Cleaning Waste System was to collect wash water from the air heaters and boilers, transport the wash water to the metal cleaning waste basin and treat the basin discharge for the removal of dissolved metals and suspended solids to produce an acceptable effluent for discharge to the Ash Surge Basin under the Station's National Pollutant Discharge Elimination System (NPDES) permit. Solids that settle in the Basin are periodically hauled off-site.

Operation of the Basin has changed to also occasionally receive dry bottom ash and fly ash from maintenance activities into the Basin for temporary storage. Wastewater is periodically pumped from the Basin (when the dry ash is not in the Basin), treated to remove dissolved metals and suspended solids, and discharged into the Ash Surge Basin under the Station's NPDES permit. Other than boiler wastes and precipitation falling on the basin, the Basin has no inflow."

1.3 CCR Impoundment Length of Operation

The MCB was constructed circa 1978 and has been operating since. The pond has been operating for about 43 years.

1.4 Type of CCR in Impoundment

The type of CCR temporarily stored in the MCB are bottom ash and fly ash Any CCR present in the MCB is routinely removed after the time needed for temporary storage is complete. The bottom ash comes from street sweeping and cleanup activities that occur on the Powerton property. The fly ash temporarily stored in the MCB is the remnants of fly ash removed from the fly ash silos after they are cleaned. The chemical constituents that make up the CCR is explained in further detail in Section 2.

1.5 Name and Size of the Watershed

The MCB is located with the Pekin Lake-Illinois River subwatershed (HUC12 071300030304), which is approximately 28,847 acres (USGS 2015).

It should be noted that surface water run-on for the MCB is limited to the immediate area surrounding it because it is isolated from the larger Powerton Station property by the ASB, the inlet channel, and the surrounding roadways.

1.6 Description of CCR Impoundment Foundation

The MCB foundation consists of constructed fill embankments on the north, west, and east sides. The south embankment consists of almost entirely natural ground with minor filling to construct the upper portion of the embankment.

The following sections discuss the foundation materials' physical and engineering properties.

1.6.1 Physical Properties of Foundation Materials

The physical properties of the foundation materials in which the MCB is constructed ranges from sand and clay. Alluvial sands and gravels with some minor clay underlies the Site. This information was obtained from published geologic information and field investigations performed by KPRG (2005), Patrick Engineering, and Geosyntec (2015). Publicly available geologic information shows the site is underlain by approximately 100 to 125 feet of alluvial sands and gravels with minor interspersed clay. Patrick Engineering (2011) and Geosyntec (2016) investigations show that the silt and clay layers identified range from 16 to 20 feet with approximately 34 to 43 feet of medium dense poorly graded sand and gravel below. No abutments are present because of the earthen berm embankment construction.

The physical properties of the embankment fill materials consist of fine to coarse silty sand in the east embankment and clay with intermingled sand and gravel layers in the west embankment. The soils that underlain the MCB consists of clay with some sand and gravel.

1.6.2 Engineering Properties of Foundation Materials

The engineering properties for the foundation materials listed in the following table are from the periodic structural stability and safety factor assessments performed by Civil & Environmental Consultants, Inc. (CEC) for the MCB. The properties were determined from the site investigation, published correlations, and laboratory testing of samples collected during the site investigations.

Material	Unit Weight (pcf)	Drained friction angle (degrees)	Effective cohesion (psf)	Undrained Shear Strength (psf)
Clay	115	32	25	600
Sand	125	32	0	-

1.7 Description of the Construction Materials, Methods, and Dates

The descriptions of the construction materials, methods, and dates are based on the construction drawings created by NUS in 1978, and site investigations. The drawings discussed in the following sections are located in Attachment 1.

1.7.1 Physical and Engineering Properties of Construction Materials

The MCB's physical properties for the construction materials for this section are the same as the physical properties of the foundation materials. As described in Section 1.6.1, the physical properties for the foundation materials were described as alluvial sands and gravels with some minor clay.

Based on construction documents available from NUS in 1978 and located in Attachment 1-1, the embankments were designed to be constructed using compacted fill. The top of the east embankment was designed to have a gravel-surfaced access road and it is the same embankment as the Ash Surge Basin's west slope. The remaining north, west, and south embankments are either gravel-covered or vegetated. The interior embankments were originally lined with a Hypalon geomembrane liner and the base was lined with a Poz-O-Pac liner. In 2010, the existing Hypalon and Poz-O-Pac liners were left in place and covered with a new 60-mil HDPE geomembrane liner.

Engineering properties used for the design and construction of the MCB were not available. Engineering properties were estimated by CEC for use in the factor of safety assessment and the structural stability analysis for the MCB. Those engineering properties are listed in the following table:

Material	Unit Weight (pcf)	Drained friction angle (degrees)	Effective cohesion (psf)
Embankment fill	125	35	25

1.7.2 Construction Methods

The MCB was constructed in 1978 and the MCB foundation consists of constructed fill embankments on the north, west, and east sides. The south embankment consists of almost entirely natural ground with minor filling to construct the upper portion of the embankment. The south embankment consists of 10 feet of natural formations with fill material used to construct the upper 3-feet of the embankment. Beneath the embankments is native material. The side slopes were designed with 3H:1V interior slopes and 3H:1V exterior slopes on the north, south, and east sides of the MCB. The exterior west slope is the east side of the intake channel and has an approximate slope of 3H:1V.

The bottom of the basin and the lower four feet of the embankments were designed with a Poz-O-Pac liner system that was designed to be installed in two 6-inch lifts for a total thickness of 12 inches. The remaining portion of the embankments were covered with a Hypalon geomembrane liner. In 2010, the MCB was re-lined with a new 60-mil high-density polyethylene (HDPE) geomembrane. The new HDPE liner was placed on the embankments and the base, over the existing Hypalon liner and Poz-O-Pac liner base. As part of the re-lining, the Poz-O-Pac liner on the north side of the outlet weir was removed and replaced with a 60-mil HDPE geomembrane that was then over topped with 18 inches of riprap. The height of the existing concrete outlet weir was extended vertically 18 inches using concrete.

1.7.3 Construction Dates

According to Powerton Station plant personnel, the MCB was constructed in 1978. The available construction drawings by NUS_were approved in 1978, and the basin was constructed with a Poz-O-Pac liner on the base and Hypalon liner on the side slopes. As stated above, the MCB was re-lined in 2010 with a new HDPE geomembrane liner.

1.8 Detailed Dimensional Drawings

No documentation of construction documents were available for the MCB. However, according to Powerton Station plant personnel, the MCB was constructed in 1978. Construction documents prepared by NUS, dated 1978, are included in Attachment 1-1. The as-built drawings for the liner replacement prepared by NRT, dated 2011, are included in Attachment 1-2.

1.9 Instrumentation

No electronic instrumentation is present in the MCB. A staff gauge was installed in the basin to determine the water level visually.

1.10 Area-Capacity Curve

An area-capacity curve for the MCB created by KPRG is provided on Figure 1.

1.11 Spillway and Diversion Capacities and Calculations

The discharge for the MCB consists of a 3.5 feet tall weir on the north end of the MCB after it was extended as part of the re-lining in 2010. After water overflows the weir, it discharges from the basin through a 24" diameter reinforced concrete pipe. The inlet for the MCB consists of three concrete inlet aprons. From the pipe, the sluice water flows into the MCB. No calculations for the original design are available.

1.12 Surveillance, Maintenance, and Repair Construction Specifications

Specifications for the original construction of the MCB were not available for this application. Attachment 1-3 contains the liner replacement specifications and Attachment 1-4 contains the IEPA issued permit for the liner replacement.

1.13 Record of Structural Instability

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

2.0 CCR Chemical Constituents Analysis, 845.230(d)(2)(B)

The CCR that has historically been placed in the MCB were dry bottom ash and dry fly ash. The bottom ash and fly ash CCR were sampled and analyzed with the results presented in Table 2. The CCR laboratory data packages are included in Attachment 2.

Currently, the Powerton Station is sending the gas-side boiler cleaning wastewater, which may contain boiler slag, to the MCB. The wastewater is produced from cleaning the generating unit's boiler, which occurs annually over a 5-day period. The total wastewater produced during the cleaning is approximately 7.2 million gallons.

The above listed waste stream is treated prior to being discharged to the Illinois River. Water discharged from the MCB enters the Metal Cleaning Treatment System and then the Ash Surge Basin. The discharge from the Ash Surge Basin is currently regulated by NPDES Permit No. IL0002232.

3.0 Chemical Constituents Analysis of Other Waste Streams, 845.230(d)(2)(C)

No other waste streams, other than what is discussed in Section 2, enter the MCB. A Powerton Flow Diagram is included in Attachment 3.

4.0 Location Standards Demonstration

4.1 Placement Above the Uppermost Aquifer

According to the Locations Restrictions Compliance Demonstration performed by KPRG in March 2022, the base of the MCB is separated from the upper limit of the uppermost aquifer by a minimum distance of five (5) feet. Therefore, the location of the MCB complies with Section 845.300. This determination is included in Attachment 4.

4.2 Wetlands

According to the Location Restrictions Compliance Demonstration performed by KPRG in March 2022, the MCB is not located in mapped wetlands included in the National Wetlands Inventory presented by the U.S. Fish and Wildlife Service (USFW) [USFW, 2018]. Therefore, the location of the MCB complies with Section 845.310. This determination is included in Attachment 4.

4.3 Fault Areas

According to the Location Restrictions Compliance Demonstration performed by KPRG in March 2022, the MCB is not located within 200 feet (60 meters) of a mapped Holocene-aged fault, as mapped by the United States Geological Survey (USGS) Quaternary Fault Database. Therefore, the location of the MCB complies with Section 845.320. This determination is included in Attachment 4.

4.4 Seismic Impact Zones

According to the Location Restrictions Compliance Demonstration performed by KPRG in March 2022, the MCB is not located within a seismic impact zone, as defined in Section 845.120, and as mapped by the United States Geological Survey (USGS). Therefore, the location of the MCB complies with Section 845.330. This determination is included in Attachment 4.

4.5 Unstable Areas

According to the Location Restrictions Compliance Demonstration performed by KPRG in March 2022, the MCB is not located in an unstable area. Therefore, the location of the MCB complies with Section 845.340. This determination is included in Attachment 4.

4.6 Floodplains

As determined by KPRG, the MCB is not located in a floodplain with a 1% chance or greater of occurring according to the National Flood Hazard Layer FIRMette Map No. 17179C0175E as mapped by the Federal Emergency Management Agency. The 1% flood elevation listed on FIRMette Map No. 17179C0175E is 457 ft above mean sea level (amsl) and the embankment crest of the MCB is between 467 to 468 ft amsl. Therefore, the location of the MCB complies with Section 845.340. The determination is located in Attachment 4.

5.0 Permanent Markers, 845.230(d)(2)(E)

The permanent marker has been installed at the MCB in accordance with 35 Ill. Adm Code 845.230(d)(2)(D). Photographic documentation of this requirement is included in Attachment 5.

6.0 Incised/Slope Protection Documentation, 845.230(d)(2)(F)

The MCB was constructed with partial embankments on all sides. The interior slopes of the MCB are lined with a 60-mil high-density polyethylene geomembrane. This geomembrane protects the slopes from erosion, the effects of wave action, and mitigation effects of rapid drawdown. The exterior north and west slopes have erosion protection because of established vegetation. The exterior east slope has erosion protection because of a paved road on the embankment crest and the geomembrane-lined interior slope of the Ash Surge Basin. The exterior south slope has erosion protection because of established vegetation and gravel. Photo documentation is included in Attachment 6.

7.0 Emergency Action Plan, 845.230(d)(2)(G)

The Emergency Action Plan (EAP) for the Ash Surge Basin (ASB) and Ash Bypass Basin (ABB) were completed by Civil and Environmental Consultants, Inc. (CEC) in April 2017 to comply with 40 CFR Part 257 to identify safety emergencies and the proper responses in relation to each basin.

The ASB and ABB were identified as Class 2 surface impoundments in their hazard potential assessments and the EAP was prepared accordingly. The MCB hazard potential assessment identified it as a Class 2 surface impoundment. KPRG updated the previously completed EAP to include the MCB and reviewed the EAP for its compliance with Section 845.520. KPRG's review ensured that all the necessary sections required by Section 845.520 are included within the EAP. This review neither accepts nor rejects the safety emergencies identified by CEC. The safety emergencies identified along with the responses are the product of CEC. KPRG has not altered the safety emergencies or the responses associated with each emergency. The updated EAP is included in Attachment 7.

8.0 Fugitive Dust Control Plan, 845.230(d)(2)(H)

The Fugitive Dust Control Plan is included in Attachment 8. This plan covers the ASB, the ABB, the FAB, and the MCB. This plan was originally created in October 2015 and was revised in September 2021 by KPRG. This plan complies with Section 845.500(b).

9.0 Groundwater Monitoring Information, 845.230(d)(2)(I)

9.1 Hydrogeologic Site Characterization

The following subsections provide information on the geology and hydrogeology of the site as required under Section 845.620(b). Site geology and hydrogeology are discussed separately below. Referenced Tables and Figures are provided at the end of this section. Other supporting documentation is provided with the referenced Attachment.

9.1.1. Geology

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

Regionally, the stratigraphy in the area consists of approximately 100 to 125 feet of unconsolidated deposits consisting mainly of alluvial sands and gravels with some interspersed clays/silty clays. The unconsolidated deposits are underlain by alternating layers of limestone, shale, and coal of the Carbondale Formation. To evaluate local stratigraphy and as part of groundwater model development in support of the Construction Permit being submitted under separate cover, water and test well logs were obtained for wells in the general vicinity of the Powerton Generation

Station. The stratigraphy data from these boring logs and the well locations are provided in Attachment 9-1. In addition, well logs from 21 monitoring wells that were installed in the vicinity of the subject surface impoundments were evaluated (MW-1 through MW-21; see Figure 9-1) with those borings ranging in depth from 30 feet to 41 feet. This information is also included in Attachment 9-1. Boring logs for these monitoring wells are included in Attachment 9-2. Based on an evaluation of this data, the following general site-specific stratigraphy is defined based on the 21 on-site monitoring well boring logs:

- Fill (16' to 24.5' thick) – Consisting of tan, brown and black fine to medium sand/silty sand with some gravel and clay seams. Several locations also included black cinders and brick fragments.

- Clay/silty clay/silts (0' to approximately 18' thick) – Consisting of olive, brown and gray clays, silts and silty clays with some more organic rich layers. May locally contain fine silty sand and/or fine sand. This unit is not mappable across the site (i.e., discontinuous).

- Sand and gravel (thickness undetermined; borings terminate within unit) – Consisting of light brown, brown and/or gray medium to coarse sands and gravels.

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

Geologic cross-sections for the broader vicinity of the ash basins in the area were provided with the Application for Initial Operating Permit – Powerton Generating Station submitted on October 31, 2021 for the Ash Surge Basin, Ash By-pass Basin and Former Ash Basin. Geologic cross-sections focusing on the vicinity of the MCB are provided on Figures 9-2 through 9-4.

There are no underground mines beneath the subject CCR surface impoundment.

9.1.2 Hydrogeology

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

Groundwater beneath the Powerton Generating Station occurs under water table conditions. Saturated conditions are generally encountered between 18 to 32 feet bgs, depending on the well location. Saturated conditions occur either within the clay/silty clay unit (identified as Unit B in the cross-sections), or within the sand and gravel unit (Unit C) where the clay/silty clay unit is not present. The clay/silty clay unit is present beneath the MCB as therefore, is the target unit for the groundwater monitoring system. The leak detection monitoring system around the MCB consists of five wells. Monitoring wells MW-15 and MW-17 are upgradient monitoring wells situated between the Ash Surge Basin to the east and the MCB to the west. Monitoring wells MW-14, MW-20 and MW-21 are situated immediately downgradient of the MCB, along its western side. Well MW-13, located at the east portion of the south side of the MCB, has also been being sampled concurrently with the above noted wells. This well was initially installed in 2010 by Patrick Engineering as an upgradient well location for the MCB as part of the relining construction permit requirements (Permit No. 2009-EB-2748). It is noted, however, that this well is actually located side-gradient relative to groundwater flow within the clay/silty clay unit and its screen extends down into the underlying, more extensive sand and gravel unit (see Figures 9-2 and 9-3). Therefore, it has been determined that the water quality data from this well, although useful in evaluating overall site conditions, is not representative of groundwater data for the purposes of leak detection monitoring for the MCB.

Groundwater elevation data from the monitoring wells around the MCB are provided in Table 9-2. A hydrograph of water levels for the MCB leak detection monitoring wells are provided as Figure 9-5. A review of the hydrographs shows some temporal fluctuations with the highest water levels generally occurring within the first or second quarters of the year. It is noted that the water levels in the two new monitoring wells are consistently several feet lower than the other wells, however, based on the boring log data, the wells are all screened within the clay/silty clay unit.

Monthly groundwater flow maps from April 2021 through December 2021 are provided in Attachment 9-3. The water elevation data within the clay/silt unit indicates localized groundwater flow beneath the MCB in a westerly direction. Table 9-3 provides a summary of the flow direction, gradients and an estimated rate of groundwater flow based on the monthly flow maps provided in Attachment 9-3. The flow rate was calculated using the following equation:

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

Where:

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

The average hydraulic conductivity of 3.28×10^{-7} ft/sec (silt/clay unit) in Table 9-3 is consistent with estimates from current ongoing groundwater modeling evaluations in support of construction permit evaluations and literature values (Freeze and Cherry, 1979). The estimated effective porosity of the silt/clay materials (0.40) was obtained from literature (Applied Hydrogeology, Fetter, 1980).

At this time, based on the geology discussion in Section 9.1.1 and the site-specific hydrogeology discussion above, the groundwater beneath the CCR surface impoundments is considered as Class

I Potable Resource Groundwater in accordance with Section 620.210. It is noted, however, that a Groundwater Management Zone (GMZ) and an Environmental Land Use Control ("ELUC") have been established where the CCR surface impoundments are located, including the MCB, in as part of a Compliance Commitment Agreement (CCA) between Midwest Generation and Illinois EPA. The ELUC states that the groundwater shall not be used as potable water. The extent of the established and approved GMZ and ELUC are provided on Figure 9-6. The GMZ and ELUC occupy the same extent of the Powerton property.

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

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

As part of this permit preparation, KPRG evaluated the NRT information and reviewed the new Illinois State Geological Survey database and interactive map references as "ILWATER". The survey results are provided on Figure 9-7. Twelve wells were identified within a 2,500-foot radius of the Station's subject CCR surface impoundments. The two wells off-site to the east are upgradient of the subject impoundments. There were eight wells identified on Powerton Station property on the ILWATER interactive map all of which were older construction wells installed by previous Ownership. Discussions with facility personnel indicate that all eight of these wells were taken out of service/abandoned. The two wells at the far western boundary of the 2,500 foot radius (identified as wells 9 and 10 from the NRT evaluation) are part of the six water wells currently on the Powerton Station property that are in use (the remaining four wells are located further west, outside the 2,500 foot search radius). These two wells are screened within the sand/gravel aquifer but are not directly downgradient of the surface impoundments and are separated from those units by the intake and outfall channels. They are regularly sampled and analyzed for potable water constituents. The sampling results consistently have been in compliance with potable water regulations.

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

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

There is quarterly groundwater quality data associated with monitoring wells MW-13 through MW-15 dating back to December 2010. However, the parameter list was slightly different from that specified in Section 845.600 and included analysis of dissolved inorganic parameters rather than total inorganic parameters. That historical water quality data is provided in Attachment 9-4.

The MCB is not subject to the federal requirements under Federal Register, Environmental Protection Agency, 40 CFR Parts 257.94, Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule dated April 17, 2015 (Federal CCR Rule). However, monitoring wells MW-15 and MW-17 are also part of the CCR monitoring well network for the ABB/ASB which are subject to the Federal CCR Rule. Therefore, as required under the Federal CCR Rule, eight rounds of background sampling were completed for the monitoring wells within the monitoring network for the subject CCR surface impoundments. This included the full list of Appendix III (detection monitoring) and IV (assessment monitoring) parameters. Since the effective date of the State CCR Rule, quarterly groundwater monitoring for the full list of parameters specified in Section 845.600, which includes all parameters in the Federal CCR Rule Appendix III/IV, has continued. This data is provided in Table 9-4 for the MCB. In addition, it is noted that Illinois EPA added turbidity measurements to the list with a required eight rounds of background of that parameter for each well in the monitoring network for regulated CCR surface impoundments. This data is provided in Table 9-5.

9.2 Groundwater Monitoring System Design and Construction Plans (845.230(d)(2)(H)(ii)

A monitoring well network that includes other basins in the vicinity of the MCB was established in 2010 and expanded pursuant to the CCA. In addition, wells MW-20 and MW-21 were installed in March 2021 on the west side of the MCB to meet the State CCR Rule requirements. The well depths were determined based on depth to groundwater and the base elevations of the basins being monitored. The following groundwater monitoring network is established for the MCB:

- Upgradient/background wells – MW-15 and MW-17
- Downgradient monitoring wells – MW-14, MW-20 and MW-21

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

As previously discussed, well MW-13, located at the east portion of the south side of the MCB, has also been being sampled concurrently with the above noted detection wells. This well was initially installed in 2010 by Patrick Engineering as an upgradient well location for the MCB as part of the relining construction permit requirements (Permit No. 2009-EB-2748). It is noted, however, that this well is actually located side-gradient relative to groundwater flow within the clay/silty clay unit and its screen extends down into the underlying, more extensive sand and gravel unit (see Figures 9-2 and 9-3). Therefore, it has been determined that the water quality data from this well, although useful in evaluating overall site conditions, is not representative of groundwater data for the purposes of leak detection monitoring for the MCB.

Monitoring wells MW-14 and MW-15 were installed in 2010 by Patrick Engineering, Inc. Wells MW-17, MW-20 and MW-21 were installed by KPRG and Associates, Inc. at varying times since the initial 2010 well installations (well MW-17 in September 2015 and wells MW-20 and 21 in March 2021). Wells were drilled using 4.25-inch hollow stem augers. The wells were completed with standard 2-inch inner-diameter PVC casing with 10-feet of 0.010 slot PVC screen. Filter sand pack around each screen was extended to approximately 2-feet above the top of the well screen. The remainder of the annulus was backfilled with bentonite. Surface completions include stick-up (above grade two to three feet) locking protector casings set in concrete aprons. The wells are further protected by traffic bollards, as necessary. Boring logs and well construction summaries for these wells are provided in Attachment 9-2. Ground surface and top-of-casing elevations were surveyed by an Illinois licensed surveyor and are included in the previously referenced groundwater elevation table.

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

In accordance with requirements under Section 845.630(g), Attachment 9-5 includes an Illinois licensed Professional Engineer certification of the above-defined monitoring system.

9.3 Groundwater Sampling and Analysis Program (845.230)(d)(2)(I)(iii)

9.3.1 Sample Frequency

As noted in Section 9.1, wells MW-15 and MW-17 are also part of the CCR Groundwater monitoring network for the ABB/ASB, which is regulated under the Federal CCR Rule. As such, these two wells have been sampled on a quarterly basis starting the 4th quarter of 2015 for eight consecutive quarters for both Appendix III and Appendix IV parameters specified in the Federal CCR Rule which is the same parameter listing as provided under the State CCR Rule Section 845.600(a) plus calcium. Monitoring wells MW-14, MW-20 and MW-21 had eight rounds of CCR sampling done to meet the State CCR Rule requirements starting in April 2021 through December 2021. This dataset will facilitate the development of proper statistical evaluation procedures for the site and use in development of applicable GWPSs for each constituent pursuant to Section 845.600(b). All available data will be used in statistical evaluations and in developing an appropriate and representative background for the State CCR Rule compliance. Illinois EPA added turbidity as an additional parameter that will require development of a statistical background. Since this parameter was not included within the Federal CCR Rule, eight rounds of turbidity measurements were obtained within the 180-day period since the effective date of the State Rule. However, this restricted period of background data collection does not facilitate evaluation of potential seasonal variations during the development of statistical background for this parameter.

Currently, all wells within this CCR monitoring network are being sampled on a quarterly basis for all parameters specified in Section 845.600(a) plus calcium and turbidity. Between quarterly monitoring events, groundwater level measurements from all designated CCR monitoring wells will be also obtained and recorded on a monthly basis along with Basin water level elevations.

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

9.3.2 Sampling Preparation and Calibrations

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

Prior to sampling activities, and at intervals recommended by the manufacturer, all non-dedicated equipment shall be cleaned and calibrated. Specifically, the field parameter water quality meter to be used for pH, specific conductance, turbidity and temperature will be calibrated using standard reference solutions. In addition, an operational check of the electronic water level probe will also be performed by placing the probe into a bucket of water and ensuring that the audio signal is triggered when the sensor meets the water interface. The associated tape measure of the probe will also be checked for wear.

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

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

9.3.3 Groundwater Sample Collection

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

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

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

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

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

- Pull the dedicated tubing and pump from the well and ensure that the tubing does not come in contact with the ground.

- Visually inspect the intake of the pump for clogging from sedimentation. If clogging is noted, clean the intake with distilled water. If there is no clogging, dismantle the pump casing and inspect the bladder for any holes, cracks or tears.

- If the bladder is determined to be compromised (i.e., wear has resulted in cracking or tearing), remove the bladder and replace it with a new bladder. Properly clean all parts of the pump using procedures described in Section 9.3.4, reassemble the pump and slowly lower it back down hole. Continue sampling as described above.

- If the entire pump is determined to have failed, a new pump will need to be ordered for replacement and a modified sampling procedure will be implemented as described below.

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

9.3.4 Equipment Decontamination

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

9.3.5 Sample Preservation, Chain-of-Custody and Shipment

Since measurement of total recoverable metals is required by the State CCR Rule, the samples will not be filtered prior to collection. This will facilitate the analysis to capture both the particulate fraction and dissolved fraction of metals in natural groundwater. Groundwater samples will be collected directly into Illinois certified laboratory provided containers. Those containers will be prepared by the laboratory to contain any necessary chemical preservation. The samples shall be stored at temperatures required by the lab following sample collection. Table 9-6 includes a summary of sample bottle requirements, preservatives and holding times

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

- Project name and number, state samples collected in, sample name and type, time and date collected, analysis requested, and printed name and signatures of person(s) sampling.

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

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

9.3.6 Analytical Methods

A list of the analytical methods to be used by the laboratory for each specified parameter is included in the above referenced Table 9-6. Individual detection limits for the parameters may change slightly from sample to sample depending on potential matrix interferences with a sample (e.g., amount of suspended solids/sediment) and/or the concentration of the constituent in the sample. However, the base detection limits will be set below the applicable Illinois Class I Drinking Water Standards as defined in Section 845.600(a)(1) for that compound which are also provided in Table 9-6.

9.3.7 Quality Assurance and Quality Control

Laboratory

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

Field

The QA/QC program for fieldwork will include the collection of blind duplicate samples. The blind duplicate will be collected from a random well during every sampling event in which more than three (3) samples are collected. The duplicate will be blind in the manner that there will be no way for the laboratory to determine from which well or point the sample was collected.
Upon receipt of the analytical data, a determination will be made if the duplicate is consistent with the sample collected from the well/point. A generally acceptable range for groundwater samples is +/- 30 percent. If outside the acceptable range, a resample may be determined to be necessary and reanalyzed. If there are any questions regarding the duplicate or other reported analytical

QA/QC runs, the laboratory will be contacted to determine the effect on data quality, if any, and usability. If necessary, a specific well may need to be re-sampled.

9.3.8 Statistical Methods
A proposed statistical evaluation plan meeting the requirements specified in Section 845.640(f) is provided in Attachment 9-6 along with a certification of the plan by an Illinois licensed Professional Engineer.

9.4 Groundwater Monitoring Program, (845.230(d)(2)(I)(iv)

The groundwater sample and water level collection frequency is discussed in Section 9.3.1 above.

As previously noted, the monitoring well system for the subject surface impoundment consists of the following monitoring wells:

- Upgradient/background wells – MW-15 and MW-17
- Downgradient monitoring wells – MW-14, MW-20 and MW-21

For wells MW-15 and MW-17, eight rounds of background sampling for the purposes of statistical evaluation and background determination is available from the initial groundwater sampling which occurred starting in 2015 in compliance with the Federal CCR Rule requirements. Subsequent groundwater sampling has also occurred under the Federal CCR Rule detection and assessment monitoring requirements. All available CCR monitoring data through the end of the fourth quarter 2021 is summarized in Table 9-4 and the eight rounds of turbidity data collected since the enactment of the State CCR Rule in April 2021 in Table 9-5.

Using the currently available data for the subject CCR surface impoundment, proposed site specific Groundwater Protection Standards (GWPSs) have been established in accordance with Section 845.600(b) and are summarized in Table 9-7. The background concentrations noted in these tables were calculated using the statistical evaluation approach noted in Section 9.3.8 and provided in Attachment 9-6. A presentation of the statistical evaluations which resulted in the background concentration calculations is provided in Attachment 9-7.

Once the proposed GWPSs presented in this permit application are approved by Illinois EPA, these values will be used for all subsequent groundwater monitoring data comparisons. Monitoring will continue on a quarterly basis for all constituents specified in Section 845.600(a)(1) plus calcium and turbidity. In accordance with Section 845.610(b)(3)(D), a data summary report will be submitted to Illinois EPA within 60-days of receipt of all analytical data (including resample data if necessary as discussed below) which will include a data summary tables with a comparison against the established/approved GWPSs. This report will be placed the facility's operating record.

If during a monitoring event, a constituent(s) is/are detected above an established and approved GWPS, that well will be resampled for the specific constituent(s). If the resample data confirms that the constituent(s) concentration(s) is/are above the GWPS then the following will occur:

- Characterize the nature and extent of the potential release and any relevant site conditions that may affect the remedy evaluation/selection. This characterization must meet the requirements set forth under Section 845.650(d)(1).

- If groundwater impacts extend off-site, provide off-site landowner/resident notifications as specified under Section 845.650(d)(2) and place the notifications into the facility's operating record. This must occur within no more than 30-days of determination that a GWPS has been exceeded.

- An Alternate Source Demonstration (ASD) may be initiated and completed for submittal to Illinois EPA review/approval as allowed under Section 845.650(e). Place the ASD into the facility's operating record.

- Within 90-days of determining that a constituent(s) was detected above an established/approved GWPS at a downgradient waste boundary monitoring point, initiate an assessment of corrective measures meeting the requirements specified under Section 845.660 unless an ASD is submitted in accordance with Section 845.650(d)(2) and subsequently approved by the Illinois EPA.

By no later January 31st of each year, an Annual Groundwater Monitoring and Corrective Action Report will be prepared for inclusion as part of an Annual Consolidated Report for the facility. The Annual Groundwater Monitoring and Corrective Action Report will meet the requirements set forth under Section 845.610(e)(1 through 4). The Annual Consolidated Report will be placed into the facility's operating record.

10.0 Written Closure Plan, 845.230(d)(2)(J)

The current intention is to retrofit the MCB and not to execute closure. The included preliminary closure plan is written in accordance with Section 845.720(a) to identify that the preferred closure method for the MCB is closure through removal of CCR as defined in Section 845.740(a). The preliminary closure plan is included as part of this application in Attachment 10.

11.0 Post-Closure Care Plan, 845.230(d)(2)(K)

As stated in Section 10, the MCB will be retrofitted for further use by the station. At the time of final closure, the MCB will be closed through the removal of CCR; therefore, the post-closure care requirements in Section 845.780 are not applicable. However, groundwater monitoring will continue in accordance with Section 845.740.

12.0 Liner Certification, 845.230(d)(2)(L)

The existing liner for the MCB is considered to not have a two-component liner as described in the liner requirements of Section 845.400. The upper liner component for the MCB consists of white 60-mil high-density polyethylene (HDPE) topped with 12-inches of limestone screenings, which is then covered with 6-inches of sand. The lower liner component below the 60-mil HDPE geomembrane is the existing 12-inch Poz-O-Pac liner system and an estimated three feet of sand with silt and gravel. This composition of the liner components of the MCB was evaluated against the liner design criteria using the process outlined in Section 845.400(c) to determine if the MCB is considered lined or unlined. The calculations showing the flow rate calculations and comparison are provided in Attachment 12. The calculations indicate that the liner components for the MCB do not comply with the requirements of Section 845.400 and the surface impoundment is considered unlined.

The calculations use a weighted permeability determined based on the thickness and permeability of each layer component to compare the alternative composite liner to the composite liner requirements. With this method, this reduces the permeability on paper because of the thickness of the lower components compared to the thickness of the geomembrane portion of the liner. In reality, the upper component 60-mil HDPE geomembrane liner will significantly reduce the permeability of the basin liner and will be as effective, if not more effective, than two feet of soil with a hydraulic conductivity of 1×10^{-7} cm/sec.

13.0 History of Known Exceedances, 845.230(d)(2)(M)

As previously noted in the introduction, there is no Attachment with supporting documentation for this Section since the referenced data is provided in Attachment 9 documentation. In the fourth quarter 2010, Midwest Generation voluntarily initiated groundwater monitoring in the vicinity of the MCB. As discussed in Section 9 of this permit application, the CCR groundwater monitoring network for the MCB consists of upgradient wells MW-15 and MW-17 and downgradient wells MW-14, MW-20, and MW-21.

Proposed GWPSs in accordance with Section 845.600(a)(2) are being submitted as part of this Application for Initial Operating Permit for the MCB. If the IEPA accepts the proposed GWPSs, the groundwater monitoring since the enactment of the State CCR Rule in April 2021 has identified the following constituents above the proposed GWPSs:

- MW-15 (upgradient): Calcium, Lithium, Sulfate, and TDS.
- MW-17 (upgradient): Calcium, Chloride, Molybdenum, Radium, Sulfate, Thallium, TDS
- MW-14 (downgradient): Selenium, TDS, and Thallium
- MW-20 (downgradient): Calcium, pH, Sulfate, and TDS
- MW-21 (downgradient): Arsenic and Cobalt

The proposed GWPSs developed in accordance with Section 845.600(a)(2), are presented in Section 9.4 above. Once Illinois EPA reviews and approves those proposed GWPSs, those values will be used for subsequent groundwater monitoring data comparisons. Because the GWPSs developed in accordance with Section 845.600(a)(2) are under review, there are no approved GWPSs for the constituents in the groundwater and accordingly it cannot be determined if there is an exceedance of the groundwater protection standards in Section 845.600.

14.0 Financial Assurance, 845.230(d)(2)(N)

The financial assurance certification is included in Attachment 14.

15.0 Hazard Potential Classification Assessment, 845.230(d)(2)(O) & 845.440

The hazard potential classification has been completed by Civil & Environmental Consultants, Inc. and is included in Attachment 15.

16.0 Structural Stability Assessment, 845.230(d)(2)(P) & 845.450

The structural stability assessment has been completed by Civil & Environmental Consultants, Inc. in accordance with Section 845.540. The structural stability assessment is included in Attachment 16.

17.0 Safety Factor Assessment, 845.230(d)(2)(Q) & 845.460

The safety factor assessment has been completed by Civil & Environmental Consultants, Inc. in accordance with 845.460(b) and is included in Attachment 16. The safety factor assessment was completed as part of the same document as the structural stability assessment.

18.0 Inflow Design Flood Control System Plan, 845.230(d)(2)(R) & 845.510

An Inflow Design Flood Control System Plan has been completed by Sargent & Lundy, LLC in accordance with 845.510 and is included in Attachment 18.

19.0 Safety and Health Plan, 845.230(d)(2)(S) & 845.530

A Safety and Health Plan in accordance with Section 845.530 has been completed and is provided in Attachment 19.

20.0 Closure Priority Categorization, 845.230(d)(2)(T)

Based on Section 845.700(g), the category designation for the MCB is Category 7. The Category 7 designation for the MCB is based on the following:

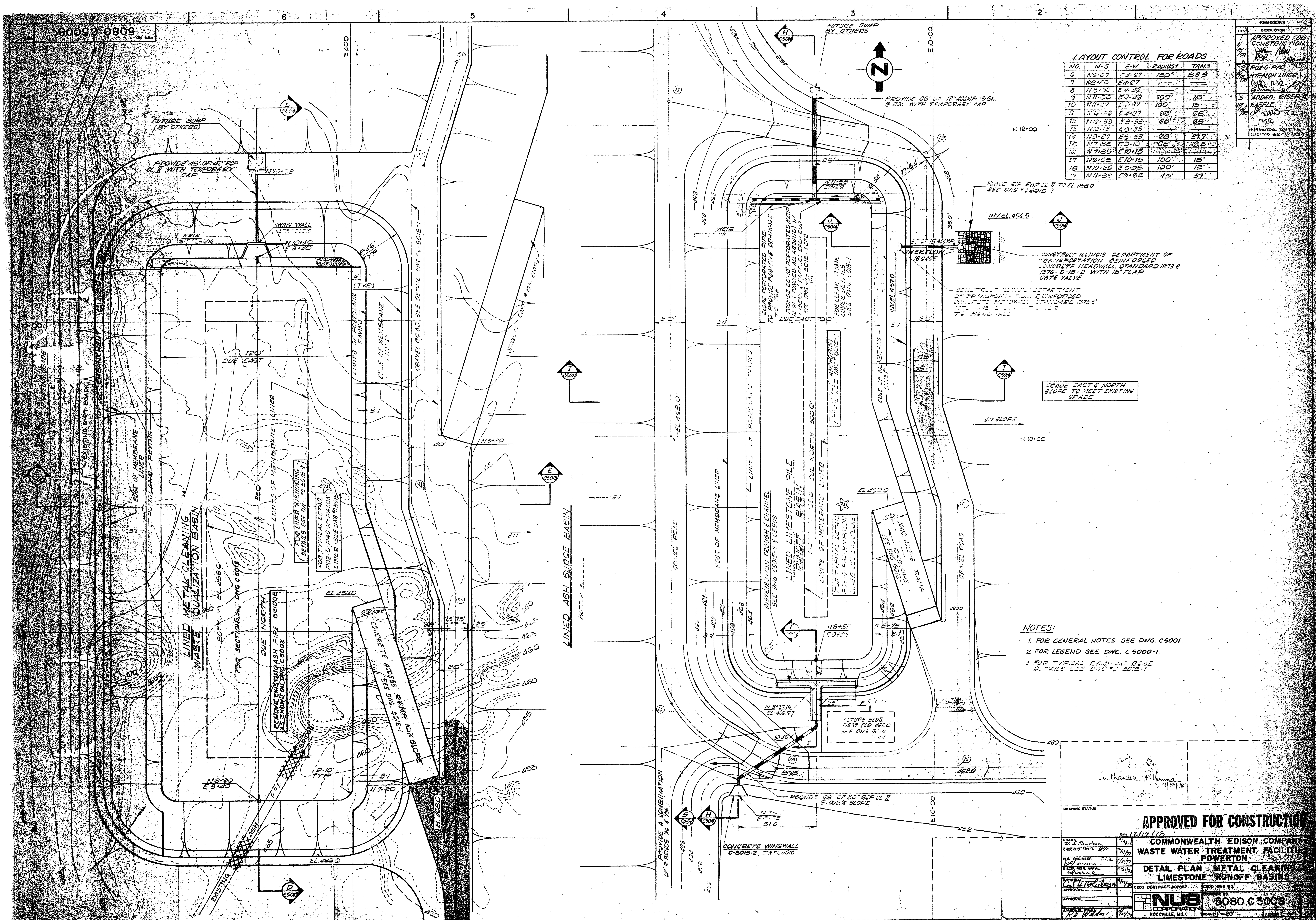
- The MCB is an active CCR surface impoundment.
- There are no potable water supply wells or setbacks of existing potable water supply wells downgradient of the MCB. As such, Midwest Generation is not aware of any imminent threat to human health or the environment.

- MWG used the Illinois EPA EJ Start tool found at https://illinois-epa.maps.arcgis.com/apps/webappviewer/index.html?id=f154845da68a4a3f837cd3b880b0233c to determine that the MCB is not within one mile of an area of environmental justice concern.

- Because the GWPSs developed in accordance with Section 845.600(a)(2) are under review, there are no approved GWPSs for the constituents in the groundwater and accordingly it cannot be determined if there is an exceedance of the groundwater protection standards in Section 845.600.

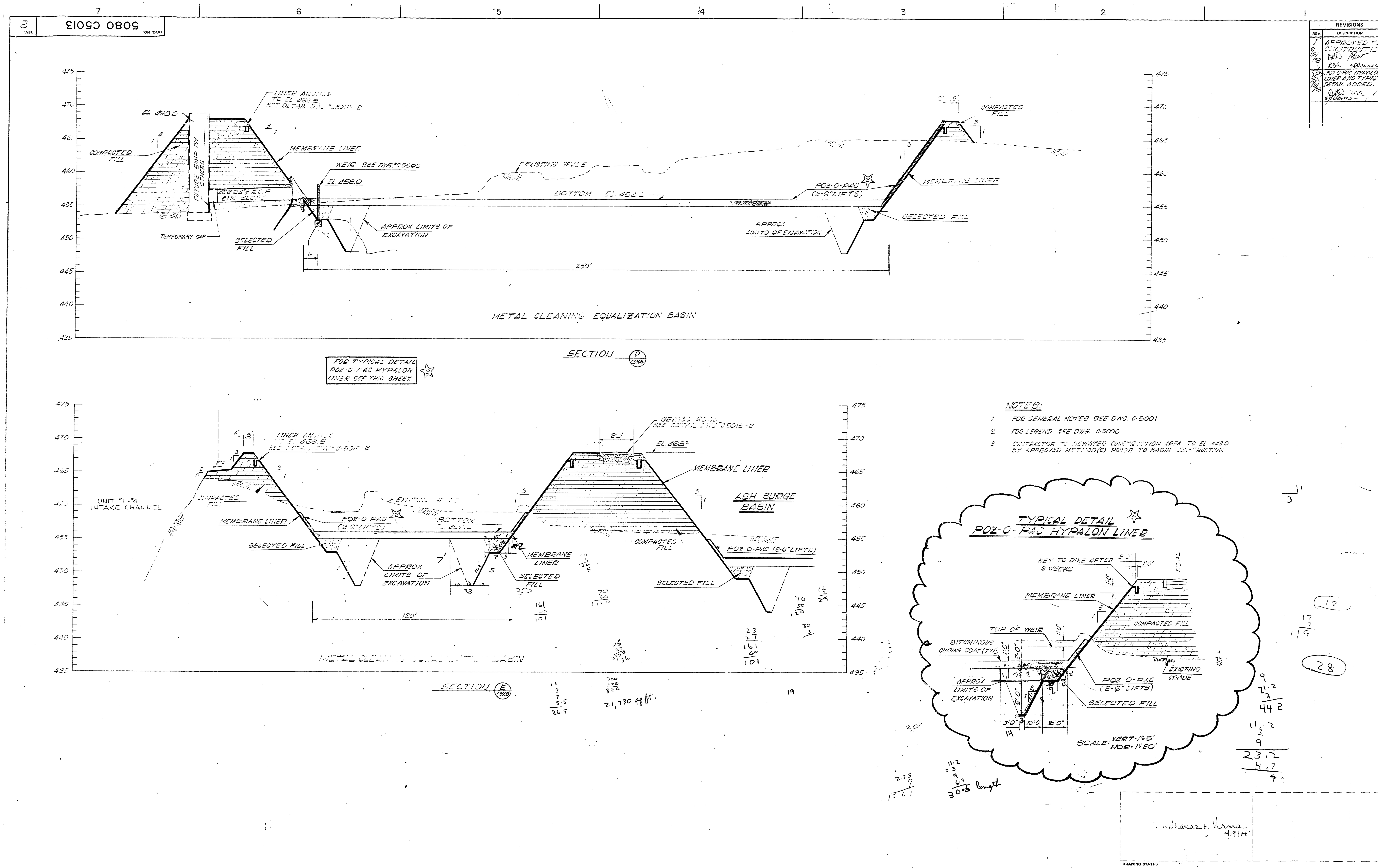
ATTACHMENT 1
HISTORY OF CONSTRUCTION

Attachment 1-1 – MCB NUS Construction Drawings



LAYOUT CONTROL FOR ROADS

NO.	N-S	E-W	RADIUS±	TAN±
6	N6+07	E4+67	150'	83.3
7	N8+25	E4+67	—	—
8	N8+90	E4+46	—	—
9	N11+00	E4+46	100'	15'
10	N11+87	E4+67	100'	15
11	N16+33	E4+37	68'	68'
12	N16+33	E8+33	68'	68'
13	N12+18	E8+33	—	—
14	N8+27	E8+33	68'	37.7'
15	N7+85	E9+10	68'	19.5
16	N7+85	E10+15	—	—
17	N9+55	E10+15	100'	15'
18	N10+20	E9+95	100'	15'
19	N11+82	E9+95	45'	37'



DRAWING STATUS

APPROVED FOR CONSTRUCTION

COMMONWEALTH EDISON COMPANY
WASTE WATER TREATMENT FACILITIES
POWERTON

METAL CLEANING BASIN
SECTIONS

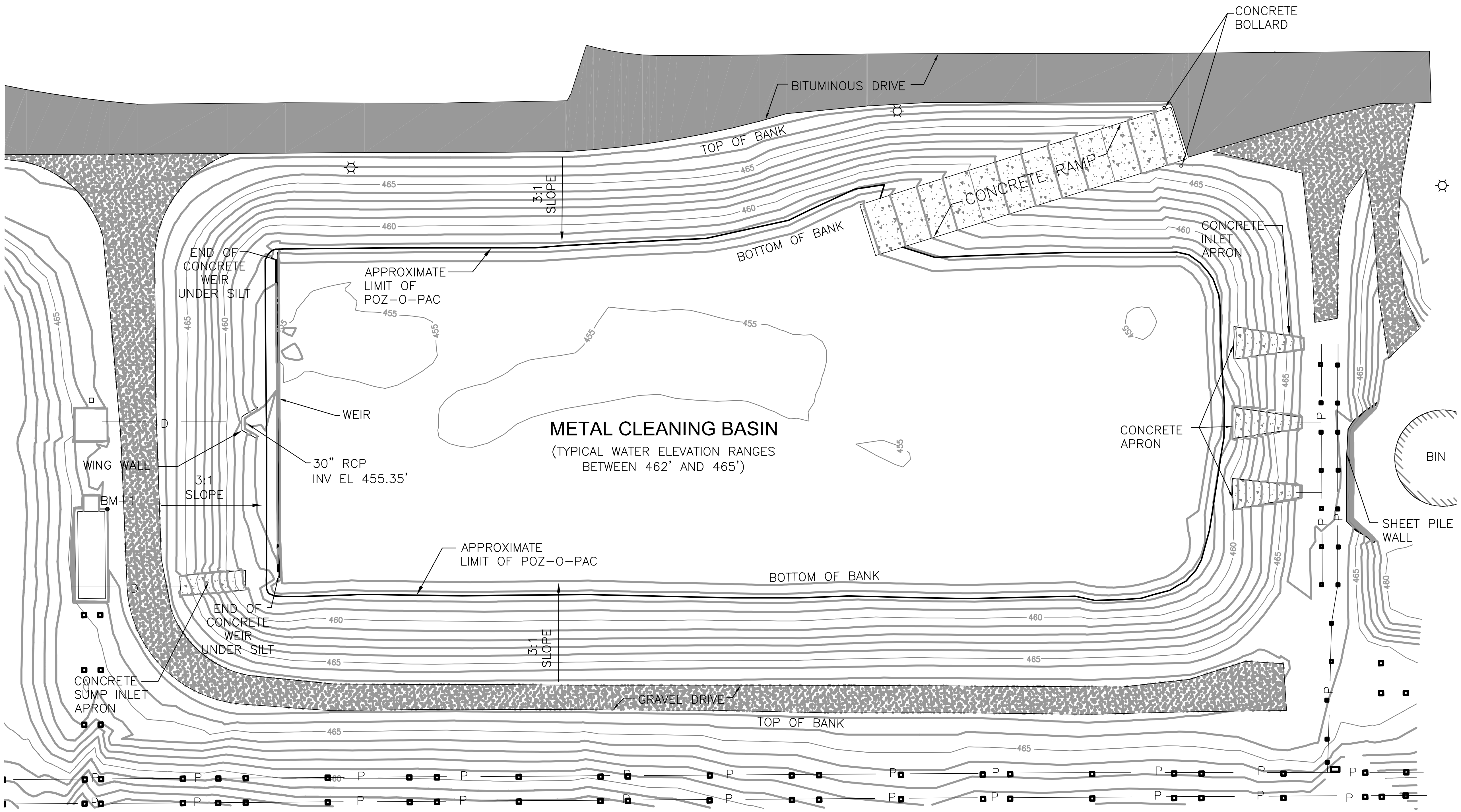
CECO CONTRACT 802667 | CECO DWG. NO. | REV.

NUS CORPORATION ROCKVILLE, MD.

DRAWING NO. 5080 C5013 REV. 2

SCALE: AS NOTED SHEET 1 OF 1

Attachment 1-2 – MCB NRT Liner Replacement Drawings



LEGEND

Symbol	Description
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

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
REVISION:		DATE:	APP'D BY:

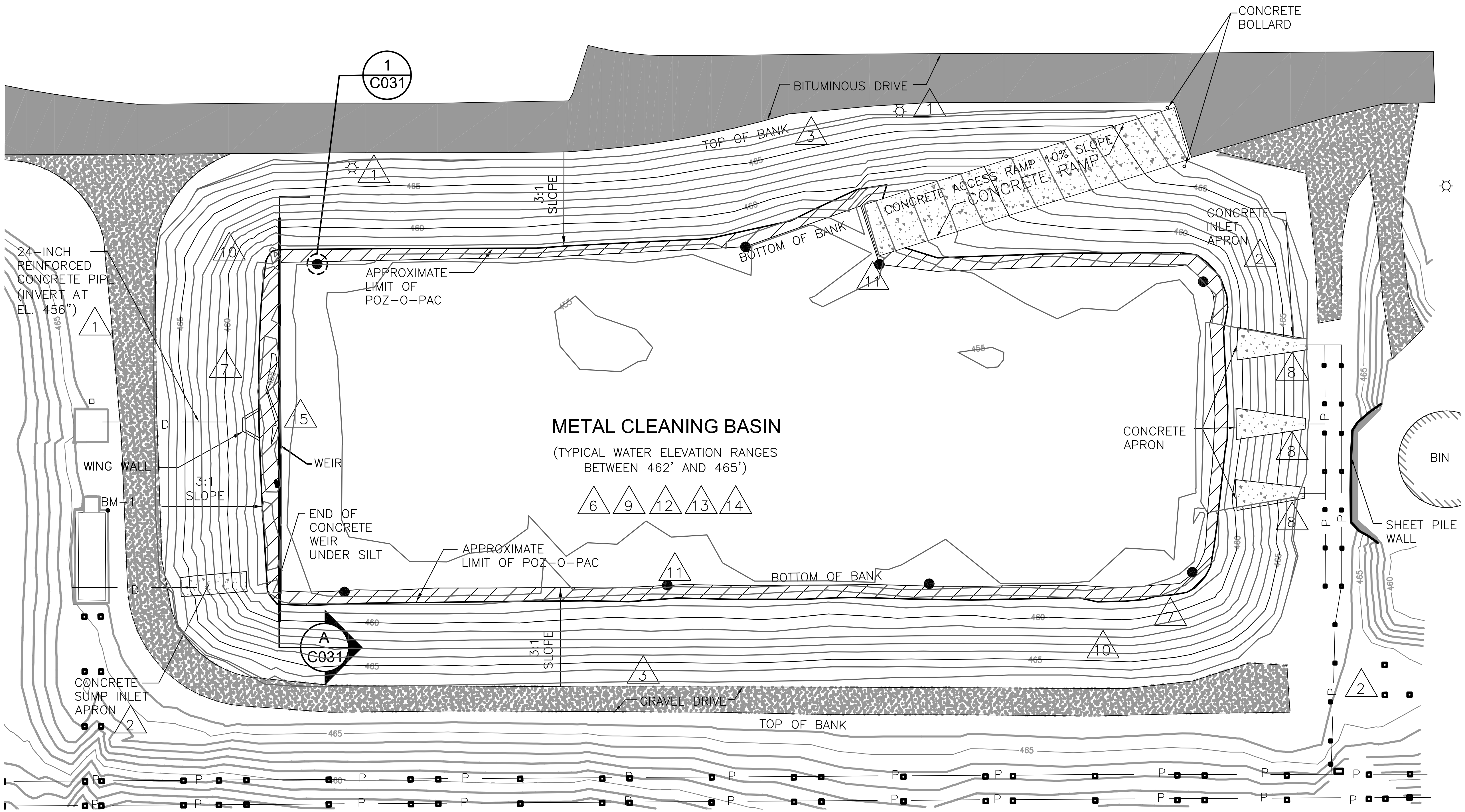
NATURAL RESOURCE TECHNOLOGY

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:

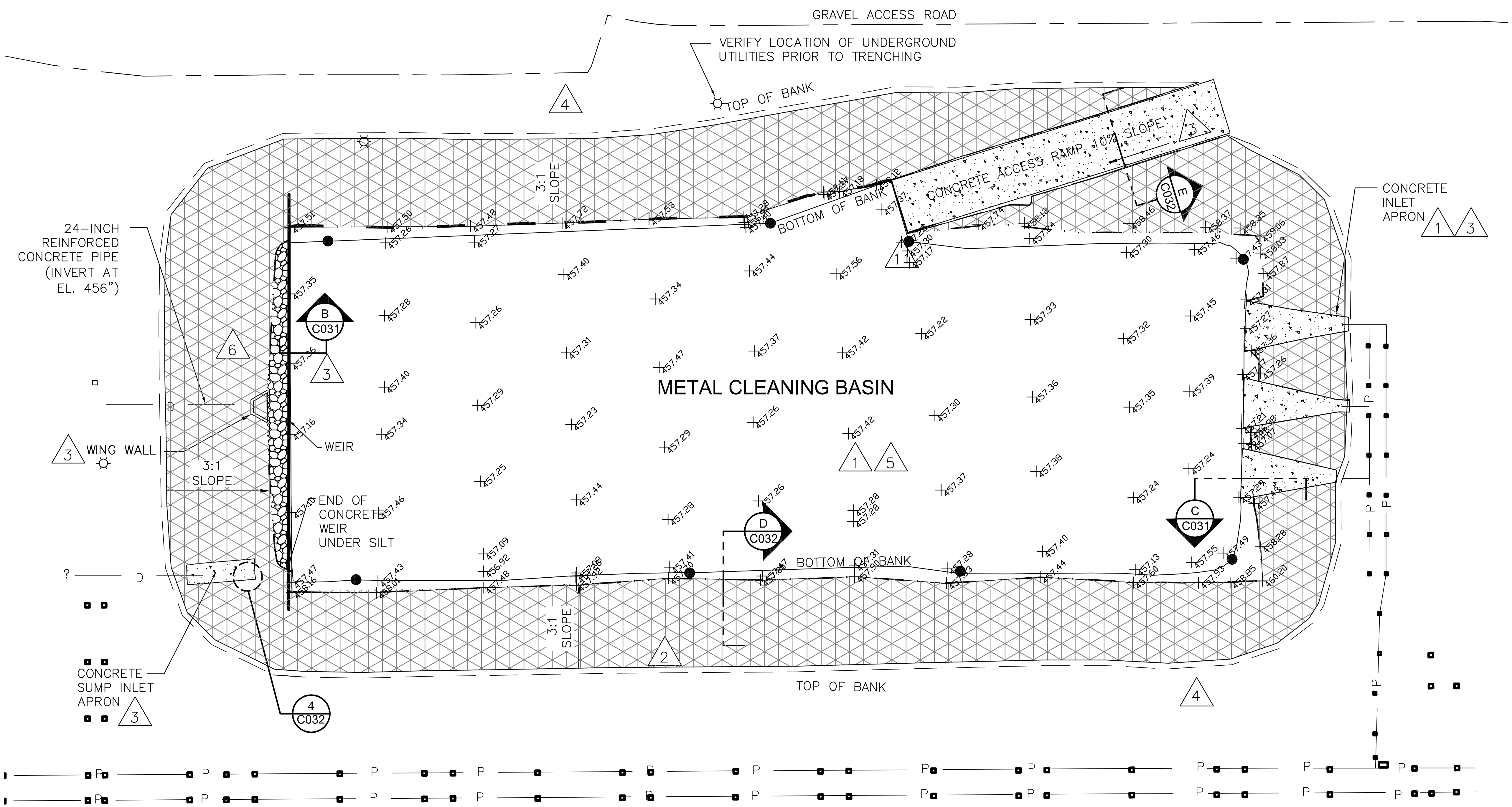
NATURAL RESOURCE TECHNOLOGY

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

LINER SUBGRADE PREPARATION

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

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.

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

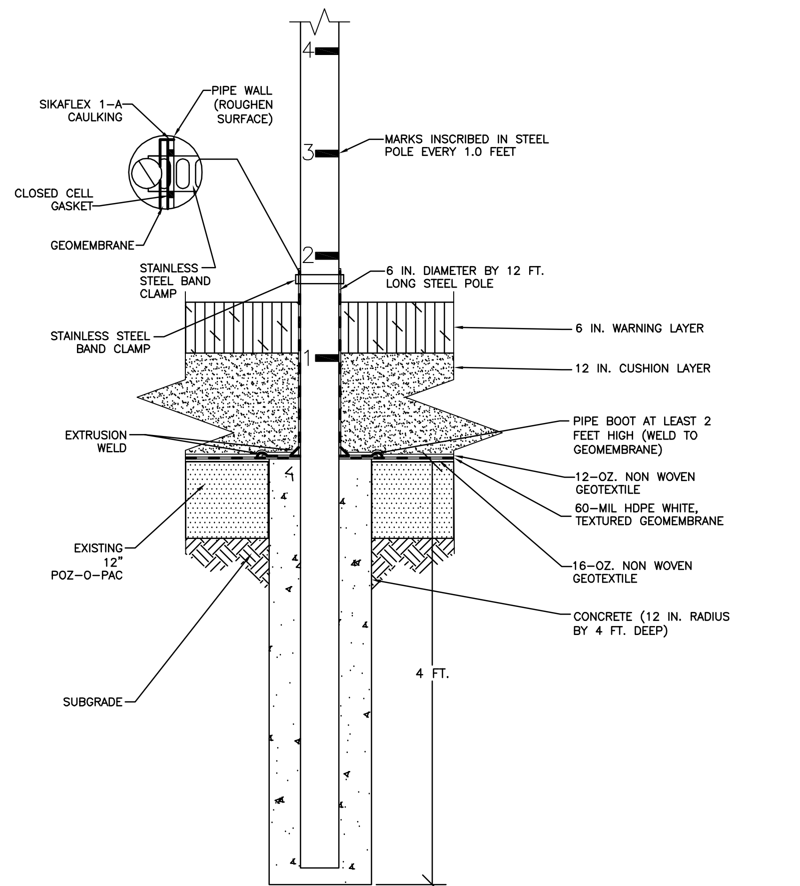
PROJECT NO.	1965/4.0
DRAWN BY:	KNW 08/25/09
CHECKED BY:	RJG 10/05/09
APPROVED BY:	HMS 10/05/09

WARNING LAYER

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

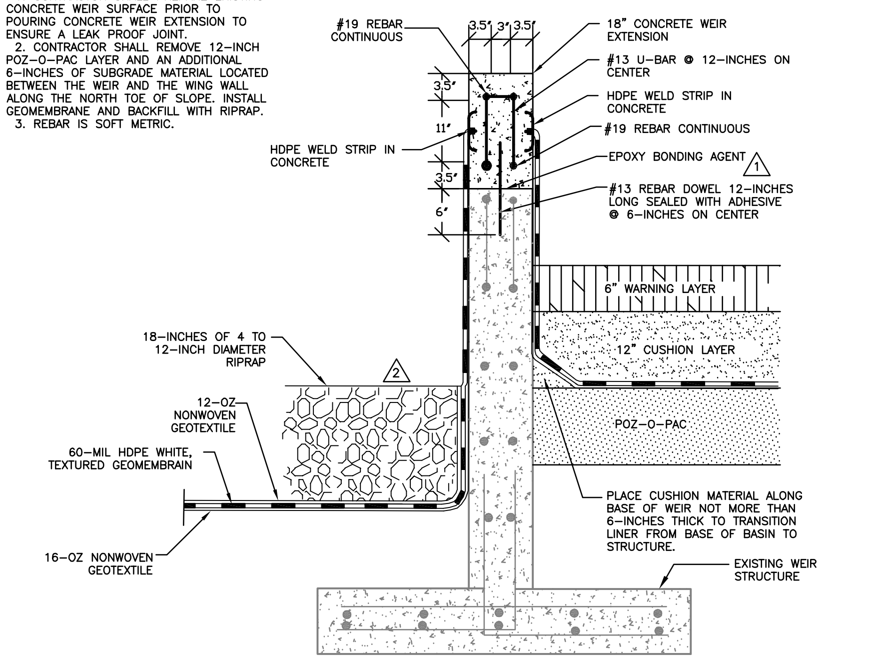
DRAWING NO: D1965C030-03
REFERENCE: -

SHEET NO. C030

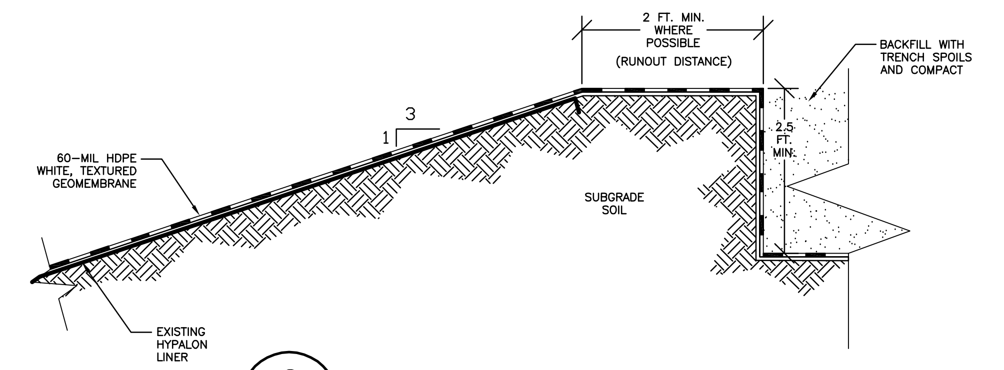


1 / C020 MARKER POST DETAIL
NOT TO SCALE

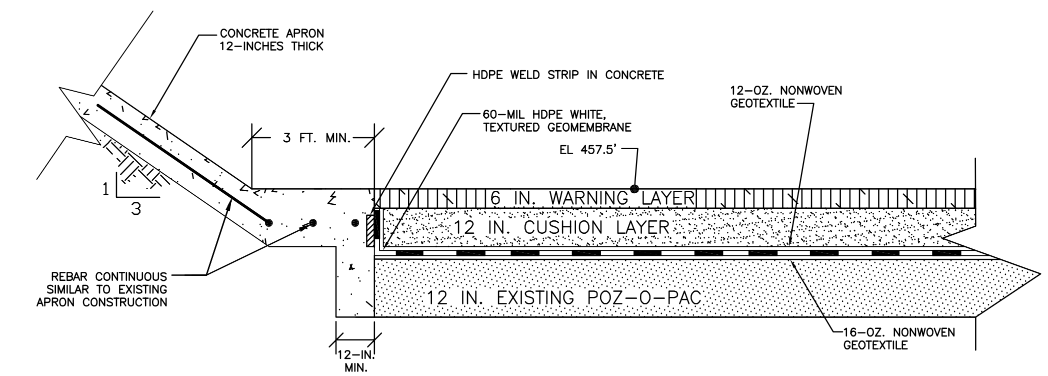
CONTRACTOR NOTES: △1
1. CONTRACTOR SHALL PREPARE EXISTING CONCRETE WEIR SURFACE PRIOR TO POURING CONCRETE WEIR EXTENSION TO ENSURE A LEAK PROOF JOINT.
2. CONTRACTOR SHALL REMOVE 12-INCH POZ-O-PAC LAYER AND AN ADDITIONAL 6-INCHES OF SUBGRADE MATERIAL LOCATED BETWEEN THE WEIR AND THE WING WALL ALONG THE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



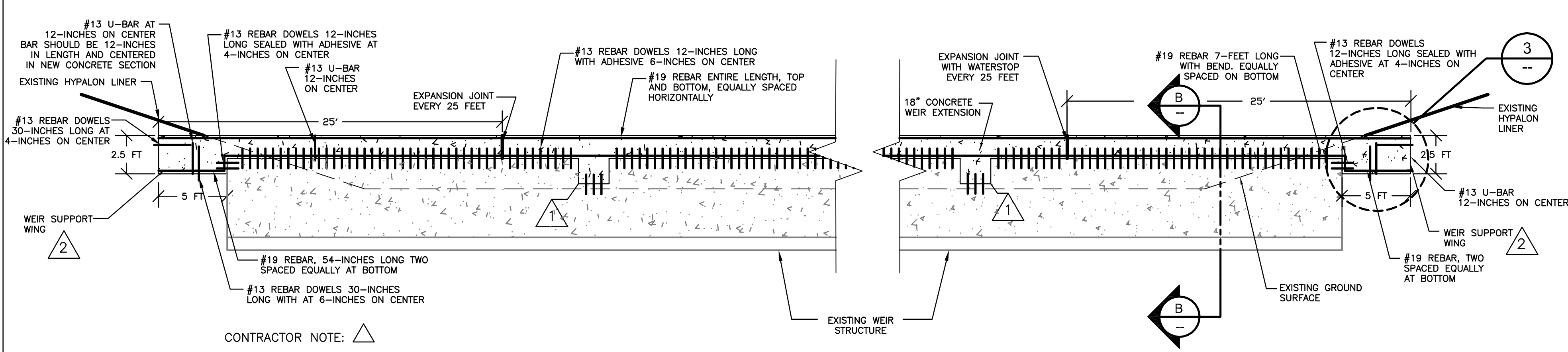
B / -- CONCRETE WEIR EXTENSION DETAIL
NOT TO SCALE



2 / C030 ANCHOR TRENCH SECTION
NOT TO SCALE



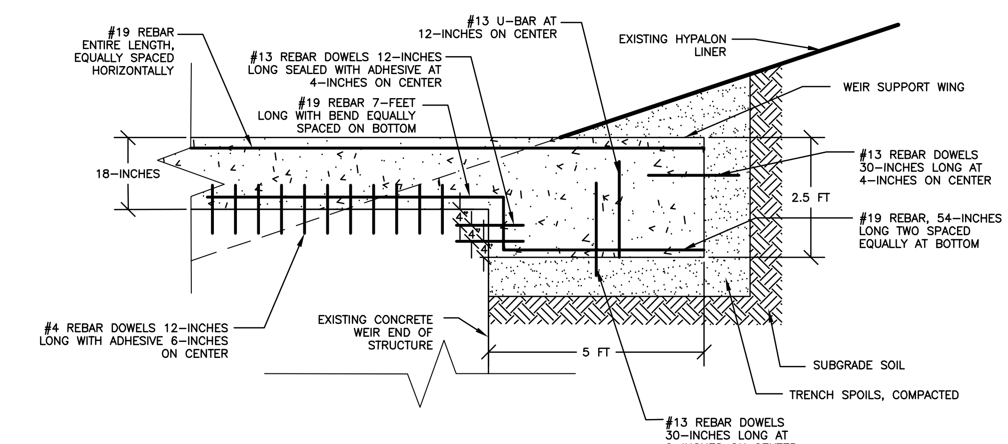
C / C030 CONCRETE INLET APRON SECTION
NOT TO SCALE



CONTRACTOR NOTE: △

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

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

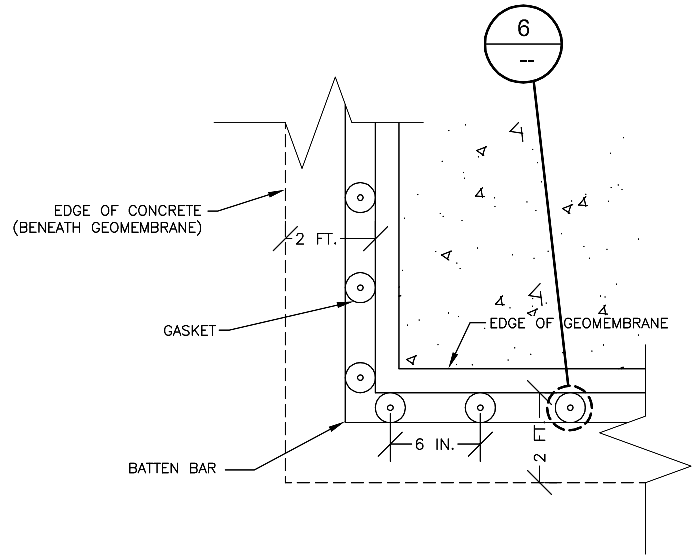
NATURAL RESOURCE TECHNOLOGY

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

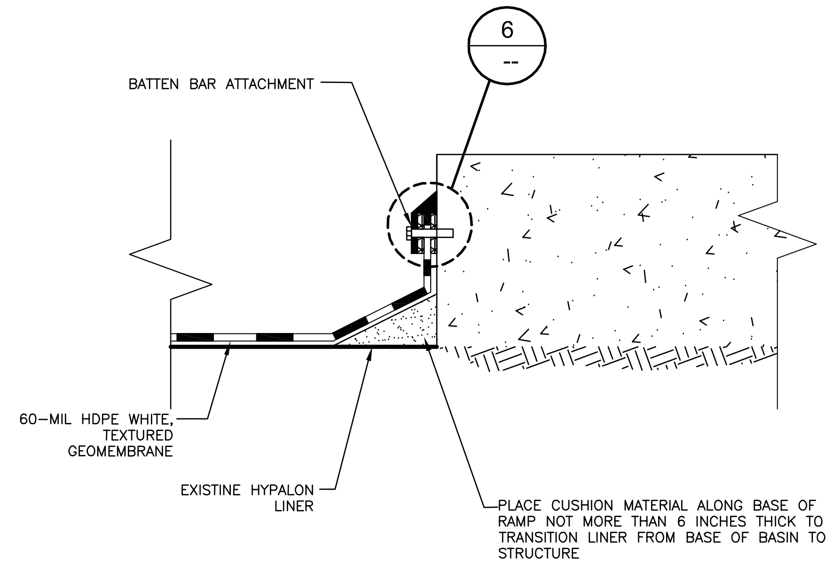
DETAILS AND SECTIONS

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

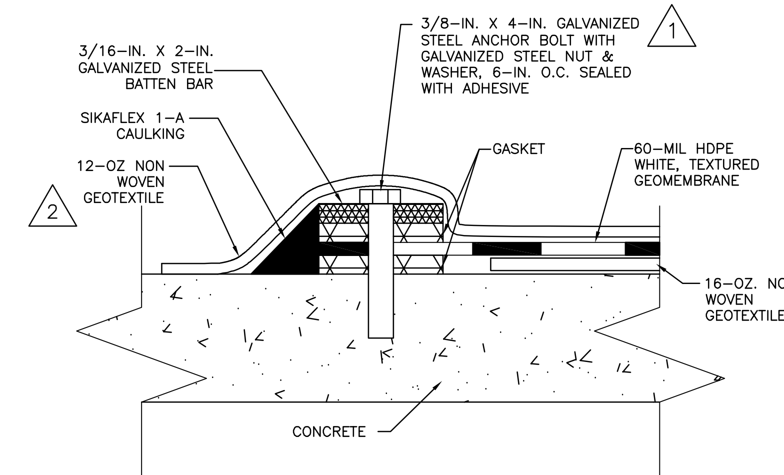
DRAWING NO: D1965C031-03
REFERENCE:.
SHEET NO. C031



4
C030
SUMP INLET APRON DETAIL
NOT TO SCALE

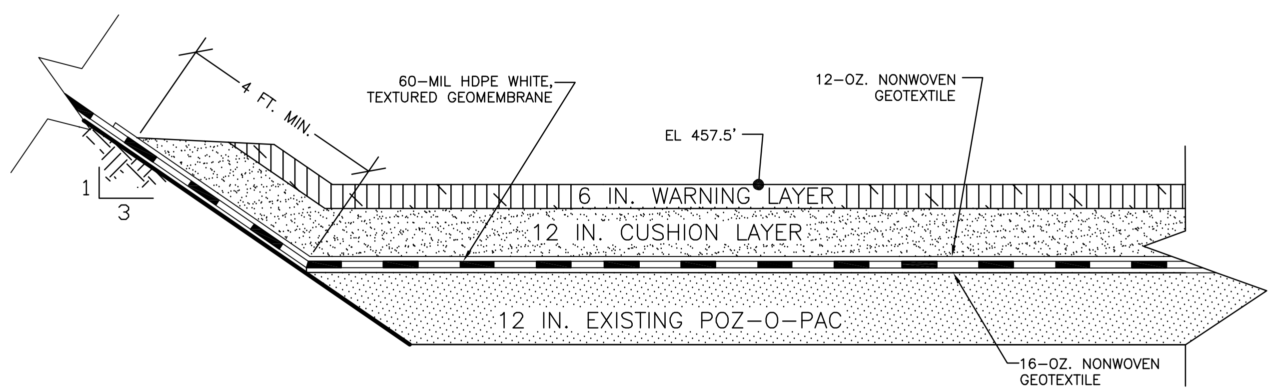


5
._.
CONCRETE RAMP CONNECTION DETAIL
NOT TO SCALE



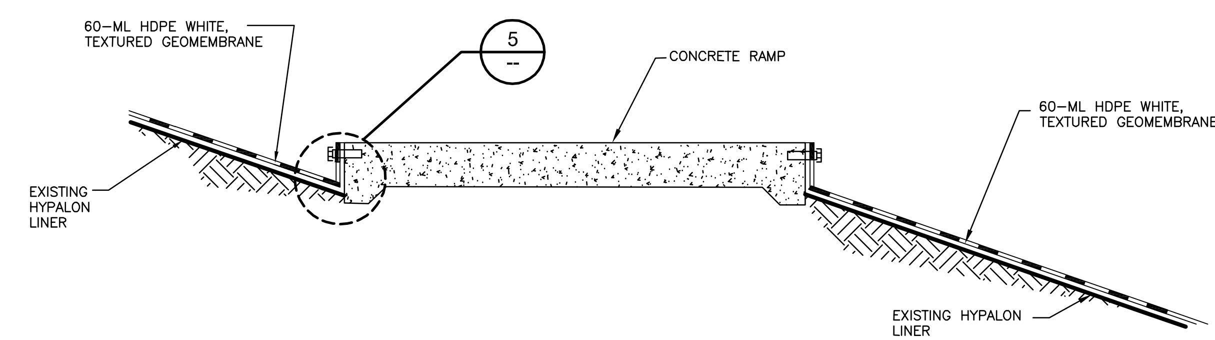
NOTE:
1. ANCHOR BOLTS 6 IN. ON CENTER.
2. 12-OZ. NONWOVEN GEOTEXTILE TO BE USED TO PROTECT GEOMEMBRANE BELOW CUSHION LAYER OR RIPRAP LAYER.

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

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

<u>Attachment 1-3 – MCB Liner Replacement Specifications</u>

MIDWEST GENERATION EME, LLC
An EDISON INTERNATIONAL® Company

Maria L. Race
Environmental Program Manager

July 27, 2009

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
Metal Cleaning 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 Metal Cleaning Basin at the Powerton Power 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 Metal Cleaning Basin are provided in Appendix B; and
- Specification Section 02600 for installation of high-density polyethylene (HDPE) geomembrane liner is provided in Appendix C.

Midwest Generation EME, LLC
One Financial Place
440 South LaSalle Street
Suite 3500
Chicago, IL 60605
Tel: 312 583 6062
Fax: 312 788 5526
Email: mrace@mwgen.com

Maria L. Race
Environmental Program Manager

FACILITY DESCRIPTION

The Metal Cleaning Basin is for settling of solid/sludge waste from cleaning/wash water associated with boiler maintenance at the Powerton Generating Station. The basin is operational when maintenance activities are conducted, which is generally between March and June each year. The total depth of the basin is 12 feet with a capacity of approximately 5.4 million gallons. Typically, the basin freeboard ranges between 3 and 6 feet during operation. Currently, the basin is lined with Hypalon® geomembrane on the side slopes, and a 12-inch thick layer of Poz-o-pac[1] at the base (Sheet C010) and 5 feet up the side slopes. Photographs of the current condition of the basin are provided in Appendix B.

PROJECT DESCRIPTION

Liner replacement activities for the Metal Cleaning Basin are anticipated to occur in October/November 2009, 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 liner along the side slopes of the basin (i.e., 12 inches of Poz-o-pac to remain at the base), and removal of the concrete aprons for the inlet pipes;
- 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

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

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

MIDWEST GENERATION EME, LLC
An EDISON INTERNATIONAL Company

Maria L. Race
Environmental Program Manager

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.

If you have any questions or require additional information as you review this application, please call me at 312-583-6062.

Sincerely,

Maria Race
Environmental Program Manager

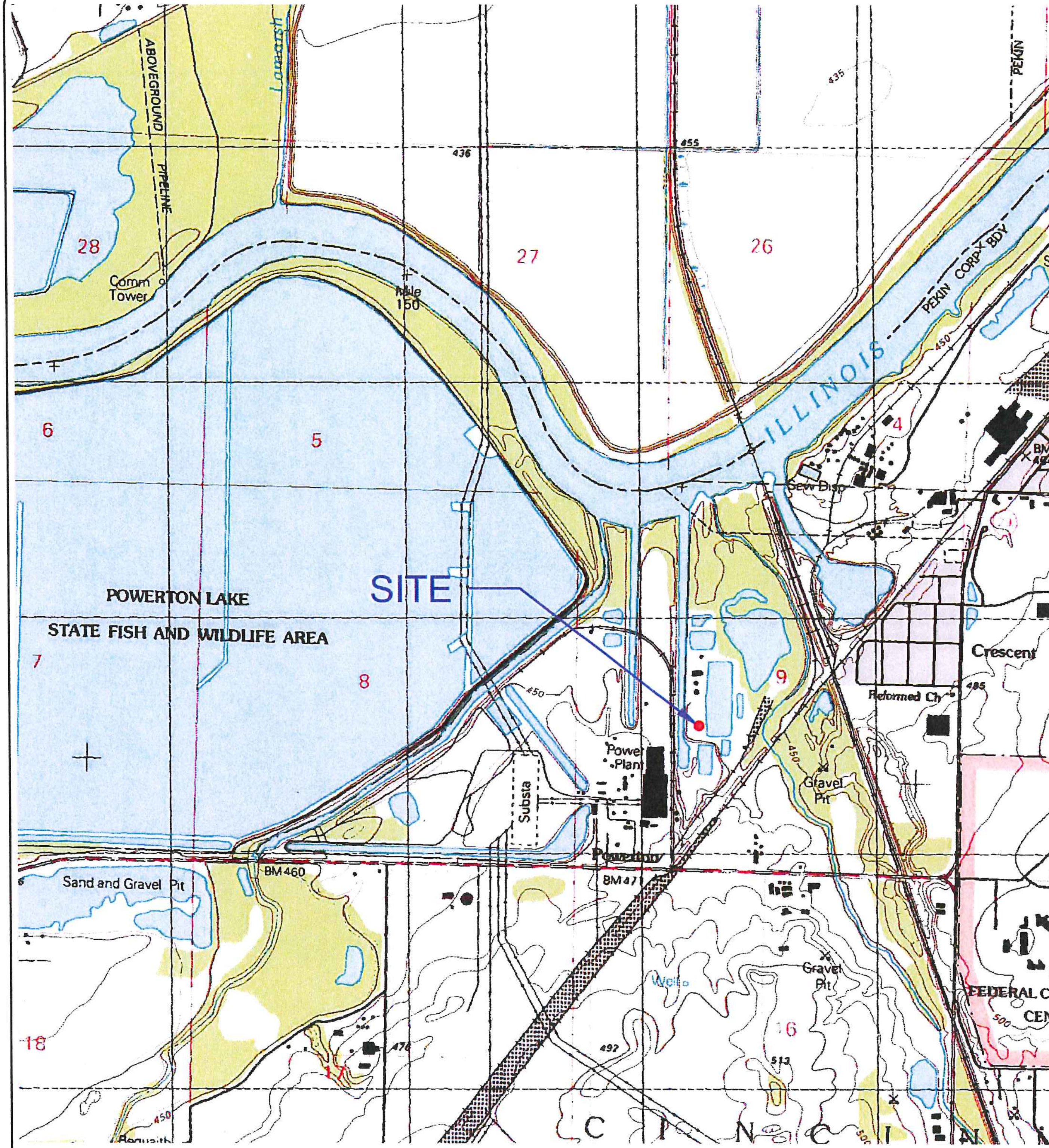
Attachments: Figure 1 – Site Location Map
Appendix A – WPC-PS-1 and Schedules G, J and N
Appendix B – Site Photographs
Appendix C – Specification Section 02600, HDPE Geomembrane
Sheet C010 – Existing Conditions
Sheet C020 – Liner Subgrade Preparation
Sheet C030 – Warning Layer Plan
Sheet C031 – Details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

cc: Mr. Mark Kelly, MWG-Powerton

[1965 Metal Cleaning Basin letter DRAFT 090715]

Midwest Generation EME, LLC
One Financial Place
440 South LaSalle Street
Suite 3500
Chicago, IL 60605
Tel: 312 583 6062
Fax: 312 788 5526
Email: mrace@mwgen.com

FIGURE



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

QUADRANGLE LOCATION

N

0 2000 4000

SCALE IN FEET

CONTOUR INTERVAL 10 FEET

NATURAL RESOURCE TECHNOLOGY

SITE LOCATION MAP

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

DRAWN BY: KNW 07/27/09 APP'D BY: HMS DATE: 07/27/09

PROJECT NO. 1965/2.0

DRAWING NO. 1965-2-A01C

FIGURE NO. 1

APPENDIX A

APPLICATION FOR PERMIT OR CONSTRUCTION APPROVAL
(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 Metal Cleaning Basin Liner Replacement

   Township: Pekin County: Tazewell

2. Brief Description of Project:

   Maintenance on Metal Cleaning Basin includes replacement of the pond liner. There will be no significant changes to current operation of the pond.

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 Metal Cleaning Basin Liner Replacement, Midwest Generation, Powerton Power Station, Pekin, IL No. of Pages: 4

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

No. of Books/Pages: 20

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)

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

(Seal) ILLINOIS HEATHER M. SIMON 062.060491 WATERTOWN WI PROFESSIONAL ENGINEER

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

Signature X ________ Date: 7/27/09

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 ________ Date: 8-4-2009

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: ________

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 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 Metal Cleaning Basin Liner Replacement
2. General Information
   - 2.1 Source(s) Boiler wash water
   - 2.2 Production Volume per year 2,350 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 _________ 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 a year 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: 500-19969-1

Job Description: Powerton Station

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

Attention: Mr. Joe Heredia

Approved for release.
Bonnie M Stadelmann
Project Manager II
7/28/2009 4:28 PM

Bonnie Stadelmann

Bonnie M Stadelmann
Project Manager II
bonnie.stadelmann@testamericainc.com
07/28/2009

cc: 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.

Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable.

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

Job Narrative
500-J19969-1

Comments
No additional comments.

Receipt
All samples were received in good condition within temperature requirements.

Metals
No analytical or quality issues were noted.

General Chemistry
Method(s) 9071B: A deviation from the Standard Operating Procedure (SOP) occurred. Details are as follows: Due to the high moisture content of sample 500-19969-1, additional sodium sulfate was required to chemically dry the sample prior to analysis. Accordingly, the sample weight was reduced. This fact along with the higher correction for moisture content resulted in a higher reporting limit.

No other analytical or quality issues were noted.

EXECUTIVE SUMMARY - Detections

Client: Midwest Generation EME LLC Job Number: 500-19969-1

Lab Sample ID / Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
500-19969-1	**MCW BASIN**				
Potassium		1900	77	mg/Kg	6010B
Sodium		7000	150	mg/Kg	6010B
Sulfate		13000	4300	mg/Kg	9038
pH		9.04	0.200	SU	9045C
Phenolics, Total Recoverable		1.5	0.60	mg/Kg	9066
TOC Dup		3700	120	mg/Kg	Lloyd Kahn
Percent Moisture		42	0.10	%	Moisture
Percent Solids		58	0.10	%	Moisture
Ammonia		38	31	mg/Kg	SM 4500 NH3 C
Nitrogen, Kjeldahl		250	64	mg/Kg	SM 4500 Norg C
Phosphorus as P		4100	580	mg/Kg	SM 4500 P E
Biochemical Oxygen Demand		70	3.4	mg/Kg	SM 5210B
Chemical Oxygen Demand		22000	2200	mg/Kg	SM 5220C
TCLP					
Cadmium		0.0094	0.0050	mg/L	6010B
Soluble					
Alkalinity-Soluble		1400	510	mg/Kg	SM 2320B

METHOD SUMMARY

Client: Midwest Generation EME LLC

Job Number: 500-19969-1

Description	Lab Location	Method	Preparation Method
Matrix: Solid			
Metals (ICP)	TAL CHI	SW846 6010B	
Toxicity Characteristic Leaching Procedure	TAL CHI		SW846 1311
Preparation, Total Metals	TAL CHI		SW846 3010A
Preparation, Metals	TAL CHI		SW846 3050B
Mercury (CVAA)	TAL CHI	SW846 7470A	
Toxicity Characteristic Leaching Procedure	TAL CHI		SW846 1311
Preparation, Mercury	TAL CHI		SW846 7470A
Acidity	TAL SAV	MCAWW 305.1	
Deionized Water Leaching Procedure	TAL SAV		ASTM DI Leach
Cyanide	TAL CHI	SW846 9014	
Cyanide, Distillation	TAL CHI		SW846 9010B
Sulfide, Acid Soluble and Insoluble (Titrimetric)	TAL CHI	SW846 9034	
Sulfide, Distillation (Acid Soluble and Insoluble)	TAL CHI		SW846 9030B
Sulfate, Turbidimetric	TAL CHI	SW846 9038	
Anions, Ion Chromatography, 10% Wt/Vol	TAL CHI		MCAWW 300_Prep
pH	TAL CHI	SW846 9045C	
Phenolics, Total Recoverable	TAL CHI	SW846 9066	
Distillation, Phenolics	TAL CHI		Distill/Phenol
HEM	TAL CHI	SW846 9071B	
HEM	TAL CHI		SW846 9071B
Organic Carbon, Total (TOC)	TAL CHI	NJDEP Lloyd Kahn	
Percent Moisture	TAL CHI	EPA Moisture	
Alkalinity	TAL CHI	SM SM 2320B	
Deionized Water Leaching Procedure	TAL CHI		ASTM DI Leach
Ammonia	TAL CHI	SM SM 4500 NH3 C	
Ammonia, Distillation	TAL CHI		SM SM 4500 NH3 B
Nitrogen-Total Kjeldahl	TAL CHI	SM SM 4500 Norg C	
Nitrogen, Total Kjeldahl	TAL CHI		MCAWW 351.3_Prep
Phosphorus	TAL CHI	SM SM 4500 P E	
Phosphorous, Total and Ortho	TAL CHI		SM SM 4500 P B
BOD, 5-Day	TAL CHI	SM SM 5210B	
COD	TAL CHI	SM SM 5220C	
COD	TAL CHI		SM SM 5220

Lab References:

TAL CHI = TestAmerica Chicago

TAL SAV = TestAmerica Savannah

METHOD SUMMARY

Client: Midwest Generation EME LLC | Job Number: 500-19969-1

Description	Lab Location	Method	Preparation Method

Method References:

ASTM = ASTM International

EPA = US Environmental Protection Agency

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

NJDEP = New Jersey Department of Environmental Protection

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

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

METHOD / ANALYST SUMMARY

Client: Midwest Generation EME LLC Job Number: 500-19969-1

Method	Analyst	Analyst ID
SW846 6010B	Smith, Todd D	TDS
SW846 7470A	Klee, George O	GOK
MCAWW 305.1	Vasquez, Juana	JV
SW846 9014	Moore, Colleen L	CLM
SW846 9034	Moore, Colleen L	CLM
SW846 9038	Boyd, Cheryl L	CLB
SW846 9045C	Moore, Colleen L	CLM
SW846 9066	Ficarello, Peter M	PMF
SW846 9071B	Brogan, Mary T	MTB
NJDEP Lloyd Kahn	Deb, Khona	KD
EPA Moisture	Boyd, Cheryl L	CLB
SM SM 2320B	Moore, Colleen L	CLM
SM SM 4500 NH3 C	Brogan, Mary T	MTB
SM SM 4500 Norg C	Brogan, Mary T	MTB
SM SM 4500 P E	Dillman, Jessica	JD
SM SM 5210B	Dillman, Jessica	JD
SM SM 5220C	Deb, Khona	KD

SAMPLE SUMMARY

Client: Midwest Generation EME LLC

Job Number: 500-19969-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
500-19969-1	MCW BASIN	Solid	07/14/2009 1310	07/15/2009 0930

SAMPLE RESULTS

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

Job Number: 500-19969-1

Client Sample ID: MCW BASIN
Lab Sample ID: 500-19969-1

Date Sampled: 07/14/2009 1310
Date Received: 07/15/2009 0930
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	RL	Dilution
Method: TCLP-6010B		Date Analyzed:	07/20/2009 1736	
Prep Method: 3010A		Date Prepared:	07/20/2009 1015	
Arsenic	<0.050	mg/L	0.050	1.0
Barium	<0.50	mg/L	0.50	1.0
Cadmium	0.0094	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:	07/17/2009 1412	
Prep Method: 3050B		Date Prepared:	07/17/2009 0752	
Potassium	1900	mg/Kg	77	1.0
Sodium	7000	mg/Kg	150	1.0
Method: TCLP-7470A		Date Analyzed:	07/21/2009 1329	
Prep Method: 7470A		Date Prepared:	07/21/2009 0900	
Mercury	<0.0020	mg/L	0.0020	1.0
Method: Soluble-305.1		Date Analyzed:	07/17/2009 0936	
Acidity	<200	mg/Kg	200	1.0
Method: 9014		Date Analyzed:	07/21/2009 1352	
Prep Method: 9010B		Date Prepared:	07/21/2009 1045	
Cyanide, Total	<0.48	mg/Kg	0.48	1.0
Method: 9034		Date Analyzed:	07/24/2009 1610	
Prep Method: 9030B		Date Prepared:	07/24/2009 1040	
Sulfide	<40	mg/Kg	40	1.0
Method: 9038		Date Analyzed:	07/21/2009 2341	
Prep Method: 300_Prep		Date Prepared:	07/17/2009 0001	
Sulfate	13000	mg/Kg	4300	50
Method: 9045C		Date Analyzed:	07/27/2009 1120	
pH	9.04	SU	0.200	1.0
Method: 9066		Date Analyzed:	07/22/2009 0803	
Prep Method: Distill/Phenol		Date Prepared:	07/21/2009 1400	
Phenolics, Total Recoverable	1.5	mg/Kg	0.60	1.0
Method: 9071B		Date Analyzed:	07/27/2009 1504	
Prep Method: 9071B		Date Prepared:	07/27/2009 0735	
HEM (Oil & Grease)	<1700	mg/Kg	1700	1.0

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

Job Number: 500-19969-1

Client Sample ID: MCW BASIN
Lab Sample ID: 500-19969-1

Date Sampled: 07/14/2009 1310
Date Received: 07/15/2009 0930
Client Matrix: Solid

Analyte	Result/Qualifier	Unit		RL	Dilution
Method: Lloyd Kahn			Date Analyzed:	07/24/2009 0843	
TOC Dup	3700	mg/Kg		120	1.0
Method: Moisture			Date Analyzed:	07/15/2009 2210	
Percent Moisture	42	%		0.10	1.0
Method: Soluble-SM 2320B			Date Analyzed:	07/20/2009 1229	
Alkalinity	1400	mg/Kg		510	1.0
Method: SM 4500 NH3 C			Date Analyzed:	07/16/2009 1436	
Prep Method: SM 4500 NH3 B			Date Prepared:	07/16/2009 0745	
Ammonia	38	mg/Kg		31	1.0
Method: SM 4500 Norg C			Date Analyzed:	07/16/2009 1443	
Prep Method: 351.3_Prep			Date Prepared:	07/16/2009 0730	
Nitrogen, Kjeldahl	250	mg/Kg		64	1.0
Method: SM 4500 P E			Date Analyzed:	07/20/2009 1235	
Prep Method: SM 4500 P B			Date Prepared:	07/17/2009 1339	
Phosphorus as P	4100	mg/Kg		580	50
Method: SM 5210B			Date Analyzed:	07/22/2009 1326	
Biochemical Oxygen Demand	70	mg/Kg		3.4	1.0
Method: SM 5220C			Date Analyzed:	07/24/2009 1352	
Prep Method: SM 5220			Date Prepared:	07/24/2009 0900	
Chemical Oxygen Demand	22000	mg/Kg		2200	10

DATA REPORTING QUALIFIERS

Client: Midwest Generation EME LLC

Job Number: 500-19969-1

Lab Section	Qualifier	Description
General Chemistry		
	4	MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable.

APPENDICES

SHEETS

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

2417 Bond Street, University Park, IL 60466
Phone: 708.534.5200 Fax: 708.534.5211

EFFECTIVE 7/1/09 OUR NEW ZIP CODE IS 60484

Chain of Custody Record

Lab Job #: 500-19969

Chain of Custody Number:

Page ___ of ___

Temperature °C of Cooler:

Report To		Bill To	
Contact:	M-KELLY	Contact:	
Company:	MIDWEST GEN-POWERN	Company:	
Address:	13082 E. MANITO Rd.	Address:	
Address:	PEKIN IL 61554	Address:	
Phone:	309-477-5240	Phone:	
Fax:	309-477-5386	Fax:	
E-Mail:	MKELLY@MWGEN.com	PO#/Reference#	

Client: Midwest Gen-Powerton
Client Project #:
Project Name: MCW BASIN
Project Location/State: POWERTON / IL
Lab Project #:
Sampler: MARK KELLY
Lab PM: B. STADELMANN

Preservative: None (all parameters)

Parameter: TCLP metals; pH; BOD5; Oil & Grease; Phenols; Cyanide; Sulfate; Sulfide; Sodium; Acidity mg; Alkalinity mg; TOC; Ammonia; Phosphorus; Potassium; COD; Total Kjeldahl Nitrogen

Lab ID	MS/MSD	Sample ID	Sampling Date	Sampling Time	# of Containers	Matrix	Parameters	Comments
1		MCW BASIN	7-14-09	1:10pm	2	SL	X (all parameters)	

Preservative Key
1. HCL, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn, Cool to 4°
6. Cool to 4°
7. None
8. Other

Page 36 of 38

Turnaround Time Required (Business Days)

__ 1 Day __ 2 Days __ 5 Days __ 10 days __ 15 Days ______ Other

Sample Disposal

[ ] Return to Client [X] Disposal by Lab [ ] Archive for ____ Months (A fee may be assessed if samples are retained longer than 1 month)

Relinquished By	Company	Date	Time	Received By	Company	Date	Time
M. Kelly	MW GEN	7-14-09	1:45pm	[signature]	TA	7/15/09	0930

Lab Courier:
Shipped: UPS
Hand Delivered:

Matrix Key
WW – Wastewater
W – Water
S – Soil
SL – Sludge
MS – Miscellaneous
OL – Oil
A – Air
SE – Sediment
SO – Soil
L – Leachate
WI – Wipe
DW – Drinking Water
O – Other

Client Comments:

Lab Comments:

TAL-4124-500 (1008)

Login Sample Receipt Check List

Client: Midwest Generation EME LLC

Job Number: 500-19969-1

Login Number: 19969
Creator: Lunt, Jeff T
List Number: 1

List Source: TestAmerica Chicago

Question	T / F/ NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Is the Field Sampler's name present on COC?	True	
Sample Preservation Verified	True	

Login Sample Receipt Check List

Client: Midwest Generation EME LLC

Job Number: 500-19969-1

Login Number: 19969
Creator: Conner, Keaton
List Number: 1

List Source: TestAmerica Savannah
List Creation: 07/16/09 01:39 PM

Question	T / F/ NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	N/A	
Is the Field Sampler's name present on COC?	True	
Sample Preservation Verified	True	

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 Metal Cleaning 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)

   During annual maintenance of the Powerton Power Station boilers, cleaning/wash water flows to the metal cleaning basin periodically between March and June of each year, 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 10/15/09 ; Date of Completion 12/31/09

   Operation Schedule not in service btw 7/09 & Spring 2010 Date Operation Begins Spring 2010

   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 NA MGD.

7.3 Design Maximum Flow Rate NA MGD.

7.4 Design Minimum Flow Rate NA 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 (last 12 months)

8.1.1 Average Flow 0.89 MGD

8.1.2 Maximum Flow 1.19 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.

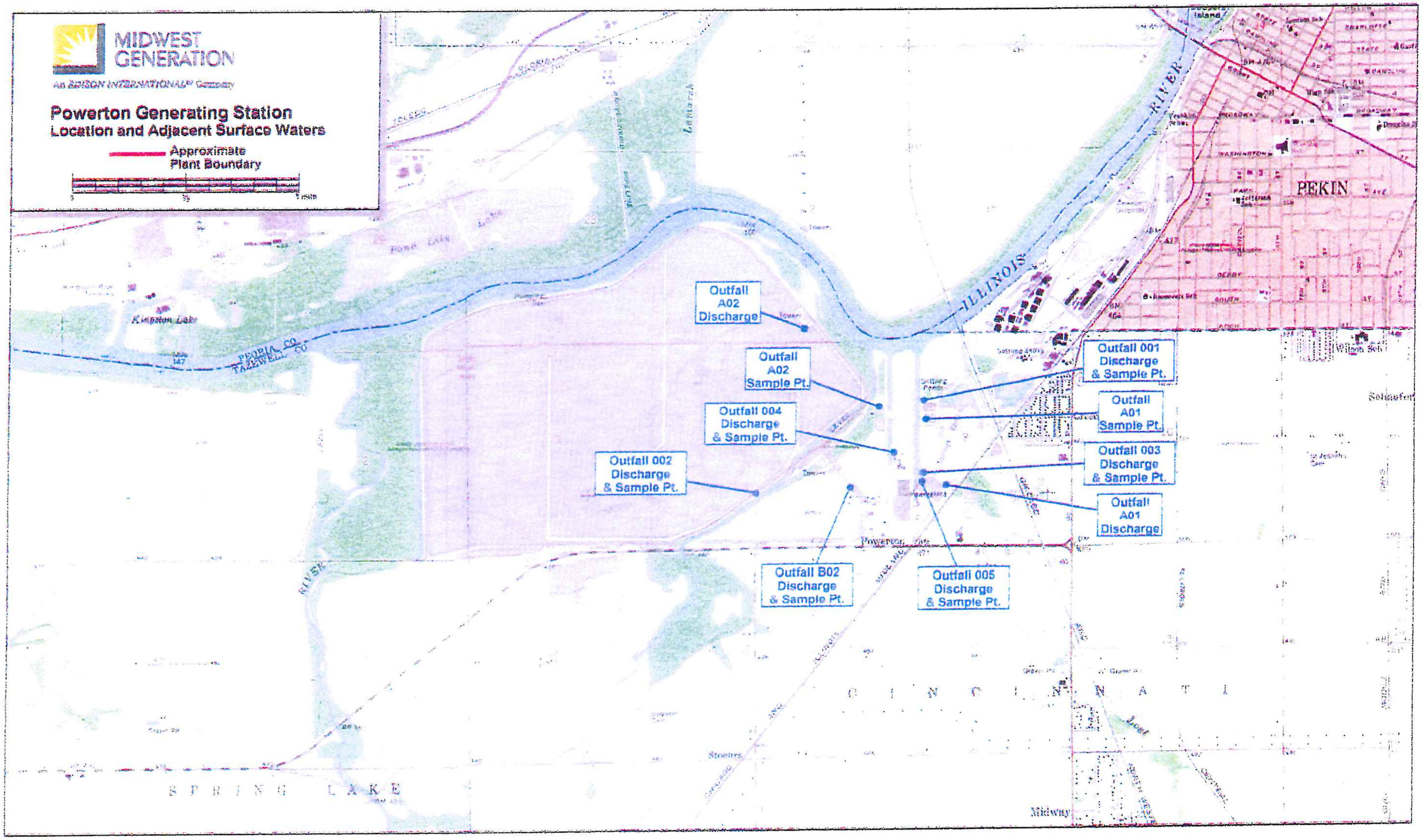
There is no equipment in the basin. Influent pumped to basin, so in the event of power failure or equipment malfunction, the flow of influent to the basin stops.

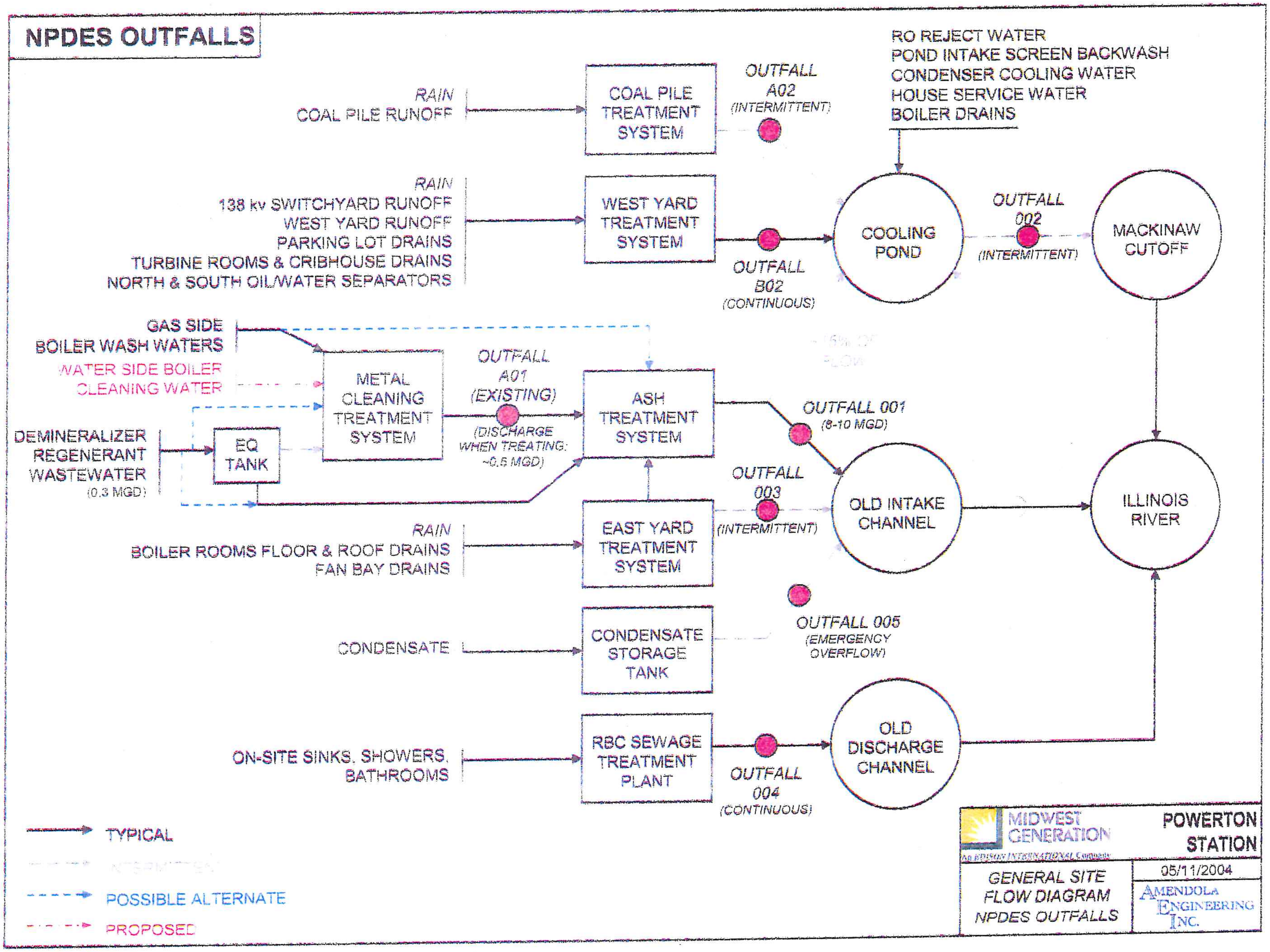
12. Complete and submit Schedule G if sludge disposal will be required by this facility.

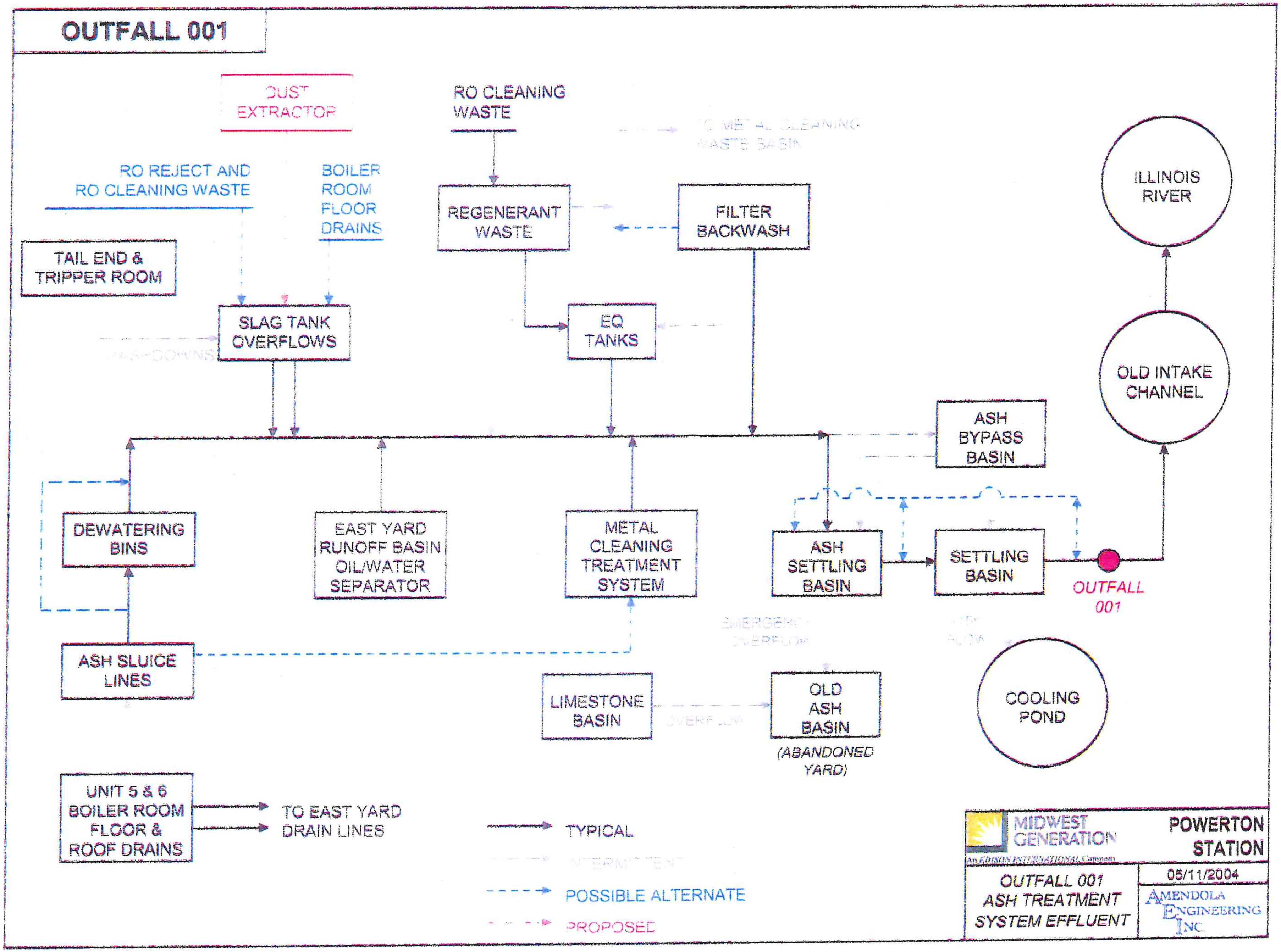
13. WASTE CHARACTERISTICS: Schedule N must be submitted.

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

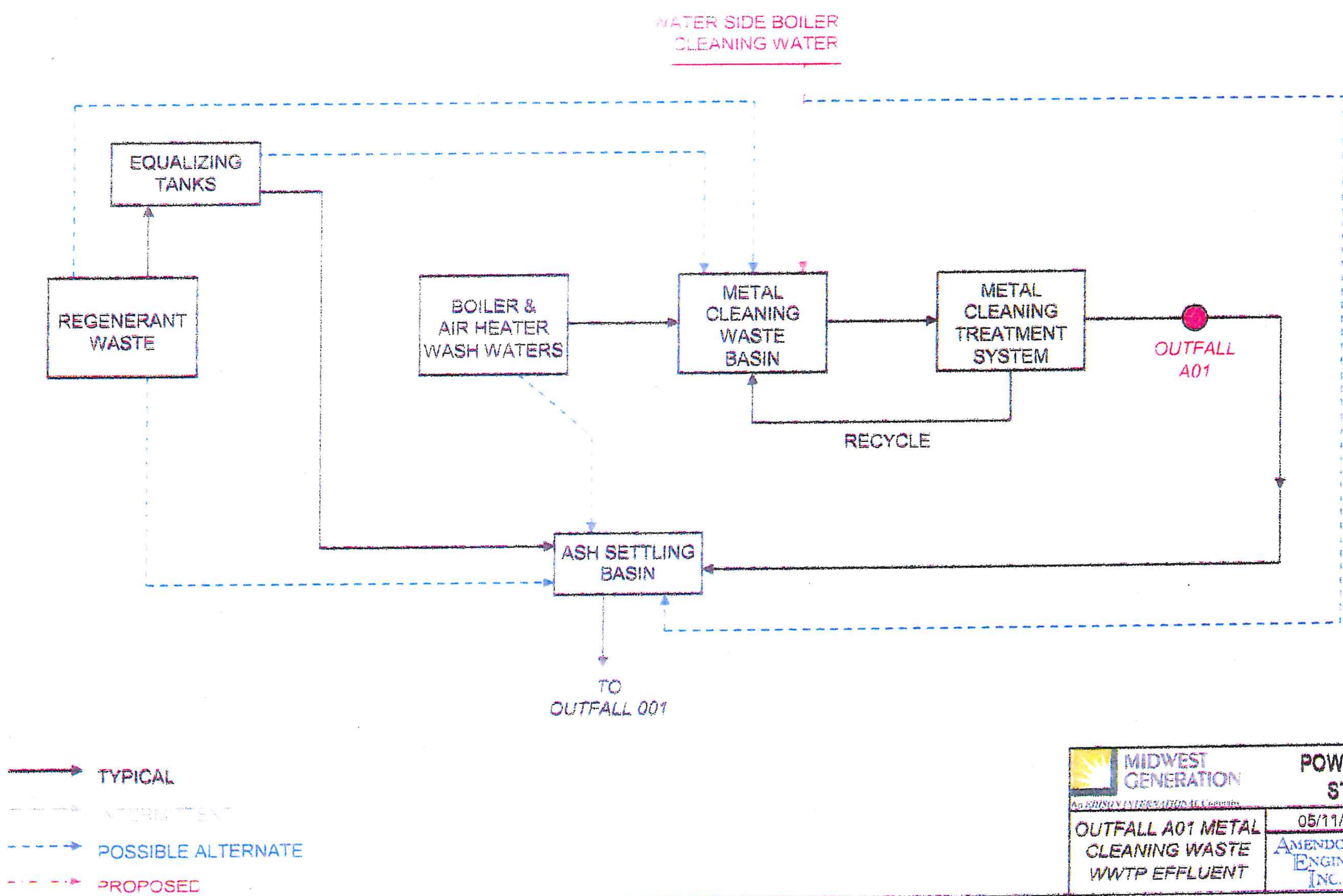
Mark Kelly (see attached certification)


MIDWEST GENERATION
An EDISON INTERNATIONAL Company
Powerton Generating Station
Location and Adjacent Surface Waters
Approximate Plant Boundary
1 mile
PEKIN
ILLINOIS
RIVER
Kingston Lake
PEORIA CO
TAZEWELL CO
Outfall A02 Discharge
Outfall A02 Sample Pt.
Outfall 004 Discharge & Sample Pt.
Outfall 002 Discharge & Sample Pt.
Outfall B02 Discharge & Sample Pt.
Outfall 005 Discharge & Sample Pt.
Outfall 001 Discharge & Sample Pt.
Outfall A01 Sample Pt.
Outfall 003 Discharge & Sample Pt.
Outfall A01 Discharge
C I N C I N N A T I
SPRING LAKE
Midway


NPDES OUTFALLS
RAIN
COAL PILE RUNOFF
COAL PILE TREATMENT SYSTEM
OUTFALL A02 (INTERMITTENT)
RO REJECT WATER
POND INTAKE SCREEN BACKWASH
CONDENSER COOLING WATER
HOUSE SERVICE WATER
BOILER DRAINS
RAIN
138 kv SWITCHYARD RUNOFF
WEST YARD RUNOFF
PARKING LOT DRAINS
TURBINE ROOMS & CRIBHOUSE DRAINS
NORTH & SOUTH OIL/WATER SEPARATORS
WEST YARD TREATMENT SYSTEM
OUTFALL B02 (CONTINUOUS)
COOLING POND
OUTFALL 002 (INTERMITTENT)
MACKINAW CUTOFF
GAS SIDE BOILER WASH WATERS
WATER SIDE BOILER CLEANING WATER
DEMINERALIZER REGENERANT WASTEWATER (0.3 MGD)
EQ TANK
METAL CLEANING TREATMENT SYSTEM
OUTFALL A01 (EXISTING)
(DISCHARGE WHEN TREATING: ~0.5 MGD)
ASH TREATMENT SYSTEM
OUTFALL 001 (8-10 MGD)
OLD INTAKE CHANNEL
ILLINOIS RIVER
RAIN
BOILER ROOMS FLOOR & ROOF DRAINS
FAN BAY DRAINS
EAST YARD TREATMENT SYSTEM
OUTFALL 003 (INTERMITTENT)
CONDENSATE
CONDENSATE STORAGE TANK
OUTFALL 005 (EMERGENCY OVERFLOW)
ON-SITE SINKS, SHOWERS, BATHROOMS
RBC SEWAGE TREATMENT PLANT
OUTFALL 004 (CONTINUOUS)
OLD DISCHARGE CHANNEL
TYPICAL
POSSIBLE ALTERNATE
PROPOSED
MIDWEST GENERATION
POWERTON STATION
GENERAL SITE FLOW DIAGRAM NPDES OUTFALLS
05/11/2004
AMENDOLA ENGINEERING INC.


OUTFALL 001
DUST EXTRACTOR
RO CLEANING WASTE
RO REJECT AND RO CLEANING WASTE
BOILER ROOM FLOOR DRAINS
TAIL END & TRIPPER ROOM
REGENERANT WASTE
FILTER BACKWASH
SLAG TANK OVERFLOWS
EQ TANKS
ILLINOIS RIVER
OLD INTAKE CHANNEL
ASH BYPASS BASIN
DEWATERING BINS
EAST YARD RUNOFF BASIN OIL/WATER SEPARATOR
METAL CLEANING TREATMENT SYSTEM
ASH SETTLING BASIN
SETTLING BASIN
OUTFALL 001
ASH SLUICE LINES
LIMESTONE BASIN
OLD ASH BASIN
(ABANDONED YARD)
COOLING POND
UNIT 5 & 6 BOILER ROOM FLOOR & ROOF DRAINS
TO EAST YARD DRAIN LINES
TYPICAL
POSSIBLE ALTERNATE
PROPOSED
MIDWEST GENERATION
POWERTON STATION
OUTFALL 001 ASH TREATMENT SYSTEM EFFLUENT
05/11/2004
AMENDOLA ENGINEERING INC.

OUTFALL A01



MIDWEST GENERATION

POWERTON STATION

OUTFALL A01 METAL CLEANING WASTE WWTP EFFLUENT

05/11/2004

AMENDOLA ENGINEERING INC.

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

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 Metal Cleaning Basin Liner Replacement

2. FLOW DATA

	EXISTING	PROPOSED-DESIGN
2.1	0	NA
2.2 Maximum Daily Flow (gpd)	1,190,000	NA

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	<0.010 / <0.010	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	0.047 / 0.210	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	<5.6 / <6.0	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	<4.9 / 11.0	NA	NA
Total Dissolved Solids	NA	NA	NA	NA
Zinc	NA	NA	NA	NA
Others				

APPENDIX B

PHOTOGRAPHS

PHOTOGRAPH LOG

Powerton Power Station Metal Cleaning Basin
Midwest Generation, LLC
Pekin, Illinois

Photograph Number	Photograph Description
1.	South end of Metal Cleaning Basin looking north on June 22, 2009.
2.	West side of Metal Cleaning Basin looking southeast on June 22, 2009
3.	North end of Metal Cleaning Basin looking northeast on June 22, 2009.
4.	South end of Metal Cleaning Basin looking southwest on June 22, 2009.
5.	Looking down concrete access ramp on June 22, 2009.
6.	Northwest corner looking east on June 22, 2009.

Photo 1

Photo 2

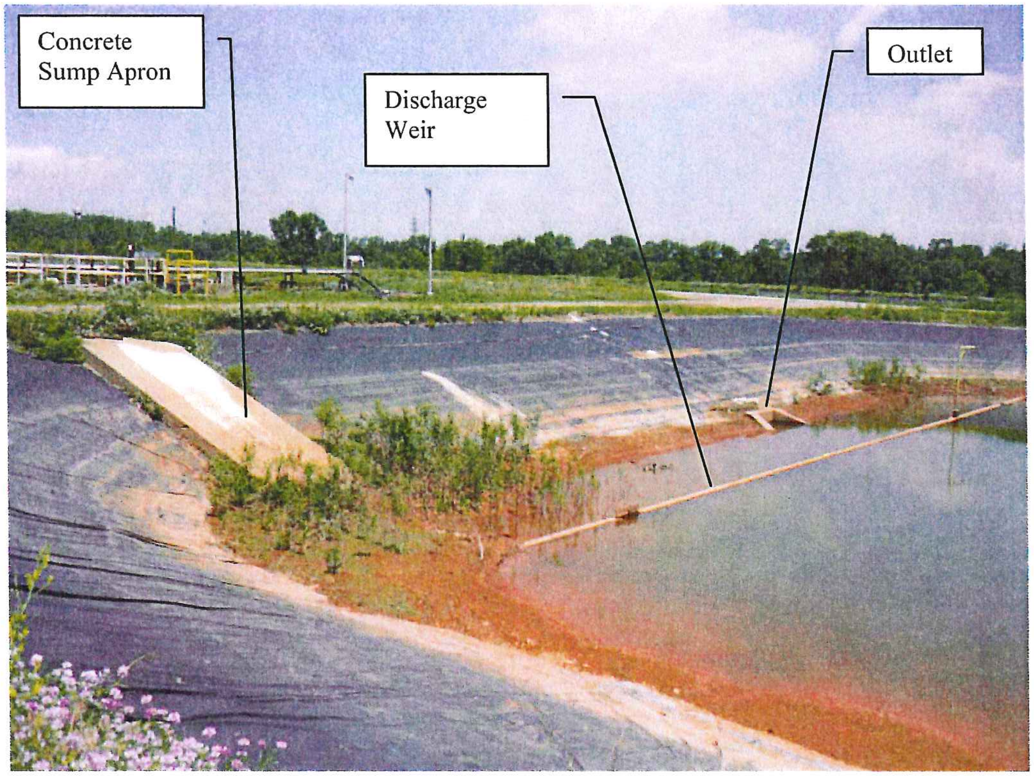


Photo 3

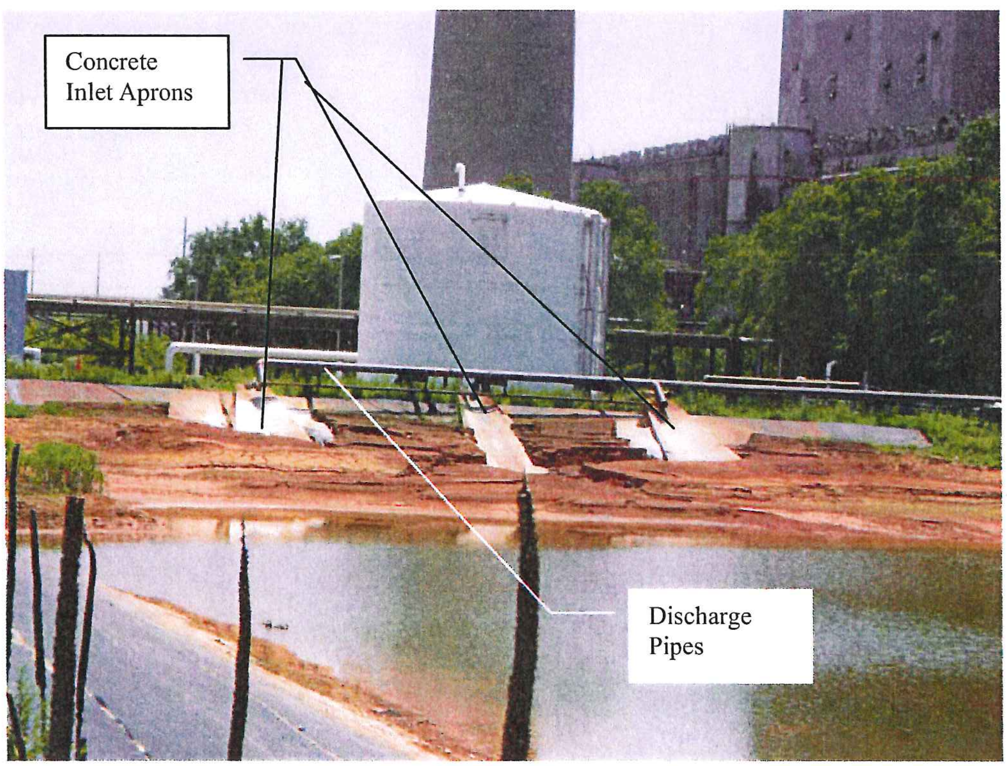


Photo 4

Photo 5

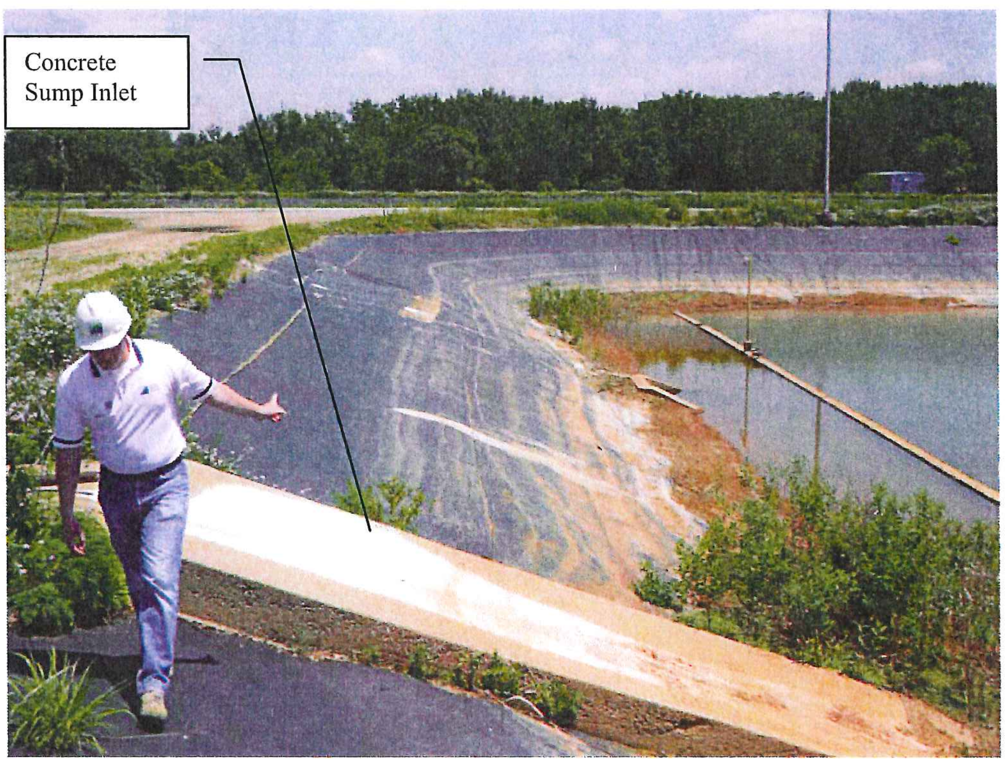


Photo 6

APPENDIX C

SPECIFICATION SECTION 02600

SECTION 02600
HIGH DENSITY POLYETHYLENE (HDPE) GEOMEMBRANE

PART 1 - GENERAL

1.01 WORK INCLUDES

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

1.02 REFERENCE STANDARDS

A. ASTM D5641 – Standard Practice for Geomembrane Seam Evaluation by Vacuum Chamber

B. ASTM D5820 – Standard Practice for Pressurized Air Channel Evaluation of Dual Seamed Geomembranes

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

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

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

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

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

1.03 DEFINITIONS

A. Geomembrane Installer: hired by Contractor 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 may 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.

3. The Geomembrane Manufacturer and/or Geomembrane Installer may perform independent tests in accordance with methods and procedures specified in GRI GM 13. Results shall not be substituted for quality assurance testing described herein.

D. Procedures for Determining Conformance Test Failures

1. If conformance test results fail to meet specifications, the roll and/or batch may be retested using specimens from either the original roll sample or from another sample collected by the 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.

B. Seaming Processes/Equipment

1. Approved processes for field seaming (panel to panel) are extrusion or hot wedge fusion-type seam methods. No other processes can be used without prior written authorization from the Geosynthetic Quality Assurance Consultant. Only equipment which has been specifically approved by make and model shall be used, if applicable.

4. The Geomembrane Installer will meet the following requirements regarding use, availability, and cleaning of welding equipment at job site:

   a. Intersecting hot wedge seams shall be patched using extrusion welding process.

   b. Electric generator for equipment shall be placed on a smooth base such that no damage occurs to geomembrane. A smooth insulating plate or fabric shall be placed beneath hot equipment after usage.

3. The Geomembrane Installer shall keep records for performance and testing of all seams.

C. Seaming Requirements/Procedures

1. Weather Conditions - Range of weather conditions under which geomembrane seaming can be performed are as follows:

   a. Unless otherwise authorized in writing by Geosynthetic Quality Assurance Consultant, no seaming shall be attempted or performed at an ambient temperature below 41 degrees F (5 degrees C) or above 104 degrees F (40 degrees C).

   b. Between ambient temperatures of 32 degrees F (0 degrees C) and 41 degrees F (5 degrees C), seaming shall be performed only if geomembrane is preheated by either sun or a hot air device, provided there is no excessive ambient cooling resulting from high winds. Pre-qualification seams shall be produced under identical conditions.

   c. Above 41 degrees F (5 degrees C), no preheating of geomembrane will be required.

   d. Geomembrane shall be dry and protected from wind.

   e. Seaming shall not be performed during any precipitation event.

f. Seaming shall not be performed in areas where ponded water has collected below surface of geomembrane.

2. If the Geomembrane Installer chooses to use methods which may allow seaming at ambient temperatures below 41 degrees F or above 104 degrees F, the Geomembrane Installer shall demonstrate and submit certification to Geosynthetic Quality Assurance Consultant that methods and techniques used to perform seaming produce seams that are equivalent to seams produced at temperatures above 41 degrees F and below 104 degrees F. The Geosynthetic Quality Assurance Consultant may deny approval for use of the proposed technique regardless of demonstration results.

3. Overlapping - Geomembrane panels shall have finished overlap as follows:

   a. Minimum of 6 inches for thermal fusion welding.

   b. Insufficient overlap will be considered a failed seam.

4. Pre-qualification tests for geomembrane fusion welding shall be conducted by a minimum of 2 pre-qualification seams conducted per day per welding machine by each seaming technician performing welding with that machine. At least one test shall be performed at the start of each work day, with tests at intervals of no greater than 5 hours and additional pre-qualification tests following work interruptions, weather changes, changes to machine settings, or as directed by the Geosynthetic Quality Assurance Consultant. Pre-qualification seams shall be made under the same conditions as the actual seams.

   a. Pre-qualification seam samples shall be 5 feet long by 1-foot wide (minimum) after seaming, with seam centered along its length. Each pre-qualification seam shall be labeled with the date, geomembrane temperature, seaming unit identifier, seam number or test location, technician performing the test seam and description of testing results.

   b. Seam overlap shall be in accordance with Subsection 3.04(C)(3).

   c. Pre-qualification seams shall be inspected for proper squeeze-out, footprint pressure, and general appearance.

   d. Four specimens, each 1-inch in length, shall be cut from opposite ends of the pre-qualification seam sample by the Geomembrane Installer. The remainder of pre-qualification seam shall be retained by the Geosynthetic Quality Assurance Consultant and may be submitted for laboratory testing.

   e. The Geomembrane Installer shall complete two shear tests and two peel tests in accordance with GRI GM 19.

   f. Pre-qualification seams failed by inspection or testing may be retested at request of the Geomembrane Installer. If the second pre-qualification seam fails, then the seaming apparatus or seaming technique shall be disqualified from use until two consecutive, satisfactory pre-qualification seams are obtained.

5. Seam Preparation

a. Prior to seaming, seam area shall be clean and free of moisture, dust, dirt, debris of any kind, and foreign material.

b. Seams shall be aligned so as to minimize number of wrinkles and fishmouths.

6. General Seaming Procedures

a. Fishmouths or wrinkles at seam overlaps shall be cut along ridge of the wrinkle to achieve a flat overlap. Cut fishmouths or wrinkles shall be repaired, and/or patched in accordance with Part 3.08.

b. Seaming shall extend to the outside edge of geomembrane panels including material placed in anchor trenches.

c. The intersecting thermal fusion seams shall be patched using the extrusion welding process.

3.05 NON-DESTRUCTIVE TESTING

A. Each field seam shall be non-destructively tested over its entire length by the Installer. Testing shall be conducted as field seaming progresses, not at completion of all seams, unless specifically agreed to by the Geosynthetic Quality Assurance Consultant in writing.

B. Vacuum Testing – shall be performed in accordance with ASTM D5641.

C. Air Pressure Testing – shall be performed in accordance with ASTM D5820, and GRI GM 6, Pressurized Air Channel Test for Dual Seamed Geomembranes.

D. Each seam tested non-destructively shall be marked with the date of the test, name of the testing technician, length of the seam, test method and results. The same shall also be recorded by the Geosynthetic Quality Assurance Consultant on the appropriate CQA documentation.

E. Non-Destructive Seam Test Failures

1. Seams failing non-destructive testing shall be repaired by the Geomembrane Installer according to Part 3.08. Seams shall be non-destructively retested. If the seam defect cannot be located, the entire section of seam affected shall be repaired and retested.

3.06 DESTRUCTIVE TESTING

A. The Owner shall have the option to destructively test geomembrane panel seams completed in the field. Destructive seam testing shall be performed by the Geomembrane Installer under the observation of the Geosynthetic Quality Assurance Consultant.

B. Sampling Procedure

1. For each sample location, the Geosynthetic Installer will:

   a. Assign a sample number and mark the sample accordingly.

   b. Record the sample location on the as-built layout drawing.

   c. By sample number, record reason for collecting sample (e.g., as part of statistical testing program, suspicious seam, retest, etc.).

   d. Record pertinent information, including date, time, seam number, number of seaming unit, and name of seamer, on the seam sample.

2. Each destructive sample shall be at least 12 inches wide (at least 6 inches on each side of seam) by 54 inches long. Samples will be cut by the Geomembrane Installer and distributed as follows:

   a. A 12-inch by 12-inch portion shall be cut and tested in accordance with Subsection 3.06(C) by the Geomembrane Installer.

   b. A 12-inch by 12-inch portion shall be cut and retained by the Geomembrane Installer. The Geomembrane Installer may elect to omit this requirement.

   c. A 12-inch by 12-inch portion shall be cut and retained by the Geosynthetic Quality Assurance Consultant as an archive sample.

   d. A 12-inch by 18-inch portion shall be submitted by the Geosynthetic Quality Assurance Consultant for laboratory testing as described in Part 3.06(D).

3. Ten specimens, each 1 inch wide by 12 inches long with seam centered perpendicular to width, shall be collected and field tested by the Geomembrane Installer prior to shipping the sample to the laboratory. If all samples pass field tensiometer test described in Part 3.06(C), then the laboratory sample shall be submitted for testing by the Geosynthetic Quality Assurance Consultant.

4. Holes cut into geomembrane resulting from destructive seam sampling shall be immediately repaired by Geomembrane Installer in accordance with repair procedures described in Part 3.08.

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

Attachment 1-4 – IEPA Issued Liner Replacement Permit

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 DEL

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.

ATTACHMENT 2
CCR CHEMICAL CONSTITUENTS ANALYSIS

eurofins | Environment Testing America

ANALYTICAL REPORT

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

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

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

Attn: Joseph Kotas

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

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

1 2 3 4 5 6 7 8 9 10 11 12 13

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

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

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

Table of Contents

Job ID: 500-201436-1

Laboratory: Eurofins TestAmerica, Chicago

Narrative

Job Narrative
500-201436-1

Comments
No additional comments.

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

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

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

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

Method Summary

Client: Midwest Generation EME LLC
Project/Site: Ash

Job ID: 500-201436-1

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

Protocol References:

EPA = US Environmental Protection Agency

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

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

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

Laboratory References:

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

Sample Summary

Client: Midwest Generation EME LLC
Project/Site: Ash

Job ID: 500-201436-1

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

Client Sample ID: FAB

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

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

Method: 6010B - Metals (ICP)

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

Method: 7471A - Mercury (CVAA)

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

General Chemistry

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

Client Sample Results

Client: Midwest Generation EME LLC
Project/Site: Ash

Job ID: 500-201436-1

Client Sample ID: ASH BASIN

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

Lab Sample ID: 500-201436-2

Matrix: Solid

Method: 6010B - Metals (ICP)

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

Method: 7471A - Mercury (CVAA)

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

General Chemistry

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

Client Sample Results

Client: Midwest Generation EME LLC
Project/Site: Ash

Job ID: 500-201436-1

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

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

Method: 6010B - Metals (ICP)

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

Method: 7471A - Mercury (CVAA)

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

General Chemistry

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

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

Glossary

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

QC Association Summary

Client: Midwest Generation EME LLC
Project/Site: Ash

Job ID: 500-201436-1

Metals

Prep Batch: 607902

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

Analysis Batch: 608143

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

Prep Batch: 608328

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

Analysis Batch: 608625

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

General Chemistry

Analysis Batch: 606811

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

Prep Batch: 607760

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

QC Association Summary

Client: Midwest Generation EME LLC
Project/Site: Ash

Job ID: 500-201436-1

General Chemistry

Analysis Batch: 607876

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

Analysis Batch: 607925

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

Prep Batch: 608902

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

Analysis Batch: 608919

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

QC Sample Results

Client: Midwest Generation EME LLC
Project/Site: Ash

Job ID: 500-201436-1

Method: 6010B - Metals (ICP)

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

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

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

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

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

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

Method: 7471A - Mercury (CVAA)

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

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

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

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

Lab Sample ID: LCS 500-607902/13-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 608143 — **Prep Batch: 607902**

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

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 500-608902/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 608919 — **Prep Batch: 608902**

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

Lab Sample ID: LCS 500-608902/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 608919 — **Prep Batch: 608902**

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

Method: SM 4500 Cl- E - Chloride, Total

Lab Sample ID: MB 500-607760/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 607925 — **Prep Batch: 607760**

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

Lab Sample ID: LCS 500-607760/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 607925 — **Prep Batch: 607760**

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

Lab Sample ID: LCSD 500-607760/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 607925 — **Prep Batch: 607760**

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

Method: SM 4500 F C - Fluoride

Lab Sample ID: MB 500-607760/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 607876 — **Prep Batch: 607760**

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

Method: SM 4500 F C - Fluoride (Continued)

Lab Sample ID: LCS 500-607760/2-A
Client Sample ID: Lab Control Sample
Matrix: Solid
Prep Type: Total/NA
Analysis Batch: 607876
Prep Batch: 607760

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

Lab Sample ID: LCSD 500-607760/3-A
Client Sample ID: Lab Control Sample Dup
Matrix: Solid
Prep Type: Total/NA
Analysis Batch: 607876
Prep Batch: 607760

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

Lab Chronicle

Client: Midwest Generation EME LLC | Job ID: 500-201436-1

Project/Site: Ash

Client Sample ID: FAB
Lab Sample ID: 500-201436-1

Date Collected: 06/23/21 13:30
Matrix: Solid

Date Received: 06/24/21 15:35

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

Client Sample ID: ASH BASIN
Lab Sample ID: 500-201436-2

Date Collected: 06/23/21 14:23
Matrix: Solid

Date Received: 06/24/21 15:35

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

Client Sample ID: METALS CB
Lab Sample ID: 500-201436-3

Date Collected: 06/23/21 15:00
Matrix: Solid

Date Received: 06/24/21 15:35

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

Lab Chronicle

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

Client Sample ID: METALS CB Lab Sample ID: 500-201436-3

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

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

Laboratory References:

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

Accreditation/Certification Summary

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

Laboratory: Eurofins TestAmerica, Chicago

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

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

1 2 3 4 5 6 7 8 9 10 11 12 13

Eurofins TestAmerica, Chicago

2417 Bond Street
University Park IL 60484
Phone 708-534-5200 Fax. 708-534-5211

Chain of Custody Record

eurofins Environment Testing America

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

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

Analysis columns: Field Filtered Sample (Yes or No); Perform MS/MSD (Yes or No); 903.0, 904.0; Ra226Ra228_GFPC - Combined Rad 226/228; 4500_F_C, 6010B, 7471A, 9056A, SM4500_Cl_E; Total Number of containers

500-201436 COC

Preservation Codes

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

Other:

	Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered	Perform MS/MSD	903.0, 904.0	Ra226Ra228_GFPC	4500_F_C, 6010B, 7471A, 9056A, SM4500_Cl_E	Total Number of containers	Special Instructions/Note
					Preservation Code:			N	N	N		
1	FAB	6/23/21	13:30	G	Solid			X		X		
1	FAB2	6/23/21	1330	C	Solid				X			
					Solid							
2	ASH BASIN	6/23/21	1423	C	Sol				X			
1	ASH 2	6/23/21	14:23	C	Sol			X		X		
3	Metals 2	6/23/21	15:00	C	Sol				X			
1	Metals CB	6/23/21	15:00	C	Sol			X		X		

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

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

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

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

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

Ver: 11/01/2020 7/12/2021

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

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

BILL SENDER

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

UNIVERSITY PARK IL 60484
(708) 534-5200 X 153 REF
INV
PO DEPT

500-201436 Wayb

56DJ3/B38/FE4A

FedEx Express

E

J211321033101uv

THU - 24 JUN 4:30P
STANDARD OVERNIGHT

TRK# 0201 **7740 8262 9809**

60484
IL-US **ORD**

UF JOTA

48qt.

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

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

Login Sample Receipt Checklist

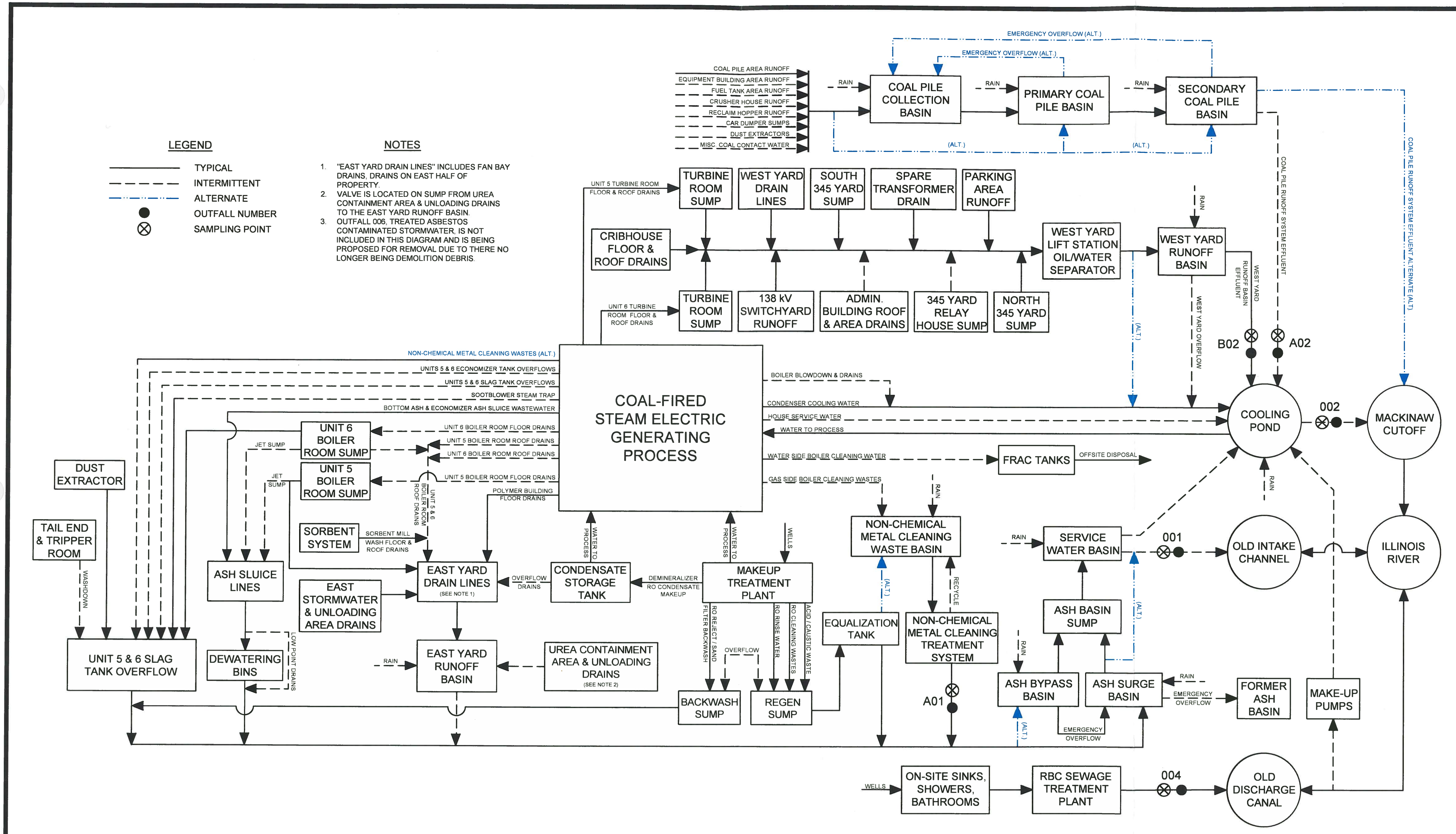
Client: Midwest Generation EME LLC | Job Number: 500-201436-1

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

List Source: Eurofins TestAmerica, Chicago

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

ATTACHMENT 3
CHEMICAL CONSTITUENTS ANALYSIS OF OTHER WASTE STREAMS



REV. NO.	DATE	DESCRIPTION

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: NOVEMBER 2019

ATTACHMENT 4
LOCATIONS STANDARDS DETERMINATIONS

PLACEMENT ABOVE THE UPPERMOST AQUIFER LOCATION RESTRICTION
METAL CLEANING BASIN
POWERTON GENERATING STATION
MARCH 2022

This location restriction determination has been prepared in accordance with 35 Ill. Adm. Code Subpart C, Section 845.300 for the Metal Cleaning Basin (MCB) at the Powerton Generating Station, operated by Midwest Generation, LLC (Midwest Generation), in Pekin, Illinois to document compliance with location restrictions related to placement above the uppermost aquifer.

1. Placement Location Restriction Determination

The base of the MCB is approximately elevation 457.5 ft amsl and the upper limit groundwater elevation is 450.14 ft amsl. The MCB is separated from the upper limit of the uppermost aquifer by a minimum of five (5) feet. Therefore, the location of the MCB is in compliance with the requirements outlined in 845.300.

2. Professional Engineer's Certification

This report was prepared in accordance with current practices and the standard of care exercised by scientists and engineers performing similar tasks in the field of environmental engineering. The contents of this report are based solely on the observations of the conditions observed by KPRG personnel and information provided to KPRG by Midwest Generation. Consistent with applicable professional standards of care, our opinions and recommendations were based in part on data furnished by others, which was consistent with other information that we developed in the course of our performance of the scope of services. The information contained in this report is intended for use solely by Midwest Generation and their subconsultants.

Joshua D. Davenport, P.E.
Illinois Professional Engineer No. 062.061945
License Expires: 11/30/2023

JOSHUA D. DAVENPORT 062-061945 LICENSED PROFESSIONAL ENGINEER STATE OF ILLINOIS

WETLANDS LOCATION RESTRICTION
METAL CLEANING BASIN
POWERTON GENERATING STATION
MARCH 2022

This location restriction determination has been prepared in accordance with 35 Ill. Adm. Code Subpart C, Section 845.310 for the Metal Cleaning Basin (MCB) at the Powerton Generating Station, operated by Midwest Generation, LLC (Midwest Generation), in Pekin, IL, to document compliance with location restrictions related to wetlands.

1. Placement Location Restriction Determination

In accordance with 845.310, an existing CCR surface impoundment must not be located in wetlands, unless it can be demonstrated that the CCR unit meets the requirements of paragraphs 845.310(a)(1) through 845.310(a)(5). The identification of wetlands near the MCB was determined using the National Wetlands Inventory (NWI) presented by the U.S. fish and Wildlife Service. The NWI identified the MCB is not located in mapped wetlands. Therefore, the location of the MCB complies with 845.310.

2. Professional Engineer's Certification

This report was prepared in accordance with current practices and the standard of care exercised by scientists and engineers performing similar tasks in the field of environmental engineering. The contents of this report are based solely on the observations of the conditions observed by KPRG personnel and information provided to KPRG by Midwest Generation. Consistent with applicable professional standards of care, our opinions and recommendations were based in part on data furnished by others, which was consistent with other information that we developed in the course of our performance of the scope of services. The information contained in this report is intended for use solely by Midwest Generation and their subconsultants.

Joshua D. Davenport, P.E.
Illinois Professional Engineer No. 062.061945
License Expires: 11/30/2023

JOSHUA D. DAVENPORT
062-061945
LICENSED
PROFESSIONAL
ENGINEER
STATE OF ILLINOIS

3. Reference

U.S. Fish and Wildlife Service, 2022. "National Wetlands Inventory," https://www.fws.gov/program/national-wetlands-inventory/wetlands-mapper, accessed March 9, 2022.

KPRG

ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG and Associates, Inc.

FAULT AREAS LOCATION RESTRICTION
METAL CLEANING BASIN
POWERTON GENERATING STATION
MARCH 2022

This location restriction determination has been prepared in accordance with 35 Ill. Adm. Code Subpart C, Section 845.320 for the Metal Cleaning Basin (MCB) at the Powerton Generating Station, operated by Midwest Generation, LLC (Midwest Generation), in Pekin, Illinois to document compliance with location restrictions related to fault areas.

1. Fault Areas Location Restriction Determination

The MCB is not located within 200 feet (60 meters) of a mapped Holocene-aged fault, as mapped by the United States Geological Survey (USGS) Quaternary Fault Database. Therefore, the location of the MCB complies with the requirements outlined in §845.320.

2. Professional Engineer's Certification

This report was prepared in accordance with current practices and the standard of care exercised by scientists and engineers performing similar tasks in the field of environmental engineering. The contents of this report are based solely on the observations of the conditions observed by KPRG personnel and information provided to KPRG by Midwest Generation. Consistent with applicable professional standards of care, our opinions and recommendations were based in part on data furnished by others, which was consistent with other information that we developed in the course of our performance of the scope of services. The information contained in this report is intended for use solely by Midwest Generation and their subconsultants.

Joshua D. Davenport, P.E.
Illinois Professional Engineer No. 062.061945
License Expires: 11/30/2023

JOSHUA D. DAVENPORT 062-061945 LICENSED PROFESSIONAL ENGINEER STATE OF ILLINOIS

3. References

U.S. Geological Survey and Illinois State Geological Survey, Quaternary Fault and Fold Database for the United States, accessed March 9, 2022, at https://www.usgs.gov/natural-hazards/earthquake-hazards/faults.

K P R G

ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG and Associates, Inc.

SEISMIC IMPACT ZONES LOCATION RESTRICTION
METAL CLEANING BASIN
POWERTON GENERATING STATION
MARCH 2022

This location restriction determination has been prepared in accordance with 35 Ill. Adm. Code Subpart C, Section 845.320 for the Metal Cleaning Basin (MCB) at the Powerton Generating Station, operated by Midwest Generation, LLC (Midwest Generation), in Pekin, Illinois to document compliance with location restrictions related to seismic impact zones.

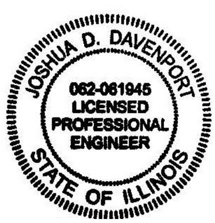
1. Seismic Impact Zones Location Restriction Determination

The U.S. Geological Survey (USGS) National Seismic Hazard Tool website was used to provide the peak ground acceleration based on a 2% probability in 50 years, with a land designation of 'a site on rock' with a ground acceleration of 760 m/s in the upper 30 meters. The peak ground acceleration was determined to be 0.0651 g in 50 years, which is less than 0.10 g in 50 years. Therefore, the MCB complies with the location requirement in 845.330 and is not located in a seismic impact zone.

2. Limitations and Certification

This report was prepared in accordance with current practices and the standard of care exercised by scientists and engineers performing similar tasks in the field of environmental engineering. The contents of this report are based solely on the observations of the conditions observed by KPRG personnel and information provided to KPRG by Midwest Generation. Consistent with applicable professional standards of care, our opinions and recommendations were based in part on data furnished by others, which was consistent with other information that we developed in the course of our performance of the scope of services. The information contained in this report is intended for use solely by Midwest Generation and their subconsultants.

Joshua D. Davenport, P.E.
Illinois Professional Engineer No. 062.061945
License Expires: 11/30/2023



3. References

U.S. Geological Survey, 2018. Earthquake Hazards Program, "National Seismic Hazard Tool," https://www.earthquake.usgs.gov/hazards/interactive/, accessed March 9, 2022.

K P R G

ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG and Associates, Inc.

UNSTABLE AREAS AND FLOODPLAINS LOCATION RESTRICTIONS
METAL CLEANING BASIN
POWERTON GENERATING STATION
MARCH 2022

This location restriction determination has been prepared in accordance with 35 Ill. Adm. Code Subpart C, Section 845.340 for the Metal Cleaning Basin (MCB) at the Powerton Generating Station, operated by Midwest Generation, LLC (Midwest Generation), in Pekin, Illinois, to document compliance with location restrictions related to unstable areas and floodplains.

1. Unstable Areas Location Restriction Determination

The MCB is not located in unstable areas. Therefore, the location of the MCB complies with the requirements outlined in 845.340.

2. Floodplains Location Restriction Determination

The MCB is not located in a floodplain with a 1% chance or greater of occurring according to the National Flood Hazard Layer FIRMette Map No. 17179C0175E as mapped by the Federal Emergency Management Agency. The 1% flood elevation listed on FIRMette Map No. 17179C0175E is 457 ft above mean sea level (amsl) and the embankment crest of the MCB is between 467 to 468 ft amsl. Therefore, the location of the MCB complies with Section 845.340.

3. Limitations and Certification

This report was prepared in accordance with current practices and the standard of care exercised by scientists and engineers performing similar tasks in the field of environmental engineering. The contents of this report are based solely on the observations of the conditions observed by KPRG personnel and information provided to KPRG by Midwest Generation. Consistent with applicable professional standards of care, our opinions and recommendations were based in part on data furnished by others, which was consistent with other information that we developed in the course of our performance of the scope of services. The information contained in this report is intended for use solely by Midwest Generation and their subconsultants.

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License Expires: 11/30/2023

JOSHUA D. DAVENPORT
062-061945
LICENSED
PROFESSIONAL
ENGINEER
STATE OF ILLINOIS

4. Reference

Federal Emergency Management Agency (FEMA), 2020, *National Flood Hazard Layer FIRMette 17179C0175E*, 25 March 2022. https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd.

ATTACHMENT 5
PERMANENT MARKERS

Photo documentation –Metal Cleaning Basin Signage. Powerton Generating Station, Pekin, IL.

1. Metal Cleaning Basin Posted IEPA ID Sign

ATTACHMENT 6
INCISED/SLOPE PROTECTION DOCUMENTATION

Photo documentation – Metal Cleaning Basin Slopes Protection. Powerton Generating Station, Pekin, IL.

1. Metal Cleaning Basin North Slope

2. Metal Cleaning Basin South Slope

3. Metal Cleaning Basin West Slope

4. Metal Cleaning Basin West Slope

ATTACHMENT 7
EMERGENCY ACTION PLAN

EMERGENCY ACTION PLAN
ASH SURGE BASIN, BYPASS BASIN, and METAL CLEANING BASIN
POWERTON STATION
OCTOBER 2021

The Emergency Action Plan (EAP) was initially prepared by Civil & Environmental Consultants, Inc. (CEC) pursuant to 40 CFR 257.73(a)(3) for the Ash Surge Basin and Bypass Basin at the Midwest Generation, LLC (MWG) Powerton Station (Station) in Pekin, Illinois. This EAP has been revised to comply with 35 Ill. Adm. Code Part 845, Subpart E, §845.520 by revising the code references and including the Metal Cleaning Basin. Previous assessments performed in accordance with §257.73(a)(2) identified the Ash Surge Basin and the Ash Bypass Basin as significant hazard potential Coal Combustion Residual (CCR) surface impoundments, and as a result, this written EAP has been prepared to address a potential failure of the Ash Surge Basin and Bypass Basin along with the Metal Cleaning Basin. The Metal Cleaning Basin was not originally included in the hazard potential assessment, but the relative location of the Metal Cleaning Basin allows for the failures and the result of the failures for the Ash Surge Basin and Bypass Basin to be applied to the Metal Cleaning Basin. The EAP is presented as follows:

Section 1.0: §845.520(b)(1) Definition of the events or circumstances involving the CCR unit(s) that represent a safety emergency, along with a description of the procedures that will be followed to detect a safety emergency in a timely manner;

Section 2.0: §845.520(b)(2) Definition of the responsible persons, their respective responsibilities, and notification procedures in the event of a safety emergency involving the CCR unit(s);

Section 3.0: §845.520(b)(3) Contact information of emergency responders;

Section 4.0: §845.520(b)(4) Provide Site Maps, which delineate the downstream areas which would be affected in the event of the Basins failure and a physical description of the CCR Units;

Section 5.0: §845.520(b)(5) Include provisions for an annual face-to-face meeting or exercise between representatives of the Powerton Station and the local emergency responders; and

Section 6.0: §845.520(e) The owner or operator of the CCR unit(s) must obtain a certification from a qualified professional engineer stating that the written EAP, and any subsequent amendment of the EAP, meets the requirements of 845.520.

1.0 DEFINITION OF THE EVENTS THAT REPRESENT A SAFETY EMERGENCY

In accordance with Section 845.520(b)(1), the following tables define the events and/or circumstances involving the Basins that represent a safety emergency, along with a description of the procedures that will be followed to detect a safety emergency in a timely manner.

The information provided in the Tables 1 through 4 provide a listing of problems which may occur at the Basins, how to make a rapid evaluation of the problem, and what action should be taken in response to the problem. This section presents only generalized information to aid in first response to a given problem. Suspected problems should be reported as soon as possible, as discussed in Section 2.0, and assistance from a qualified engineer should be obtained if necessary.

The problems outlined in this Section are related to above grade, earthen type embankment dams similar in construction to the Ash Surge Basin, Ash Bypass Basin, and the Metal Cleaning Basin. The problems discussed herein include:

- Table 1: Seepage
- Table 2: Sliding
- Table 3: Cracking
- Table 4: Animal Burrows and Holes

For each problem, the indicators are discussed followed by evaluation techniques and then by action items for each problem.

2.0 RESPONSIBLE PERSONS, RESPECTIVE RESPONSIBILITIES, AND NOTIFICATION PROCEDURES

The EAP must be implemented once events or circumstances involving the CCR unit that represent a safety emergency are detected, including conditions identified during periodic structural stability assessments, annual inspections, and inspections by a qualified person. In accordance with §845.520(b)(2), the following sections define responsible persons, their respective responsibilities, and notification procedures in the event of a safety emergency involving the Ash Surge Basin, Bypass Basin, and/or the Metal Cleaning Basin. Contact information is provided in Table 5, attached.

2.1 Responsible Persons and Responsibilities

Appropriate parties will be notified based on the nature and severity of the incident as determined by the Station Environmental Specialist or Chemical Specialist. If failure is imminent or has occurred, notification and mitigation procedures are a top priority, particularly for a potentially hazardous situation. The Station Environmental Specialist or Chemical Specialist, in conjunction with the Station Director, is responsible for this determination.

2.2 Notification Sequence

The following notification procedures shall be used by employees in the event of a safety emergency with the Ash Surge Basin, Bypass Basin, and/or the Metal Cleaning Basin.

(1) Notify the Shift Supervisor and Environmental Specialist, Chemical Specialist, or alternate.

(2) If unsafe conditions exist, the employee should evacuate the area.

(3) Only the Environmental Specialist, Chemical Specialist, Corporate Environmental or designated alternate shall have any official communication with non-employees or regulatory agencies, and only the Communications Director shall have any contact with the media.

The Environmental Specialist, Chemical Specialist, or designated alternate should follow these procedures in the event of a safety emergency involving the Ash Surge Basin and/or Bypass Basin:

(1) Organize appropriately trained Station personnel and/or other employees or contractors as necessary to assist with the safety emergency.

(2) After consultation with appropriately trained Station personnel, contact the proper civil authorities (e.g., fire, police, etc.) if necessary. Notify the appropriate agencies where there has been a reportable release of material(s) into the environment. See Table 5, attached for contact information. Notify MWG Corporate via the Intelex online notification system within 24 hours in the event of a reportable release. A reportable release is a Material Release defined as a spill or leak that materialized in the waterway. A Non-Material Release is a spill or leak that did not come into contact with the waterway.

(3) Be prepared to evacuate the inundation area at any time during the safety emergency response.

(4) If the emergency is beyond the Facility's response capabilities, contact one or more emergency response contractors as necessary.

(5) Corrective actions should only be performed by properly trained individuals.

2.3 Emergency Responders Contact Information

In accordance with §845.520(b)(3), Table 5, attached, provides contact information of emergency responders. The Station Environmental Specialist, Chemical Specialist, or alternate will determine who to notify, including any affected residents and/or businesses, in the case of an imminent or actual CCR surface impoundment dam failure. The Station Environmental Specialist, Chemical Specialist, or alternate will ensure proper notifications are made.

Appropriate contractors will be utilized to assist the Station Environmental Specialist, Chemical Specialist or alternate with mitigated actions being undertaken in order to minimize the impact of an event that has occurred. Contact information for contractors and consultants are provided in Table 5.

3.0 SITE MAP AND A SITE MAP DELINEATING THE DOWNSTREAM AREA

In accordance with §845.520(b)(4), the following section provides a physical description of the Ash Surge Basin, Bypass Basin, and the Metal Cleaning Basin. A Site Vicinity Map is provided as Figure 1, a Site Plan for the Ash Surge Basin, Bypass Basin, and the Metal Cleaning Basin is provided as Figure 2. Drawings depicting the locations of, and the downstream areas affected by, a potential failure of the Ash Surge Basin and Bypass Basin were prepared by Geosyntec in October 16, 2016 and are provided in Appendix A.

3.1 Basin Locations and Descriptions

The Ash Surge Basin, Bypass Basin and Metal Cleaning Basin are located in the eastern portion of Powerton Station (see Figure 1) northeast of the Main Power Block Building situated between the Old Intake Channel and the Former Ash Basin. The Bypass Basin is immediately southeast of the Ash Surge Basin. The Metal Cleaning Basin is immediately west of the Ash Surge Basin.

From CEC's observations and review of construction and engineering documentation provided by MWG, the Basins were constructed with elevated earthen berms or embankments. Run-on is limited to precipitation contained within the earthen berm. Physical characteristics of the Ash Surge Basin, Bypass Basin, and the Metal Cleaning Basin are provided in Table 6.

3.2 Delineation of Downstream Areas

The potential impacts from failure of the Ash Surge Basin and Bypass Basin were evaluated and reported by Geosyntec in the Hazard Potential Classification Assessment (HPCA), dated October 2016. A copy of the HPCA is contained on the CCR Rule Compliance Data and Information web site (http://www.nrg.com/legal/coalcombustion-residuals/).

Results of the HPCA indicate that both the Ash Surge Basin and Bypass Basin are classified as significant hazard potential CCR surface impoundments. The evaluation reports no loss of life resulting from failure of the Basin embankments is probable because no occupied buildings are located within the anticipated inundation areas. However, potential failure during flood conditions could result in offsite economic or environmental impacts. Inundation Maps are provided in Appendix A.

Reviewing the location of the Metal Cleaning Basin, it is reasonable to conclude that no loss of life would occur resulting from a failure of the Metal Cleaning Basin embankments because no occupied buildings are located downstream.

4.0 ANNUAL FACE-TO-FACE MEETING

In accordance with §845.520(b)(5), a face-to-face meeting or an exercise between representatives of the Powerton Station and the local emergency responders shall be offered and, if accepted, held on an annual basis. The purpose of the annual meeting is to review the EAP to assure that contacts, addresses, telephone numbers, etc. are current. The annual meeting will be held whether or not an incident occurred in the previous year. In the event an incident occurs, the annual meeting date may be moved up in order to discuss the incident closer to the date of occurrence. If no incidents have occurred, the annual meeting will be held to inform local emergency responders on the contents of the EAP and changes from the previous year. Documentation of the annual face to face meeting will be recorded and placed in the operating record for the Station.

5.0 LIMITATIONS AND CERTIFICATION

This EAP was prepared to initially meet the requirements of 257.73(a)(3) and was previously prepared by CEC in April 2017 to address the Ash Surge Basin and the Bypass Basin. This EAP has been updated to include the Metal Cleaning Basin and the remainder was reviewed by KPRG for compliance with 35 Ill. Adm. Code 845.520(b). KPRG's review of the EAP is based solely on the observations of the conditions observed by KPRG personnel and information provided to KPRG by Midwest Generation. This review neither accepts nor rejects the safety emergencies identified by CEC. The safety emergencies identified along with the responses are the product of CEC. KPRG has not altered the safety emergencies or the responses associated with each emergency. As such, the Emergency Action Plan complies with 35 Ill. Adm. Code 845.520(b).

Signature:

Name: Joshua D. Davenport, P.E.

JOSHUA D. DAVENPORT 062-061945 LICENSED PROFESSIONAL ENGINEER STATE OF ILLINOIS

Date of Certification: 10/21/2021

Illinois Professional Engineer No. 062.061945

License Expires: 11/30/2021

FIGURES

W:\projects\midwest generation\operating permit\powerton\figures\eap map.dwg

E N V I R O N M E N T A L C O N S U L T A T I O N & R E M E D I A T I O N

KPRG

KPRG and Associates, inc.

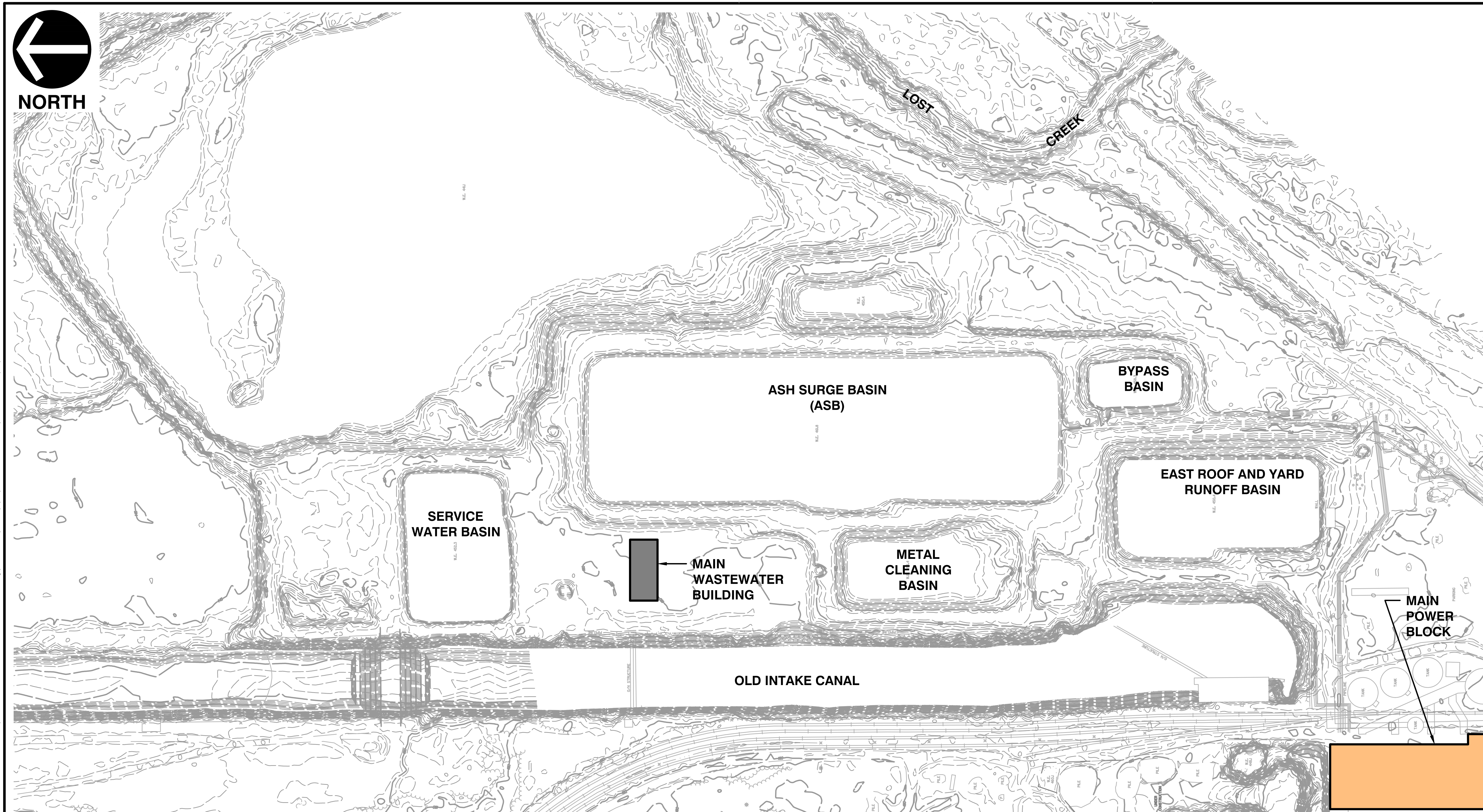
414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

14665 West Lisbon Road, Suite 1A Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478

SITE MAP

POWERTON GENERATING STATION
PEKIN, ILLINOIS

Scale: 1" = 550'	Date: October 20, 2021
KPRG Project No. 19520	FIGURE 1



P:\2016\163-469\-CADD\Dwg\CIV01-Powerton Station\163469-CV01-C102-Site Plan.dwg{LAYOUT1} LS:(3/9/2017 - ccase) - LP: 4/5/2017 1:26 PM

REFERENCE

1. TOPOGRAPHIC INFORMATION SOUTH OF SECONDARY ASH SETTLING BASIN AND FAB IS BASED ON AERIAL SURVEY PERFORMED BY AEROMETRIC, INC. DATED JUNE 19, 2008. TOPOGRAPHY NORTH OF ASH SURGE BASIN IS BASED ON SURVEY BY RIDGELINE CONSULTANTS PERFORMED IN FEBRUARY AND MARCH 2016.

LEGEND

- OCCUPIED STRUCTURE
- UNOCCUPIED STRUCTURE
- TOPOGRAPHY (1-FOOT INTERVAL)

*HAND SIGNATURE ON FILE

SCALE IN FEET

0 200 400

CEC
Civil & Environmental Consultants, Inc.
555 Butterfield Road, Suite 300 - Lombard, IL 60148
630-963-6026 · 877-963-6026
www.cecinc.com

POWERTON STATION
ASH SURGE BASIN - BYPASS BASIN
PEKIN, ILLINOIS

SITE PLAN

DRAWN BY: MSK	CHECKED BY: MDJ	APPROVED BY: MDJ*	FIGURE NO.:
DATE: 04/05/2017	DWG SCALE: 1"=200'	PROJECT NO: 163-469.0100	2

TABLES

Table 1: Ash Surge Basin, Ash Bypass Basin, and Metal Cleaning Basin
Event Definition, Evaluation and Action: Seepage

Definition	Evaluation	Action
1A: Wet area on downstream embankment slope or other area downstream of the embankment, with very little or no surface water or very minor seeps.	1B: Condition may be caused by infiltration of rain water, which is not serious; or may be the start of a serious seepage problem, which would be indicated by a quick change to one of the conditions below.	1C: No immediate action required. Note the location for future comparison.
2A: Same wet area as above, with moderate seeps of clear or relatively clear water and the rate of flow not increasing.	2B: Measure the flow periodically and note changes in clarity.	2C: No immediate action required. Note the location, flow rate, and clarity for future comparison. During reservoir flood stages, the seepage area should be watched for changes.
3A: Same wet area as above, with moderate seeps of clear or relatively clear water and rate of flow increasing.	3B: Measure the flow periodically and note changes in clarity. Inspect downstream area for new seeps.	3C: Contact a qualified engineer for immediate inspection (see Table 5). Observe the condition constantly for further changes in flow rate or clarity, unless notified otherwise by the engineer.
4A: Piping (seepage with the removal of materials from the foundation or embankment), moderate to active flows of cloudy to muddy water.	If the water is cloudy to muddy, and the rate of flow is increasing, this condition could lead to failure of the dam. If, along the piping, there is an upstream swirl (whirlpool) caused by water entering through the abutments of embankment, failure is imminent.	4C: Immediate action is necessary. Notify the appropriate agencies (see Table 5).
5A: Boils (soil particles deposited around a water exit forming a cone, varying from a few inches in diameter spaced 2 to 3 feet apart to isolated locations several feet in diameter in the floodplain downstream of the dam) may show the types of flow as noted above.	5B: Evaluation of the problem is the same as noted above for the various flow conditions, i.e., clear and constant, clear and increasing, and cloudy or muddy and increasing.	5C: Actions to be taken are essentially the same as those noted above.

Table 2: Ash Surge Basin, Ash Bypass Basin, and Metal Cleaning Basin
Event Definition, Evaluation and Action: Sliding

Definition	Evaluation	Action
1A: Movement of a portion of the embankment, either the upstream or downstream slope, toward the toe of the dam.	1B: Various degrees of severity of a slide require different responses. The first condition is that the slide does not pass through the crest and does not extend into the embankment for more than 5 ft., measured perpendicular to the slope	1C: For this condition, a qualified engineer (see Table 5) should be consulted before repairs are initiated to determine the cause of the slide and to recommend modifications to prevent future slides. The downstream side of the dam should be watched for the emergence of water, either through the slide or opposite the slide. If water is noted discharging, the area should be treated as a seepage location and monitored as noted above.
2A: Slide passes is the second condition.	2B: In this condition, the slide passes through the crest and that the reservoir elevation is more than 10 ft. below the lowered crest.	2C: Use the same actions as noted above, and notify the appropriate MWG personnel (see Table 5) of the situation so they may be prepared to act if the condition worsens.
3A: Slide passes is also the third condition.	3B: In this condition, the slide passes through the crest and that the reservoir elevation is less than 10 ft. below the lowered crest.	3C: This condition is critical, and failure of the dam should be considered imminent. Notify the appropriate agencies (see Table 5).

Table 3: Ash Surge Basin, Ash Bypass Basin, and Metal Cleaning Basin
Event Definition, Evaluation and Action: Cracking

Definition	Evaluation	Action
1A: Cracks in the embankment can occur either in the longitudinal (along the length of the dam) or transverse (across the dam from upstream to downstream directions).	1B: Some cracking of the surface soils may occur when they become dry. This cracking is to be expected, and no further action is required.	1C: No further action is required.
2A: Longitudinal cracking can indicate the beginning of a slide or be an uneven settlement of the embankment.	2B: Monitor the crack for future changes, and contact a qualified engineer for assistance in the evaluation of the crack and recommended repairs.	2C: Contact a qualified engineer for assistance and recommendations (see Table 5).
3A: Transverse cracking can indicate uneven settlement or the loss of support below the crack. Such cracks usually occur over an outlet conduit, near the abutments, or in the taller portion of the embankment.	3B: Monitor the crack for future changes, and contact a qualified engineer for assistance in the evaluation of the crack and recommended repairs.	3C: Contact a qualified engineer for assistance and recommendations (see Table 5).

Table 4: Ash Surge Basin, Ash Bypass Basin, and Metal Cleaning Basin
Event Definition, Evaluation and Action: Animal Burrows and Holes

Definition	Evaluation	Action
1A: Holes in the embankment, varying in size from about one inch in diameter to one foot in diameter caused by animals.	1B: If the holes do not penetrate through the embankment, the situation is usually not serious. Some animal holes will have soil pushed out around the hole in a circular fashion, which may look like a boil (crayfish or crawdad). Watch for the movement of water and soil particles from these holes to determine whether they are boils.	1C: Backfill as deeply as possible with impervious material. If rodents become a nuisance, an effective rodent control program, as approved by the Illinois Department of Natural Resources District Wildlife Biologist, should be implemented.

Table 5: Midwest Generation Powerton Generating Station
CCR EAP Notification List – Updated September 2021

Plant Contacts:

Name	Title	Contact Info
Joseph Kotas	Environmental Specialist	(O) 309-477-5216 (C) 815-901-6549
Dale Green	Plant Manager	(O) 309-477-5212 (C) 309-620-3908
Todd Mundorf	Operations Manager	(O) 309-477-5215 (C) 847-456-4642
Mark Vannaken	Maintenance Manager	(O) 309-477-5221 (C) 309-824-5686
Sunish Shah	Engineering Manager	(O) 309-477-5243 (C) 773-410-3225
Bill Gaynor	Class K WWT Operator	(O) 309-477-5437 (C) 309-824-2999
Station Control Room	24-Hour, 7-day	309-477-5299

Corporate Support:

Name	Title	Contact Info
Sharene Shealey	Director, Environmental	(C) 724-255-3220
Jill Buckley	Environmental Manager	(C) 724-448-9732
Tony Shea	Sr. Director, Environmental	(O) 609-524-4923 (C) 609-651-6478
Dave Schrader	Sr. Manager, Communications (public point of contact)	(O) 267-295-5768 (C) 267-294-2860

Emergency Response Agencies:

Agency	Address	Contact Info
National Response Center (NRC) – US Army Corp of Engineers	Peoria Lock and Dam 1139 Wesley Rd, Creve Coeur, IL 61610	800-424-8802 (309) 699-6111 (local)
Illinois Department of Natural Resources, Office of Water Resources	One Natural Resources Way, 2nd Floor Springfield, IL 62702-1271	8:30 a.m.-5:00 p.m. 217-782-4427
Illinois Emergency Management Agency (IEMA)	2200 Dirksen Parkway Springfield, IL 62703	800-782-7860
Illinois Environmental Protection Agency (IEPA)	Bureau of Water 1021 North Grand Avenue East Springfield, IL 62794	217-782-3637
Tazewell County Emergency Management Agency Operations Center	21304 IL State Rt. 9 Tremont, IL 61568	Phone: 309-925-2271 24-hour: 309-477-2234
Tazewell County TC3: Dispatches to Fire, Police and Emergency Medical services	101 S Capitol Street Pekin, IL 61554	Emergency: 9-1-1 Non-Emergency: 309-478-5796
Pekin Police Department	111 S Capitol St #100 Pekin, IL 61554	Emergency: 9-1-1 Non-Emergency: 309-346-3132 Front Desk: 309-478-5330
Pekin Fire Department	3232 Court Street Pekin, IL 61554	Emergency: 9-1-1 Non-Emergency: 309-477-2388

Environmental Response Contractors/Consultants:

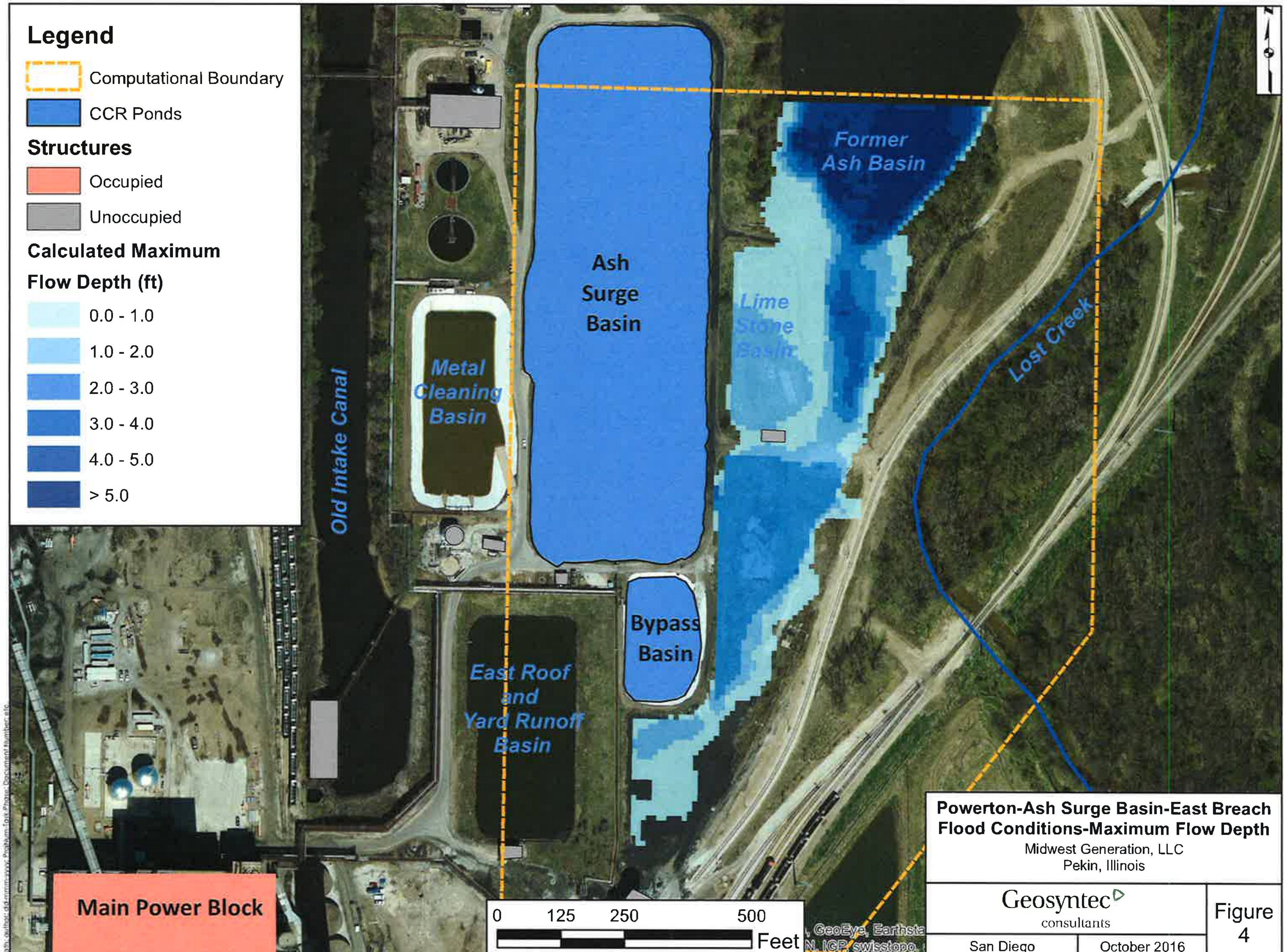
Contractor/Consultant	Address	Contact Info
Civil & Environmental Consultants, Inc.	555 Butterfield Road, Suite 300 Lombard, IL 60148	630-963-6026
Iron Hustler Excavating	1604 West Detweiller Drive Peoria, IL61615	309 691-9894
SET Environmental	450 Sumac Road Wheeling, IL 60090	847 850-1056 877-437-7455 (24-hr)
Heritage Environmental Services	15330 Canal Bank Road Lemont, IL 62095	630-739-1151

Table 6: Basin Characteristics

	Ash Surge Basin	Bypass Basin	Metal Cleaning Basin
Estimated Capacity (acre-feet)	92.1	5.1	14.0
Estimated Maximum Basin Depth (feet)	16	10	10
Elevation - Maximum Crest (ft msl.)	467.6	467.6	467.6

APPENDIX A

GEOSYNTEC HPCA INUNDATION MAPS

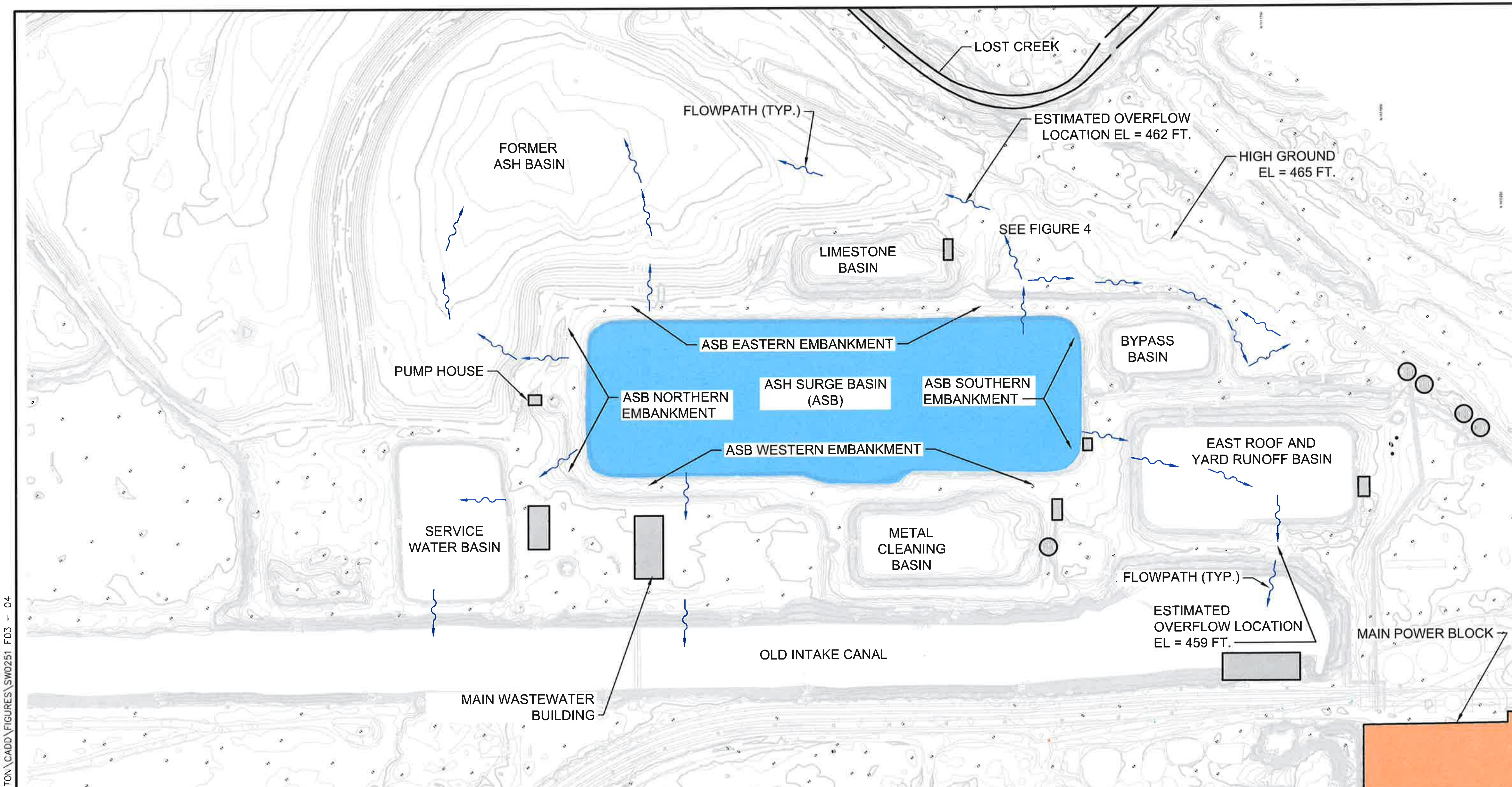


Powerton-Ash Surge Basin-East Breach Flood Conditions-Maximum Flow Depth

Midwest Generation, LLC
Pekin, Illinois

Geosyntec consultants

San Diego	October 2016	Figure 4



SOURCE OF SURVEY:

TOPOGRAPHY SOUTH OF SECONDARY ASH SETTLING BASIN AND FAB IS BASED ON AERIAL SURVEY PERFORMED BY AEROMETRIC, INC. DATED JUNE 19, 2008. TOPOGRAPHY NORTH OF ASH SURGE BASIN IS BASED ON SURVEY BY RIDGELINE CONSULTANTS PERFORMED IN FEBRUARY AND MARCH 2016.

NOTE:

1. TOPOGRAPHY SHOWN DOES NOT REFLECT MINOR REGRADING OF THE SLOPE EAST OF THE BYPASS BASIN PERFORMED IN FALL 2016.

LEGEND

STRUCTURES

- OCCUPIED
- UNOCCUPIED

0 200' 400'

SCALE IN FEET

ASH SURGE BASIN

POTENTIAL BREACH FLOWPATHS

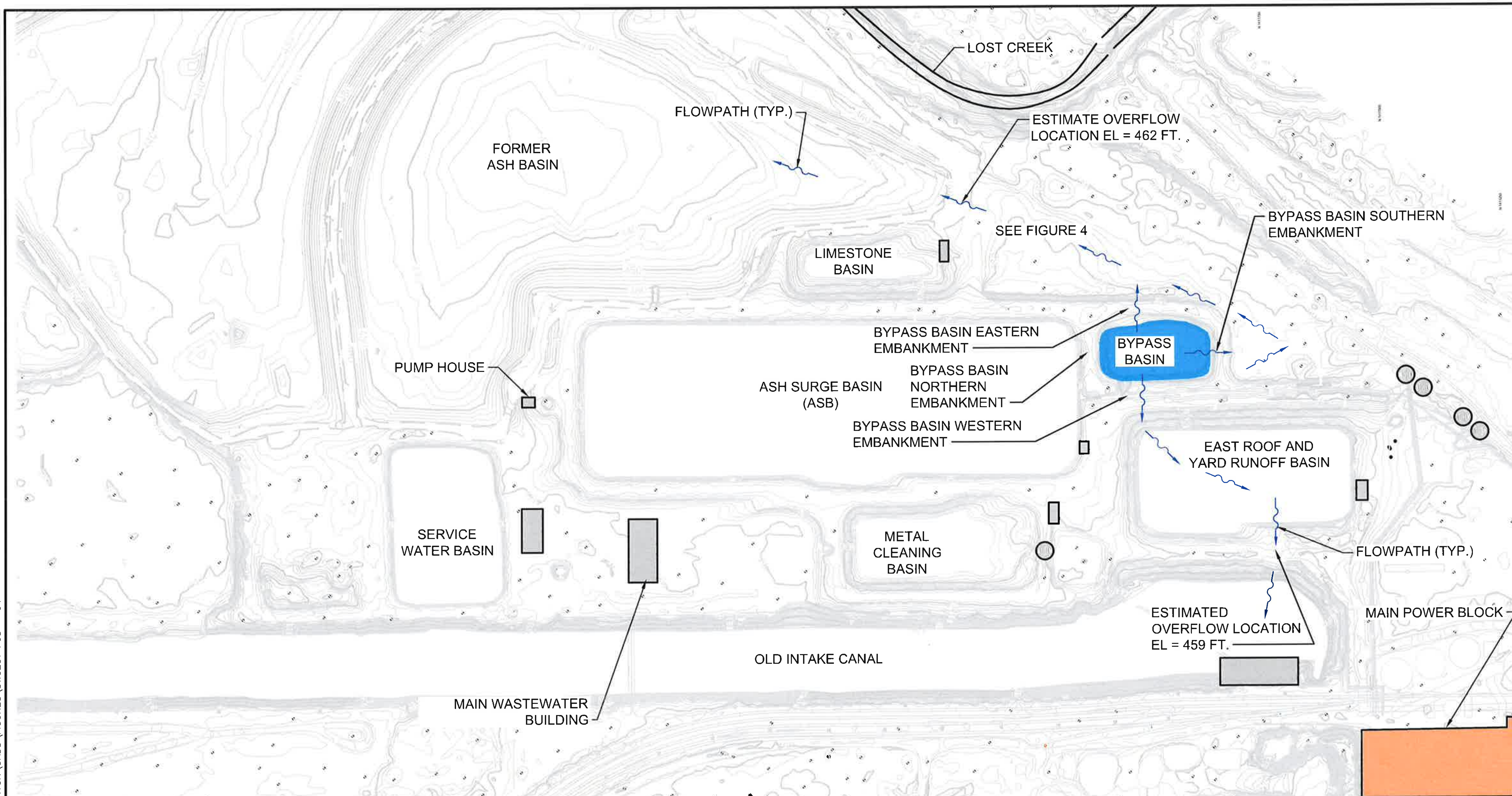
POWERTON STATION

PEKIN, ILLINOIS

Geosyntec consultants

FIGURE 3

PROJECT NO: SW0251 | OCTOBER 2016



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LEGEND

STRUCTURES

- OCCUPIED
- UNOCCUPIED

N

0 200' 400'

SCALE IN FEET

BYPASS BASIN

POTENTIAL BREACH FLOWPATHS

POWERTON STATION

PEKIN, ILLINOIS

Geosyntec consultants

FIGURE 5

PROJECT NO: SW0251 | OCTOBER 2016

\\SANDIEGO-01\SW0251\07 POWERTON\CADD\FIGURES\SW0251 F03 - 04

ATTACHMENT 8
FUGITIVE DUST CONTROL PLAN

CCR COMPLIANCE
FUGITIVE DUST CONTROL PLAN

Midwest Generation, LLC
Powerton Generating Station
13082 East Manito Road
Pekin, Illinois

PREPARED BY: KPRG and Associates, Inc.
14665 W. Lisbon Road, Suite 1A
Brookfield, WI 53005

October 19, 2021

TABLE OF CONTENTS

SECTION/DESCRIPTION **PAGE**

1.0 INTRODUCTION

On April 15, 2021, the Illinois Environmental Protection Agency adopted a new Part 845 of its waste disposal regulations creating statewide standards for the disposal of coal combustion residuals (CCR) in surface impoundments, created by the generation of electricity by coal-fired power plants. Part 845 specifically requires that "the owner or operator of a CCR surface impoundment, or any lateral expansion of a CCR surface impoundment, must adopt measures that will effectively minimize CCR from becoming airborne at the facility, including CCR fugitive dust originating from CCR surface impoundments, roads, and other CCR management and material handling activities". As a result, each regulated facility must develop a CCR fugitive dust control plan that complies with 35 Ill. Adm. Code 845.500(b).

This site specific Fugitive Dust Control Plan (Plan) has been developed to comply with the requirements specified in Section 845.500. In general, the Plan identifies the potential CCR fugitive dust sources and describes the control measures that will be implemented to minimize CCR fugitive dust emissions. The Plan also includes a procedure for the periodic assessment of the Plan's effectiveness, documentation of any Plan amendments deemed necessary to assure continued compliance, a record of any citizen complaints received pertaining to CCR fugitive dust emissions, and an outline of the required reporting and recordkeeping requirements in 35 Ill. Adm. Code 845.500.

2.0 SITE INFORMATION

2.1 Owner/Operator and Address:

Midwest Generation, LLC
Powerton Generating Station
13082 East Manito Road
Pekin, Illinois

2.2 Owner Representative/Responsible Person Contact Information:

Mr. Dale Green
Plant Manager
309-346-2165

2.3 Location and Description of Facility Operations

The Midwest Generation Powerton Generating Station is located at 13082 East Manito Road, Pekin, Tazewell County, Illinois. The facility is a coal-fired electric power generating station occupying approximately 1,710 acres. Units 5 and 6 began operating in 1972 and 1975, respectively. Electrical power is transmitted from the site to the area grid through overhead transmission power lines. In conjunction with the station is a man-made perched cooling pond which occupies approximately 1,440 acres and provides cooling water to the facility.

The general vicinity is a primarily mixed industrial and agricultural area with limited commercial and residential developments.

3.0 POTENTIAL FUGITIVE DUST SOURCES

Potential fugitive dust sources associated with the bottom ash and slag and fly ash systems have been identified at the facility; however, some of these are regulated by the facility's operating permit and are adequately addressed within the required fugitive dust operating program. The potential CCR fugitive dust sources generally include exterior ash distribution systems, temporary ash storage locations, ash bulk loading/unloading operations and ash truck transportation routes. Fugitive dust could potentially be generated from these sources as a result of equipment malfunctions, wind erosion, housekeeping issues and/or the nature of the operation. Specifically, these identified sources were further evaluated to determine the probability of CCR fugitive dust being generated and to determine the level of emission controls that are warranted to mitigate fugitive dust emissions. The findings of the evaluation are individually discussed in the following sections.

3.1 Bottom Ash and Slag Distribution System

Collected bottom ash and slag in the boilers is transported as a liquid mixture through an enclosed piping system to the dewatering bins. Some of this piping is located inside a building; however, a portion is situated above ground and in the outside environment. Although not an anticipated occurrence, a breach in the exterior piping could result in the accidental release of bottom ash and slag and potential fugitive dust emissions if the material were to accumulate and dry out.

3.2 Dewatering Bins

The dewatering bins are designed to remove water from the bottom ash and slag. Bottom ash and slag that is relatively wet is drop loaded through the bins into open top trucks for removal off-site for beneficial reuse purposes. The water removed from the dewatering bins is pumped to the Ash Surge Basin and the Ash Bypass Basin where settling occurs prior to discharge of the water from the facility. As of right now, the Metals Cleaning Basin has no water. The loading operation has the potential for fugitive dust emissions if bottom ash and slag is not properly loaded and is allowed to accumulate and dry out on the ground surface beneath the dewatering bins.

3.3 Ash Surge Basin, Bypass Basin, and Metal Cleaning Basin

Extracted water from the dewatering bins is pumped through enclosed pipes to the Ash Surge Basin or the Ash Bypass Basin. Occasionally, CCR material is placed in the Metal Cleaning Basin. After settling occurs, water from the Ash Surge Basin, Ash Bypass Basin, and the Metal Cleaning Basin is ultimately discharged through a final settling basin and then through a regulated NPDES outfall. These basins are normally filled with water; however, dredging occasionally may be required to remove the settled material from each basin. When this requirement occurs, the basins are dewatered and the dredged material is allowed to dry within each basin. When the material is suitable for transport, it is loaded into open top trucks, covered if necessary, and sent off site to a mine reclamation site. Potential fugitive dust emissions could occur if dry bottom ash and slag residual is exposed or loaded during excessive windy and dry weather conditions.

3.4 Former Ash Basin

This basin was formerly used for the routine disposal of bottom ash and slag; however, this procedure ceased in the 1970s. The bottom ash and slag is completely submerged within the basin. Water level fluctuations in the basin are attributable to precipitation and other weather-related conditions. In rare emergency operational situations, overflow from the Ash Surge Basin to the Former Ash Basin could occur by gravity through the spillway. This discharge is not expected to contain significant quantities of CCR and is allowed through the existing NPDES permit. It is noted that a new railroad spur was constructed through the middle of the Former Ash Basin.

3.5 Concrete Storage Pad

This partially below-grade concrete structure is used for the temporary storage of residual bottom ash and slag generated at the dewatering bins and as a result of other routine ash-related maintenance activities. The staged bottom ash and slag is allowed to partially dry within the structure until it is suitable for off-site removal. The material is placed in temporary storage, loaded into open top trucks, covered and sent off site to a mine reclamation site. Dry material that is exposed during excessively windy and dry weather conditions has the potential for becoming fugitive dust emissions.

3.6 Fly Ash Equipment

Collected fly ash in the precipitator hoppers is initially transported in a closed vacuum piping system to a cyclone and bag filter where it is mechanically separated from the air stream within an enclosed building. Fly ash is then sent within an enclosed building to the fly ash silos. At the silos, the fly ash is drop loaded into trucks through a telescopic pipe contained within a drop chute. The loading of fly ash occurs within a partially enclosed structure. After the trucks containing fly ash have been loaded and the truck’s rear gate is water sprayed to remove dust, they proceed to a nearby platform to allow the truck driver to secure the truck and to broom sweep or water spray any residual fly ash remaining on the truck. This entire process is covered by the fugitive dust operating program for the facility.

3.7 Ash Transport Roadways

Both gravel covered and asphalt paved roads within the facility are used by trucks hauling bottom ash, slag, and fly ash to the mine reclamation site as well as by other vehicles entering and exiting the facility. Fugitive CCR dust emissions could occur during transit if CCR material is not properly cleaned from the trucks or if there is a release of CCR material from the vehicle due to a malfunction or accident.

These potential fugitive dust sources are identified on the Site Diagram included in Appendix A.

4.0 DESCRIPTION OF CONTROL MEASURES

4.1 Purpose

The purpose of developing appropriate control measures is to minimize and reduce the emissions of CCR fugitive dust from the identified potential emission sources. The control measures and work practices implemented at the facility are described in the following sections.

4.2 Bottom Ash and Slag Distribution System

Bottom ash and slag is in a liquid mixture within a closed system until the point of discharge at the dewatering bins. A significant portion of the piping system is contained within a building, which eliminates dust emissions to the outside environment. An assessment of the exterior distribution system will be performed on a quarterly basis to verify the integrity of the system or when a breach in the system is detected. If a leak is noted, resulting in the release of bottom ash and slag, the affected area will be restored to original conditions and repair of the pipe will be performed as soon as feasible. The CCR will be sent off site to a mine reclamation site.

4.3 Dewatering Bins

The bottom ash and slag is drop loaded from the dewatering bins in a wet state and into trucks positioned beneath the bins. The bottom ash and slag has sufficient moisture to preclude this material from becoming airborne during loading. An assessment of the dewatering bin loading operation will be performed on a quarterly basis to verify if there has been an equipment malfunction resulting in an accumulation of released material. Should there be a malfunction in the dewatering equipment that results in a spill of the material, repair of any malfunctioning equipment and clean up and transfer of the material to the concrete storage pit will be performed as soon as feasible.

4.4 Ash Surge Basin, Ash Bypass Basin, and Metal Cleaning Basin

During normal operations, the Ash Surge Basin and Ash Bypass Basin are filled with water thereby suppressing any potential fugitive dust emissions. The Metal Cleaning Basin has recently been emptied and cleaned thereby suppressing any potential fugitive dust emissions. Infrequently, the basins will need to be dewatered and the sediment removed for proper off-site disposition. While the bottom ash and slag residue is drying, there is the potential for this material to become airborne especially during excessively dry and windy conditions. Loading of this material under these adverse conditions also has the potential for generating fugitive dust. Dewatered basins will be assessed on a quarterly basis or more frequently during excessively dry and windy conditions. To minimize fugitive dust emissions from exposed dry bottom ash and slag, the height of the staged material will be minimized and the material piles will be either sprayed with water or covered. Loading activities also will be limited during such occasions.

4.5 Former Ash Basin

The Former Ash Basin was used for the disposal of bottom ash and slag in the past; however, this procedure is no longer occurring. The previously deposited material is completely submerged within the basin with the typical water level at approximately 10-15 feet below grade, thereby, making the bottom ash and slag not readily susceptible to wind erosion and generation of potential fugitive dust emissions.

4.6 Concrete Storage Pad

The concrete pad only periodically contains bottom ash and slag and other CCR-related materials generated from routine plant maintenance activities. Typically these materials are in a wet state but are allowed to partially dry to facilitate removal. When sufficiently dry, the material is promptly removed off site. The concrete pad will be assessed on a quarterly basis or more frequently during excessively dry and windy conditions. To minimize fugitive dust emissions from exposed dry bottom ash and slag and other CCR-related materials, the height of the staged material will be minimized and the material piles will be either sprayed with water or covered.

4.7 Fly Ash Equipment

Fly ash from the mechanical separators is sent to the silos within an enclosed structure. The fly ash is drop loaded into an opening within the tarp covering the truck trailer through a telescopic pipe contained within a drop chute. This loading mechanism minimizes the potential for fly ash to become airborne during the loading process. The loading of trucks also occurs within a partial enclosure. At the completion of loading but prior to leaving the enclosure, the rear of each truck trailer is sprayed with water. The truck is then broom swept or water sprayed at the truck stand to remove any accumulated fly ash. Accumulated CCR is promptly transferred to the concrete storage pad.

This process is covered by the facility's fugitive dust operating program. Under the program, the facility must maintain control measures, including enclosures, covers and dust collection devices. Additionally, the facility is required to conduct weekly inspections of the process to confirm compliance. A record of the inspections is maintained at the facility.

4.8 Ash Transport Roadways

Truck drivers are instructed on the proper procedure for cleaning trucks and a vehicle speed limit is enforced at the facility. Ash material that may not have been adequately removed from the trucks has the potential to become airborne and ultimately be deposited on haul roads. To minimize fugitive dust emissions, these roads will be assessed on a quarterly basis and any observed accumulated ash material will be promptly cleaned up and collected for off-site removal.

5.0 PLAN ASSESSMENTS/AMENDMENTS

To assure that the work practices being implemented adequately control the dust from the identified potential fugitive dust emission sources at the facility, routine assessments and record keeping are performed. These procedures include the following:

5.1 Fugitive CCR Dust Assessments

Pursuant to 845.500(b)(3), assessments of the potential fugitive dust emission sources identified within this Plan will be conducted to assess the effectiveness of this Plan. The assessment will include observation of ash removal from basins, temporary storage and transport activities at the facility to confirm the adequacy of the control measures. The assessments will be conducted on a quarterly basis by an individual designated by the contact identified in Section 2.2 of this Plan. Observations made during each assessment are recorded on a form similar to the one included in Appendix B, however, the station may create their own form.

If the results of the assessment determine that ash-related equipment has malfunctioned or the integrity of the equipment has been compromised, the necessary repairs or replacement will be performed as soon as feasible. If the assessment finds that this Plan does not effectively minimize the CCR from becoming airborne, this Plan will be amended to include additional control measures.

5.2 Plan Amendments

This Fugitive Dust Plan will be reviewed whenever there is a change in conditions that would substantially affect the written Plan currently in place. A record of the reviews and any modifications or amendments made to the Plan currently in place will be kept on a form similar to the one included in Appendix C, however, the station may create their own form. The amended Plan will be reviewed by a Registered Professional Engineer and, if deemed acceptable, will be recertified.

5.3 Citizen Complaints

Any written or verbal complaints received from a citizen involving alleged CCR fugitive dust emission events at the facility will be recorded by an individual designated by the contact identified in Section 2.2 of this Plan. The complaints will be recorded on a form similar to the one included in Appendix D, however, the station may create their own form. Upon receipt of the complaint, an investigation of the alleged source of the fugitive dust emissions will be performed and the results of that investigation recorded on the form. If the fugitive dust emission event is confirmed, any necessary repairs or changes in operation required to mitigate the fugitive dust emissions will be implemented as soon as practicable. Quarterly reports will be submitted to the IEPA no later than 14 days from the end of the quarter of all complaints received during that quarter, including the information required by 845.500(b)(2)(A).

6.0 CCR FUGITIVE DUST PLAN REPORTING/RECORDKEEPING REQUIREMENTS

This section outlines the Plan reports that must be prepared, submitted, and records that must be maintained to meet the requirements specified in 35 Ill. Adm. Code Section 845.500. These requirements include the following:

- Place the Plan in the facility's operating record and publicly accessible internet site. If the Plan is amended, replace the initial Plan with the amended Plan. Only the most recent amended Plan will be maintained in the facility's operating record and internet site.

- Prepare an annual CCR Fugitive Dust Control Report and submit to the IEPA as part of the annual consolidated report required by 845.550. The annual report will include:
  - A description of the actions taken to control CCR fugitive dust,
  - A record of all citizen complaints, and
  - A summary of any corrective measures taken.
  - Placement of this report in the operating record and publicly accessible internet site.

- Provide notification to the IEPA and, if applicable, the Tribal authority when the Plan and reports are placed in the facility's operating record and publicly accessible internet site.

- Submit quarterly reports to IEPA within 14 days from the end of the quarter of all complaints received in that quarter. The quarterly reports will include:
  - The date of the complaint,
  - The date of the incident,
  - The name and contact information of the complainant, and
  - All actions taken to assess and resolve the complaint.

7.0 PROFESSIONAL ENGINEER CERTIFICATION

The undersigned Registered Professional Engineer is familiar with the requirements of 845.500 and has visited and examined the facility or has supervised examination of the facility by appropriately qualified personnel. The undersigned Registered Professional Engineer attests that this CCR Fugitive Dust Control Plan has been prepared in accordance with good engineering practice, including consideration of applicable industry standards and meets the requirements of 845.500, and that this Plan is adequate for the facility. This certification was prepared as required by 845.500(b)(7).

Engineer: Joshua D. Davenport

Signature: ______________________

Date: 10/19/21

Company: KPRG and Associates, Inc.

Registration State: Wisconsin

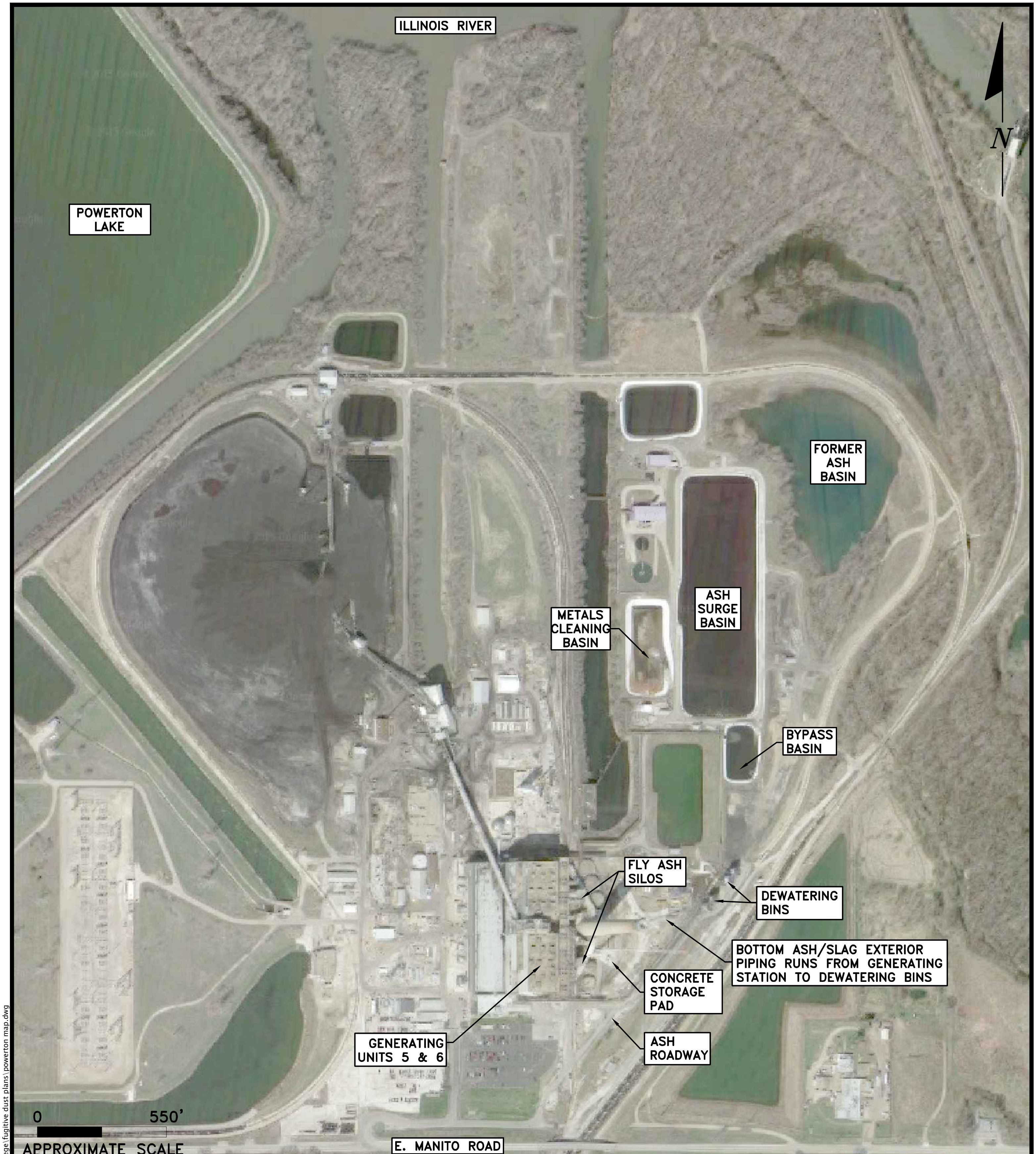
Registration Number: 062.061945

License Expiration Date: November 30, 2021

Professional Engineer Stamp:

APPENDIX A

SITE DIAGRAM
POTENTIAL FUGITIVE DUST SOURCES



ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG

KPRG and Associates, inc.

414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

14665 West Lisbon Road, Suite 2B Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478

SITE DIAGRAM/FUGITIVE DUST SOURCES

POWERTON GENERATING STATION
PEKIN, ILLINOIS

Scale: 1" = 550'

Date: October 15, 2021

KPRG Project No. 15315

APPENDIX A

W:\projects\midwest generation\attorney-client privilege\fugitive dust plans\powerton map.dwg

APPENDIX B

EXAMPLE ASSESSMENT RECORD

APPENDIX B

POWERTON STATION

EXAMPLE ASSESSMENT RECORD

Date	Inspector	Unit Inspected (See Key Below)	Maintenance/Cleanup Required (yes/no)	Response Action Performed (completion date)	Inspector Signature

Unit Key:

1 - Exterior Bottom Ash/Slag Piping
2 - Dewatering Bins
3 - Concrete Storage Pad
4 - Ash Roadways
5 - Ash Surge Basin
6 - Bypass Basin

APPENDIX C

EXAMPLE PLAN REVIEW AND AMENDMENT RECORD

APPENDIX C

POWERTON STATION

EXAMPLE CCR PLAN REVIEW/AMENDMENT RECORD

Date of Review	Reason for Review	Section Amended	P.E. Certification (Name/Date)

APPENDIX D

EXAMPLE CITIZEN COMPLAINT LOG

APPENDIX D

POWERTON STATION

EXAMPLE CITIZEN COMPLAINT LOG

Date	Time	Citizen Information (Name, Address, Phone No., Email)	Summary of Complaint	Action Taken	Recorded By

ATTACHMENT 9
GROUNDWATER MONITORING INFORMATION

Attachment 9-1 – Local Well Stratigraphy Information

ATTACHMENT 9-1 - Local Stratigraphy Data General Pekin, IL Area

ID	Well_Count	Well_ID	From	To	Original Logged Description	Grouped As
1	1	121792196100	0	2	top soil	topsoil
2		121792196100	2	27	fine sand	sand
3		121792196100	27	95	medium to coarse gravel	coarse sand and/or gravel
4		121792196100	95	95	fine sand at	sand
5	2	121790013100	0	28	sand and gravel, dry	coarse sand and/or gravel
6		121790013100	28	60	sand and gravel, water	coarse sand and/or gravel
7	3	121790013000	0	2	topsoil	topsoil
8		121790013000	2	35	coarse sand and gravel	coarse sand and/or gravel
9		121790013000	35	56	coarse sand, test 1m., 36 sec.	coarse sand and/or gravel
10		121790013000	56	70	medium sand, test 3m., 20 sec.	coarse sand and/or gravel
11		121790013000	70	70	shale at	shale
12	4	121790012900	0	4	topsoil	topsoil
13		121790012900	4	21	dry sand and gravel	coarse sand and/or gravel
14		121790012900	21	44	coarse sand and gravel 1m., 40 s.	coarse sand and/or gravel
15		121790012900	44	66	med coarse sand and gravel, 2m., 10s.	coarse sand and/or gravel
16		121790012900	66	74	medium sand and gravel, 2m. 20s.	coarse sand and/or gravel
17		121790012900	74	74	clay, white at	clay and silt
18	5	121790012800	0	2	cinders and brick	FILL
19		121790012800	2	14	sand, medium	coarse sand and/or gravel
20		121790012800	14	18	sand, coarse	coarse sand and/or gravel
21		121790012800	18	19	coal	coal
22		121790012800	19	20	sand	sand
23		121790012800	20	39	sand, coarse, and gravel, 3m	coarse sand and/or gravel
24		121790012800	39	48	sand, coal, and boulders, 9m	coarse sand and/or gravel
25		121790012800	48	50	clay and rock	silt and clay
26		121790012800	50	55	sand, coarse, 3m	coarse sand and/or gravel
27		121790012800	55	63	sand, coarse, 2m	coarse sand and/or gravel
28		121790012800	63	66	sand, medium, 5m	coarse sand and/or gravel
29		121790012800	66	76	sand, 3m, 10s	coarse sand and/or gravel
30		121790012800	76	76	shale at	shale
31	6	121790025600	0	3	clay	clay
32		121790025600	3	15	sand & gravel	coarse sand and/or gravel
33		121790025600	15	19	gravel, coarse	coarse sand and/or gravel
34		121790025600	19	27	sand and gravel	coarse sand and/or gravel
35		121790025600	27	29	clay	clay
36		121790025600	29	33	gravel and small stones	coarse sand and/or gravel
37		121790025600	33	35	gravel	coarse sand and/or gravel
38		121790025600	35	42	sand, coarse	coarse sand and/or gravel
39		121790025600	42	51	sand, coarse	coarse sand and/or gravel
40	7	121790013800	0	3	soil	Topsoil
41		121790013800	3	82	sand and gravel	coarse sand and/or gravel

42	8	121790013300	0	3	soil, black	Topsoil
43		121790013300	3	5	sand, soil	coarse sand and/or gravel
44		121790013300	5	80	sand and gravel	coarse sand and/or gravel
45	9	121790013200	0	14	gravel, sand and clay	clay, sand, gravel
46		121790013200	14	18	sand and clay	clay, sand
47		121790013200	18	24	sand and gravel	coarse sand and/or gravel
48		121790013200	24	35	gravel and sand	coarse sand and/or gravel
49		121790013200	35	45	gravel	coarse sand and/or gravel
50		121790013200	45	59	gravel and sand	coarse sand and/or gravel
51		121790013200	59	61	shale	shale
52	10	121790052800	0	1	brown fill sand-some rocks	topsoil
53		121790052800	1	3	black sandy dirt	sand
54		121790052800	3	7	yellow sand-medium	coarse sand and/or gravel
55		121790052800	7	15	gray sand-medium	coarse sand and/or gravel
56		121790052800	15	28	gray sand & gravel	coarse sand and/or gravel
57		121790052800	28	49	gray sand & gravel-very coarse	coarse sand and/or gravel
58		121790052800	49	49	blue shale at	shale
59	11	121790050100	0	3	sandy loam	loam
60		121790050100	3	47	dirty sand & gravel	coarse sand and/or gravel
61		121790050100	47	81	yellow sand, trace gravel	coarse sand and/or gravel
62	12	121790048800	0	3	topsoil	topsoil
63		121790048800	3	8	yellow sand	sand
64		121790048800	8	20	gray silty clay	Silt and Clay
65		121790048800	20	21	brown clay	clay
66		121790048800	21	116	brown fine to med sand & gravel	coarse sand and/or gravel
67		121790048800	116	120	med to crs gravel, some coarse sand	coarse sand and/or gravel
68		121790048800	120	121	gray shale	shale
69	13	121790047700	0	3	brown sandy clay	clay, sand
70		121790047700	3	10	yellow clay - very sandy	clay, sand
71		121790047700	10	40	brown sand - coarse & clean	coarse sand and/or gravel
72		121790047700	40	47	brown sand - fine	sand
73		121790047700	47	58	dirty sand & yellow clay	clay, sand
74		121790047700	58	73	brown sand - fine to coarse	sand
75		121790047700	73	78	yellow sand - fine	sand
76		121790047700	78	87	fine to coarse sand - some pebbles	coarse sand and/or gravel
77		121790047700	87	93	fine to crs water sand-some pebbles	coarse sand and/or gravel
78		121790047700	93	96	med to coarse sand - some gravel	coarse sand and/or gravel
79		121790047700	96	101	fine to med sand-some rocks	coarse sand and/or gravel
80		121790047700	101	114	fine red sand	sand
81		121790047700	114	120	fine to coarse brown sand	sand
82		121790047700	120	127	f to crs sand with some fine gravel	coarse sand and/or gravel
83		121790047700	127	127	fine sand at	sand

84	14	121790012700	0	4	topsoil	topsoil
85		121790012700	4	15	sand, gravel, and clay	clay, sand, gravel
86		121790012700	15	32	sand, gravel, and boulders	coarse sand and/or gravel
87		121790012700	32	33	coal	coal
88		121790012700	33	36	hardpan	hardpan
89		121790012700	36	38	boulders	coarse sand and/or gravel
90		121790012700	38	40	sand and gravel, 2m. 15 s.	coarse sand and/or gravel
91		121790012700	40	48	coarse sand and gravel 1m. 40s.	coarse sand and/or gravel
92		121790012700	48	56	sand and gravel, 2 m., 15 s.	coarse sand and/or gravel
93		121790012700	56	58	sand 3m. 25 s.	sand
94		121790012700	58	66	sand, fine 5m, 20s	sand
95		121790012700	66	71	sand, 3m., 5s.	sand
96		121790012700	71	76	sand, 3m., 40 s.	sand
97		121790012700	76	76	shale at	shale
98	15	121790012600	0	18	muck	topsoil
99		121790012600	18	28	gravel, coarse and boulders	coarse sand and/or gravel
100		121790012600	28	36	sand, fine	sand
101		121790012600	36	36	shale at	shale
102	16	121790012500	0	85	sand & gravel	coarse sand and/or gravel
103		121790012500	85	85	shale at	shale
104	17	121790058500	0	4	topsoil	topsoil
105		121790058500	4	71	sand & gravel	coarse sand and/or gravel
106	18	121792462600	0	21	cinders black soil	cinders
107		121792462600	21	26	black & brown clay	clay
108		121792462600	26	39	fine sand w/soft clay mixed	clay, sand
109		121792462600	39	41	large gravel & coarse sand	coarse sand and/or gravel
110		121792462600	41	52	coarse sand & some small gravel	coarse sand and/or gravel
111		121792462600	52	79	coarse sand w/streaks of small gvl	coarse sand and/or gravel
112		121792462600	79	98	fine to coarse sand w/some small gvl	sand
113		121792462600	98	99	fine silty sand	sand
114		121792462600	99	103	dk gray shale & hd dk color limestone	shale

115	19	121792456600	0	4	loam-sandy	Loam
116		121792456600	4	15	sand -yellow	sand
117		121792456600	15	53	sand & gravel	coarse sand and/or gravel
118		121792456600	53	83	sand & gravel-coarse	coarse sand and/or gravel
119	20	121790041500	0	85	Sand	sand
120	21	121790041300	0	2	cindres, fill	FILL
121		121790041300	2	35	fine to coarse sand & gravel	sand
122		121790041300	35	74	f to crs, sand, fine to crs gravel bldrs	sand
123		121790041300	74	80	f to crs sand	sand
124		121790041300	80	93	f to crs sand, medium gravel	sand
125	22	121792453000	0	3	topsoil	topsoil
126		121792453000	3	22	lt. med gravel	coarse sand and/or gravel
127		121792453000	22	44	med-large gravel	coarse sand and/or gravel
128		121792453000	44	45	shale bedrock	shale
129	23	121792323500	0	4	topsoil	topsoil
130		121792323500	4	12	fine silty clay	Silt and clay
131		121792323500	12	48	medium sand	coarse sand and/or gravel
132		121792323500	48	93	medium to coarse gravel	coarse sand and/or gravel
133		121792323500	93	93	shale at	shale
134	24	121792489200	0	21	sand	sand
135		121792489200	21	38	sand & gravel	coarse sand and/or gravel
136		121792489200	38	56	sand medium	coarse sand and/or gravel
137		121792489200	56	61	sand coarse	coarse sand and/or gravel
138		121792489200	61	63	sand & gravel	coarse sand and/or gravel
139		121792489200	63	63	shale below	shale
140	25	121792486200	0	15	fine sand	sand
141		121792486200	15	20	gritty sand	sand
142		121792486200	20	30	fine to medium sand	sand
143		121792486200	30	35	medium-coarse sand with light gravel	coarse sand and/or gravel
144		121792486200	35	40	fine to medium sand	sand
145		121792486200	40	45	clay	clay
146		121792486200	45	60	light to medium sand	sand
147		121792486200	60	65	medium to coarse gravel	coarse sand and/or gravel
148		121792486200	65	88	fine sand	sand
149		121792486200	88	93	fine to medium sand	sand
150		121792486200	93	103	fine sand	sand
151		121792486200	103	108	coarse sand with big gravel	coarse sand and/or gravel
152		121792486200	108	113	medium to coarse sand with gravel	coarse sand and/or gravel
153		121792486200	113	118	medium to coarse sand	coarse sand and/or gravel
154		121792486200	118	120	medium to big gravel	coarse sand and/or gravel
155	26	121792485000	0	70	Sand	sand
156	27	121792377600	0	9	loam	Loam
157		121792377600	9	15	gravel very coarse	coarse sand and/or gravel
158		121792377600	15	60	sand & gravel	coarse sand and/or gravel
159		121792377600	60	85	sand & finer gravel	coarse sand and/or gravel

160	28	121792444600	0	2	topsoil	topsoil
161		121792444600	2	14	sand	sand
162		121792444600	14	75	sand & gravel	coarse sand and/or gravel
163	29	121792326500	0	2	loam sandy	Loam
164		121792326500	2	9	clay yellow sandy	clay, sand
165		121792326500	9	42	sand & gravel - coarse	coarse sand and/or gravel
166		121792326500	42	72	coarse sand	coarse sand and/or gravel
167		121792326500	72	82	sand & gravel	coarse sand and/or gravel
168	30	121792481400	0	2	topsoil	topsoil
169		121792481400	2	29	sand	sand
170		121792481400	29	70	sand & gravel	coarse sand and/or gravel
171	31	121792478800	0	21	cinders, black soil	cinders
172		121792478800	21	26	black & brown clay	clay
173		121792478800	26	39	fine sand clay mixed	clay, sand
174		121792478800	39	46	coarse sand gravel (boulders)	coarse sand and/or gravel
175		121792478800	46	48	black peat	Organic
176		121792478800	48	79	coarse sand gravel	coarse sand and/or gravel
177		121792478800	79	99	medium sand gravel	coarse sand and/or gravel
178		121792478800	99	104	gray shale	shale
179	32	121792477400	0	3	topsoil sandy	topsoil
180		121792477400	3	52	sand	sand
181		121792477400	52	70	sand & gravel	coarse sand and/or gravel
182	33	121792474300	0	4	topsoil	topsoil
183		121792474300	4	23	sand	sand
184		121792474300	23	60	sand & gravel	coarse sand and/or gravel
185	34	121792484700	0	4	topsoil	topsoil
186		121792484700	4	28	fine to medium sand & gravel	sand
187		121792484700	28	88	coarse gravel & rocks	coarse sand and/or gravel
188	35	121792481600	0	6	cinders	cinders
189		121792481600	6	42	coarse sand & gravel	coarse sand and/or gravel
190		121792481600	42	50	brown silty sand & fine gravel	coarse sand and/or gravel
191		121792481600	50	66	coarse sand & gravel	coarse sand and/or gravel
192		121792481600	66	99	fine to coarse sand	sand
193		121792481600	99	102	fine to coarse sand & gravel	coarse sand and/or gravel
194		121792481600	102	103	dark gray shale	shale
195	36	121792478000	0	3	topsoil	topsoil
196		121792478000	3	26	sand	sand
197		121792478000	26	70	sand & gravel	coarse sand and/or gravel
198	37	121792467500	0	4	topsoil	topsoil
199		121792467500	4	10	red clay with light gravel	clay, sand, gravel
200		121792467500	10	14	tan sandy hardpan	hardpan
201		121792467500	14	24	light medium gray with coarse sand	coarse sand and/or gravel
202		121792467500	24	29	light gravel, coarse sand	coarse sand and/or gravel
203		121792467500	29	38	light tan clay, coarse sand	clay, sand
204		121792467500	38	71	medium coarse gravel	coarse sand and/or gravel
205		121792467500	71	72	medium sand with light gravel at	coarse sand and/or gravel

206	38	121792313900	0	4	loam	loam
207		121792313900	4	82	sand & gravel	coarse sand and/or gravel
208		121792313900	82	82	brown clay below	clay
209	39	121792534000	0	2	loam	loam
210		121792534000	2	12	sand - yellow, fine	sand
211		121792534000	12	60	sand & gravel - coarse	coarse sand and/or gravel
212		121792534000	60	67	sand	sand
213		121792534000	67	70	sand & gravel	coarse sand and/or gravel
214		121792534000	70	70	boulders or bedrock at	shale
215	40	121792539500	0	10	sand, gravel, cinders	coarse sand and/or gravel
216		121792539500	10	14	sand, gravel, clay	clay, sand, gravel
217		121792539500	14	26	organic clay	clay
218		121792539500	26	34	organic silt	Silt and clay
219		121792539500	34	45	sand and gravel	coarse sand and/or gravel
220	41	121792539400	0	10	clay and gravel	clay, sand, gravel
221		121792539400	10	14	clayey silt	Silt and clay
222		121792539400	14	18	cinders	cinders
223		121792539400	18	28	organic silt and clay	Silt and clay
224	42	121792509100	0	12	black sand, gravel & cement fill	FILL
225		121792509100	12	25	brown sand & small gravel	coarse sand and/or gravel
226		121792509100	25	27	gray clay with gravel	clay, sand, gravel
227		121792509100	27	104	coarse sand & gravel	coarse sand and/or gravel
228	43	121792497500	0	4	topsoil	topsoil
229		121792497500	4	18	sand	sand
230		121792497500	18	26	clay	clay
231		121792497500	26	86	sand & gravel	coarse sand and/or gravel
232	44	121792497400	0	4	black topsoil, rock	topsoil
233		121792497400	4	15	medium sand	sand
234		121792497400	15	45	medium sand - rocks	coarse sand and/or gravel
235	45	121792501800	0	2	topsoil	topsoil
236		121792501800	2	4	brown clay	clay
237		121792501800	4	73	medium sand & gravel	coarse sand and/or gravel
238		121792501800	73	73	shale at	shale
239	46	121792538900	0	10	cinders, gravel, clay	FILL
240		121792538900	10	18	cinders and sand	sand
241		121792538900	18	32	organic silt	Silt and clay
242		121792538900	32	34	silty clay, sand	clay, sand
243		121792538900	34	40	gravel	coarse sand and/or gravel
244	47	121792538800	0	10	gravel, sand, cinders	coarse sand and/or gravel
245		121792538800	10	16	clay and gravel	clay, sand, gravel
246		121792538800	16	20	silt and clay	Silt and clay
247		121792538800	20	26	organic silt	Silt and clay
248		121792538800	26	33	silty clay	Silt and clay
249		121792538800	33	40	sand and gravel	coarse sand and/or gravel

250	48	121792538700	0	1	topsoil	topsoil
251		121792538700	1	16	clay & silt	Silt and clay
252		121792538700	16	20	sand	sand
253		121792538700	20	34	gravel	coarse sand and/or gravel
254	49	121792492400	0	17	sand	sand
255		121792492400	17	20	gravel	coarse sand and/or gravel
256		121792492400	20	27	sand fine	sand
257		121792492400	27	60	sand & gravel coarse	coarse sand and/or gravel
258		121792492400	60	85	blue-green shale below 60'	shale
259	50	121792539300	0	2	topsoil	topsoil
260		121792539300	2	17	clay and silt with gravel	clay, sand, gravel
261		121792539300	17	31	sand and gravel	coarse sand and/or gravel
262	51	121792539200	0	10	gravel, sand, silt, clay fill	clay, sand, gravel
263		121792539200	10	25	cinders	cinders
264		121792539200	25	28	organic clay	clay
265		121792539200	28	30	organic silt	silt and clay
266	52	121792539100	0	10	cinders, gravel, clay	FILL
267		121792539100	10	20	cinders, gravel, sand	coarse sand and/or gravel
268		121792539100	20	24	fine sand	sand
269		121792539100	24	28	silt	silt and clay
270		121792539100	28	30	silty clay	silt and clay
271	53	121792539000	0	10	cinders, gravel, clay	FILL
272		121792539000	10	20	gravel and clay	clay, sand, gravel
273		121792539000	20	30	organic silt	silt and clay
274	54	121792565200	0	10	topsoil	topsoil
275		121792565200	10	16	fine sand	sand
276		121792565200	16	26	med to coarse sand & gravel	coarse sand and/or gravel
277		121792565200	26	39	super coarse gravel	coarse sand and/or gravel
278	55	121792564300	0	2	cinders	cinders
279		121792564300	2	7	black and dark gray peaty clay	clay
280		121792564300	7	38	brown sandy clay	clay
281		121792564300	38	85	coarse sand & gravel	coarse sand and/or gravel
282	56	121792560500	0	15	med sand light gravel	coarse sand and/or gravel
283		121792560500	15	25	med gravel w/ rocks	coarse sand and/or gravel
284		121792560500	25	35	med sand - med gravel w/ rocks	coarse sand and/or gravel
285		121792560500	35	37	med sand - med gravel	coarse sand and/or gravel
286	57	121792366700	0	2	topsoil	topsoil
287		121792366700	2	15	sand	sand
288		121792366700	15	39	big gravel	coarse sand and/or gravel
289		121792366700	39	100	sand & gravel	coarse sand and/or gravel
290	58	121792354800	0	3	(ML) silt, some clay, little sand	topsoil
291		121792354800	3	6	(SP) sand, little gravel	coarse sand and/or gravel
292		121792354800	6	14	(SW) sand, little gravel	coarse sand and/or gravel
293		121792354800	14	30	(SP) sand ltl gvl, SW sand some gvl @30'	coarse sand and/or gravel
294		121792354800	30	44	sand	sand

295	59	121792355100	0	3	(ML) silt, some clay, little sand	topsoil
296		121792355100	3	6	(SP) sand fine gravel little gravel	coarse sand and/or gravel
297		121792355100	6	14	(SW) sand, little gravel	coarse sand and/or gravel
298		121792355100	14	30	(SP) sand, little gravel	coarse sand and/or gravel
299		121792355100	30	65	(SW) sand, some gravel	coarse sand and/or gravel
300		121792355100	65	69	(SP) sand, little gravel	coarse sand and/or gravel
301		121792355100	69	77	(SW) sand, some gravel	coarse sand and/or gravel
302		121792355100	77	103	(SP) sand, little gravel	coarse sand and/or gravel
303	60	121792355000	0	3	(ML) silt, some clay, little sand	clay, sand
304		121792355000	3	6	(SP) sand fine gravel little gravel	coarse sand and/or gravel
305		121792355000	6	14	(SW) sand, little gravel	coarse sand and/or gravel
306		121792355000	14	30	(SP) sand ltl gvl, SW sand some gvl @30'	coarse sand and/or gravel
307		121792355000	30	44	sand	sand
308	61	121792354900	0	3	(ML) silt, some clay, little sand	clay, sand
309		121792354900	3	6	(SP) sand, little gravel	coarse sand and/or gravel
310		121792354900	6	14	(SW) sand, little gravel	coarse sand and/or gravel
311		121792354900	14	30	(SP) sand, little gravel	coarse sand and/or gravel
312		121792354900	30	30	(SW) sand, some gravel at 30'	coarse sand and/or gravel
313		121792354900	30	44	sand	sand
314	62	121792378900	0	3	black cinder and gravel fill	FILL
315		121792378900	3	4.5	black silty sand	sand
316		121792378900	4.5	6.5	brown clayey sand	clay, sand
317		121792378900	6.5	35	brown fine to coarse sand, little fine to medium gravel, wet at 29'	coarse sand and/or gravel
318	63	121792378800	0	1	black to brown gravel, fill	FILL
319		121792378800	1	3	brown silty sand fill	FILL
320		121792378800	3	5.5	black silty sand , trace clay, topsoil	topsoil
321		121792378800	5.5	7.5	brown silty fine to coarse sand	sand
322		121792378800	7.5	50	brown fine to coarse sand, little fine to medium gravel, more sandy below 36'	sand
323	64	121792378700	0	1.5	black silty sand fill	FILL
324		121792378700	1.5	4	black grading brown silty sand	sand
325		121792378700	4	5.5	tan fine sand, clean	sand
326		121792378700	5.5	8.5	brown silty sand, cobbles at 8.5'	sand
327		121792378700	8.5	17.5	brown fine to coarse sand, little fine to medium gravel, dry, clay seam at 10.5' to 11.5	coarse sand and/or gravel
328		121792378700	17.5	30	brown fine to coarse sand, trace of gravel, dry	coarse sand and/or gravel
329	65	121792379400	0	5.5	brown, stiff silt clay loam	loam
330		121792379400	5.5	14	brown, loose sandy loam	loam
331		121792379400	14	16.5	brown, medium silt clay loam	loam
332		121792379400	16.5	24	brown, loose, sand	sand
333		121792379400	24	61	brown, medium, sand and gravel	coarse sand and/or gravel
334		121792379400	61	65.5	light gray, hard, shale	shale

335	66	121792379300	0	4	brown stiff silt loam	loam
336		121792379300	4	14	brown and gray stiff, silt clay loam	loam
337		121792379300	14	14.5	brown and gray sand	sand
338		121792379300	14.5	19	dark gray, medium, wet silt clay loam	loam
339		121792379300	19	31.5	gray, loose, sand	sand
340		121792379300	31.5	58	brown, medium sand and gravel	coarse sand and/or gravel
341	67	121792379200	0	1.5	black grading brown clayey sand	clay, sand
342		121792379200	1.5	15	brown fine to coarse sand, little fine to medium gravel, dry	coarse sand and/or gravel
343	68	121792379100	0	1.5	black silty sand, fill, some gravel	clay, sand
344		121792379100	1.5	6	black grading down to brown silty sand	sand
345		121792379100	6	40	brown fine to coarse sand, little fine to medium gravel, water in 27.5'	coarse sand and/or gravel
346	69	121792379000	0	6.5	black silty sand disturbed, fill and topsoil, few sand seams 5'-6.5'	topsoil
347		121792379000	6.5	35	brown fine to coarse sand little fine to medium gravel, wet at 28'	coarse sand and/or gravel
348	70	121792361700	0	5	loam	loam
349		121792361700	5	14	sand & gravel	coarse sand and/or gravel
350		121792361700	14	34	sand & gravel - coarse	coarse sand and/or gravel
351		121792361700	34	39	gravel & rocks	coarse sand and/or gravel
352		121792361700	39	40	shale gray	shale
353	71	121792553800	0	8	cinders old burnt coal	FILL
354		121792553800	8	79	sand & gravel	coarse sand and/or gravel
355	72	121792552000	0	6	topsoil	topsoil
356		121792552000	6	32	sand & gravel-medium	coarse sand and/or gravel
357		121792552000	32	141	sand & gravel-coarse	coarse sand and/or gravel
358		121792552000	141	141	shale below	shale
359	73	121792538600	0	10	silty clay	silt and clay
360		121792538600	10	14	organic silt	silt and clay
361		121792538600	14	17	organic clay	clay
362		121792538600	17	21	silty clay	silt and clay
363		121792538600	21	29	sand & gravel	coarse sand and/or gravel
364	74	121792378600	0	1.5	black clayey silt topsoil	topsoil
365		121792378600	1.5	5.5	dark brown to brown clayey silt, more sandy with depth	clay, sand
366		121792378600	5.5	10	brown fine to coarse sand, trace of fine to medium gravel	coarse sand and/or gravel
367	75	121792356100	0	10	fill	FILL
368		121792356100	10	23	loam - soft	loam
369		121792356100	23	55	sand & gravel	coarse sand and/or gravel
370		121792356100	55	64	sand coarse fine gravel	coarse sand and/or gravel
371		121792356100	64	84	sand & gravel	coarse sand and/or gravel
372	76	121792365600	0	3	loam sandy	loam
373		121792365600	3	5	clay yellow sandy	clay, sand
374		121792365600	5	56	sand & gravel	coarse sand and/or gravel
375		121792365600	56	67	sand medium	coarse sand and/or gravel
376		121792365600	67	83	sand & gravel fine	coarse sand and/or gravel
377	77	121792538100	0	19	sand, gravel fill material	FILL
378		121792538100	19	31	coarse sand and fine gravel	coarse sand and/or gravel
379	78	121792373700	0	82	sand and gravel, red sand at bottom	coarse sand and/or gravel

380	79	121792373400	0	98	sand and gravel	coarse sand and/or gravel
381	80	121792333600	0	2	black dirt	topsoil
382		121792333600	2	9	brown sand	sand
383		121792333600	9	42	light to coarse gravel	coarse sand and/or gravel
384	81	121792538500	0	10	cinders, gravel, clay	FILL
385		121792538500	10	19	cinders	cinders
386		121792538500	19	26	silt and sand	sand
387		121792538500	26	29	clayey silt	silt and clay
388	82	121792538400	0	10	gravel, crushed rock, cinders	FILL
389		121792538400	10	17	cinders, sand, brick	Cinders
390		121792538400	17	19	clayey silt	silt and clay
391		121792538400	19	32	sand	sand
392	83	121792538300	0	1	topsoil	topsoil
393		121792538300	1	34	sand	sand
394	84	121792538200	0	2	topsoil	topsoil
395		121792538200	2	24	sand	sand
396		121792538200	24	34	gravel	coarse sand and/or gravel
397	85	121792439900	0	2	silty topsoil, little sand, trace clay & roots-medium dark brown	topsoil
398		121792439900	2	4	clayey silty fine sand, trace medium sand, rust brown-medium dense-moist	sand
399		121792439900	4	6	fine sand, trace gravel,medium coarse sand & silt-light brown-medium dense moist	sand
400		121792439900	6	8	fine to coarse sand, trace gravel & silt brown & slightly dark gray-medium densemoist	sand
401		121792439900	8	26.5	fine to coarse sand-moist @8' & saturated @19'-little gravel, trace silt-light brown & s	sand
402	86	121792439200	0	2	clayey, sandy. silty topsoil, trace roots, dark brown-loose-moist	topsoil
403		121792439200	2	4.4	sandy, silty & gravelly clay-brown-loosemoist	clay, sand
404		121792439200	4.4	6	clayey silty fine & coarse sand,trace gravel-brown & slightly gray-loose-moist to wet	sand
405		121792439200	6	13.5	gravelly, fine & coarse sand, trace siltbrown & slightly gray & dark gray-medium dens	coarse sand and/or gravel
406		121792439200	13.5	19	fine & medium sand, trace gravel-brown & slightly gray-loose-moist	sand
407		121792439200	19	26.5	fine & medium sand, trace gravel-brown, light gray & dark gray-dense-wet	sand
408	87	121792438800	0	2	silty sandy topsoil, trace roots-dark brown-moist	topsoil
409		121792438800	2	4	fine to coarse sand, little clay & gravel trace silt-brown & slight gray-medium dense-m	sand
410		121792438800	4	6	silty clayey sand, little topsoil, trace gravel-dark brown & slight gray-moist	topsoil
411		121792438800	6	9	fine to coarse sand, little gravel, trace silt-brown & slight gray-medium densemoist	sand
412		121792438800	9	14	silty clayey fine to coarse sand, brown & gray-medium dense-moist	clay, sand
413		121792438800	14	18	gravelly fine to medium sand, trace silt coarse sand & clay-brown-medium densemois	coarse sand and/or gravel
414		121792438800	18	26.5	gravelly fine to coarse sand, trace siltbrown & slight gray-extremely dense	coarse sand and/or gravel
415		121792438000	0	2	silty sandy topsoil-dark brown	topsoil
416		121792438000	2	6	gravelly, fine to medium sand, trace coarse sand & silt-light gray & slight gray-mediun	coarse sand and/or gravel
417		121792438000	6	9	fine sand, trace silt & clay-dark brown loose, moist to wet	sand
418		121792438000	9	18	gravelly fine to coarse sand, trace silt, light brown & slight gray-medium dense to den	coarse sand and/or gravel
419		121792438000	18	23	coarse sand, trace fine to medium sand & fine gravel-brown to light gray & dark gray-	coarse sand and/or gravel
420		121792438000	23	45.5	gravelly fine to coarse sand, trace siltbrown & slight gray-medium dense to densesatu	coarse sand and/or gravel
421		121792438000	45.5	50.25	clayey shale, gray & rust brown-extremely dense	shale
422	88	121792430400	0	2	topsoil	topsoil
423		121792430400	2	9	sandy soil	topsoil
424		121792430400	9	17	sand	sand
425		121792430400	17	68	sand & gravel	coarse sand and/or gravel

426	89	121792437700	0	2.5	clay, silty, brown, some organic material	silt and clay
427		121792437700	2.5	4.5	sand, light yellow brown, very fine grained, silty, poorly graded, subangular	sand
428		121792437700	4.5	6.5	sand, brown, fine to medium grained, silty, some clay, sand grains subangular	sand
429		121792437700	6.5	15	sand & gravel, brown,well graded, sand, fine to medium grained, silty some coarse gr	coarse sand and/or gravel
430		121792437700	15	31.5	sand, light yellow brown very fine grained to fine grained, subrounded silty in upper p	sand
431	90	121792440300	0	2	sandy, silty topsoil, trace clay & rootsdark brown	topsoil
432		121792440300	2	4	clayey silty fine to medium sand, little gravel, trace coarse sand, rust brown & slightly	clay, sand
433		121792440300	4	6	fine to coarse sand, trace gravel & silt brown & slighty gray-loose to medium moist	sand
434		121792440300	6	9	fine to medium sand & gravel-trace siltbrown & slightly gray-medium dense to dense-	sand
435		121792440300	9	13	gravelly fine to coarse sand trace silt & shale-light brown, slight gray & dark gray-very	coarse sand and/or gravel
436		121792440300	13	18	fine to medium sand & gravel medium dense	coarse sand and/or gravel
437		121792440300	18	28	fine to coarse sand, trace gravel-brown & light gray-medium dense to dense-wetsatu	coarse sand and/or gravel
438		121792440300	28	36.5	Fine to medium sand, trace gravel & siltbrown & slight gray	sand
439		121792440300	36.5	43	fine sand, trace silt-brown-extremely dense-wet	sand
440		121792440300	43	54	fine to medium sand, gravelly @45'-trace silt-reddish brown & slightly gray-densesatu	coarse sand and/or gravel
441		121792440300	54	60	clayey shale-gray-weathered	shale
442		121792440300	60	70	clayey shale;medium dark gray	shale
443	91	121792440000	0	2	clayey sandy silty topsoil, trade rootsdark brown	topsoil
444		121792440000	2	4	silty sand, little clay & gravel-medium dark brown to light gray-medium densedesiccat	sand
445		121792440000	4	6	silty clay, trace gravel & sand-brown & slightly gray-hard	silt and clay
446		121792440000	6	8	silty clay, atrace sand-brown ato medium dark gray-very stiff	silt and clay
447		121792440000	8	13	silty fine to medium sand & gravel-brown & dark gray-dense to very dense moist	coarse sand and/or gravel
448		121792440000	13	18	gravelly fine to coarse sand, trace siltbrown & slightly gray-loose to medium dense-m	coarse sand and/or gravel
449		121792440000	18	28	fine to medium sand, trace gravel & siltbrown & slightly gray-medium dense to dense	sand
450		121792440000	28	35	fine sand, trace gravel & silt-brown & slightly gray - very dense to extremely dense-we	sand
451		121792440000	35	48.1	clayey shale-gray weathered-very dense	shale
452	92	121792343700	0	4	topsoil	topsoil
453		121792343700	4	37	sand	sand
454		121792343700	37	85	sand & gravel	coarse sand and/or gravel
455	93	121792341200	3	8	gravel brown	coarse sand and/or gravel
456		121792341200	8	40	gravel & big rocks	coarse sand and/or gravel
457		121792341200	40	42	gray clay & gravel	clay, sand, gravel
458	94	121792336400	0	2	topsoil	topsoil
459		121792336400	2	60	sand	sand
460		121792336400	60	70	sand & gravel	coarse sand and/or gravel
461	95	121792336600	0	4	black sandy topsoil	topsoil
462		121792336600	4	7	brown sandy clay	clay, sand
463		121792336600	7	35	brown sand - light gravel	coarse sand and/or gravel
464		121792336600	35	40	coarse brown sand light 3" gravel	coarse sand and/or gravel
465		121792336600	40	68	medium brown sand - light gravel	coarse sand and/or gravel
466		121792336600	68	110	medium brown sand - light coarse gravel	coarse sand and/or gravel
467		121792336600	110	112	gray clay	clay

468	96	121792347100	0	4	fill	Fill
469		121792347100	4	22	brown clay	clay
470		121792347100	22	44	sand & gravel	coarse sand and/or gravel
471		121792347100	44	47	gray clay	clay
472		121792347100	47	77	sand & gravel	coarse sand and/or gravel
473	97	121792517900	0	12	black sand, gravel & cement fill	Fill
474		121792517900	12	25	brown sand & small gravel	coarse sand and/or gravel
475		121792517900	25	27	gray clay with gravel	clay, sand, gravel
476		121792517900	27	104	coarse sand & gravel	coarse sand and/or gravel
477	98	121792516200	0	10	fine sand	sand
478		121792516200	10	25	medium gravel	coarse sand and/or gravel
479		121792516200	25	35	medium sand, light gravel	coarse sand and/or gravel
480		121792516200	35	50	fine sand, light gravel	coarse sand and/or gravel
481		121792516200	50	60	fine coarse sand	coarse sand and/or gravel
482		121792516200	60	65	fine sand, medium light gravel	coarse sand and/or gravel
483		121792516200	65	80	medium sand, light gravel	coarse sand and/or gravel
484		121792516200	80	95	medium fine sand, light gravel	coarse sand and/or gravel
485		121792516200	95	121	coarse sand medium gravel	coarse sand and/or gravel
486	99	121792515900	0	2	gravel	coarse sand and/or gravel
487		121792515900	2	4	loam	loam
488		121792515900	4	15	sand black, clay mix	clay, sand
489		121792515900	15	19	sand black, wood	sand
490		121792515900	19	26	clay black, gray mix	clay
491		121792515900	26	28	sand med to coarse loose	coarse sand and/or gravel
492		121792515900	28	35	sand fine to med	coarse sand and/or gravel
493		121792515900	35	40	sand med to coarse, some gravel	coarse sand and/or gravel
494		121792515900	40	48	sand fine to med, trace coarse	sand
495		121792515900	48	54	sand med to coarse	coarse sand and/or gravel
496		121792515900	54	59	sand coarse, fine gravel	coarse sand and/or gravel
497		121792515900	59	63	sand med to coarse	coarse sand and/or gravel
498		121792515900	63	66	sand med to crs, tr gry cl (backfilled)	coarse sand and/or gravel
499		121792515900	66	72	sand fine to med (backfilled)	sand
500		121792515900	72	72	gray shale at	shale
501	100	121792515800	0	9	fill	fill
502		121792515800	9	15	light brown clay	clay
503		121792515800	15	19	gray clay with gravel embedded	silt and clay
504		121792515800	19	21	coarse sand to coarse gravel	coarse sand and/or gravel
505		121792515800	21	32	sty brn med s to crs gvl (strk cl 22-23)	coarse sand and/or gravel
506		121792515800	32	52	med sand to coarse gvl (sty)	coarse sand and/or gravel
507		121792515800	52	93	fine sand to fine gravel	coarse sand and/or gravel
508		121792515800	93	100	soft and hard shale	shale
509	101	121792336500	0	4	topsoil	topsoil
510		121792336500	4	28	fine sand	sand
511		121792336500	28	54	medium sand	coarse sand and/or gravel
512		121792336500	54	103	medium gravel	coarse sand and/or gravel
513		121792336500	103	103	fine sand at	sand
514		121792520800	0	10	fine sand	sand

515	102	121792520800	10	15	light gravel with medium gravel	coarse sand and/or gravel
516		121792520800	15	20	medium gravel	coarse sand and/or gravel
517		121792520800	20	30	medium sand - light gravel	coarse sand and/or gravel
518		121792520800	30	35	light gravel	coarse sand and/or gravel
519		121792520800	35	38	medium sand - light gravel	coarse sand and/or gravel
520	103	121792520000	0	15	sandy black topsoil	topsoil
521		121792520000	15	50	sand & gravel	coarse sand and/or gravel
522		121792520000	50	68	gray clay	clay
523	104	121792519900	0	14	coarse sand & gravel	coarse sand and/or gravel
524		121792519900	14	56	coarse sand & gravel w/boulders	coarse sand and/or gravel
525		121792519900	56	58	shale	shale
526	105	121792577600	0	2	topsoil	topsoil
527		121792577600	2	42	fine to coarse gravel	coarse sand and/or gravel
528	106	121792312100	0	2	topsoil	topsoil
529		121792312100	2	8	fine sand	sand
530		121792312100	8	12	brown clay	clay
531		121792312100	12	25	fine sand	sand
532		121792312100	25	68	coarse sand	coarse sand and/or gravel
533		121792312100	68	73	fine gravel	coarse sand and/or gravel
534		121792312100	73	77	fine sand	sand
535		121792312100	77	103	fine gravel & medium gravel	coarse sand and/or gravel
536		121792312100	103	103	shale at	shale
537	107	121792200900	0	2	topsoil	topsoil
538		121792200900	2	20	coarse gravel	coarse sand and/or gravel
539		121792200900	20	47	medium to coarse gravel	coarse sand and/or gravel
540		121792200900	47	47	shale at	shale
541	108	121792104600	0	68	yellow sand	sand
542		121792104600	68	88	gray sand	sand
543	109	121792180900	0	5	top soil	topsoil
544		121792180900	5	43	sand	sand
545		121792180900	43	115	gravel	coarse sand and/or gravel
546	110	121792312000	0	2	topsoil	topsoil
547		121792312000	2	10	brown clay	clay
548		121792312000	10	25	fine sand	sand
549		121792312000	25	45	fine gravel	coarse sand and/or gravel
550		121792312000	45	83	medium gravel	coarse sand and/or gravel
551		121792312000	83	86	fine sand	sand
552		121792312000	86	108	medium to coarse gravel	coarse sand and/or gravel
553	111	121792311900	0	4	topsoil	topsoil
554		121792311900	4	28	fine sand	sand
555		121792311900	28	48	medium sand	coarse sand and/or gravel
556		121792311900	48	78	medium sand to coarse gravel	coarse sand and/or gravel
557		121792311900	78	106	medium gravel	coarse sand and/or gravel
558		121792311900	106	106	shale at	shale

559		121792311800	0	2	topsoil	topsoil
560		121792311800	2	12	brown clay	clay
561	112	121792311800	12	24	sand & gravel lenses	coarse sand and/or gravel
562		121792311800	24	55	sand & gravel	coarse sand and/or gravel
563		121792311800	55	60	gravel	coarse sand and/or gravel
564		121792307200	0	7	topsoil	topsoil
565	113	121792307200	7	87	sand	sand
566		121792307200	87	100	pea gravel	coarse sand and/or gravel
567		121792180200	0	2	top soil	topsoil
568		121792180200	2	13	fine sand	sand
569	114	121792180200	13	39	coarse gravel	coarse sand and/or gravel
570		121792180200	39	48	medium sand	coarse sand and/or gravel
571		121792180200	48	104	coarse gravel	coarse sand and/or gravel
572		121792180200	104	104	rocks	shale
573		121792179800	0	2	top soil	topsoil
574		121792179800	2	20	yellow fine sand	sand
575		121792179800	20	25	sand & gravel	coarse sand and/or gravel
576		121792179800	25	40	fine/medium sand	sand
577	115	121792179800	40	50	sand & gravel	coarse sand and/or gravel
578		121792179800	50	60	all fine sand	sand
579		121792179800	60	72	sand, pea gravel	coarse sand and/or gravel
580		121792179800	72	78	sand, stones	coarse sand and/or gravel
581		121792179800	78	79	shale	shale
582		121792179700	0	25	sand & gravel	coarse sand and/or gravel
583	116	121792179700	25	48	clay	clay
584		121792179700	48	67	rock	shale
585	117	121792261600	0	37	sand	sand
586		121792180800	0	4	top soil	topsoil
587	118	121792180800	4	40	sand	sand
588		121792180800	40	108	gravel	coarse sand and/or gravel
589		121792180700	0	10	sandy loam	loam
590	119	121792180700	10	48	sand & crs gvl	coarse sand and/or gravel
591		121792180700	48	50	coarse	coarse sand and/or gravel
592		121792180600	0	3	top soil	topsoil
593		121792180600	3	13	sand & gravel	coarse sand and/or gravel
594	120	121792180600	13	18	fine brown sand	sand
595		121792180600	18	28	brown sand & rocks	coarse sand and/or gravel
596		121792180600	28	31	fine/med brown sand	sand
597		121792180500	0	3	top soil	topsoil
598	121	121792180500	3	88	med sand to/crs gvl	coarse sand and/or gravel
599		121792180500	88	88	shale	shale

600	122	121792256700	0	10	dirty brown sand	sand
601		121792256700	10	16	brown sand, fine & clean	sand
602		121792256700	16	30	brown sand, fine-very coarse some gravel	coarse sand and/or gravel
603		121792256700	30	42	medium sand, coarse gravel	coarse sand and/or gravel
604		121792256700	42	53	fine red sand tr. med sand & few pebbles	sand
605		121792256700	53	56	red fine sand med-coarse sand w/pebbles	sand
606		121792256700	56	57	fine brown sand fine gravel w/rocks	sand
607		121792256700	57	61	fine brn sand, coarse sand w/fine gravel	coarse sand and/or gravel
608	123	121792091900	0	3	fill	fill
609		121792091900	3	9	fine to crs sand, some gravel	coarse sand and/or gravel
610		121792091900	9	22	fine sand to crs gravel	coarse sand and/or gravel
611		121792091900	22	28	fine sand to med gravel	coarse sand and/or gravel
612		121792091900	28	73	fine to crs sand with gvl seams	coarse sand and/or gravel
613		121792091900	73	81	fine sand to med gravel	coarse sand and/or gravel
614		121792091900	81	100	f to crs sand w/gravel seams	coarse sand and/or gravel
615		121792091900	100	105	fine sand to coarse gravel	coarse sand and/or gravel
616		121792090700	105	107	shale	shale
617	124	121792090700	0	6	sandy clay	clay, sand
618		121792090700	6	16	clay (yellow)	clay
619		121792090700	16	20	clay (blue-gravelly)	clay
620		121792090700	20	22	gravel & sand	coarse sand and/or gravel
621		121792090700	22	70	sand (brown-coarse)	coarse sand and/or gravel
622	125	121792088600	0	11	fine brown sand--dirty	sand
623		121792088600	11	29	fine to coarse brown sand-some rocks	sand
624		121792088600	29	32	coarse brown sand & gravel	coarse sand and/or gravel
625		121792088600	32	38	coarse brown water sand & gravel	coarse sand and/or gravel
626		121792088600	38	48	fine to coarse brown sand-some pebbles	coarse sand and/or gravel
627		121792088600	48	53	fine to med. sand-some pebbles	coarse sand and/or gravel
628		121792088600	53	54	brown & gray sand-some coal	sand
629		121792088600	54	54	cap rock & gray shale at	shale
630	126	121792261500	0	4	brown silt	silt and clay
631		121792261500	4	42	sand	sand
632	127	121792260000	0	4	silt & loam	loam
633		121792260000	4	40	sand	sand
634	128	121792259900	0	37	Sand	sand
635	129	121792259800	0	3	silt	silt and clay
636		121792259800	3	37	sand	sand
637	130	121792238000	0	2	top soil	topsoil
638		121792238000	2	25	fine sand	sand
639		121792238000	25	45	medium sand	coarse sand and/or gravel
640		121792238000	45	105	medium gravel	coarse sand and/or gravel
641		121792238000	105	105	rocks at	shale

642	131	121792237900	0	2	black & brown sandy topsoil	topsoil
643		121792237900	2	4	bricks & fill	fill
644		121792237900	4	7	black clayey sand	clay, sand
645		121792237900	7	16	sand & gravel	coarse sand and/or gravel
646		121792237900	16	23	coarse sand to small gravel	coarse sand and/or gravel
647		121792237900	23	45	coarse sand & gravel with boulders	coarse sand and/or gravel
648		121792237900	45	59	fine sand to coarse gravel with boulders	coarse sand and/or gravel
649		121792237900	59	95	f to crs s w/med to crs g layers & bldrs	coarse sand and/or gravel
650		121792237900	95	100	firm gray shale	shale
651	132	121792237800	0	16	fill	fill
652		121792237800	16	26	black & gray peaty clay with sand	clay, sand
653		121792237800	26	50	yellow & brown coarse sand & gravel	coarse sand and/or gravel
654		121792237800	50	61	fine sand & gravel	coarse sand and/or gravel
655		121792237800	61	83	fine sand, coarse gravel & boulders	coarse sand and/or gravel
656		121792237800	83	85	gray clay	clay
657	133	121792237700	0	4	parking lot gravel & fill	fill
658		121792237700	4	17	coarse s & g w/buff colored clay layers	dirty coarse sand and/or gravel
659		121792237700	17	47	yellow brown coarse s & g w/boulders	coarse sand and/or gravel
660		121792237700	47	81	f to med sd w/coarse gravel & sand	coarse sand and/or gravel
661		121792237700	81	85	firm gray shale	shale
662	134	121792246300	0	19	fine brown sand	sand
663		121792246300	19	52	brown sand & rock	coarse sand and/or gravel
664		121792246300	52	81	brown medium sand, not on shale	coarse sand and/or gravel
665	135	121792157500	0	7	top soil	topsoil
666		121792157500	7	42	fine/coarse gravel	coarse sand and/or gravel
667		121792157500	42	42	shale	shale
668	136	121792156800	0	105	sand & gravel	coarse sand and/or gravel
669		121792156800	105	108	black shale	shale
670	137	121792238100	0	4	top soil (black)	topsoil
671		121792238100	4	25	sand (brown) fine	sand
672		121792238100	25	39	sand (brown) medium	coarse sand and/or gravel

673	138	121792219300	0	3	top soil	topsoil
674		121792219300	3	5	clay	clay
675		121792219300	5	43	coarse sand & gravel	coarse sand and/or gravel
676		121792219300	43	49	blue clay	clay
677		121792219300	49	53	fine sand	sand
678		121792219300	53	80	coarse sand & gravel	coarse sand and/or gravel
679		121792219300	80	105	medium gravel	coarse sand and/or gravel
680		121792219300	105	136	fine to coarse sand	coarse sand and/or gravel
681		121792219300	136	136	shale at	shale
682	139	121792138700	0	3	sand and dirt	sand
683		121792138700	3	53	sand and gravel and rocks	coarse sand and/or gravel
684		121792138700	53	74	sand (brown) fine	sand
685		121792138700	74	84	sand (medium)	coarse sand and/or gravel
686		121792138700	84	88	sand, gravel and rocks	coarse sand and/or gravel
687	140	121792138600	0	5	topsoil	topsoil
688		121792138600	5	25	yellow fine sand	sand
689		121792138600	25	75	coarse gray sand	coarse sand and/or gravel
690	141	121792138000	0	3	topsoil	topsoil
691		121792138000	3	50	coarse gravel and rocks	coarse sand and/or gravel
692		121792138000	50	80	sand gravel and rocks	coarse sand and/or gravel
693		121792138000	80	108	rocks	shale
694	142	121792237600	0	1	top soil	topsoil
695		121792237600	1	10	brown sand	sand
696		121792237600	10	20	sand & gravel	coarse sand and/or gravel
697		121792237600	20	55	coarse gravel	coarse sand and/or gravel
698		121792237600	55	90	medium gravel & sand	coarse sand and/or gravel
699		121792237600	90	117	brown fine sand, some small gravel	sand
700		121792237600	117	118	coarse gravel	coarse sand and/or gravel
701		121792237600	118	120	gray shale	shale
702	143	121792154000	0	2	top soil	topsoil
703		121792154000	2	11	fine sand	sand
704		121792154000	11	99	medium/coarse gravel	coarse sand and/or gravel
705	144	121790072100	0	66	yellow sand	sand
706		121790072100	66	86	blue sand	sand
707	145	121790071600	0	4	black sandy loam	loam
708		121790071600	4	75	dirty yellow sand	sand
709		121790071600	75	112	sand trace gravel	coarse sand and/or gravel
710	146	121792285300	0	2	top soil	topsoil
711		121792285300	2	54	fine to coarse gravel	coarse sand and/or gravel
712		121792285300	54	60	clay	clay
713		121792285300	60	92	coarse sand to coarse gravel	coarse sand and/or gravel
714		121792285300	92	133	coarse sand to medium gravel	coarse sand and/or gravel
715		121792285300	133	133	shale at	shale

716	147	121792282400	0	2	top soil	topsoil
717		121792282400	2	13	fine sand	sand
718		121792282400	13	21	blue clay	clay
719		121792282400	21	62	fine to medium sand	sand
720		121792282400	62	107	fine to coarse sand & gravel	coarse sand and/or gravel
721		121792282400	107	107	fine sand at	sand
722	148	121792204800	0	13	misc. fill, gravel, cinders, bricks etc	fill
723		121792204800	13	17	black clayey gravel & sand	clay, sand, gravel
724		121792204800	17	25	black sand w/clay & other misc.	clay, sand, gravel
725		121792204800	25	50	loos crs sand to crs gravel & boulders	clay, sand, gravel
726		121792204800	50	60	med brn sand-crs gvl w/clay pckts & lyrs	coarse sand and/or gravel
727		121792204800	60	66	coarse sand to coarse gravel	coarse sand and/or gravel
728		121792204800	66	95	loose med s-sml gvl, occ bldrs & crs gvl	coarse sand and/or gravel
729		121792204800	95	96	dark gray lime	limestone
730		121792204800	96	100	dark gray shale	shale
731	149	121792197300	0	2	top soil	topsoil
732		121792197300	2	17	fine sand	sand
733		121792197300	17	42	coarse gravel	coarse sand and/or gravel
734		121792197300	42	61	medium sand	coarse sand and/or gravel
735		121792197300	61	85	coarse gravel	coarse sand and/or gravel
736	150	121792885900	0	16	sand (brown) fine	sand
737		121792885900	16	18	sand (brown) fine with rocks	sand
738		121792885900	18	26	sand (brown) medium	coarse sand and/or gravel
739		121792885900	26	30	sand (brown) medium with rocks	coarse sand and/or gravel
740		121792885900	30	40	sand (brown) medium	coarse sand and/or gravel
741		121792885900	40	71	sand (brown) medium with rocks	coarse sand and/or gravel
742	151	121792293000	0	4	topsoil	topsoil
743		121792293000	4	28	sand w/clay streaks	clay, sand
744		121792293000	28	58	medium sand	coarse sand and/or gravel
745		121792293000	58	105	big gravel	coarse sand and/or gravel
746	152	121790067100	0	6	fill	fill
747		121790067100	6	22	sand	sand
748		121790067100	22	25	silty clay	silt and clay
749		121790067100	25	100	sand & gravel	coarse sand and/or gravel
750		121790067100	100	100	hardpan at	shale
751	153	121792124200	0	4	brown sandy clay	clay, sand
752		121792124200	4	38	brown fine sand to crs gravel boulders	coarse sand and/or gravel
753		121792124200	38	62	brown fine sand to coarse gravel	coarse sand and/or gravel
754		121792124200	62	68	brown fine to coarse sand	coarse sand and/or gravel
755		121792124200	68	113	multi-colored medium to coarse sand	coarse sand and/or gravel

Attachment 9-2 – Boring Logs

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-1-Po** SHEET **1** OF **2**

CLIENT **Midwest Generation**

PROJECT & NO. **21053.070**

LOCATION **Powerton**

LOGGED BY **MPG**

GROUND ELEVATION **461.7**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	PL □ Water Content ○ LL △ (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
461.7	0.0		Brown coarse to fine sand, dry FILL				
				SS-1 1.0-2.5 14"R	3 4 4		qu=NT
				SS-2 3.5-5.0 12"R	3 3 5		Bentonite seal 3.0'-18.0'. Stickup protective cover installed. qu=NT
				SS-3 6.0-7.5 12"R	2 6 8		qu=NT
				SS-4 8.5-10.0 10"R	2 5 8		qu=NT
			Trace coarse gravel	SS-5 11.0-12.5 8"R	5 9 10		qu=NT
				SS-6 13.5-15.0 12"R	3 6 6		qu=NT
				SS-7 16.0-17.5 16"R	4 6 7		qu=NT
443.2	18.5		Brown coarse to medium sand, trace fine gravel, medium dense, saturated SW	SS-8 18.5-20.0 14"R	4 5 6		Sand pack 18.0'-30.0' qu=NT

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/4/10** ENDED **10/4/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **22.0**
▽
▼

PATRICK ENGINEERING INC.

BORING NUMBER	B-MW-1-Po
SHEET	2 OF 2
CLIENT	Midwest Generation
PROJECT & NO.	21053.070
LOCATION	Powerton

LOGGED BY **MPG**
GROUND ELEVATION **461.7**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □---○---△ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
441.7	20.0						Set screen (slot 0.010") 20.5'-30.5'
				SS-9 21.0-22.5 15"R	4 5 5		qu=NT
439.7	22.0		▽				
				SS-10 23.5-25.0 18"R	4 4 4		qu=NT
				SS-11 26.0-27.5 18"R	4 4 6		qu=NT
433.7	28.0		Coarse to fine gravel, some coarse sand, medium dense, saturated GP				
				SS-12 28.5-30.0 18"R	4 5 6		qu=NT
				SS-13 31.0-32.5 18"R	4 6 7		qu=NT
429.2	32.5		End of Boring at 32.5'				

DRILLING CONTRACTOR	Groff Testing
DRILLING METHOD	4.25" I.D. HSA
DRILLING EQUIPMENT	CME 550 ATV
DRILLING STARTED	10/4/10
ENDED	10/4/10

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ 22.0
▼
▼

PATRICK ENGINEERING INC.

BORING NUMBER B-MW-2-Po

CLIENT Midwest Generation
PROJECT & NO. 21053.070
LOCATION Powerton

LOGGED BY MPG
GROUND ELEVATION 459.2

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □---○---△ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
459.2	0.0		Dark brown topsoil, silty clay, dry FILL				
				SS-1 1.0-2.5 10"R	4 4 4		qu=NT
457.7	1.5		Light brown coarse to fine sand, loose, dry FILL				
				SS-2 3.5-5.0 10"R	2 3 2		Bentonite seal 3.0'-20.0'. Stickup protective cover installed. qu=NT
				SS-3 6.0-7.5 12"R	3 3 4		qu=NT
			Dry	SS-4 8.5-10.0 14"R	4 5 4		qu=NT
				SS-5 11.0-12.5 15"R	2 2 3		qu=NT
			Some fine gravel	SS-6 13.5-15.0 15"R	3 6 5		qu=NT
				SS-7 16.0-17.5 18"R	2 5 6		qu=NT
			Dry	SS-8 18.5-20.0 18"R	3 3 4		qu=NT
439.2	20.0						

DRILLING CONTRACTOR Groff Testing
DRILLING METHOD 4.25" I.D. HSA
DRILLING EQUIPMENT CME 550 ATV
DRILLING STARTED 10/5/10 ENDED 10/5/10

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ 24.0
▼
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-2-Po** SHEET **2** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **459.2**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ 10 20 30 40 50 LL / Unconfined Compressive Strength (TSF) ✳ 1 2 3 4 5	NOTES & TEST RESULTS
439.2	20.0		Light brown fine to medium sand, well graded, medium dense, dry FILL				Sand pack 20.0'-33.5'
				SS-9 21.0-22.5 18"R	4 10 11		qu=NT
435.7	23.5		Gray coarse to fine gravel, coarse sand, trace fine sand and silt, poorly graded, medium dense GP	SS-10 23.5-25.0 18"R	5 13 13		qu=NT Set screen (slot 0.010") 23.5'-33.5'
435.2	24.0	⊻					
				SS-11 26.0-27.5 18"R	4 6 8		qu=NT
				SS-12 28.5-30.0 18"R	7 10 10		qu=NT
				SS-13 31.0-32.5 18"R	7 8 7		qu=NT
				SS-14 33.5-35.0 18"R	6 9 10		qu=NT
424.2	35.0		End of Boring at 35.0'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/5/10** ENDED **10/5/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
⊻ **24.0**
⊻
⊻

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-3-Po** SHEET **1** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **459.1**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	PL Water Content LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) (1 2 3 4 5)	NOTES & TEST RESULTS
459.1 458.6	0.0 0.5		Dark brown silty clay topsoil				
			Light brown coarse to medium sand, trace fine gravel, trace fine sand, very loose to loose, dry FILL	SS-1 1.0-2.5 16"R	2 1 2		qu=NT
				SS-2 3.5-5.0 14"R	1 1 2		Bentonite seal 3.0'-20.0'. Stickup protective cover installed. qu=NT
				SS-3 6.0-7.5 16"R	2 2 3		qu=NT
			Some fine sand	SS-4 8.5-10.0 18"R	2 3 2		qu=NT
			Light brown medium to fine sand, loose, dry	SS-5 11.0-12.5 17"R	1 2 2		qu=NT
				SS-6 13.5-15.0 18"R	4 5 6		qu=NT
				SS-7 16.0-17.5 16"R	2 2 3		qu=NT
440.1	19.0		Brown coarse sand, trace fine gravel, well graded, very loose, wet	SS-8 18.5-20.0 16"R	3 4 3		qu=NT

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/5/10** ENDED **10/5/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
∇ 23.0

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-3-Po** SHEET **2** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **459.1**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ 10 20 30 40 50 △ LL) / Unconfined Compressive Strength (TSF) ✳ 1 2 3 4 5	NOTES & TEST RESULTS
439.1	20.0		SW				Sand pack 20.0'-34.0'
				SS-9 21.0-22.5 18"R	1 1 1		qu=NT
436.1	23.0		∇ Saturated				
				SS-10 23.5-25.0 0"R	1 2 2		qu=NT Set screen (slot 0.010") 24.0'-34.0'
				SS-11 26.0-27.5 18"R	1 2 2		qu=NT
				SS-12 28.5-30.0 18"R	2 1 2		qu=NT
				SS-13 31.0-32.5 18"R	1 2 2		qu=NT
425.1	34.0		End of Boring at 34.0'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/5/10** ENDED **10/5/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
∇ **23.0**
∇
∇

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-4-Po** SHEET **1** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **457.3**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □- - -○- - -△ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
457.3	0.0		Brown silty clay, roots, topsoil FILL				
456.5	0.8		Light brown sand, medium to fine brown silty clay, fine gravel, dry FILL	SS-1 1.0-2.5 10"R	6 3 4		
				SS-2 3.5-5.0 8"R	3 4 4		Bentonite seal 3.0'-20.0'. Stickup protective cover installed.
				SS-3 6.0-7.5 18"R	4 6 9		qu=4.0**tsf
			Brown clayey silt	SS-4 8.5-10.0 18"R	4 5 5		qu=4.0**tsf
				SS-5 11.0-12.5 17"R	3 3 4		qu=3.5**tsf
				SS-6 13.5-15.0 17"R	2 2 3		qu=3.5**tsf
			Black clayey silt to silty clay				
441.3	16.0		Light brown coarse to fine sand, fine gravel, loose, dry SP	SS-7 16.0-17.5 18"R	2 2 3		
				SS-8 18.5-20.0 18"R	2 3 5		
437.3	20.0						

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/16/10** ENDED **10/16/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **24.0**
▽
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-4-Po** SHEET **2** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **457.3**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □---○---△ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
437.3	20.0		Brown coarse to fine gravel, trace coarse to medium sand, loose to medium dense, poorly graded GP				Sand pack 20.0'-34.0'
				SS-9 21.0-22.5 12"R	4 8 6		qu=NT
433.3	24.0		▽ Saturated	SS-10 23.5-25.0 18"R	6 5 7		qu=NT Set screen (slot 0.010") 24.0'-34.0'
				SS-11 26.0-27.5 14"R	2 3 3		qu=NT
				SS-12 28.5-30.0 18"R	5 6 10		qu=NT
			Coarse to fine gravel, trace silt	SS-13 31.0-32.5 10"R	4 4 8		qu=NT
423.3	34.0		End of Boring at 34.0'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/16/10** ENDED **10/16/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **24.0**
▼
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-5-Po** SHEET **1** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **455.8**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ - - ○ - - △ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
455.8	0.0		Dark brown silty clay, black coal cinders, topsoil FILL				
				SS-1 1.0-2.5 12"R	2 2 3		qu=NT Bentonite seal 2.0'-19.0'. Stickup protective cover installed.
			Dry	SS-2 3.5-5.0 14"R	6 8 10		qu=NT
			Coarse gravel, red coal cinders				
			Gray silty clay with coarse sand and fine gravel, medium stiff, dry	SS-3 6.0-7.5 16"R	2 3 3		qu=1.25**tsf
				SS-4 8.5-10.0 18"R	1 2 2		qu=1.0**tsf
				SS-5 11.0-12.5 18"R	2 2 3		qu=0.5**tsf
			Trace black coal cinders Trace coarse sand, moist				
			Gray clayey silt	SS-6 13.5-15.0 18"R	WOH 2 2		
				SS-7 16.0-17.5 18"R	WOH 6 6		
438.8	17.0		Gray coarse to fine gravel, coarse to fine sand, poorly graded, medium dense, dry GP				
				SS-8 18.5-20.0 18"R	4 8 7		Sand pack 19.0'-31.0'
435.8	20.0						

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/5/10** ENDED **10/6/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **20.5**
▼
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-5-Po** SHEET **2** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **455.8**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □- - -O- - -△ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
435.8 435.3	20.0 20.5		▽ Coarse to fine gravel, trace coarse to fine sand, poorly graded, medium dense, saturated GP				
				SS-9 21.0-22.5 0"R	4 6 6		qu=NT Set screen (slot 0.010") 21.0'-31.0'
				SS-10 23.5-25.0 10"R	4 6 6		qu=NT
			Loose	SS-11 26.0-27.5 10"R	3 4 4		qu=NT
				SS-12 28.5-30.0 10"R	4 5 6		qu=NT
424.8	31.0		End of Boring at 31.0'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/5/10** ENDED **10/6/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **20.5**
▽
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-6-Po** SHEET **1** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **461.2**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	PL □ Water Content ○ LL △ (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
461.2	0.0		Gravel, clay, coal cinders FILL				
				SS-1 1.0-2.5			
				SS-2 3.5-5.0			Bentonite seal 3.0'-18.0'. Stickup protective cover installed.
				SS-3 6.0-7.5			
				SS-4 8.5-10.0			
451.2	10.0		Dark gray clayey silt, organics, very soft, moist FILL				
				SS-5 11.0-12.5 17"R	WOH 1 1		qu=0.25**tsf
				SS-6 13.5-15.0 16"R	WOH 3 3		qu=0.25**tsf
447.2	14.0		Black coal cinders, loose, wet FILL				
				SS-7 16.0-17.5 14"R	2 3 3		
444.2	17.0	∇					
443.2	18.0		Olive gray and gray organic silt, trace clay, trace peat, low plasticity, wet OL				Sand pack 18.0'-28.0'
				SS-8 18.5-20.0	2 2 1		qu=NT Set screen (slot 0.010") 19.0'-29.0'

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/6/10** ENDED **10/6/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
∇ **17.0**
∇
∇

PATRICK ENGINEERING INC.	BORING NUMBER **B-MW-6-Po** SHEET **2** OF **2** CLIENT **Midwest Generation** PROJECT & NO. **21053.070** LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **461.2**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ 10 20 ○ 30 40 △ 50 LL / Unconfined Compressive Strength (TSF) ✳ 1 2 3 4 5	NOTES & TEST RESULTS
441.2	20.0		Trace fine sand, dark gray mottled black organic silt, trace fine sand, wet				
				SS-9 21.0-22.5 16"R	WOH 1 2		qu=0.25**tsf
				SS-10 23.5-25.0 18"R	1 2 3		qu=0.50**tsf
				SS-11 26.0-27.5 18"R	3 3 3		qu=0.75**tsf
433.7	27.5		Dark gray organic clay, trace fine sand, medium stiff, moist OL				
				SS-12 28.5-30.0 18"R	2 2 3		qu=1.25**tsf
431.2	30.0		End of Boring at 30.0'				

DRILLING CONTRACTOR **Groff Testing** DRILLING METHOD **4.25" I.D. HSA** DRILLING EQUIPMENT **CME 550 ATV** DRILLING STARTED **10/6/10** ENDED **10/6/10**	REMARKS **Installed 2" diameter PVC monitoring well.**	WATER LEVEL (ft.) ▽ **17.0** ▼ ▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-7-Po** SHEET **1** OF **3**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **459.6**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content: PL □ 10 20 ○ 30 40 △ LL 50 / Unconfined Compressive Strength (TSF) ✳ 1 2 3 4 5	NOTES & TEST RESULTS
459.6	0.0		Sand, gravel, black cinders, dry FILL				
				SS-1 1.0-2.5			
				SS-2 3.5-5.0			Bentonite seal 3.0'-32.0'. Stickup protective cover installed.
				SS-3 6.0-7.5			
				SS-4 8.5-10.0			
449.6	10.0		Sand, gravel, clay, black coal cinders FILL				
				SS-5 11.0-12.5 6"R	5 3 3		
446.1	13.5		Dark gray organic clay, soft, moist OH	SS-6 13.5-15.0 10"R	2 2 2		qu=0.5**tsf
			Moist	SS-7 16.0-17.5 18"R	2 1 2		qu=0.5**tsf
			Trace fine sand, organic silt, moist	SS-8 18.5-20.0 18"R	WOH 2 2		qu=0.75**tsf
439.6	20.0						

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/4/10** ENDED **10/5/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **36.0**
▼
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-7-Po** SHEET **2** OF **3**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **459.6**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ 10 20 30 40 50 △ LL) / Unconfined Compressive Strength (TSF) ✳ 1 2 3 4 5	NOTES & TEST RESULTS
439.6	20.0		Dark gray organic clay, mottled black, medium stiff, dry OH				
				SS-9 21.0-22.5 18"R	3 2 4		qu=1.0**tsf
				SS-10 23.5-25.0 18"R	2 3 4		qu=1.25**tsf
433.6	26.0		Gray organic silt, trace shells, fibers, very soft, moist OL	SS-11 26.0-27.5 18"R	2 2 2		qu=0.25**tsf
			Dry	SS-12 28.5-30.0 18"R	2 3 3		qu=1.75**tsf
428.6	31.0		Dark gray organic clay, trace fine gravel, moist OH	SS-13 31.0-32.5 18"R	2 4 3		qu=1.25**tsf Sand pack 32.0'-45.0'
426.1	33.5		Gray clayey gravel, coarse sand, clay, silt, moist GC	SS-14 33.5-35.0 18"R	WOH 2 2		qu=NT Set screen (slot 0.010") 35.0'-45.0'
423.6	36.0		⊻ Medium dense, saturated	SS-15 36.0-37.5 18"R	2 7 6		qu=NT
				SS-16 38.5-40.0 10"R	2 4 7		
419.6	40.0						

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/4/10** ENDED **10/5/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
⊻ **36.0**
⊻
⊻

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-8-Po** SHEET **1** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **468.7**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □---○---△ LL (10, 20, 30, 40, 50) / Unconfined Compressive Strength (TSF) ✳ (1, 2, 3, 4, 5)	NOTES & TEST RESULTS
468.7	0.0		Fine gravel, sand, silt, clay, black cinders, dry FILL				
				SS-1 1.0-2.5			
				SS-2 3.5-5.0			Bentonite seal 3.0'-18.0'. Stickup protective cover installed.
				SS-3 6.0-7.5			
				SS-4 8.5-10.0			
458.7	10.0		Black cinders FILL				
				SS-5 11.0-12.5 14"R	15 28 15/3"		
				SS-6 13.5-15.0 18"R	11 15 12		
			Silty clay seam 15.5'-16.5'				
				SS-7 16.0-17.5 17"R	15 15 14		
							Sand pack 18.0'-30.0'
449.2	19.5		▼	SS-8 18.5-20.0 18"R	7 11 11		

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **9/30/10** ENDED **9/30/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **21.0**
▼ **19.5**
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-8-Po** SHEET **2** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **468.7**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ - - - ○ - - - △ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✱ (1 2 3 4 5)	NOTES & TEST RESULTS
448.7	20.0		Black cinders FILL				Set screen (slot 0.010") 20.0'-30.0'
447.7	21.0		▽ Saturated	SS-9 21.0-22.5 18"R	5 5 3		
				SS-10 23.5-25.0 18"R	1 1 2		
444.2	24.5		Dark gray organic clay, soft, moist OH				qu=0.75**tsf
				SS-11 26.0-27.5 18"R	1 2 2		qu=1.0**tsf
441.2	27.5		Dark gray organic silt, medium stiff to soft, low plasticity, moist OL	SS-12 28.5-30.0 18"R	2 4 4		qu=1.25**tsf
438.7	30.0		End of Boring at 30.0'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **9/30/10** ENDED **9/30/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **21.0**
▼ **19.5**
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-9-Po** SHEET **1** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **466.2**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	PL ▢- - -O- - -△ LL Water Content 10 20 30 40 50 / Unconfined Compressive Strength (TSF) ✳ 1 2 3 4 5	NOTES & TEST RESULTS
466.2	0.0		Black cinders, fine gravel, crushed rock, dry FILL				
				SS-1 1.0-2.5			
				SS-2 3.5-5.0			Bentonite seal 3.0'-20.0'. Stickup protective cover installed.
				SS-3 6.0-7.5			
				SS-4 8.5-10.0			
456.2	10.0		Black cinders, coarse to fine sand, brick, fine gravel, dry FILL				
				SS-5 11.0-12.5 14"R	6 12 15		qu=NT
				SS-6 13.5-15.0 18"R	5 6 7		qu=NT
				SS-7 16.0-17.5 18"R	6 9 10		qu=NT
449.2	17.0		Moist				
			Brown clayey silt, trace fine sand, moist CL				
447.2	19.0			SS-8 18.5-20.0 18"R	3 6 11		qu=NT
			Light brown fine to medium sand, loose, well graded				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **9/28/10** ENDED **9/28/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **23.5**
▼ **21.6**
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-9-Po** SHEET **2** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **466.2**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ - - - ○ - - - △ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
446.2	20.0		SW				Sand pack 20.0'-32.0'
444.6	21.6		▼	SS-9 21.0-22.5 18"R	3 3 4		Set screen (slot 0.010") 22.0'-32.0'
442.7	23.5		∇ Saturated	SS-10 23.5-25.0 18"R	1 3 8		
				SS-11 26.0-27.5 18"R	0 2 2		
			Medium dense	SS-12 28.5-30.0 18"R	2 6 13		
			Trace fine gravel	SS-13 31.0-32.5 18"R	2 5 10		
433.7	32.5		End of Boring at 32.5'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **9/28/10** ENDED **9/28/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
∇ **23.5**
▼ **21.6**
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-10-Po** SHEET **1** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **454.1**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION		SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ - - - ○ - - - △ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
454.1	0.0		Black and brown silty clay topsoil	CL				
					SS-1 1.0-2.5			
					SS-2 3.5-5.0			Bentonite seal 3.0'-17.0'. Stickup protective cover installed.
					SS-3 6.0-7.5			
					SS-4 8.5-10.0			
444.1	10.0		Brown organic silt, some clay, trace peat, soft, moist	OL				
					SS-5 11.0-12.5 16"R	1 2 2		qu=0.5**tsf
440.6	13.5		Black organic clay, medium plasticity, medium stiff, dry	OL	SS-6 13.5-15.0 18"R	2 3 4		qu=1.5**tsf
438.1	16.0		Brown and gray silty clay, trace to little coarse to fine sand, medium stiff, dry	CL	SS-7 16.0-17.5 18"R	4 4 4		qu=2.0**tsf Sand pack 17.0'-29.0'
					SS-8 18.5-20.0			Set screen (slot 0.010") 19.0'-29.0'

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/4/10** ENDED **10/4/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **21.0'**
▼
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-10-Po** SHEET **2** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **454.1**

ELEVATION	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ --- ○ --- △ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✱ (1 2 3 4 5)	NOTES & TEST RESULTS
434.1	20.0						
433.1	21.0		Gray coarse to fine sand, trace fine gravel, silt, poorly graded, loose, saturated SP	SS-9 21.0-22.5 18"R	2 2 1		qu=NT
				SS-10 23.5-25.0 10"R	2 4 3		qu=NT
429.6	24.5		Brown and gray coarse to fine gravel, poorly graded, loose, saturated GP				
				SS-11 26.0-27.5 10"R	2 4 7		qu=NT
				SS-12 28.5-30.0 14"R	5 7 8		qu=NT
424.1	30.0		End of Boring at 30.0'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **10/4/10** ENDED **10/4/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
∇ 21.0'
▼
▼

PATRICK ENGINEERING INC.

BORING NUMBER B-MW-11-Po SHEET 1 OF 2
CLIENT Midwest Generation
PROJECT & NO. 21053.070
LOCATION Powerton

LOGGED BY MPG
GROUND ELEVATION 468.1

ELEV.	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	PL □ Water Content ○ LL △ (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
468.1	0.0		Cinders, gravel, sand, silt FILL				
				SS-1 1.0-2.5			
				SS-2 3.5-5.0			Bentonite seal 3.0'-28.0'. Stickup protective cover installed.
				SS-3 6.0-7.5			
				SS-4 8.5-10.0			
458.1	10.0		Black and brown clay, fine gravel, cinders, bricks, silt, coarse sand, dry FILL				
				SS-5 11.0-12.5 16"R	8 10 10		qu=NT
				SS-6 13.5-15.0 17"R	2 2 3		qu=2.5**tsf
452.1	16.0		Brown and gray silty clay, trace fine gravel, trace fine sand, stiff, dry CL	SS-7 16.0-17.5 18"R	1 3 4		qu=1.5**tsf
449.6	18.5		Gray clayey silt, organics, very soft, moist ML	SS-8 18.5-20.0 18"R	WOH 2 2		qu=0.5**tsf

DRILLING CONTRACTOR Groff Testing
DRILLING METHOD 4.25" I.D. HSA
DRILLING EQUIPMENT CME 550 ATV
DRILLING STARTED 9/28/10 ENDED 9/29/10

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
32.5 while drilling
26.5 after 12 hours
26.5 after 48 hours

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-11-Po** SHEET **2** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **468.1**

ELEV.	DEPTH (FT)	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	NOTES & TEST RESULTS
448.1	20.0				
			SS-9 21.0-22.5 0"R	1 2 3	qu=NT
			SS-10 23.5-25.0 18"R	WOH WOH 1	qu=0.5**tsf
442.1	26.0				
441.6	26.5	Dark gray silty clay, some organics, medium stiff, dry CL	SS-11 26.0-27.5 18"R	1 3 4	qu=1.5**tsf
			SS-12 28.5-30.0 18"R	3 4 6	Sand pack 28.0'-40.0' qu=2.5**tsf
			SS-13 31.0-32.5 18"R	3 4 6	Set screen (slot 0.010") 30.0'-40.0' qu=2.5**tsf
435.6	32.5	Brown and gray coarse to fine gravel, coarse to fine sand, loose, saturated GP			
			SS-14 33.5-35.0 18"R	1 2 1	qu=NT
431.6	36.5	Light brown fine sand, well graded, very loose, saturated SW	SS-15 36.0-37.5 18"R	1 0 0	qu=NT
			SS-16 38.5-40.0 18"R	2 3 4	qu=NT
428.1	40.0	End of Boring at 40.0'			

Water Content: PL □ - - - ○ - - - △ LL (10, 20, 30, 40, 50)
Unconfined Compressive Strength (TSF) ✱ (1, 2, 3, 4, 5)

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **9/28/10** ENDED **9/29/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **32.5** while drilling
▼ **26.5** after 12 hours
▼ **26.5** after 48 hours

PATRICK ENGINEERING INC.

BORING NUMBER B-MW-12-Po SHEET 1 OF 2
CLIENT Midwest Generation
PROJECT & NO. 21053.070
LOCATION Powerton

LOGGED BY MPG
GROUND ELEVATION 470.0

ELEV.	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □- - -○- - -△ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✱ (1 2 3 4 5)	NOTES & TEST RESULTS
470.0	0.0		Black cinders, fine gravel, silty clay, dry FILL				
				SS-1 1.0-2.5			
				SS-2 3.5-5.0			Bentonite seal 3.0'-18.0'. Stickup protective cover installed.
				SS-3 6.0-7.5			
				SS-4 8.5-10.0			
460.0	10.0		Black cinders FILL				
				SS-5 11.0-12.5 18"R	17 18 11		qu=NT
				SS-6 13.5-15.0 18"R	12 20 17		qu=NT
			Seam of l ight brown coarse sand	SS-7 16.0-17.5 18"R	6 7 6		qu=NT
451.5	18.5		Gray silt, little to some coarse to fine sand, trace clay, very soft, saturated	SS-8 18.5-20.0 18"R	1 5 2		Sand pack 18.0'-35.0' qu=NT Set screen (slot 0.010") 19.0'-29.0'
450.5	19.5		▼				

DRILLING CONTRACTOR Groff Testing
DRILLING METHOD 4.25" I.D. HSA
DRILLING EQUIPMENT CME 550 ATV
DRILLING STARTED 9/29/10 ENDED 9/29/10

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ 20.5
▼ 19.5
▼

PATRICK ENGINEERING INC.

BORING NUMBER B-MW-12-Po SHEET 2 OF 2
CLIENT Midwest Generation
PROJECT & NO. 21053.070
LOCATION Powerton

LOGGED BY MPG
GROUND ELEVATION 470.0

ELEV.	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	PL □ Water Content ○ LL △ (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
450.0 / 449.5	20.0 / 20.5		▽ ML				
				SS-9 21.0-22.5 18"R	1 2 1		qu=0.25**tsf
			Trace peat	SS-10 23.5-25.0 18"R	WOH 2 1		qu=0.5**tsf
444.0	26.0		Gray mottled black clayey silt, with some organics, trace peat, very soft, medium stiff, moist OH	SS-11 26.0-27.5 18"R	WOH WOH 2		qu=0.5**tsf
				SS-12 28.5-30.0 18"R	1 3 4		qu=1.75**tsf
				SS-13 31.0-32.5 18"R	2 3 3		qu=2.0**tsf
437.5	32.5		Dark brown and gray silty clay, trace coarse sand, trace organics, stiff to very stiff, dry CL	SS-14 33.5-35.0 18"R	4 6 6		qu=2.5**tsf
435.0	35.0		End of Boring at 35.0'				

DRILLING CONTRACTOR Groff Testing
DRILLING METHOD 4.25" I.D. HSA
DRILLING EQUIPMENT CME 550 ATV
DRILLING STARTED 9/29/10 ENDED 9/29/10

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ 20.5
▼ 19.5
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-13-Po** SHEET **1** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **467.7**

ELEV.	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □ - ○ - △ LL; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✱ (1 2 3 4 5)	NOTES & TEST RESULTS
467.7	0.0		Black cinders, sand, rock, dry FILL				
				SS-1 1.0-2.5			
				SS-2 2.5-4.0			Bentonite seal 3.0'-28.0'. Stickup protective cover installed.
				SS-3 6.0-7.5			
				SS-4 8.5-10.0			
457.7	10.0		Black cinders, medium sand FILL				
				SS-5 11.0-12.5 14"R	5 9 7		qu=NT
				SS-6 13.5-15.0 15"R	3 3 2		qu=NT
			Some organic silt, moist	SS-7 16.0-17.5 18"R	WOH 1 1		qu=NT
450.2	17.5		Gray/olive gray organic silt, very soft OL				
				SS-8 18.5-20.0 18"R	1 0 0		qu=0.0**tsf
447.7	20.0						

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **9/29/10** ENDED **9/29/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **31.5**
▼ **29.5**
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-13-Po** SHEET **2** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **467.7**

ELEV.	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content PL □ ○ △ LL (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
447.7	20.0		Dark gray and black organic clay, very soft, moist OH	SS-9 21.0-22.5 18"R	WOH WOH 2		qu=0.25**tsf
445.2	22.5		Dark gray and black organic silt, very soft, moist OL	SS-10 23.5-25.0 18"R	WOH 1 1		qu=0.25**tsf
441.7	26.0		Dark gray and black organic clay, soft, dry OH	SS-11 26.0-27.5 18"R	WOH 1 2		qu=1.0**tsf
			Medium stiff	SS-12 28.5-30.0 18"R	0 2 3		Sand pack 28.0'-40.0' qu=1.5**tsf
438.2	29.5	▼					
437.2	30.5		Gray silty clay, some coarse to fine sand, trace fine gravel, wet CL				Set screen (slot 0.010") 30.0'-40.0'
436.2	31.5	▽		SS-13 31.0-32.5 18"R	2 4 5		qu=2.0**tsf
433.7	34.0		Stiff	SS-14 33.5-35.0 6"R	2 3 2		qu=2.0**tsf
			Brown coarse to fine gravel, trace coarse to medium sand, silt, medium dense, saturated GP	SS-15 36.0-37.5 8"R	4 6 6		qu=NT
				SS-16 38.5-40.0 8"R	5 8 8		qu=NT
427.7	40.0		End of Boring at 40.0'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **9/29/10** ENDED **9/29/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **31.5**
▼ **29.5**
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-14-Po** SHEET **1** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **467.7**

ELEV.	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content: PL □ – – ○ – – △ LL (10, 20, 30, 40, 50) / Unconfined Compressive Strength (TSF) ✳ (1, 2, 3, 4, 5)	NOTES & TEST RESULTS
467.7	0.0		Cinders, gravel, sand, silt, dry FILL				
				SS-1 1.0-2.5			
				SS-2 3.5-5.0			Bentonite seal 3.0'-18.0'. Stickup protective cover installed.
				SS-3 6.0-7.5			
				SS-4 8.5-10.0			
457.7	10.0		Brown fine gravel, some silty clay and coarse sand, dry FILL				
				SS-5 11.0-12.5 18"R	4 4 4		
				SS-6 13.5-15.0 16"R	4 3 4		
			Black cinders	SS-7 16.0-17.5 16"R	2 3 3		
				SS-8 18.5-20.0 18"R	3 3 1		Sand pack 18.0'-30.0'
448.2	19.5	∇	Gray organic silt, some fine sand,				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **9/30/10** ENDED **9/30/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
∇ **19.5**
▼ **20.5**
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-14-Po** SHEET **2** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **467.7**

ELEV.	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content (PL □, ○, LL △; 10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
447.7	20.0		very loose, low plasticity, saturated OL				Set screen (slot 0.010") 20.0'-30.0'
447.2	20.5		▼ (water level)				
				SS-9 21.0-22.5 18"R	1 0 0		qu=NT
				SS-10 23.5-25.0 18"R	1 1 2		qu=0.25**tsf
442.7	25.0		Gray and mottled black organic silt, trace fine sand, soft, low plasticity, moist OL				
				SS-11 26.0-27.5 18"R	0 0 1		qu=0.25**tsf
438.7	29.0		Gray and black organic clay, medium stiff, moist OH	SS-12 28.5-30.0 18"R	2 3 4		qu=1.25**tsf
437.7	30.0		End of Boring at 30.0'				

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **9/30/10** ENDED **9/30/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ **19.5**
▼ **20.5**
▼

PATRICK ENGINEERING INC.

BORING NUMBER B-MW-15-Po SHEET 2 OF 2
CLIENT Midwest Generation
PROJECT & NO. 21053.070
LOCATION Powerton

LOGGED BY MPG
GROUND ELEVATION 468.3

ELEV.	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	PL □ Water Content ○ LL △ (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✳ (1 2 3 4 5)	NOTES & TEST RESULTS
448.3	20.0		Gray fine sand, trace medium sand, loose, saturated SM				Set screen (slot 0.010") 20.0'-30.0'
				SS-9 21.0-22.5 18"R	1 1 1		qu=NT
444.8	23.5		Gray silt, mottled black, some organics, soft, moist to wet OL	SS-10 23.5-25.0 18"R	1 2 2		qu=0.75**tsf
				SS-11 26.0-27.5 18"R	1 2 2		qu=1.0**tsf
440.3	28.0		Gray silty clay, some organics, soft, medium stiff, dry CL	SS-12 28.5-30.0 18"R	1 3 2		qu=1.0**tsf
438.3	30.0		End of Boring at 30.0'				

DRILLING CONTRACTOR Groff Testing
DRILLING METHOD 4.25" I.D. HSA
DRILLING EQUIPMENT CME 550 ATV
DRILLING STARTED 9/30/10 ENDED 9/30/10

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
▽ 20.0'
▼ 19.5
▼

PATRICK ENGINEERING INC.

BORING NUMBER **B-MW-15-Po** SHEET **1** OF **2**
CLIENT **Midwest Generation**
PROJECT & NO. **21053.070**
LOCATION **Powerton**

LOGGED BY **MPG**
GROUND ELEVATION **468.3**

ELEV.	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	PL ☐ Water Content ○ LL △ (10 20 30 40 50) / Unconfined Compressive Strength (TSF) ✱ (1 2 3 4 5)	NOTES & TEST RESULTS
468.3	0.0		Black cinders, fine gravel, sand, silt, dry FILL				
				SS-1 1.0-2.5			
				SS-2 3.5-5.0			Bentonite seal 3.0'-17.0'. Stickup protective cover installed.
				SS-3 6.0-7.5			
				SS-4 8.5-10.0			
458.3	10.0		Black cinders, fine gravel, coarse sand, silt, dry FILL				
				SS-5 11.0-12.5 14"R	6 13 12		
				SS-6 13.5-15.0 0"R	50/1"		
				SS-7 16.0-17.5 14"R	7 7 5		Sand pack 17.0'-30.0'
				SS-8 18.5-20.0 18"R	2 1 1		
448.8	19.5	⊻					
448.3	20.0						

DRILLING CONTRACTOR **Groff Testing**
DRILLING METHOD **4.25" I.D. HSA**
DRILLING EQUIPMENT **CME 550 ATV**
DRILLING STARTED **9/30/10** ENDED **9/30/10**

REMARKS
Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)
⊻ **20.0'**
⊻ **19.5**
⊻

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ENVIRONMENTAL CONSULTATION & REMEDIATION
KPRG and Associates, Inc.

Midwest Generation, LLC
Powerton Station
Pekin, Illinois

KPRG Project No. 18311.21

GEOLOGIC LOG OF MW-16

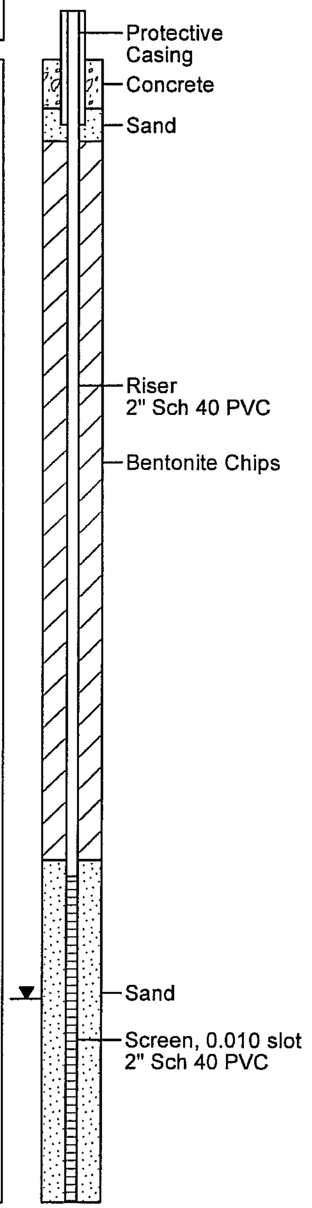
(Page 1 of 1)

Date Started	: 11/27/2012
Date Well Set	: 11/27/2012
Rock Coring Tools	: Not cored
Drilling Tools	: 4.25 ID HSA
Drill Rig	: Geoprobe
Driller Name/Co	: S. Keehma/Cabeno

Total Boring Depth	: 35 feet
Well Bottom Depth	: 35 feet
Surface Elev.	: 468.957 feet above MSL
TOC Elev.	: 471.564 feet above MSL
Groundwater Elev.	: 439.81
Riser Material	: 2" Sch 40 PVC
Screen Material	: 2" Sch 40 PVC, 0.010 slot
Coordinate N	: 40 32' 22.9" N
Coordinate E	: 89 40' 41.1" W
Logged By	: M. Wilson

Depth in Feet	Surf. Elev. 468.957	DESCRIPTION	PID	% Recovery
0	469			
		FILL: Black to brown silty clay with sand and gravel (Hydrovac from 0-10')		
2	467			
4	465			
6	463			
8	461	Approximate extent of fill		
10	459	Tan medium to fine grained SAND with some gravel		
			0	60
12	457			
14	455		0	
16	453		0	70
18	451			
			0	
20	449	- Gravel layer approximately 2" thick		
			0	100
22	447			
24	445		0	
		- Thin layer of fine grained sand		
26	443		0	100
28	441			
			0	
30	439	- Wet		
			0	60
32	437			
34	435		0	
		End of boring at 35'		
36	433			
38	431			
40				

Well Diagram: MW-16



12-13-2012 N:\Projects\18311 - Midwest Generation Ash Storage Issues\18311.2 - Powerton\Well Install\MW 16.bor

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ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG and Associates, Inc.

Midwest Generation, LLC
Powerton Station
Pekin, Illinois

Project No. 15315.7

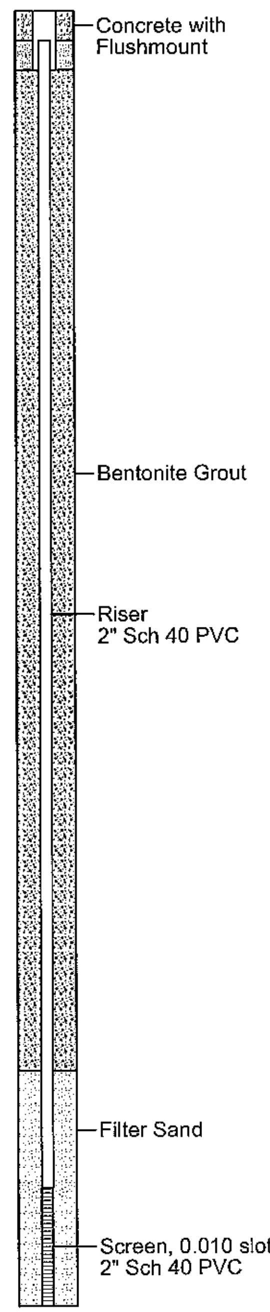
GEOLOGIC LOG OF MW-17

Date Started	: 09/21/15
Date Well Set	: 09/21/15
Drilling Tools	: 8 1/4 HSA
Reaming Tools	: None
Drill Rig	: Geoprobe
Driller Name/Co	: Nick / Cabeno Env. Serv.

Total Boring Depth	: 30.0 feet
Well Bottom Depth	: 30.0 feet
Surface Elev.	: xxx feet above MSL
TOC Elev.	: xxx feet above MSL
Groundwater Elev.	: xxx feet above MSL
Riser Material	: 2" Sch 40 PVC
Screen Material	: 2" Sch 40 PVC, 0.010 slot
Coordinate N	:
Coordinate E	:
Logged By	: P. Allenstein

Depth in Feet	Surf. Elev. 575	DESCRIPTION	% RQD	% Recovery
0	575	Asphalt Roadway over sand, silt, gravel mix, brown, dry.		
1	574	SILTY SAND, fine to coarse, black, slightly moist, occ silty layers.		
2	573			
3	572			
4	571			
5	570			
6	569			
7	568			
8	567			
9	566			
10	565			
11	564			
12	563	- begin black with orange brown		
13	562			
14	561			
15	560			
16	559	- some gray silt laminates		
17	558			
18	557	SILT, gray, laminated with SILTY SAND, moist		
19	556			
20	555	- increase to very moist then wet		
21	554	SILT, gray, laminated with light brown silt, trace organics, wet.		
22				

Well Diagram:



ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG and Associates, Inc.

GEOLOGIC LOG OF MW-17

Midwest Generation, LLC
Powerton Station
Pekin, Illinois

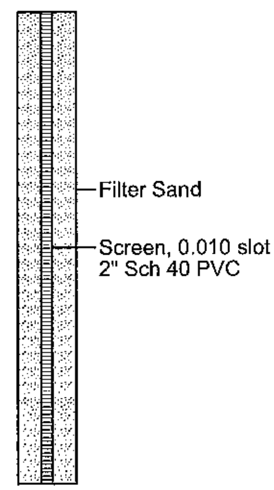
Project No. 15315.7

Date Started	: 09/21/15
Date Well Set	: 09/21/15
Drilling Tools	: 8 1/4 HSA
Reaming Tools	: None
Drill Rig	: Geoprobe
Driller Name/Co	: Nick / Cabeno Env. Serv.

Total Boring Depth	: 30.0 feet
Well Bottom Depth	: 30.0 feet
Surface Elev.	: xxx feet above MSL
TOC Elev.	: xxx feet above MSL
Groundwater Elev.	: xxx feet above MSL
Riser Material	: 2" Sch 40 PVC
Screen Material	: 2" Sch 40 PVC, 0.010 slot
Coordinate N	:
Coordinate E	:
Logged By	: P. Allenstein

Depth in Feet	Surf. Elev. 575	DESCRIPTION	% RQD	% Recovery
22	553			
23	552			
24	551			
25	550	SILTY SAND, black and dark gray, fine to meduim, wet.		
26	549			
27	548	SILT and SAND, gray and black, wet.		
28	547			
29	546			
30	545	End of Boring at 30 feet.		
31	544			
32	543			
33	542			
34	541			
35	540			
36	539			
37	538			
38	537			
39	536			
40	535			
41	534			
42	533			
43	532			
44				

Well Diagram:



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KPRG and Associates, Inc.

Midwest Generation, LLC
Powerton Station
Pekin, Illinois

Project No. 15315.7

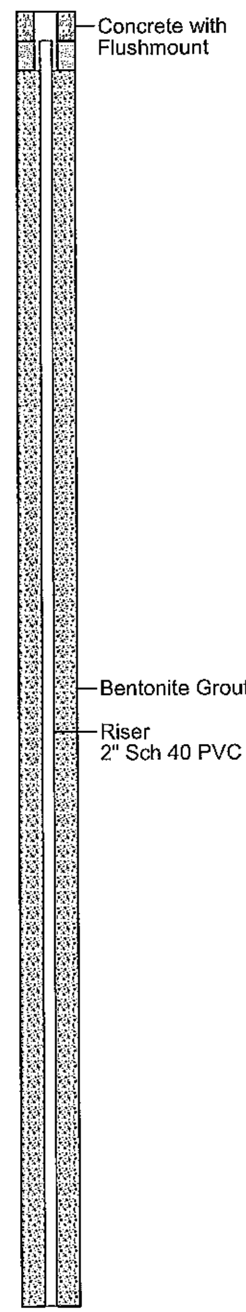
GEOLOGIC LOG OF MW-18

Date Started	: 09/21/15
Date Well Set	: 09/21/15
Drilling Tools	: 8 1/4 HSA
Reaming Tools	: None
Drill Rig	: Geoprobe
Driller Name/Co	: Nick / Cabeno Env. Serv.

Total Boring Depth	: 30.0 feet
Well Bottom Depth	: 30.0 feet
Surface Elev.	: xxx feet above MSL
TOC Elev.	: xxx feet above MSL
Groundwater Elev.	: xxx feet above MSL
Riser Material	: 2" Sch 40 PVC
Screen Material	: 2" Sch 40 PVC, 0.010 slot
Coordinate N	:
Coordinate E	:
Logged By	: P. Allenstein

Depth in Feet	Surf. Elev. 575	DESCRIPTION	% RQD	% Recovery
0	575	SILTY CLAY, brown, trace gravel, slightly moist.		
1	574			
2	573	SILTY SAND, fine to coarse, black, brown and dark gray, dry to slightly moist.		
3	572			
4	571			
5	570			
6	569			
7	568	- clayey from 7-8, followed by occasional clayey layers		
8	567			
9	566			
10	565			
11	564			
12	563			
13	562			
14	561			
15	560			
16	559	- begin all black		
17	558			
18	557			
19	556	- very moist		
20	555			
21	554			
22				

Well Diagram:



ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG and Associates, Inc.

Midwest Generation, LLC
Powerton Station
Pekin, Illinois

Project No. 15315.7

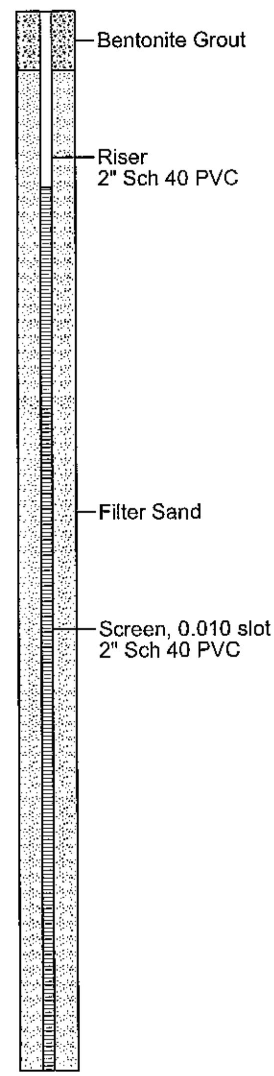
GEOLOGIC LOG OF MW-18

Date Started	: 09/21/15
Date Well Set	: 09/21/15
Drilling Tools	: 8 1/4 HSA
Reaming Tools	: None
Drill Rig	: Geoprobe
Driller Name/Co	: Nick / Cabeno Env. Serv.

Total Boring Depth	: 30.0 feet
Well Bottom Depth	: 30.0 feet
Surface Elev.	: xxx feet above MSL
TOC Elev.	: xxx feet above MSL
Groundwater Elev.	: xxx feet above MSL
Riser Material	: 2" Sch 40 PVC
Screen Material	: 2" Sch 40 PVC, 0.010 slot
Coordinate N	:
Coordinate E	:
Logged By	: P. Allenstein

Depth in Feet	Surf. Elev. 575	DESCRIPTION	% RQD	% Recovery
22	553			
23	552			
24	551			
25	550			
26	549			
27	548			
28	547			
29	546	CLAY, gray, some black, moist.		
30	545			
31	544			
32	543	CLAY, dark gray, trace organics, moist.		
33	542			
34	541			
35	540			
36	539	CLAY, greenish gray, trace organics, moist.		
37	538			
38	537			
39	536	SILTY SAND, tan, some gravel, very moist.		
40	535	End of Boring at 40 feet.		
41	534			
42	533			
43	532			
44				

Well Diagram:



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KPRG and Associates, Inc.

Midwest Generation, LLC
Powerton Station
Pekin, Illinois

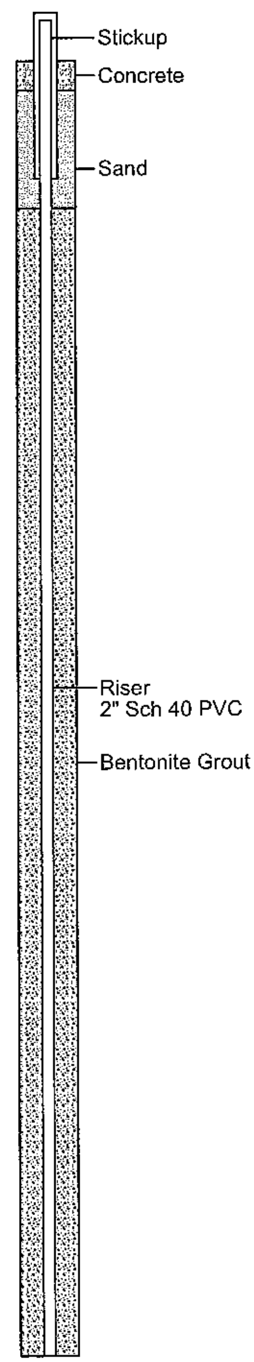
GEOLOGIC LOG OF MW-19

Date Started	: 10/05/16
Date Well Set	: 10/05/16
Drilling Tools	: 8 1/4 HSA
Reaming Tools	: None
Drill Rig	: Geoprobe
Driller Name/Co	: Nick / Cabeno Env. Serv.

Total Boring Depth	: 41.0 feet
Well Bottom Depth	: 41.0 feet
Surface Elev.	: xxx feet above MSL
TOC Elev.	: xxx feet above MSL
Groundwater Elev.	: xxx feet above MSL
Riser Material	: 2" Sch 40 PVC
Screen Material	: 2" Sch 40 PVC, 0.010 slot
Coordinate N	:
Coordinate E	:
Logged By	: P. Allenstein

Depth in Feet	Surf. Elev. 575	DESCRIPTION	% RQD	% Recovery
0	575			
1	574	SILTY SAND, black, fine to coarse, occasional clayey layers slightly moist.		
2	573			
3	572			
4	571			
5	570	- very moist to wet		
6	569			
7	568	- slightly moist		
8	567			
9	566			
10	565			
11	564			
12	563			
13	562			
14	561	- 6" white and brown gravel		
15	560			
16	559			
17	558			
18	557	- moist		
19	556			
20	555			
21	554			
22				

Well Diagram:



ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG and Associates, Inc.

Midwest Generation, LLC
Powerton Station
Pekin, Illinois

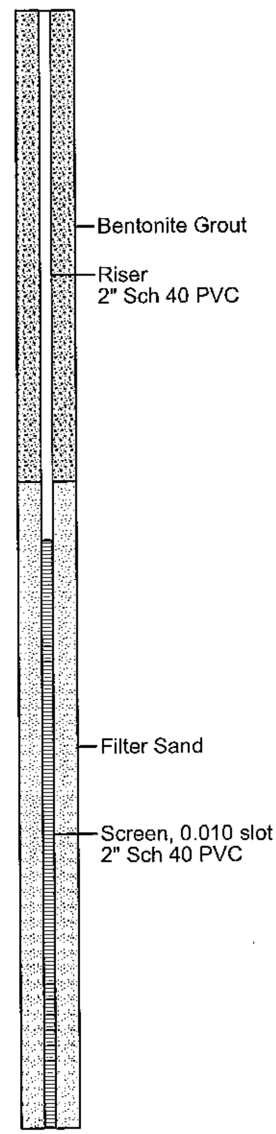
GEOLOGIC LOG OF MW-19

Date Started	: 10/05/16
Date Well Set	: 10/05/16
Drilling Tools	: 8 1/4 HSA
Reaming Tools	: None
Drill Rig	: Geoprobe
Driller Name/Co	: Nick / Cabeno Env. Serv.

Total Boring Depth	: 41.0 feet
Well Bottom Depth	: 41.0 feet
Surface Elev.	: xxx feet above MSL
TOC Elev.	: xxx feet above MSL
Groundwater Elev.	: xxx feet above MSL
Riser Material	: 2" Sch 40 PVC
Screen Material	: 2" Sch 40 PVC, 0.010 slot
Coordinate N	:
Coordinate E	:
Logged By	: P. Allenstein

Depth in Feet	Surf. Elev. 575	DESCRIPTION	% RQD	% Recovery
22	553			
23	552			
24	551			
25	550			
26	549			
27	548			
28	547			
29	546	SAND, fine to medium, gray, trace gravel, moist.		
30	545	SAND, fine to medium, brown, very moist.		
31	544			
32	543			
33	542			
34	541			
35	540			
36	539			
37	538			
38	537			
39	536			
40	535			
41	534	End of Boring at 41 feet.		
42	533			
43	532			
44				

Well Diagram:



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GEOLOGIC LOG OF MW-20

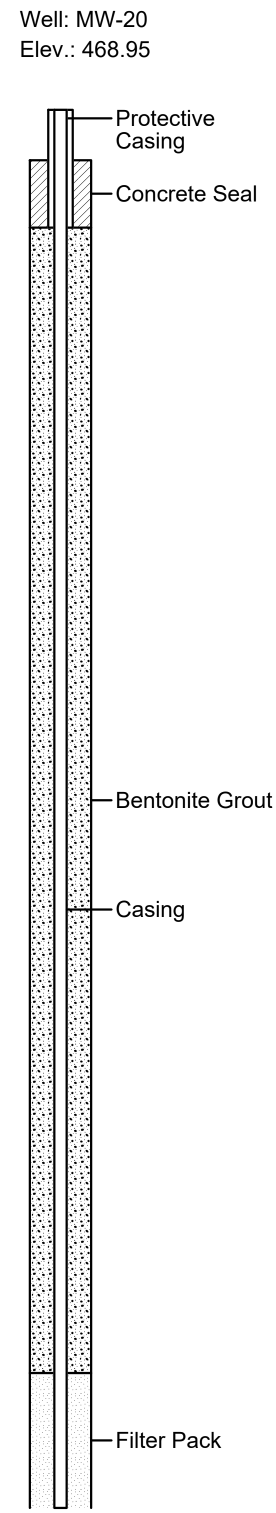
Midwest Generation, LLC
Powerton Station
Pekin, IL

Project # 12313.5

Date Started	: 03/11/21
Date Completed	: 03/11/21
Drilling Method	: 8 1/4 HSA
Drill Rig	: Geoprobe
Driller Name/Co.	: Matt / Cabeno Env. Serv.

Boring Depth	: 30.0
Well Bottom Depth	: 30.0
Surface Elevation	: 466.43 ft. above MSL
Top of Casing Elev.	: 468.95 ft. above MSL
Groundwater Elev.	: 441.60 ft. above MSL
Riser Material	: 2 " Sch 40 PVC
Screen Material	: 2 " Sch 40 PVC, 0.01 slot
Coordinate N	:
Coordinate E	:
Logged By	: M. Dolan

Depth in Feet	Surf. Elev. 466.5	DESCRIPTION	Recovery (in.)	REMARKS
0	466	CLAY with SAND and GRAVEL, brown, dark brown, top soil, dry.	24	
5	461	SAND and GRAVEL, coarse, brown, tan, dry.	30	
10	456			
		CLAY, trace SAND and GRAVEL, brown, dark brown, dry.	36	
		CLAY, some SAND and GRAVEL, cinders and slag, dark brown, black, dry.		
15	451			
		CLAY, black, organic, stiff, dry.	48	
		SILTY CLAY with SAND and GRAVEL, black, gray, dry.		
20				



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GEOLOGIC LOG OF MW-20

Midwest Generation, LLC
Powerton Station
Pekin, IL

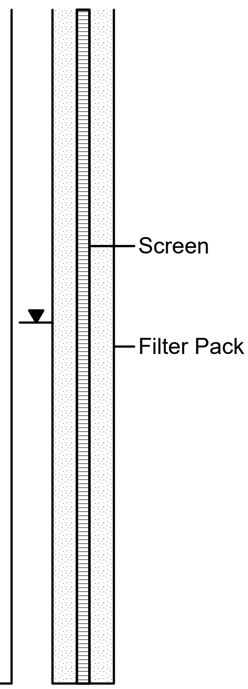
Project # 12313.5

Date Started	: 03/11/21
Date Completed	: 03/11/21
Drilling Method	: 8 1/4 HSA
Drill Rig	: Geoprobe
Driller Name/Co.	: Matt / Cabeno Env. Serv.

Boring Depth	: 30.0
Well Bottom Depth	: 30.0
Surface Elevation	: 466.43 ft. above MSL
Top of Casing Elev.	: 468.95 ft. above MSL
Groundwater Elev.	: 441.60 ft. above MSL
Riser Material	: 2 " Sch 40 PVC
Screen Material	: 2 " Sch 40 PVC, 0.01 slot
Coordinate N	:
Coordinate E	:
Logged By	: M. Dolan

Depth in Feet	Surf. Elev. 466.5	DESCRIPTION	Recovery (in.)	REMARKS
20	446		36	
21		CLAYEY SILT, trace SAND and GRAVEL, black, gray, moist.		
25	441		42	
27.5		SILT, trace SAND, organic with laminations, dark gray, black, wet.		
30	436	End of Boring at 30 feet.		
35	431			
40				

Well: MW-20
Elev.: 468.95



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KPRG and Associates, Inc.

GEOLOGIC LOG OF MW-21

Midwest Generation, LLC
Powerton Station
Pekin, IL

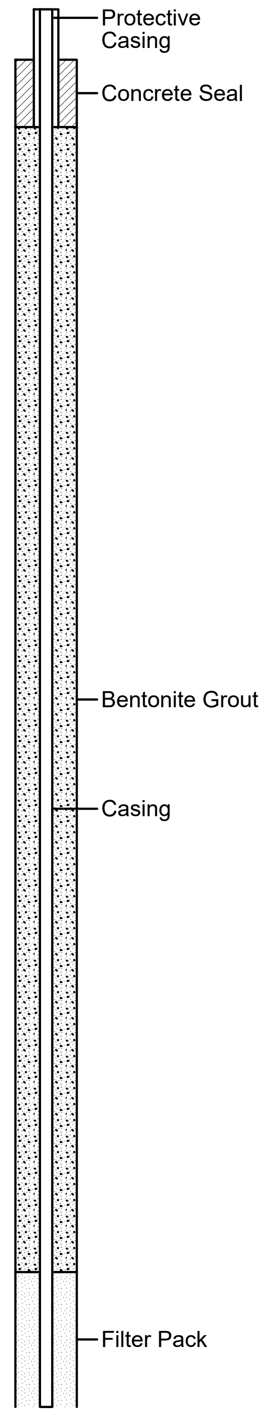
Project # 12313.5

Date Started	: 03/11/21
Date Completed	: 03/11/21
Drilling Method	: 8 1/4 HSA
Drill Rig	: Geoprobe
Driller Name/Co.	: Matt / Cabeno Env. Serv.

Boring Depth	: 35.0
Well Bottom Depth	: 30.0
Surface Elevation	: 465.71 ft. above MSL
Top of Casing Elev.	: 468.17 ft. above MSL
Groundwater Elev.	: 440.65 ft. above MSL
Riser Material	: 2 " Sch 40 PVC
Screen Material	: 2 " Sch 40 PVC, 0.01 slot
Coordinate N	:
Coordinate E	:
Logged By	: M. Dolan

Depth in Feet	Surf. Elev. 466	DESCRIPTION	Recovery (in.)	REMARKS
0	465.5	CLAY, black, dark brown, top soil, dry.		
		CLAY, dark brown, black cinders, dry.		
		SAND and GRAVEL, brown, black cinders, dry.	36	
		SAND and fine grained GRAVEL, brown, dry.		
5	460.5			
		CLAY with SAND and GRAVEL, black, dark brown, dry.	30	
10	455.5	SAND and GRAVEL, coarse, trace CLAY, brown, dry.	42	
		SILTY SAND, trace GRAVEL, brown, dry.		
15	450.5			
		CLAY, black, stiff, dry	42	
		SILT, trace SAND, black, gray, organic, moist		
20				

Well: MW-21
Elev.: 468.17



KPRG
ENVIRONMENTAL CONSULTATION & REMEDIATION
KPRG and Associates, Inc.

GEOLOGIC LOG OF MW-21

Midwest Generation, LLC
Powerton Station
Pekin, IL

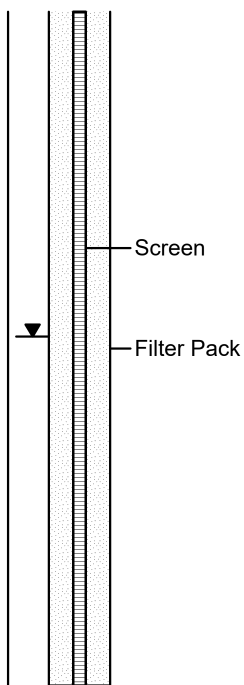
Project # 12313.5

Date Started	: 03/11/21
Date Completed	: 03/11/21
Drilling Method	: 8 1/4 HSA
Drill Rig	: Geoprobe
Driller Name/Co.	: Matt / Cabeno Env. Serv.

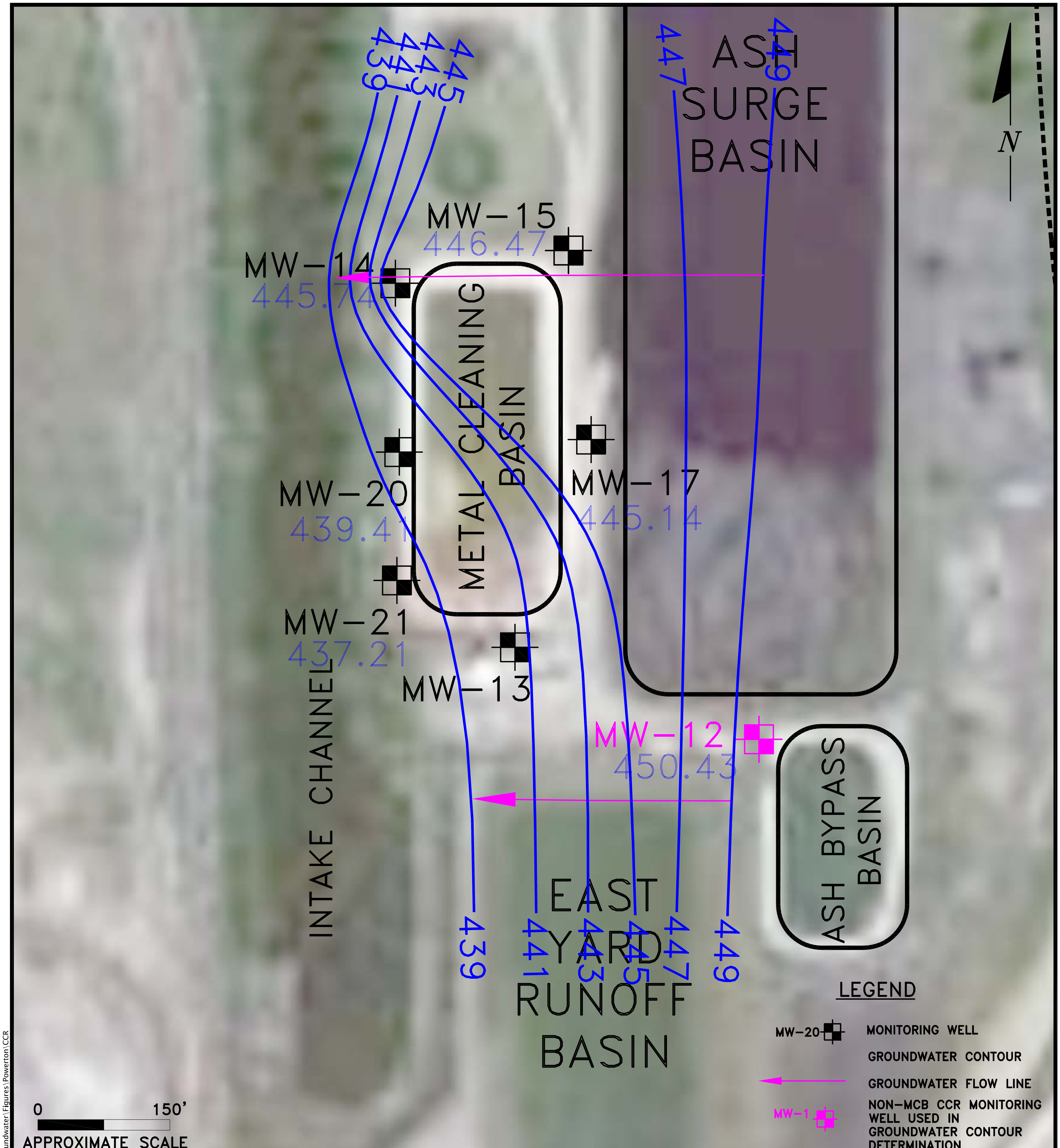
Boring Depth	: 35.0
Well Bottom Depth	: 30.0
Surface Elevation	: 465.71 ft. above MSL
Top of Casing Elev.	: 468.17 ft. above MSL
Groundwater Elev.	: 440.65 ft. above MSL
Riser Material	: 2 " Sch 40 PVC
Screen Material	: 2 " Sch 40 PVC, 0.01 slot
Coordinate N	:
Coordinate E	:
Logged By	: M. Dolan

Depth in Feet	Surf. Elev. 466	DESCRIPTION	Recovery (in.)	REMARKS
20	445.5		60	
25	440.5		60	
29		SILT, trace very fine grained SAND, black, gray, organic, stiff, wet.		
30	435.5		48	
33		CLAYEY SILT, trace very fine grained SAND, black, gray, organic, stiff, wet.		
35	430.5	End of Boring at 35 feet.		
40				

Well: MW-21
Elev.: 468.17



Attachment 9-3 – Monthly MCB Potentiometric Maps



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ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG

KPRG and Associates, inc.

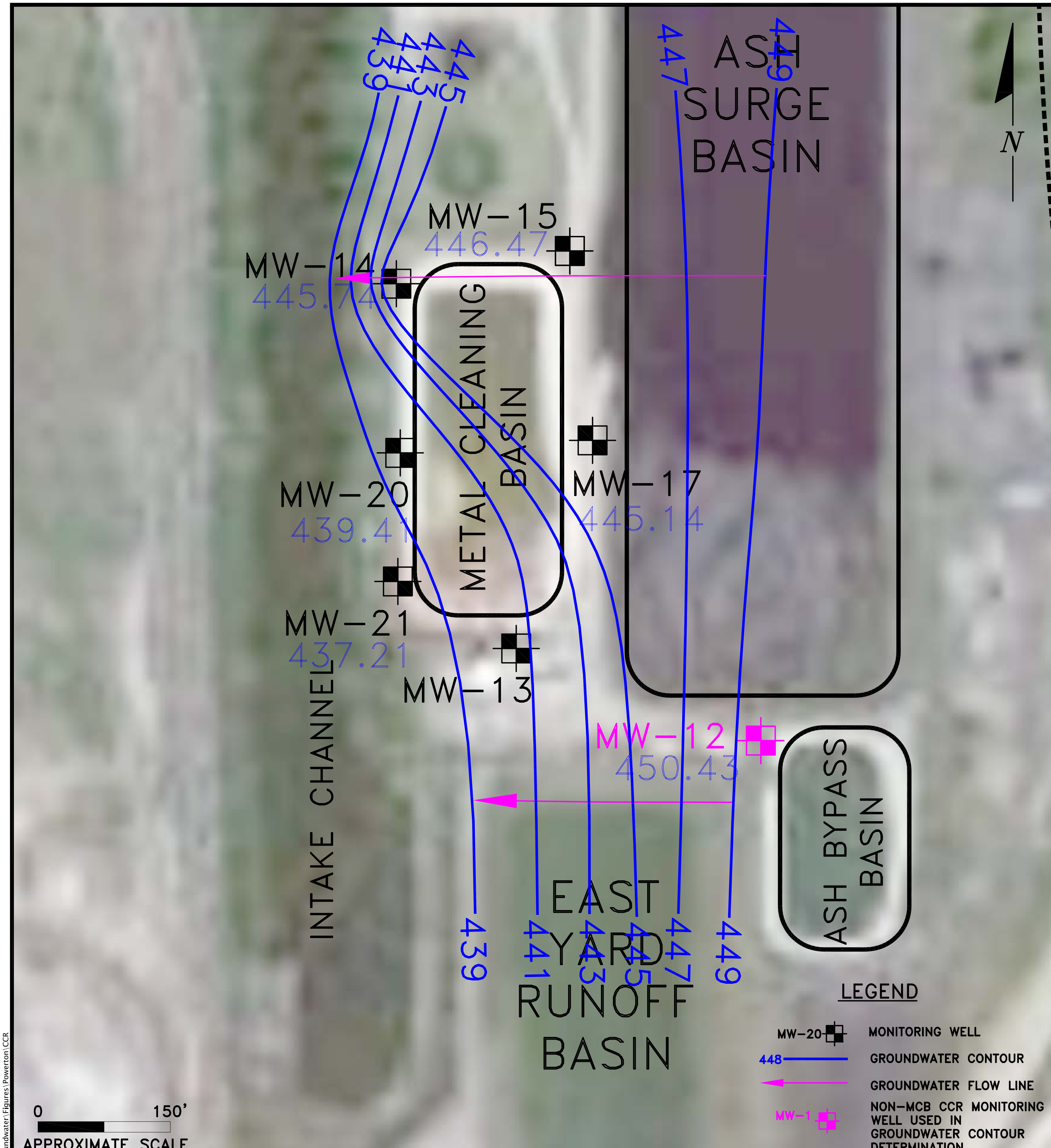
414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

14665 West Lisbon Road, Suite 1A Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478

POTENTIOMETRIC MAP 05/2021

POWERTON STATION METAL CLEANING BASIN
PEKIN, ILLINOIS

Scale: 1" = 150'	Date: January 20, 2022
KPRG Project No. 12313.5	ATTACHMENT 9-3



ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG

KPRG and Associates, inc.

414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

14665 West Lisbon Road, Suite 1A Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478

POTENTIOMETRIC MAP 06/2021

POWERTON STATION METAL CLEANING BASIN
PEKIN, ILLINOIS

Scale: 1" = 150'

Date: January 20, 2022

KPRG Project No. 12313.5

ATTACHMENT 9-3

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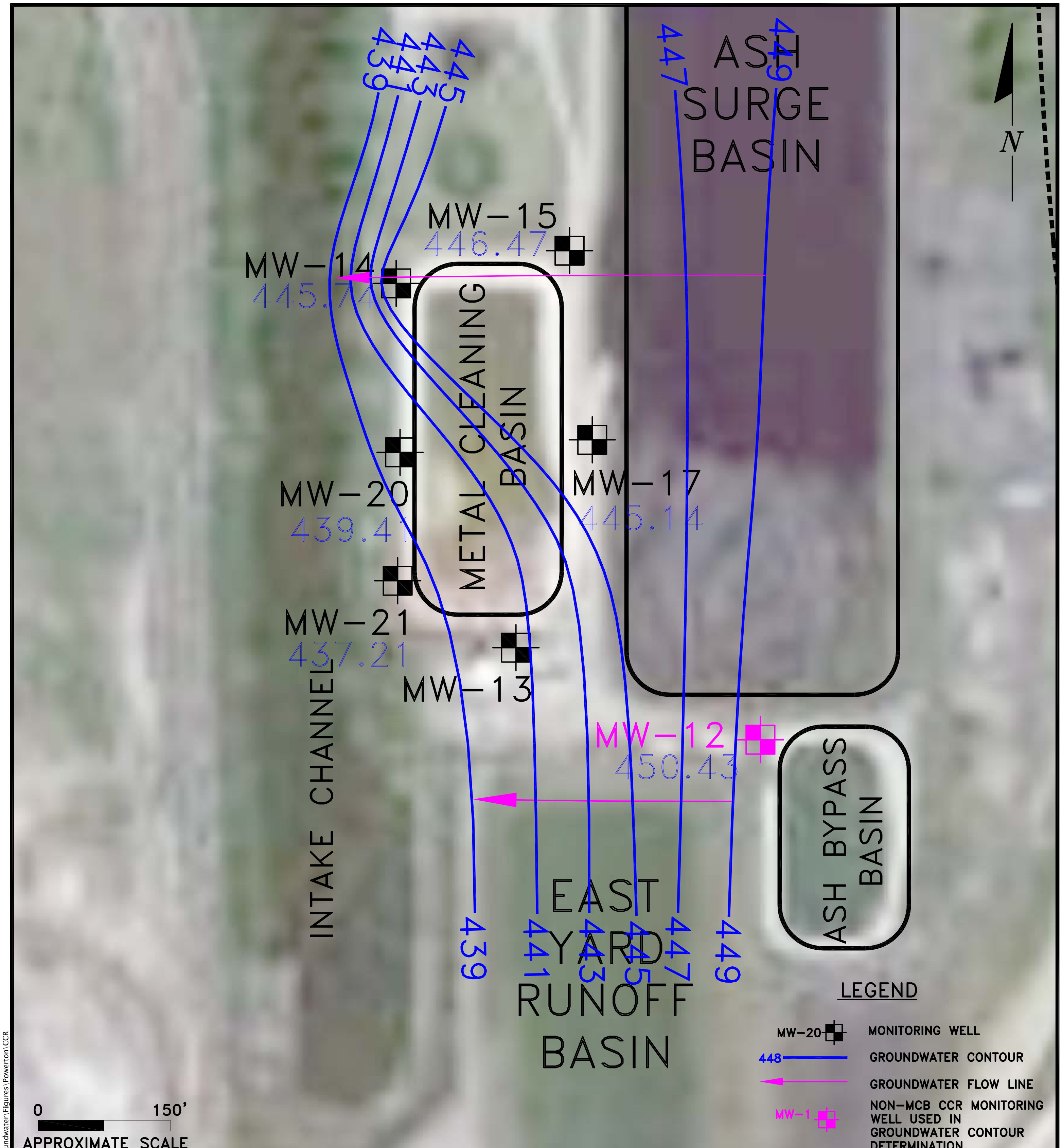

ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG

KPRG and Associates, inc.

414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

14665 West Lisbon Road, Suite 1A Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478

POTENTIOMETRIC MAP 07/2021

POWERTON STATION METAL CLEANING BASIN
PEKIN, ILLINOIS

Scale: 1" = 150'

Date: January 20, 2022

KPRG Project No. 12313.5

ATTACHMENT 9-3

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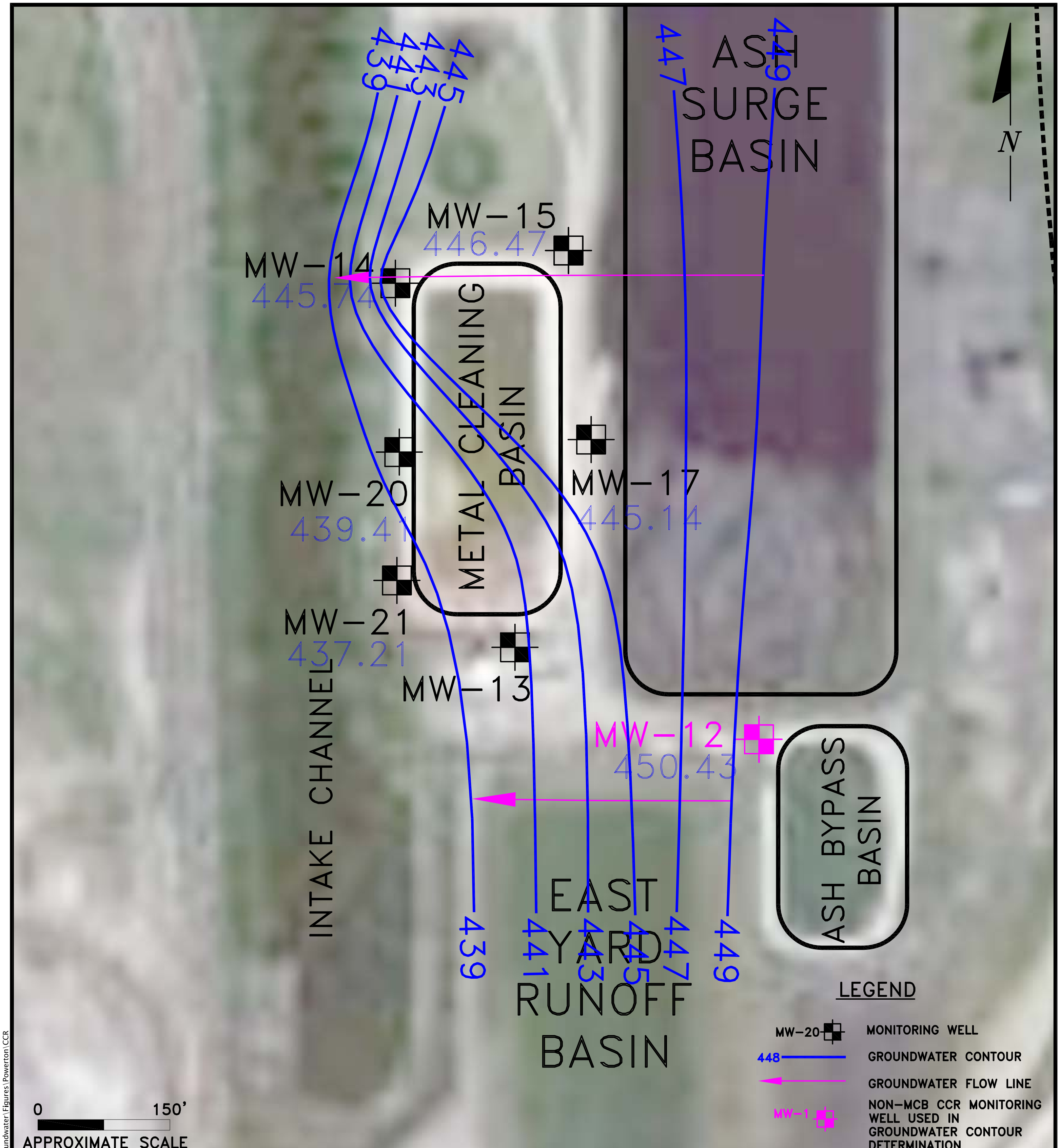

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POTENTIOMETRIC MAP 08/2021

POWERTON STATION METAL CLEANING BASIN
PEKIN, ILLINOIS

Scale: 1" = 150'	Date: January 20, 2022
KPRG Project No. 12313.5	ATTACHMENT 9-3

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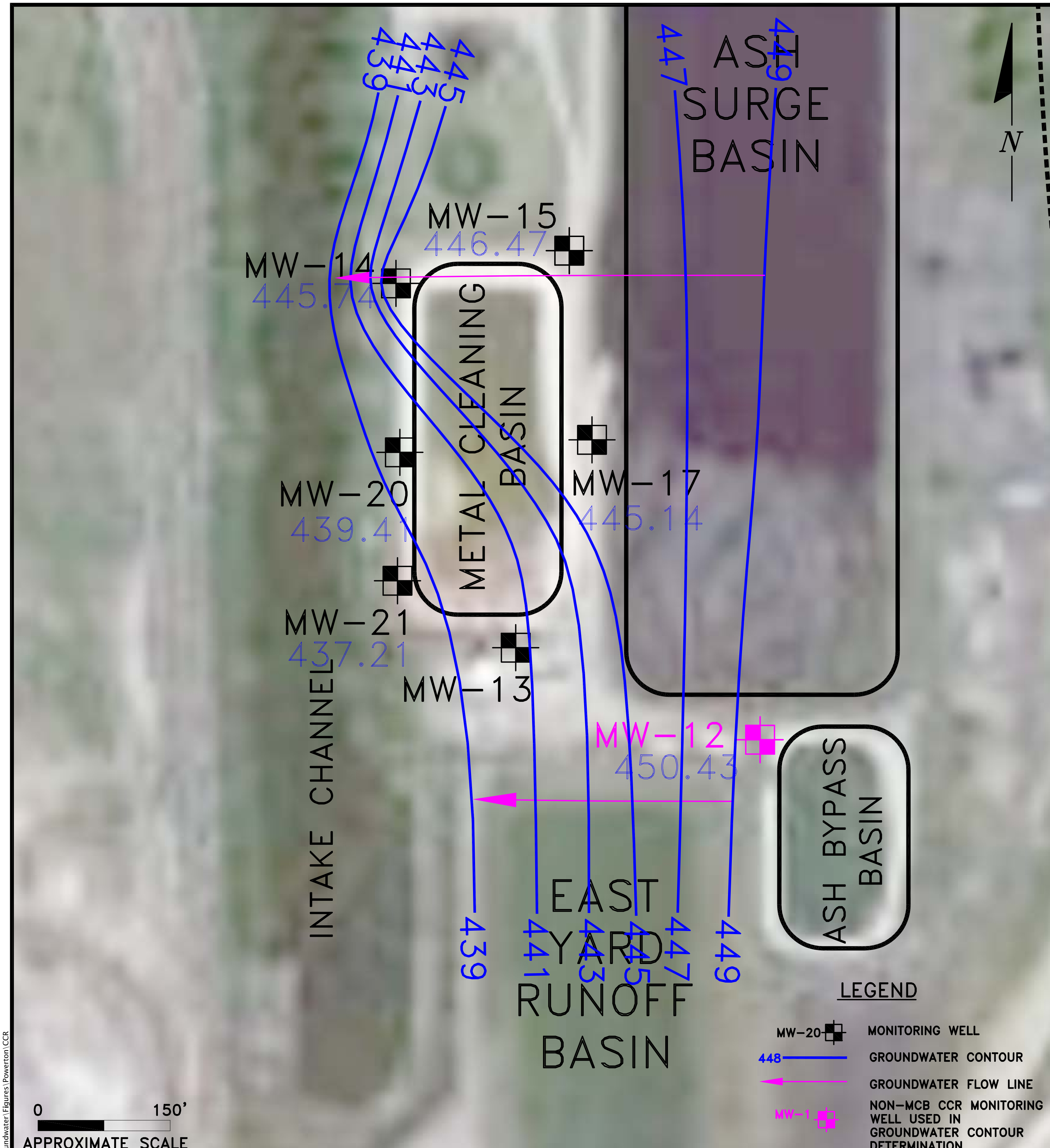

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POTENTIOMETRIC MAP 09/2021

POWERTON STATION METAL CLEANING BASIN
PEKIN, ILLINOIS

Scale: 1" = 150'	Date: January 20, 2022
KPRG Project No. 12313.5	ATTACHMENT 9-3

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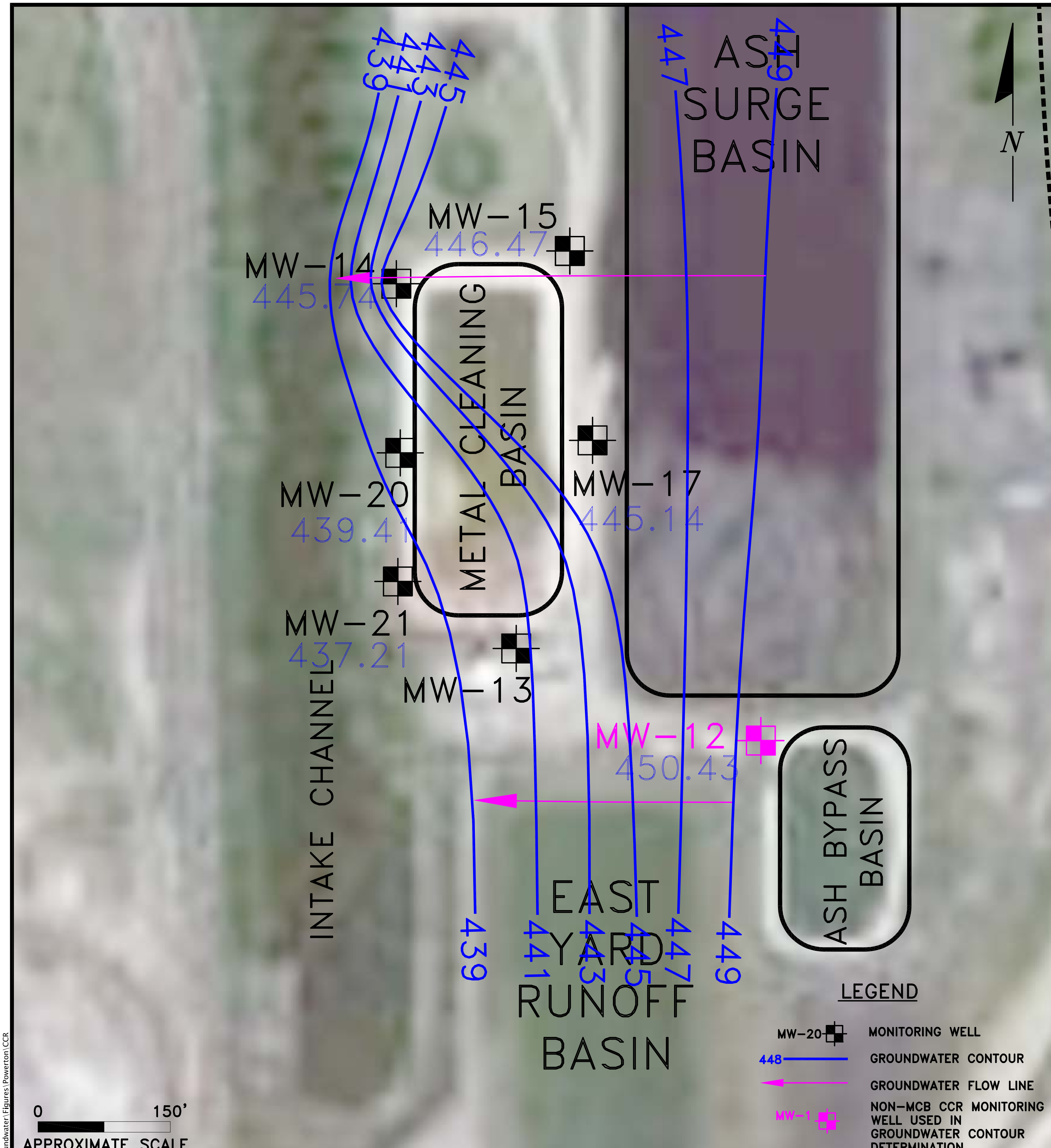

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POTENTIOMETRIC MAP 10/2021

POWERTON STATION METAL CLEANING BASIN
PEKIN, ILLINOIS

Scale: 1" = 150'

Date: January 20, 2022

KPRG Project No. 12313.5

ATTACHMENT 9-3

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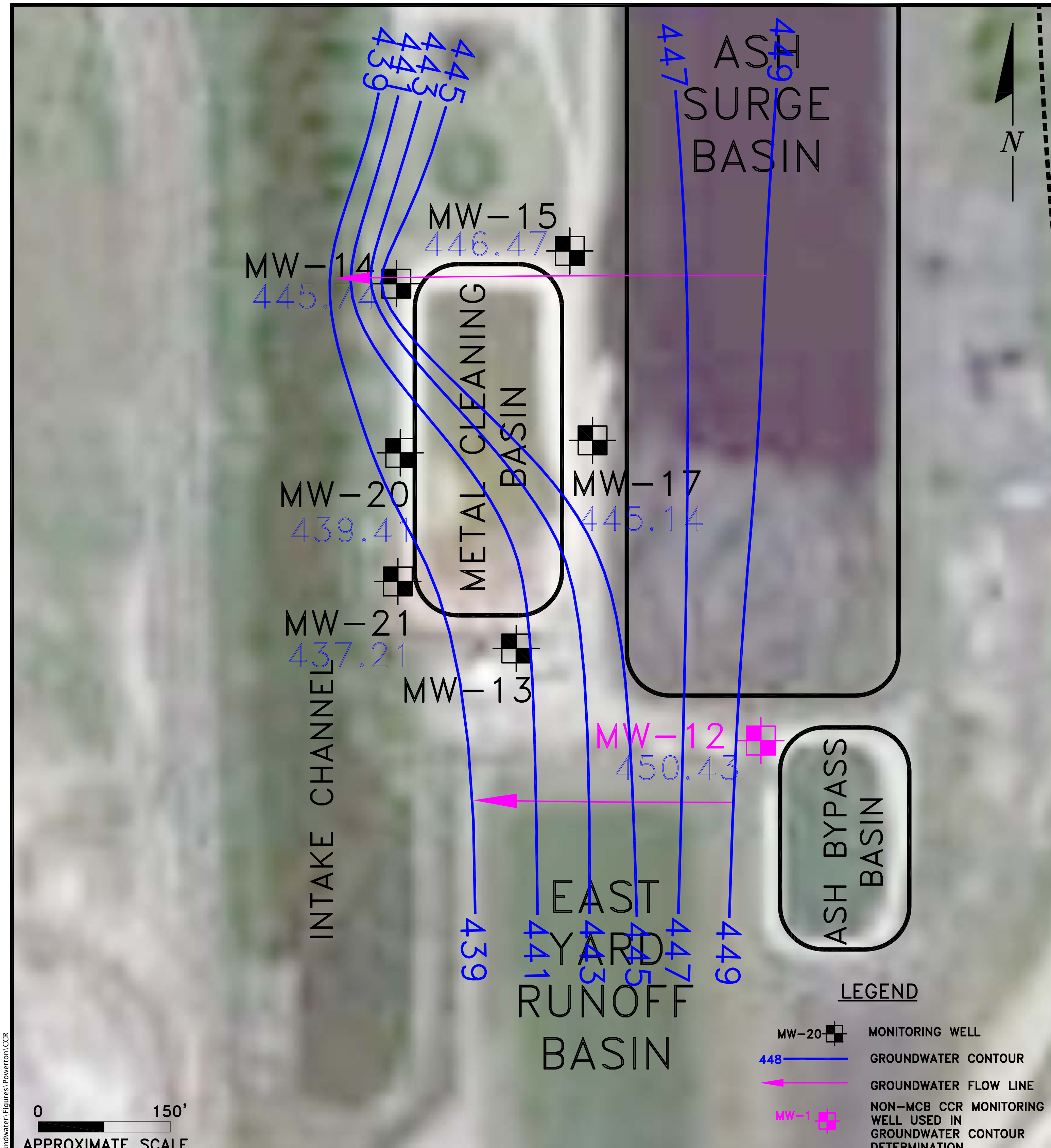

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POTENTIOMETRIC MAP 11/2021

POWERTON STATION METAL CLEANING BASIN
PEKIN, ILLINOIS

Scale: 1" = 150'

Date: January 20, 2022

KPRG Project No. 12313.5

ATTACHMENT 9-3

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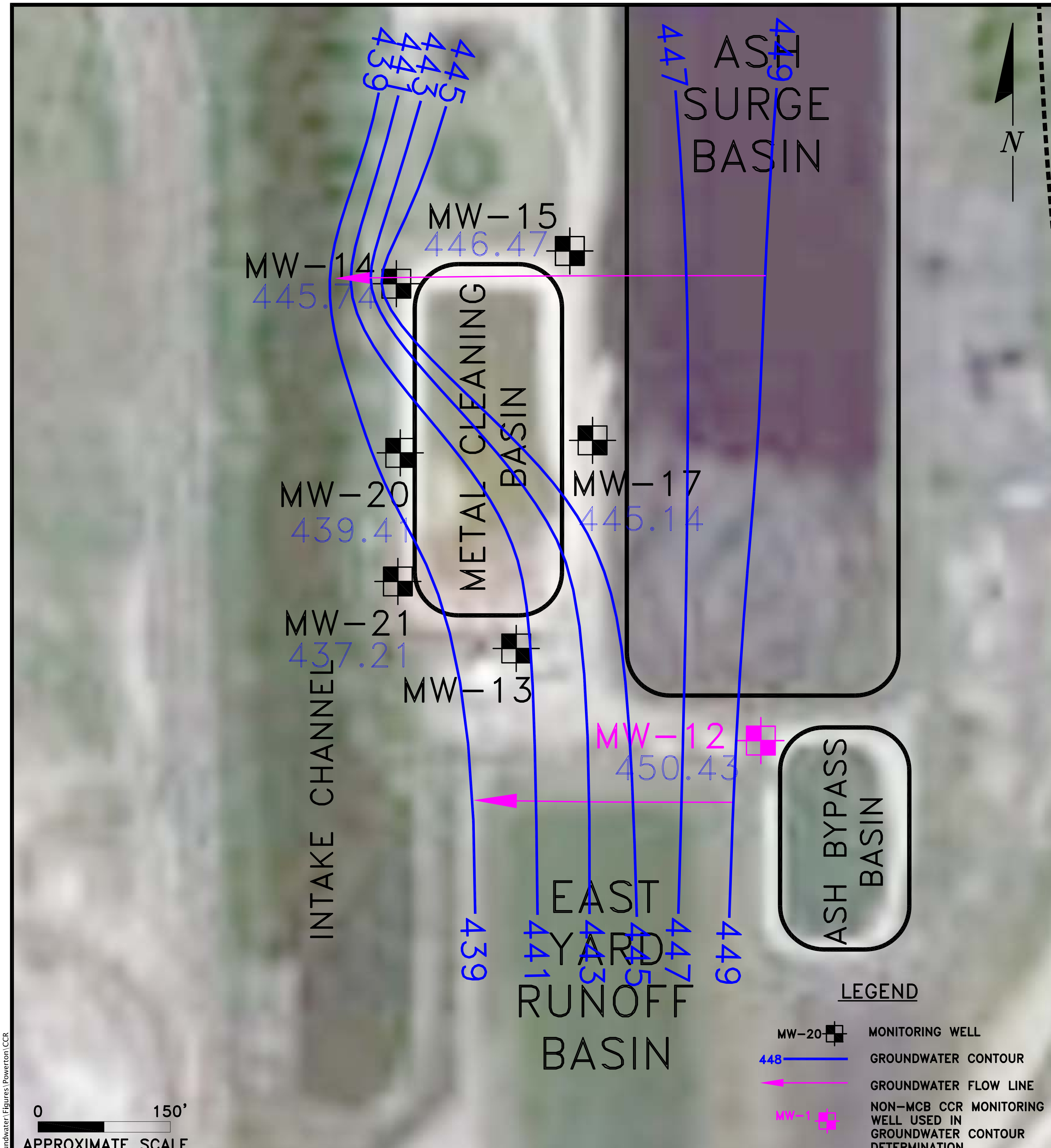

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POTENTIOMETRIC MAP 12/2021

POWERTON STATION METAL CLEANING BASIN
PEKIN, ILLINOIS

Scale: 1" = 150'	Date: January 20, 2022
KPRG Project No. 12313.5	ATTACHMENT 9-3

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Attachment 9-4 – Historical CCA Groundwater Data

Attachment 9-4. Table. CCA Groundwater Analytical Results - Midwest Generation LLC, Powerton Station, Pekin, IL

Sample: MW-01

Parameter	Standards	12/15/2010 DL	Result	3/25/2011 DL	Result	6/16/2011 DL	Result	9/19/2011 DL	Result	12/12/2011 DL	Result	3/19/2012 DL	Result	6/25/2012 DL	Result	9/18/2012 DL	Result	12/12/2012 DL	Result	2/27/2013 DL	Result	5/29/2013 DL	Result	7/29/2013 DL	Result	10/21/2013 DL	Result	3/6/2014 DL	Result
Antimony through BETX	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
pH	6.5 - 9.0	NA	7.46	NA	7.43	NA	7.58	NA	7.37	NA	6.39	NA	7.59	NA	7.45	NA	7.06	NA	6.98	NA	9.53	NA	7.00	NA	6.75	NA	7.12	NA	7.65
Temperature	NA	NA	10.47	NA	3.77	NA	9.71	NA	18.42	NA	10.85	NA	7.33	NA	17.97	NA	15.74	NA	13.58	NA	11.00	NA	10.71	NA	15.64	NA	15.06	NA	9.08
Conductivity	NA	NA	0.92	NA	0.64	NA	0.69	NA	0.74	NA	0.56	NA	0.53	NA	0.79	NA	0.92	NA	0.85	NA	0.88	NA	0.94	NA	1.06	NA	0.88	NA	0.55
Dissolved Oxygen	NA	NA	NM	NA	7.76	NA	4.61	NA	4.57	NA	5.21	NA	8.46	NA	0.66	NA	3.34	NA	3.04	NA	3.03	NA	3.10	NA	2.03	NA	1.33	NA	3.25
ORP	NA	NA	NM	NA	140.1	NA	209.8	NA	-98	NA	13	NA	242	NA	43	NA	165	NA	130	NA	94	NA	30.4	NA	58.8	NA	-127	NA	-37.2

Parameter	5/27/2014 DL	Result	8/28/2014 DL	Result	10/29/2014 DL	Result	2/23/2015 DL	Result	5/11/2015 DL	Result	8/18/2015 DL	Result	11/16/2015 DL	Result	2/25/2016 DL	Result	5/20/2016 DL	Result	8/17/2016 DL	Result	11/16/2016 DL	Result	2/14/2017 DL	Result	5/3/2017 DL	Result	8/25/2017 DL	Result	11/8/2017 DL	Result	3/6/2018 DL	Result	5/17/2018 DL	Result
Antimony	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.003	0.0036	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND ^	0.0010	ND	0.001	0.0042	0.001	ND	0.001	ND	0.001	ND
Barium	0.0025	0.041	0.0025	0.046	0.0025	0.049	0.0025	0.037	0.0025	0.038	0.0025	0.065	0.0025	0.054	0.0025	0.049	0.0025	0.052	0.0025	0.046	0.0025	0.044	0.0025	0.036	0.0025	0.032	0.0025	0.048	0.0025	0.075	0.0025	0.047	0.0025	0.045
Beryllium	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND ^	0.0010	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Boron	0.050	0.26	0.050	0.16	0.050	0.075	0.050	0.059	0.050	0.087	0.050	0.30	0.050	0.94	0.050	0.26	0.050	0.31	0.050	0.27	0.050	0.17	0.050	0.14	0.050	0.17	0.05	0.55	0.05	0.44	0.05	0.37	0.05	0.13
Cadmium	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	2.0	73	2.0	58	2.0	42	2.0	37	2.0	67	2.0	58	2.0	44	2.0	42	2.0	44	2.0	40	2.0	39	2.0	55	2.0	58	2	41	2	39	2	63	2	50
Chromium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.0020	ND	0.0020	ND ^	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND
Fluoride	0.10	0.13	0.10	0.15	0.10	0.18	0.10	0.17	0.10	0.23	0.10	0.16	0.10	0.18	0.10	0.16	0.10	0.17	0.10	0.24	0.10	0.23	0.10	0.42	0.10	0.16	0.1	0.18	0.1	0.12	0.1	0.1	0.1	0.11
Iron	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Lead	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0043	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0028	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0054	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Mercury	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND F2	0.00020	ND	0.0002	ND	0.0002	0.00081	0.0002	ND	0.0002	ND
Nickel	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Nitrogen/Nitrate	0.10	2.2	0.10	1.5	0.10	4.4	0.10	4.1	0.10	2.6	0.10	0.27	0.10	4.3	0.10	3.6	0.10	4.9	0.10	5.7	0.10	5.2	0.10	6.4	0.10	4.6	0.1	6.6	0.1	4.4	0.1	5	0.1	3.8
Nitrogen/Nitrate, Nit	0.50	2.2	0.10	1.5	0.50	4.4	0.50	4.1	0.20	2.6	0.10	0.27	0.50	4.3	0.20	3.6	0.50	4.9	0.50	5.7	0.50	5.2	0.50	6.4	0.50	4.6	0.5	6.6	0.5	4.4	0.5	5	0.5	3.8
Nitrogen/Nitrite	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Perchlorate	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND ^
Selenium	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0037	0.0025	ND	0.0025	ND	0.0025	ND ^	0.0025	ND ^	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	20	51	10	36	20	54	10	43	10	50	20	55	20	66	10	57	10	59	10	51	10	55	10	58	10	40	20	69	20	57	20	42	20	58
Thallium	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Solids	10	440	10	350	10	410	10	470	10	450	10	650	10	510	10	460	10	500	10	620	10	480	10	500	10	470	10	440	10	660	10	500	10	530
Vanadium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	0.0016	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0053	0.0025	ND	0.0025	0.0038	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0011	0.0025	0.0014	0.0025	ND
pH	NA	7.15	NA	7.25	NA	7.25	NA	6.93	NA	7.39	NA	6.89	NA	7.07	NA	7.23	NA	6.95	NA	7.16	NA	7.22	NA	7.30	NA	7.41	NA	7.41	NA	6.69	NA	7.09	NA	6.70
Temperature	NA	18.25 *	NA	21.57	NA	17.15	NA	1.92	NA	14.01	NA	22.91	NA	13.85	NA	7.82	NA	14.70	NA	24.92	NA	18.68	NA	10.70	NA	9.68	NA	18.50	NA	13.54	NA	7.93	NA	15.57
Conductivity	NA	0.73	NA	0.71	NA	0.92	NA	0.44	NA	0.65	NA	1.01	NA	0.68	NA	0.57	NA	0.62	NA	0.74	NA	0.62	NA	0.59	NA	0.54	NA	0.67	NA	0.81	NA	0.48	NA	0.56
Dissolved Oxygen	NA	5.05	NA	0.94	NA	1.63	NA	9.99	NA	4.82	NA	2.51	NA	1.62	NA	3.74	NA	5.69	NA	1.53	NA	3.11	NA	6.64	NA	7.36	NA	0.86	NA	5.83	NA	9.54	NA	10.50
ORP	NA	-14.1	NA	21.5	NA	-3.6	NA	150.7	NA	53.6	NA	-15.3	NA	118.2	NA	47.3	NA	38.8	NA	10.1	NA	10.7	NA	21.7	NA	-46.6	NA	102.4	NA	83.2	NA	-4.8	NA	11.8

Parameter	8/8/2018 DL	Result	10/30/2018 DL	Result	2/25/2019 DL	Result	4/30/2019 DL	Result	8/27/2019 DL	Result	11/13/2019 DL	Result	2/24/2020 DL	Result	5/19/2020 DL	Result	8/10/2020 DL	Result	12/7/2020 DL	Result	2/23/2021 DL	Result	5/11/2021 DL	Result	8/24/2021 DL	Result	11/30/2021 DL	Result
Antimony	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	0.0086	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Barium	0.0025	0.053	0.0025	0.066	0.0025	0.045	0.0025	0.036	0.0025	0.056	0.0025	0.05	0.0025	0.042	0.0025	0.059	0.0025	0.057	0.0025	0.058	0.0025	0.046	0.0025	0.045	0.0025	0.055	0.0025	0.062
Beryllium	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND ^	0.001	ND	0.001	ND ^1+	0.001	ND ^+	0.001	ND ^+	0.001	ND	0.001	ND
Boron	0.05	0.13	0.05	0.17	0.05	0.057	0.05	0.061	0.05	0.53	0.05	0.53	0.05	0.24	0.5	2	0.25	0.82	0.05	0.53	0.05	0.34	0.05	0.17	0.05	0.24	0.05	0.29
Cadmium	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND ^	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	2	46	2	42	2	67	2	55	2	38	2	46	2	54	10	36	2	39	2	53	4	61	2	49	4	40	6	41
Chromium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.005	ND	0.005	0.0064 *	0.005	ND	0.005	ND	0.005	ND ^-	0.005	0.0051 *-
Fluoride	0.1	0.13	0.1	0.12	0.1	0.15	0.1	0.16	0.1	0.13	0.1	0.2	0.1	0.24	0.1	0.17	0.1	0.17	0.1	0.26	0.1	0.18	0.1	0.18 H	0.1	0.17	0.1	0.19
Iron	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	0.35	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Lead	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.0025	ND	0.0025	ND	0.0025	0.0059	0.0025	ND	0.0025	ND	0.0025	0.013	0.0025	0.0029	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.008	0.0025	ND	0.0025	ND	0.0025	ND
Mercury	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Nitrogen/Nitrate	0.1	5.2	0.1	3.4	0.1	4.6	0.1	3.8	0.1	5.1	0.1	5.7	0.1	4.5	0.1	2.4	0.1	1.3	0.1	8.4	0.1	5.5	0.1	3.3	0.1	3.3	0.1	4.1
Nitrogen/Nitrate, Nit	0.5	5.2	0.2	3.4	0.5	4.6	0.5	3.8	0.5	5.1	0.5	5.7 ^	0.5	4.5	0.5	2.4	0.1	1.3	0.5	8.4	0.5	5.5	0.5	3.3 F1	0.5	3.3	0.5	4.1
Nitrogen/Nitrite	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND ^1+	0.02	ND
Perchlorate	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0054	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0064
Silver	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	20	33	10	39	25	33	5	28	5	89	5	46	5	32	25	98 H	25	64	15	57 F1	10	41	10	38	10	54	5	29 ^+ ^-
Thallium	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Solids	10	370	10	530	10	470	10	410	10	580	10	380	10	410	10	500	30	440	10	420	10	430	10	380	10	490	10	440
Vanadium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	0.02	ND	0.02	ND	0.02	ND	0.02	ND ^	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.0005	0.00079	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	0.01089	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	6.80	NA	7.59	NA	7.32	NA	7.20	NA	7.15	NA	7.51	NA	7.19	NA	7.10	NA	6.86	NA	7.22	NA	7.52	NA	7.52	NA	7.19	NA	7.14
Temperature	NA	22.04	NA	17.91	NA	5.80	NA	6.10	NA	12.10	NA	16.07	NA	9.90	NA	10.00	NA	13.90	NA	11.90	NA	5.70	NA	8.00	NA	18.50	NA	17.80
Conductivity	NA	0.62	NA	0.68	NA	0.85	NA	0.47	NA	0.14	NA	0.69	NA	0.28	NA	0.76	NA	0.82	NA	0.86	NA	0.55	NA	0.77	NA	0.85	NA	0.76
Dissolved Oxygen	NA	5.17	NA	6.29	NA	9.35	NA	7.43	NA	3.51	NA	2.88	NA	4.50	NA	3.28	NA	5.33	NA	4.36	NA	8.66	NA	3.41	NA	1.57	NA	4.73
ORP	NA	64.2	NA	15.5	NA	66.1	NA	119.1	NA	110.7	NA	-48	NA	52.7	NA	73.9	NA	139.9	NA	-4.8	NA	37.3	NA	116	NA	224.2	NA	165.6

Notes: Standards obtained from IAC, Title 35, Chapter I, Part 620, Subpart D, Section 620.410 - Groundwater Quality Standards for Class I: Potable Resource Groundwater. All values are in mg/L (ppm) unless otherwise noted.
DL - Detection limit; NA - Not Applicable; ND - Not Detected; NM - Not Measured
NR - Not Required; NS - Not Sampled; H - Prepped/analyzed past hold time; V - Serial Dilution Exceeds Control Limits
F1 - MS and/or MSD Recovery outside of limits. F2 - MS/MSD RPD exceeds control limits. ^1+ - Initial Calibration Verification is outside acceptance limits, high biased. ^+ - Continuing Calibration Verification is outside acceptance limits, high biased
^ - Denotes instrument related QC exceeds the control limits. * - Median Value (for temp). * - LCS or LCSD is outside acceptance limits
Temperature °C degrees Celcius; Conductivity ms/cm^c millisiemens/centimeters; Dissolved Oxygen mg/L milligrams/liter; Oxygen Reduction Potential (ORP) mV millivolts

Sample: MW-02

Parameter	Standards	12/15/2010 DL	Result	3/25/2011 DL	Result	6/16/2011 DL	Result	9/19/2011 DL	Result	12/12/2011 DL	Result	3/19/2012 DL	Result	6/25/2012 DL	Result	9/18/2012 DL	Result	12/12/2012 DL	Result	2/27/2013 DL	Result	5/29/2013 DL	Result	7/29/2013 DL	Result	10/21/2013 DL	Result	3/5/2014 DL	Result
Antimony	0.006	NP	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.0050	ND	0.003	ND	0.0030	0.015	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.010	NP	0.0018	0.001	0.0015	0.001	0.0017	0.001	ND	0.001	ND	0.001	ND	0.001	0.0011	0.001	0.0012	0.0050	ND	0.001	0.0011	0.0010	0.0010	0.0010	ND	0.0010	ND	0.0010	ND
Barium	2.0	NP	0.042	0.001	0.025	0.001	0.053	0.001	0.059	0.001	0.066	0.001	0.049	0.001	0.064	0.001	0.06	0.040	0.075	0.001	0.035	0.0025	0.053	0.0025	0.078	0.0025	0.088	0.0025	0.046
Beryllium	0.004	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.0010	ND	0.001	ND	0.0010	ND ^	0.0010	ND	0.0010	ND	0.0010	ND
Boron	2.0	NP	0.38	0.01	0.23	0.01	0.35	0.01	0.83	0.01	0.69	0.01	0.27	0.01	0.74	0.01	0.65	0.40	0.8	0.01	0.29	0.050	0.21	0.050	1.4	0.050	2.7	0.050	0.28
Cadmium	0.005	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.0010	ND	0.001	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	200.0	NP	45	10	43	10	44	10	46	10	40	10	53	10	51	10	45	10	48	10	52	2.0	53	2.0	48	10	90	10	88
Chromium	0.1	NP	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.0030	0.0096	0.004	0.0042	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND^
Cobalt	1.0	NP	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.0030	ND	0.002	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.65	NP	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.010	ND	0.003	ND	0.0020	0.0021	0.0020	ND	0.0020	ND	0.0020	ND^
Cyanide	0.2	NP	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	4.0	NP	ND	0.25	0.30	0.25	0.35	0.25	ND	0.25	ND	0.25	ND	0.25	ND	0.25	ND	0.25	0.28	0.25	ND	0.10	0.32	0.10	0.19	0.10	0.17	0.10	0.19
Iron	5.0	NP	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	0.046	0.01	0.026	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Lead	0.0075	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.0050	ND	0.001	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.15	NP	ND	0.001	0.0012	0.001	0.0022	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	0.0019	0.0020	0.0063	0.001	ND	0.0025	ND	0.0025	0.0060	0.0025	0.0060	0.0025	ND
Mercury	0.002	NP	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.1	NP	0.0086	0.005	0.0096	0.005	0.0053	0.005	0.01	0.005	0.0073	0.005	ND	0.005	0.0065	0.005	0.0066	0.010	ND	0.005	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Nitrogen/Nitrate	10.0	NP	7.5	0.20	4.5	0.20	4.7	0.20	4.3	0.20	6.9	0.20	5.1	0.20	4.4	0.20	2.9	0.20	2.4	0.2	5.7	0.10	0.44	0.10	0.59	0.10	1.1	0.10	2.4
Nitrogen/Nitrate, Nit	NA	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.10	0.48	0.10	0.59	0.10	1.1	0.50	2.4
Nitrogen/Nitrite	NA	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.020	0.041	0.020	ND	0.020	ND	0.020	ND
Perchlorate	0.0049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND
Selenium	0.05	NP	0.0017	0.001	0.0032	0.001	0.0014	0.001	0.0032	0.001	0.0037	0.001	ND	0.001	0.0039	0.001	0.0016	0.0050	ND	0.001	0.0032	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.05	NP	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.010	ND	0.005	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	400.0	NP	52	10	42	10	53	10	70	10	69	10	55	10	73	10	69	10	95	10	53	20	96	25	140	50	190	10	53
Thallium	0.002	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.0010	ND	0.001	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Solic	1,200	NP	480	17	420	17	470	17	460	17	490	17	440	17	500	17	510	26	520	26	440	10	340	10	560	10	770	10	430
Vanadium	0.049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0080	ND	0.005	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Zinc	5.0	NP	ND	0.006	ND	0.006	ND	0.006	ND	0.006	ND	0.006	0.013	0.006	ND	0.006	ND	0.020	ND	0.006	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	0.005	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.005	ND	0.005	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
BETX	11.705	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.03	ND	0.03	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	6.5 - 9.0	NA	7.91	NA	7.78	NA	7.20	NA	7.52	NA	6.41	NA	7.92	NA	7.35	NA	7.32	NA	7.38	NA	7.53	NA	7.39	NA	7.03	NA	7.20	NA	8.21
Temperature	NA	NA	14.01	NA	3.26	NA	13.14	NA	14.75	NA	9.58	NA	9.56	NA	14.90	NA	17.12	NA	12.33	NA	13.30	NA	20.87	NA	17.02	NA	12.34	NA	6.67
Conductivity	NA	NA	0.96	NA	0.74	NA	0.75	NA	0.64	NA	0.59	NA	0.56	NA	0.66	NA	0.68	NA	0.68	NA	0.54	NA	0.56	NA	0.74	NA	0.80	NA	0.40
Dissolved Oxygen	NA	NA	NM	NA	7.73	NA	0.58	NA	0.28	NA	3.34	NA	3.91	NA	0.78	NA	0.53	NA	2.03	NA	10.89	NA	0.65	NA	0.47	NA	0.32	NA	7.92
ORP	NA	NA	NM	NA	124.5	NA	226.3	NA	-196	NA	63	NA	272	NA	168	NA	157	NA	200	NA	185.2	NA	-34.5	NA	33.9	NA	-180.3	NA	-53

Parameter	5/27/2014 DL	Result	8/25/2014 DL	Result	10/27/2014 DL	Result	2/25/2015 DL	Result	5/13/2015 DL	Result	8/17/2015 DL	Result	11/17/2015 DL	Result	2/23/2016 DL	Result	5/17/2016 DL	Result	8/16/2016 DL	Result	11/15/2016 DL	Result	2/14/2017 DL	Result	5/1/2017 DL	Result	8/23/2017 DL	Result	11/7/2017 DL	Result	3/6/2018 DL	Result	5/15/2018 DL	Result
Antimony	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	0.0015	0.0010	0.0016	0.0010	0.0017	0.0010	ND	0.0010	0.0013	0.0010	0.0010	0.0010	ND	0.0010	0.0015	0.0010	0.0013	0.0010	0.0012	0.001	0.0038	0.001	ND	0.001	ND	0.001	ND
Barium	0.0025	0.069	0.0025	0.071	0.0025	0.067	0.0025	0.051	0.0025	0.055	0.0025	0.072	0.0025	0.066	0.0025	0.058	0.0025	0.061	0.0025	0.050	0.0025	0.057	0.0025	0.046	0.0025	0.050	0.0025	0.062	0.0025	0.088	0.0025	0.058	0.0025	0.065
Beryllium	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND ^	0.0010	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Boron	0.050	0.38	0.050	1.1	0.050	0.078	0.050	0.082	0.050	0.11	0.050	0.41	0.050	0.50	0.050	0.24	0.050	0.30	0.050	0.32	0.050	0.15	0.050	0.16	0.050	0.21	0.25	1.3	0.05	2.8	0.25	0.39	0.05	0.18
Cadmium	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	10	91	2.0	58 ^	2.0	44	2.0	54	10	92	2.0	51	2.0	45	2.0	45	2.0	47	2.0	39	2.0	39	2.0	50	2.0	56	2	48	2	47	2	62	2	47
Chromium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.010	ND	0.010	0.024	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND
Fluoride	0.10	0.18	0.10	0.19	0.10	0.22	0.10	0.17	0.10	0.22	0.10	0.22	0.10	0.18	0.10	0.16	0.10	0.23	0.10	0.24	0.10	0.19	0.10	0.22	0.10	0.15	0.1	0.18	0.1	0.16	0.1	0.15	0.1	0.23
Iron	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Lead	0.00050	ND	0.00050	ND	0.00050	0.0013	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.015	0.0025	0.0027	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Mercury	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND F2	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Nitrogen/Nitrate	0.10	4.0	0.10	0.28	0.10	4.3	0.10	5.9	0.10	1.2	0.10	ND	0.10	3.2	0.10	2.9	0.10	4.1	0.10	2.7	0.10	4.5	0.10	4.1	0.10	0.78	0.1	1.6	0.1	1.8	0.1	4.1	0.1	3.6
Nitrogen/Nitrate, Nit	0.50	4.0	0.10	0.28	0.50	4.3	0.50	5.9	0.10	1.2	0.10	ND ^	0.20	3.2	0.20	2.9	0.50	4.1	0.50	2.7	0.50	4.5	0.50	4.1	0.10	0.78	0.1	1.6	0.1	1.8	0.5	4.1	0.2	3.6
Nitrogen/Nitrite	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND ^
Perchlorate	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.004	ND	0.004	ND F1	0.004	ND	0.004	ND
Selenium	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND ^	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	20	63	20	76	20	49	10	57	10	41	10	53	20	77	20	73	10	54	10	39	10	53	10	50	25	60	20	57	25	83	20	45	20	57
Thallium	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Solic	10	440	10	460	10	440	10	510	10	490	10	540	10	480	10	440	10	470	10	370	10	470	10	510	10	500	10	420	10	530	10	490	10	500
Vanadium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	0.001	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.00055	0.0025	0.0042	0.0025	ND	0.0025	0.00077	0.0025	0.00068	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.00066	0.0025	0.0015	0.0025	0.0007
pH	NA	7.19	NA	7.01	NA	7.37	NA	8.13	NA	7.86	NA	7.28	NA	7.12	NA	7.28	NA	7.33	NA	7.29	NA	7.50	NA	6.18	NA	7.99	NA	7.40	NA	7.10	NA	7.10	NA	7.71
Temperature	NA	15.72 *	NA	20.87	NA	17.43	NA	2.61	NA	12.12	NA	24.86	NA	13.93	NA	5.47	NA	11.12	NA	10.65	NA	11.20	NA	5.17	NA	10.37	NA	15.30	NA	12.19	NA	5.33	NA	14.74
Conductivity	NA	0.69	NA	0.76	NA	0.78	NA	0.49	NA	0.66	NA	0.86	NA	0.64	NA	0.47	NA	0.55	NA	0.56	NA	0.53	NA	0.50	NA	0.56	NA	0.64	NA	0.57	NA	0.45	NA	0.51
Dissolved Oxygen	NA	0.55	NA	0.46	NA	2.96	NA	11.55	NA	1.99	NA	1.52	NA	8.66	NA	4.93	NA	2.58	NA	1.89	NA	6.05	NA	5.00	NA	3.26	NA	0.79	NA	6.57	NA	10.49	NA	5.03
ORP	NA	72.5	NA	35.9	NA	60.1	NA	113.1	NA	87.3	NA	-37.7	NA	112.9	NA	36.9	NA	27.6	NA	-32.8	NA	13.2	NA	235.1	NA	-51.6	NA	45.5	NA	2.6	NA	19.4	NA	-6.7

Parameter	8/7/2018 DL	Result	10/30/2018 DL	Result	2/26/2019 DL	Result	4/30/2019 DL	Result	8/27/2019 DL	Result	11/12/2019 DL	Result	2/24/2020 DL	Result	5/19/2020 DL	Result	8/10/2020 DL	Result	12/9/2020 DL	Result	2/22/2021 DL	Result	5/11/2021 DL	Result	8/24/2021 DL	Result	11/30/2021 DL	Result
Antimony	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	0.0036	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.001	ND	0.001	ND	0.001	0.0012	0.001	0.0017	0.001	ND	0.001	0.0011	0.001	ND	0.001	0.0012	0.001	ND	0.001	ND	0.001	ND	0.001	0.001	0.001	ND	0.001	ND
Barium	0.0025	0.066	0.0025	0.068	0.0025	0.038	0.0025	0.046	0.0025	0.066	0.0025	0.066	0.0025	0.061	0.0025	0.057	0.0025	0.078	0.0025	0.071	0.0025	0.054	0.0025	0.057	0.0025	0.075	0.0025	0.066
Beryllium	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND ^	0.001	ND	0.001	ND ^1+	0.001	ND ^+	0.001	ND ^+	0.001	ND	0.001	ND
Boron	0.25	1.5	0.05	0.092	0.05	0.064	0.05	0.13	0.05	0.49	0.05	0.43	0.05	0.3	0.05	0.33	0.25	1.1	0.05	0.56	0.05	0.25	0.05	0.19	0.05	0.56	0.05	0.17
Cadmium	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND ^	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	2	55	2	42	2	51	2	51	2	49	2	46	2	55	10	47	2	42	2	43	4	44	2	50	4	47	6	42
Chromium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND ^-	0.005	ND *-
Fluoride	0.1	0.14	0.1	0.17	0.1	0.16	0.1	0.18	0.1	0.17	0.1	0.19	0.1	0.23	0.1	0.2	0.1	0.22	0.1	0.15	0.1	0.15	0.1	0.18 H	0.1	0.17	0.1	0.14
Iron	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Lead	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND F1	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Mercury	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Nitrogen/Nitrate	0.1	1.7	0.1	3.4	0.1	3.7	0.1	1.2	0.1	0.71	0.1	2.4	0.1	2.1	0.1	4.1	0.1	6.3	0.1	9.5	0.1	7.9	0.1	3.4	0.1	7.3	0.1	4.5
Nitrogen/Nitrate, Nit	0.1	1.7	0.2	3.4	0.5	3.7	0.1	1.2	0.1	0.71	0.5	2.4	0.5	2.1	0.5	4.1	1	6.3	0.5	9.5	0.5	7.9	0.5	3.4	0.5	7.3	0.5	4.5
Nitrogen/Nitrite	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND ^1+	0.02	ND	0.02	ND ^1+	0.02	ND
Perchlorate	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND F2	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	20	66	10	33	1	24	5	30	5	38	5	43	5	39	5	37 H	25	68	15	65	15	51	10	39	10	54	5	36 ^+ ^-
Thallium	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND F1	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Solic	10	560	10	480	10	400	10	440	10	420	10	420	10	380	10	390	30	450	10	340	10	540	10	300	10	410	10	420
Vanadium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	0.02	ND	0.02	ND	0.02	ND	0.02	ND ^	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	0.00062	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	7.09	NA	7.83	NA	7.82	NA	7.60	NA	7.13	NA	7.66	NA	7.43	NA	7.33	NA	6.96	NA	7.78	NA	7.65	NA	7.70	NA	7.31	NA	7.39
Temperature	NA	19.91	NA	12.91	NA	1.60	NA	4.90	NA	15.20	NA	13.75	NA	6.80	NA	10.10	NA	17.90	NA	9.50	NA	2.40	NA	12.30	NA	18.30	NA	12.70
Conductivity	NA	0.63	NA	0.57	NA	0.70	NA	0.48	NA	0.13	NA	0.71	NA	0.33	NA	0.64	NA	0.84	NA	0.84	NA	0.50	NA	0.76	NA	0.85	NA	0.78
Dissolved Oxygen	NA	5.17	NA	8.30	NA	8.28	NA	4.19	NA	0.45	NA	0.61	NA	1.11	NA	0.55	NA	1.03	NA	5.30	NA	11.49	NA	0.68	NA	0.62	NA	5.75
ORP	NA	39.7	NA	16.6	NA	91.4	NA	116.0	NA	108.7	NA	-65.1	NA	44.5	NA	60.2	NA	135.3	NA	168.3	NA	140.7	NA	132.7	NA	185.8	NA	106.4

Notes: Standards obtained from IAC, Title 35, Chapter I, Part 620, Subpart D, Section 620.410 - Groundwater Quality Standards for Class I: Potable Resource Groundwater. All values are in mg/L (ppm) unless otherwise noted.
DL - Detection limit; NA - Not Applicable; ND - Not Detected; NM - Not Measured
NR - Not Required; NS - Not Sampled; H - Prepped/analyzed past hold time; V - Serial Dilution Exceeds Control Limits
F1 - MS and/or MSD Recovery outside of limits. F2 - MS/MSD RPD exceeds control limits. ^1+ - Initial Calibration Verification is outside acceptance limits, high biased. ^+ - Continuing Calibration Verification is outside acceptance limits, high biased
^ - Denotes instrument related QC exceeds the control limits. * - Median Value (for temp). * - LCS or LCSD is outside acceptance limits
Temperature °C degrees Celcius; Conductivity ms/cm^c millisiemens/centimeters; Dissolved Oxygen mg/L milligrams/liter; Oxygen Reduction Potential (ORP) mV millivolts

Sample: MW-03

Parameter	Standards	12/15/2010 DL	Result	3/25/2011 DL	Result	6/16/2011 DL	Result	9/19/2011 DL	Result	12/12/2011 DL	Result	3/19/2012 DL	Result	6/25/2012 DL	Result	9/18/2012 DL	Result	12/12/2012 DL	Result	2/27/2013 DL	Result	5/29/2013 DL	Result	7/31/2013 DL	Result	10/21/2013 DL	Result	3/5/2014 DL	Result
Antimony	0.006	NP	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.0050	ND	0.003	ND	0.0030	0.0057	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic through ORP	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Notes: Standards obtained from IAC, Title 35, Chapter I, Part 620, Subpart D, Section 620.410 - Groundwater Quality Standards for Class I: Potable Resource Groundwater. All values are in mg/L (ppm) unless otherwise noted.

Attachment 9-4. Table. CCA Groundwater Analytical Results - Midwest Generation LLC, Powerton Station, Pekin, IL.

Sample: MW-04	Date	12/15/2010		3/25/2011		6/16/2011		9/19/2011		12/12/2011		3/19/2012	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	NP	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.010	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Barium	2.0	NP	0.055	0.001	0.052	0.001	0.058	0.001	0.041	0.001	0.048	0.001	0.043
Beryllium	0.004	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Boron	2.0	NP	0.77	0.01	0.83	0.01	0.33	0.01	0.84	0.01	0.79	0.01	0.78
Cadmium	0.005	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Chloride	200.0	NP	150	10	77	10	43	25	86	1.0	8.1	10	58
Chromium	0.1	NP	0.0045	0.004	ND	0.004	ND	0.004	0.0044	0.004	ND	0.004	ND
Cobalt	1.0	NP	ND	0.002	0.0026	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Copper	0.65	NP	ND	0.003	ND	0.003	ND	0.003	0.0033	0.003	0.01	0.003	ND
Cyanide	0.2	NP	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Fluoride	4.0	NP	0.3	0.25	0.39	0.25	0.43	0.25	0.31	0.25	ND	0.25	ND
Iron	5.0	NP	ND	0.010	0.017	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Lead	0.0075	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Manganese	0.15	NP	0.77	0.001	0.68	0.001	0.41	0.001	0.69	0.001	0.35	0.001	0.089
Mercury	0.002	NP	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.1	NP	0.012	0.005	0.012	0.005	0.0067	0.005	0.011	0.005	0.01	0.005	0.0055
Nitrogen/Nitrate	10.0	NP	0.34	0.02	0.73	0.20	2.7	0.02	0.06	0.02	0.07	0.02	0.65
Nitrogen/Nitrate, Nit	NA	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Nitrogen/Nitrite	NA	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Perchlorate	0.0049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Selenium	0.05	NP	0.0022	0.001	0.0037	0.001	0.0022	0.001	0.0039	0.001	0.002	0.001	0.0085
Silver	0.05	NP	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Sulfate	400.0	NP	110	25	140	10	48	25	61	1.0	6.7	50	160
Thallium	0.002	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Total Dissolved Solids	1,200	NP	680	17	620	17	470	17	580	17	520	17	660
Vanadium	0.049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Zinc	5.0	NP	ND	0.006	ND	0.006	ND	0.006	ND	0.006	ND	0.006	ND
Benzene	0.005	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
BETX	11.705	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
pH	6.5 - 9.0	NA	7.27	NA	7.48	NA	7.26	NA	7.22	NA	6.37	NA	7.24
Temperature	NA	NA	16.30	NA	13.33	NA	17.54	NA	19.07	NA	16.35	NA	12.99
Conductivity	NA	NA	1.29	NA	1.06	NA	0.75	NA	0.91	NA	0.76	NA	0.76
Dissolved Oxygen	NA	NA	NM	NA	3.93	NA	0.26	NA	0.18	NA	0.20	NA	1.43
ORP	NA	NA	NM	NA	116.5	NA	202.6	NA	-228	NA	51	NA	212

Sample: MW-04	6/25/2012		9/18/2012		12/12/2012		2/27/2013		5/29/2013		7/31/2013		10/21/2013		3/5/2014		5/27/2014		8/25/2014		10/27/2014		2/25/2015		5/13/2015		8/17/2015		11/17/2015		2/23/2016		5/17/2016	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.003	ND	0.003	ND	0.0050	ND	0.003	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.001	ND	0.001	0.0012	0.0050	ND	0.001	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Barium	0.001	0.04	0.001	0.07	0.040	0.09	0.001	0.054	0.0025	0.030	0.0025	0.048	0.0025	0.062	0.0025	0.039	0.0025	0.054	0.0025	0.055	0.0025	0.070	0.0025	0.025	0.0025	0.025	0.0025	0.027	0.0025	0.030	0.0025	0.028	0.0025	0.037
Beryllium	0.001	ND	0.001	ND	0.0010	ND	0.001	ND	0.0010	ND ^	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Boron	0.01	0.83	0.01	0.76	0.40	0.74	0.01	0.97	0.050	0.23	0.050	0.67	0.050	0.81	0.050	0.81	0.050	0.94	0.050	1.0	0.050	0.77	0.050	0.94	0.050	0.80	0.050	0.44	0.050	0.51	0.050	0.43	0.050	0.60
Cadmium	0.001	ND	0.001	ND	0.0010	ND	0.001	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	10	75	25	110	25	130	10	90	2.0	54	2.0	70	10	150	10	130	10	92	10	95	10	96	10	74	2.0	65	2.0	47	2.0	74	2.0	47	2.0	60
Chromium	0.004	ND	0.004	0.0045	0.0030	0.01	0.004	0.0052	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND^	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	0.002	ND	0.002	ND	0.0030	ND	0.002	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.003	ND	0.003	ND	0.010	ND	0.003	ND	0.0020	ND	0.0020	0.0024	0.0020	0.0025	0.0020	ND^	0.0020	ND	0.0020	0.0021	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	0.0021	0.0020	ND	0.0020	ND
Cyanide	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	0.25	ND	0.25	0.26	0.25	0.29	0.25	ND	0.10	0.39	0.10	0.31	0.10	0.21	0.10	0.29	0.10	0.23	0.10	0.25	0.10	0.21	0.10	0.32	0.10	0.26	0.10	0.30	0.10	0.26	0.10	0.22	0.10	0.25
Iron	0.010	ND	0.010	ND	0.010	0.14	0.01	0.059	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Lead	0.001	ND	0.001	ND	0.0050	ND	0.001	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.001	0.26	0.001	0.50	0.0020	0.027	0.001	0.007	0.0025	ND	0.0025	0.13	0.0025	0.27	0.0025	0.026	0.0025	0.029	0.0025	0.24	0.0025	0.075	0.0025	0.018	0.0025	ND	0.0025	0.015	0.0025	0.14	0.0025	ND	0.0025	0.0041
Mercury	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.005	0.0074	0.005	0.0095	0.010	ND	0.005	ND	0.0020	ND	0.0020	0.0023	0.0020	0.0039	0.0020	ND	0.0020	ND	0.0020	0.0024	0.0020	0.0020	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	0.0021	0.0020	ND
Nitrogen/Nitrate	0.02	1.1	0.02	0.46	0.02	1.0	0.02	1.8	0.10	ND	0.10	ND	0.10	0.50	0.10	ND	0.10	ND	0.10	ND	0.10	0.14	0.10	0.30	0.10	ND	0.10	ND	0.10	0.85	0.10	0.45	0.10	ND
Nitrogen/Nitrate, Nit	NR	NR	NR	NR	NR	NR	NR	NR	0.10	ND	0.10	ND	0.10	0.50	0.10	ND	0.10	ND	0.10	ND	0.10	0.14	0.10	0.30	0.10	ND	0.10	ND ^	0.10	0.85	0.10	0.45	0.10	ND
Nitrogen/Nitrite	NR	NR	NR	NR	NR	NR	NR	NR	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Perchlorate	NR	NR	NR	NR	NR	NR	NR	NR	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND
Selenium	0.001	0.0035	0.001	0.0032	0.0050	ND	0.001	0.013	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0033	0.0025	ND
Silver	0.005	ND	0.005	ND	0.010	ND	0.005	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	10	94	25	170	25	150	50	130	20	92	50	190	100	260	50	200	100	320	50	260	100	390	25	100	20	120	10	47	25	75	20	74	20	65
Thallium	0.001	ND	0.001	ND	0.0010	ND	0.001	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Solids	17	600	17	800	26	720	26	640	10	350	10	670	10	980	10	780	10	980	10	880	10	1100	10	580	10	540	10	470	10	550	10	420	10	480
Vanadium	NR	NR	NR	NR	0.0080	ND	0.005	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Zinc	0.006	ND	0.006	ND	0.020	ND	0.006	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	NR	NR	NR	NR	0.005	ND	0.005	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	0.0017	0.00050	ND	0.00050	ND
BETX	NR	NR	NR	NR	0.03	ND	0.03	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0056	0.0025	0.00069	0.0025	0.0013
pH	NA	7.04	NA	7.13	NA	7.14	NA	7.37	NA	7.30	NA	7.02	NA	7.00	NA	8.00	NA	7.04	NA	7.06	NA	7.20	NA	7.63	NA	7.30	NA	7.37	NA	6.72	NA	7.28	NA	7.09
Temperature	NA	18.12	NA	16.51	NA	14.11	NA	13.20	NA	21.84	NA	26.31	NA	16.83	NA	11.96	NA	17.48 *	NA	24.18	NA	20.48	NA	8.95	NA	13.52	NA	24.79	NA	16.54	NA	6.06	NA	14.14
Conductivity	NA	0.83	NA	1.05	NA	0.98	NA	0.92	NA	0.58	NA	1.08	NA	1.15	NA	0.81	NA	1.20	NA	1.36	NA	1.62	NA	0.72	NA	0.73	NA	0.79	NA	0.77	NA	0.48	NA	0.67
Dissolved Oxygen	NA	0.33	NA	0.46	NA	4.01	NA	5.93	NA	0.47	NA	0.24	NA	0.53	NA	1.63	NA	2.01	NA	1.23	NA	0.83	NA	1.97	NA	3.05	NA	1.31	NA	6.90	NA	9.71	NA	0.94
ORP	NA	124	NA	119	NA	130	NA	170.3	NA	-90.1	NA	4.1	NA	-169.7	NA	-57	NA	13.7	NA	53.5	NA	22.9	NA	22.5	NA	72.4	NA	-32.1	NA	88.4	NA	43.8	NA	43.3

Sample: MW-04	8/16/2016		11/15/2016		2/14/2017		5/1/2017		8/28/2017		11/7/2017		3/6/2018		5/15/2018		8/7/2018		10/30/2018		2/26/2019		4/30/2019		8/26/2019		11/12/2019		2/24/2020		4/28/2020		8/10/2020		12/9/2020		2/22/2021		5/11/2021		8/24/2021		11/30/2021	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.0010	ND	0.0010	ND	0.0010	ND ^	0.0010	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND ^	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Barium	0.0025	0.035	0.0025	0.026	0.0025	0.022	0.0025	0.029	0.0025	0.026	0.0025	0.046	0.0025	0.057	0.0025	0.033	0.0025	0.03	0.0025	0.048	0.0025	0.025	0.0025	0.024	0.0025	0.034	0.0025	0.028	0.0025	0.024	0.0025	0.024	0.0025	0.03	0.0025	0.033	0.0025	0.032	0.0025	0.024	0.0025	0.025	0.0025	0.036
Beryllium	0.0010	ND	0.0010	ND	0.0010	ND ^	0.0010	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND ^1+	0.001	ND ^+	0.001	ND ^+	0.001	ND	0.001	ND
Boron	0.050	0.90	0.10	0.79	0.050	0.48	0.050	0.55	0.05	0.69	0.05	0.51	0.05	0.099	0.05	0.63	0.05	0.74	0.05	0.53	0.05	0.35	0.05	0.37	0.05	0.58	0.05	0.25	0.05	0.32	0.05	0.52	0.05	0.69	0.05	0.5	0.05	0.47	0.05	0.56	0.05	0.67	0.05	0.43
Cadmium	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	2.0	59	2.0	53	2.0	56	2.0	58	10	77	10	93	10	81	2	68	2	69	10	86	2	55	2	47	2	58	2	53	2	51	2	50	2	56	10	88	6	62	4	44	4	48	6	57
Chromium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.0020	0.0020	0.0020	ND	0.0020	ND	0.0020	ND	0.002	ND	0.002	ND	0.002	0.0023	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.01	ND H	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND ^-	0.005	0.0051 *-
Fluoride	0.10	0.28	0.10	0.27	0.10	0.25	0.10	0.19	0.1	0.29	0.1	0.21	0.1	0.26	0.1	0.27	0.1	0.33	0.1	0.24	0.1	0.26	0.1	0.25	0.1	0.24	0.1	0.27	0.1	0.22	0.1	0.25	0.1	0.25	0.1	0.32	0.1	0.31	0.1	0.30 H	0.1	0.34	0.1	0.25
Iron	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Lead	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.0025	0.025	0.0025	0.22	0.0025	0.19	0.0025	ND	0.0025	0.46	0.0025	0.025	0.0025	ND	0.0025	ND	0.0025	0.054	0.0025	0.013	0.0025	0.033	0.0025	ND	0.0025	0.086	0.0025	0.1	0.0025	0.041	0.0025	0.0098	0.0025	0.024	0.0025	0.22	0.0025	0.059	0.0025	0.0036	0.0025	0.075	0.0025	0.034
Mercury	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.0002	0.0002	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.002	0.0029	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	0.0022	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Nitrogen/Nitrate	0.10	1.3	0.10	ND	0.10	0.64	0.10	0.38	0.1	ND	0.1	1.5	0.1	4.2	0.1	ND	0.1	ND	0.1	0.44	0.1	0.18	0.1	ND	0.1	ND	0.1	ND	0.1	0.1	0.1	ND	0.1	ND	0.1	0.23	0.1	0.36	0.1	ND	0.1	0.64	0.1	ND
Nitrogen/Nitrate, Nit	0.10	1.3	0.10	ND	0.10	0.64	0.10	0.38	0.1	ND	0.1	1.5	0.5	4.2	0.1	ND	0.1	ND	0.1	0.44	0.1	0.18	0.1	ND	0.1	ND	0.1	ND	0.1	0.1	0.1	ND	0.1	ND	0.1	0.23	0.1	0.36	0.1	ND	0.1	0.64	0.1	ND
Nitrogen/Nitrite	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND ^	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND ^1+	0.02	ND	0.02	ND ^1+	0.02	ND
Perchlorate	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.0025	ND	0.0025	ND ^	0.0025	0.0049	0.0025	0.0026	0.0025	ND	0.0025	0.0071	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND ^	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	20	61	10	30	20	68	25	67	25	80	50	120	10	50	25	100	20	50	50	100	50	59	5	36	5	15	5	66	5	71	5	54 ^	5	23	15	97	15	86	15	80	5	14	15	62 ^+ ^-
Thallium	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Solids	10	590	10	510	10	510	10	540	10	640	10	700	10	410	10	650	10	460	10	710	10	450	10	380	10	520	10	440	10	390	10	380	30	420	10	530	10	560	10	430	10	290	10	560
Vanadium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND ^	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND ^	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND ^	0.02	0.035	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.00722	0.0025	0.0015	0.0025	0.00097	0.0025	0.004	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	7.07	NA	7.12	NA	7.21	NA	7.34	NA	7.13	NA	6.80	NA	7.19	NA	7.63	NA	6.72	NA	7.55	NA	7.18	NA	7.08	NA	7.08	NA	7.78	NA	7.05	NA	7.03	NA	6.92	NA	7.10	NA	7.23	NA	7.22	NA	7.12	NA	6.95
Temperature	NA	21.42	NA	17.30	NA	12.11	NA	12.10	NA	20.80	NA	13.71	NA	7.31	NA	15.20	NA	21.89	NA	17.42	NA	8.90	NA	11.70	NA	25.10	NA	18.93	NA	6.70	NA	12.50	NA	23.60	NA	16.60	NA	13.20	NA	13.50	NA	23.10	NA	15.50
Conductivity	NA	0.77	NA	0.68	NA	0.64	NA	0.61	NA	0.80	NA	0.71	NA	0.43	NA	0.56	NA	0.75	NA	0.85	NA	0.83	NA	0.44	NA	0.91	NA	0.72	NA	0.65	NA	0.23	NA	0.77	NA	0.19	NA	0.73	NA	0.72	NA	0.76	NA	0.95
Dissolved Oxygen	NA	2.20	NA	2.26	NA	2.91	NA	5.49	NA	0.42	NA	5.10	NA	2.30	NA	8.73	NA	2.47	NA	1.28	NA	1.00	NA	2.32	NA	3.98	NA	6.90	NA	2.92	NA	2.51	NA	5.96	NA	1.92	NA	4.10	NA	3.07	NA	1.74	NA	0.76
ORP	NA	-95.2	NA	-43.9	NA	57.7	NA	-4.5	NA	196.4	NA	-5.5	NA	-10.1	NA	5.0	NA	51.2	NA	-7.4	NA	107.7	NA	117.8	NA	15.9	NA	-56.0	NA	138.9	NA	62.1	NA	111.5	NA	60.5	NA	143.4	NA	136.2	NA	170.5	NA	73.7

Notes: Standards obtained from IAC, Title 35, Chapter I, Part 620, Subpart D, Section 620.410 - Groundwater Quality Standards for Class I: Potable Resource Groundwater
All values are in mg/L (ppm) unless otherwise noted.
DL - Detection limit
NA - Not Applicable
ND - Not Detected
NM - Not Measured
NR - Not Required
NS - Not Sampled
H - Prepped/analyzed past hold time
V - Serial Dilution Exceeds Control Limits
F1- MS and/or MSD Recovery outside of limits.
F2- MS/MSD RPD exceeds control limits.
^1+ - Initial Calibration Verification is outside acceptance limits, high biased
^+ - Continuing Calibration Verification is outside acceptance limits, high biased
^ - Denotes instrument related QC exceeds the control limits
* - Median Value (for temp)
*- LCS or LCSD is outside acceptance limits
Temperature °C degrees Celcius
Conductivity ms/cm² millisiemens/centimeters
Dissolved Oxygen mg/L milligrams/liter
Oxygen Reduction Potential (ORP) mV millivolts

Sample: MW-05	Date	12/15/2010		3/25/2011		6/16/2011		9/19/2011		12/12/2011		3/19/2012		6/25/2012		9/18/2012		12/12/2012		2/27/2013		5/29/2013		7/31/2013		10/21/2013		3/5/2014		5/27/2014		8/25/2014		10/27/2014		2/25/2015		5/13/2015		8/17/2015		11/17/2015		2/23/2016		5/17/2016	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	NP	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.0050	ND	0.003	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.010	NP	0.0011	0.001	ND	0.001	ND	0.001	ND	0.001	0.001	0.001	ND	0.001	ND	0.001	ND	0.0050	ND	0.001	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Barium	2.0	NP	0.053	0.001	0.048	0.001	0.046	0.001	0.071	0.001	0.065	0.001	0.054	0.001	0.058	0.001	0.066	0.040	0.077	0.001	0.061	0.0025	0.089	0.0025	0.092	0.0025	0.088	0.0025	0.059	0.0025	0.052	0.0025	0.069	0.0025	ND	0.0025	0.041	0.0025	0.055	0.0025	0.073	0.0025	0.060	0.0025	0.043	0.0025	0.051
Beryllium	0.004	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.0010	ND	0.001	ND	0.0010	ND ^	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Boron	2.0	NP	0.95	0.01	0.93	0.01	0.79	0.01	0.79	0.01	0.77	0.01	0.82	0.01	0.74	0.01	0.65	0.40	0.66	0.01	0.66	0.050	0.70	0.050	0.64	0.050	0.83	0.050	0.70	0.050	0.76	0.050	0.71	0.050	ND	0.050	1.1	0.050	0.72	0.050	1.3	0.050	0.74	0.050	0.59	0.050	0.63
Cadmium	0.005	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.0010	ND	0.001	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	0.00050	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	200.0	NP	150	25	120	10	89	25	160	25	140	10	82	50	100	50	150	25	170	50	110	10	92	10	150	10	170	10	120	10	80	10	140	10	120	10	79	10	120	2.0	60	10	110	2.0	54	10	88
Chromium	0.1	NP	0.0044	0.004	0.0042	0.004	ND	0.004	0.0066	0.004	ND	0.004	ND	0.004	ND	0.004	0.0058	0.0030	0.0049	0.004	0.0053	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND^	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	1.0	NP	0.0025	0.002	0.0023	0.002	ND	0.002	0.0027	0.002	0.0022	0.002	ND	0.002	ND	0.002	0.002	0.0030	ND	0.002	ND	0.0010	0.0022	0.0010	0.0015	0.0010	0.0015	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.65	NP	ND	0.003	ND	0.003	ND	0.003	0.0036	0.003	0.0061	0.003	ND	0.003	0.0031	0.003	ND	0.010	ND	0.003	ND	0.0020	ND	0.0020	ND	0.0020	0.0027	0.0020	ND^	0.0020	ND	0.0020	0.0023	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.2	NP	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	4.0	NP	0.27	0.25	0.36	0.25	0.43	0.25	0.25	0.25	ND	0.25	ND	0.25	ND	0.25	0.32	0.25	0.32	0.25	ND	0.10	0.23	0.10	0.24	0.10	0.24	0.10	0.35	0.10	0.29	0.10	0.32	0.10	0.28	0.10	0.38	0.10	0.37	0.10	0.26	0.10	0.27	0.10	0.27	0.10	0.35
Iron	5.0	NP	0.13	0.010	0.050	0.010	0.046	0.010	0.082	0.010	0.036	0.010	ND	0.010	ND	0.010	ND	0.010	0.43	0.01	0.052	0.10	0.20	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Lead	0.0075	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.0050	ND	0.001	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.15	NP	0.51	0.001	0.49	0.001	0.48	0.001	0.64	0.001	0.50	0.001	0.26	0.001	0.41	0.001	1.00	0.040	0.59	0.001	0.21	0.0025	0.67	0.0025	0.29	0.0025	0.62	0.0025	0.077	0.0025	0.043	0.0025	0.016	0.0025	ND	0.0025	0.058	0.0025	0.0078	0.0025	0.13	0.0025	0.084	0.0025	0.044	0.0025	0.039
Mercury	0.002	NP	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.1	NP	0.014	0.005	0.013	0.005	0.0077	0.005	0.014	0.005	0.014	0.005	0.008	0.005	0.0095	0.005	0.013	0.010	ND	0.005	0.009	0.0020	0.0055	0.0020	0.0059	0.0020	0.0068	0.0020	0.0038	0.0020	0.0036	0.0020	0.0041	0.0020	ND	0.0020	0.0025	0.0020	0.0023	0.0020	0.0051	0.0020	0.0027	0.0020	0.0032	0.0020	0.0027
Nitrogen/Nitrate	10.0	NP	ND	0.02	ND	0.02	0.08	0.02	ND	0.02	ND	0.02	1.6	0.02	0.04	0.02	0.04	0.02	0.04	0.02	0.19	0.10	ND	0.10	ND	0.10	0.34	0.10	0.74	0.10	2.2	0.10	0.11	0.10	0.20	0.10	0.74	0.10	ND	0.10	ND	0.10	ND	0.10	0.27	0.10	ND
Nitrogen/Nitrate, Nit	NA	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.10	ND	0.10	ND	0.10	0.34	0.10	0.77	0.50	2.2	0.10	0.11	0.10	0.20	0.10	0.74	0.10	ND	0.10	ND ^	0.10	ND	0.10	0.27	0.10	ND
Nitrogen/Nitrite	NA	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.020	ND	0.020	ND	0.020	ND	0.020	0.033	0.020	0.026	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Perchlorate	0.0049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND
Selenium	0.05	NP	0.0019	0.001	0.003	0.001	ND	0.001	0.0045	0.001	0.0023	0.001	0.0028	0.001	0.0033	0.001	0.0031	0.0050	ND	0.001	0.0029	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0028	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.05	NP	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.010	ND	0.005	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	400.0	NP	160	25	170	25	110	25	250	25	170	25	120	50	130	50	200	25	200	50	180	100	310	100	290	100	260	50	180	50	150	50	200	50	310	20	110	50	150	50	250	50	180	25	130	25	140
Thallium	0.002	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.0010	ND	0.001	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Solids	1,200	NP	740	17	680	17	640	17	890	17	820	17	590	17	700	17	890	26	840	26	790	10	990	10	1000	10	1100	10	840	10	640	10	870	10	910	10	570	10	730	10	860	10	810	10	550	10	690
Vanadium	0.049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0080	ND	0.005	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Zinc	5.0	NP	ND	0.006	ND	0.006	ND	0.006	ND	0.006	ND	0.006	ND	0.006	ND	0.006	ND	0.020	ND	0.006	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	0.005	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.005	ND	0.005	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	0.00068	0.00050	ND	0.00050	ND
BETX	11.705	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.03	ND	0.03	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.00278	0.0025	ND	0.0025	0.0011
pH	6.5 - 9.0	NA	7.24	NA	7.36	NA	7.29	NA	7.05	NA	6.34	NA	7.14	NA	7.00	NA	6.94	NA	6.94	NA	8.01	NA	6.87	NA	6.82	NA	6.89	NA	7.69	NA	7.01	NA	6.86	NA	7.30	NA	7.52	NA	7.26	NA	7.35	NA	6.65	NA	7.18	NA	7.08
Temperature	NA	NA	14.80	NA	14.35	NA	15.83	NA	15.80	NA	15.64	NA	17.03	NA	16.99	NA	16.03	NA	14.38	NA	14.50	NA	16.36	NA	17.75	NA	14.79	NA	12.62	NA	20.54	NA	21.14	NA	21.18	NA	5.51	NA	17.46	NA	25.42	NA	15.07	NA	11.30	NA	13.85
Conductivity	NA	NA	1.33	NA	1.16	NA	1.00	NA	1.21	NA	1.10	NA	0.85	NA	0.94	NA	1.19	NA	1.17	NA	1.17	NA	1.14	NA	1.25	NA	1.33	NA	0.28	NA	1.01	NA	1.28	NA	1.38	NA	0.69	NA	1.06	NA	1.32	NA	1.06	NA	0.75	NA	0.83
Dissolved Oxygen	NA	NA	NM	NA	3.95	NA	0.07	NA	0.06	NA	0.06	NA	0.05	NA	0.07	NA	0.01	NA	0.46	NA	0.40	NA	0.28	NA	0.36	NA	0.32	NA	1.17	NA	0.53	NA	1.01	NA	2.20	NA	2.50	NA	1.54	NA	2.24	NA	1.32	NA	1.99	NA	2.58
ORP	NA	NA	NM	NA	110.1	NA	70.5	NA	-274	NA	-26	NA	237	NA	128	NA	152	NA	30	NA	99.2	NA	-50.9	NA	55.5	NA	-197	NA	-51	NA	-59.6	NA	64.8	NA	6.8	NA	9.8	NA	23.5	NA	-27.7	NA	-4.8	NA	-103.8	NA	-65.0

Sample: MW-05	8/16/2016		11/15/2016		2/14/2017		5/1/2017		8/28/2017		11/7/2017		3/6/2018		5/15/2018		8/7/2018		10/30/2018		2/26/2019		4/30/2019		8/26/2019		11/12/2019		2/24/2020		4/28/2020		8/10/2020		12/9/2020		2/22/2021		5/11/2021		8/24/2021		11/30/2021	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.0010	ND	0.0010	ND	0.0010	ND ^	0.0010	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND ^	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Barium	0.0025	0.055	0.0025	0.051	0.0025	0.052	0.0025	0.055	0.0025	0.063	0.0025	0.057	0.0025	0.072	0.0025	0.057	0.0025	0.051	0.0025	0.07	0.0025	0.054	0.0025	0.041	0.0025	0.053	0.0025	0.049	0.0025	0.055	0.0025	0.05	0.0025	0.059	0.0025	0.048	0.0025	0.045	0.0025	0.039	0.0025	0.041	0.0025	0.048
Beryllium	0.0010	ND	0.0010	ND	0.0010	ND ^	0.0010	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND ^1+	0.001	ND ^+	0.001	ND ^+	0.001	ND	0.001	ND
Boron	0.050	0.66	0.10	0.83	0.050	0.59	0.050	0.68	0.05	0.57	0.05	0.45	0.05	0.34	0.05	0.56	0.05	0.45	0.05	0.5	0.05	0.56	0.05	0.6	0.05	0.47	0.05	0.56	0.05	0.52	0.05	0.48	0.05	0.68	0.05	0.46	0.05	0.53	0.05	0.48	0.05	0.51	0.05	0.58
Cadmium	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	0.00053	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	10	100	2.0	66	10	98	10	92	10	120	10	110	10	110	10	90	10	120	10	120	10	87	2	74	10	78	2	72	2	80	2	56	2	70	10	80	6	70	4	53	4	64	6	67
Chromium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.002	ND	0.002	ND	0.002	0.0022	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	0.0039	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.01	ND H	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.005	ND	0.005	ND	0.005	0.0069	0.005	ND	0.005	ND ^-	0.005	ND *-
Fluoride	0.10	0.30	0.10	0.25	0.10	0.27	0.10	0.27	0.1	0.33	0.1	0.32	0.1	0.21	0.1	0.29	0.1	0.33	0.1	0.29	0.1	0.34	0.1	0.37	0.1	0.29	0.1	0.35	0.1	0.39	0.1	0.37	0.1	0.26	0.1	0.31	0.1	0.33	0.1	0.34 H	0.1	0.31	0.1	0.31
Iron	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND ^	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Lead	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.0025	0.015	0.0025	0.0040	0.0025	0.0068	0.0025	0.024	0.0025	0.032	0.0025	ND	0.0025	0.77	0.0025	0.015	0.0025	0.12	0.0025	ND	0.0025	0.0076	0.0025	0.039	0.0025	0.037	0.0025	0.053	0.0025	0.028	0.0025	0.03	0.0025	0.042	0.0025	0.04	0.0025	0.0084	0.0025	0.018	0.0025	0.031	0.0025	ND
Mercury	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.0002	0.00021	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	0.00047	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.0020	0.0020	0.0020	ND	0.0020	ND	0.0020	0.0022	0.002	0.0027	0.002	ND	0.002	0.0039	0.002	ND	0.002	0.003	0.002	ND	0.002	ND	0.002	ND	0.002	0.0025	0.002	0.0022	0.002	0.0026	0.002	0.0022	0.002	0.0023	0.002	0.0022	0.002	ND	0.002	ND	0.002	0.0023	0.002	ND
Nitrogen/Nitrate	0.10	ND	0.10	0.12	0.10	ND	0.10	ND	0.1	ND	0.1	0.22	0.1	3.7	0.1	ND	0.1	0.13	0.1	0.28	0.1	0.48	0.1	0.24	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	0.33	0.1	0.92	0.1	ND	0.1	ND
Nitrogen/Nitrate, Nit	0.10	ND	0.10	0.12	0.10	ND	0.10	ND	0.1	ND	0.1	0.22	0.2	3.7	0.1	ND	0.1	0.13	0.1	0.28	0.1	0.48	0.1	0.24	0.1	ND	0.1	ND	0.1	0.1	0.1	ND	0.1	ND	0.1	ND	0.1	0.33	0.1	0.92	0.1	ND	0.1	ND
Nitrogen/Nitrite	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND ^	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND ^1+	0.02	ND	0.02	ND ^1+	0.02	ND
Perchlorate	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.0025	ND	0.0025	ND ^	0.0025	ND ^	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0031	0.0025	ND	0.0025	ND	0.0025	0.0032	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND ^	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	50	160	25	94	50	130	50	180	50	230	50	140	20	64	50	230	50	160	50	130	130	140	5	130	5	140	5	120	5	140	5	130 ^	25	92	15	110	25	110	15	100	25	100	15	100
Thallium	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Solids	10	800	10	630	10	720	10	720	10	880	10	690	10	570	10	1000	10	790	10	890	10	660	10	590	10	660	10	590	10	660	10	600	30	650	10	580	10	650	10	540	10	530	10	640
Vanadium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND ^	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND ^	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	0.020	ND	0.020	ND	0.020	ND ^	0.020	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND ^	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	0.00056	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	0.0006	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0021	0.0025	0.00092	0.0025	0.00073	0.0025	0.00896	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	6.85	NA	6.96	NA	7.25	NA	7.60	NA	7.05	NA	6.87	NA	7.10	NA	7.70	NA	6.56	NA	7.57	NA	6.99	NA	6.96	NA	7.01	NA	7.85	NA	6.90	NA	6.87	NA	6.79	NA	6.91	NA	7.14	NA	7.20	NA	6.84	NA	6.92
Temperature	NA	19.41	NA	15.32	NA	13.93	NA	12.43	NA	16.90	NA	13.03	NA	10.12	NA	16.71	NA	17.48	NA	15.77	NA	14.50	NA	14.40	NA	17.70	NA	15.40	NA	14.20	NA	13.50	NA	16.70	NA	15.00	NA	15.60	NA	14.60	NA	15.30	NA	14.40
Conductivity	NA	1.02	NA	0.77	NA	0.87	NA	0.82	NA	1.06	NA	0.82	NA	0.63	NA	0.83	NA	1.04	NA	1.01	NA	1.13	NA	0.62	NA	0.15	NA	0.96	NA	0.34	NA	0.26	NA	1.12	NA	0.19	NA	0.86	NA	0.89	NA	0.98	NA	1.06
Dissolved Oxygen	NA	2.88	NA	1.33	NA	1.93	NA	3.43	NA	0.49	NA	4.09	NA	1.68	NA	4.33	NA	2.17	NA	8.36	NA	0.10	NA	0.21	NA	0.35	NA	0.51	NA	0.21	NA	0.23	NA	0.20	NA	0.21	NA	1.12	NA	0.21	NA	0.22	NA	0.99
ORP	NA	-99.8	NA	-34.7	NA	-18.4	NA	-142.5	NA	232.2	NA	-9.6	NA	-43.3	NA	-9.7	NA	41.1	NA	17.8	NA	109.7	NA	116.4	NA	139.4	NA	-58.1	NA	40.3	NA	17.0	NA	-0.9	NA	56.3	NA	146.2	NA	116.7	NA	220.9	NA	113.1

Notes: Standards obtained from IAC, Title 35, Chapter I, Part 620, Subpart D, Section 620.410 - Groundwater Quality Standards for Class I: Potable Resource Groundwater
All values are in mg/L (ppm) unless otherwise noted.
DL - Detection limit
NA - Not Applicable
ND - Not Detected
NM - Not Measured
NR - Not Required
NS - Not Sampled
H - Prepped/analyzed past hold time
V - Serial Dilution Exceeds Control Limits
F1- MS and/or MSD Recovery outside of limits.
F2- MS/MSD RPD exceeds control limits.
^1+ - Initial Calibration Verification is outside acceptance limits, high biased
^+ - Continuing Calibration Verification is outside acceptance limits, high biased
^ - Denotes instrument related QC exceeds the control limits
* - Median Value (for temp)
*- LCS or LCSD is outside acceptance limits
Temperature °C degrees Celcius
Conductivity ms/cm² millisiemens/centimeters
Dissolved Oxygen mg/L milligrams/liter
Oxygen Reduction Potential (ORP) mV millivolts

Sample: MW-06	Date	12/15/2010		3/25/2011		6/16/2011		9/19/2011		12/12/2011		3/19/2012		6/25/2012		9/18/2012		12/12/2012		2/27/2013		5/29/2013		7/31/2013		10/23/2013		3/6/2014		5/29/2014		8/27/2014		10/29/2014		2/23/2015		5/11/2015		8/18/2015		11/17/2015		2/23/2016		5/17/2016	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	NP	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.0050	ND	0.003	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND F1	0.0030	ND
Arsenic	0.010	NP	0.0042	0.001	0.0024	0.001	0.0029	0.001	0.0031	0.001	0.0036	0.001	0.002	0.001	0.0021	0.001	0.0022	0.0050	ND	0.001	0.0017	0.0010	0.0027	0.0010	0.0037	0.0010	0.0039	0.0010	0.0010	0.0010	0.20	0.0010	0.0024	0.0010	0.0016	0.0010	0.0011	0.0010	ND	0.0010	0.0025	0.0010	0.0016	0.0010	0.0019 F1	0.0010	ND
Barium	2.0	NP	0.11	0.001	0.092	0.001	0.1	0.001	0.1	0.001	0.12	0.001	0.097	0.001	0.12	0.001	0.11	0.040	0.12	0.001	0.088	0.0025	0.12	0.0025	0.12	0.0025	0.11	0.0025	0.10	0.0025	0.54	0.0025	0.11	0.0025	0.10	0.0025	0.099	0.0025	0.094	0.0025	0.12	0.0025	0.11	0.0025	0.082 F1	0.0025	0.098
Beryllium	0.004	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.0010	ND	0.001	ND	0.0010	ND ^	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Boron	2.0	NP	0.5	0.01	0.35	0.01	0.43	0.01	0.61	0.01	0.63	0.01	0.39	0.01	0.46	0.01	0.57	0.40	0.45	0.01	0.39	0.050	1.0	0.050	0.62	0.050	0.51	0.050	0.34	0.050	0.35	0.050	0.52	0.050	0.34	0.050	0.34	0.050	0.35	0.050	0.75	0.050	0.51	0.050	0.40 F1	0.050	0.34
Cadmium	0.005	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.0010	ND	0.001	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND F1	0.00050	ND
Chloride	200.0	NP	180	50	200	50	160	50	210	50	150	50	150	50	200	50	190	50	240	50	200	10	99	10	200	10	210	10	230	10	230	10	230 ^	10	240	10	110	10	230	10	170	10	210	10	200	10	200 F1
Chromium	0.1	NP	0.006	0.004	0.0083	0.004	0.0045	0.004	0.0085	0.004	0.0056	0.004	ND	0.004	0.0054	0.004	0.0072	0.0030	0.0077	0.004	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND^	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND F1	0.0050	ND
Cobalt	1.0	NP	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.0030	ND	0.002	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	0.0068	0.0010	ND	0.0010	ND	0.0010	0.0013	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND F1	0.0010	ND
Copper	0.65	NP	ND	0.003	ND	0.003	0.0032	0.003	0.0042	0.003	ND	0.003	0.16	0.003	ND	0.003	ND	0.010	ND	0.003	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND^	0.0020	ND	0.0020	ND ^	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND F1	0.0020	ND
Cyanide	0.2	NP	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	4.0	NP	0.65	0.25	0.61	0.25	0.63	0.25	0.64	0.25	0.50	0.25	0.47	0.25	0.37	0.25	0.48	0.25	0.42	0.25	ND	0.10	0.36	0.10	0.56	0.10	0.64	0.10	0.42	0.10	0.53	0.10	0.74	0.10	0.79	0.10	0.48	0.10	0.52	0.10	0.56	0.10	0.64	0.10	0.58	0.10	0.48
Iron	5.0	NP	1.6	0.010	1.6	0.010	1.7	0.010	1.8	0.010	1.9	0.010	1.7	0.010	1.9	0.010	1.9	0.010	1.6	0.01	1.1	0.10	1.8	0.10	2.2	0.10	1.8	0.10	1.5	0.10	22	0.10	1.0	0.10	0.81	0.10	1.0	0.10	0.29	0.10	1.8	0.10	1.4	0.10	1.6 F1	0.10	0.15
Lead	0.0075	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.0050	ND	0.001	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	0.00082	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND F1	0.00050	ND
Manganese	0.15	NP	0.68	0.001	0.68	0.001	0.63	0.001	0.66	0.001	0.63	0.001	0.61	0.001	0.71	0.001	0.64	0.040	0.61	0.001	0.50	0.0025	1.3	0.0025	0.70	0.0025	0.58	0.0025	0.68	0.013	8.0	0.0025	0.71	0.0025	0.57	0.0025	0.86	0.0025	0.90	0.0025	1.2	0.0025	0.98	0.0025	0.87 F1	0.0025	0.85
Mercury	0.002	NP	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.00020	ND	0.0002	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.1	NP	0.0091	0.005	0.014	0.005	0.0078	0.005	0.0099	0.005	0.0089	0.005	ND	0.005	0.0095	0.005	0.011	0.010	ND	0.005	0.0062	0.0020	ND	0.0020	ND	0.0020	0.0020	0.0020	ND	0.0020	0.0061	0.0020	ND	0.0020	ND	0.0020	0.0024	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	0.0020	0.0020	ND
Nitrogen/Nitrate	10.0	NP	0.037	0.02	ND	0.02	ND	0.02	0.04	0.02	0.06	0.02	ND	0.02	ND	0.02	0.04	0.02	0.06	0.02	0.02	0.10	ND	0.10	ND	0.10	0.16	0.10	ND	0.10	ND	0.10	ND	0.10	0.11	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrate, Nit	NA	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.10	ND	0.10	ND	0.10	0.16	0.10	ND	0.10	ND	0.10	ND	0.10	0.11	0.10	ND	0.10	ND	0.10	ND ^	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrite	NA	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Perchlorate	0.0049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND
Selenium	0.05	NP	0.0034	0.001	ND	0.001	ND	0.001	0.0025	0.001	0.0033	0.001	ND	0.001	0.0013	0.001	0.0023	0.0050	ND	0.001	0.001	0.0025	0.0030	0.0025	ND	0.0025	0.0065	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND F1	0.0025	ND
Silver	0.05	NP	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.010	ND	0.005	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND F1	0.00050	ND
Sulfate	400.0	NP	210	50	250	50	280	50	260	50	170	50	250	50	450	50	340	50	440	50	320	130	560	100	440	100	310	100	410	100	530	100	300	100	380	100	360	100	350	100	400	100	490	100	390	250	500
Thallium	0.002	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.0010	ND	0.001	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND F1	0.0020	ND
Total Dissolved Solids	1,200	NP	950	17	990	17	1100	17	970	17	1000	17	1100	17	1300	17	1200	26	1200	26	1100	10	1400	10	1200	10	1100	10	1100	10	1400	10	1300	10	1100	10	1100	10	1300	10	1400	10	1100	10	1100	10	1400
Vanadium	0.049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0080	ND	0.005	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Zinc	5.0	NP	0.0064	0.006	ND	0.006	ND	0.006	ND	0.006	ND	0.006	0.049	0.006	ND	0.006	ND	0.020	ND	0.006	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND F1	0.020	ND
Benzene	0.005	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.005	ND	0.005	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
BETX	11.705	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.03	ND	0.03	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0013	0.0025	0.00061	0.0025	0.00053
pH	6.5 - 9.0	NA	7.67	NA	7.97	NA	7.62	NA	7.61	NA	7.35	NA	7.68	NA	7.59	NA	7.73	NA	7.68	NA	9.30	NA	7.23	NA	7.37	NA	7.55	NA	8.21	NA	7.45	NA	7.73	NA	7.60	NA	8.05	NA	7.76	NA	7.94	NA	7.46	NA	7.68	NA	7.47
Temperature	NA	NA	24.53	NA	16.38	NA	18.99	NA	22.40	NA	22.76	NA	20.99	NA	19.83	NA	20.30	NA	20.07	NA	14.40	NA	16.14	NA	24.20	NA	23.30	NA	10.06	NA	19.41 *	NA	26.15	NA	19.31	NA	7.20	NA	17.91	NA	21.94	NA	18.66	NA	13.60	NA	15.26
Conductivity	NA	NA	1.65	NA	1.63	NA	1.68	NA	1.56	NA	1.61	NA	1.54	NA	1.65	NA	1.69	NA	1.75	NA	1.49	NA	1.47	NA	1.71	NA	1.74	NA	1.01	NA	1.84	NA	1.91	NA	2.36	NA	1.17	NA	1.67	NA	1.99	NA	1.58	NA	1.31	NA	1.56
Dissolved Oxygen	NA	NA	NM	NA	0.24	NA	0.08	NA	0.10	NA	0.08	NA	0.03	NA	0.23	NA	0.02	NA	0.41	NA	0.18	NA	0.45	NA	0.14	NA	0.26	NA	1.24	NA	0.80	NA	0.39	NA	0.32	NA	0.96	NA	1.57	NA	1.60	NA	1.20	NA	0.64	NA	0.83
ORP	NA	NA	NM	NA	-137.5	NA	-161.9	NA	-236	NA	-196	NA	-176	NA	-169	NA	-183	NA	-160	NA	-85.8	NA	-97.1	NA	-180.4	NA	-233.2	NA	-168.8	NA	-25.3	NA	-143.4	NA	-126.7	NA	-147.7	NA	-73.6	NA	-142.7	NA	-90.4	NA	-96.8	NA	-58.8

Sample: MW-06	8/16/2016		11/16/2016		2/16/2017		5/2/2017		8/24/2017		11/8/2017		3/6/2018		5/18/2018		8/10/2018		10/29/2018		2/25/2019		5/1/2019		8/27/2019		11/12/2019		2/25/2020		4/27/2020		8/11/2020		12/9/2020		2/23/2021		5/10/2021		8/25/2021		11/30/2021	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.003	0.0033	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.0010	ND	0.0010	0.0022	0.0010	ND	0.0010	ND	0.001	0.0016	0.001	0.0015	0.001	ND	0.001	ND	0.001	0.0014	0.001	ND	0.001	ND	0.001	0.0017	0.001	0.0023	0.001	0.0022	0.001	ND	0.001	ND ^	0.001	0.0016	0.001	0.0017	0.001	0.0011	0.001	ND	0.001	0.0026	0.001	0.002
Barium	0.0025	0.090	0.0025	0.090	0.0025	0.079	0.0025	0.077	0.0025	0.097	0.0025	0.098	0.0025	0.071	0.0025	0.072	0.0025	0.1	0.0025	0.083	0.0025	0.071	0.0025	0.073	0.0025	0.081	0.0025	0.07	0.0025	0.055	0.0025	0.063	0.0025	0.062	0.0025	0.052	0.0025	0.049	0.0025	0.047	0.0025	0.065	0.0025	0.057
Beryllium	0.0010	ND	0.0010	ND	0.0010	ND ^	0.0010	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND ^1+	0.001	ND ^+	0.001	ND ^+	0.001	ND	0.001	ND
Boron	0.050	0.41	0.050	0.36	0.050	0.29	0.050	0.36	0.05	0.36	0.05	0.3	0.05	0.3	0.05	0.39	0.05	0.36	0.05	0.31	0.05	0.24	0.05	0.33	0.05	0.35	0.05	0.26	0.05	0.22	0.05	0.31	0.05	0.49	0.05	0.23	0.05	0.25	0.05	0.32	0.05	0.35	0.05	0.25
Cadmium	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	10	210	10	180 F1	10	190	10	180	10	180	10	180	10	180	10	170	10	190	10	170	10	170	10	180	10	160	10	150	10	150	10	140	10	140	10	140	10	130	10	130	10	140	10	140
Chromium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	0.002	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.010	ND	0.010	ND	0.010	ND	0.010	ND F1 F2	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND *-
Fluoride	0.10	0.60	0.10	0.50	0.10	0.26	0.10	0.31	0.1	0.62	0.1	0.6	0.1	0.36	0.1	0.37	0.1	0.55	0.1	0.6	0.1	0.43	0.1	0.42	0.1	0.49	0.1	0.51	0.1	0.46	0.1	0.42	0.1	0.47	0.1	0.57	0.1	0.41	0.1	0.44 H F1	0.1	0.49	0.1	0.48
Iron	0.10	ND	0.10	1.1	0.10	1.4	0.10	ND	0.1	1.2	0.1	1.5	0.1	0.94	0.1	ND	0.1	1	0.1	0.47	0.1	1.2	0.1	1.8	0.1	1.1	0.1	0.87	0.1	1.4	0.1	1.1	0.1	0.65	0.1	1.2	0.1	1	0.1	0.45	0.1	0.94	0.1	0.89
Lead	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.0025	0.57	0.0025	0.79	0.0025	1.0	0.0025	0.086	0.0025	0.73	0.0025	0.95	0.0025	1.1	0.0025	0.48	0.0025	1	0.0025	0.75	0.0025	0.78	0.0025	1.1	0.0025	0.77	0.0025	0.73	0.0025	0.7	0.0025	0.7	0.0025	0.57	0.0025	0.57	0.0025	0.66	0.0025	0.47	0.0025	0.65	0.0025	0.62
Mercury	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Nitrogen/Nitrate	0.10	ND	0.10	ND	0.10	ND	0.10	0.19	0.1	ND	0.1	ND	0.1	0.11	0.1	0.22	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	0.13 H	0.1	ND	0.1	ND
Nitrogen/Nitrate, Nit	0.10	ND	0.10	ND	0.10	ND	0.10	0.19	0.1	ND	0.1	ND	0.1	0.11	0.1	0.22	0.1	ND	0.1	ND	0.1	ND	0.1	ND ^	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	0.13	0.1	ND	0.1	ND
Nitrogen/Nitrite	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	0.037	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Perchlorate	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND ^	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.0025	ND	0.0025	ND ^	0.0025	ND ^	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0036	0.0025	ND	0.0025	ND	0.0025	0.0063	0.0025	ND	0.0025	0.012	0.0025	0.0025	0.0025	ND	0.0025	0.0069	0.0025	ND	0.0025	0.0034	0.0025	0.0053
Silver	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	100	380	100	470	100	390	100	420	100	340	100	410	100	350	100	460	100	320	100	410	20	350	20	390	20	360 F1	20	280	20	280	50	400	100	280	50	220	50	240	50	400	50	270	50	230 ^-
Thallium	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Solids	10	1200	10	1100	10	1000	10	1200	10	1100	10	1100	10	1000	10	1300	10	1100	10	1100	10	1000	10	1100	10	970	10	920	10	830	10	1200	30	790	10	640	10	790	10	680	10	660	10	820
Vanadium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND ^	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	0.020	ND	0.020	ND	0.020	ND ^	0.020	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	0.00099	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.00067	0.0025	0.0014	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	7.31	NA	7.66	NA	7.66	NA	7.58	NA	7.38	NA	7.24	NA	7.42	NA	6.97	NA	6.96	NA	7.75	NA	7.55	NA	7.36	NA	7.52	NA	8.03	NA	7.76	NA	7.52	NA	7.50	NA	7.65	NA	7.90	NA	7.74	NA	7.65	NA	7.61
Temperature	NA	28.74	NA	19.81	NA	12.94	NA	14.71	NA	22.90	NA	18.78	NA	8.80	NA	15.39	NA	24.22	NA	21.39	NA	12.10	NA	12.40	NA	22.80	NA	18.25	NA	10.50	NA	11.90	NA	18.90	NA	16.00	NA	10.70	NA	12.40	NA	20.50	NA	19.30
Conductivity	NA	1.94	NA	1.43	NA	1.24	NA	1.26	NA	1.53	NA	1.43	NA	0.99	NA	1.18	NA	1.49	NA	1.37	NA	1.60	NA	1.02	NA	1.50	NA	1.35	NA	1.21	NA	0.34	NA	0.66	NA	1.21	NA	0.94	NA	1.49	NA	1.37	NA	1.30
Dissolved Oxygen	NA	1.32	NA	1.42	NA	1.06	NA	2.84	NA	0.21	NA	1.56	NA	2.82	NA	8.16	NA	7.57	NA	7.50	NA	0.75	NA	0.19	NA	0.23	NA	0.22	NA	0.22	NA	0.24	NA	0.36	NA	0.11	NA	0.34	NA	0.20	NA	0.43	NA	0.53
ORP	NA	-166.3	NA	-154.6	NA	-102.5	NA	-79.2	NA	-102.3	NA	-141.4	NA	-83.1	NA	-33.8	NA	-42.8	NA	-63.3	NA	-125.9	NA	-49.2	NA	-159.0	NA	-132.2	NA	-193.2	NA	-173.0	NA	-102.4	NA	-217.5	NA	-171.7	NA	37.5	NA	-77.1	NA	-173.4

Notes: Standards obtained from IAC, Title 35, Chapter I, Part 620, Subpart D, Section 620.410 - Groundwater Quality Standards for Class I: Potable Resource Groundwater
All values are in mg/L (ppm) unless otherwise noted.
DL - Detection limit
NA - Not Applicable
ND - Not Detected
NM - Not Measured
NR - Not Required
NS - Not Sampled
H - Prepped/analyzed past hold time
V - Serial Dilution Exceeds Control Limits
F1- MS and/or MSD Recovery outside of limits.
F2- MS/MSD RPD exceeds control limits.
^1+ - Initial Calibration Verification is outside acceptance limits, high biased
^+ - Continuing Calibration Verification is outside acceptance limits, high biased
^ - Denotes instrument related QC exceeds the control limits
* - Median Value (for temp)
*- LCS or LCSD is outside acceptance limits
Temperature °C degrees Celcius
Conductivity ms/cm² millisiemens/centimeters
Dissolved Oxygen mg/L milligrams/liter
Oxygen Reduction Potential (ORP) mV millivolts

Attachment 9-4. Table. CCA Groundwater Analytical Results - Midwest Generation LLC, Powerton Station, Pekin, IL.

Sample: MW-07	Date	12/6/2010		3/25/2011		6/16/2011		9/19/2011		12/12/2011		3/19/2012		6/25/2012		9/18/2012		12/12/2012		2/27/2013		5/31/2013	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	NP	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.0050	ND	0.003	ND	0.0030	ND
Arsenic	0.010	NP	0.026	0.001	0.085	0.001	0.12	0.001	0.18	0.001	0.23	0.001	0.23	0.001	0.15	0.001	0.18	0.0050	0.26	0.001	0.17	0.0010	0.12
Barium	2.0	NP	0.55	0.001	0.52	0.001	0.57	0.001	0.57	0.001	0.59	0.001	0.57	0.001	0.44	0.001	0.46	0.040	0.47	0.001	0.44	0.0025	0.42
Beryllium	0.004	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.0010	ND	0.001	ND	0.0010	ND ^
Boron	2.0	NP	0.61	0.01	0.44	0.012	0.43	0.01	0.38	0.01	0.34	0.01	0.35	0.01	0.41	0.01	0.36	0.40	0.41	0.01	0.47	0.050	0.52
Cadmium	0.005	NP	0.0026	0.001	ND	0.001	0.0015	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.0010	ND	0.001	ND	0.00050	ND
Chloride	200.0	NP	170	50	200	25	140	25	130	10	81	25	99	25	130	25	130	25	150	50	160	10	180
Chromium	0.1	NP	0.0088	0.004	0.0075	0.004	0.0061	0.004	0.011	0.004	ND	0.004	ND	0.004	0.0043	0.004	0.0051	0.0030	0.028	0.004	0.017	0.0050	ND
Cobalt	1.0	NP	0.017	0.002	0.0056	0.002	0.007	0.002	0.0055	0.002	0.006	0.002	0.0067	0.002	0.011	0.002	0.009	0.0030	0.0056	0.002	0.0075	0.0010	0.0059
Copper	0.65	NP	0.14	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.010	ND	0.003	ND	0.0020	ND
Cyanide	0.2	NP	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	0.0055	0.0050	ND	0.0050	ND	0.005	ND	0.010	ND
Fluoride	4.0	NP	0.47	0.25	0.42	0.25	0.58	0.25	0.94	0.25	0.47	0.25	0.54	0.25	0.38	0.25	0.35	0.25	0.35	0.25	ND	0.10	0.47
Iron	5.0	NP	8.0	0.010	7.5	0.010	10	0.010	22	0.010	26	0.010	31	0.010	10	0.010	21	0.010	18	0.01	27	0.10	15
Lead	0.0075	NP	0.039	0.001	ND	0.001	0.0014	0.001	ND	0.001	ND	0.001	ND	0.001	0.0013	0.001	ND	0.0050	ND	0.001	ND	0.00050	ND
Manganese	0.15	NP	3.5	0.001	5.9	0.001	6.4	0.001	12	0.001	12	0.001	11	0.001	9.3	0.001	8	0.040	6.7	0.001	9.5	0.025	5.7
Mercury	0.002	NP	ND	0.0002	ND	0.0002	0.00025	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.00020	ND	0.0002	ND	0.00020	ND
Nickel	0.1	NP	0.045	0.005	0.021	0.005	0.022	0.005	0.026	0.005	0.022	0.005	0.018	0.005	0.026	0.005	0.028	0.010	ND	0.005	0.014	0.0020	0.0063
Nitrogen/Nitrate	10.0	NP	0.043	0.02	0.08	0.02	ND	0.20	0.31	0.02	0.03	0.02	ND	0.02	0.02	0.02	ND	0.02	0.03	0.02	0.06	0.10	ND
Nitrogen/Nitrate, Nit	NA	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.10	ND
Nitrogen/Nitrite	NA	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.020	ND
Perchlorate	0.0049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0040	ND
Selenium	0.05	NP	0.0043	0.001	0.0026	0.001	0.0025	0.001	0.0073	0.001	0.0054	0.001	0.0013	0.001	0.006	0.001	0.0047	0.0050	ND	0.001	0.0031	0.0025	0.0028
Silver	0.05	NP	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.010	ND	0.005	ND	0.00050	ND
Sulfate	400.0	NP	120	10	49	10	25	1.0	9.1	1.0	3.3	1.0	3.0	10	18	10	25	10	43	10	36	25	120
Thallium	0.002	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.0010	ND	0.001	ND	0.0020	ND
Total Dissolved Solids	1,200	NP	860	17	1100	17	1300	17	1300	17	1300	17	1400	17	1300	17	1300	26	1100	26	1200	10	1000
Vanadium	0.049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0080	0.012	0.005	0.0051	0.0050	ND
Zinc	5.0	NP	0.076	0.006	ND	0.006	ND	0.006	ND	0.006	ND	0.006	ND	0.006	0.011	0.006	ND	0.020	ND	0.006	ND	0.020	ND
Benzene	0.005	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.005	ND	0.005	ND	0.00050	ND
BETX	11.705	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.03	ND	0.03	ND	0.0025	ND
pH	6.5 - 9.0	NA	NM	NA	7.04	NA	6.78	NA	6.83	NA	6.45	NA	6.79	NA	6.91	NA	6.93	NA	6.97	NA	6.87	NA	6.69
Temperature	NA	NA	NM	NA	16.49	NA	18.51	NA	19.33	NA	16.43	NA	21.06	NA	19.19	NA	17.25	NA	16.64	NA	16.30	NA	17.12
Conductivity	NA	NA	NM	NA	1.98	NA	2.02	NA	2.02	NA	1.90	NA	2.04	NA	1.84	NA	1.78	NA	1.63	NA	1.87	NA	1.42
Dissolved Oxygen	NA	NA	NM	NA	0.61	NA	0.12	NA	0.34	NA	0.17	NA	0.13	NA	-0.02	NA	5.53	NA	2.86	NA	2.31	NA	0.50
ORP	NA	NA	NM	NA	-81.6	NA	-95.7	NA	-171	NA	-148	NA	-141	NA	-119	NA	-100	NA	-100	NA	-116.9	NA	-145.5

Sample: MW-07	7/31/2013		10/23/2013		3/5/2014		5/29/2014		8/27/2014		10/29/2014		2/23/2015		5/11/2015		8/18/2015		11/16/2015		2/24/2016		5/18/2016		8/19/2016		11/16/2016		2/16/2017		5/2/2017	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.0010	0.22	0.0010	0.20	0.0010	0.15	0.0010	ND	0.0010	0.19	0.0010	0.31	0.0010	0.18	0.0010	0.18	0.0010	0.23	0.0010	0.13	0.0010	0.21	0.0010	0.13	0.0010	0.14	0.0010	0.18	0.0010	0.19	0.0010	0.12
Barium	0.0025	0.46	0.0025	0.49	0.0025	0.56	0.0025	0.13	0.0025	0.52	0.0025	0.55	0.0025	0.61	0.0025	0.50	0.0025	0.49	0.0025	0.43	0.0025	0.50	0.0025	0.46	0.0025	0.44	0.0025	0.51	0.0025	0.50	0.0025	0.41
Beryllium	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND ^	0.0010	ND
Boron	0.050	0.41	0.050	0.46	0.050	0.37	0.25	1.0	0.050	0.33	0.050	0.27	0.050	0.39	0.050	0.34	0.050	0.38	0.050	0.36	0.050	0.39	0.050	0.36	0.050	0.36	0.050	0.35	0.050	0.30	0.050	0.50
Cadmium	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	10	150	10	160	10	170	10	150	10	160 ^	10	150	10	130	10	170	10	140	10	160	10	150	10	180	10	160	10	150	10	170	10	170
Chromium	0.0050	ND	0.0050	ND	0.0050	ND^	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	0.0010	0.0045	0.0010	0.0071	0.0010	0.0085	0.0010	ND	0.0010	0.0070	0.0010	0.0046	0.0010	0.012	0.0010	0.0070	0.0010	0.0026	0.0010	0.0062	0.0010	0.0038	0.0010	0.0062	0.0010	0.0064	0.0010	0.0058	0.0010	0.0054	0.0010	0.0044
Copper	0.0020	ND	0.0020	ND	0.0020	ND^	0.0020	ND	0.0020	ND ^	0.0020	ND	0.0020	0.0091	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	0.10	0.46	0.10	0.43	0.10	0.41	0.10	0.41	0.10	0.43	0.10	0.46	0.10	0.42	0.10	0.42	0.10	0.44	0.10	0.43	0.10	0.47	0.10	0.41	0.10	0.43	0.10	0.39	0.10	0.37	0.10	0.38
Iron	0.10	30	0.10	20	0.10	17	0.10	0.15	0.10	14	0.10	35	0.10	23	0.10	9.5	0.10	38	0.10	12	0.10	33	0.10	9.2	0.10	14	0.10	22	0.10	20	0.10	13
Lead	0.00050	ND	0.00050	ND	0.00050	0.0011	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	0.0066	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.0025	11	0.0025	5.9	0.0025	5.8 E	0.0025	0.33	0.013	6.6	0.013	13	0.013	7.0	0.050	5.9	0.13	15	0.025	6.2	0.025	13	0.025	3.0	0.013	7.1	0.025	7.8	0.050	8.6	0.013	5.5
Mercury	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.0020	0.0055	0.0020	0.0081	0.0020	0.0099	0.0020	ND	0.0020	0.0072	0.0020	0.0045	0.0020	0.020	0.0020	0.0077	0.0020	0.0024	0.0020	0.0064	0.0020	0.0052	0.0020	0.0069	0.0020	0.0066	0.0020	0.0055	0.0020	0.0054	0.0020	0.0050
Nitrogen/Nitrate	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrate, Nit	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND ^	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrite	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Perchlorate	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND
Selenium	0.0025	ND	0.0025	0.0056	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND ^	0.0025	ND ^	0.0025	ND
Silver	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	10	42	20	80	20	95	10	52	20	71	5.0	16	10	50	10	55	10	59	20	68	10	41	20	69	10	54	10	27	10	49	25	95
Thallium	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Solids	10	1300	10	1200	10	1200	10	1200	10	1300	10	1300	10	1100	10	1100	10	1300	10	1100	10	1300	10	1000	10	1400	10	1200	10	1200	10	1100
Vanadium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	0.0084	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Zinc	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	0.027	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND ^	0.020	ND
Benzene	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	0.00078	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND
BETX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.00238	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	6.68	NA	6.82	NA	7.20	NA	6.67	NA	7.00	NA	6.94	NA	6.90	NA	6.88	NA	7.03	NA	6.60	NA	6.80	NA	6.77	NA	6.62	NA	6.64	NA	6.83	NA	7.08
Temperature	NA	17.95	NA	16.36	NA	14.02	NA	17.66 *	NA	22.30	NA	14.31	NA	8.40	NA	17.66	NA	22.21	NA	13.34	NA	10.72	NA	16.18	NA	21.90	NA	18.24	NA	16.29	NA	15.35
Conductivity	NA	1.77	NA	1.66	NA	1.36	NA	1.78	NA	1.87	NA	2.62	NA	1.37	NA	1.67	NA	2.18	NA	1.47	NA	1.55	NA	1.47	NA	1.75	NA	1.61	NA	1.66	NA	1.43
Dissolved Oxygen	NA	0.29	NA	0.44	NA	1.01	NA	0.65	NA	0.47	NA	1.50	NA	2.66	NA	1.19	NA	0.75	NA	1.47	NA	1.61	NA	2.26	NA	2.66	NA	2.07	NA	1.26	NA	3.06
ORP	NA	-140.7	NA	-134.7	NA	-116.9	NA	-94.6	NA	-118.1	NA	-109.2	NA	-93.7	NA	-109.8	NA	-149.0	NA	-40.8	NA	-87.7	NA	-78.3	NA	-68.0	NA	-78.6	NA	-72.3	NA	-92.4

Sample: MW-07	8/24/2017		11/8/2017		3/6/2018		5/18/2018		8/10/2018		10/29/2018		2/25/2019		5/1/2019		8/27/2019		11/12/2019		2/25/2020		4/27/2020		8/11/2020		12/9/2020		2/23/2021		5/10/2021		8/25/2021		11/30/2021	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.003	0.0032	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.001	0.15	0.001	0.17	0.001	0.073	0.001	0.16 V	0.001	0.17 V	0.001	0.2	0.001	0.14	0.001	0.21	0.001	0.17	0.001	0.16	0.001	0.11	0.001	0.2	0.001	0.15	0.001	0.13	0.001	0.12	0.001	0.14	0.001	0.13	0.001	0.14
Barium	0.0025	0.44	0.0025	0.49	0.0025	0.33	0.0025	0.5	0.0025	0.48	0.0025	0.5	0.0025	0.51	0.0025	0.45	0.0025	0.48	0.0025	0.44	0.0025	0.47	0.0025	0.49	0.0025	0.52	0.0025	0.49	0.0025	0.46	0.0025	0.47	0.0025	0.45	0.0025	0.46
Beryllium	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND ^1+	0.001	ND ^+	0.001	ND ^+	0.001	ND	0.001	ND
Boron	0.05	0.35	0.05	0.29	0.05	0.56	0.1	0.37	0.05	0.33	0.05	0.31	0.05	0.33	0.1	0.58	0.05	0.38	0.05	0.58	0.05	0.53	0.05	0.44	0.05	0.59	0.05	0.46	0.05	0.47	0.05	0.34	0.05	0.51	0.05	0.54
Cadmium	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	10	160	10	160	10	170	10	150	10	170	10	160	10	170	10	170	10	170	10	150	10	170	10	170	10	170	10	170	10	150	10	130	10	140	10	140
Chromium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.001	0.0052	0.001	0.0056	0.001	0.0038	0.001	0.0061	0.001	0.006	0.001	0.0056	0.001	0.0058	0.001	0.0044	0.001	0.005	0.001	0.0043	0.001	0.0052	0.001	0.0052	0.001	0.0044	0.001	0.0056	0.001	0.0051	0.001	0.0054	0.001	0.0043	0.001	0.0037
Copper	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.005	ND	0.005	ND	0.005	ND F1	0.005	0.0053	0.005	ND	0.005	0.0058 *-
Fluoride	0.1	0.43	0.1	0.41	0.1	0.46	0.1	0.41	0.1	0.39	0.1	0.42	0.1	0.41	0.1	0.45	0.1	0.37	0.1	0.44	0.1	0.44	0.1	0.44	0.1	0.31	0.1	0.5	0.1	0.48	0.1	0.46 H	0.1	0.44	0.1	0.48
Iron	0.1	15	0.1	16	0.1	5.5	0.1	15	0.1	15	0.1	19	0.1	11	0.1	13	0.1	19	0.1	10	0.1	14	0.1	11	0.1	20	0.1	15	0.1	12	0.1	11	0.1	17	0.1	16
Lead	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	0.0012	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	0.00054	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.013	6.9	0.013	8.5	0.0025	3.9	0.005	6.6	0.013	7.7	0.013	8.6	0.0025	4.9	0.005	5.9	0.013	7.5	0.013	5.3	0.013	11	0.013	5.1	0.013	7.3	0.013	5.2	0.0025	4.9	0.013	5.5	0.013	6.6	0.013	6.2
Mercury	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.002	0.0055	0.002	0.0058	0.002	0.0047	0.002	0.006	0.002	0.0059	0.002	0.0053	0.002	0.0073	0.002	0.0055	0.002	0.0053	0.002	0.0054	0.002	0.0068	0.002	0.0064	0.002	0.005	0.002	0.0064	0.002	0.0061	0.002	0.0055	0.002	0.0069	0.002	0.0048
Nitrogen/Nitrate	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND H	0.1	ND	0.1	ND
Nitrogen/Nitrate, Nit	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND ^	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen/Nitrite	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Perchlorate	0.004	ND	0.004	ND	0.004	ND	0.004	ND ^	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.0025	ND	0.0025	ND	0.0025	0.0026	0.0025	0.0029	0.0025	ND	0.0025	ND	0.0025	0.0041	0.0025	0.0077	0.0025	ND	0.0025	0.0094	0.0025	ND	0.0025	0.011	0.0025	0.0063	0.0025	ND	0.0025	0.0035	0.0025	ND	0.0025	0.003	0.0025	0.0085
Silver	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	20	58	5	32	50	120	20	62	10	26	10	34	2	49	5	48	5	18	5	87	5	64	5	30	25	57	15	52	10	82	10	59	25	55	15	69 ^-
Thallium	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Solids	10	1100	10	1200	10	1100	10	1300	10	1200	10	1300	10	1100	10	1100	10	1100	10	1100	10	1100	10	1100	60	1100	10	1000	10	1000	10	970	10	1100	10	1100
Vanadium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND ^	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	ND	0.0025	0.0015	0.0025	0.002	0.0025	0.00077	0.0025	0.0011	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	6.75	NA	6.63	NA	7.01	NA	6.74	NA	6.83	NA	7.13	NA	6.61	NA	6.58	NA	6.68	NA	7.32	NA	6.64	NA	6.58	NA	6.55	NA	6.51	NA	6.76	NA	6.76	NA	6.55	NA	6.64
Temperature	NA	17.40	NA	15.76	NA	9.19	NA	17.83	NA	21.77	NA	17.67	NA	16.20	NA	16.50	NA	18.80	NA	15.85	NA	15.50	NA	15.90	NA	16.20	NA	15.20	NA	14.80	NA	15.50	NA	15.90	NA	19.80
Conductivity	NA	1.72	NA	1.59	NA	1.13	NA	1.52	NA	1.70	NA	1.67	NA	1.96	NA	1.26	NA	2.05	NA	1.77	NA	0.42	NA	1.69	NA	0.82	NA	0.23	NA	1.64	NA	1.91	NA	2.04	NA	1.96
Dissolved Oxygen	NA	0.58	NA	4.41	NA	5.01	NA	7.09	NA	7.47	NA	3.48	NA	0.00	NA	0.25	NA	0.67	NA	0.55	NA	0.20	NA	0.31	NA	5.14	NA	0.29	NA	0.41	NA	0.23	NA	0.18	NA	0.47
ORP	NA	-88.1	NA	-69.3	NA	-33.4	NA	-61.4	NA	-45.4	NA	-41.0	NA	-103.7	NA	-127.6	NA	-102.7	NA	-113.0	NA	-162.0	NA	-153.6	NA	127.3	NA	-119.8	NA	-126.9	NA	-97.5	NA	-87.5	NA	-156.6

Notes: Standards obtained from IAC, Title 35, Chapter I, Part 620, Subpart D, Section 620.410 - Groundwater Quality Standards for Class I: Potable Resource Groundwater
All values are in mg/L (ppm) unless otherwise noted.
DL - Detection limit; NA - Not Applicable; ND - Not Detected; NM - Not Measured
NR - Not Required; NS - Not Sampled; H - Prepped/analyzed past hold time; V - Serial Dilution Exceeds Control Limits
F1 - MS and/or MSD Recovery outside of limits.; F2 - MS/MSD RPD exceeds control limits.; ^1+ - Initial Calibration Verification is outside acceptance limits, high biased; ^+ - Continuing Calibration Verification is outside acceptance limits, high biased
^ - Denotes instrument related QC exceeds the control limits; * - Median Value (for temp); *- - LCS or LCSD is outside acceptance limits
Temperature °C degrees Celcius; Conductivity ms/cm^c millisiemens/centimeters; Dissolved Oxygen mg/L milligrams/liter; Oxygen Reduction Potential (ORP) mV millivolts

Sample: MW-08	Date	12/15/2010		3/25/2011		6/16/2011		9/19/2011		12/12/2011		3/19/2012		6/25/2012		9/18/2012		12/12/2012		2/27/2013		5/30/2013	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	NP	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.0050	ND	0.003	ND	0.0030	ND
Arsenic	0.010	NP	0.0052	0.001	0.0039	0.001	0.0044	0.001	0.0036	0.001	0.0052	0.001	0.0038	0.001	0.004	0.001	0.0041	0.0050	0.0062	0.001	0.005	0.0010	0.0036
Barium	2.0	NP	0.11	0.001	0.12	0.001	0.11	0.001	0.11	0.001	0.13	0.001	0.14	0.001	0.14	0.001	0.14	0.040	0.16	0.001	0.14	0.0025	0.14
Beryllium	0.004	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.0010	ND	0.001	ND	0.0010	ND ^
Boron	2.0	NP	0.93	0.01	0.72	0.012	0.64	0.01	0.82	0.01	0.82	0.01	0.57	0.01	0.57	0.01	1	0.40	0.93	0.01	1.1	0.050	0.91
Cadmium	0.005	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.0010	ND	0.001	ND	0.00050	ND
Chloride	200.0	NP	180	50	210	50	140	50	210	50	190	50	170	50	200	50	210	50	220	50	200	10	230
Chromium	0.1	NP	0.0059	0.004	0.0081	0.004	0.0059	0.004	0.0084	0.004	0.0053	0.004	ND	0.004	0.0056	0.004	0.0066	0.0030	0.012	0.004	0.0046	0.0050	ND
Cobalt	1.0	NP	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.0030	ND	0.002	ND	0.0010	ND
Copper	0.65	NP	ND	0.003	ND	0.003	0.0036	0.003	0.0037	0.003	0.01	0.003	ND	0.003	ND	0.003	0.0032	0.010	ND	0.003	ND	0.0020	ND
Cyanide	0.2	NP	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND	0.010	ND
Fluoride	4.0	NP	0.77	0.25	0.76	0.25	0.81	0.25	0.84	0.25	0.75	0.25	0.70	0.25	0.63	0.25	0.53	0.25	0.63	0.25	0.28	0.10	0.74
Iron	5.0	NP	0.56	0.010	2.1	0.010	1.7	0.010	0.97	0.010	0.94	0.010	2.3	0.010	1.2	0.010	1.3	0.010	2.1	0.01	6.5	0.10	2.3
Lead	0.0075	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.0050	ND	0.001	ND	0.00050	ND
Manganese	0.15	NP	0.15	0.001	0.27	0.001	0.29	0.001	0.18	0.001	0.2	0.001	0.27	0.001	0.2	0.001	0.2	0.0020	0.23	0.001	0.43	0.0025	0.25
Mercury	0.002	NP	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.00020	ND	0.0002	ND	0.00020	ND
Nickel	0.1	NP	0.011	0.005	0.013	0.005	0.0076	0.005	0.007	0.005	0.009	0.005	0.0054	0.005	0.0075	0.005	0.009	0.010	ND	0.005	0.0057	0.0020	ND
Nitrogen/Nitrate	10.0	NP	ND	0.02	ND	0.02	0.10	1.0	1.6	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.10	ND
Nitrogen/Nitrate, Nit	NA	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.10	ND
Nitrogen/Nitrite	NA	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.020	ND
Perchlorate	0.0049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0040	ND
Selenium	0.05	NP	0.0036	0.001	0.0013	0.001	ND	0.001	0.0031	0.001	0.0036	0.001	0.0018	0.001	0.0018	0.001	ND	0.0050	ND	0.001	0.002	0.0025	0.0029
Silver	0.05	NP	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.010	ND	0.005	ND	0.00050	ND
Sulfate	400.0	NP	160	50	240	50	140	50	200	50	200	50	300	50	440	50	330	50	360	50	330	100	460
Thallium	0.002	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.0010	ND	0.001	ND	0.0020	ND
Total Dissolved Solids	1,200	NP	890	17	990	17	970	17	940	17	990	17	1200	17	1200	17	1200	26	1200	26	1100	10	1300
Vanadium	0.049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0080	ND	0.005	ND	0.0050	ND
Zinc	5.0	NP	ND	0.006	ND	0.006	ND	0.006	ND	0.006	ND	0.006	ND	0.006	ND	0.006	ND	0.020	ND	0.006	ND	0.020	ND
Benzene	0.005	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.005	ND	0.005	ND	0.00050	ND
BETX	11.705	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.03	ND	0.03	ND	0.0025	ND
pH	6.5 - 9.0	NA	8.24	NA	8.17	NA	7.66	NA	8.24	NA	7.87	NA	7.97	NA	8.20	NA	8.23	NA	8.09	NA	7.72	NA	7.81
Temperature	NA	NA	19.95	NA	18.15	NA	18.82	NA	17.95	NA	19.20	NA	19.73	NA	18.28	NA	19.15	NA	18.34	NA	17.10	NA	18.11
Conductivity	NA	NA	1.62	NA	1.67	NA	1.61	NA	1.40	NA	1.47	NA	1.57	NA	1.65	NA	1.79	NA	1.82	NA	1.78	NA	1.55
Dissolved Oxygen	NA	NA	NM	NA	0.25	NA	0.08	NA	0.05	NA	0.03	NA	0.03	NA	0.06	NA	0.09	NA	0.64	NA	0.33	NA	0.32
ORP	NA	NA	NM	NA	-190.8	NA	-181.5	NA	-271	NA	-238	NA	-222	NA	-228	NA	-231	NA	-210	NA	-183.8	NA	-225.9

Sample: MW-08	7/31/2013		10/23/2013		3/3/2014		5/28/2014		8/27/2014		10/28/2014		2/26/2015		5/11/2015		8/18/2015		11/18/2015		2/25/2016		5/18/2016		8/17/2016		11/15/2016		2/16/2017		5/2/2017		8/29/2017		11/8/2017	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.003	ND	0.003	ND
Arsenic	0.0010	0.0041	0.0010	0.0037	0.0010	0.0030	0.0010	ND	0.0010	0.0025	0.0010	0.0022	0.0010	0.0026	0.0010	0.0024	0.0010	0.0024	0.0010	0.0021	0.0010	0.0015	0.0010	0.0028	0.0010	0.0016	0.0010	ND	0.0010	ND ^	0.0010	0.0025	0.001	ND	0.001	0.0016
Barium	0.0025	0.13	0.0025	0.13	0.0025	0.11	0.0025	0.11	0.0025	0.13	0.0025	0.13	0.0025	0.12	0.0025	0.10	0.0025	0.092	0.0025	0.14	0.0025	0.093	0.0025	0.17	0.0025	0.12	0.0025	0.068	0.0025	0.071	0.0025	0.12	0.0025	0.062	0.0025	0.11
Beryllium	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND ^	0.0010	ND	0.001	ND	0.001	ND
Boron	0.050	1.2	0.050	0.93	0.050	0.83	0.050	0.44	0.050	0.80	0.050	0.72	0.050	0.81	0.050	0.74	0.050	1.5	0.050	1.4	0.25	1.8	0.050	1.4	0.050	0.86	0.25	1.2	0.050	0.87	0.050	0.68	0.25	1.4	0.05	0.52
Cadmium	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND
Chloride	10	220	10	260	10	230	10	340	50	380 ^	10	340	10	260	10	270	10	250	10	160	10	190	10	130	10	260	10	300	10	360	10	300	50	380	10	280
Chromium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND	0.005	ND
Cobalt	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.001	ND	0.001	ND
Copper	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND ^	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.002	ND	0.002	ND
Cyanide	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.01	ND	0.01	ND
Fluoride	0.10	0.68	0.10	0.74	0.10	0.67	0.10	0.65	0.10	0.73	0.10	0.71	0.10	0.63	0.10	0.66	0.10	0.34	0.10	0.44	0.10	0.33	0.10	0.33	0.10	0.33	0.10	0.36	0.10	0.32	0.10	0.34	0.1	0.48	0.1	0.43
Iron	0.10	6.6	0.10	1.3	0.10	0.89	0.10	0.24	0.10	0.62	0.10	0.53	0.10	0.17	0.10	0.12	0.10	0.85	0.10	0.89	0.10	0.23	0.10	1.7	0.10	1.5	0.10	ND	0.10	0.26	0.10	2.4	0.1	ND	0.1	0.7
Lead	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND
Manganese	0.0025	0.48	0.0025	0.16	0.0025	0.20	0.0025	0.70	0.0025	0.17	0.0025	0.13	0.0025	0.11	0.0025	0.11	0.0025	0.78	0.0025	0.21	0.0025	0.23	0.0025	0.23	0.0025	0.28	0.0025	0.38	0.0025	0.43	0.0025	0.58	0.0025	0.3	0.0025	0.33
Mercury	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.0002	0.00025	0.0002	ND
Nickel	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	0.0040	0.0020	ND	0.0020	0.0038	0.0020	ND	0.0020	ND	0.0020	0.0024	0.0020	0.0026	0.0020	ND	0.002	0.0032	0.002	ND
Nitrogen/Nitrate	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	0.19	0.10	ND	0.10	ND	0.10	0.44	0.10	ND	0.10	ND	0.1	1.3	0.1	ND
Nitrogen/Nitrate, Nit	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	0.19	0.10	ND	0.10	ND	0.10	0.44	0.10	ND	0.10	ND	0.1	1.3	0.1	ND
Nitrogen/Nitrite	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.02	0.034	0.02	ND
Perchlorate	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.004	ND	0.004	ND
Selenium	0.0025	ND	0.0025	0.0048	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND ^	0.0025	ND ^	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND
Sulfate	100	380	100	350	100	320	100	300	50	240	50	290	50	160	50	160	50	310	100	530	50	250	100	290	100	360	50	290	50	300	100	350	50	310	50	240
Thallium	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.002	ND	0.002	ND
Total Dissolved Solids	10	1300	10	1300	10	1200	10	1400	10	1400	10	1200	10	1100	10	1100	10	1200	10	1200	10	1100	10	1200	10	1400	10	1300	10	1400	10	1300	10	1500	10	1100
Vanadium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND ^	0.005	ND
Zinc	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND ^	0.020	ND	0.02	ND	0.02	ND
Benzene	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	0.00081	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0040	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.00281	0.0025	0.00068	0.0025	0.0015	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0013
pH	NA	7.39	NA	8.16	NA	8.46	NA	7.72	NA	8.12	NA	7.89	NA	8.62	NA	7.90	NA	7.36	NA	7.61	NA	7.00	NA	7.67	NA	7.33	NA	6.90	NA	7.00	NA	7.30	NA	7.29	NA	7.27
Temperature	NA	17.58	NA	15.62	NA	11.74	NA	19.53	NA	19.84	NA	16.22	NA	6.86	NA	15.81	NA	19.60	NA	14.72	NA	10.91	NA	19.30	NA	22.16	NA	16.05	NA	14.27	NA	14.28	NA	15.50	NA	14.04
Conductivity	NA	1.60	NA	1.62	NA	1.29	NA	1.94	NA	1.95	NA	1.99	NA	1.19	NA	1.55	NA	1.86	NA	1.56	NA	1.32	NA	1.55	NA	1.80	NA	2.01	NA	1.89	NA	1.63	NA	1.81	NA	1.47
Dissolved Oxygen	NA	0.16	NA	0.25	NA	1.19	NA	0.59	NA	0.51	NA	0.66	NA	1.22	NA	2.97	NA	1.03	NA	0.72	NA	1.09	NA	0.41	NA	2.22	NA	1.36	NA	2.26	NA	1.71	NA	1.89	NA	1.83
ORP	NA	-182	NA	-225	NA	140.2	NA	-65.2	NA	-148.4	NA	-62.6	NA	-154.2	NA	-97.9	NA	-81.8	NA	-30.2	NA	-46.8	NA	-139.2	NA	-96.6	NA	-24.8	NA	-41.8	NA	-110.0	NA	37.2	NA	-81.1

Sample: MW-08	3/7/2018		5/17/2018		8/8/2018		10/31/2018		2/25/2019		5/1/2019		8/27/2019		11/13/2019		2/25/2020		5/19/2020		8/11/2020		12/9/2020		2/23/2021		5/11/2021		8/25/2021		12/1/2021	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.001	0.0038	0.001	ND	0.001	ND	0.001	ND	0.001	0.0014	0.001	0.0023	0.001	ND	0.001	0.0017	0.001	0.0011	0.001	0.0027	0.001	ND	0.001	0.0016	0.001	0.0015	0.001	0.0014	0.001	ND	0.001	0.0013
Barium	0.0025	0.088	0.0025	0.055	0.0025	0.062	0.0025	0.06	0.0025	0.064	0.0025	0.066	0.0025	0.11	0.0025	0.072	0.0025	0.08	0.0025	0.096	0.0025	0.1	0.0025	0.12	0.0025	0.1	0.0025	0.09	0.0025	0.059	0.0025	0.091
Beryllium	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND ^	0.001	ND	0.001	ND ^1+	0.001	ND ^+	0.001	ND ^+	0.001	ND	0.001	ND
Boron	0.1	0.63	0.05	0.84	0.05	0.89	0.05	0.69	0.05	0.67	0.05	0.6	0.25	1.2	0.5	0.99	0.5	0.82	0.05	0.62	0.25	0.96	0.05	0.72	0.05	0.58	0.05	0.5	0.05	0.61	0.05	0.55
Cadmium	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND ^	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	10	250	10	180	10	250	10	220	10	100	2	73	10	100	10	80	10	78	10	130	10	220	10	200	10	130	10	100	10	100	10	96
Chromium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	0.0054 *-
Fluoride	0.1	0.46	0.1	0.39	0.1	0.32	0.1	0.36	0.1	0.36	0.1	0.35	0.1	0.22	0.1	0.34	0.1	0.35	0.1	0.37	0.1	0.26	0.1	0.38	0.1	0.36	0.1	0.36 H	0.1	0.35	0.1	0.36
Iron	0.1	0.71	0.1	0.2	0.1	0.33	0.1	0.2	0.1	0.44	0.1	1.4	0.1	0.61	0.1	1.6	0.1	2.5	0.1	3.5 ^	0.1	2.5	0.1	4	0.1	4.6	0.1	3.3	0.1	1.3	0.1	3.6
Lead	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.0025	0.35	0.0025	0.16	0.0025	0.3	0.0025	0.43	0.0025	0.32	0.0025	0.35	0.0025	0.5	0.0025	0.73	0.0025	0.77	0.0025	0.65	0.0025	0.65	0.0025	0.68	0.0025	0.74	0.0025	0.52	0.0025	0.58	0.0025	0.59
Mercury	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.002	ND	0.002	ND	0.002	0.0022	0.002	ND	0.002	ND	0.002	ND	0.002	0.0026	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Nitrogen/Nitrate	0.1	0.14	0.1	0.17	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	0.12	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen/Nitrate, Nit	0.1	0.14	0.1	0.17	0.1	ND	0.1	ND	0.1	ND	0.1	ND ^	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	0.12	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen/Nitrite	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Perchlorate	0.004	ND	0.004	ND ^	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0053	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	50	250	50	230	50	140	50	130	130	130	5	88	20	280	5	110	5	59	25	86 H	25	110	15	88	25	69	15	110	50	100	15	66 ^-
Thallium	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Solids	10	1100	10	1100	10	1100	10	1000	10	780	10	640	10	950	10	700	10	610	10	680	60	880	10	740	10	630	10	660	10	610	10	670
Vanadium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.0005	ND	0.0005	ND	0.0005	0.0021	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	0.0017	0.0025	0.0013	0.0025	0.016	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	7.17	NA	6.79	NA	6.93	NA	7.38	NA	7.13	NA	7.60	NA	6.92	NA	7.66	NA	7.43	NA	7.40	NA	7.09	NA	7.40	NA	7.70	NA	7.64	NA	7.28	NA	7.50
Temperature	NA	8.99	NA	18.33	NA	18.22	NA	12.40	NA	13.30	NA	14.30	NA	15.00	NA	13.04	NA	14.10	NA	13.80	NA	14.40	NA	14.60	NA	14.30	NA	14.10	NA	15.50	NA	14.30
Conductivity	NA	1.22	NA	1.36	NA	1.59	NA	1.22	NA	1.42	NA	0.70	NA	1.57	NA	1.14	NA	0.34	NA	0.23	NA	0.72	NA	1.37	NA	0.98	NA	1.15	NA	1.13	NA	1.08
Dissolved Oxygen	NA	1.28	NA	3.53	NA	4.71	NA	2.59	NA	0.06	NA	0.13	NA	0.31	NA	0.45	NA	0.16	NA	0.24	NA	2.16	NA	0.12	NA	0.56	NA	0.12	NA	0.20	NA	0.54
ORP	NA	-92.1	NA	-36.6	NA	-103.2	NA	-35.5	NA	-38.6	NA	-176.8	NA	-19.3	NA	-90.5	NA	-191.8	NA	-231.6	NA	-57.9	NA	-194.7	NA	-178.0	NA	-174.6	NA	-37.4	NA	-201.0

Notes: Standards obtained from IAC, Title 35, Chapter I, Part 620, Subpart D, Section 620.410 - Groundwater Quality Standards for Class I: Potable Resource Groundwater
All values are in mg/L (ppm) unless otherwise noted.
DL - Detection limit; NA - Not Applicable; ND - Not Detected; NM - Not Measured
NR - Not Required; NS - Not Sampled; H - Prepped/analyzed past hold time; V - Serial Dilution Exceeds Control Limits
F1 - MS and/or MSD Recovery outside of limits.; F2 - MS/MSD RPD exceeds control limits.; ^1+ - Initial Calibration Verification is outside acceptance limits, high biased; ^+ - Continuing Calibration Verification is outside acceptance limits, high biased
^ - Denotes instrument related QC exceeds the control limits; * - Median Value (for temp); *- - LCS or LCSD is outside acceptance limits
Temperature °C degrees Celcius; Conductivity ms/cm^c millisiemens/centimeters; Dissolved Oxygen mg/L milligrams/liter; Oxygen Reduction Potential (ORP) mV millivolts

Sample: MW-09	Date	12/16/2010		3/25/2011		6/16/2011		9/19/2011		12/12/2011		3/19/2012		6/25/2012		9/18/2012		12/12/2012		2/27/2013		5/30/2013		7/30/2013		10/22/2013	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	NP	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.0050	ND	0.003	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.010	NP	ND	0.001	0.0018	0.001	0.0017	0.001	ND	0.001	0.0012	0.001	ND	0.001	0.0017	0.001	ND	0.0050	ND	0.001	0.0013	0.0010	ND	0.0010	ND	0.0010	ND
Barium	2.0	NP	0.038	0.001	0.042	0.001	0.038	0.001	0.03	0.001	0.038	0.001	0.035	0.001	0.038	0.001	0.038	0.040	0.062	0.001	0.049	0.0025	0.042	0.0025	0.050	0.0025	0.048
Beryllium	0.004	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.0010	ND	0.001	ND	0.0010	ND ^	0.0010	ND	0.0010	ND
Boron	2.0	NP	2.1	0.01	1.9	0.012	1.9	0.01	2.5	0.01	2.7	0.01	2.6	0.01	2.6	0.01	2.9	1.0	3.2	0.01	4.3	0.050	3.2	0.050	2.5	0.050	1.6
Cadmium	0.005	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.0010	ND	0.001	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	200.0	NP	25	10	28	10	28	10	30	25	30	10	30	10	27	10	28	10	31	10	27	2.0	29	2.0	33	2.0	42
Chromium	0.1	NP	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.0030	0.01	0.004	0.0046	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	1.0	NP	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.0030	ND	0.002	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.65	NP	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.010	ND	0.003	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.2	NP	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	4.0	NP	ND	0.25	0.31	0.25	0.34	0.25	0.25	0.25	ND	0.25	ND	0.25	ND	0.25	ND	0.25	0.3	0.25	ND	0.10	0.21	0.10	0.18	0.10	0.17
Iron	5.0	NP	ND	0.010	0.066	0.010	ND	0.010	ND	0.010	ND	0.010	0.014	0.010	ND	0.010	ND	0.010	ND	0.01	0.024	0.10	ND	0.10	ND	0.10	ND
Lead	0.0075	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.0050	ND	0.001	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.15	NP	0.23	0.001	0.45	0.001	0.48	0.001	0.14	0.001	0.28	0.001	0.22	0.001	0.34	0.001	0.11	0.0020	0.1	0.001	0.19	0.0025	0.053	0.0025	0.038	0.0025	0.019
Mercury	0.002	NP	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.00020	ND	0.0002	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.1	NP	0.01	0.005	0.0093	0.005	0.0063	0.005	0.0065	0.005	0.0088	0.005	ND	0.005	ND	0.005	0.0067	0.010	ND	0.005	ND	0.0020	ND	0.0020	ND	0.0020	ND
Nitrogen/Nitrate	10.0	NP	2.9	0.20	5.6	0.20	5.6	0.20	3.7	0.50	2.6	0.20	5.0	0.20	2.8	0.20	6.3	0.20	10	0.2	12	0.10	11	0.10	7.9	0.10	4.6
Nitrogen/Nitrate, Nit	NA	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	1.0	11	0.50	7.9	0.50	4.6
Nitrogen/Nitrite	NA	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.020	ND	0.020	ND	0.020	ND
Perchlorate	0.0049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0040	ND	0.0040	ND	0.0040	ND
Selenium	0.05	NP	0.0024	0.001	0.0072	0.001	0.0017	0.001	0.0043	0.001	0.0041	0.001	0.0072	0.001	0.0047	0.001	0.0044	0.0050	0.009	0.001	0.015	0.0025	0.016	0.0025	0.014	0.0025	0.0047
Silver	0.05	NP	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.010	ND	0.005	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	400.0	NP	110	25	110	25	110	25	130	25	110	25	120	50	130	25	120	25	130	50	140	50	140	25	130	25	90
Thallium	0.002	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.0010	ND	0.001	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Solids	1,200	NP	500	17	510	17	540	17	500	17	520	17	530	17	520	17	580	26	560	26	520	10	600	10	610	10	430
Vanadium	0.049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0080	ND	0.005	ND	0.0050	ND	0.0050	ND	0.0050	ND
Zinc	5.0	NP	ND	0.006	ND	0.006	ND	0.006	ND	0.006	ND	0.006	ND	0.006	ND	0.006	ND	0.020	ND	0.006	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	0.005	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.005	ND	0.005	ND	0.00050	ND	0.00050	ND	0.00050	ND
BETX	11.705	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.03	ND	0.03	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	6.5 - 9.0	NA	7.22	NA	7.34	NA	7.10	NA	7.32	NA	6.31	NA	7.28	NA	7.30	NA	7.18	NA	7.10	NA	8.00	NA	7.21	NA	6.63	NA	7.19
Temperature	NA	NA	14.61	NA	13.19	NA	14.51	NA	14.08	NA	14.56	NA	18.11	NA	15.72	NA	16.55	NA	13.91	NA	16.40	NA	17.38	NA	14.49	NA	14.68
Conductivity	NA	NA	0.91	NA	0.85	NA	0.84	NA	0.66	NA	0.66	NA	0.73	NA	0.67	NA	0.72	NA	0.77	NA	0.82	NA	0.72	NA	0.76	NA	0.66
Dissolved Oxygen	NA	NA	NM	NA	0.27	NA	0.49	NA	0.16	NA	0.08	NA	0.07	NA	0.11	NA	0.56	NA	1.10	NA	0.87	NA	0.64	NA	0.29	NA	1.01
ORP	NA	NA	NM	NA	21.2	NA	148.2	NA	-268	NA	20	NA	68	NA	47	NA	168	NA	210	NA	77.2	NA	-68.3	NA	117.2	NA	-159.8

Sample: MW-09	3/3/2014		5/29/2014		8/26/2014		10/30/2014		2/24/2015		5/12/2015		8/19/2015		11/18/2015		2/25/2016		5/19/2016		8/17/2016		11/17/2016		2/15/2017		5/3/2017	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.0010	0.0021	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND ^	0.0010	ND
Barium	0.0025	0.064	0.0025	0.044	0.0025	0.039	0.0025	0.047	0.0025	0.043	0.0025	0.026	0.0025	0.034	0.0025	0.023	0.0025	0.034	0.0025	0.030	0.0025	0.036	0.0025	0.037	0.0025	0.038	0.0025	0.035
Beryllium	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0050	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND ^	0.0010	ND
Boron	0.050	1.7	0.25	2.5	0.050	2.4	0.050	1.6	0.050	3.0	0.050	3.2	0.25	3.3	0.050	2.2	0.25	2.3	0.050	1.5	0.050	2.7	0.50	3.8	0.050	3.0	0.050	3.4
Cadmium	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	2.0	25	2.0	34	2.0	33	2.0	32	2.0	34	2.0	37	2.0	36	2.0	30	2.0	35	2.0	36	2.0	41	2.0	38	2.0	38	2.0	37
Chromium	0.0050	ND^	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	0.0010	0.0032	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.0020	ND^	0.0020	ND	0.0020	ND ^	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	0.10	0.16	0.10	0.20	0.10	0.19	0.10	0.15	0.10	0.18	0.10	0.16	0.10	0.14	0.10	0.19	0.10	0.20	0.10	0.16	0.10	0.15	0.10	0.15	0.10	0.14	0.10	0.13
Iron	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Lead	0.00050	0.00051	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.0025	0.84	0.0025	0.36	0.0025	0.031	0.0025	0.022	0.0025	0.024	0.0025	0.086	0.0025	0.020	0.0025	0.076	0.0025	0.084	0.0025	0.079	0.0025	0.11	0.0025	0.10	0.0025	0.088	0.0025	0.12
Mercury	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.0020	0.0045	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Nitrogen/Nitrate	0.10	3.2	0.10	11	0.10	1.6	0.10	5.9	0.10	13	0.10	9.3	0.10	11	0.10	0.74	0.10	1.0	0.10	5.9	0.10	5.7	0.10	4.4	0.10	5.2	0.10	9.9
Nitrogen/Nitrate, Nit	0.50	3.2	2.5	11	0.10	1.6	0.50	5.9	1.0	13	1.0	9.3	2.0	11	0.10	0.74	0.10	1.0	0.50	5.9	0.50	5.7	0.50	4.4	0.50	5.2	1.0	9.9
Nitrogen/Nitrite	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Perchlorate	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND
Selenium	0.0025	0.0030	0.0025	0.0074	0.0025	0.0061	0.0025	0.0084	0.0025	0.0091	0.0025	0.014	0.0025	0.010	0.0025	0.0028	0.0025	ND	0.0025	0.0047	0.0025	0.0034	0.0025	0.0035	0.0025	0.0063	0.0025	0.011
Silver	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	25	110	50	110	25	100	50	160	25	130	50	140	50	160	25	130	25	140	25	100	50	130	50	140	50	120	50	180
Thallium	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Solids	10	560	10	540	10	490	10	630	10	570	10	620	10	670	10	410	10	480	10	490	10	760	10	600	10	590	10	690
Vanadium	0.0050	ND^	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Zinc	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND ^	0.020	ND
Benzene	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	0.00089	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND
BETX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.00379	0.0025	0.00063	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	7.53	NA	6.99	NA	7.09	NA	7.29	NA	7.53	NA	7.44	NA	7.35	NA	7.15	NA	7.34	NA	7.30	NA	7.32	NA	7.37	NA	6.94	NA	7.48
Temperature	NA	11.20	NA	19.42	NA	20.80	NA	12.73	NA	11.65	NA	14.26	NA	18.58	NA	16.51	NA	10.02	NA	20.82	NA	22.91	NA	17.20	NA	9.91	NA	13.52
Conductivity	NA	0.66	NA	0.78	NA	0.79	NA	1.05	NA	0.67	NA	0.79	NA	0.88	NA	0.67	NA	0.55	NA	0.76	NA	0.85	NA	0.70	NA	0.65	NA	0.70
Dissolved Oxygen	NA	1.27	NA	2.11	NA	0.80	NA	1.52	NA	1.37	NA	2.20	NA	0.68	NA	1.42	NA	1.47	NA	4.29	NA	2.87	NA	4.07	NA	2.52	NA	3.10
ORP	NA	316.1	NA	41.5	NA	22.3	NA	16.3	NA	25.0	NA	35.5	NA	-22.6	NA	72.9	NA	-37.1	NA	-54.3	NA	-76.3	NA	-40.5	NA	69.1	NA	-74.4

Sample: MW-09	8/25/2017		11/8/2017		3/7/2018		5/16/2018		8/8/2018		11/1/2018		2/27/2019		5/1/2019		8/28/2019		11/14/2019		2/25/2020		4/29/2020		8/12/2020		12/8/2020		2/24/2021		5/13/2021		8/25/2021		12/1/2021	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.003	0.0037	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.001	0.0043	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND ^	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Barium	0.0025	0.046	0.0025	0.047	0.0025	0.055	0.0025	0.04	0.0025	0.038	0.0025	0.042	0.0025	0.051	0.0025	0.039	0.0025	0.04	0.0025	0.044	0.0025	0.03	0.0025	0.033	0.0025	0.034	0.0025	0.037	0.0025	0.032	0.0025	0.03	0.0025	0.033	0.0025	0.036
Beryllium	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND ^1+	0.001	ND ^+	0.001	ND	0.001	ND	0.001	ND
Boron	0.5	3.8	0.05	3.4	1	4.1	1	4.1	1	4.4	0.5	5.2	0.05	4.5	1	4.8	0.5	3.8	0.5	2.4	0.5	2.4	0.05	2.1	0.5	1.8	0.25	2.2	0.25	2.2	0.25	1.9	0.5	2.2	0.5	3.3
Cadmium	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	2	37	2	38	2	37	2	37	2	36	2	39	2	37	2	39	2	36	2	32	2	38	2	35	2	34	2	33	2	32	2	32	2	32	2	32
Chromium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.005	ND	0.005	ND *	0.005	ND	0.005	ND	0.005	ND	0.005	ND *-
Fluoride	0.1	0.14	0.1	0.13	0.1	0.16	0.1	0.15	0.1	0.14	0.1	0.16	0.1	0.16	0.1	0.17	0.1	0.14	0.1	0.18	0.1	0.2	0.1	0.19	0.1	0.17	0.1	0.23	0.1	0.2	0.1	0.18	0.1	0.17	0.1	0.2
Iron	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND ^	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Lead	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.0025	0.21	0.0025	0.16	0.0025	0.084	0.0025	0.085	0.0025	0.075	0.0025	0.077	0.0025	0.19	0.0025	0.077	0.0025	0.077	0.0025	0.1	0.0025	0.1	0.0025	0.11	0.0025	0.08	0.0025	0.069	0.0025	0.096	0.0025	0.083	0.0025	0.092	0.0025	0.052
Mercury	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Nitrogen/Nitrate	0.1	5.7	0.1	2.1	0.1	6.6	0.1	10	0.1	10	0.1	2.9	0.1	2.4	0.1	6.2	0.1	4.2	0.1	2.1	0.1	ND	0.1	1.7	0.1	5.9	0.1	0.83	0.1	1	0.1	2.1	0.1	3.4	0.1	2.8
Nitrogen/Nitrate, Nit	0.5	5.7	0.2	2.1	0.5	6.6	1	10	1	10	0.2	2.9	0.5	2.4	0.5	6.2	0.5	4.2	0.5	2.1	0.5	ND	0.1	1.7	1	5.9	0.5	0.83	0.1	1	0.2	2.1	0.5	3.4	0.5	2.8
Nitrogen/Nitrite	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Perchlorate	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.0025	0.0053	0.0025	ND	0.0025	0.0035	0.0025	0.0069	0.0025	0.0086	0.0025	0.0026	0.0025	0.0028	0.0025	0.005	0.0025	0.0027	0.0025	ND	0.0025	ND	0.0025	ND ^	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	50	160	50	170	50	200	50	210	50	150	50	130	10	180	10	190	5	150	5	88	5	87	5	130 ^	25	120	15	64	25	80	25	120	25	130	25	110 ^-
Thallium	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Solids	10	600	10	620	10	690	10	780	10	640	10	700	10	630	10	630	10	610	10	500	10	400	10	520	30	480	10	220	10	360	10	370	10	470	10	550
Vanadium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND ^	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	0.00069	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	ND	0.0025	ND	0.0025	0.0012	0.0025	ND	0.0025	0.01689	0.0025	0.00329	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	7.30	NA	6.92	NA	6.95	NA	7.83	NA	7.31	NA	7.09	NA	7.13	NA	7.11	NA	7.34	NA	7.49	NA	7.23	NA	7.19	NA	7.22	NA	7.29	NA	7.35	NA	7.33	NA	7.11	NA	7.22
Temperature	NA	14.20	NA	14.50	NA	10.71	NA	16.88	NA	19.90	NA	13.00	NA	14.80	NA	14.80	NA	13.70	NA	14.87	NA	15.10	NA	13.20	NA	12.50	NA	15.60	NA	14.50	NA	13.20	NA	13.50	NA	15.20
Conductivity	NA	0.76	NA	0.77	NA	0.65	NA	0.74	NA	0.83	NA	0.75	NA	1.03	NA	0.64	NA	0.96	NA	0.79	NA	0.67	NA	0.72	NA	0.47	NA	0.24	NA	0.62	NA	0.79	NA	0.84	NA	0.86
Dissolved Oxygen	NA	0.17	NA	2.43	NA	1.91	NA	2.48	NA	5.67	NA	2.21	NA	0.05	NA	0.23	NA	0.34	NA	5.80	NA	0.35	NA	0.24	NA	3.26	NA	0.53	NA	0.42	NA	0.10	NA	0.16	NA	0.48
ORP	NA	127.0	NA	-51.7	NA	-43.0	NA	-20.5	NA	-73.1	NA	16.0	NA	22.5	NA	10.6	NA	38.5	NA	-36.5	NA	0.2	NA	-12.6	NA	112.4	NA	88.3	NA	4.7	NA	61.9	NA	156.3	NA	7.2

Notes: Standards obtained from IAC, Title 35, Chapter I, Part 620, Subpart D, Section 620.410 - Groundwater Quality Standards for Class I: Potable Resource Groundwater
All values are in mg/L (ppm) unless otherwise noted.
DL - Detection limit; NA - Not Applicable; ND - Not Detected; NM - Not Measured
NR - Not Required; NS - Not Sampled; H - Prepped/analyzed past hold time; V - Serial Dilution Exceeds Control Limits
F1 - MS and/or MSD Recovery outside of limits.; F2 - MS/MSD RPD exceeds control limits.; ^1+ - Initial Calibration Verification is outside acceptance limits, high biased; ^+ - Continuing Calibration Verification is outside acceptance limits, high biased
^ - Denotes instrument related QC exceeds the control limits; * - Median Value (for temp); *- - LCS or LCSD is outside acceptance limits
Temperature °C degrees Celcius; Conductivity ms/cm^c millisiemens/centimeters; Dissolved Oxygen mg/L milligrams/liter; Oxygen Reduction Potential (ORP) mV millivolts

Sample: MW-10

[illegible]

Sample: MW-11

[illegible]

Notes: Standards obtained from IAC, Title 35, Chapter I, Part 620, Subpart D, Section 620.410 - Groundwater Quality Standards for Class I: Potable Resource Groundwater
All values are in mg/L (ppm) unless otherwise noted.
DL - Detection limit
NA - Not Applicable
ND - Not Detected
NM - Not Measured
NR - Not Required
NS - Not Sampled
H - Prepped/analyzed past hold time
V - Serial Dilution Exceeds Control Limits
F1- MS and/or MSD Recovery outside of limits.
F2- MS/MSD RPD exceeds control limits.
^1+ - Initial Calibration Verification is outside acceptance limits, high biased
^+ - Continuing Calibration Verification is outside acceptance limits, high biased
^ - Denotes instrument related QC exceeds the control limits
* - Median Value (for temp)
* - LCS or LCSD is outside acceptance limits
Temperature °C degrees Celcius
Conductivity ms/cm^{c} millisiemens/centimeters
Dissolved Oxygen mg/L milligrams/liter
Oxygen Reduction Potential (ORP) mV millivolts

Sample: MW-12

Parameter	Standards	12/15/2010 DL	12/15/2010 Result	2/15/2011 DL	2/15/2011 Result	6/16/2011 DL	6/16/2011 Result	9/19/2011 DL	9/19/2011 Result	12/12/2011 DL	12/12/2011 Result	3/19/2012 DL	3/19/2012 Result	6/25/2012 DL	6/25/2012 Result	9/18/2012 DL	9/18/2012 Result	12/12/2012 DL	12/12/2012 Result	2/27/2013 DL	2/27/2013 Result	5/30/2013 DL	5/30/2013 Result	7/29/2013 DL	7/29/2013 Result	10/22/2013 DL	10/22/2013 Result	3/4/2014 DL	3/4/2014 Result	5/29/2014 DL	5/29/2014 Result
Antimony	0.006	NP	ND	NP	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.0050	ND	0.003	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.010	NP	0.0088	NP	0.013	0.001	0.0064	0.001	0.0087	0.001	0.0089	0.001	0.0042	0.001	0.014	0.001	0.011	0.0050	0.022	0.001	0.0066	0.0010	0.0031	0.0010	0.016	0.0010	0.018	0.0010	0.0025	0.0010	0.0017
Barium	2.0	NP	0.089	NP	0.11	0.001	0.091	0.001	0.085	0.001	0.09	0.001	0.071	0.001	0.12	0.001	0.11	0.040	0.1	0.001	0.1	0.0025	0.091	0.0025	0.092	0.0025	0.087	0.0025	0.086	0.0025	0.073
Beryllium	0.004	NP	ND	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.0010	ND	0.001	ND	0.0010	ND ^	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Boron	2.0	NP	1.6	NP	1.4	0.012	1.3	0.01	1.2	0.01	1.3	0.01	0.92	0.01	1.2	0.01	1.1	0.40	0.85	0.01	1.1	0.050	3.7	0.050	1.1	0.050	1.1	0.050	0.41	0.050	0.69
Cadmium	0.005	NP	ND	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.0010	ND	0.001	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	200.0	NP	170	NP	180	50	180	50	190	50	210	50	170	50	190	50	170	50	210	50	190	10	200	10	190	10	180	10	220	10	220
Chromium	0.1	NP	ND	NP	0.0056	0.004	0.0044	0.004	0.0071	0.004	0.0047	0.004	ND	0.004	0.0043	0.004	0.0045	0.0030	0.0079	0.004	0.0052	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND^	0.0050	ND
Cobalt	1.0	NP	ND	NP	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.0030	ND	0.002	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.65	NP	ND	NP	ND	0.003	0.0032	0.003	0.0036	0.003	0.0031	0.003	ND	0.003	ND	0.003	ND	0.010	ND	0.003	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND^	0.0020	ND
Cyanide	0.2	NP	ND	NP	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	4.0	NP	0.71	NP	0.61	0.25	0.64	0.25	0.74	0.25	0.61	0.25	0.46	0.25	0.36	0.25	0.42	0.25	0.43	0.25	ND	0.10	0.62	0.10	0.56	0.10	0.51	0.10	0.56	0.10	0.42
Iron	5.0	NP	5.5	NP	6.3	0.010	5.6	0.010	4.0	0.010	3.1	0.010	4.8	0.010	8.2	0.010	8.9	0.010	6.4	0.01	5.8	0.10	8.9	0.10	4.5	0.10	0.23	0.10	2.4	0.10	0.39
Lead	0.0075	NP	ND	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.0050	ND	0.001	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.15	NP	0.32	NP	0.58	0.001	0.26	0.001	0.37	0.001	0.25	0.001	0.13	0.001	0.71	0.001	0.64	0.040	1.7	0.001	0.38	0.0025	0.24	0.0025	1.3	0.0025	1.5	0.0025	0.23	0.0025	0.65
Mercury	0.002	NP	ND	NP	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.00020	ND	0.0002	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.1	NP	0.0096	NP	0.01	0.005	0.0072	0.005	0.0075	0.005	0.0091	0.005	0.0075	0.005	0.0082	0.005	0.012	0.010	ND	0.005	0.0065	0.0020	ND	0.0020	0.0029	0.0020	0.0028	0.0020	0.0020	0.0020	0.0026
Nitrogen/Nitrate	10.0	NP	ND	NP	ND	0.02	0.14	0.02	ND	0.02	ND	0.02	0.04	0.20	ND	0.02	0.03	0.02	ND	0.02	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrate, Nit	NA	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrite	NA	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Perchlorate	0.0049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND
Selenium	0.05	NP	0.0026	NP	0.0027	0.001	ND	0.001	0.0023	0.001	0.0034	0.001	0.0043	0.001	0.0038	0.001	0.0016	0.0050	ND	0.001	0.002	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.05	NP	ND	NP	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.010	ND	0.005	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	400.0	NP	290	NP	270	50	350	50	360	50	300	50	310	50	430	50	370	50	300	50	350	100	410	100	420	100	270	100	530	100	560
Thallium	0.002	NP	ND	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.0010	ND	0.001	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Soli	1,200	NP	980	NP	1000	17	1100	17	970	17	970	17	1000	17	1200	17	1200	26	1100	26	1000	10	1200	10	1200	10	1000	10	1400	10	1300 H
Vanadium	0.049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0080	ND	0.005	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Zinc	5.0	NP	ND	NP	ND	0.006	ND	0.006	ND	0.006	ND	0.006	ND	0.006	ND	0.006	ND	0.020	ND	0.006	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	0.005	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.005	ND	0.005	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
BETX	11.705	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.03	ND	0.03	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	6.5 - 9.0	NA	7.65	NA	7.51	NA	6.98	NA	7.66	NA	7.38	NA	7.22	NA	7.40	NA	7.50	NA	7.37	NA	8.36	NA	7.17	NA	7.29	NA	7.73	NA	7.99	NA	7.14
Temperature	NA	NA	16.90	NA	16.77	NA	18.77	NA	17.75	NA	17.78	NA	19.62	NA	19.07	NA	18.88	NA	17.51	NA	16.30	NA	21.42	NA	17.93	NA	14.78	NA	11.22	NA	19.48
Conductivity	NA	NA	1.69	NA	1.66	NA	1.63	NA	1.34	NA	1.38	NA	1.54	NA	1.63	NA	1.61	NA	1.48	NA	1.60	NA	1.63	NA	1.47	NA	1.20	NA	1.30	NA	1.73
Dissolved Oxygen	NA	NA	NM	NA	NM	NA	NM	NA	NM	NA	NM	NA	NM	NA	0.06	NA	0.11	NA	1.70	NA	0.35	NA	1.04	NA	0.25	NA	0.20	NA	1.43	NA	1.59
ORP	NA	NA	NM	NA	NM	NA	NM	NA	NM	NA	NM	NA	NM	NA	-168	NA	-157	NA	-130	NA	-141.2	NA	-146.5	NA	-85.9	NA	-205.6	NA	-91.9	NA	-23.6

Parameter	8/26/2014 DL	8/26/2014 Result	10/28/2014 DL	10/28/2014 Result	2/24/2015 DL	2/24/2015 Result	5/12/2015 DL	5/12/2015 Result	8/19/2015 DL	8/19/2015 Result	11/19/2015 DL	11/19/2015 Result	2/26/2016 DL	2/26/2016 Result	5/20/2016 DL	5/20/2016 Result	8/18/2016 DL	8/18/2016 Result	11/18/2016 DL	11/18/2016 Result	2/16/2017 DL	2/16/2017 Result	5/3/2017 DL	5/3/2017 Result	8/29/2017 DL	8/29/2017 Result	11/10/2017 DL	11/10/2017 Result	3/8/2018 DL	3/8/2018 Result	5/16/2018 DL	5/16/2018 Result
Antimony	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.0010	0.0021	0.0010	0.0019	0.0010	ND	0.0010	0.0034	0.0010	0.0025	0.0010	0.0033	0.0010	0.0020	0.0010	0.0045 F1	0.0010	0.0038	0.0010	0.013	0.0010	0.0022	0.0010	0.0020	0.001	0.0082	0.001	0.015	0.001	0.0026	0.001	0.0015
Barium	0.0025	0.066	0.0025	0.063	0.0025	0.070	0.0025	0.071	0.0025	0.083	0.0025	0.091	0.0025	0.060	0.0025	0.094	0.0025	0.092	0.0025	0.096	0.0025	0.059	0.0025	0.074	0.0025	0.12	0.0025	0.096	0.0025	0.065	0.0025	0.067
Beryllium	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND ^	0.0010	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Boron	0.050	0.73	0.050	0.59	0.050	0.58	0.050	0.59	0.050	1.5	0.050	0.94	0.050	0.57	0.050	0.50	0.050	0.75	0.10	0.81	0.050	0.40	0.050	0.50	0.25	1.5	0.05	0.77	0.05	0.39	0.05	0.45
Cadmium	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	10	210	10	200	10	210	10	230	10	220	10	220	10	210	10	200 F1	10	210	10	180	10	190	10	190	10	180	10	170	10	180	10	180
Chromium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.001	0.0013	0.001	ND ^	0.001	ND	0.001	ND
Copper	0.0020	ND ^	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND
Fluoride	0.10	0.54	0.10	0.54	0.10	0.58	0.10	0.52	0.10	0.59	0.10	0.58	0.10	0.41	0.10	0.48	0.10	0.53	0.10	0.53	0.10	0.42	0.10	0.37	0.1	0.53	0.1	0.51	0.1	0.5	0.1	0.48
Iron	0.10	0.17	0.10	0.33	0.10	1.7	0.10	0.48	0.10	2.2	0.10	0.61	0.10	0.88	0.10	1.2	0.10	1.5	0.10	2.2	0.10	0.76	0.10	2.1	0.1	1.1	0.1	2.2	0.1	1.1	0.1	1.1
Lead	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.0025	1.2	0.0025	1.2	0.0025	0.17	0.0025	0.63	0.0025	0.16	0.0025	1.2	0.0025	0.065	0.0025	0.51	0.0025	1.0	0.0025	0.96	0.0025	0.079	0.0025	0.081	0.0025	2.7	0.0025	1.2	0.0025	0.098	0.0025	0.066
Mercury	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.0002	0.00026	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.0020	0.0033	0.0020	0.0031	0.0020	0.0031	0.0020	0.0022	0.0020	0.0020	0.0020	0.0023	0.0020	0.0020	0.0020	ND	0.0020	0.0037	0.0020	ND	0.0020	0.0022	0.0020	ND	0.002	0.0026	0.002	ND	0.002	ND	0.002	ND
Nitrogen/Nitrate	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.1	0.11	0.1	ND	0.1	ND	0.1	ND
Nitrogen/Nitrate, Nit	0.10	ND	0.10	ND^	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	0.31	0.10	ND	0.10	ND	0.10	ND	0.1	0.14	0.1	ND	0.1	ND	0.1	ND
Nitrogen/Nitrite	0.020	0.048	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	0.024	0.020	ND	0.020	ND	0.040	0.22	0.020	ND	0.020	ND	0.020	ND	0.02	0.027	0.02	ND	0.02	ND	0.02	ND
Perchlorate	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND ^
Selenium	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND F1	0.0025	ND	0.0025	ND ^	0.0025	ND ^	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND ^	0.0005	ND	0.0005	ND
Sulfate	100	310	100	420	100	450	100	530	100	390	100	750	100	580	100	570	100	600	100	300	100	550	100	450	100	520	100	370	100	610	250	660
Thallium	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Soli	10	1100	10	1000	10	1300	10	1400	10	1300	10	1400	10	1300	10	1300	10	1700	10	1300	10	1200	10	1200	10	1400	10	1100	10	1300	10	1600
Vanadium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND ^	0.005	ND	0.005	ND	0.005	ND
Zinc	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND ^	0.020	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	0.0013	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0061	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.00056	0.0025	0.0011	0.0025	0.00067
pH	NA	7.37	NA	7.33	NA	7.61	NA	7.49	NA	7.43	NA	7.12	NA	7.96	NA	7.28	NA	7.06	NA	7.34	NA	7.54	NA	7.47	NA	7.34	NA	7.38	NA	7.20	NA	8.12
Temperature	NA	22.71	NA	16.37	NA	6.11	NA	18.19	NA	19.48	NA	14.85	NA	9.04	NA	15.14	NA	24.40	NA	17.01	NA	11.48	NA	14.00	NA	17.30	NA	14.47	NA	9.07	NA	23.82
Conductivity	NA	1.69	NA	1.55	NA	1.24	NA	1.76	NA	1.74	NA	1.59	NA	1.29	NA	1.55	NA	1.91	NA	1.39	NA	1.34	NA	1.29	NA	1.48	NA	1.27	NA	1.13	NA	1.59
Dissolved Oxygen	NA	0.36	NA	0.36	NA	1.29	NA	1.87	NA	1.13	NA	1.49	NA	1.31	NA	2.73	NA	2.81	NA	1.51	NA	1.68	NA	3.77	NA	0.87	NA	1.33	NA	1.54	NA	4.53
ORP	NA	-49.2	NA	6.0	NA	-80.6	NA	-55.7	NA	-109.9	NA	36.6	NA	-134	NA	-91.4	NA	8.9	NA	-110.1	NA	1.9	NA	-74.9	NA	-59.0	NA	-96.9	NA	-23.0	NA	-38.9

Parameter	8/9/2018 DL	8/9/2018 Result	11/1/2018 DL	11/1/2018 Result	2/27/2019 DL	2/27/2019 Result	5/1/2019 DL	5/1/2019 Result	8/28/2019 DL	8/28/2019 Result	11/14/2019 DL	11/14/2019 Result	2/26/2020 DL	2/26/2020 Result	4/29/2020 DL	4/29/2020 Result	8/12/2020 DL	8/12/2020 Result	12/8/2020 DL	12/8/2020 Result	2/25/2021 DL	2/25/2021 Result	5/13/2021 DL	5/13/2021 Result	8/25/2021 DL	8/25/2021 Result	12/1/2021 DL	12/1/2021 Result
Antimony	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.001	0.0057	0.001	0.0063	0.001	0.0015	0.001	0.002	0.001	0.0045	0.001	0.01	0.001	ND	0.001	ND ^	0.001	0.0059	0.001	0.0079	0.001	ND	0.001	ND	0.001	0.0049	0.001	0.011
Barium	0.0025	0.061	0.0025	0.058	0.0025	0.044	0.0025	0.052	0.0025	0.057	0.0025	0.058	0.0025	0.028	0.0025	0.035	0.0025	0.051	0.0025	0.053	0.0025	0.031	0.0025	0.053	0.0025	0.036	0.0025	0.041
Beryllium	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND ^1+	0.001	ND ^+	0.001	ND	0.001	ND	0.001	ND
Boron	0.05	0.67	0.05	0.64	0.05	0.4	0.05	0.44	0.05	0.57	0.05	0.67	0.05	0.24	0.05	0.37	0.05	0.5	0.05	0.56	0.05	0.31	0.05	0.34	0.05	0.49	0.05	0.5
Cadmium	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	10	180	10	150	10	160	10	170	10	180	10	150	10	140	10	150 F1	10	150	10	160	10	130	10	140	10	130	10	120
Chromium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.005	ND	0.005	ND *	0.005	ND	0.005	ND	0.005	ND	0.005	ND *-
Fluoride	0.1	0.45	0.1	0.48	0.1	0.44	0.1	0.38	0.1	0.41	0.1	0.47	0.1	0.31	0.1	0.34	0.1	0.48	0.1	0.57	0.1	0.27	0.1	0.19	0.1	0.44	0.1	0.5
Iron	0.1	1.1	0.1	0.23	0.1	0.88	0.1	0.94	0.1	1	0.1	0.92	0.1	0.28	0.1	0.64	0.1	1.7	0.1	0.77	0.1	0.61	0.1	0.69	0.1	0.66	0.1	0.57
Lead	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.0025	0.77	0.0025	0.84	0.0025	0.11	0.0025	0.042	0.0025	0.42	0.0025	0.69	0.0025	0.029	0.0025	0.043	0.0025	0.52	0.0025	0.55	0.0025	0.046	0.0025	0.079	0.0025	0.36	0.0025	0.52
Mercury	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.002	0.0024	0.002	0.002	0.002	0.0029	0.002	ND	0.002	0.0043	0.002	0.0028	0.002	ND	0.002	ND	0.002	ND	0.002	0.002	0.002	ND	0.002	ND	0.002	0.0021	0.002	ND
Nitrogen/Nitrate	0.1	1	0.1	0.27	0.1	ND	0.1	ND	0.1	0.13	0.1	ND	0.1	ND	0.1	ND	0.1	0.98	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen/Nitrate, Nit	0.1	1	0.1	0.72	0.1	ND	0.1	ND	0.1	0.13	0.1	ND	0.1	ND ^	0.1	ND	0.1	0.98	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen/Nitrite	0.02	ND	0.1	0.45	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Perchlorate	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0025	0.0025	ND ^	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	100	360	100	260	20	390	20	360	20	390	20	360 F1	20	250	50	350	100	370	50	320	100	270	50	340	50	220	25	180 ^-
Thallium	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Soli	10	1200	10	1100	10	1000	10	1000	10	1200	10	1100	10	800	10	1000	60	1000	10	920	10	850	10	920	10	600	10	740
Vanadium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND ^	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	ND	0.0025	0.00259	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	7.42	NA	7.70	NA	7.43	NA	7.68	NA	7.37	NA	7.61	NA	8.00	NA	7.96	NA	7.18	NA	7.36	NA	7.91	NA	7.39	NA	7.43	NA	7.38
Temperature	NA	20.87	NA	13.39	NA	12.20	NA	14.00	NA	15.10	NA	14.41	NA	8.80	NA	10.00	NA	13.20	NA	14.00	NA	9.90	NA	11.10	NA	14.10	NA	14.60
Conductivity	NA	1.57	NA	1.19	NA	1.60	NA	0.99	NA	1.70	NA	1.52	NA	1.16	NA	1.33	NA	0.63	NA	0.29	NA	0.95	NA	1.45	NA	1.30	NA	1.22
Dissolved Oxygen	NA	5.89	NA	6.50	NA	0.05	NA	0.25	NA	0.57	NA	1.10	NA	0.18	NA	0.24	NA	3.94	NA	0.16	NA	0.45	NA	0.18	NA	0.34	NA	0.51
ORP	NA	-32.6	NA	-11.6	NA	-110.4	NA	-179.2	NA	-0.3	NA	-60.7	NA	-193.5	NA	-220.4	NA	-79.4	NA	-78.8	NA	-160.7	NA	-70.4	NA	67.0	NA	-119.3

Notes: Standards obtained from IAC, Title 35, Chapter I, Part 620, Subpart D, Section 620.410 - Groundwater Quality Standards for Class I: Potable Resource Groundwater
All values are in mg/L (ppm) unless otherwise noted.
DL - Detection limit
NA - Not Applicable
ND - Not Detected
NM - Not Measured
NR - Not Required
NS - Not Sampled
H - Prepped/analyzed past hold time
V - Serial Dilution Exceeds Control Limits
F1- MS and/or MSD Recovery outside of limits.
F2- MS/MSD RPD exceeds control limits.
^1+ - Initial Calibration Verification is outside acceptance limits, high biased
^+ - Continuing Calibration Verification is outside acceptance limits, high biased
^ - Denotes instrument related QC exceeds the control limits
* - Median Value (for temp)
* - LCS or LCSD is outside acceptance limits
Temperature °C degrees Celcius
Conductivity ms/cm^{c} millisiemens/centimeters
Dissolved Oxygen mg/L milligrams/liter
Oxygen Reduction Potential (ORP) mV millivolts

Attachment 9-4. Table. CCA Groundwater Analytical Results - Midwest Generation LLC, Powerton Station, Pekin, IL

Sample: MW-13	Date	12/15/2010		2/15/2011		4/25/2011		6/16/2011		8/9/2011		10/13/2011	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	NP	ND	NP	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.010	NP	0.011	NP	0.0069	0.001	0.0063	0.001	0.0057	0.001	0.0048	0.001	0.0066
Barium	2.0	NP	0.11	NP	0.052	0.001	0.073	0.001	0.059	0.001	0.046	0.001	0.083
Beryllium	0.004	NP	ND	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Boron	2.0	NP	3.9	NP	3.1	0.01	2.6	0.012	3.0	0.01	2.7	0.01	3.0
Cadmium	0.005	NP	ND	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Chloride	200.0	NP	160	NP	120	25	100	25	86	25	110	25	110
Chromium	0.1	NP	0.0062	NP	0.0042	0.004	0.0045	0.004	ND	0.004	ND	0.004	0.01
Cobalt	1.0	NP	0.0031	NP	0.0026	0.002	0.0023	0.002	0.0022	0.002	0.0031	0.002	ND
Copper	0.65	NP	0.0068	NP	0.0037	0.003	0.0041	0.003	0.004	0.003	0.004	0.003	0.0055
Cyanide	0.2	NP	ND	NP	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Fluoride	4.0	NP	0.28	NP	0.29	0.25	0.31	0.25	0.44	0.25	0.38	0.25	0.30
Iron	5.0	NP	0.69	NP	0.052	0.010	0.077	0.010	ND	0.010	0.043	0.010	ND
Lead	0.0075	NP	ND	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Manganese	0.15	NP	5	NP	3.8	0.001	2.7	0.001	2.9	0.001	2.6	0.001	3.6
Mercury	0.002	NP	ND	NP	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.1	NP	0.03	NP	0.023	0.005	0.021	0.005	0.018	0.005	0.016	0.005	0.015
Nitrogen/Nitrate	10.0	NP	0.14	NP	1.3	0.02	1.8	0.20	2.2	0.50	3.6	0.02	1.6
Nitrogen/Nitrate, Nit	NA	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Nitrogen/Nitrite	NA	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Perchlorate	0.0049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Selenium	0.05	NP	0.0046	NP	0.0046	0.001	0.0045	0.001	0.0029	0.001	0.0056	0.001	0.004
Silver	0.05	NP	ND	NP	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Sulfate	400.0	NP	1400	NP	770	250	580	100	540	100	440	250	660
Thallium	0.002	NP	ND	NP	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Total Dissolved Solic	1,200	NP	2600	NP	1600	17	1400	17	1300	17	1100	17	1500
Vanadium	0.049	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Zinc	5.0	NP	ND	NP	ND	0.006	ND	0.006	ND	0.006	ND	0.006	0.06
Benzene	0.005	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
BETX	11.705	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
pH	6.5 - 9.0	NA	7.68	NA	7.53	NA	7.26	NA	6.75	NA	7.13	NA	7.31
Temperature	NA	NA	12.59	NA	13.82	NA	14.40	NA	16.84	NA	15.92	NA	14.87
Conductivity	NA	NA	3.33	NA	2.15	NA	1.92	NA	1.79	NA	1.63	NA	1.59
Dissolved Oxygen	NA	NA	NM	NA	NM	NA	NM	NA	NM	NA	NM	NA	NM
ORP	NA	NA	NM	NA	NM	NA	NM	NA	NM	NA	NM	NA	NM

Sample: MW-13	12/12/2011		4/10/2012		12/14/2012		2/28/2013		5/30/2013		7/30/2013		10/22/2013		3/4/2014		5/28/2014	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.003	ND	0.003	ND	0.0050	ND	0.003	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.001	0.023	0.001	0.027	0.0050	0.041	0.001	0.029	0.0010	0.031	0.0010	0.029	0.0010	0.024	0.0010	0.028	0.0010	0.024
Barium	0.001	0.21	0.001	0.14	0.0020	0.3	0.001	0.19	0.0025	0.23	0.0025	0.23	0.0025	0.16	0.0025	0.21	0.0025	0.22
Beryllium	0.001	ND	0.001	ND	0.0010	ND	0.001	ND	0.0010	ND ^	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Boron	0.01	4.1	0.01	4.0	1.0	3.6	0.01	4.2	0.050	1.6	0.050	3.8	0.050	3.5	0.050	2.9	0.25	3.5
Cadmium	0.001	ND	0.001	ND	0.0010	ND	0.001	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	100	180	50	170	50	210	50	170	10	190	10	190	10	180	10	190	10	180
Chromium	0.004	0.0055	0.004	0.0055	0.0030	0.011	0.004	0.0057	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND ^	0.0050	ND
Cobalt	0.002	ND	0.002	ND	0.0030	ND	0.002	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.003	0.0066	0.003	0.0068	0.010	ND	0.003	0.0037	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND ^	0.0020	ND
Cyanide	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	0.25	ND	0.25	0.32	0.25	ND	0.25	ND	0.10	0.39	0.10	0.39	0.10	0.39	0.10	0.36	0.10	0.35
Iron	0.010	0.11	0.010	0.20	0.010	0.066	0.01	0.28	0.10	1.3	0.10	1.6	0.10	0.29	0.10	1.8	0.10	0.74
Lead	0.001	ND	0.001	ND	0.0050	ND	0.001	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.001	3.5	0.001	3.5	0.0020	3.7	0.001	3.5	0.0025	3.8	0.0025	4.0	0.0025	2.8	0.0025	2.9	0.0025	3.4
Mercury	0.0002	ND	0.0002	ND	0.00020	ND	0.0002	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.005	0.022	0.005	0.02	0.010	ND	0.005	0.011	0.0020	ND	0.0020	0.0027	0.0020	0.0024	0.0020	ND	0.0020	ND
Nitrogen/Nitrate	0.02	0.07	0.02	0.06	0.02	ND	0.02	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrate, Nit	NR	NR	NR	NR	NR	NR	NR	NR	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrite	NR	NR	NR	NR	NR	NR	NR	NR	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Perchlorate	NR	NR	NR	NR	NR	NR	NR	NR	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND
Selenium	0.001	0.0036	0.001	0.0037	0.0050	ND	0.001	0.0025	0.0025	0.010	0.0025	0.0095	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.005	ND	0.005	ND	0.010	ND	0.005	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	250	1100	500	1100	500	1100	250	730	250	880	250	1000	250	690	250	660	250	630
Thallium	0.001	ND	0.001	ND	0.0010	ND	0.001	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Solic	17	2100	17	2300	26	1900	26	1600	10	2000	10	2000	10	1700	10	1900	10	2100
Vanadium	NR	NR	NR	NR	0.0080	ND	0.005	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Zinc	0.006	ND	0.006	ND	0.020	ND	0.006	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	NR	NR	NR	NR	0.005	ND	0.005	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
BETX	NR	NR	NR	NR	0.03	ND	0.03	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	7.19	NA	8.49	NA	7.92	NA	8.26	NA	7.65	NA	7.61	NA	7.81	NA	8.67	NA	7.73
Temperature	NA	13.78	NA	14.90	NA	14.88	NA	14.00	NA	18.10	NA	16.26	NA	12.38	NA	12.91	NA	23.09
Conductivity	NA	2.33	NA	2.89	NA	2.15	NA	2.05	NA	2.12	NA	2.13	NA	1.83	NA	1.72	NA	2.63
Dissolved Oxygen	NA	NM	NA	NM	NA	3.54	NA	1.69	NA	1.16	NA	0.27	NA	0.94	NA	0.99	NA	0.93
ORP	NA	NM	NA	NM	NA	-20	NA	134	NA	-177.9	NA	-171.2	NA	-189.1	NA	-190.9	NA	-44.7

Sample: MW-13	8/27/2014		10/29/2014		2/26/2015		5/13/2015		8/19/2015		11/19/2015		2/24/2016		5/19/2016		8/18/2016	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.0010	0.031	0.0010	0.028	0.0010	0.028	0.0010	0.033	0.0010	0.030	0.0010	0.027	0.0010	0.027	0.0010	0.033	0.0010	0.027
Barium	0.0025	0.21	0.0025	0.24	0.0025	0.24	0.0025	0.27	0.0025	0.25	0.0025	0.14	0.0025	0.23	0.0025	0.12	0.0025	0.23
Beryllium	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0050	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Boron	0.050	3.0	0.050	2.2	0.25	3.5	0.50	3.8	0.25	3.6	0.050	3.2	0.50	3.7	0.050	2.9	0.050	3.0
Cadmium	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	10	190	10	180	10	180	10	180	10	190	10	170 F1	10	180	10	170	10	180
Chromium	0.0050	ND	0.0050	ND	0.0050	ND	0.010	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.0020	ND ^	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	0.10	0.40	0.10	0.40	0.10	0.37	0.10	0.39	0.10	0.34	0.10	0.37	0.10	0.38	0.10	0.36	0.10	0.35
Iron	0.10	0.63	0.10	0.98	0.10	0.69	0.10	0.92	0.10	1.0	0.10	0.85	0.10	1.0	0.10	0.88	0.10	1.0
Lead	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.0025	3.5	0.0025	3.8	0.0025	3.8	0.0025	3.9	0.025	4.7	0.0025	4.3	0.0025	4.5	0.0025	4.4	0.0025	4.9
Mercury	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.0020	ND	0.0020	0.0020	0.0020	0.0040	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	0.0035	0.0020	ND	0.0020	ND
Nitrogen/Nitrate	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrate, Nit	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Nitrogen/Nitrite	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Perchlorate	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND
Selenium	0.0025	0.0047	0.0025	0.0045	0.0025	ND	0.0025	0.012	0.0025	0.0066	0.0025	0.0031	0.0025	0.0036	0.0025	0.011	0.0025	0.0043
Silver	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	250	740	250	1400	250	1000	250	1100	250	1300	250	1700	500	1300	500	1200	500	1500
Thallium	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Solic	10	2300	10	2200	10	2300	10	2600	10	2500	10	2400	10	2600	10	2800	10	3300
Vanadium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Zinc	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	0.001	0.00050	ND	0.00050	ND	0.00050	ND
BETX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0033	0.0025	ND	0.0025	0.00069	0.0025	ND
pH	NA	7.82	NA	7.72	NA	8.20	NA	7.99	NA	8.03	NA	7.57	NA	7.67	NA	7.60	NA	7.53
Temperature	NA	20.49	NA	13.90	NA	9.51	NA	16.67	NA	19.27	NA	12.62	NA	9.43	NA	17.47	NA	25.95
Conductivity	NA	2.50	NA	3.41	NA	2.11	NA	2.78	NA	2.91	NA	2.36	NA	2.21	NA	2.81	NA	3.48
Dissolved Oxygen	NA	0.34	NA	0.84	NA	1.60	NA	1.10	NA	1.20	NA	0.96	NA	1.56	NA	1.02	NA	1.79
ORP	NA	-128.5	NA	-140.4	NA	-161.4	NA	-175.5	NA	-153.2	NA	-76.2	NA	-137.5	NA	-147.5	NA	-195.8

Sample: MW-13	11/17/2016		2/17/2017		5/4/2017		8/24/2017		11/9/2017		3/7/2018		5/16/2018		8/9/2018		10/31/2018		2/28/2019		5/2/2019	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.0030	ND	0.0060	ND	0.0030	ND	0.003	0.0034	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.0010	0.028	0.0050	0.024	0.0010	0.028	0.001	0.022	0.001	0.022	0.001	0.022	0.001	0.024	0.001	0.024	0.001	0.022	0.001	0.022	0.001	0.024
Barium	0.0025	0.094	0.013	0.14	0.0025	0.075	0.0025	0.22	0.0025	0.17	0.0025	0.1	0.0025	0.16	0.0025	0.26	0.0025	0.1	0.0025	0.17	0.0025	0.12
Beryllium	0.0010	ND	0.0020	ND ^	0.0010	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Boron	0.50	3.7	0.10	3.0	0.25	3.0	0.25	3	0.05	2.4	0.5	3.3	0.5	3.1	0.5	3	0.05	2.7	0.05	2.4	0.25	3.2
Cadmium	0.00050	ND	0.0010	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	10	160	10	170	10	170	10	170 F1	10	190	10	86	10	170	10	180	10	170	10	160	10	160
Chromium	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.0010	ND	0.0020	ND	0.0010	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.0020	ND	0.0040	ND ^	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.010	ND	0.010	ND	0.010	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND
Fluoride	0.10	0.34	0.10	0.31	0.10	0.29	0.1	0.34	0.1	0.35	0.1	0.29	0.1	0.35	0.1	0.34	0.1	0.35	0.1	0.35	0.1	0.34
Iron	0.10	0.96	0.10	0.67	0.10	2.1	0.1	0.77	0.1	0.73	0.1	0.61	0.1	0.79	0.1	0.67	0.1	0.72	0.1	0.76	0.1	0.64
Lead	0.00050	ND	0.0010	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.0025	5.0	0.0025	4.5	0.025	5.2	0.0025	4.1	0.0025	3.6	0.0025	2.7	0.0025	4.3	0.0025	3.7	0.0025	3.8	0.0025	3.9	0.0025	3.8
Mercury	0.00020	ND	0.00020	ND	0.00020	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.0020	ND	0.0040	ND	0.0020	0.0048	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Nitrogen/Nitrate	0.10	ND	0.10	ND	0.10	0.25	0.1	ND	0.1	0.31	0.1	0.24	0.1	ND	0.1	1.1	0.1	0.21	0.1	ND	0.1	ND
Nitrogen/Nitrate, Nit	0.10	ND	0.10	ND	0.10	0.30	0.1	ND	0.1	0.31	0.1	0.24	0.1	ND	0.1	1.1	0.1	0.21	0.1	ND	0.1	ND
Nitrogen/Nitrite	0.020	ND	0.020	ND	0.020	0.047	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Perchlorate	0.0040	ND	0.0040	ND	0.0040	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND ^	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.0025	ND	0.0050	ND ^	0.0025	0.019	0.0025	0.0058	0.0025	0.004	0.0025	0.0046	0.0025	0.015	0.0025	0.0048	0.0025	0.01	0.0025	0.006	0.0025	ND
Silver	0.00050	ND	0.0010	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	500	1700	500	1700	500	1800	500	1600	500	1500	100	340	500	1600	500	1300	500	950	1000	1700	40	1500
Thallium	0.0020	ND	0.0040	ND	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Solic	10	3400	10	3500	10	3500	13	3000	10	2800	10	1100	10	3400	10	2900	13	3100	13	3000	10	2800
Vanadium	0.0050	ND	0.0050	ND	0.0050	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	0.020	ND	0.040	ND ^	0.020	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	0.0015	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.00086	0.0025	0.0015	0.0025	0.00086	0.0025	0.0079	0.0025	0.00075	0.0025	ND	0.0025	ND
pH	NA	7.65	NA	7.87	NA	7.82	NA	7.78	NA	7.49	NA	7.37	NA	8.33	NA	7.60	NA	8.29	NA	7.74	NA	7.71
Temperature	NA	20.32	NA	15.28	NA	11.67	NA	15.30	NA	12.33	NA	9.41	NA	20.13	NA	18.37	NA	14.94	NA	12.50	NA	13.60
Conductivity	NA	3.12	NA	3.05	NA	2.68	NA	2.98	NA	2.53	NA	1.41	NA	2.78	NA	2.80	NA	2.68	NA	3.69	NA	2.25
Dissolved Oxygen	NA	1.13	NA	1.76	NA	4.03	NA	0.82	NA	4.63	NA	2.70	NA	1.05	NA	5.16	NA	5.01	NA	0.04	NA	0.18
ORP	NA	-81.0	NA	-93.1	NA	-151.5	NA	-141.2	NA	-123.3	NA	-120.4	NA	-147.5	NA	-167.4	NA	-132.7	NA	-153.9	NA	-176.9

Sample: MW-13	8/28/2019		11/14/2019		2/26/2020		4/30/2020		8/11/2020		12/10/2020		2/24/2021		5/13/2021		8/23/2021		11/30/2021	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.001	0.022	0.001	0.024	0.001	0.02	0.001	0.027	0.001	0.022	0.001	0.022	0.001	0.023	0.001	0.023	0.001	0.022	0.001	0.023
Barium	0.0025	0.14	0.0025	0.095	0.0025	0.1	0.0025	0.17	0.0025	0.14	0.0025	0.19	0.0025	0.18	0.0025	0.21	0.0025	0.17	0.0025	0.2
Beryllium	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND ^1+	0.001	ND ^+	0.001	ND	0.001	ND	0.001	ND
Boron	0.25	2.7	0.5	2.9	0.5	2.5	0.05	2.8	0.5	3.1	0.25	1.4	0.25	2.8	0.5	3.2	0.5	2.8	0.5	2.6
Cadmium	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	10	160	10	150	10	150	10	140	10	160	10	140	10	130	10	130	10	120	10	110
Chromium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND *-
Fluoride	0.1	0.3	0.1	0.35	0.1	0.36	0.1	0.39	0.1	0.34	0.1	0.41	0.1	0.38	0.1	0.38	0.1	0.36	0.1	0.36
Iron	0.1	0.93	0.1	0.79	0.1	1	0.1	0.91	0.1	1.3	0.1	1.3	0.1	1	0.1	0.87	0.1	1	0.1	0.8
Lead	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.0025	4.1	0.0025	4.4	0.0025	4.1	0.0025	3.9	0.0025	4.8	0.0025	4.4	0.0025	4.1	0.0025	3.4	0.0025	3.9	0.0025	3.4
Mercury	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	0.003	0.002	ND
Nitrogen/Nitrate	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen/Nitrate, Nit	0.1	ND	0.1	ND	0.1	ND ^	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Nitrogen/Nitrite	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Perchlorate	0.008	ND	0.008	ND	0.008	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.008	ND	0.008	ND	0.008	ND
Selenium	0.0025	ND	0.0025	0.017	0.0025	ND	0.0025	0.029	0.0025	0.0093	0.0025	ND	0.0025	0.011	0.0025	ND	0.0025	0.0084	0.0025	0.011
Silver	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	40	1700	50	1500	50	1300	50	1300 ^	250	1600	250	1300	250	1400	250	1500	250	1100	130	1000
Thallium	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Solic	10	2800	10	2800	10	2500	10	2600	150	2700	10	2300	10	2500	10	2600	10	1900	10	2100
Vanadium	0.005	ND	0.005	ND	0.005	ND	0.005	ND ^	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BETX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	7.71	NA	8.11	NA	7.75	NA	7.66	NA	7.43	NA	7.62	NA	7.79	NA	7.86	NA	7.72	NA	7.79
Temperature	NA	13.90	NA	12.68	NA	13.20	NA	14.10	NA	14.80	NA	14.30	NA	14.00	NA	14.80	NA	15.60	NA	14.30
Conductivity	NA	0.23	NA	3.24	NA	0.53	NA	0.36	NA	3.47	NA	3.27	NA	2.75	NA	3.25	NA	3.20	NA	3.01
Dissolved Oxygen	NA	0.30	NA	8.63	NA	0.18	NA	0.19	NA	7.18	NA	1.91	NA	0.44	NA	0.24	NA	0.14	NA	0.20
ORP	NA	-171.5	NA	-123.8	NA	-232.8	NA	-226.3	NA	-180.5	NA	-218.5	NA	-182.0	NA	-160.2	NA	-149.0	NA	-133.3

Notes: Standards obtained from IAC, Title 35, Chapter I, Part 620, Subpart D, Section 620.410 - Groundwater Quality Standards for Class I: Potable Resource Groundwater
All values are in mg/L (ppm) unless otherwise noted.

DL - Detection limit
NA - Not Applicable
ND - Not Detected
NM - Not Measured

NR - Not Required
NS - Not Sampled
H - Prepped/analyzed past hold time
V - Serial Dilution Exceeds Control Limits

F1- MS and/or MSD Recovery outside of limi…
F2- MS/MSD RPD exceeds control limits.
^1+ - Initial Calibration Verification is outside …
^+ - Continuing Calibration Verification is out…

Attachment 9-4. Table. CCA Groundwater Analytical Results - Midwest Generation LLC, Powerton Station, Pekin, IL

Sample: MW-16	Date	12/15/2010		2/15/2011		4/25/2011		6/16/2011		8/9/2011		10/13/2011		12/12/2011		4/10/2012	
Parameter	Standards	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.006	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Arsenic	0.010	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Barium	2.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Beryllium	0.004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Boron	2.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Cadmium	0.005	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Chloride	200.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Chromium	0.1	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Cobalt	1.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Copper	0.65	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Cyanide	0.2	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Fluoride	4.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Iron	5.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Lead	0.0075	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Manganese	0.15	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Mercury	0.002	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Nickel	0.1	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Nitrogen/Nitrate	10.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Nitrogen/Nitrate, Nit	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Nitrogen/Nitrite	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Perchlorate	0.0049	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Selenium	0.05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Silver	0.05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Sulfate	400.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Thallium	0.002	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Total Dissolved Solids	1,200	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Vanadium	0.049	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Zinc	5.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Benzene	0.005	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
BTEX	11.705	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
pH	6.5 - 9.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Temperature	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Conductivity	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Dissolved Oxygen	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
ORP	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Sample: MW-16	12/12/2012		2/27/2013		5/29/2013		7/29/2013		10/22/2013		3/3/2014		5/30/2014		8/26/2014		10/30/2014	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.0050	ND	0.003	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.0050	ND	0.001	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Barium	0.020	0.039	0.001	0.042	0.0025	0.038	0.0025	0.035	0.0025	0.037	0.0025	0.060	0.0025	0.036	0.0025	0.035	0.0025	0.034
Beryllium	0.0010	ND	0.001	ND	0.0010	ND ^	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Boron	0.20	ND	0.01	0.13	0.050	0.20	0.050	0.26	0.050	0.35	0.050	0.17	0.050	0.17	0.050	0.15	0.050	0.14
Cadmium	0.0010	ND	0.001	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	10	26	10	18	2.0	19	2.0	21	2.0	35	10	230	2.0	20	2.0	25	2.0	24
Chromium	0.0030	0.0047	0.004	0.0052	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND^	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	0.0030	ND	0.002	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.010	ND	0.003	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND^	0.0020	ND	0.0020	ND ^	0.0020	ND
Cyanide	0.0050	ND	0.005	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	0.25	ND	0.25	ND	0.10	ND	0.10	0.11	0.10	0.11	0.10	ND	0.10	0.11	0.10	0.11	0.10	0.10
Iron	0.010	0.012	0.01	0.019	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Lead	0.0050	ND	0.001	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.0020	0.022	0.001	0.0053	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0035	0.0025	ND	0.0025	ND	0.0025	ND
Mercury	0.00020	ND	0.0002	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.010	ND	0.005	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Nitrogen/Nitrate	0.50	18	0.5	23	0.10	20	0.10	13	0.10	19	0.10	16	0.10	21	0.10	22	0.10	28
Nitrogen/Nitrate, Nit	NR	NR	NR	NR	2.5	20	2.5	13	1.0	19	2.0	16	2.5	21	2.0	22	2.5	28
Nitrogen/Nitrite	NR	NR	NR	NR	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Perchlorate	NR	NR	NR	NR	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND
Selenium	0.0050	ND	0.001	0.0015	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.010	ND	0.005	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	10	37	10	31	20	50	20	55	20	55	10	34	10	40	10	35	10	54
Thallium	0.0010	ND	0.001	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Solids	26	520	26	420	10	460	10	440	10	540	10	800	10	390	10	440	10	510
Vanadium	0.0080	ND	0.005	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND^	0.0050	ND	0.0050	ND	0.0050	ND
Zinc	0.020	ND	0.006	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	0.005	ND	0.005	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
BTEX	0.03	ND	0.03	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	7.38	NA	8.31	NA	7.10	NA	7.18	NA	7.27	NA	7.85	NA	7.20	NA	7.41	NA	7.30
Temperature	NA	12.84	NA	13.10	NA	15.29	NA	16.61	NA	12.74	NA	9.98	NA	17.83 *	NA	22.10	NA	13.09
Conductivity	NA	0.61	NA	1.17	NA	0.60	NA	0.59	NA	0.63	NA	0.89	NA	0.88	NA	0.75	NA	0.94
Dissolved Oxygen	NA	9.54	NA	8.53	NA	6.78	NA	4.91	NA	6.24	NA	6.50	NA	6.99	NA	6.84	NA	2.05
ORP	NA	110	NA	-38	NA	70.2	NA	24.7	NA	-83.4	NA	315.3	NA	74.8	NA	36.7	NA	-2.7

Sample: MW-16	2/24/2015		5/12/2015		8/18/2015		11/16/2015		2/24/2016		5/16/2016		8/19/2016		11/16/2016	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND	0.0030	ND
Arsenic	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Barium	0.0025	0.038	0.0025	0.037	0.0025	0.039	0.0025	0.038	0.0025	0.043	0.0025	0.043	0.0025	0.039	0.0025	0.041
Beryllium	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Boron	0.050	0.17	0.050	0.15	0.050	0.25	0.050	1.0	0.050	0.63	0.050	0.23	0.050	0.19	0.050	0.18
Cadmium	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Chloride	2.0	24	2.0	29	2.0	29	2.0	33	2.0	45	2.0	33	2.0	33	2.0	26
Chromium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Cobalt	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND	0.0010	ND
Copper	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Cyanide	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND
Fluoride	0.10	0.10	0.10	0.11	0.10	0.10	0.10	0.11	0.10	0.11	0.10	0.10	0.10	0.10	0.10	ND
Iron	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND
Lead	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Manganese	0.0025	0.0025	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0059
Mercury	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND	0.00020	ND
Nickel	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Nitrogen/Nitrate	0.10	28	0.10	24	0.10	19	0.10	17	0.10	16	0.10	22	0.10	25	0.10	27
Nitrogen/Nitrate, Nit	2.0	28	2.0	24	2.0	19	1.0	17	1.0	16	2.0	22	2.0	25	2.0	27
Nitrogen/Nitrite	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Perchlorate	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND	0.0040	ND
Selenium	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND ^
Silver	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
Sulfate	10	27	10	33	20	64	25	57	10	50	10	40	10	43	10	38
Thallium	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND	0.0020	ND
Total Dissolved Solids	10	490	10	530	10	540	10	460	10	510	10	530	10	620	10	540
Vanadium	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND
Zinc	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND	0.020	ND
Benzene	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND	0.00050	ND
BTEX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0011	0.0025	ND	0.0025	0.0018	0.0025	ND	0.0025	ND
pH	NA	7.56	NA	7.35	NA	7.19	NA	6.78	NA	7.23	NA	7.13	NA	7.09	NA	6.93
Temperature	NA	8.21	NA	12.56	NA	19.75	NA	13.05	NA	9.13	NA	14.63	NA	22.11	NA	16.10
Conductivity	NA	0.57	NA	0.67	NA	0.80	NA	0.62	NA	0.59	NA	0.68	NA	0.80	NA	0.67
Dissolved Oxygen	NA	8.44	NA	7.97	NA	7.43	NA	7.61	NA	7.95	NA	8.26	NA	7.50	NA	6.51
ORP	NA	95.6	NA	105.0	NA	-9.1	NA	188.1	NA	43.3	NA	57.0	NA	67.0	NA	17.0

Sample: MW-16	2/15/2017		5/2/2017		8/23/2017		11/9/2017		3/8/2018		5/17/2018		8/8/2018		10/31/2018		2/27/2019		5/2/2019	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.0030	ND	0.0030	ND	0.003	0.0031	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.0010	ND ^	0.0010	ND	0.001	0.004	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Barium	0.0025	0.040	0.0025	0.039	0.0025	0.039	0.0025	0.045	0.0025	0.041	0.0025	0.041	0.0025	0.038	0.0025	0.041	0.0025	0.045	0.0025	0.039
Beryllium	0.0010	ND ^	0.0010	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Boron	0.050	0.17	0.050	0.14	0.05	0.14	0.05	0.19	0.05	0.13	0.05	0.14	0.05	0.15	0.05	0.18	0.05	0.17	0.05	0.2
Cadmium	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	2.0	29	2.0	33	2	22	2	29	2	28	2	23	2	23	2	24	2	25	2	22
Chromium	0.0050	ND	0.0050	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.0010	ND	0.0010	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.0020	ND	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.010	ND	0.010	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND
Fluoride	0.10	ND	0.10	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Iron	0.10	ND	0.10	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	0.23	0.1	ND
Lead	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.028	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.014	0.0025	ND
Mercury	0.00020	ND	0.00020	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.0020	ND	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Nitrogen/Nitrate	0.10	23	0.10	27	0.1	22	0.1	24	0.1	26	0.1	25	0.1	24	0.1	22	0.1	23	0.1	20
Nitrogen/Nitrate, Nit	2.5	23	2.5	27	2	22	2	24	2	26	2	25	2	24	2	22	2.5	23	2.5	20
Nitrogen/Nitrite	0.020	ND	0.020	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Perchlorate	0.0040	ND	0.0040	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND ^	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.0025	ND ^	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.00050	ND	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	10	33	10	43	10	34	20	38	20	41	20	30	10	29	10	25	25	36	5	33
Thallium	0.0020	ND	0.0020	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Solids	10	520	10	560	10	460	10	530	10	530	10	540	10	470	10	590	10	520	10	550
Vanadium	0.0050	ND	0.0050	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	0.020	ND ^	0.020	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.00050	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	0.00056	0.0005	ND	0.0005	ND	0.0005	ND
BTEX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0014	0.0025	0.0009	0.0025	0.00866	0.0025	0.0021	0.0025	ND	0.0025	ND
pH	NA	6.72	NA	7.14	NA	7.44	NA	6.95	NA	6.93	NA	6.76	NA	7.19	NA	7.85	NA	7.00	NA	6.94
Temperature	NA	9.78	NA	13.99	NA	16.10	NA	13.06	NA	6.81	NA	17.97	NA	18.67	NA	14.83	NA	12.30	NA	12.40
Conductivity	NA	0.61	NA	0.65	NA	0.67	NA	0.66	NA	0.53	NA	0.67	NA	0.67	NA	0.63	NA	0.89	NA	0.53
Dissolved Oxygen	NA	8.00	NA	8.04	NA	7.63	NA	8.10	NA	7.53	NA	8.80	NA	8.26	NA	8.59	NA	8.16	NA	6.89
ORP	NA	214.2	NA	39.1	NA	170.0	NA	-34.3	NA	-16.9	NA	12.8	NA	5.4	NA	2.4	NA	81.3	NA	75.8

Sample: MW-16	8/27/2019		11/14/2019		2/25/2020		4/27/2020		8/11/2020		12/10/2020		2/23/2021		5/10/2021		8/25/2021		11/30/2021	
Parameter	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Result
Antimony	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND	0.003	ND
Arsenic	0.001	ND	0.001	ND F1	0.001	ND	0.001	ND ^	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Barium	0.0025	0.039	0.0025	0.046	0.0025	0.042	0.0025	0.04	0.0025	0.04	0.0025	0.041	0.0025	0.038	0.0025	0.041	0.0025	0.035	0.0025	0.043
Beryllium	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND ^1+	0.001	ND ^+	0.001	ND ^+	0.001	ND	0.001	ND
Boron	0.05	0.16	0.05	0.22	0.05	0.16	0.05	0.15	0.05	0.14	0.05	0.12	0.05	0.12	0.05	0.091	0.05	0.14	0.05	0.14
Cadmium	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Chloride	2	31	2	26	2	26	2	18	2	21	2	23	2	24	2	25	2	20	2	23
Chromium	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Cobalt	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Copper	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Cyanide	0.01	ND	0.01	ND	0.01	ND	0.01	ND F1 F2	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND *-
Fluoride	0.1	ND	0.1	0.11	0.1	0.1	0.1	0.12	0.1	ND	0.1	0.11	0.1	0.1	0.1	0.10 H	0.1	ND	0.1	ND
Iron	0.1	ND	0.1	0.13	0.1	ND ^	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND
Lead	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Manganese	0.0025	0.027	0.0025	0.019	0.0025	0.0051	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	0.0058	0.0025	ND	0.0025	ND	0.0025	ND
Mercury	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND	0.0002	ND
Nickel	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Nitrogen/Nitrate	0.1	12	0.1	19	0.1	22	0.1	23	0.1	18	0.1	29	0.1	22	0.1	22 H	0.1	18	0.1	23
Nitrogen/Nitrate, Nit	2.5	12	2.5	19 ^	2.5	22	2	23	1	18	5	29	2	22	2.5	22	2.5	18	5	23
Nitrogen/Nitrite	0.02	ND	0.02	ND	0.02	ND	0.02	ND F1	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Perchlorate	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND	0.004	ND
Selenium	0.0025	ND	0.0025	ND F1	0.0025	ND	0.0025	ND ^	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
Silver	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
Sulfate	5	35	5	32	5	29	5	29	5	25	5	27	5	25	5	30	5	24	5	29 ^+ ^-
Thallium	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND
Total Dissolved Solids	10	470	10	480	10	440	10	500	30	400	10	390	10	500	10	210	10	380	10	530
Vanadium	0.005	ND	0.005	ND	0.005	ND	0.005	ND ^	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Zinc	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Benzene	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND	0.0005	ND
BTEX	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND	0.0025	ND
pH	NA	7.03	NA	7.29	NA	7.02	NA	6.94	NA	6.94	NA	7.44	NA	7.21	NA	7.20	NA	7.10	NA	6.98
Temperature	NA	14.20	NA	12.45	NA	12.30	NA	12.70	NA	13.60	NA	13.30	NA	12.70	NA	12.70	NA	14.30	NA	13.90
Conductivity	NA	0.79	NA	0.82	NA	0.29	NA	0.72	NA	0.81	NA	0.84	NA	0.64	NA	0.80	NA	0.77	NA	0.86
Dissolved Oxygen	NA	8.33	NA	8.72	NA	7.14	NA	7.20	NA	7.04	NA	5.21	NA	8.19	NA	8.64	NA	9.03	NA	8.84
ORP	NA	106.6	NA	-18.7	NA	28.9	NA	13.6	NA	135.3	NA	97.9	NA	58.8	NA	172.1	NA	211.5	NA	114.5

Notes: Standards obtained from IAC, Title 35, Chapter I, Part 620, Subpart D; Section 620.410 - Groundwater Quality Standards for Class I: Potable Resource Groundwater
All values are in mg/L (ppm) unless otherwise noted

DL - Detection limit
NA - Not Applicable
ND - Not Detected
NM - Not Measured

NR - Not Required
NS - Not Sampled
H - Prepped/analyzed past hold time
S - Serial Dilution Exceeds Control Limits

F1 - MS and/or MSD Recovery outside of limits.
F2 - MS/MSD RPD exceeds control limits.
^1+ - Initial Calibration Verification is outside acceptance limits, high biased
^+ - Continuing Calibration Verification is outside acceptance limits, high biased

^ - Denotes instrument related QC exceeds the control limits
* - Median Value (for temp)
*- - LCS or LCSD is outside acceptance limits

Temperature	°C	degrees Celcius
Conductivity	ms/cm[c]	millisiemens/centimeters
Dissolved Oxygen	mg/L	milligrams/liter
Oxygen Reduction Potential (ORP)	mV	millivolts

Attachment 9-5 – IL PE Stamp

CERTIFICATION
35 Ill. Adm. Code 845.630

In accordance with Section 35 Ill. Adm. Code 845.630(g), I hereby certify based on review of the information contained within the Initial Operating Permit Application for Powerton Generating Station Metal Cleaning Basin dated March 31, 2022, the groundwater monitoring system has been designed and constructed to satisfy the requirements of 35 Ill. Adm. Code 845.630. For this site the minimum number of wells required is deemed sufficient based on the following: 1) The number of wells, placement and screened intervals are based on a hydrogeologic assessment performed for the site; 2) hydrogeologic considerations included aquifer characteristics affecting flow velocity and physical transport processes; 3) available historical groundwater flow data indicate consistent flow conditions over time; 4) Illinois Environmental Protection Agency (IEPA) approved the overall initial hydrogeologic assessment as part of a larger study.

Certified by: ______________________________

Date: 3/31/22

JOSHUA D. DAVENPORT
062-061945
LICENSED
PROFESSIONAL
ENGINEER
STATE OF ILLINOIS

Joshua Davenport, P.E.
Professional Engineer Registration No.: 062-061945
KPRG and Associates, Inc.

Attachment 9-6 – CCR Compliance Statistical Approach

K P R G

ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG and Associates, Inc.

ILLINOIS STATE CCR RULE COMPLIANCE STATISTICAL APPROACH FOR GROUNDWATER DATA EVALUATION

Midwest Generation, LLC
Powerton Generating Station
13082 Manito Rd.
Pekin, Illinois

PREPARED BY: KPRG and Associates, Inc.
14665 West Lisbon Road, Suite 1A
Brookfield, WI 53005

August 23, 2021

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1.0 INTRODUCTION

On April 21, 2021, the Illinois Pollution Control Board (IPCB) and Illinois Environmental Protection Agency (Illinois EPA) enacted a final rule regulating coal combustion residuals (CCR) as part of Ill. Adm. Code Title 35, Part 845: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments (State CCR Rule). The State CCR Rule specifically requires that the owner or operator of a CCR unit must develop an Operating Permit that will specify a sampling and analysis program that includes procedures and techniques for sample collection, sample preservation and shipment, analytical procedures, chain of custody (COC) control, and quality assurance and quality control. As a result, each regulated facility must develop a program that meets the State CCR Rule. At the Powerton facility, the Ash Bypass Basin/Ash Surge Basin (ABB/ASB) the Former Ash Basin (FAB) and the Metals Cleaning Basin (MCB) require monitoring under the State CCR Rule. The monitoring well networks around these basins consist of the following wells:

- Combined ABB/ASB monitoring network - upgradient wells MW-01, MW-09 and MW-19 and downgradient wells MW-08, MW-11, MW-12, MW-15, MW-17 and MW-18.

- FAB monitoring network - upgradient wells MW-01 and MW-10 and downgradient wells MW-02 thru MW-05.

- MCB monitoring network – upgradient wells MW-15 and MW-17 and downgradient wells MW-14, MW-20 and MW-21.

The well locations are shown on Figure 1.

Section 845.640(f) of the State CCR Rule requires the development of the statistical approach that will be used for assessing the data and determining whether a statistically significant increase over background concentrations in groundwater has occurred at identified downgradient monitoring points. Potential statistical methods that can be applied to the data are listed in Section 845.640(f) and performance standards are provided in 845.640(g).

This narrative of the statistical approach that will be used for the Powerton facility's groundwater monitoring data is intended to fulfill certification requirements under Section 845.640(f)(2). The professional engineer's certification of this statistical approach is provided in Section 4.0 of this document.

2.0 STATISTICAL METHOD SELECTION and BACKGROUND DATA EVALUATION

Section 845.640(f)(1) identifies five statistical data evaluation methods that can be used for assessing site groundwater data. Relative to the subject site, the prediction interval procedure identified in 845.640(f)(1)(C) will be used. This approach is robust and conforms to varying data distributions and facilitates various non-detect frequencies. U.S. EPA identifies this method as preferred over establishment of tolerance intervals (Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities – Unified Guidance, March 2009 [Unified Guidance]).

Total recoverable metals groundwater data has been collected for this site at many of the monitoring well locations since 2015 as part of Federal CCR Rule requirements. Under the Federal CCR Rule, the initial eight rounds of quarterly data generated were used to develop a representative background concentration with which to develop applicable prediction limits for subsequent statistical downgradient monitoring well data comparisons. Since additional data has been generated since the initial eight rounds of groundwater monitoring under the Federal CCR Rule, the full, currently available data set through the second quarter 2021 will be evaluated for potential use in developing a representative background dataset. If appending this additional data to the original eight rounds of background sampling is determined to be not statistically appropriate, then the background calculations will be reverted to using the initial eight rounds of background data for subsequent calculations. The established, representative background concentration for the upgradient well locations will be used to develop prediction limits for the regulated unit for each constituent listed in Section 845.600(a) and (b) as provided in Table 1.

Statistical evaluations will be performed with the assistance of the Sanitas™ software package.

2.1 Outlier Testing

The background dataset will be first checked for potential outliers for each constituent. Potential causes of outliers can be, but are not limited to:

- Changes in sampling technique;
- Changes in analytical methods;
- Data transcription errors;
- Unnatural localized event such as a spill; or
- Natural but extreme variations in constituent concentration.

The Unified Guidance does not recommend removing an outlier from the data set unless it can be shown that the outlier is not caused by extreme natural variation. If the outlier can be traced to other than natural causes, the data set will be adjusted appropriately.

2.2 Spatial Variability

If more than one background well is being used for the monitored unit, an evaluation of spatial variability will be performed to determine whether the mean concentration of a constituent varies statistically between the background points. This is generally accomplished by performing an Analysis of Variance (ANOVA). If statistically significant spatial variation is determined to be present, the background points will not be combined between the wells. If the spatial variability is determined to be natural, an intrawell data evaluation approach may be considered for both upgradient and downgradient wells.

2.3 Temporal Variability

Temporal variability in groundwater data from a specific monitoring point occurs when a consistent fluctuation of constituent concentrations occurs over time. The most common example is seasonal variation. If such a variation is noted in the data, the dataset should be corrected to account for the trend; however, any such corrections must be applied judiciously and would be completed in accordance with the Unified Guidance recommended procedures.

2.4 Trend Testing

As discussed above, it is intended to expand the initial background dataset collected under the Federal CCR Rule which consisted of eight rounds of quarterly sampling, with any additional data collected for a specific well since that time to facilitate a larger background data set upon which to develop subsequent interwell, and if necessary intrawell, prediction limits. The expanded background dataset for each upgradient well, for each constituent listed in Table 1, will undergo trend analysis to determine if there may be a potential statistically significant trend in the data. Linear regression will be the primary trend analysis tool, however, other methods such Sen's Slope Estimator may also be used. If a statistically significant trend is identified in the larger combined background dataset, the new data cannot be added to the initial background dataset, and only the original eight rounds of data can be used for that well in background development and associated subsequent calculations.

2.5 Test of Normality

The main underlying assumption in parametric data evaluations, such as establishing prediction limits, is that the underlying data distribution is normal. A quick approximation can be made by calculating the Coefficient of Variance (CV) which is the quotient of the standard deviation divided by the sample mean. In general, if this quotient is greater than 1, the underlying data distribution is probably not normal. The new Unified Guidance is more conservative and suggests that if this quotient is greater than 0.5, the dataset may not be normal and a more robust distribution evaluation should be performed. Therefore, for any CV value greater than 0.5 for a specific dataset, normality will be evaluated using the Shapiro-Wilk Test with an alpha (α) value of 0.05 (or 95%).

If the dataset does not pass this initial test, the data will undergo a log transformation and the test will be repeated for the natural log values of the dataset. If it is determined that this dataset is log-normal, statistical evaluations will be completed on those values and the result converted back to the standard value. If the underlying distribution is also determined not to be log-normal, the Unified Guidance provides for a number of other data transformations that can be performed to evaluate whether those underlying distributions may be normal at which point the entire dataset would be transformed for subsequent calculations.

If a normal underlying distribution can not be determined, non-parametric statistical evaluations will need to be considered which do not rely on a specific underlying distribution.

2.6 Non-Detects

It is not uncommon in environmental datasets to have parameters being detected at low concentrations during one sampling event and being not detected in other sampling events. Having a consistent approach to the handling of non-detect values is an important part of the statistical evaluation process. The handling of non-detect values will be accomplished as follows:

- 100 Percent Non-Detects – Assumed that the constituent is not present and no statistical evaluations will be performed. The upper prediction limit will be set at the Reporting Limit (RL) established by the analytical laboratory.

- 50 Percent or Greater Non-Detects – A non-parametric evaluation will be performed where the confidence interval will be constructed using the highest detected concentration as the upper prediction limit.

- 15 to 50 Percent Non-Detects – Aitchison's Adjustment will be used with subsequent parametric or non-parametric evaluations, as appropriate, based on underlying distributions.

- 0 to 15 Percent Non-Detects - The non-detect values will be replaced with RL/2 and the dataset will be evaluated for distribution normality with subsequent parametric or non-parametric evaluations, as appropriate, based on underlying distributions.

2.7 Prediction Limit Calculation for Normally Distributed Data

For datasets where the distribution or underlying transformed distribution is normal, a parametric statistical approach will be used for establishing the prediction limit at the required 95% statistical confidence. In accordance with Unified Guidance, the following equation will be used:

$$95\%\ Prediction\ Limit = \bar{x} + t_{1-0.05/m,n-1}s\sqrt{1+\frac{1}{n}}$$

Where:

$\bar{x}$ = the sample mean of the detected or adjusted results
S = sample standard deviation of the detected or adjusted results
$t_{1-0.05/m,n-1}$ = the students t-coefficient for degrees of freedom (n-1) and confidence level (1-0.05/m)
n = the number of samples
m = the number of future samples

The number of future sampling events (*m*) will be set at 2 which will account for one sampling event and a confirmation resampling. This will assist in limiting the potential number of false positives. An acceptable site-wide false positive (SWFP) rate of 10% or less is acceptable under the Unified Guidance.

2.8 Prediction Limit Calculation for Non-Normally Distributed Data

If the dataset distribution or underlying distribution is determined not to be normal, a non-parametric approach will need to be used for the establishment of the prediction limit. The non-parametric evaluation will use the highest detected concentration as the upper prediction limit for the specific constituent.

3.0 GROUNDWATER MONITORING

The State CCR Rule does not distinguish between detection monitoring or assessment monitoring as was defined under the Federal CCR Rule. To meet the requirements set forth in Section 845.650(b), a minimum of eight rounds of groundwater data need to be collected for establishing background. As noted above, if more than eight rounds of data are available, then the larger dataset will be evaluated to determine whether the background dataset can be expanded to provide a more robust statistical assessment. At that point, statistical evaluation of the background dataset will be performed to establish the upper prediction limits for each Section 845.600(a) and (b) constituent. It is noted that in the case of pH, a lower prediction limit will also be established since this parameter has an established upper and lower value range for compliance.

Site specific Groundwater Protection Standards (GWPSs) will be developed in accordance with Section 845.600(a)(2) as follows:

- If the constituent has an established State standard listed in Section 845.600(a)(1) and the standard is greater than the calculated background upper prediction limit, then the standard will serve as the GWPS. If the background upper prediction limit is greater than the standard, the upper prediction limit will serve as the GWPS.

- If the constituent does not have an established standard (i.e., calcium and turbidity) then the calculated upper prediction limit will serve as the GWPS.

Once the proposed GWPSs are determined and approved by Illinois EPA, subsequent downgradient well concentrations will be compared against the upper prediction limit (and lower prediction limit in the case of pH), and the GWPSs. If an exceedance of the GWPS is identified during a quarterly sampling event, an immediate resampling of the specific well(s) will be completed for those specific parameters. If the exceedance is confirmed by the resampling, the Illinois EPA will be notified of the exceedance(s) and the notification will be placed in the facilities operating record in accordance with 845.800(d)(16). It is noted that there are some constituents that historically may have had no detections (i.e., 100% non-detects). In this case, in accordance with the Unified Guidance, if there is a detection of such a constituent, then the Double Quantification Rule will be applied. Under this rule, a confirmed exceedance is registered if any well-constituent pair in the 100% non-detect group exhibits quantified measurements (i.e., at or above the Reporting Limit in two consecutive sample and resample events.

If an exceedance of the GWPS is recorded and reported to Illinois EPA, an Alternate Source Demonstration (ASD) may be completed within 60-days of the confirmed exceedance in accordance with Section 845.650(e) and submitted to the Illinois EPA as well as placing the ASD on the facility's publically accessible CCR website. Illinois EPA will review and approve or disapprove the ASD.

If it is decided not to complete an ASD or if Illinois EPA does not concur with and approve the ASD, a characterization of the nature and extent of the potential release must be completed in accordance with Section 845.650(d)(1) as well as meeting the requirements of Sections 845.660, 845.670 and 845.680.

4.0 CERTIFICATION

In accordance with Section 845.640(f)(2) of the State CCR Rule, I hereby certify based on a review of the information contained within this Illinois State CCR Rule Compliance Statistical Approach for Groundwater Data Evaluation dated August 23, 2021, the statistical procedures developed and selected for evaluation of groundwater data associated with the Midwest Generation Powerton Station CCR Units are adequate and appropriate for evaluating the groundwater data.

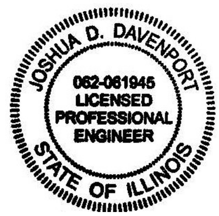
Certified by: 

Date: 8/23/21

Joshua Davenport, P.E.

Professional Engineer Registration No. 062-061945

KPRG and Associates, Inc.



FIGURE

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ENVIRONMENTAL CONSULTATION & REMEDIATION

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CCR MONITORING WELL SITE MAP

POWERTON STATION
PEKIN, ILLINOIS

Scale: 1" = 350' | Date: June 10, 2021

KPRG Project No. 12313.1 | FIGURE 1

TABLE

Table 1. Section 845.600 Groundwater Monitoring Parameter List

Parameter	Section 845.600 Standards
Antimony	0.006
Arsenic	0.01
Barium	2
Beryllium	0.004
Boron	2.0
Cadmium	0.005
Chloride	200
Chromium	0.1
Cobalt	0.006
Combined Radium 226 + 228 (pCi/L)	5.0
Fluoride	4.0
Lead	0.0075
Lithium	0.04
Mercury	0.002
Molybdenum	0.10
pH (standard units)	6.5-9.0
Selenium	0.05
Sulfate	400
Thallium	0.002
Total Dissolved Solids	1200
Calcium	NE
Turbidity	NE

All vaues in mg/l unless otherwise specified.
NE- Not Established

Attachment 9-7 – Statistical Evaluation Summary

ATTACHMENT 9-7

BACKGROUND STATISTICAL EVALUATION SUMMARY
STATE RULE CCR GROUNDWATER MONITORING
POWERTON GENERATING STATION

The newly enacted Ill. Adm. Code Title 35, Part 845: Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments (State CCR Rule) requires development of proposed Groundwater Protection Standards (GWPSs) for inclusion within the Operating Permit for the regulated surface impoundments at the facility. Upon Illinois Environmental Protection Agency (EPA) review, concurrence and approval of these site-specific proposed GWPSs, subsequent quarterly downgradient groundwater monitoring data will be compared against these standards to determine whether standard quarterly monitoring is to continue or whether additional evaluations need to occur to in accordance with Section 845.650(d), 845.650(e), 845.660 and 845.670. The overall statistical approach to be used for the development of the proposed GWPSs is provided in Attachment 9-6 of the Operating Permit.

Powerton Generating Station has four separate regulated units. The focus of this submittal is the Metal Cleaning Basin (MCB). The remaining three regulated units (i.e., the Ash-bypass Basin (ABB), Ash Surge Basin (ASB) and the Former Ash Basin (FAB) were addressed under separate cover in the Application for Initial Operating Permit for Powerton Generating Station submitted on October 31, 2021. The proposed site-specific GWPSs for the Powerton Generating Station MCB are summarized in Section 9 of this Operating Permit (see Table 9-7). The designated upgradient monitoring wells (MW-15 and MW-17) are also part of the groundwater monitoring program for the ABB/ASB noted above which has CCR monitoring data at these locations dating back to November 2015. The background Prediction Limit values presented in Table 9-7 were developed, where possible, by combining or "pooling" as many background data points as possible from the various upgradient monitoring wells. This includes evaluating whether the initial eight rounds of data generated as part of Federal CCR Rule compliance can be combined with subsequent available data from ongoing groundwater monitoring since that time at a specific upgradient monitoring well location, and whether datasets from individual upgradient monitoring points can also be combined or "pooled". It is noted that the initial eight rounds of turbidity were completed in calendar year (2021) since this was a new state requirement that was not part of the Federal CCR Rule. The following general decision process was followed to determine whether background data from within a well and/or between upgradient wells can be pooled for background calculations:

- If the combined dataset (original eight rounds of data plus any subsequent data generated since the initial background sampling) at a specific well location (intrawell evaluation) for a specific parameter does not show a statistically trend, the data for that specific parameter at that well location can be pooled. If a statistically significant trend in the data is noted then that data cannot be pooled and the most recent set of eight rounds of analyses will be further evaluated. If there is more than one background monitoring well, and one of the combined datasets for a specific parameter shows a statistically significant trend but the other does not, then the specific parameter data for the well that did not indicate a trend can potentially be used for subsequent evaluations.

- If there is more than one upgradient monitoring well, then datasets for individual parameters between the wells (interwell evaluation) must pass an analysis of variance to determine whether there may be a statistically significant variation between the two datasets. If no statistically significant variance is noted between the two (or more) upgradient monitoring points, and the individual parameter data passes the intrawell trend evaluation noted above, then the datasets for that parameter can be pooled between the wells to establish a larger background dataset. If there is a statistically significant variation noted between the two (or more) upgradient monitoring points, then the specific parameter datasets from those wells cannot be combined.

- If it is determined that datasets from upgradient monitoring points cannot be combined, then a decision needs to be made as to which monitoring point will be used for a specific parameter for background calculations. At this point some professional judgement needs to be used by considering the number of data points within each dataset, any potential statistical outliers, any statistical seasonality, the distribution and/or underlying distribution of that data, number of detects versus non-detects, etc.

With the above decision process in mind, the various statistical evaluations performed are summarized below. The evaluations were performed with the assistance of the Sanitas® statistical software package.

<u>Outlier Testing</u>

Outlier tests were performed for all monitoring wells (upgradient and downgradient) in the proposed State CCR monitoring well network for all data available since the start of Federal CCR monitoring where applicable.

Wells MW-15 and MW-17 are designated background wells. The following statistically significant outliers (dates in parentheses) were noted:

- Barium – MW-14 (7/20/21)
- Boron – MW-14 (5/12/21)
- Calcium – MW-20 (5/12/21) and MW-15 (5/19/16)
- Chloride – MW-14 (6/3/21)
- Fluoride – MW-21 (4/8/21)
- Lead – MW-21 (10/8/21)
- Lithium – MW-15 (11/17/16) and MW-17 (2/22/16)
- pH – MW-21 (4/8/21)
- Total Dissolved Solids (TDS) – MW-14 (11/29/21) and MW-15 (11/18/15 and 5/19/16)
- Turbidity – MW-15 (2/24/21)

Since the outliers cannot be attributed to either lab error, transcription error or field sampling error, the outlier values were not removed from the datasets at this time but may be considered during subsequent data evaluations. A statistical run summary which includes the specific statistical method used for each parameter for each well is provided at the end of this discussion.

Seasonality/Temporal Variability Testing

Seasonality/temporal variability tests were performed for all monitoring wells (upgradient and downgradient) in the proposed State CCR monitoring well network for all data available since the start of Federal CCR monitoring where applicable. No statistically significant seasonal/temporal variations were noted. The turbidity database to date is insufficient to evaluate potential seasonal/temporal variability at this time.

Trend Analysis

To determine whether data generated since the initial eight rounds of background groundwater sampling since the enactment of the Federal Rule can potentially be pooled at a specific upgradient monitoring well location, trend analysis for each constituent at each designated background well location was performed. The results are summarized as flows:

- MW-15 – Statistically significant trends were noted for sulfate, TDS, arsenic and molybdenum.
- MW-17 – Statistically significant trends were noted for boron, calcium, chloride, fluoride, pH, sulfate, TDS, arsenic, barium, cobalt, molybdenum and combined radium 226/228.

Relative to sulfate, TDS, arsenic, molybdenum, calcium and lithium, which as indicated above had statistically significant data trends in both background wells or early dataset statistical outliers, only the most recent eight rounds of data were further evaluated. The results are summarized as follows:

- MW-15 – Statistically significant trends were noted for TDS and calcium.
- MW-17 – A statistically significant trend was noted for sulfate.

A statistical run summary which includes the specific statistical method used for each parameter for each well is provided at the end of this discussion.

Spatial Variability Testing

To determine whether the background data sets from background wells can be pooled to establish a representative statistical background, spatial variability testing was performed on the datasets using a parametric analysis of variance (ANOVA). This analysis was done for each of the monitoring parameters. The following observations are made:

- Background wells MW-15 and MW-17 all values pooled – No statistically significant variance between the full datasets for calcium, chloride, sulfate, TDS, barium, beryllium, and turbidity.

It is noted that antimony, chromium and mercury had no detections at any of the designated background well locations during any sampling event, therefore, although an analysis of variance cannot be formally completed, these data sets can be pooled since there is no variation in the reporting limits.

Statistical run summaries which include the specific statistical method used for each parameter for each of the dataset comparisons are provided at the end of this discussion.

<u>Test of Normality</u>

The Shapiro-Wilk Normality Test with an alpha (α) value of 0.05 (or 95%) was used to evaluate the distribution of the background datasets for each constituent at each background well location and the distribution of pooled datasets for both background wells. A Test of Ladders was also run to evaluate other potential underlying transformational distributions in the case that the non-transformed dataset was found not to be normally distributed. The statistical runs are provided for the various combinations of upgradient wells by parameter at the end of this discussion.

<u>Prediction Limits</u>

Based on the various statistical evaluations discussed above, the following background data sets were used for background prediction limit calculations:

- Combined background wells MW-15 and MW-17 were used for all parameter values pooled for antimony, beryllium, chromium and mercury. As noted above there were no detections of antimony, chromium and mercury at any of the two upgradient well locations and the reporting limits were the same. Relative to beryllium, there were no statistically significant trends within wells for the combined data observations, no outliers and there was no statistically significant variance noted between the datasets. The combined beryllium dataset was non-parametric due the predominant non-detects.
- Background well MW-15 was used with all available parameter values for boron, chloride, fluoride, pH, barium, cadmium, cobalt, lead, combined radium 226/228, selenium and thallium. None of these parameters indicated statistically significant trends within this well and none of these parameters were noted as statistical outliers at this well location. Boron, fluoride, pH, barium combined radium and selenium all had normal or underlying normal data distributions. The remainder of the parameters had non-parametric distributions.
- Background well MW-15 was used with only the most recent eight rounds of data for sulfate and lithium. These datasets did not have any statistically significant trends, no noted outliers and had a normal or underlying normal distributions.
- Background well MW-17 was used with only the most recent eight rounds of data for TDS, arsenic, calcium, molybdenum and turbidity. These datasets did not have any

statistically significant trends, no noted outliers and had a normal or underlying normal distributions.

The calculated prediction limits under the various background dataset selection scenarios for the MCB are summarized in Table 9-7 in Section 9 of this permit application. A prediction limit statistical run summary which includes the specific statistical method used for each parameter for each well scenario noted above are provided at the end of this discussion.

Outlier Analysis - Powerton MCB - All Wells

Powerton Generating Station   Client: NRG   Data: Powerton MCB   Printed 2/28/2022, 1:25 PM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Antimony (mg/L)	MW-14	n/a	n/a	n/a	NP (nrm)	NaN	8	0.003	0	unknown	ShapiroWilk
Antimony (mg/L)	MW-17 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	22	0.003	0	unknown	ShapiroWilk
Antimony (mg/L)	MW-20	n/a	n/a	n/a	NP (nrm)	NaN	8	0.003	0	unknown	ShapiroWilk
Antimony (mg/L)	MW-21	n/a	n/a	n/a	NP (nrm)	NaN	8	0.003	0	unknown	ShapiroWilk
Antimony (mg/L)	MW-15 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	19	0.003	0	unknown	ShapiroWilk
Arsenic (mg/L)	MW-14	No	n/a	n/a	EPA 1989	0.05	8	0.002888	0.001136	normal	ShapiroWilk
Arsenic (mg/L)	MW-17 (bg)	No	n/a	n/a	NP (nrm)	NaN	24	0.1289	0.1462	unknown	ShapiroWilk
Arsenic (mg/L)	MW-20	No	n/a	n/a	EPA 1989	0.05	8	0.004763	0.006072	ln(x)	ShapiroWilk
Arsenic (mg/L)	MW-21	No	n/a	n/a	Dixon`s	0.05	8	0.02065	0.01147	normal	ShapiroWilk
Arsenic (mg/L)	MW-15 (bg)	No	n/a	n/a	EPA 1989	0.05	21	0.01651	0.02799	ln(x)	ShapiroWilk
Barium (mg/L)	**MW-14**	**Yes**	**0.057**	**7/20/2021**	**Dixon`s**	**0.05**	**8**	**0.03838**	**0.007836**	**normal**	**ShapiroWilk**
Barium (mg/L)	MW-17 (bg)	No	n/a	n/a	NP (nrm)	NaN	24	0.09758	0.0999	unknown	ShapiroWilk
Barium (mg/L)	MW-20	No	n/a	n/a	EPA 1989	0.05	8	0.1406	0.04313	normal	ShapiroWilk
Barium (mg/L)	MW-21	No	n/a	n/a	EPA 1989	0.05	8	0.3275	0.07833	normal	ShapiroWilk
Barium (mg/L)	MW-15 (bg)	No	n/a	n/a	EPA 1989	0.05	21	0.0639	0.02135	ln(x)	ShapiroWilk
Beryllium (mg/L)	MW-14	n/a	n/a	n/a	NP (nrm)	NaN	8	0.001	0	unknown	ShapiroWilk
Beryllium (mg/L)	MW-17 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	22	0.001014	0.0000...	unknown	ShapiroWilk
Beryllium (mg/L)	MW-20	n/a	n/a	n/a	NP (nrm)	NaN	8	0.001	0	unknown	ShapiroWilk
Beryllium (mg/L)	MW-21	n/a	n/a	n/a	NP (nrm)	NaN	8	0.001	0	unknown	ShapiroWilk
Beryllium (mg/L)	MW-15 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	19	0.001	0	unknown	ShapiroWilk
Boron (mg/L)	**MW-14**	**Yes**	**2.6**	**5/12/2021**	**NP (nrm)**	**NaN**	**8**	**2.1**	**0.2138**	**unknown**	**ShapiroWilk**
Boron (mg/L)	MW-17 (bg)	No	n/a	n/a	Rosner`s	0.01	24	1.247	0.3504	normal	ShapiroWilk
Boron (mg/L)	MW-20	No	n/a	n/a	NP (nrm)	NaN	8	1.541	0.5059	unknown	ShapiroWilk
Boron (mg/L)	MW-21	No	n/a	n/a	EPA 1989	0.05	8	0.4925	0.129	normal	ShapiroWilk
Boron (mg/L)	MW-15 (bg)	No	n/a	n/a	EPA 1989	0.05	21	1.71	0.4024	ln(x)	ShapiroWilk
Cadmium (mg/L)	MW-14	n/a	n/a	n/a	NP (nrm)	NaN	8	0.0005	8.4e-12	unknown	ShapiroWilk
Cadmium (mg/L)	MW-17 (bg)	No	n/a	n/a	NP (nrm)	NaN	24	0.000...	0.0005712	unknown	ShapiroWilk
Cadmium (mg/L)	MW-20	n/a	n/a	n/a	NP (nrm)	NaN	8	0.0005	0	unknown	ShapiroWilk
Cadmium (mg/L)	MW-21	n/a	n/a	n/a	NP (nrm)	NaN	8	0.0005	0	unknown	ShapiroWilk
Cadmium (mg/L)	MW-15 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	21	0.000...	0.0007854	unknown	ShapiroWilk
Calcium (mg/L)	MW-14	No	n/a	n/a	EPA 1989	0.05	8	200	10.69	normal	ShapiroWilk
Calcium (mg/L)	MW-17 (bg)	No	n/a	n/a	EPA 1989	0.05	24	174.2	38.21	ln(x)	ShapiroWilk
Calcium (mg/L)	**MW-20**	**Yes**	**130**	**5/12/2021**	**Dixon`s**	**0.05**	**8**	**235**	**52.92**	**normal**	**ShapiroWilk**
Calcium (mg/L)	MW-21	No	n/a	n/a	NP (nrm)	NaN	8	128.3	27.18	unknown	ShapiroWilk
Calcium (mg/L)	**MW-15 (bg)**	**Yes**	**320**	**5/19/2016**	**NP (nrm)**	**NaN**	**21**	**196.7**	**41.51**	**unknown**	**ShapiroWilk**
Chloride (mg/L)	**MW-14**	**Yes**	**26**	**6/3/2021**	**Dixon`s**	**0.05**	**8**	**85.38**	**24.77**	**normal**	**ShapiroWilk**
Chloride (mg/L)	MW-17 (bg)	No	n/a	n/a	NP (nrm)	NaN	24	209.8	93.78	unknown	ShapiroWilk
Chloride (mg/L)	MW-20	No	n/a	n/a	EPA 1989	0.05	8	92.5	45.13	normal	ShapiroWilk
Chloride (mg/L)	MW-21	No	n/a	n/a	EPA 1989	0.05	8	27.63	6.781	normal	ShapiroWilk
Chloride (mg/L)	MW-15 (bg)	No	n/a	n/a	NP (nrm)	NaN	21	188.6	27.07	unknown	ShapiroWilk
Chromium (mg/L)	MW-14	n/a	n/a	n/a	NP (nrm)	NaN	8	0.005	0	unknown	ShapiroWilk
Chromium (mg/L)	MW-17 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	22	0.005	0	unknown	ShapiroWilk
Chromium (mg/L)	MW-20	n/a	n/a	n/a	NP (nrm)	NaN	8	0.005	0	unknown	ShapiroWilk
Chromium (mg/L)	MW-21	n/a	n/a	n/a	NP (nrm)	NaN	8	0.005275	0.0007778	unknown	ShapiroWilk
Chromium (mg/L)	MW-15 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	19	0.005	0	unknown	ShapiroWilk
Cobalt (mg/L)	MW-14	n/a	n/a	n/a	NP (nrm)	NaN	8	0.001	0	unknown	ShapiroWilk
Cobalt (mg/L)	MW-17 (bg)	No	n/a	n/a	NP (nrm)	NaN	24	0.001275	0.0004627	unknown	ShapiroWilk
Cobalt (mg/L)	MW-20	No	n/a	n/a	EPA 1989	0.05	8	0.0024	0.0009813	ln(x)	ShapiroWilk
Cobalt (mg/L)	MW-21	No	n/a	n/a	EPA 1989	0.05	8	0.003475	0.002818	ln(x)	ShapiroWilk
Cobalt (mg/L)	MW-15 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	21	0.00101	0.0000...	unknown	ShapiroWilk

Outlier Analysis - Powerton MCB - All Wells

Powerton Generating Station Client: NRG Data: Powerton MCB Printed 2/28/2022, 1:25 PM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Combined Radium 226 + 228 (pCi/L)	MW-14	No	n/a	n/a	EPA 1989	0.05	8	0.5152	0.1285	normal	ShapiroWilk
Combined Radium 226 + 228 (pCi/L)	MW-17 (bg)	No	n/a	n/a	NP (nrm)	NaN	24	1.474	1.736	unknown	ShapiroWilk
Combined Radium 226 + 228 (pCi/L)	MW-20	No	n/a	n/a	EPA 1989	0.05	8	0.6628	0.1318	normal	ShapiroWilk
Combined Radium 226 + 228 (pCi/L)	MW-21	No	n/a	n/a	EPA 1989	0.05	8	0.8463	0.2487	normal	ShapiroWilk
Combined Radium 226 + 228 (pCi/L)	MW-15 (bg)	No	n/a	n/a	EPA 1989	0.05	21	0.5071	0.1508	ln(x)	ShapiroWilk
Conductivity (n/a)	MW-14	No	n/a	n/a	EPA 1989	0.05	8	2.316	0.1265	normal	ShapiroWilk
Conductivity (n/a)	**MW-17 (bg)**	**Yes**	**4.21,0.36...**	**11/13/201...**	**NP (nrm)**	**NaN**	**24**	**1.782**	**0.6926**	**unknown**	**ShapiroWilk**
Conductivity (n/a)	MW-20	No	n/a	n/a	EPA 1989	0.05	8	2.299	0.4787	normal	ShapiroWilk
Conductivity (n/a)	**MW-21**	**Yes**	**1.523**	**10/8/2021**	**Dixon`s**	**0.05**	**8**	**1.24**	**0.1325**	**normal**	**ShapiroWilk**
Conductivity (n/a)	**MW-15 (bg)**	**Yes**	**0.31**	**12/8/2020**	**Dixon`s**	**0.05**	**21**	**1.93**	**0.5366**	**normal**	**ShapiroWilk**
Fluoride (mg/L)	MW-14	No	n/a	n/a	EPA 1989	0.05	8	1.011	0.08043	normal	ShapiroWilk
Fluoride (mg/L)	MW-17 (bg)	No	n/a	n/a	Rosner`s	0.01	24	0.6504	0.08735	normal	ShapiroWilk
Fluoride (mg/L)	MW-20	No	n/a	n/a	EPA 1989	0.05	8	0.1488	0.03137	ln(x)	ShapiroWilk
Fluoride (mg/L)	**MW-21**	**Yes**	**0.25**	**4/8/2021**	**Dixon`s**	**0.05**	**8**	**0.1788**	**0.03137**	**normal**	**ShapiroWilk**
Fluoride (mg/L)	MW-15 (bg)	No	n/a	n/a	EPA 1989	0.05	21	0.529	0.04614	normal	ShapiroWilk
Lead (mg/L)	MW-14	n/a	n/a	n/a	NP (nrm)	NaN	8	0.000...	0.0000...	unknown	ShapiroWilk
Lead (mg/L)	MW-17 (bg)	No	n/a	n/a	NP (nrm)	NaN	24	0.000...	0.0003705	unknown	ShapiroWilk
Lead (mg/L)	MW-20	n/a	n/a	n/a	NP (nrm)	NaN	8	0.000...	0.0006718	unknown	ShapiroWilk
Lead (mg/L)	**MW-21**	**Yes**	**0.0026**	**10/8/2021**	**NP (nrm)**	**NaN**	**8**	**0.000825**	**0.0007382**	**unknown**	**ShapiroWilk**
Lead (mg/L)	MW-15 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	21	0.0005	0	unknown	ShapiroWilk
Lithium (mg/L)	MW-14	No	n/a	n/a	EPA 1989	0.05	8	0.02825	0.002765	normal	ShapiroWilk
Lithium (mg/L)	**MW-17 (bg)**	**Yes**	**0.038**	**2/22/2016**	**NP (nrm)**	**NaN**	**24**	**0.01996**	**0.005894**	**unknown**	**ShapiroWilk**
Lithium (mg/L)	MW-20	n/a	n/a	n/a	NP (nrm)	NaN	8	0.0045	0.001414	unknown	ShapiroWilk
Lithium (mg/L)	MW-21	n/a	n/a	n/a	NP (nrm)	NaN	8	0.0045	0.001414	unknown	ShapiroWilk
Lithium (mg/L)	**MW-15 (bg)**	**Yes**	**0.016**	**11/17/2016**	**NP (nrm)**	**NaN**	**21**	**0.02852**	**0.006743**	**unknown**	**ShapiroWilk**
Mercury (mg/L)	MW-14	n/a	n/a	n/a	NP (nrm)	NaN	8	0.0002	0	unknown	ShapiroWilk
Mercury (mg/L)	MW-17 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	24	0.0002	0	unknown	ShapiroWilk
Mercury (mg/L)	MW-20	n/a	n/a	n/a	NP (nrm)	NaN	8	0.0002	0	unknown	ShapiroWilk
Mercury (mg/L)	MW-21	n/a	n/a	n/a	NP (nrm)	NaN	8	0.0002	0	unknown	ShapiroWilk
Mercury (mg/L)	MW-15 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	21	0.0002	0	unknown	ShapiroWilk
Molybdenum (mg/L)	MW-14	No	n/a	n/a	Dixon`s	0.05	8	0.03113	0.004998	normal	ShapiroWilk
Molybdenum (mg/L)	MW-17 (bg)	No	n/a	n/a	EPA 1989	0.05	24	0.06608	0.03333	ln(x)	ShapiroWilk
Molybdenum (mg/L)	MW-20	n/a	n/a	n/a	NP (nrm)	NaN	8	0.0025	0	unknown	ShapiroWilk
Molybdenum (mg/L)	MW-21	n/a	n/a	n/a	NP (nrm)	NaN	8	0.0025	0	unknown	ShapiroWilk
Molybdenum (mg/L)	MW-15 (bg)	No	n/a	n/a	EPA 1989	0.05	21	0.02486	0.006777	normal	ShapiroWilk
pH (SU)	MW-14	No	n/a	n/a	EPA 1989	0.05	8	7.001	0.1716	normal	ShapiroWilk
pH (SU)	MW-17 (bg)	No	n/a	n/a	NP (nrm)	NaN	24	7.273	0.2035	unknown	ShapiroWilk
pH (SU)	MW-20	No	n/a	n/a	EPA 1989	0.05	8	6.685	0.2705	normal	ShapiroWilk
pH (SU)	**MW-21**	**Yes**	**7.08**	**4/8/2021**	**Dixon`s**	**0.05**	**8**	**6.669**	**0.1861**	**normal**	**ShapiroWilk**
pH (SU)	MW-15 (bg)	No	n/a	n/a	EPA 1989	0.05	21	6.961	0.2174	normal	ShapiroWilk
Selenium (mg/L)	MW-14	No	n/a	n/a	EPA 1989	0.05	8	0.02324	0.03103	ln(x)	ShapiroWilk
Selenium (mg/L)	MW-17 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	24	0.004521	0.0099	unknown	ShapiroWilk
Selenium (mg/L)	MW-20	n/a	n/a	n/a	NP (nrm)	NaN	8	0.0025	0	unknown	ShapiroWilk
Selenium (mg/L)	MW-21	n/a	n/a	n/a	NP (nrm)	NaN	8	0.0025	0	unknown	ShapiroWilk
Selenium (mg/L)	MW-15 (bg)	No	n/a	n/a	NP (nrm)	NaN	21	0.01738	0.0219	unknown	ShapiroWilk
Sulfate (mg/L)	MW-14	No	n/a	n/a	EPA 1989	0.05	8	576.3	61.63	normal	ShapiroWilk
Sulfate (mg/L)	MW-17 (bg)	No	n/a	n/a	EPA 1989	0.05	24	622.5	163.9	normal	ShapiroWilk
Sulfate (mg/L)	MW-20	No	n/a	n/a	EPA 1989	0.05	8	513.8	258	normal	ShapiroWilk
Sulfate (mg/L)	MW-21	No	n/a	n/a	EPA 1989	0.05	8	21.3	20.93	normal	ShapiroWilk
Sulfate (mg/L)	MW-15 (bg)	No	n/a	n/a	NP (nrm)	NaN	21	593.8	260.3	unknown	ShapiroWilk

Outlier Analysis - Powerton MCB - All Wells

Powerton Generating Station   Client: NRG   Data: Powerton MCB   Printed 2/28/2022, 1:25 PM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Thallium (mg/L)	MW-14	No	n/a	n/a	EPA 1989	0.05	8	0.002238	0.0002875	ln(x)	ShapiroWilk
Thallium (mg/L)	MW-17 (bg)	No	n/a	n/a	NP (nrm)	NaN	24	0.002846	0.001627	unknown	ShapiroWilk
Thallium (mg/L)	MW-20	n/a	n/a	n/a	NP (nrm)	NaN	8	0.002	0	unknown	ShapiroWilk
Thallium (mg/L)	MW-21	n/a	n/a	n/a	NP (nrm)	NaN	8	0.002	0	unknown	ShapiroWilk
Thallium (mg/L)	MW-15 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	21	0.002	0	unknown	ShapiroWilk
Total Dissolved Solids (mg/L)	**MW-14**	**Yes**	**1400**	**11/29/2021**	**Dixon`s**	**0.05**	**8**	**1650**	**119.5**	**normal**	**ShapiroWilk**
Total Dissolved Solids (mg/L)	MW-17 (bg)	No	n/a	n/a	NP (nrm)	NaN	24	1550	365.9	unknown	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-20	No	n/a	n/a	EPA 1989	0.05	8	1775	305.9	normal	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-21	No	n/a	n/a	EPA 1989	0.05	8	683.8	78.91	normal	ShapiroWilk
Total Dissolved Solids (mg/L)	**MW-15 (bg)**	**Yes**	**2400,2800**	**11/18/201...**	**Dixon`s**	**0.05**	**21**	**1695**	**354.2**	**normal**	**ShapiroWilk**
Turbidity (NTU)	MW-14	No	n/a	n/a	EPA 1989	0.05	9	6.449	4.526	normal	ShapiroWilk
Turbidity (NTU)	MW-17 (bg)	No	n/a	n/a	EPA 1989	0.05	9	23.37	11.55	normal	ShapiroWilk
Turbidity (NTU)	MW-20	No	n/a	n/a	EPA 1989	0.05	8	10.72	7.348	ln(x)	ShapiroWilk
Turbidity (NTU)	MW-21	No	n/a	n/a	EPA 1989	0.05	8	29.41	29.13	ln(x)	ShapiroWilk
Turbidity (NTU)	**MW-15 (bg)**	**Yes**	**64.9**	**2/24/2021**	**Dixon`s**	**0.05**	**9**	**16.46**	**18.73**	**normal**	**ShapiroWilk**

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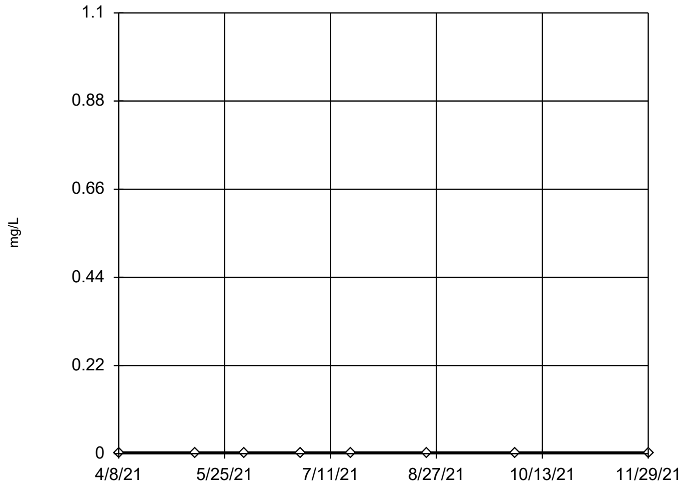
Tukey's Outlier Screening

MW-14



n = 8

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Antimony Analysis Run 2/28/2022 1:19 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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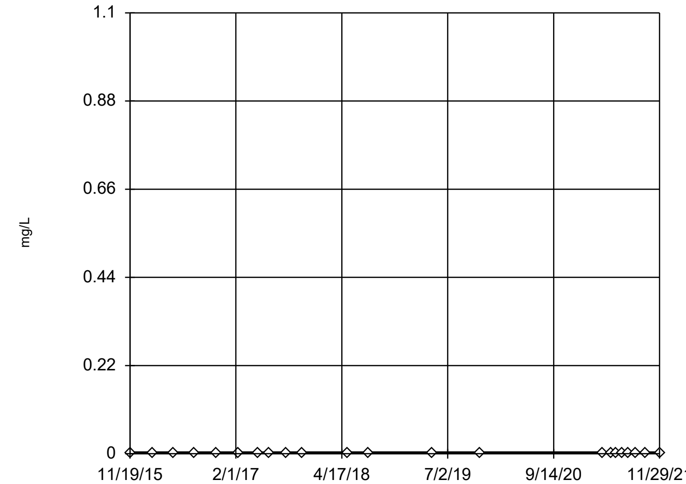
Tukey's Outlier Screening

MW-17 (bg)



n = 22

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were cube root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Antimony Analysis Run 2/28/2022 1:19 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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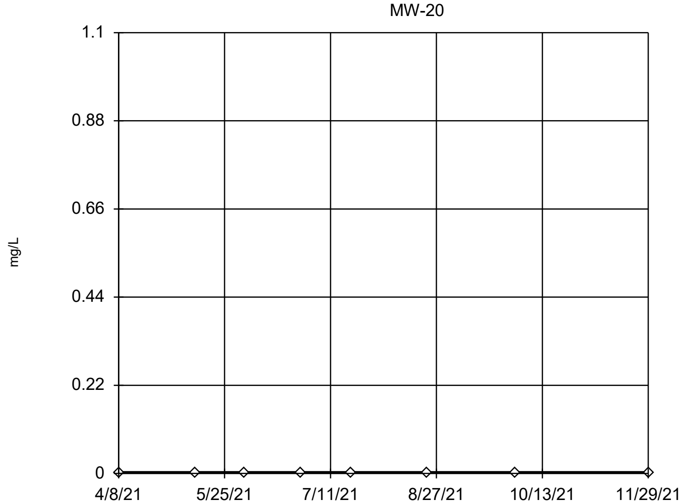
Tukey's Outlier Screening

MW-20



n = 8

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Antimony Analysis Run 2/28/2022 1:19 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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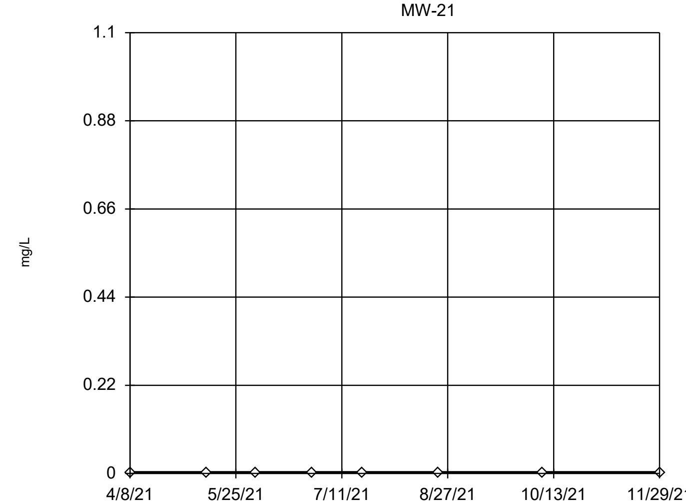
Tukey's Outlier Screening

MW-21



n = 8

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Antimony Analysis Run 2/28/2022 1:19 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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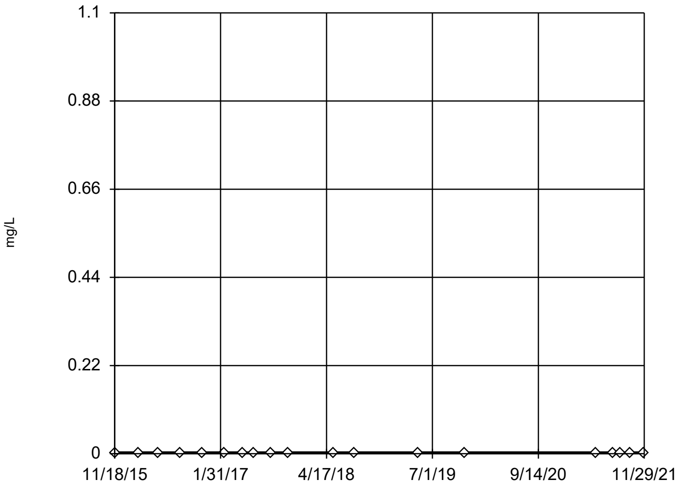
Tukey's Outlier Screening

MW-15 (bg)



n = 19

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Antimony   Analysis Run 2/28/2022 1:19 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

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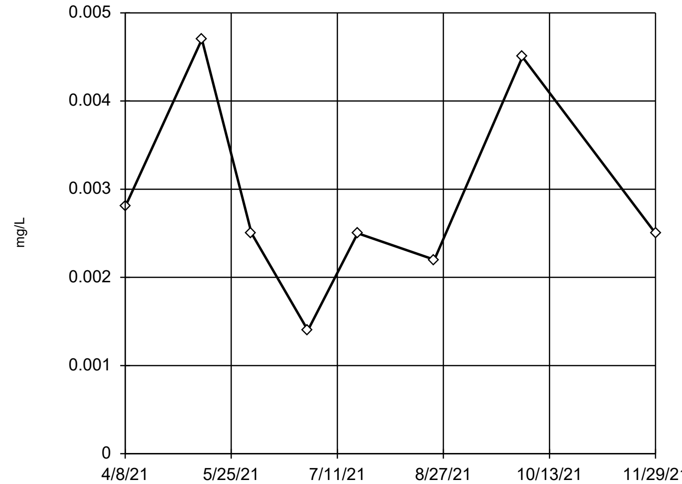
EPA Screening (suspected outliers for Dixon's Test)

MW-14



n = 8

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.002888, std. dev. 0.001136, critical Tn 2.032

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.8542
Critical = 0.851
The distribution was found to be normally distributed.

Constituent: Arsenic   Analysis Run 2/28/2022 1:19 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

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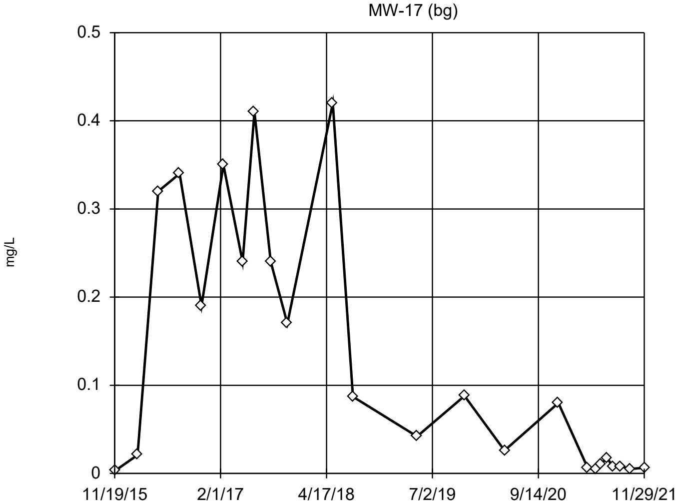
Tukey's Outlier Screening

MW-17 (bg)



n = 24

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 6893, low cutoff = 2.7e-7, based on IQR multiplier of 3.

Constituent: Arsenic   Analysis Run 2/28/2022 1:19 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

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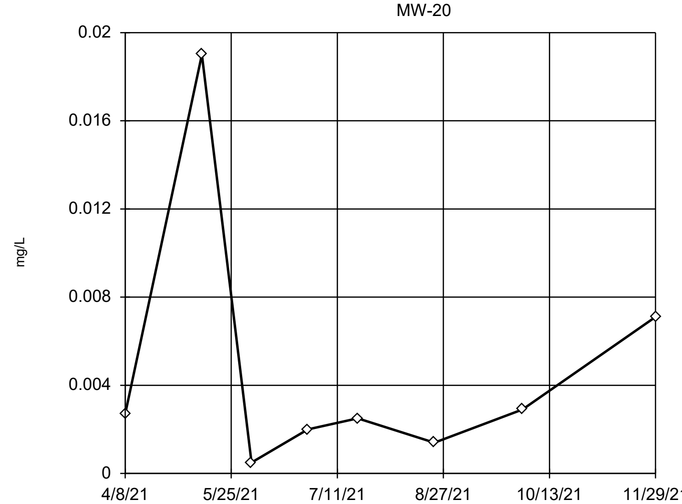
EPA Screening (suspected outliers for Dixon's Test)

MW-20



n = 8

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.004763, std. dev. 0.006072, critical Tn 2.032

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.956
Critical = 0.851 (after natural log transformation)
The distribution was found to be log-normal.

Constituent: Arsenic   Analysis Run 2/28/2022 1:19 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

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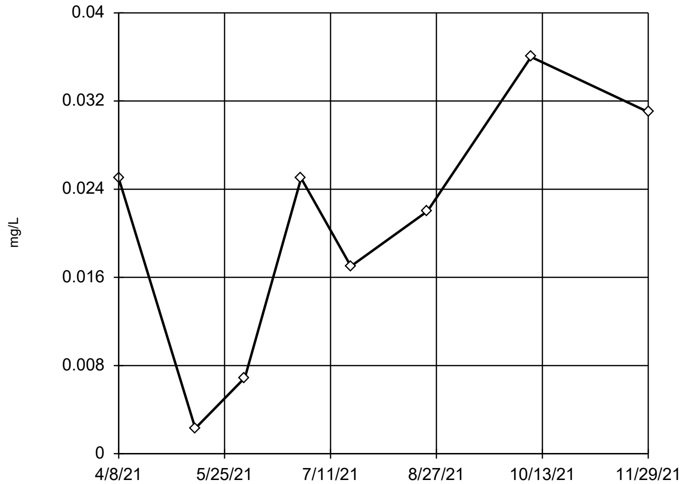
Dixon's Outlier Test

MW-21



n = 8

No statistical outliers.
Testing for 2 low outliers.
Mean = 0.02065.
Std. Dev. = 0.01147.
0.0069: c = 0.4191
tabl = 0.554.
Alpha = 0.05.
0.0023: c = 0.1603
tabl = 0.554.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9687
Critical = 0.838
The distribution was found to be normally distributed.

Constituent: Arsenic   Analysis Run 2/28/2022 1:19 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

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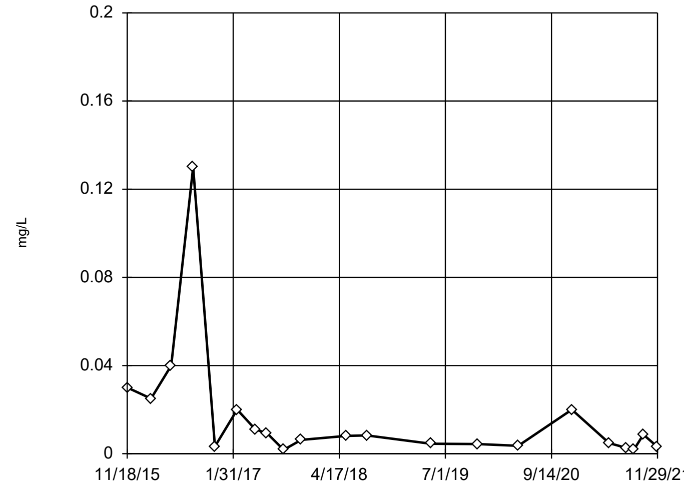
EPA Screening (suspected outliers for Dixon's Test)

MW-15 (bg)



n = 21

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.01651, std. dev. 0.02799, critical Tn 2.58

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9485
Critical = 0.923 (after natural log transformation)
The distribution was found to be log-normal.

Constituent: Arsenic   Analysis Run 2/28/2022 1:19 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

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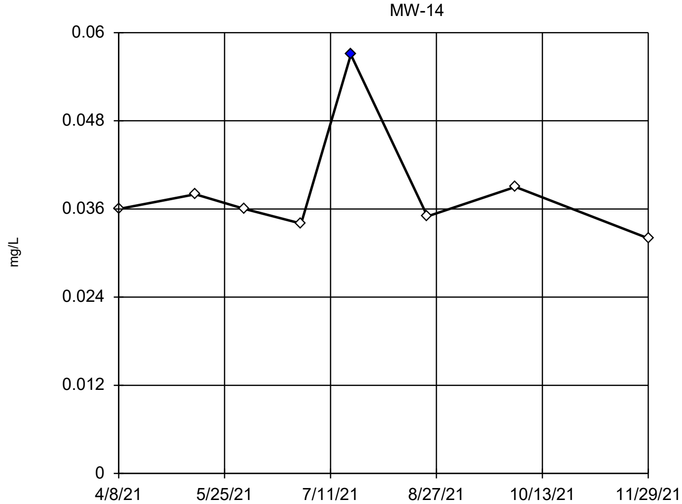
Dixon's Outlier Test

MW-14



n = 8

Statistical outlier is drawn as solid.
Testing for 1 high outlier.
Mean = 0.03838.
Std. Dev. = 0.007836.
0.057: c = 0.7826
tabl = 0.554.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9773
Critical = 0.838
The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: Barium   Analysis Run 2/28/2022 1:19 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

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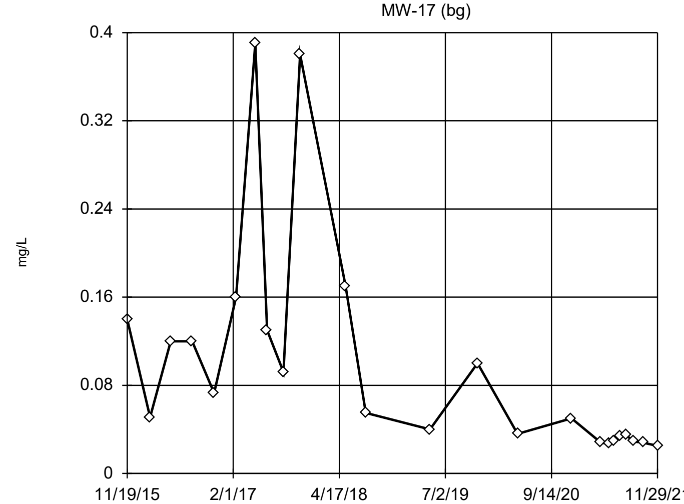
Tukey's Outlier Screening

MW-17 (bg)



n = 24

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

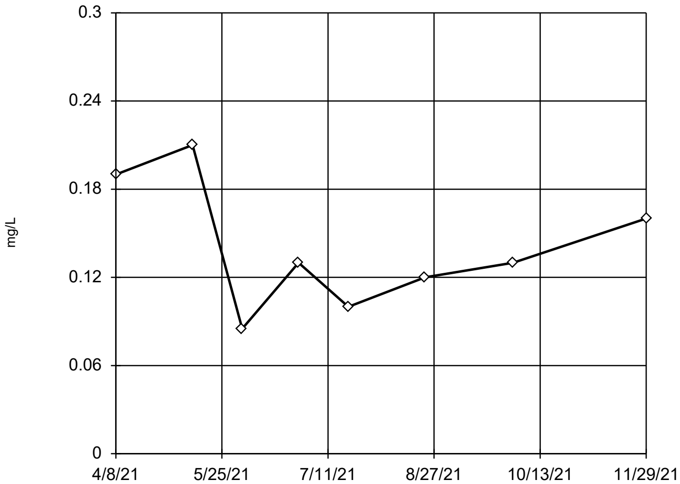
High cutoff = 7.86, low cutoff = 0.000499, based on IQR multiplier of 3.

Constituent: Barium   Analysis Run 2/28/2022 1:19 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

EPA Screening (suspected outliers for Dixon's Test)

MW-20



n = 8

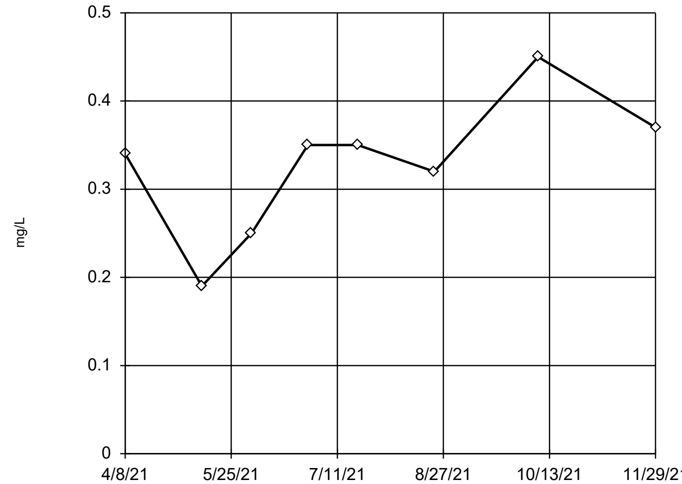
Dixon's will not be run.
No suspect values identified
or unable to establish
suspect values.
Mean 0.1406, std. dev.
0.04313, critical Tn 2.032

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9478
Critical = 0.851
The distribution was found
to be normally distrib-
uted.

Constituent: Barium Analysis Run 2/28/2022 1:19 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

EPA Screening (suspected outliers for Dixon's Test)

MW-21



n = 8

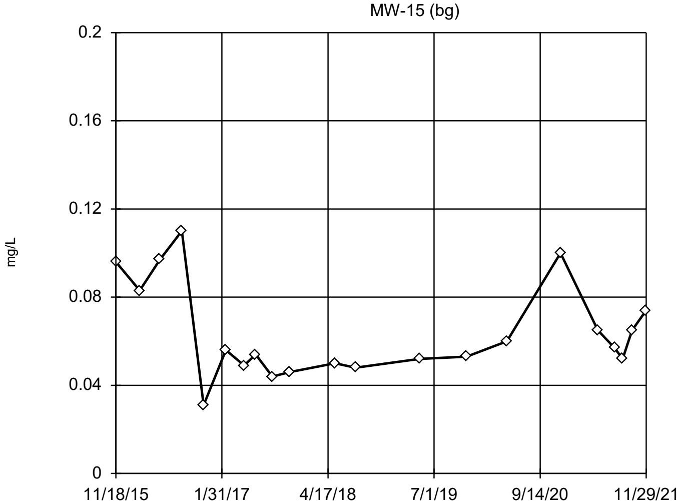
Dixon's will not be run.
No suspect values identified
or unable to establish
suspect values.
Mean 0.3275, std. dev.
0.07833, critical Tn 2.032

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9417
Critical = 0.851
The distribution was found
to be normally distrib-
uted.

Constituent: Barium Analysis Run 2/28/2022 1:19 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

EPA Screening (suspected outliers for Dixon's Test)

MW-15 (bg)



n = 21

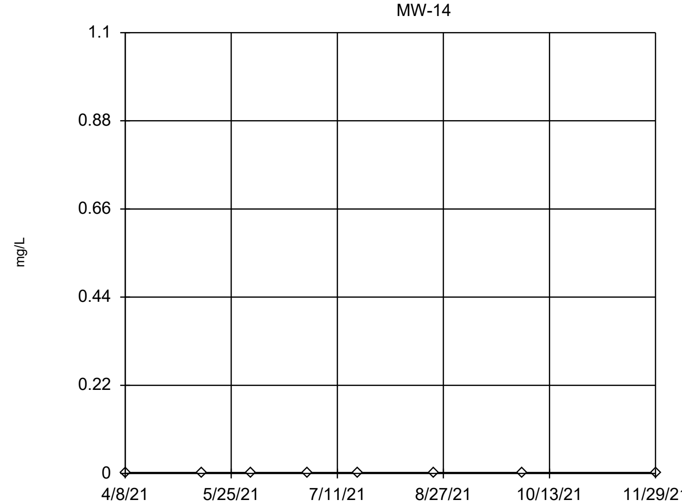
Dixon's will not be run.
No suspect values identified
or unable to establish
suspect values.
Mean 0.0639, std. dev.
0.02135, critical Tn 2.58

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9408
Critical = 0.923 (after
natural log transforma-
tion)
The distribution was found
to be log-normal.

Constituent: Barium Analysis Run 2/28/2022 1:19 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Tukey's Outlier Screening

MW-14



n = 8

No outliers found.
Tukey's method used in
lieu of parametric test
because the Shapiro Wilk
normality test failed
at the 0.1 alpha level.

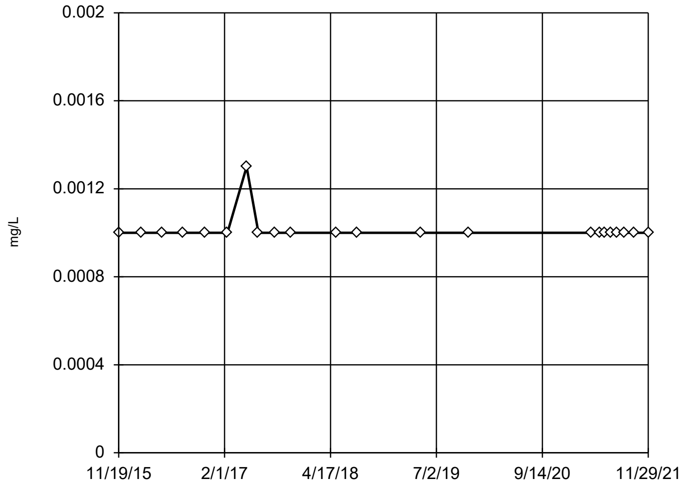
Data were cube root trans-
formed to achieve best
W statistic (graph shown
in original units).

The results were invalid-
ated, because the lower
and upper quartiles are
equal.

Constituent: Beryllium Analysis Run 2/28/2022 1:19 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Tukey's Outlier Screening

MW-17 (bg)



n = 22

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Beryllium Analysis Run 2/28/2022 1:19 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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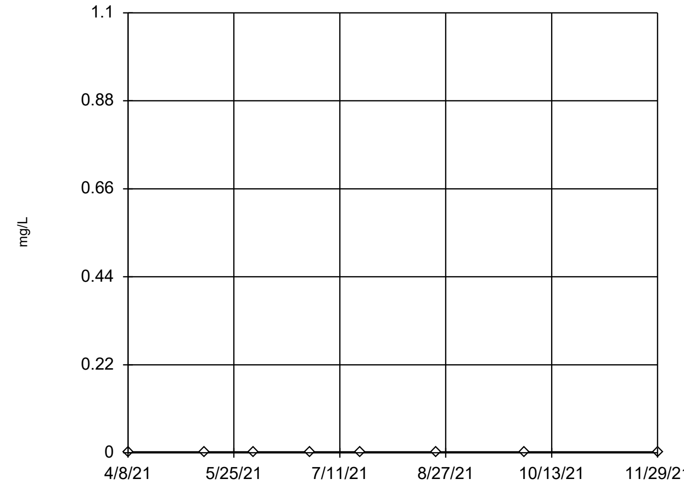
Tukey's Outlier Screening

MW-20



n = 8

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were cube root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Beryllium Analysis Run 2/28/2022 1:19 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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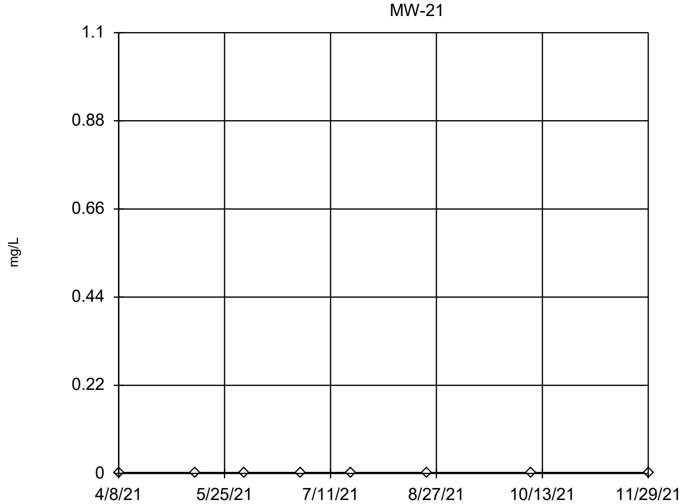
Tukey's Outlier Screening

MW-21



n = 8

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were cube root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Beryllium Analysis Run 2/28/2022 1:19 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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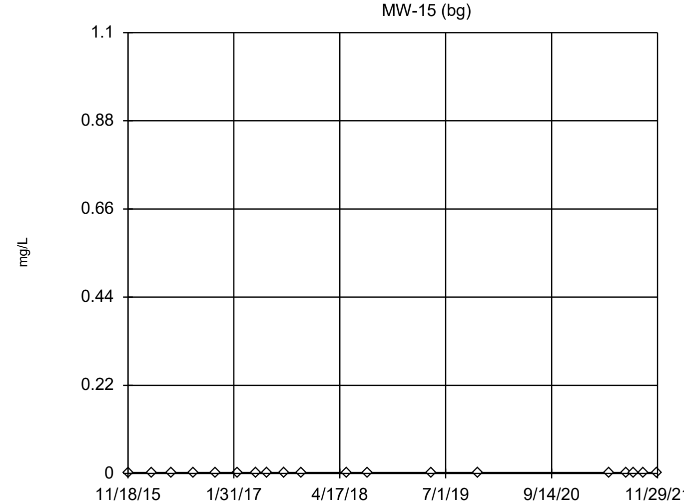
Tukey's Outlier Screening

MW-15 (bg)



n = 19

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Beryllium Analysis Run 2/28/2022 1:19 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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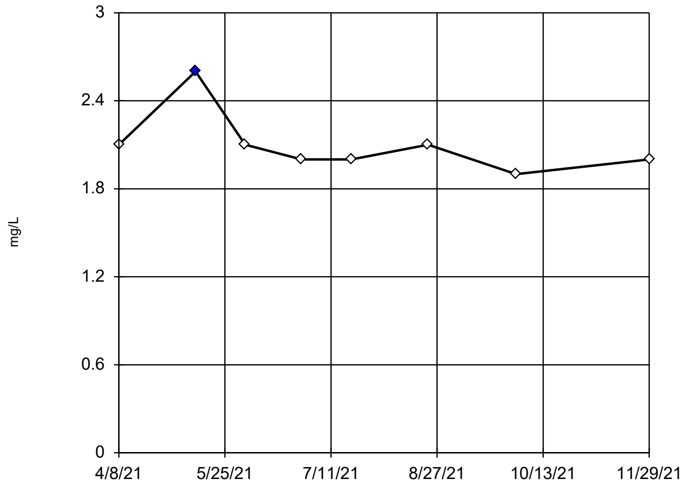
Tukey's Outlier Screening

MW-14



n = 8

Outlier is drawn as solid. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 2.431, low cutoff = 1.728, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 2/28/2022 1:19 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

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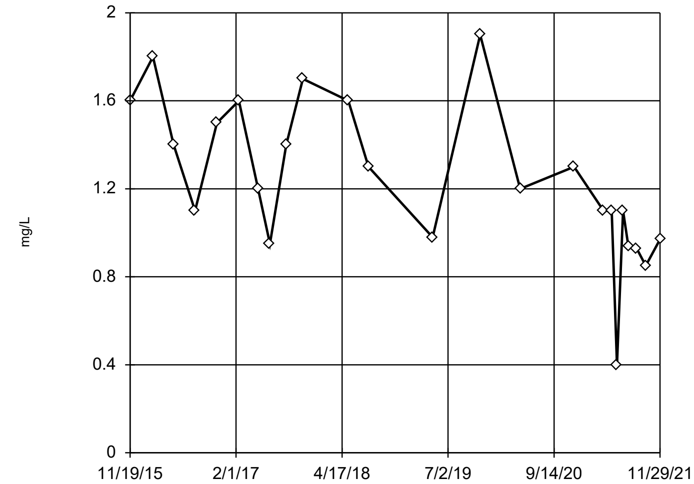
Rosner's Outlier Test

MW-17 (bg)



n = 24

No statistical outliers.

k = 1
r = 2.416
Tabulated value = 2.824
Alpha = 0.01

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.938
Critical = 0.928
The distribution was found to be normally distributed.

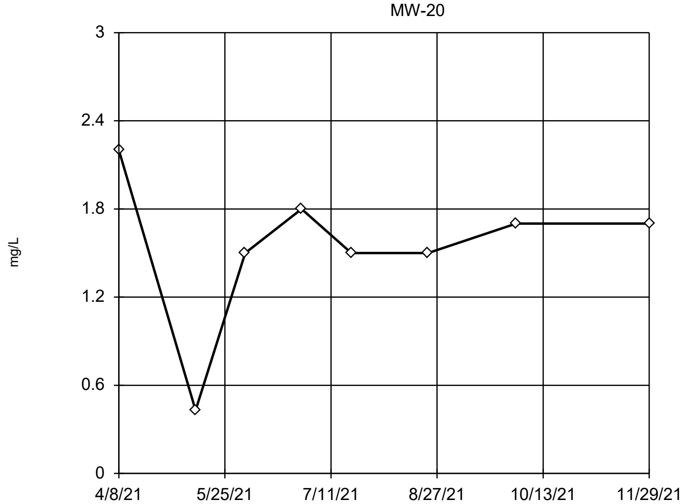
Constituent: Boron Analysis Run 2/28/2022 1:19 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Tukey's Outlier Screening

MW-20



n = 8

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square transformed to achieve best W statistic (graph shown in original units).

High cutoff = 2.347, low cutoff = -0.4416, based on IQR multiplier of 3.

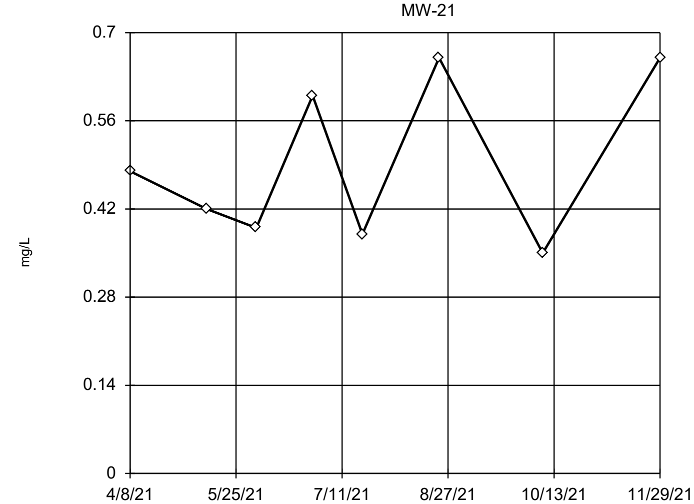
Constituent: Boron Analysis Run 2/28/2022 1:19 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

EPA Screening (suspected outliers for Dixon's Test)

MW-21



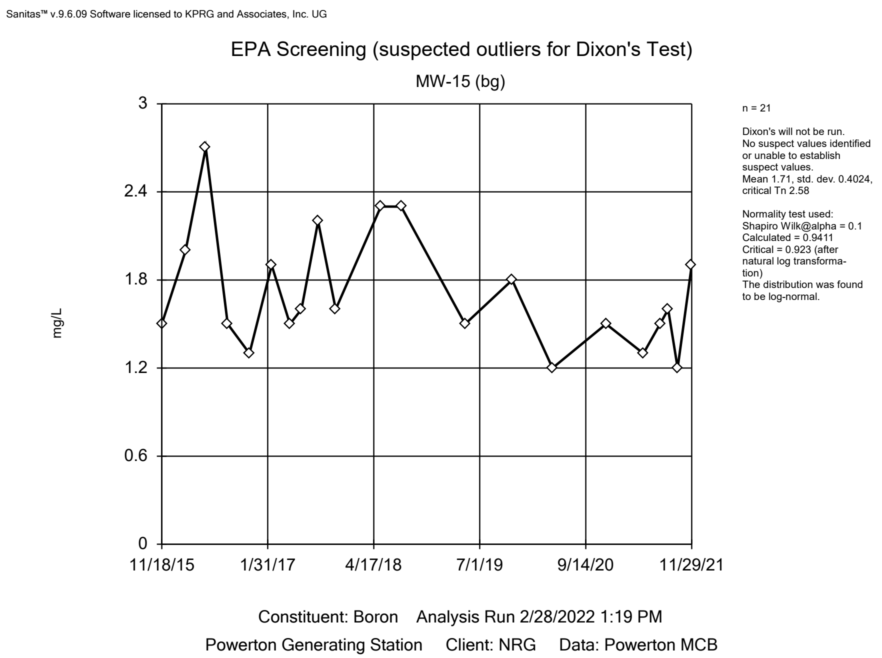
n = 8

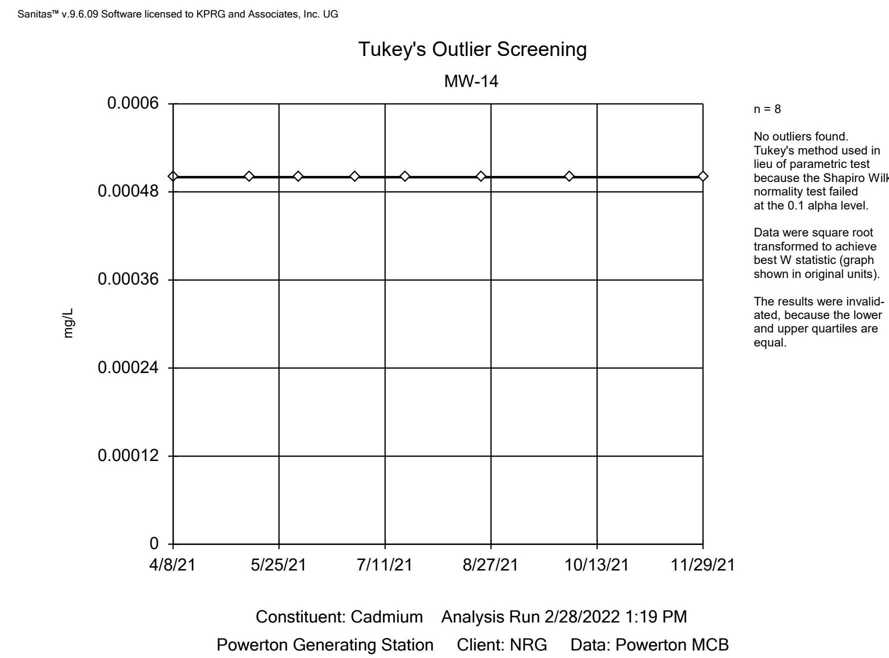
Dixon's will not be run. No suspect values identified or unable to establish suspect values. Mean 0.4925, std. dev. 0.129, critical Tn 2.032

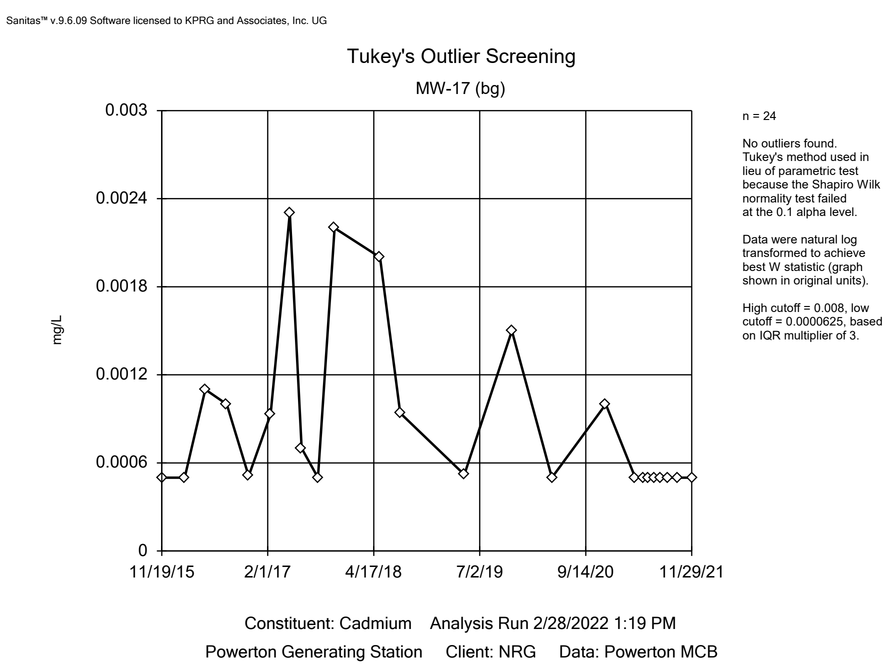
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.8577
Critical = 0.851
The distribution was found to be normally distributed.

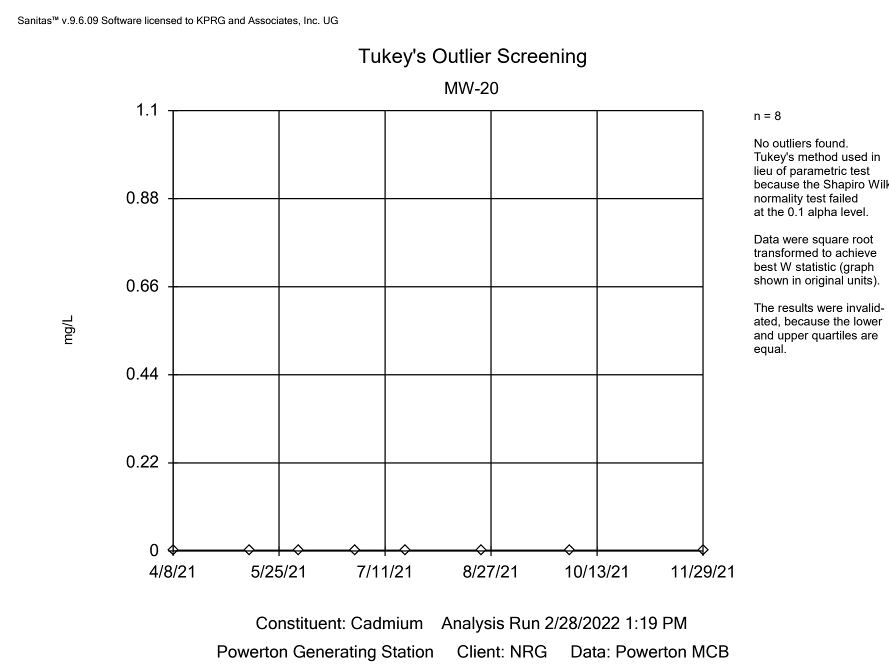
Constituent: Boron Analysis Run 2/28/2022 1:19 PM

Powerton Generating Station Client: NRG Data: Powerton MCB


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
EPA Screening (suspected outliers for Dixon's Test)
MW-15 (bg)
mg/L
3
2.4
1.8
1.2
0.6
0
11/18/15
1/31/17
4/17/18
7/1/19
9/14/20
11/29/21
n = 21
Dixon's will not be run. No suspect values identified or unable to establish suspect values. Mean 1.71, std. dev. 0.4024, critical Tn 2.58
Normality test used: Shapiro Wilk@alpha = 0.1 Calculated = 0.9411 Critical = 0.923 (after natural log transformation) The distribution was found to be log-normal.
Constituent: Boron Analysis Run 2/28/2022 1:19 PM
Powerton Generating Station Client: NRG Data: Powerton MCB


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Tukey's Outlier Screening
MW-14
mg/L
0.0006
0.00048
0.00036
0.00024
0.00012
0
4/8/21
5/25/21
7/11/21
8/27/21
10/13/21
11/29/21
n = 8
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were square root transformed to achieve best W statistic (graph shown in original units).
The results were invalidated, because the lower and upper quartiles are equal.
Constituent: Cadmium Analysis Run 2/28/2022 1:19 PM
Powerton Generating Station Client: NRG Data: Powerton MCB


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Tukey's Outlier Screening
MW-17 (bg)
mg/L
0.003
0.0024
0.0018
0.0012
0.0006
0
11/19/15
2/1/17
4/17/18
7/2/19
9/14/20
11/29/21
n = 24
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were natural log transformed to achieve best W statistic (graph shown in original units).
High cutoff = 0.008, low cutoff = 0.0000625, based on IQR multiplier of 3.
Constituent: Cadmium Analysis Run 2/28/2022 1:19 PM
Powerton Generating Station Client: NRG Data: Powerton MCB


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Tukey's Outlier Screening
MW-20
mg/L
1.1
0.88
0.66
0.44
0.22
0
4/8/21
5/25/21
7/11/21
8/27/21
10/13/21
11/29/21
n = 8
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were square root transformed to achieve best W statistic (graph shown in original units).
The results were invalidated, because the lower and upper quartiles are equal.
Constituent: Cadmium Analysis Run 2/28/2022 1:19 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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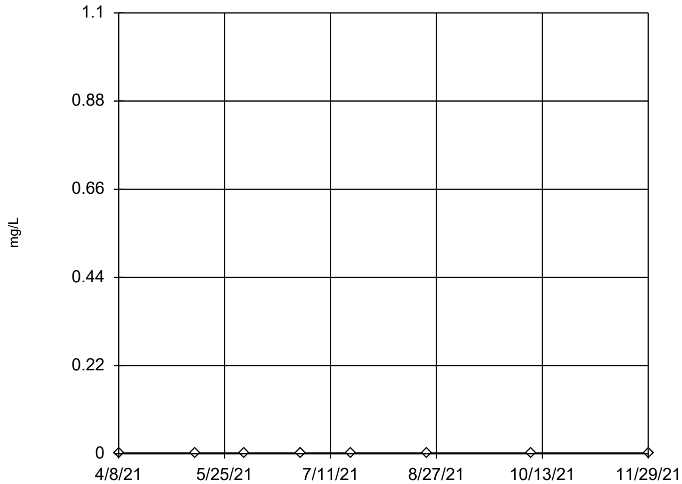
Tukey's Outlier Screening

MW-21



n = 8

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Cadmium   Analysis Run 2/28/2022 1:19 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

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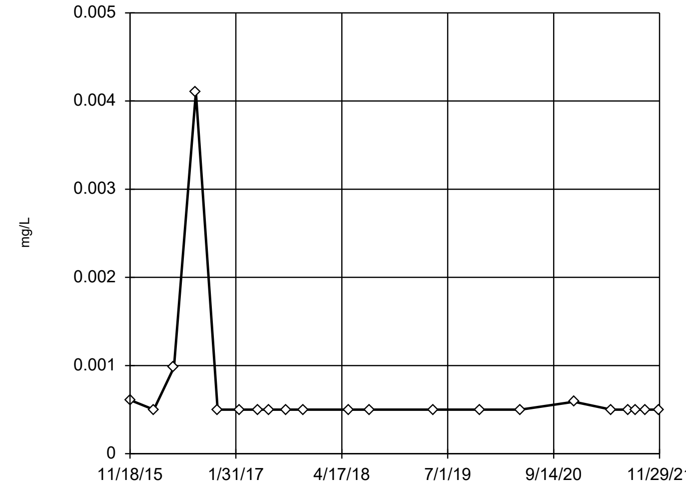
Tukey's Outlier Screening

MW-15 (bg)



n = 21

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Cadmium   Analysis Run 2/28/2022 1:19 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

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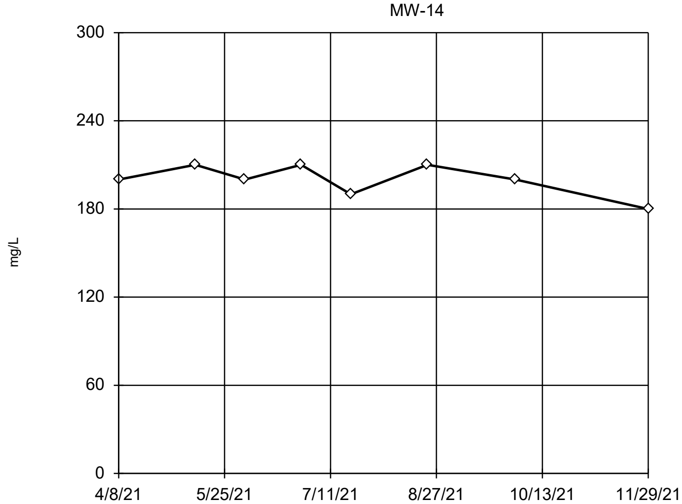
EPA Screening (suspected outliers for Dixon's Test)

MW-14



n = 8

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 200, std. dev. 10.69, critical Tn 2.032

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.8598
Critical = 0.851
The distribution was found to be normally distributed.

Constituent: Calcium   Analysis Run 2/28/2022 1:19 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

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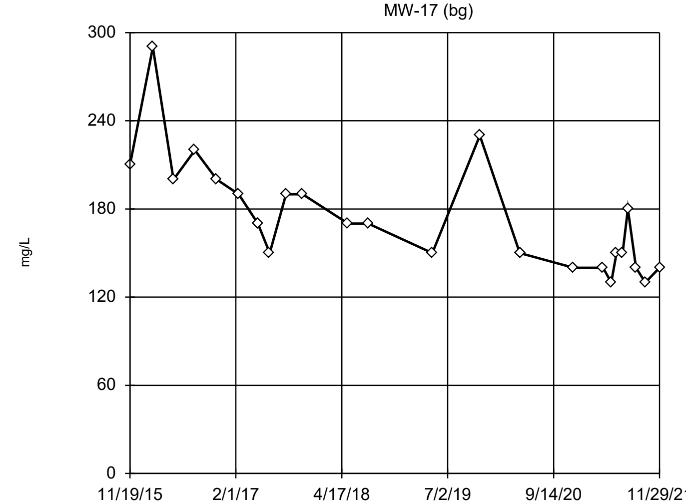
EPA Screening (suspected outliers for Rosner's Test)

MW-17 (bg)



n = 24

Rosner's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 174.2, std. dev. 38.21, critical Tn 2.644

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9323
Critical = 0.93 (after natural log transformation)
The distribution was found to be log-normal.

Constituent: Calcium   Analysis Run 2/28/2022 1:19 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

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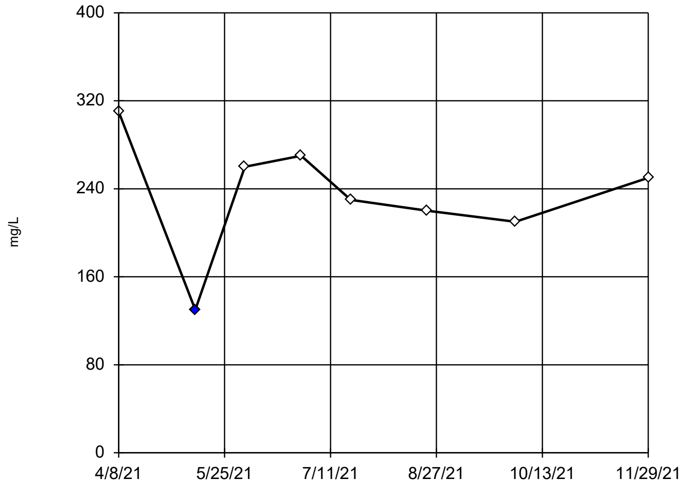
Dixon's Outlier Test

MW-20



n = 8

Statistical outlier is drawn as solid.
Testing for 1 low outlier.
Mean = 235.
Std. Dev. = 52.92.
130: c = 0.5714
tabl = 0.554.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9533
Critical = 0.838
The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: Calcium   Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

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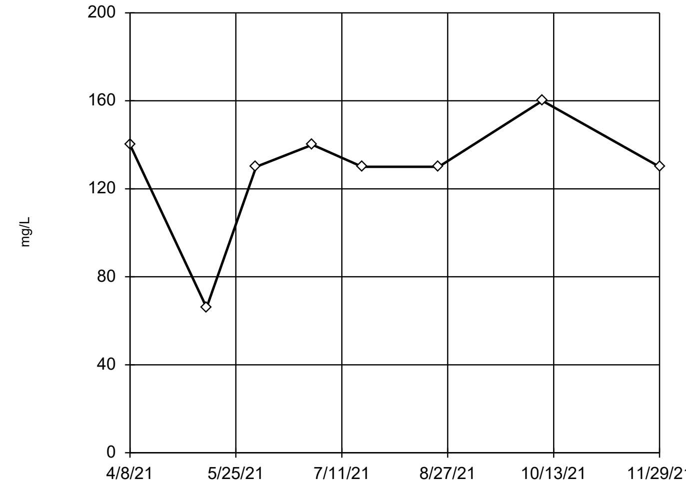
Tukey's Outlier Screening

MW-21



n = 8

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were x^4 transformed to achieve best W statistic (graph shown in original units).

High cutoff = 161.5, low cutoff = -56.29, based on IQR multiplier of 3.

Constituent: Calcium   Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

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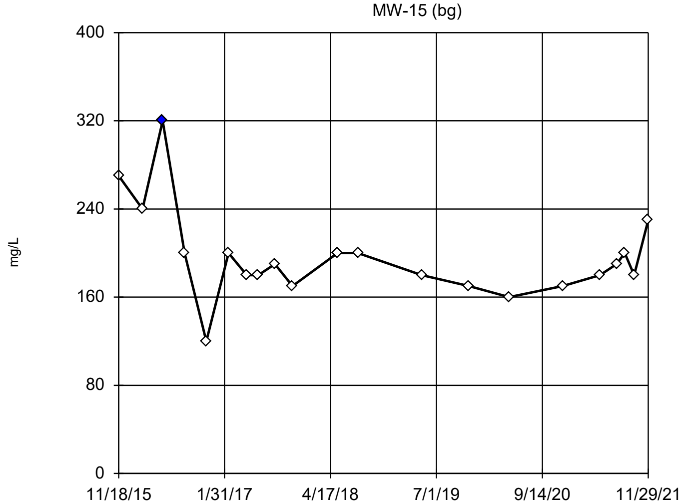
Tukey's Outlier Screening

MW-15 (bg)



n = 21

Outlier is drawn as solid.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 298.9, low cutoff = 117, based on IQR multiplier of 3.

Constituent: Calcium   Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

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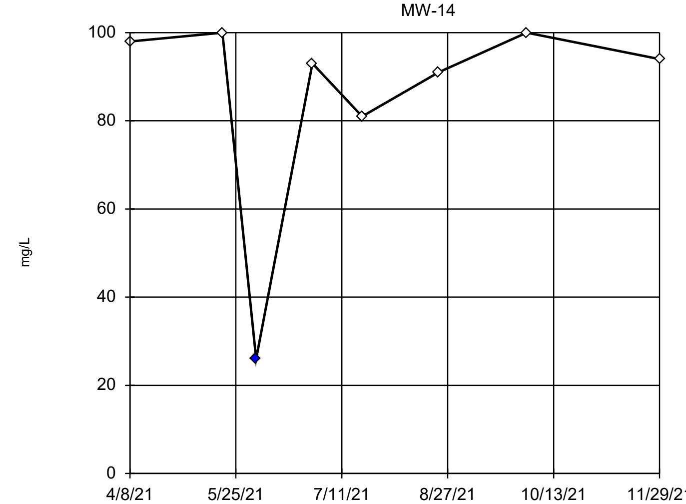
Dixon's Outlier Test

MW-14



n = 8

Statistical outlier is drawn as solid.
Testing for 2 low outliers.
Mean = 85.38.
Std. Dev. = 24.77.
81: c = 0.5263
tabl = 0.554.
Alpha = 0.05.
26: c = 0.7432
tabl = 0.554.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.8739
Critical = 0.838
The distribution, after removal of suspect value, was found to be normally distributed.

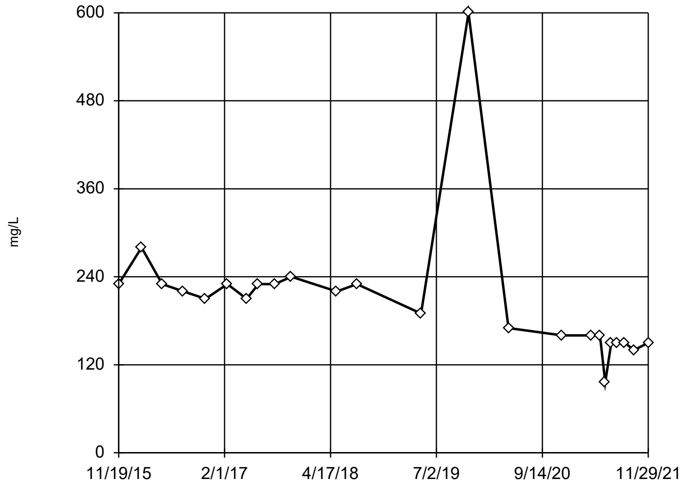
Constituent: Chloride   Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Tukey's Outlier Screening

MW-17 (bg)



n = 24

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 752.7, low cutoff = 47.34, based on IQR multiplier of 3.

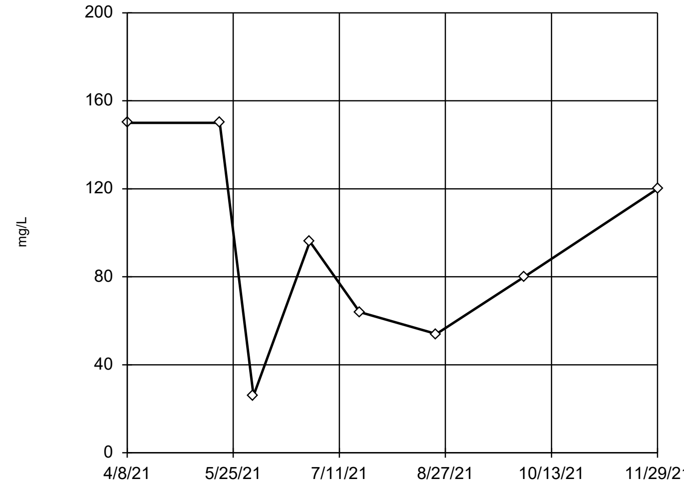
Constituent: Chloride Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

EPA Screening (suspected outliers for Dixon's Test)

MW-20



n = 8

Dixon's will not be run. No suspect values identified or unable to establish suspect values. Mean 92.5, std. dev. 45.13, critical Tn 2.032

Normality test used: Shapiro Wilk@alpha = 0.1 Calculated = 0.9453 Critical = 0.851 The distribution was found to be normally distributed.

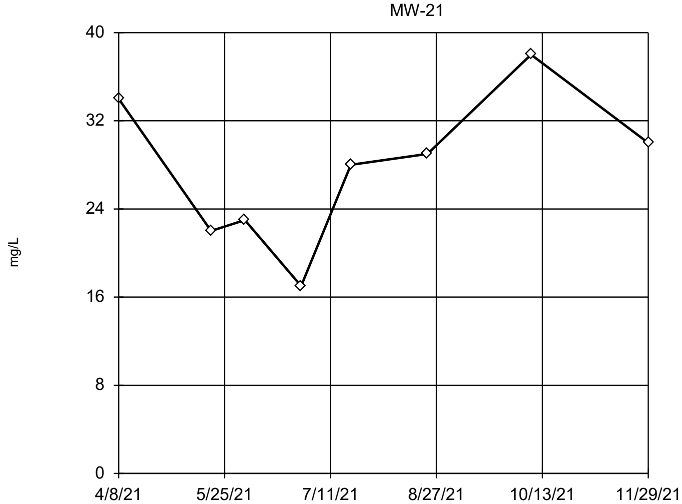
Constituent: Chloride Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

EPA Screening (suspected outliers for Dixon's Test)

MW-21



n = 8

Dixon's will not be run. No suspect values identified or unable to establish suspect values. Mean 27.63, std. dev. 6.781, critical Tn 2.032

Normality test used: Shapiro Wilk@alpha = 0.1 Calculated = 0.9824 Critical = 0.851 The distribution was found to be normally distributed.

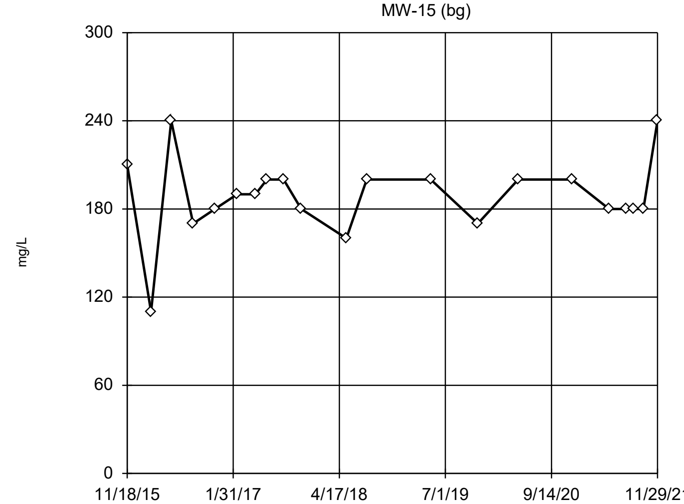
Constituent: Chloride Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Tukey's Outlier Screening

MW-15 (bg)



n = 21

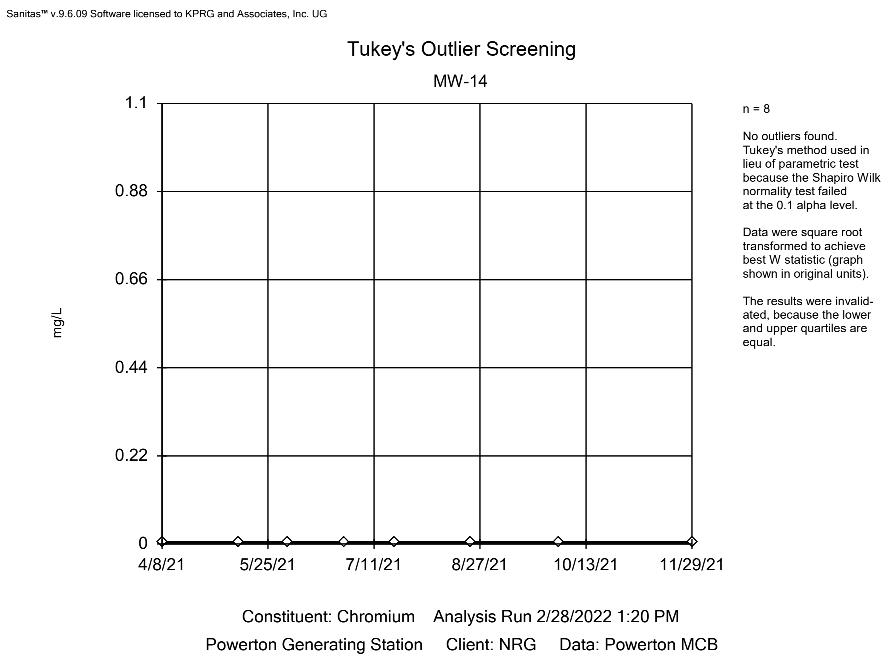
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

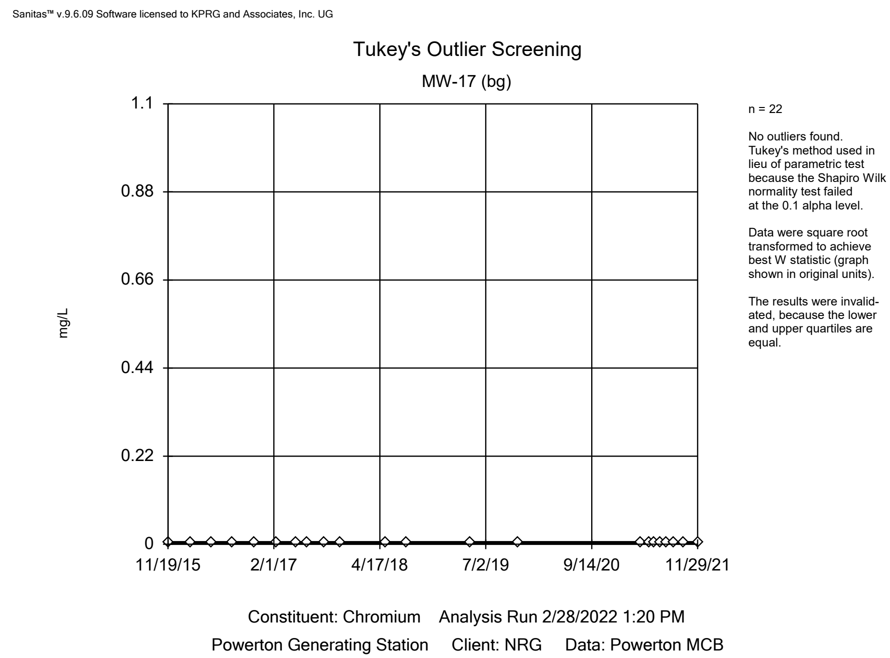
Data were square transformed to achieve best W statistic (graph shown in original units).

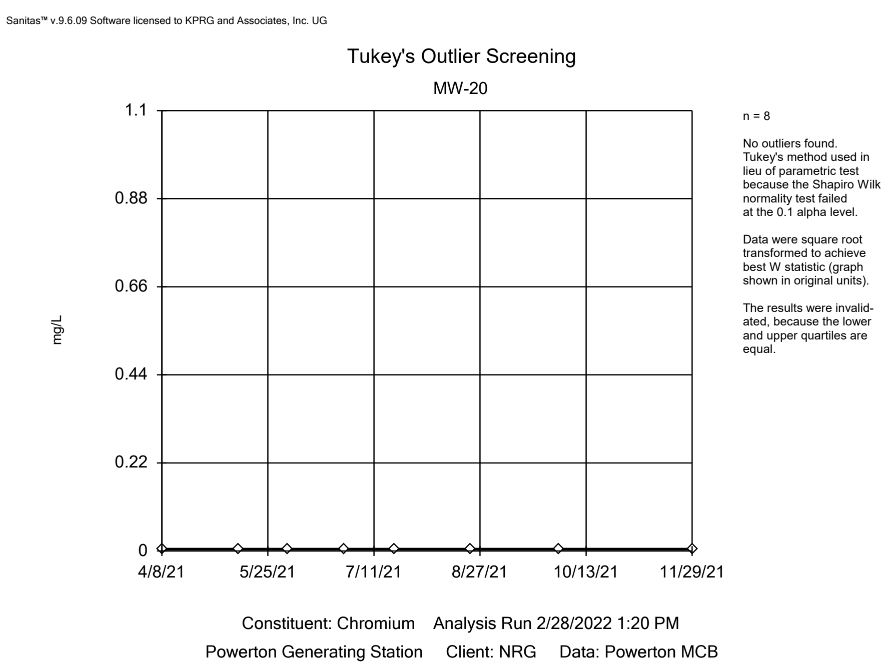
High cutoff = 250.6, low cutoff = 97.98, based on IQR multiplier of 3.

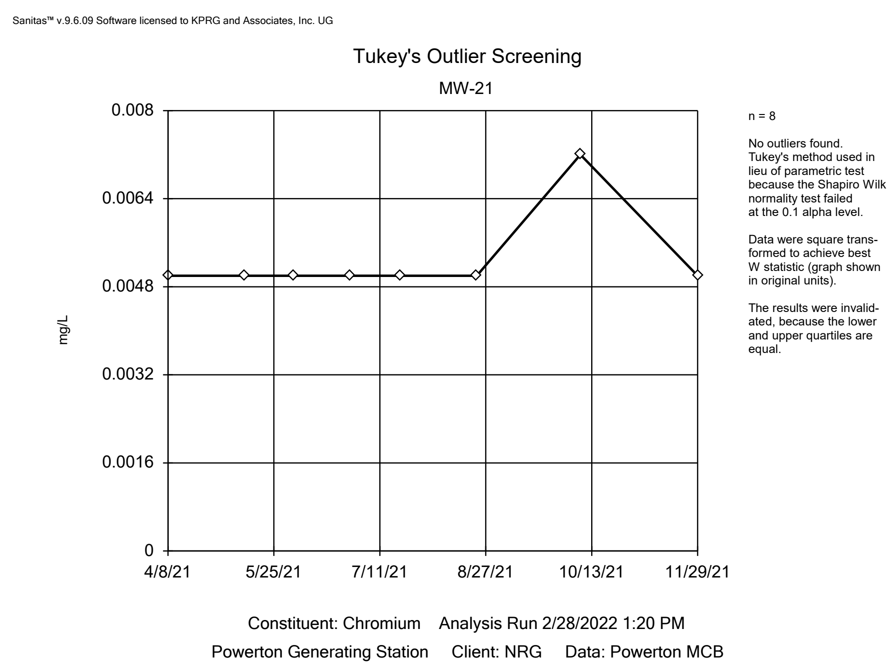
Constituent: Chloride Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station Client: NRG Data: Powerton MCB


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Tukey's Outlier Screening
MW-14
mg/L
1.1
0.88
0.66
0.44
0.22
0
4/8/21
5/25/21
7/11/21
8/27/21
10/13/21
11/29/21
n = 8
No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were square root transformed to achieve best W statistic (graph shown in original units).
The results were invalidated, because the lower and upper quartiles are equal.
Constituent: Chromium Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Tukey's Outlier Screening
MW-17 (bg)
mg/L
1.1
0.88
0.66
0.44
0.22
0
11/19/15
2/1/17
4/17/18
7/2/19
9/14/20
11/29/21
n = 22
No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were square root transformed to achieve best W statistic (graph shown in original units).
The results were invalidated, because the lower and upper quartiles are equal.
Constituent: Chromium Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Tukey's Outlier Screening
MW-20
mg/L
1.1
0.88
0.66
0.44
0.22
0
4/8/21
5/25/21
7/11/21
8/27/21
10/13/21
11/29/21
n = 8
No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were square root transformed to achieve best W statistic (graph shown in original units).
The results were invalidated, because the lower and upper quartiles are equal.
Constituent: Chromium Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Tukey's Outlier Screening
MW-21
mg/L
0.008
0.0064
0.0048
0.0032
0.0016
0
4/8/21
5/25/21
7/11/21
8/27/21
10/13/21
11/29/21
n = 8
No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were square transformed to achieve best W statistic (graph shown in original units).
The results were invalidated, because the lower and upper quartiles are equal.
Constituent: Chromium Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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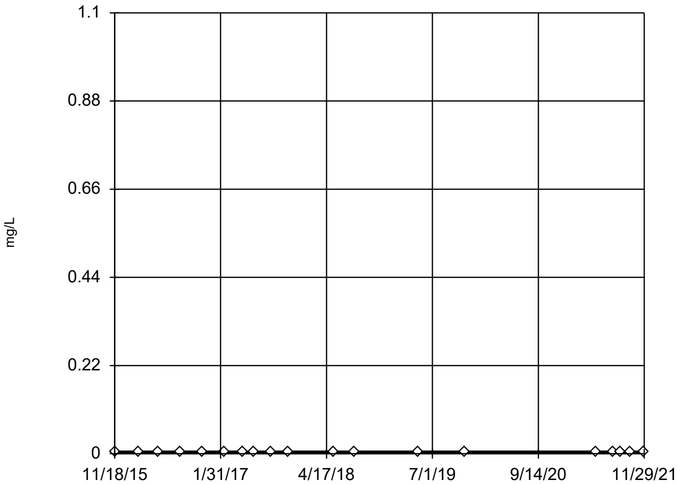
Tukey's Outlier Screening

MW-15 (bg)



n = 19

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were cube root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Chromium   Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

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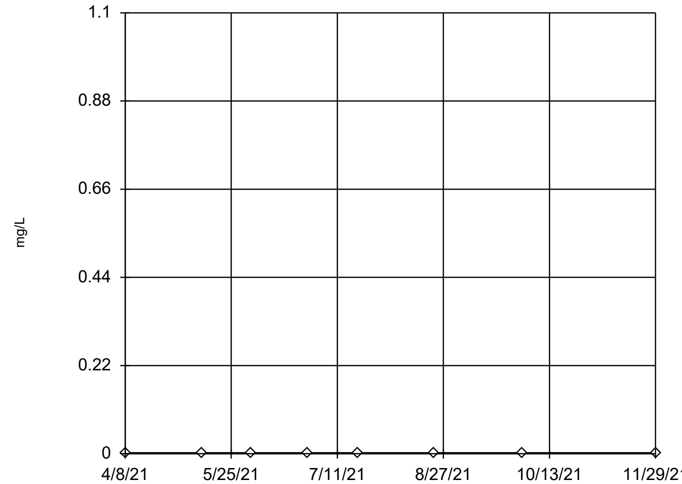
Tukey's Outlier Screening

MW-14



n = 8

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were cube root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Cobalt   Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

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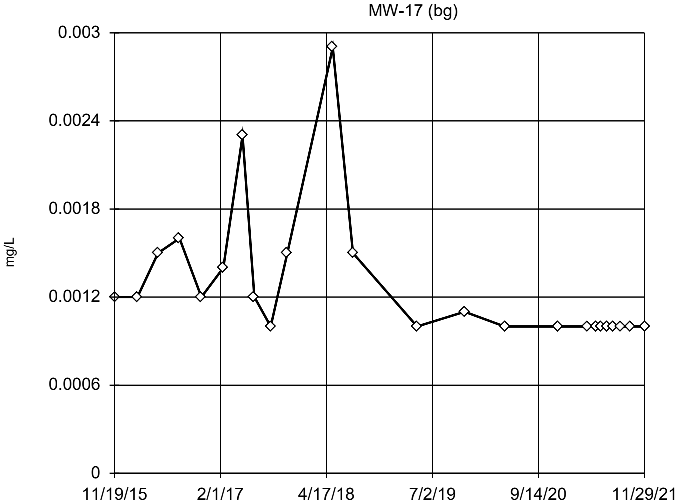
Tukey's Outlier Screening

MW-17 (bg)



n = 24

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.00441, low cutoff = 0.0003286, based on IQR multiplier of 3.

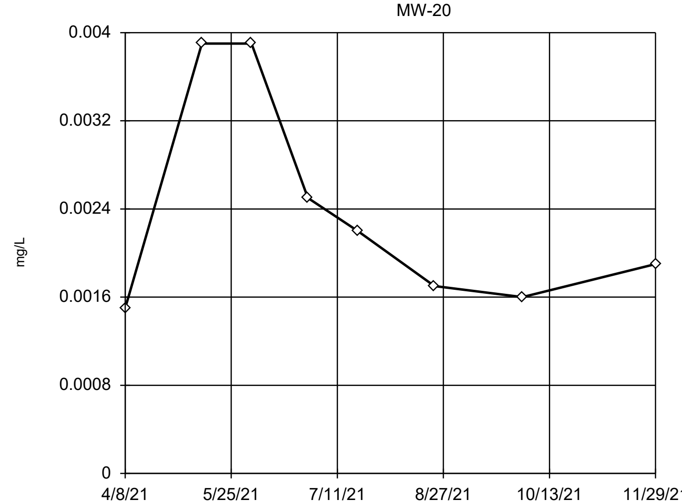
Constituent: Cobalt   Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

EPA Screening (suspected outliers for Dixon's Test)

MW-20



n = 8

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.0024, std. dev. 0.0009813, critical Tn 2.032

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.8715
Critical = 0.851 (after natural log transformation)
The distribution was found to be log-normal.

Constituent: Cobalt   Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

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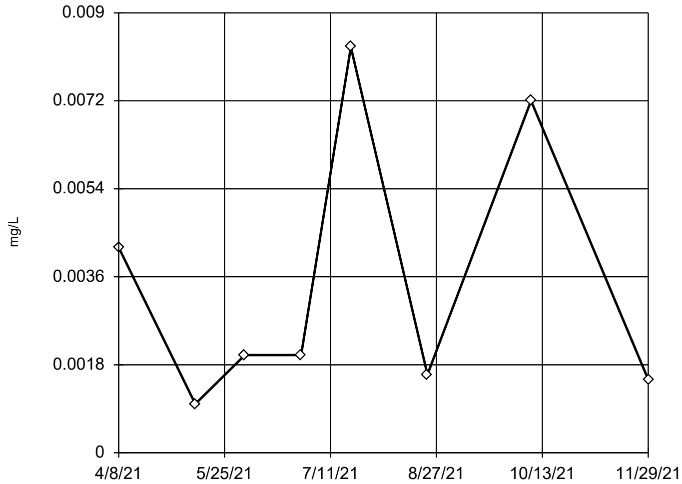
EPA Screening (suspected outliers for Dixon's Test)

MW-21



n = 8

Dixon's will not be run. No suspect values identified or unable to establish suspect values. Mean 0.003475, std. dev. 0.002818, critical Tn 2.032

Normality test used: Shapiro Wilk@alpha = 0.1 Calculated = 0.9007 Critical = 0.851 (after natural log transformation) The distribution was found to be log-normal.

Constituent: Cobalt Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

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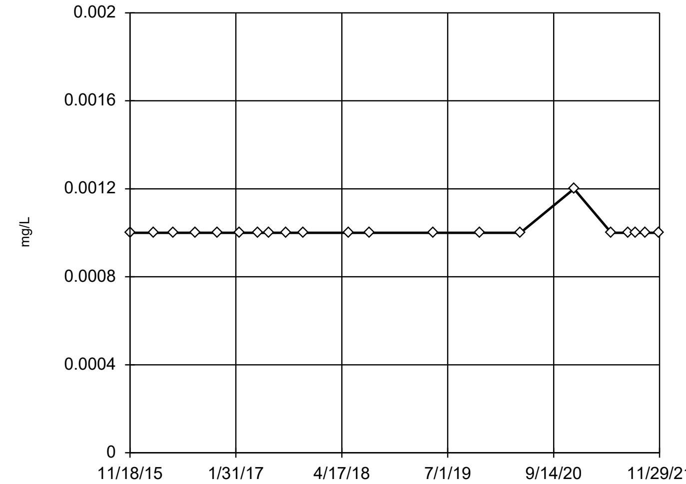
Tukey's Outlier Screening

MW-15 (bg)



n = 21

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were cube root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

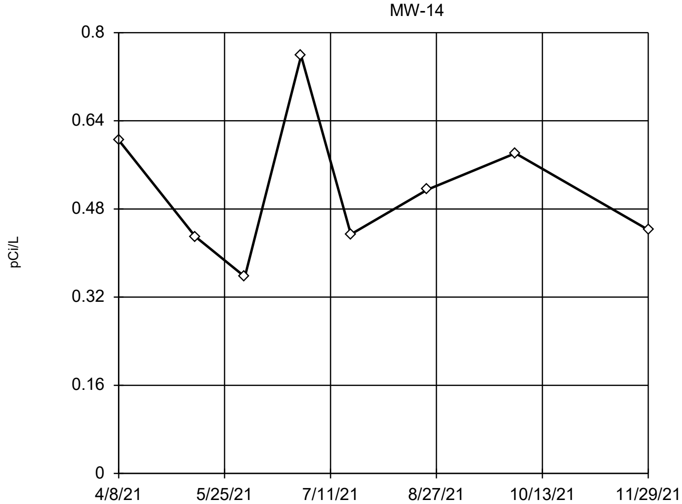
Constituent: Cobalt Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

EPA Screening (suspected outliers for Dixon's Test)

MW-14



n = 8

Dixon's will not be run. No suspect values identified or unable to establish suspect values. Mean 0.5152, std. dev. 0.1285, critical Tn 2.032

Normality test used: Shapiro Wilk@alpha = 0.1 Calculated = 0.9295 Critical = 0.851 The distribution was found to be normally distributed.

Constituent: Combined Radium 226 + 228 Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

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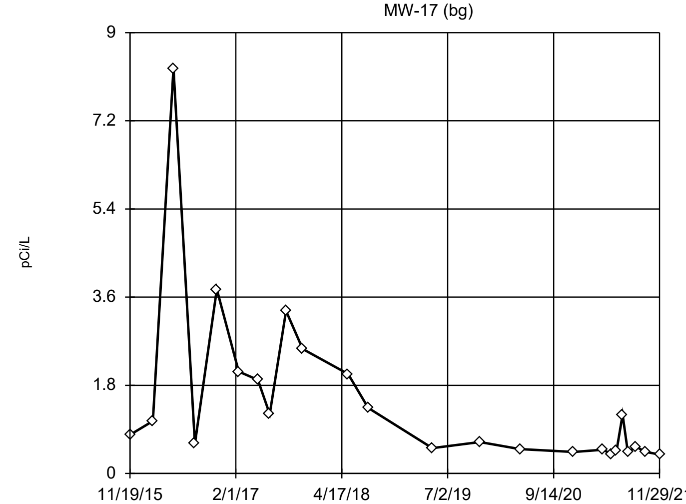
Tukey's Outlier Screening

MW-17 (bg)



n = 24

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 141.3, low cutoff = 0.006605, based on IQR multiplier of 3.

Constituent: Combined Radium 226 + 228 Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

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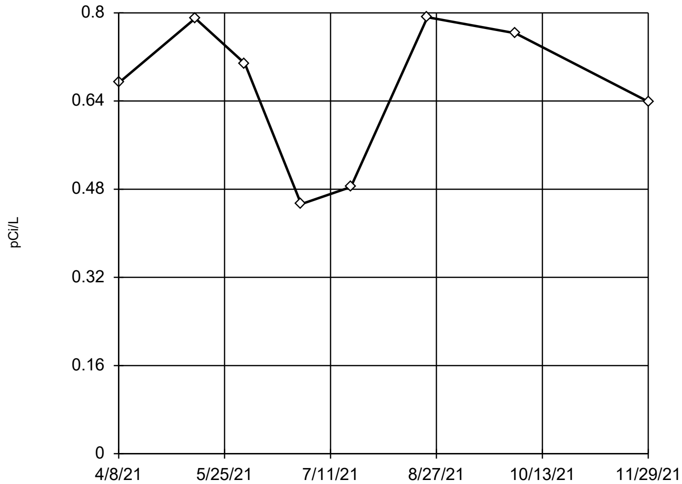
EPA Screening (suspected outliers for Dixon's Test)

MW-20



n = 8

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.6628, std. dev. 0.1318, critical Tn 2.032

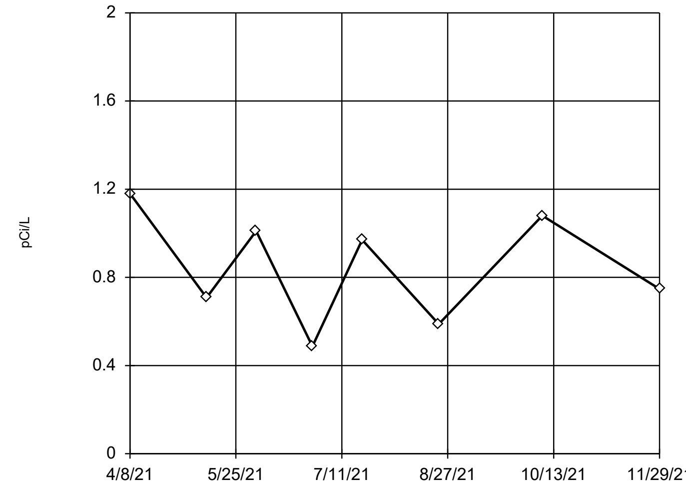
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.8715
Critical = 0.851
The distribution was found to be normally distributed.

Constituent: Combined Radium 226 + 228 Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

EPA Screening (suspected outliers for Dixon's Test)

MW-21



n = 8

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.8463, std. dev. 0.2487, critical Tn 2.032

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9469
Critical = 0.851
The distribution was found to be normally distributed.

Constituent: Combined Radium 226 + 228 Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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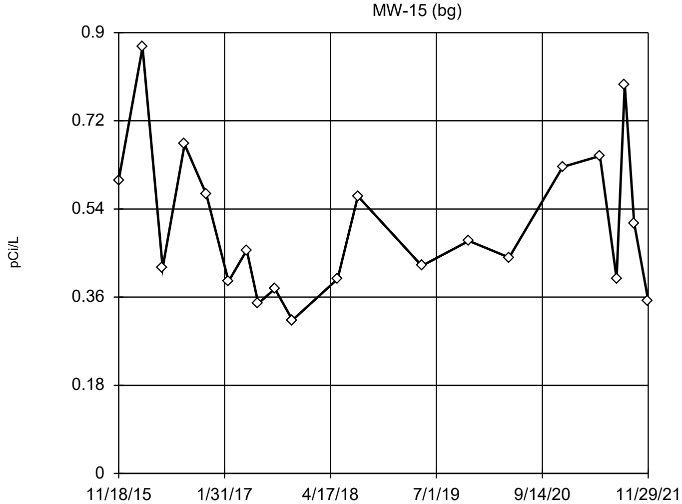
EPA Screening (suspected outliers for Dixon's Test)

MW-15 (bg)



n = 21

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.5071, std. dev. 0.1508, critical Tn 2.58

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9613
Critical = 0.923 (after natural log transformation)
The distribution was found to be log-normal.

Constituent: Combined Radium 226 + 228 Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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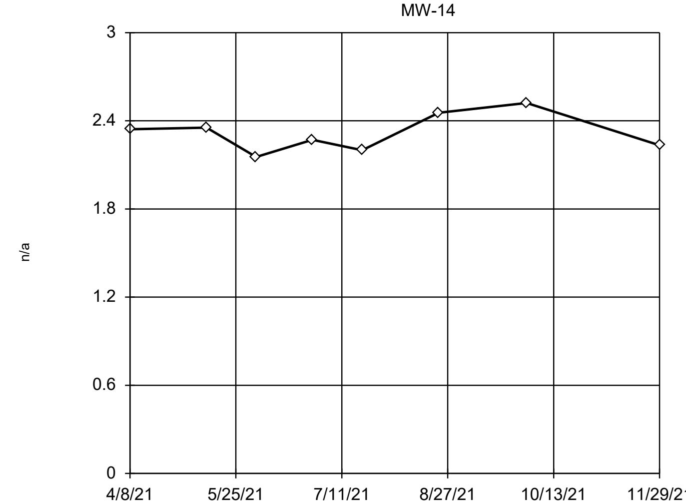
EPA Screening (suspected outliers for Dixon's Test)

MW-14



n = 8

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 2.316, std. dev. 0.1265, critical Tn 2.032

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9583
Critical = 0.851
The distribution was found to be normally distributed.

Constituent: Conductivity Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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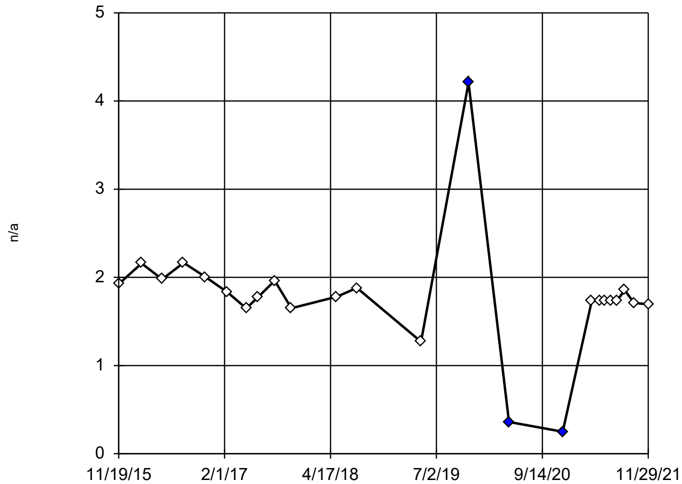
Tukey's Outlier Screening

MW-17 (bg)



n = 24

Outliers are drawn as solid.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Ladder of Powers transformations did not improve normality; analysis run on raw data.

High cutoff = 2.665, low cutoff = 0.981, based on IQR multiplier of 3.

Constituent: Conductivity Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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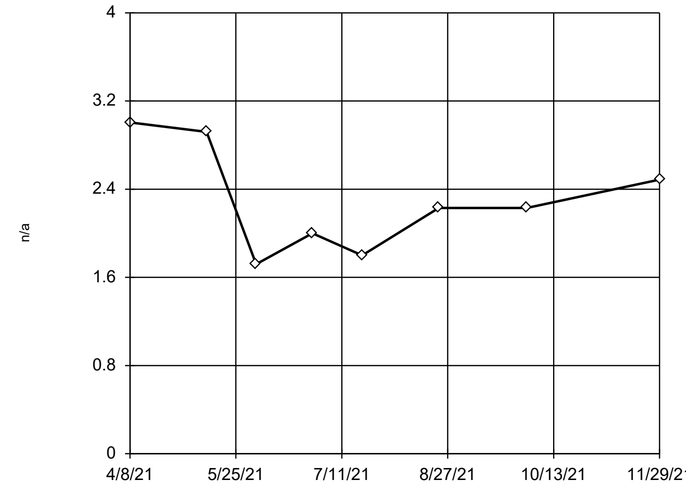
EPA Screening (suspected outliers for Dixon's Test)

MW-20



n = 8

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 2.299, std. dev. 0.4787, critical Tn 2.032

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9243
Critical = 0.851
The distribution was found to be normally distributed.

Constituent: Conductivity Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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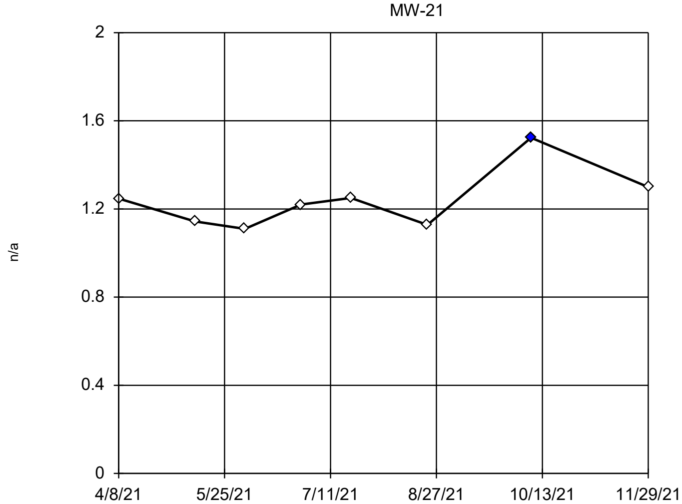
Dixon's Outlier Test

MW-21



n = 8

Statistical outlier is drawn as solid.
Testing for 1 high outlier.
Mean = 1.24.
Std. Dev. = 0.1325.
1.523: c = 0.5671
tabl = 0.554.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9122
Critical = 0.838
The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: Conductivity Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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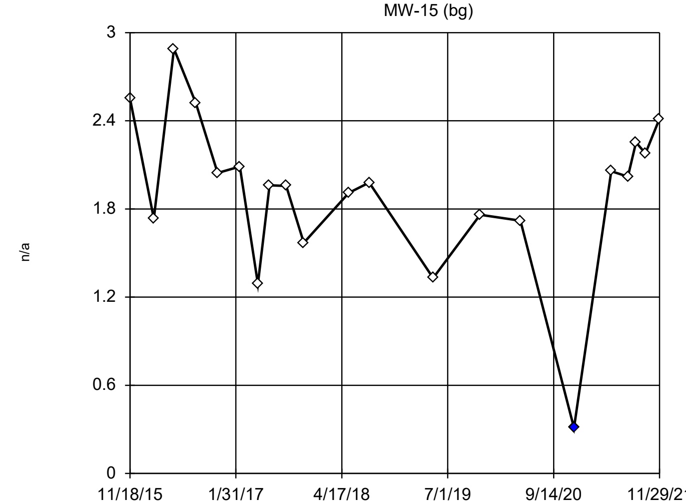
Dixon's Outlier Test

MW-15 (bg)



n = 21

Statistical outlier is drawn as solid.
Testing for 1 low outlier.
Mean = 1.93.
Std. Dev. = 0.5366.
0.31: c = 0.4615
tabl = 0.44.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.975
Critical = 0.92
The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: Conductivity Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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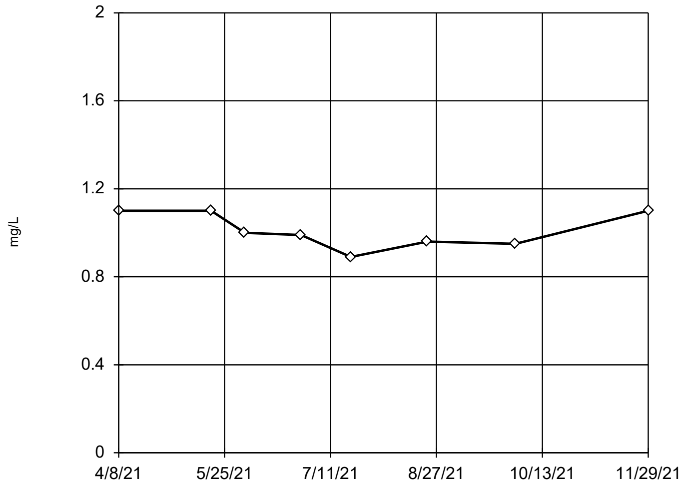
EPA Screening (suspected outliers for Dixon's Test)

MW-14



n = 8

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 1.011, std. dev. 0.08043, critical Tn 2.032

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.879
Critical = 0.851
The distribution was found to be normally distributed.

Constituent: Fluoride Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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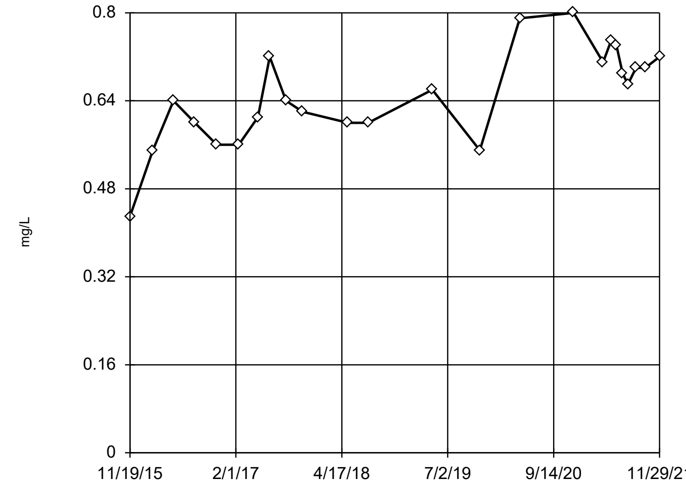
Rosner's Outlier Test

MW-17 (bg)



n = 24

No statistical outliers.

k = 1
r = 2.523
Tabulated value = 2.824
Alpha = 0.01

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9549
Critical = 0.928
The distribution was found to be normally distributed.

Constituent: Fluoride Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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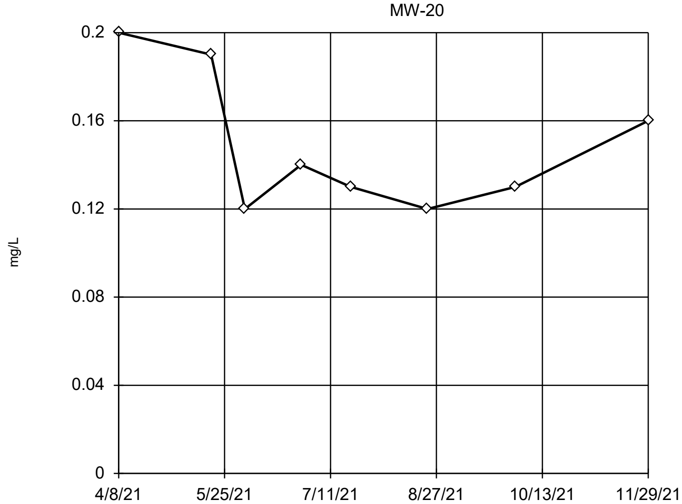
EPA Screening (suspected outliers for Dixon's Test)

MW-20



n = 8

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.1488, std. dev. 0.03137, critical Tn 2.032

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.8672
Critical = 0.851 (after natural log transformation)
The distribution was found to be log-normal.

Constituent: Fluoride Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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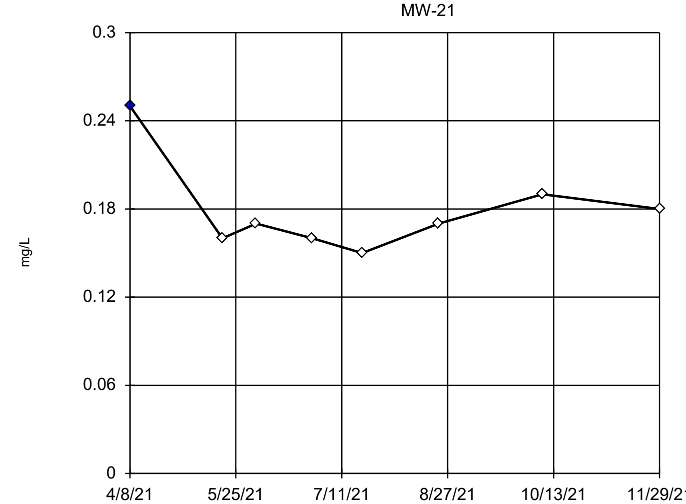
Dixon's Outlier Test

MW-21



n = 8

Statistical outlier is drawn as solid.
Testing for 1 high outlier.
Mean = 0.1788.
Std. Dev. = 0.03137.
0.25: c = 0.6667
tabl = 0.554.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9666
Critical = 0.838
The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: Fluoride Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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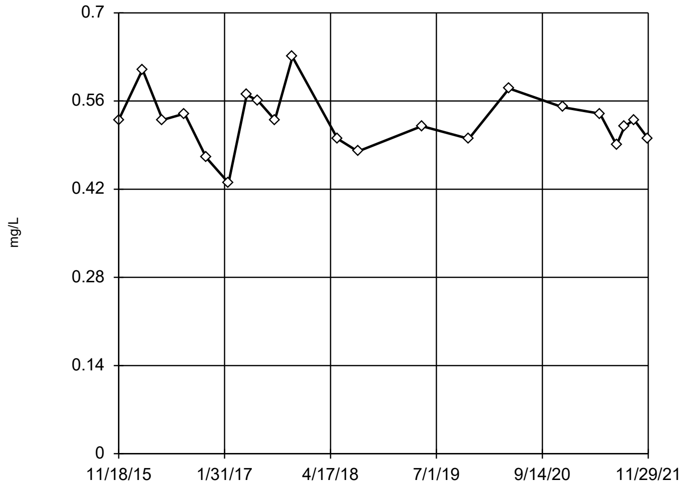
EPA Screening (suspected outliers for Dixon's Test)

MW-15 (bg)



n = 21

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.529, std. dev. 0.04614, critical Tn 2.58

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9783
Critical = 0.923
The distribution was found to be normally distributed.

Constituent: Fluoride Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

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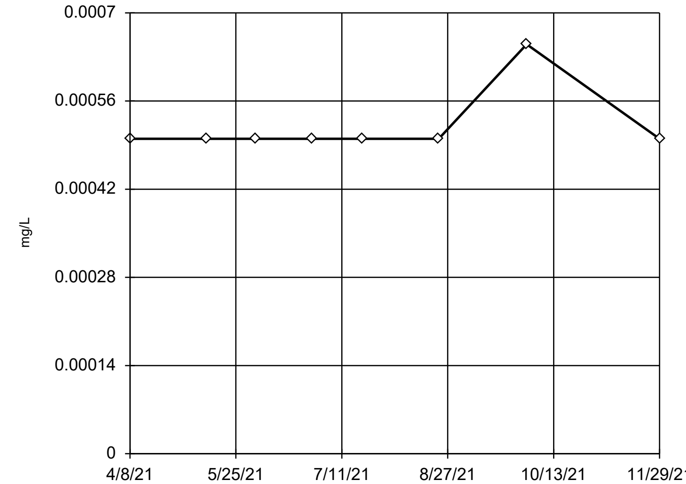
Tukey's Outlier Screening

MW-14



n = 8

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were cube transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Lead Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

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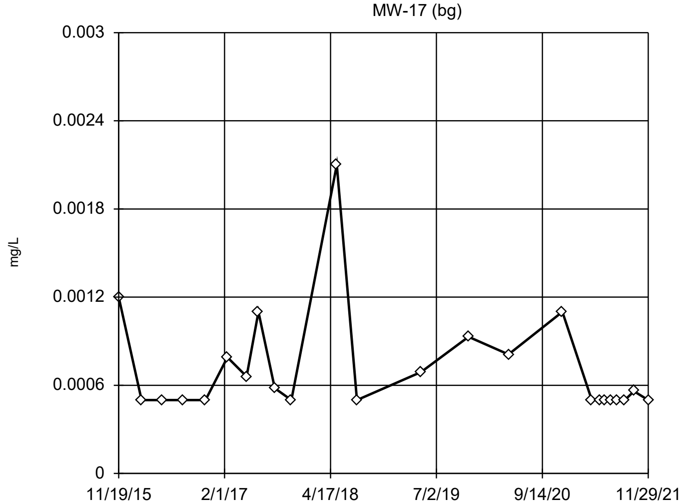
Tukey's Outlier Screening

MW-17 (bg)



n = 24

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.003276, low cutoff = 0.0001221, based on IQR multiplier of 3.

Constituent: Lead Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

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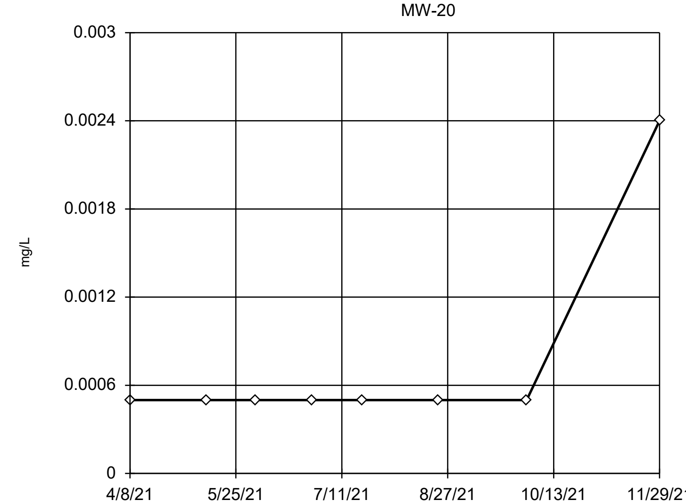
Tukey's Outlier Screening

MW-20



n = 8

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were x^6 transformed to achieve best W statistic (graph shown in original units).

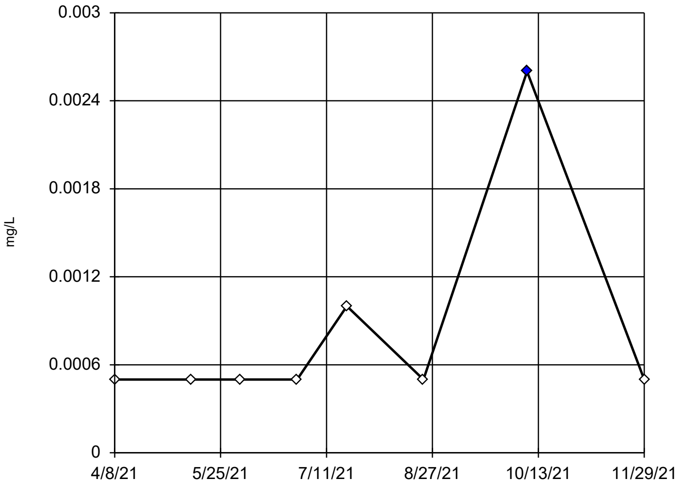
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Lead Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

Tukey's Outlier Screening

MW-21



n = 8

Outlier is drawn as solid. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

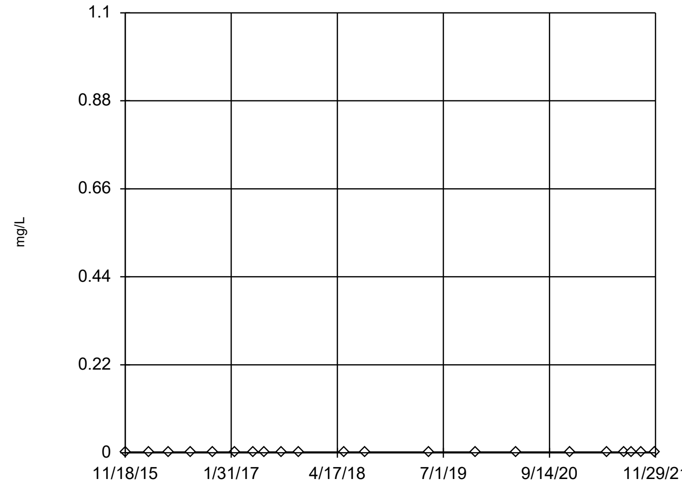
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.002, low cutoff = 0.0001768, based on IQR multiplier of 3.

Constituent: Lead Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Tukey's Outlier Screening

MW-15 (bg)



n = 21

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

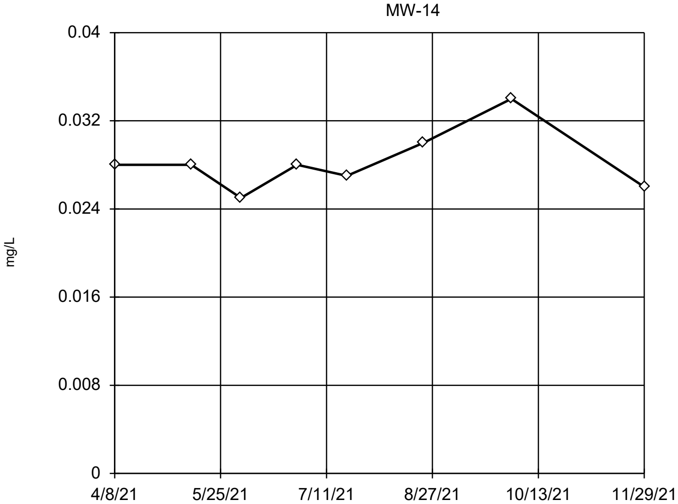
Data were square root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Lead Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

EPA Screening (suspected outliers for Dixon's Test)

MW-14



n = 8

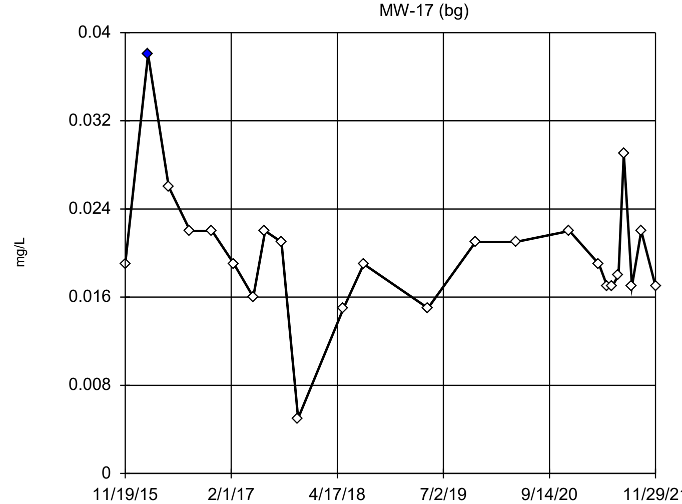
Dixon's will not be run. No suspect values identified or unable to establish suspect values. Mean 0.02825, std. dev. 0.002765, critical Tn 2.032

Normality test used: Shapiro Wilk@alpha = 0.1 Calculated = 0.8865 Critical = 0.851 The distribution was found to be normally distributed.

Constituent: Lithium Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Tukey's Outlier Screening

MW-17 (bg)



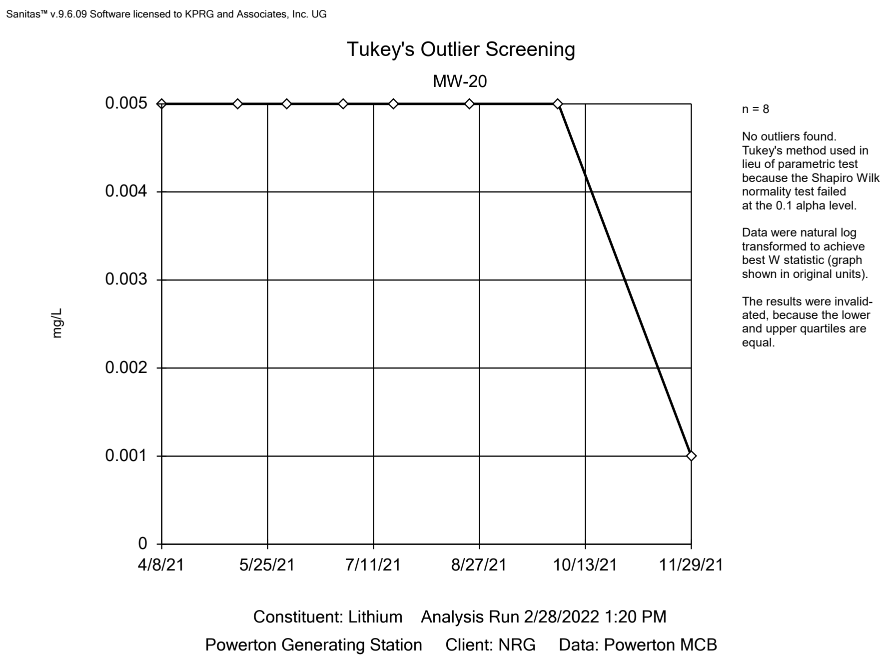
n = 24

Outlier is drawn as solid. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Ladder of Powers transformations did not improve normality; analysis run on raw data.

High cutoff = 0.037, low cutoff = 0.002, based on IQR multiplier of 3.

Constituent: Lithium Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB



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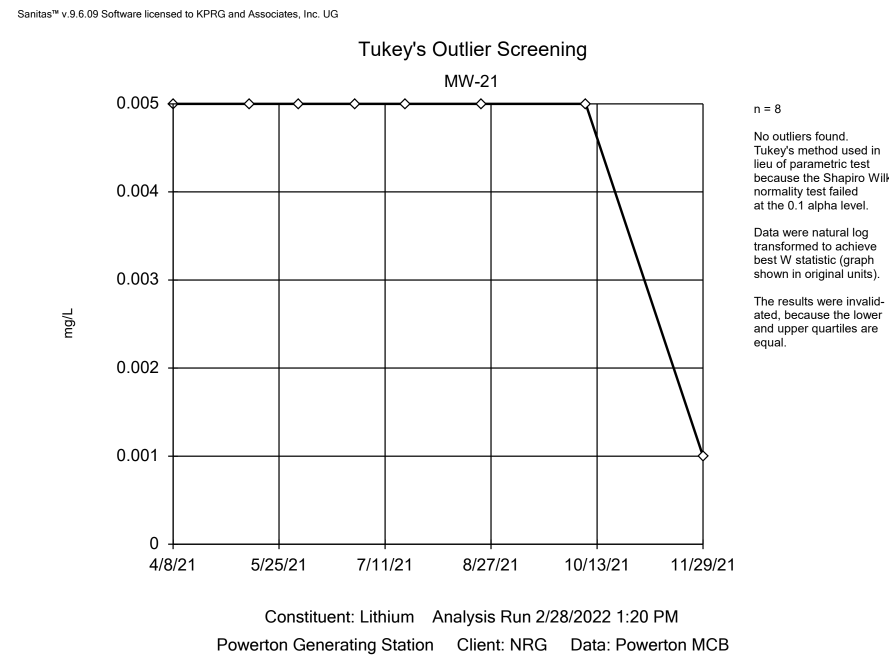
Tukey's Outlier Screening
MW-20
mg/L
0.005
0.004
0.003
0.002
0.001
0
4/8/21
5/25/21
7/11/21
8/27/21
10/13/21
11/29/21
n = 8
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were natural log transformed to achieve best W statistic (graph shown in original units).
The results were invalidated, because the lower and upper quartiles are equal.
Constituent: Lithium Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB



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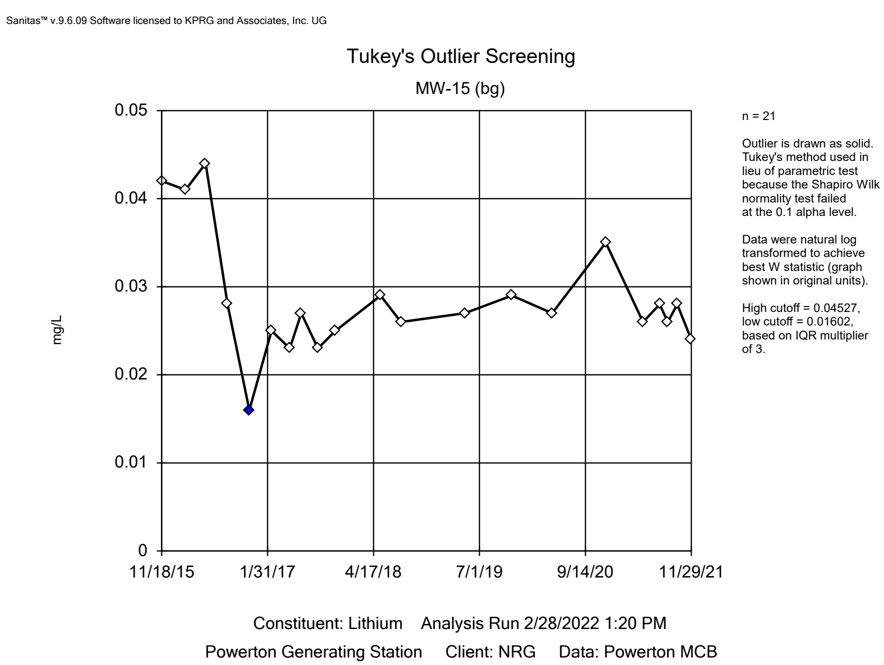
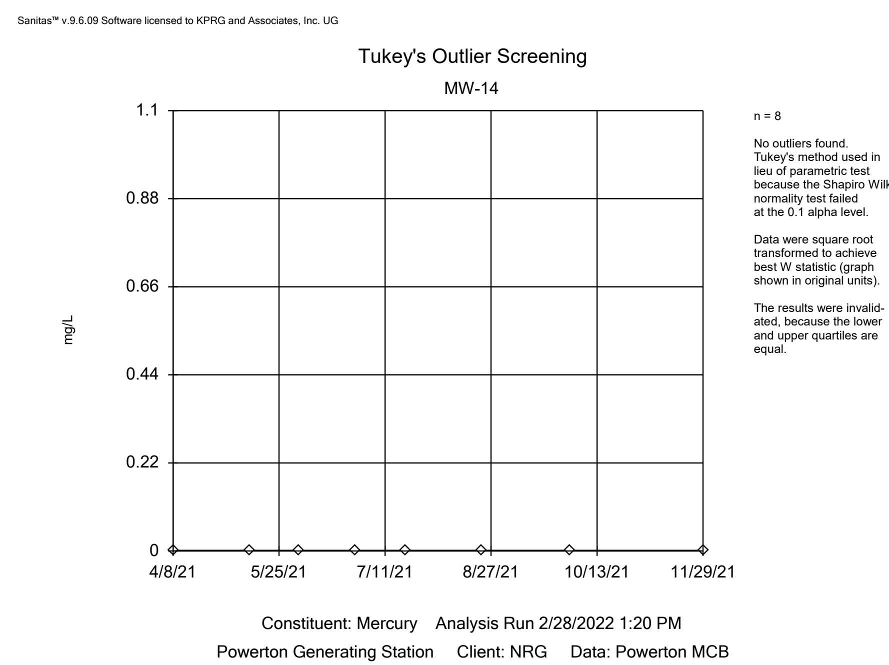
Tukey's Outlier Screening
MW-21
mg/L
0.005
0.004
0.003
0.002
0.001
0
4/8/21
5/25/21
7/11/21
8/27/21
10/13/21
11/29/21
n = 8
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were natural log transformed to achieve best W statistic (graph shown in original units).
The results were invalidated, because the lower and upper quartiles are equal.
Constituent: Lithium Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB



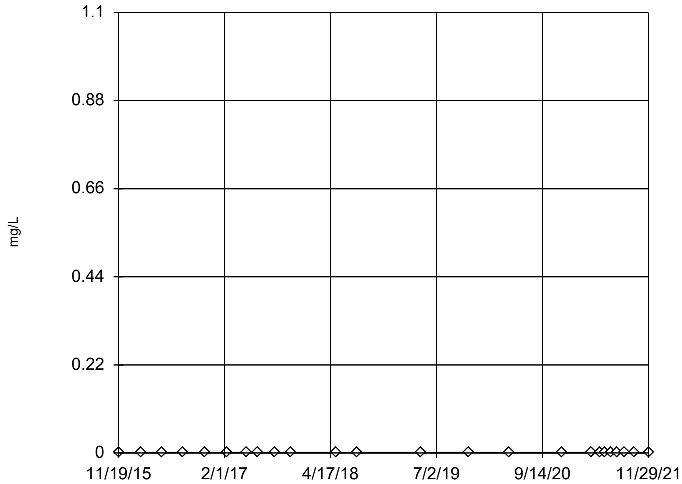
Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Tukey's Outlier Screening
MW-15 (bg)
mg/L
0.05
0.04
0.03
0.02
0.01
0
11/18/15
1/31/17
4/17/18
7/1/19
9/14/20
11/29/21
n = 21
Outlier is drawn as solid. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were natural log transformed to achieve best W statistic (graph shown in original units).
High cutoff = 0.04527, low cutoff = 0.01602, based on IQR multiplier of 3.
Constituent: Lithium Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB



Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Tukey's Outlier Screening
MW-14
mg/L
1.1
0.88
0.66
0.44
0.22
0
4/8/21
5/25/21
7/11/21
8/27/21
10/13/21
11/29/21
n = 8
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were square root transformed to achieve best W statistic (graph shown in original units).
The results were invalidated, because the lower and upper quartiles are equal.
Constituent: Mercury Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Tukey's Outlier Screening

MW-17 (bg)



n = 24

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

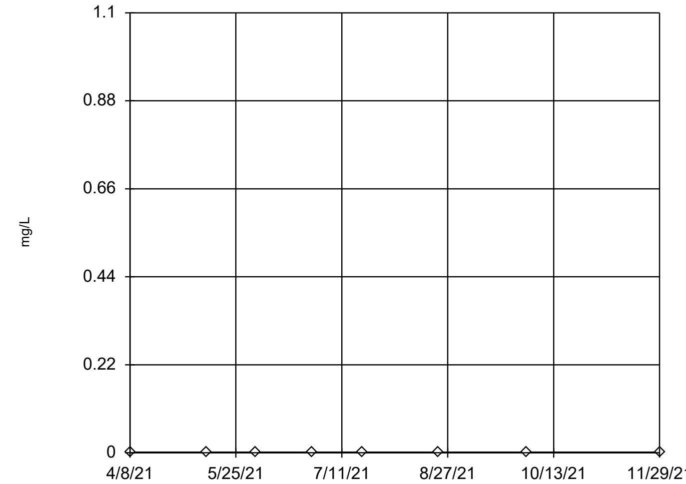
Data were square root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Mercury Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Tukey's Outlier Screening

MW-20



n = 8

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

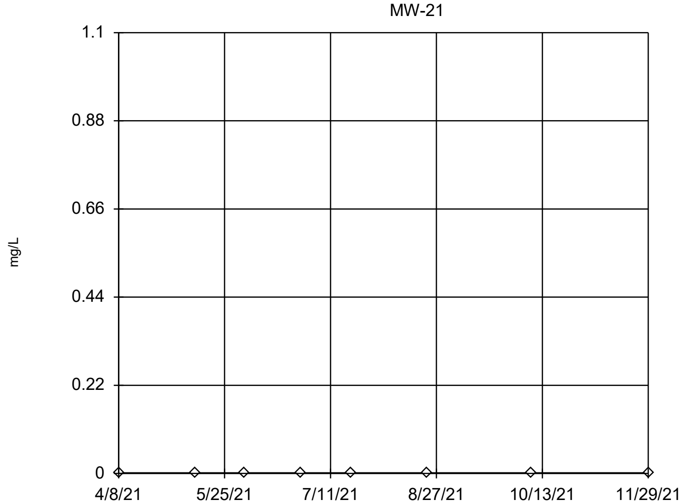
Data were square root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Mercury Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Tukey's Outlier Screening

MW-21



n = 8

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

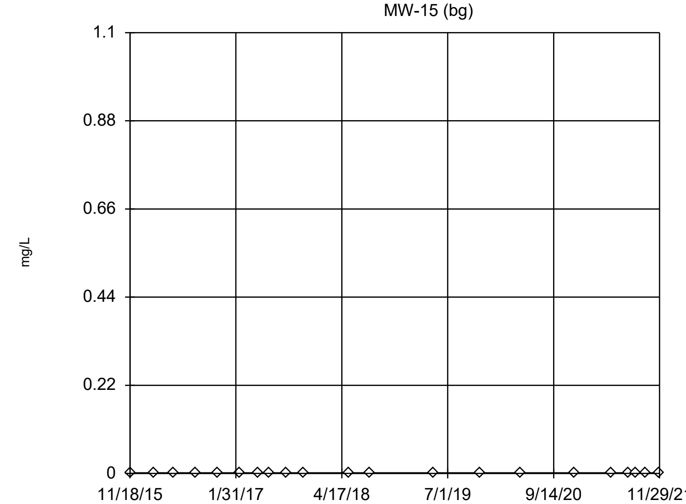
Data were square root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Mercury Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Tukey's Outlier Screening

MW-15 (bg)



n = 21

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Mercury Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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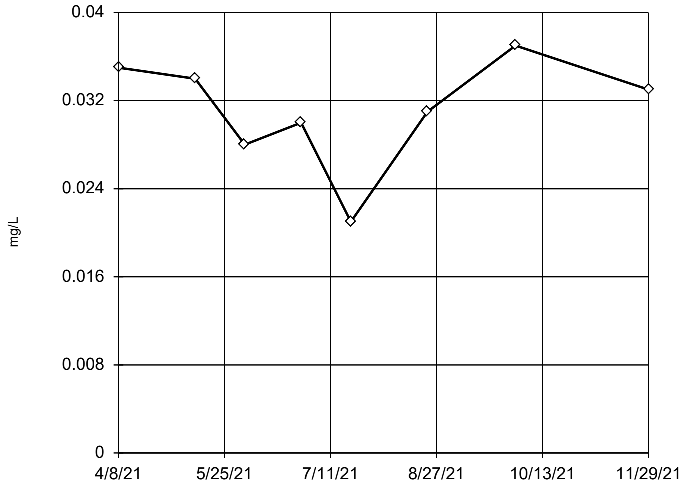
Dixon's Outlier Test

MW-14



n = 8

No statistical outliers.
Testing for 1 low outlier.
Mean = 0.03113.
Std. Dev. = 0.004998.
0.021: c = 0.5
tabl = 0.554.
Alpha = 0.05.

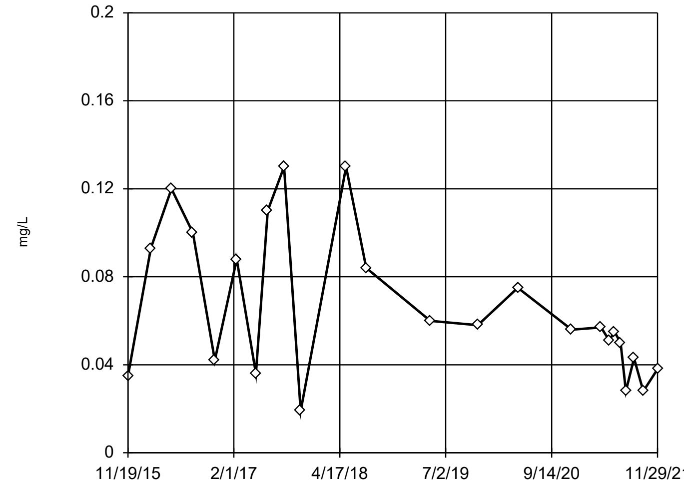
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9865
Critical = 0.838
The distribution was found to be normally distributed.

Constituent: Molybdenum Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

EPA Screening (suspected outliers for Rosner's Test)

MW-17 (bg)



n = 24

Rosner's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.06608, std. dev. 0.03333, critical Tn 2.644

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9677
Critical = 0.93 (after natural log transformation)
The distribution was found to be log-normal.

Constituent: Molybdenum Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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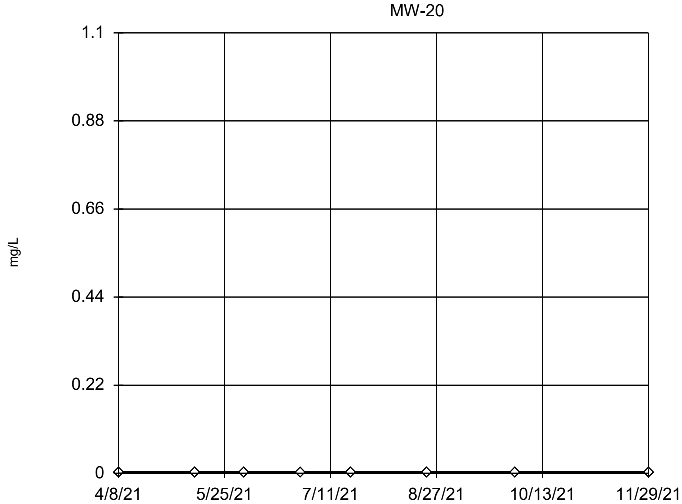
Tukey's Outlier Screening

MW-20



n = 8

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Molybdenum Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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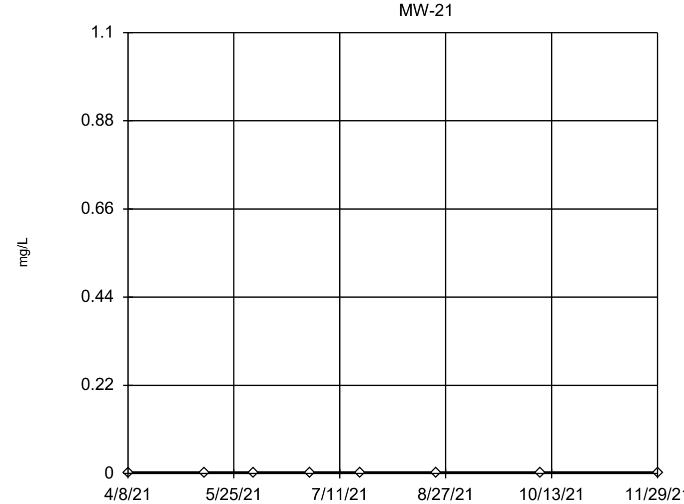
Tukey's Outlier Screening

MW-21



n = 8

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Molybdenum Analysis Run 2/28/2022 1:20 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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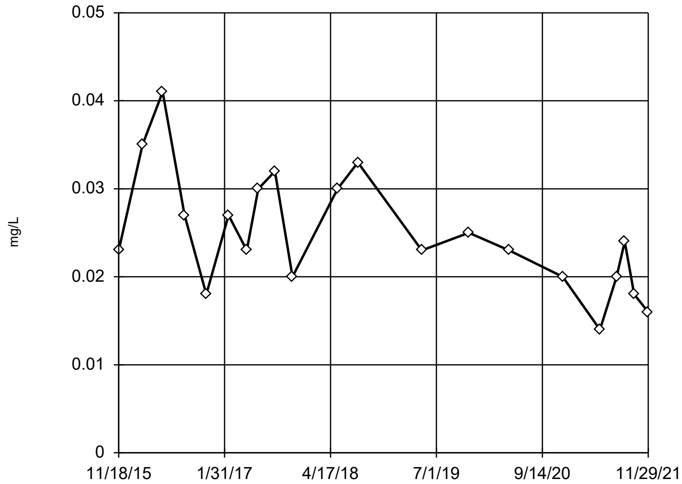
EPA Screening (suspected outliers for Dixon's Test)

MW-15 (bg)



n = 21

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.02486, std. dev. 0.006777, critical Tn 2.58

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9651
Critical = 0.923
The distribution was found to be normally distributed.

Constituent: Molybdenum   Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

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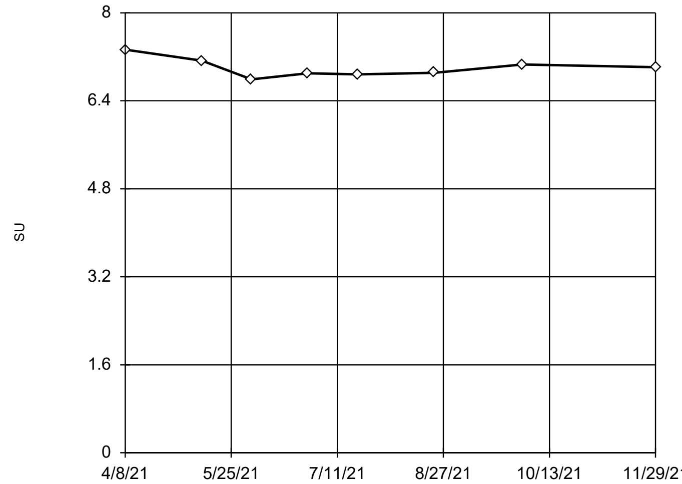
EPA Screening (suspected outliers for Dixon's Test)

MW-14



n = 8

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 7.001, std. dev. 0.1716, critical Tn 2.032

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9369
Critical = 0.851
The distribution was found to be normally distributed.

Constituent: pH   Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

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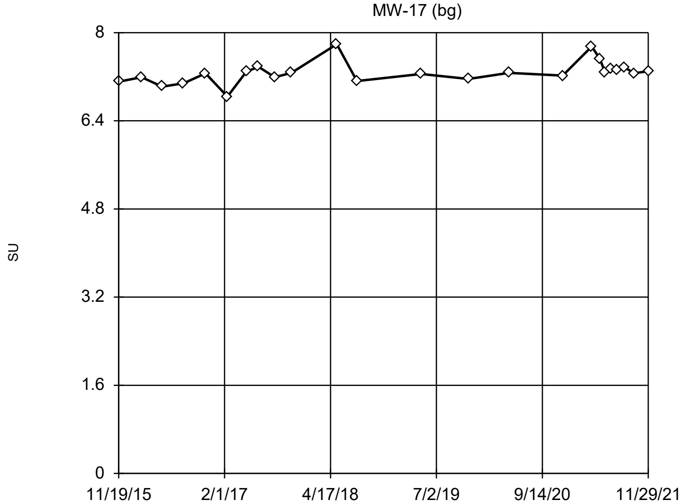
Tukey's Outlier Screening

MW-17 (bg)



n = 24

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 7.794, low cutoff = 6.743, based on IQR multiplier of 3.

Constituent: pH   Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

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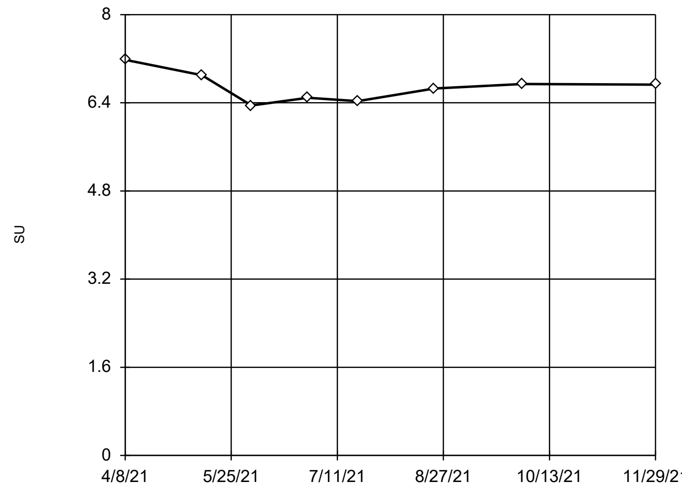
EPA Screening (suspected outliers for Dixon's Test)

MW-20



n = 8

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 6.685, std. dev. 0.2705, critical Tn 2.032

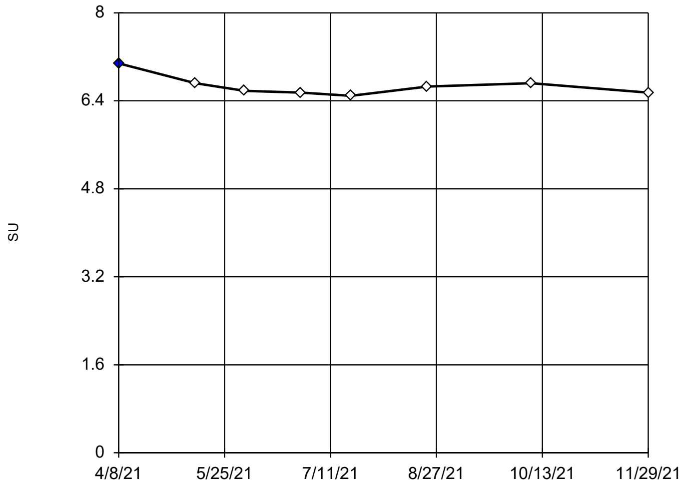
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9526
Critical = 0.851
The distribution was found to be normally distributed.

Constituent: pH   Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

Dixon's Outlier Test

MW-21



n = 8

Statistical outlier is drawn as solid.
Testing for 1 high outlier.
Mean = 6.669.
Std. Dev. = 0.1861.
7.08: c = 0.6792
tabl = 0.554.
Alpha = 0.05.

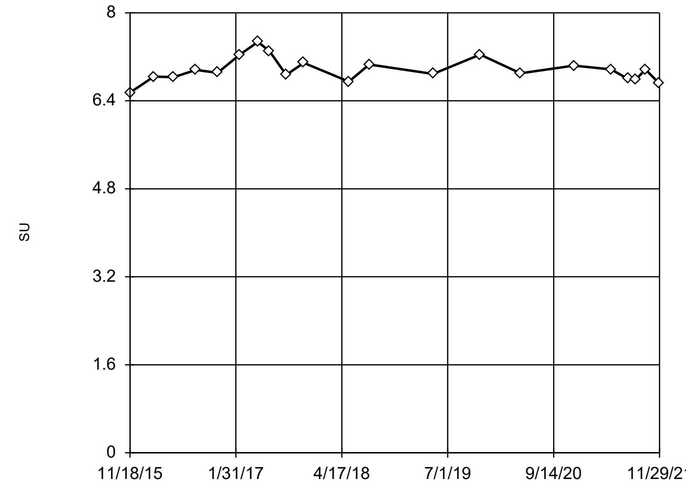
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.8989
Critical = 0.838
The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: pH Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

EPA Screening (suspected outliers for Dixon's Test)

MW-15 (bg)



n = 21

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 6.961, std. dev. 0.2174, critical Tn 2.58

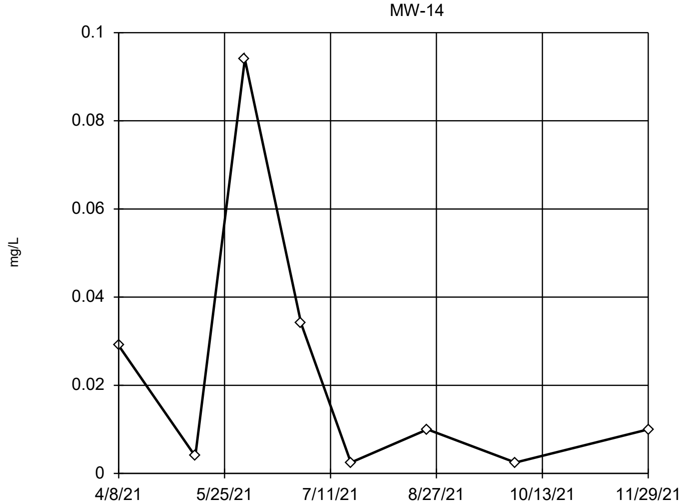
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9644
Critical = 0.923
The distribution was found to be normally distributed.

Constituent: pH Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

EPA Screening (suspected outliers for Dixon's Test)

MW-14



n = 8

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.02324, std. dev. 0.03103, critical Tn 2.032

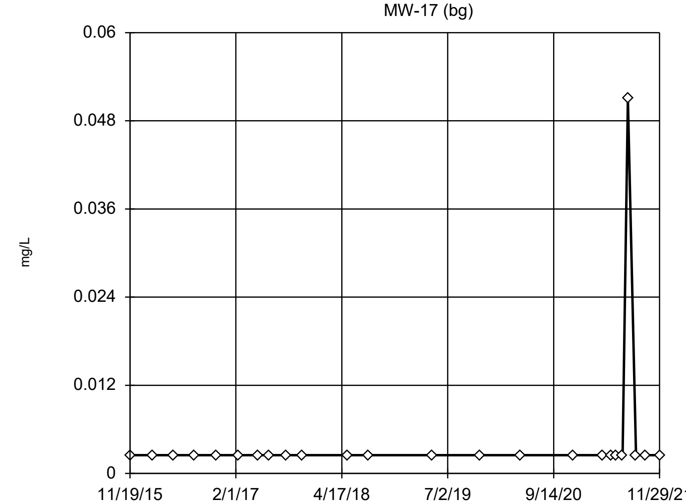
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9237
Critical = 0.851 (after natural log transformation)
The distribution was found to be log-normal.

Constituent: Selenium Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

Tukey's Outlier Screening

MW-17 (bg)



n = 24

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were cube root transformed to achieve best W statistic (graph shown in original units).

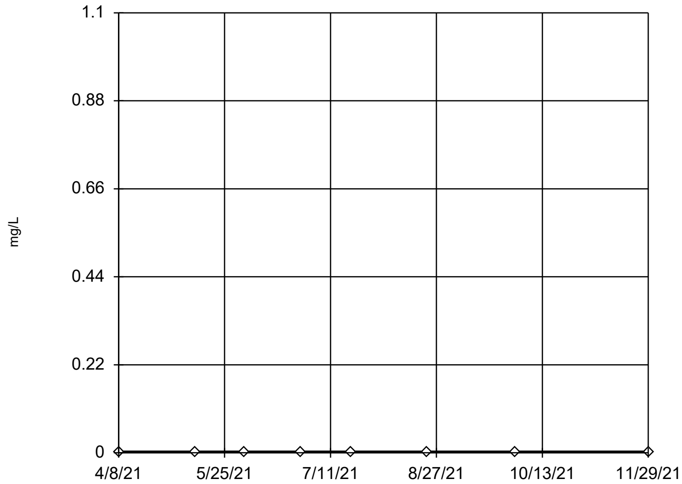
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Selenium Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

Tukey's Outlier Screening

MW-20



n = 8

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

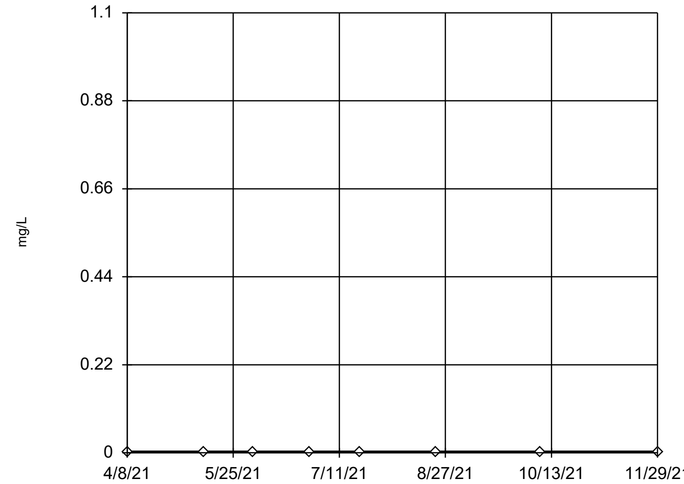
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Selenium Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

Tukey's Outlier Screening

MW-21



n = 8

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

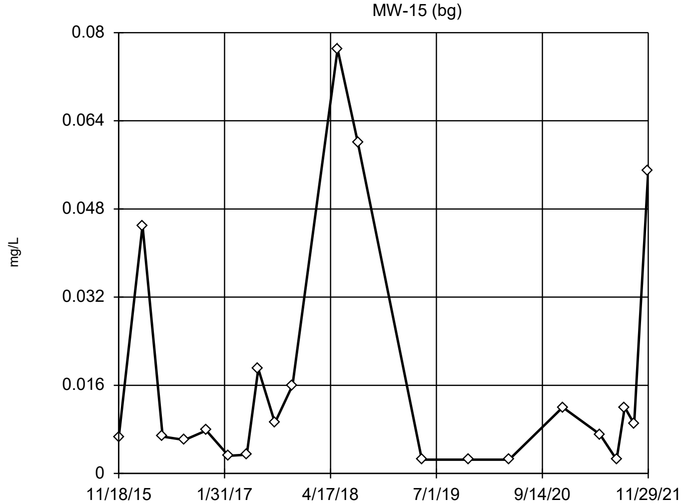
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Selenium Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

Tukey's Outlier Screening

MW-15 (bg)



n = 21

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

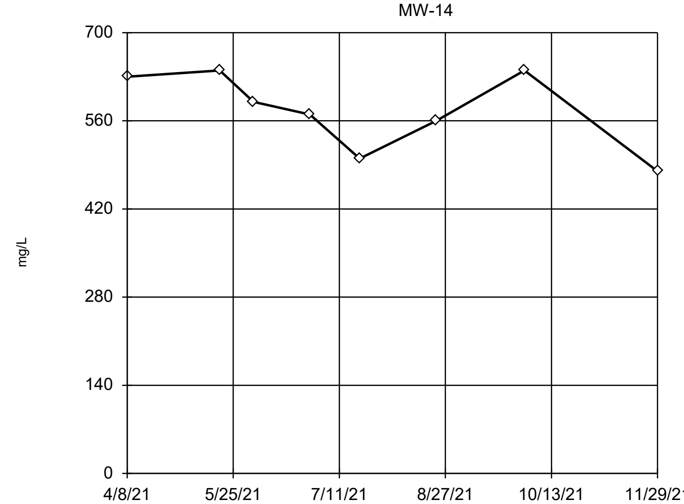
High cutoff = 2.575, low cutoff = 0.00002233, based on IQR multiplier of 3.

Constituent: Selenium Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

EPA Screening (suspected outliers for Dixon's Test)

MW-14



n = 8

Dixon's will not be run. No suspect values identified or unable to establish suspect values. Mean 576.3, std. dev. 61.63, critical Tn 2.032

Normality test used: Shapiro Wilk@alpha = 0.1 Calculated = 0.8972 Critical = 0.851 The distribution was found to be normally distributed.

Constituent: Sulfate Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

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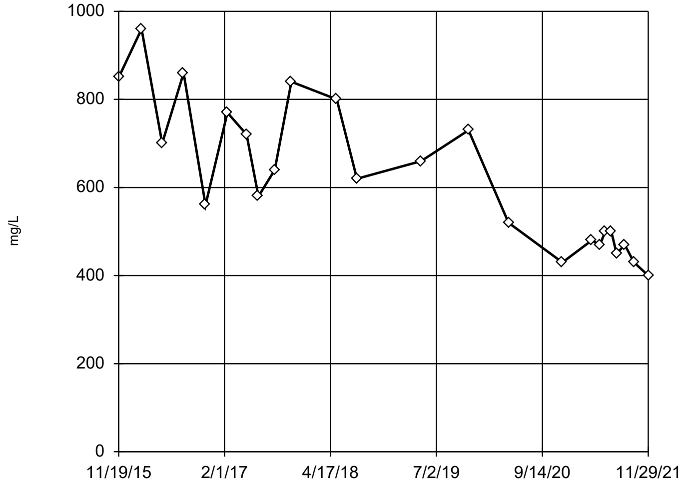
EPA Screening (suspected outliers for Rosner's Test)

MW-17 (bg)



n = 24

Rosner's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 622.5, std. dev. 163.9, critical Tn 2.644

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9339
Critical = 0.93
The distribution was found to be normally distributed.

Constituent: Sulfate Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

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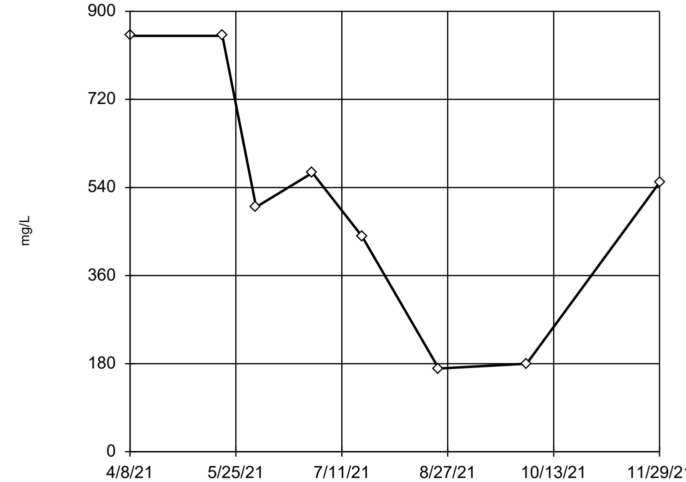
EPA Screening (suspected outliers for Dixon's Test)

MW-20



n = 8

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 513.8, std. dev. 258, critical Tn 2.032

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9042
Critical = 0.851
The distribution was found to be normally distributed.

Constituent: Sulfate Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

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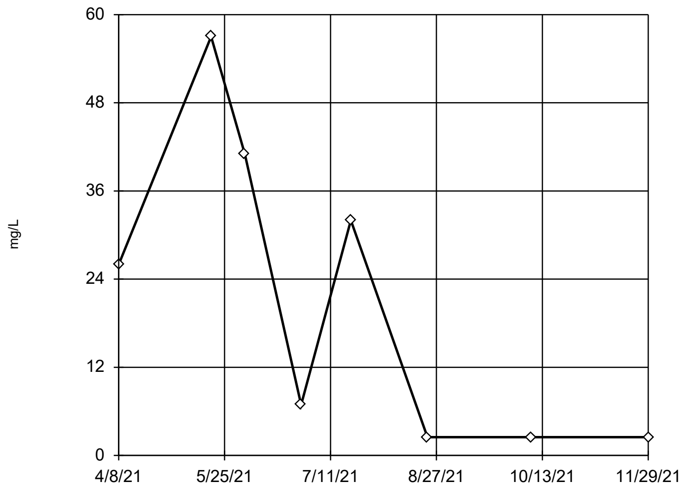
EPA Screening (suspected outliers for Dixon's Test)

MW-21



n = 8

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 21.3, std. dev. 20.93, critical Tn 2.032

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.8607
Critical = 0.851
The distribution was found to be normally distributed.

Constituent: Sulfate Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

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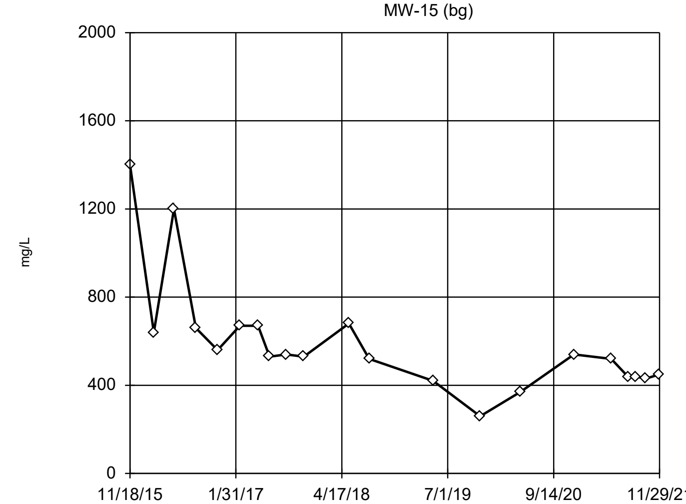
Tukey's Outlier Screening

MW-15 (bg)



n = 21

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 2296, low cutoff = 127.5, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 2/28/2022 1:20 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

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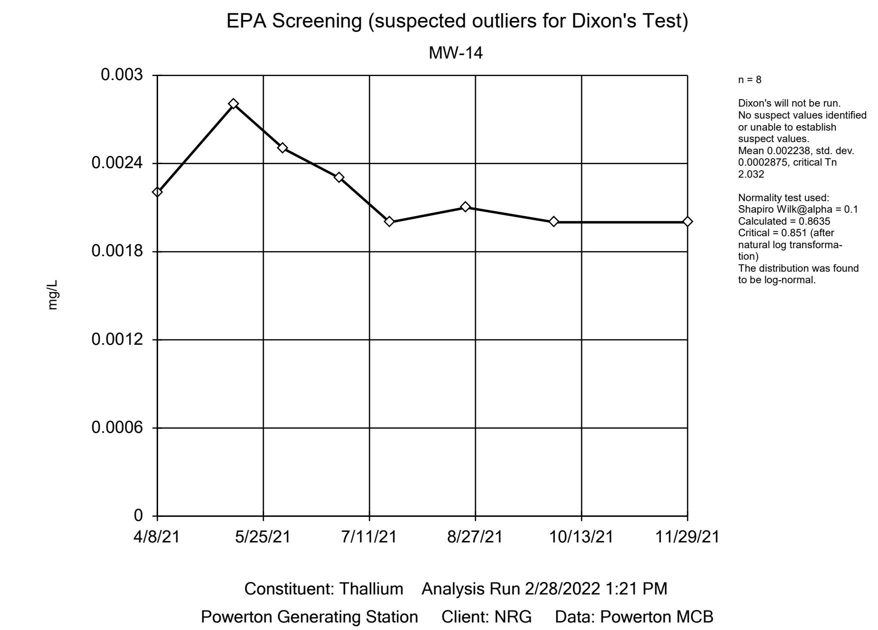
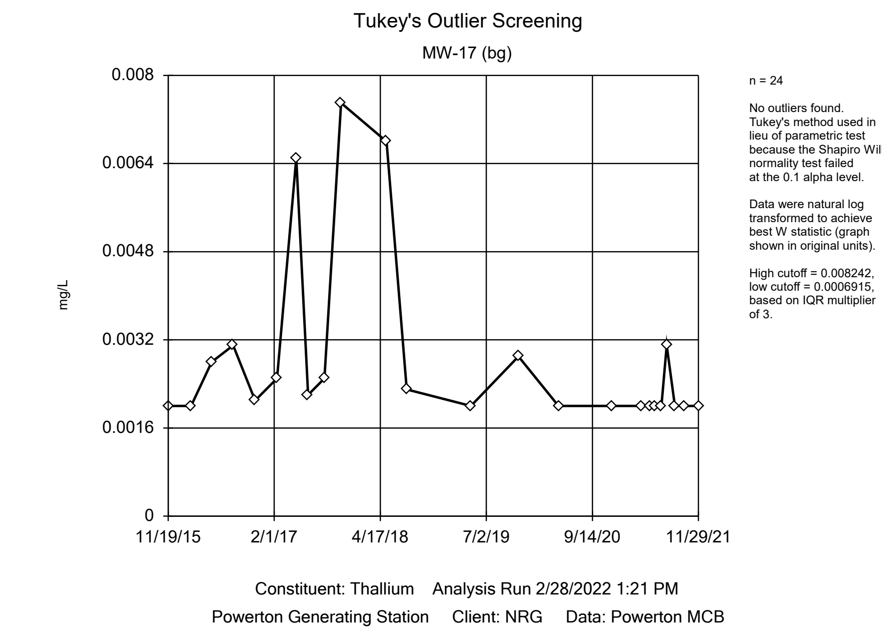
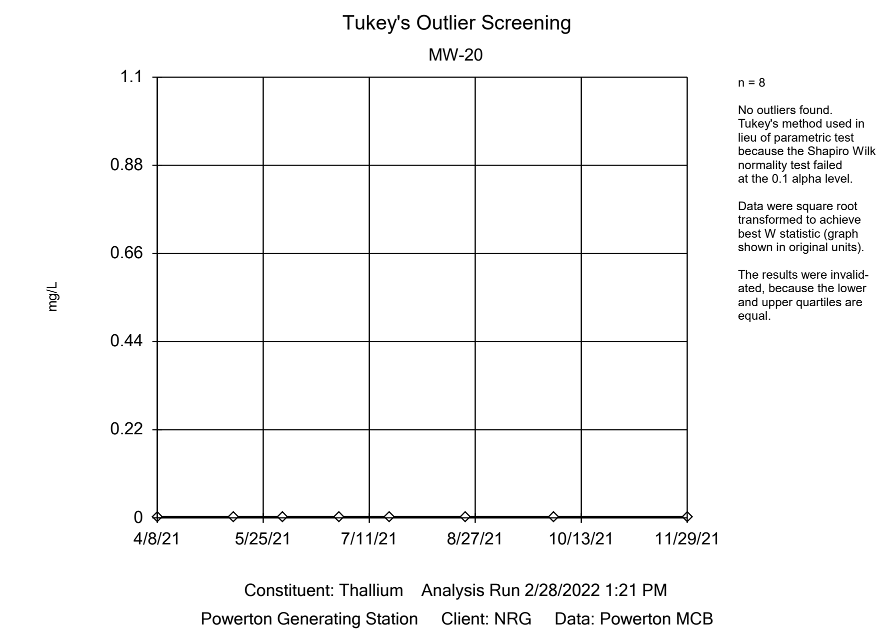


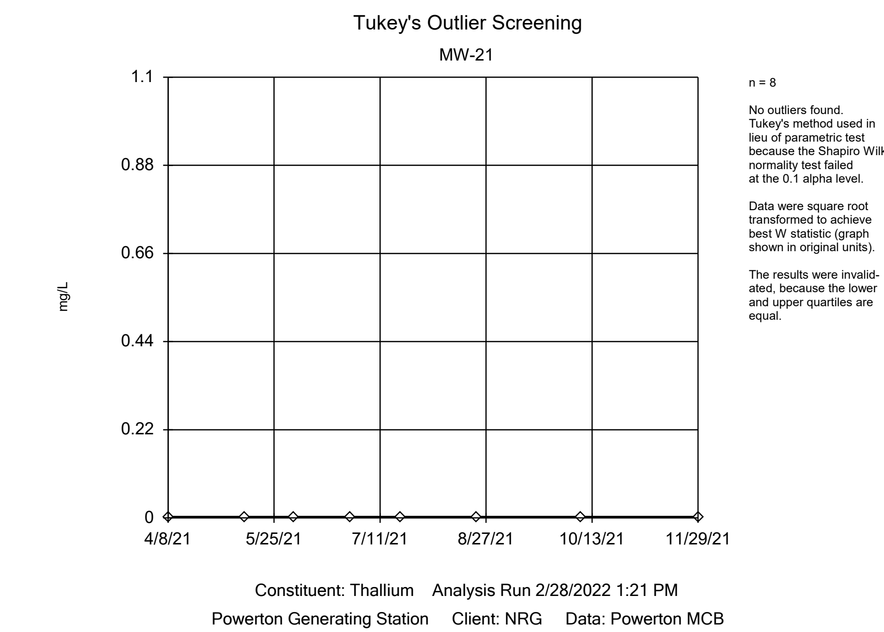
Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG



Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG



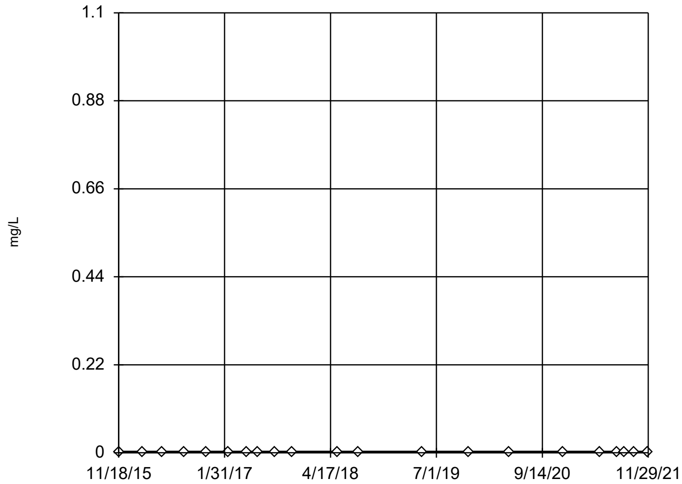
Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG



Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Tukey's Outlier Screening

MW-15 (bg)



n = 21

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Thallium   Analysis Run 2/28/2022 1:21 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

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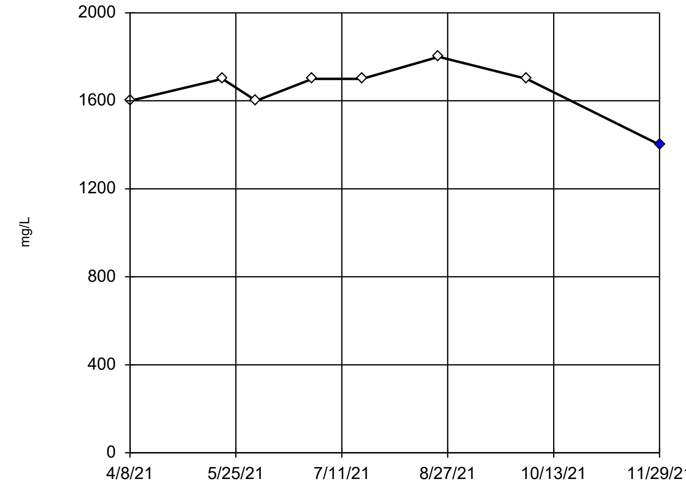
Dixon's Outlier Test

MW-14



n = 8

Statistical outlier is drawn as solid.
Testing for 1 low outlier.
Mean = 1650.
Std. Dev. = 119.5.
1400: c = 0.6667
tabl = 0.554.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.8405
Critical = 0.838
The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: Total Dissolved Solids   Analysis Run 2/28/2022 1:21 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

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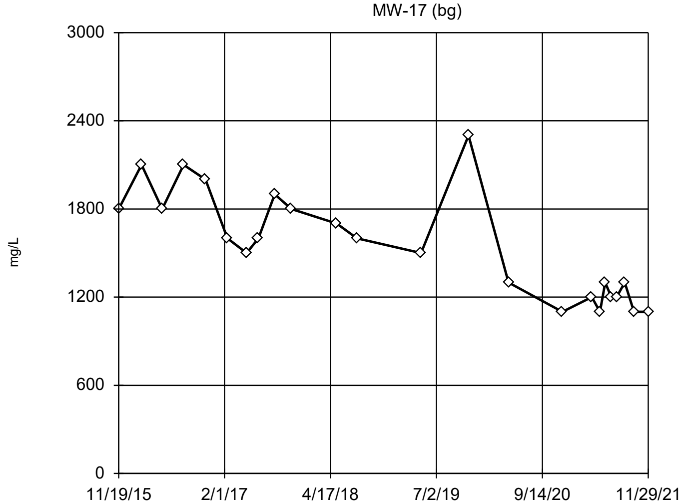
Tukey's Outlier Screening

MW-17 (bg)



n = 24

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were cube root transformed to achieve best W statistic (graph shown in original units).

High cutoff = 4723, low cutoff = 217.4, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids   Analysis Run 2/28/2022 1:21 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

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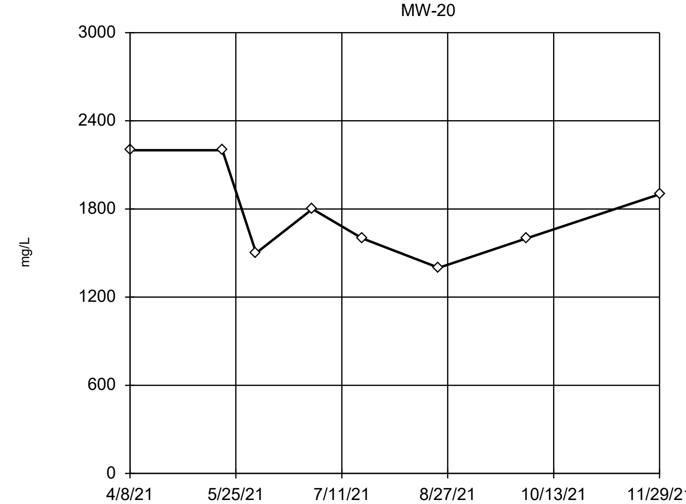
EPA Screening (suspected outliers for Dixon's Test)

MW-20



n = 8

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 1775, std. dev. 305.9, critical Tn 2.032

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9032
Critical = 0.851
The distribution was found to be normally distributed.

Constituent: Total Dissolved Solids   Analysis Run 2/28/2022 1:21 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

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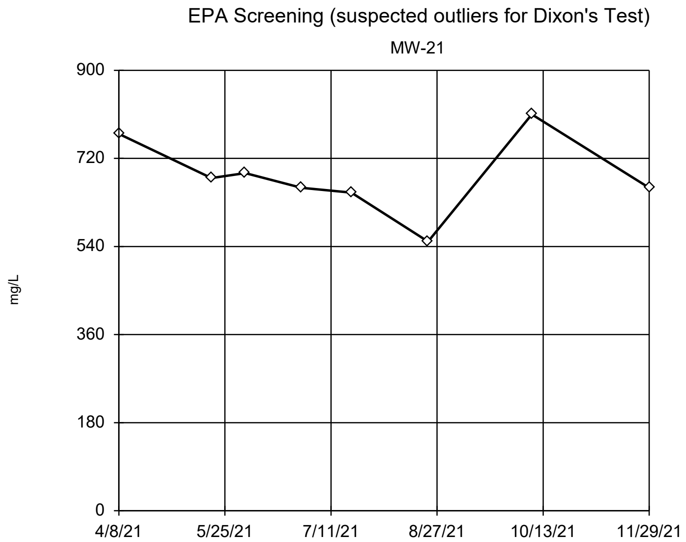

n = 8

Dixon's will not be run. No suspect values identified or unable to establish suspect values. Mean 683.8, std. dev. 78.91, critical Tn 2.032

Normality test used: Shapiro Wilk@alpha = 0.1 Calculated = 0.9331 Critical = 0.851 The distribution was found to be normally distributed.

Constituent: Total Dissolved Solids Analysis Run 2/28/2022 1:21 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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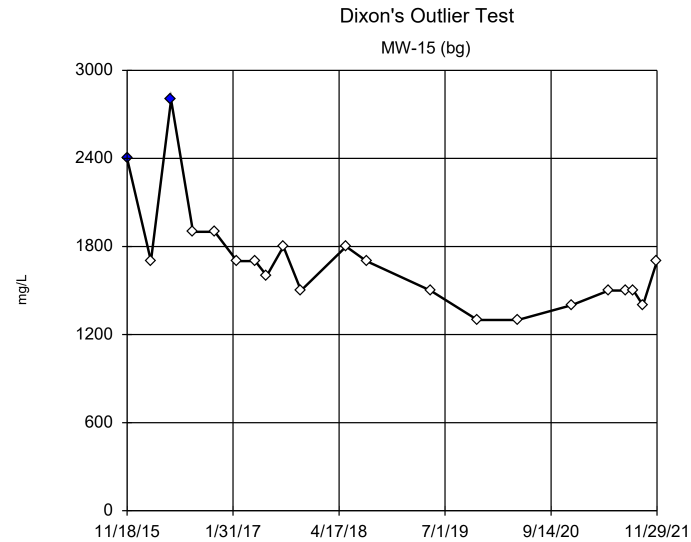

n = 21

Statistical outliers are drawn as solid. Testing for 2 high outliers. Mean = 1695. Std. Dev. = 354.2. 2400 (H): c = 0.5 tabl = 0.44. Alpha = 0.05.

Normality test used: Shapiro Wilk@alpha = 0.1 Calculated = 0.9375 Critical = 0.917 The distribution, after removal of suspect values, was found to be normally distributed.

Constituent: Total Dissolved Solids Analysis Run 2/28/2022 1:21 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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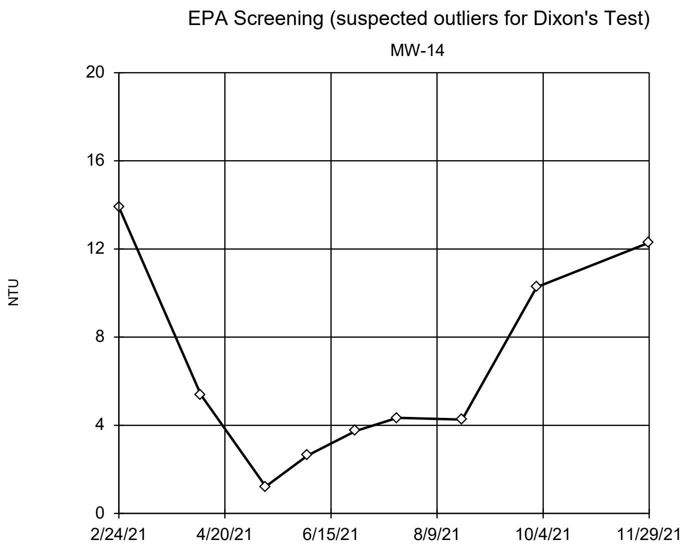

n = 9

Dixon's will not be run. No suspect values identified or unable to establish suspect values. Mean 6.449, std. dev. 4.526, critical Tn 2.11

Normality test used: Shapiro Wilk@alpha = 0.1 Calculated = 0.8784 Critical = 0.859 The distribution was found to be normally distributed.

Constituent: Turbidity Analysis Run 2/28/2022 1:21 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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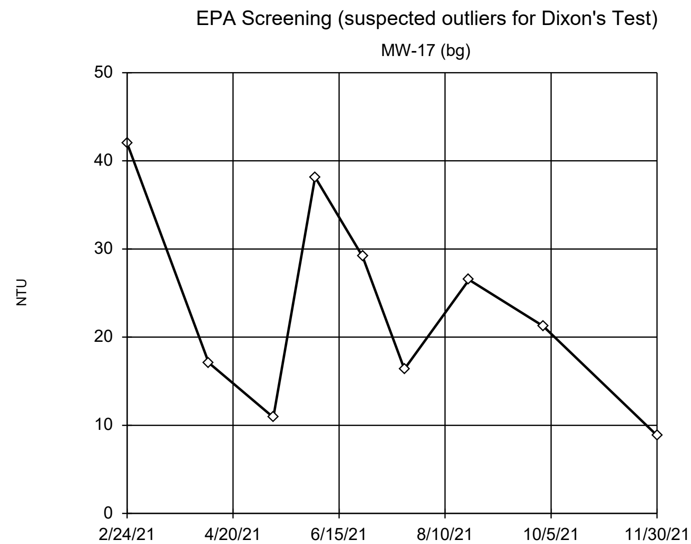

n = 9

Dixon's will not be run. No suspect values identified or unable to establish suspect values. Mean 23.37, std. dev. 11.55, critical Tn 2.11

Normality test used: Shapiro Wilk@alpha = 0.1 Calculated = 0.9454 Critical = 0.859 The distribution was found to be normally distributed.

Constituent: Turbidity Analysis Run 2/28/2022 1:21 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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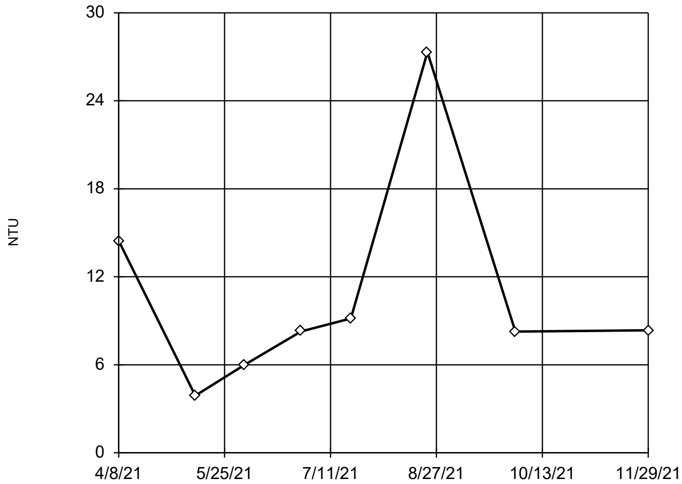
EPA Screening (suspected outliers for Dixon's Test)

MW-20



n = 8

Dixon's will not be run. No suspect values identified or unable to establish suspect values. Mean 10.72, std. dev. 7.348, critical Tn 2.032

Normality test used: Shapiro Wilk@alpha = 0.1 Calculated = 0.9296 Critical = 0.851 (after natural log transformation) The distribution was found to be log-normal.

Constituent: Turbidity Analysis Run 2/28/2022 1:21 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

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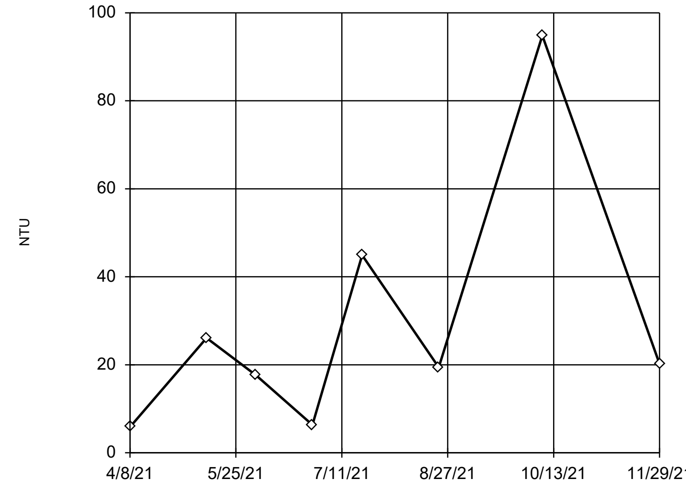
EPA Screening (suspected outliers for Dixon's Test)

MW-21



n = 8

Dixon's will not be run. No suspect values identified or unable to establish suspect values. Mean 29.41, std. dev. 29.13, critical Tn 2.032

Normality test used: Shapiro Wilk@alpha = 0.1 Calculated = 0.9412 Critical = 0.851 (after natural log transformation) The distribution was found to be log-normal.

Constituent: Turbidity Analysis Run 2/28/2022 1:21 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

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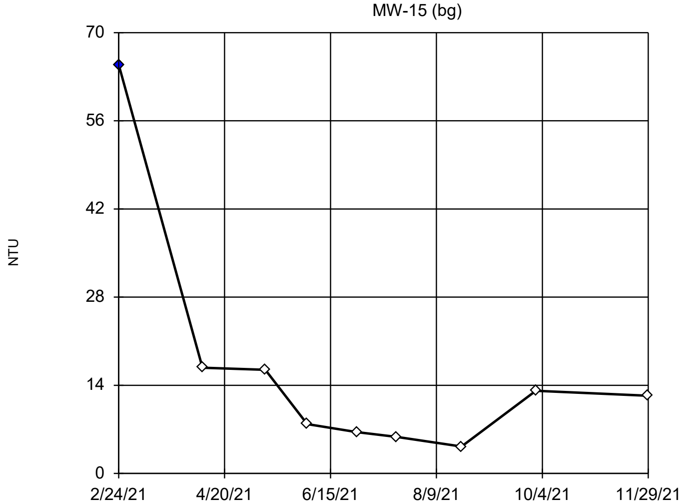
Dixon's Outlier Test

MW-15 (bg)



n = 9

Statistical outlier is drawn as solid. Testing for 1 high outlier. Mean = 16.46. Std. Dev. = 18.73. 64.9: c = 0.8142 tabl = 0.512. Alpha = 0.05.

Normality test used: Shapiro Wilk@alpha = 0.1 Calculated = 0.9038 Critical = 0.851 The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: Turbidity Analysis Run 2/28/2022 1:21 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

Seasonality - Powerton MCB - All Wells

Powerton Generating Station   Client: NRG   Data: Powerton MCB   Printed 2/28/2022, 1:31 PM

Constituent	Well	Sig.	K.-W.	Chi-Sq.	df	N	Alpha
Antimony (mg/L)	MW-17 (bg)	No	0	0	0	22	0.05
Antimony (mg/L)	MW-15 (bg)	No	0	0	0	19	0.05
Arsenic (mg/L)	MW-17 (bg)	No	0.5422	7.815	3	24	0.05
Arsenic (mg/L)	MW-15 (bg)	No	0.7956	7.815	3	21	0.05
Barium (mg/L)	MW-17 (bg)	No	0.8489	7.815	3	24	0.05
Barium (mg/L)	MW-15 (bg)	No	0.7799	7.815	3	21	0.05
Beryllium (mg/L)	MW-17 (bg)	No	1.75	7.815	3	22	0.05
Beryllium (mg/L)	MW-15 (bg)	No	1.75	7.815	3	19	0.05
Boron (mg/L)	MW-17 (bg)	No	5.67	7.815	3	24	0.05
Boron (mg/L)	MW-15 (bg)	No	0.2433	7.815	3	21	0.05
Cadmium (mg/L)	MW-17 (bg)	No	1.864	7.815	3	24	0.05
Cadmium (mg/L)	MW-15 (bg)	No	1.229	7.815	3	21	0.05
Calcium (mg/L)	MW-17 (bg)	No	1.108	7.815	3	24	0.05
Calcium (mg/L)	MW-15 (bg)	No	1.59	7.815	3	21	0.05
Chloride (mg/L)	MW-17 (bg)	No	1.89	7.815	3	24	0.05
Chloride (mg/L)	MW-15 (bg)	No	0.6829	7.815	3	21	0.05
Chromium (mg/L)	MW-17 (bg)	No	0	0	3	22	0.05
Chromium (mg/L)	MW-15 (bg)	No	0	0	3	19	0.05
Cobalt (mg/L)	MW-17 (bg)	No	0.6428	7.815	3	24	0.05
Cobalt (mg/L)	MW-15 (bg)	No	2.5	7.815	3	21	0.05
Combined Radium 226 + 228 (pCi/L)	MW-17 (bg)	No	0.1318	7.815	3	24	0.05
Combined Radium 226 + 228 (pCi/L)	MW-15 (bg)	No	2.214	7.815	3	21	0.05
Conductivity (n/a)	MW-17 (bg)	No	2.137	7.815	3	24	0.05
Conductivity (n/a)	MW-15 (bg)	No	2.146	7.815	3	21	0.05
Fluoride (mg/L)	MW-17 (bg)	No	1.589	7.815	3	24	0.05
Fluoride (mg/L)	MW-15 (bg)	No	0.6947	7.815	3	21	0.05
Lead (mg/L)	MW-17 (bg)	No	1.36	7.815	3	24	0.05
Lead (mg/L)	MW-15 (bg)	No	0	0	3	21	0.05
Lithium (mg/L)	MW-17 (bg)	No	0.4851	7.815	3	24	0.05
Lithium (mg/L)	MW-15 (bg)	No	0.6216	7.815	3	21	0.05
Mercury (mg/L)	MW-17 (bg)	No	0	0	3	24	0.05
Mercury (mg/L)	MW-15 (bg)	No	0	0	3	21	0.05
Molybdenum (mg/L)	MW-17 (bg)	No	4.906	7.815	3	24	0.05
Molybdenum (mg/L)	MW-15 (bg)	No	4.809	7.815	3	21	0.05
pH (SU)	MW-17 (bg)	No	5.018	7.815	3	24	0.05
pH (SU)	MW-15 (bg)	No	0.07657	7.815	3	21	0.05
Selenium (mg/L)	MW-17 (bg)	No	2	7.815	3	24	0.05
Selenium (mg/L)	MW-15 (bg)	No	1.594	7.815	3	21	0.05
Sulfate (mg/L)	MW-17 (bg)	No	0.8886	7.815	3	24	0.05
Sulfate (mg/L)	MW-15 (bg)	No	0.5785	7.815	3	21	0.05
Thallium (mg/L)	MW-17 (bg)	No	2.684	7.815	3	24	0.05
Thallium (mg/L)	MW-15 (bg)	No	0	0	3	21	0.05
Total Dissolved Solids (mg/L)	MW-17 (bg)	No	1.263	7.815	3	24	0.05
Total Dissolved Solids (mg/L)	MW-15 (bg)	No	0.4403	7.815	3	21	0.05

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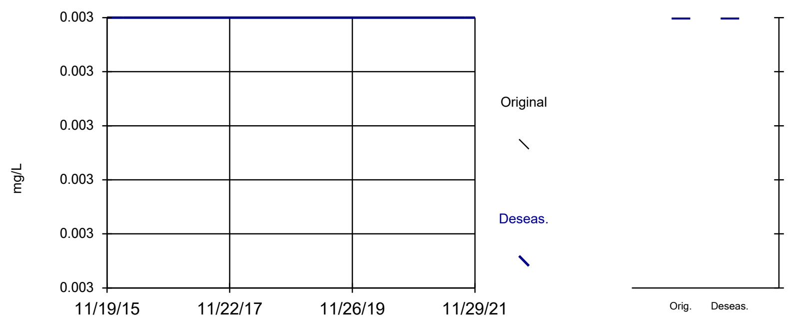
Seasonality: MW-17 (bg)

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0
Tabulated Chi-Squared value = 0 with 0 degrees of freedom at the 5% significance level.
There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



Constituent: Antimony Analysis Run 2/28/2022 1:28 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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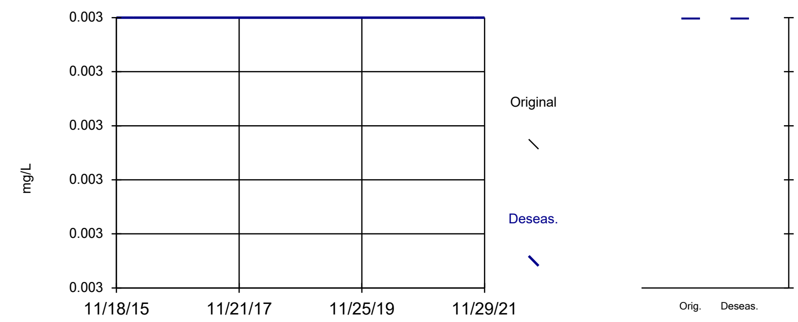
Seasonality: MW-15 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



Constituent: Antimony Analysis Run 2/28/2022 1:28 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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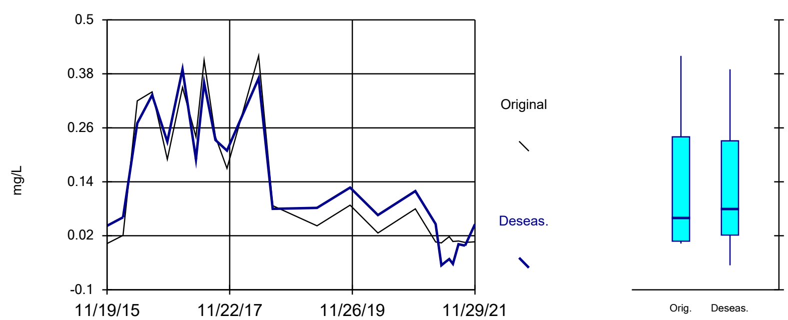
Seasonality: MW-17 (bg)

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.5422
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.542
Adjusted Kruskal-Wallis statistic (H') = 0.5422



Constituent: Arsenic Analysis Run 2/28/2022 1:28 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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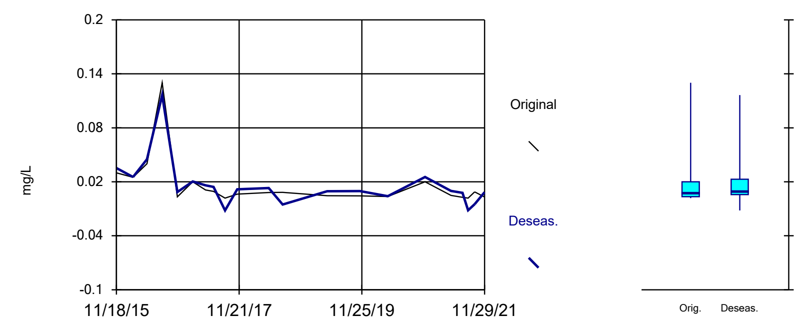
Seasonality: MW-15 (bg)

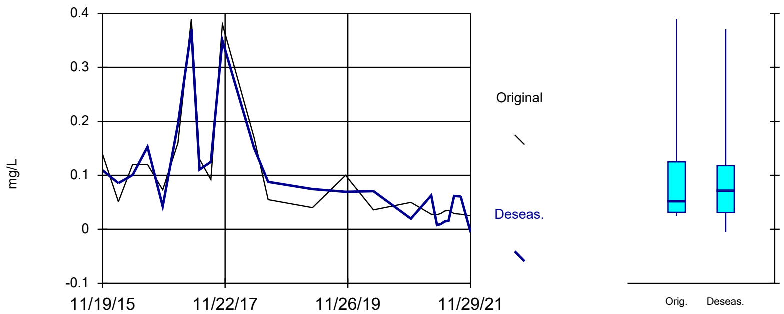
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.7956
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.7951
Adjusted Kruskal-Wallis statistic (H') = 0.7956



Constituent: Arsenic Analysis Run 2/28/2022 1:28 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Seasonality: MW-17 (bg)

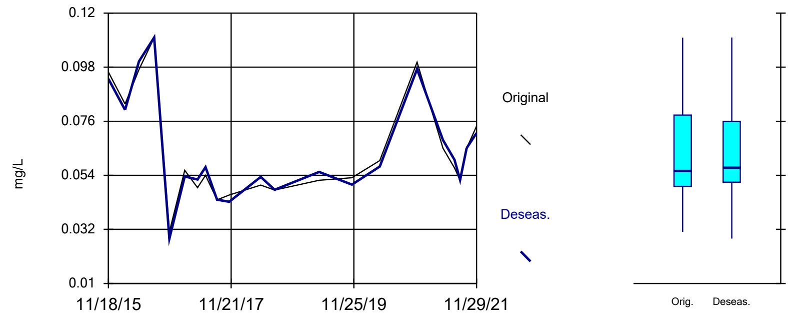
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.8489
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.8478
Adjusted Kruskal-Wallis statistic (H') = 0.8489



Constituent: Barium Analysis Run 2/28/2022 1:28 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Seasonality: MW-15 (bg)

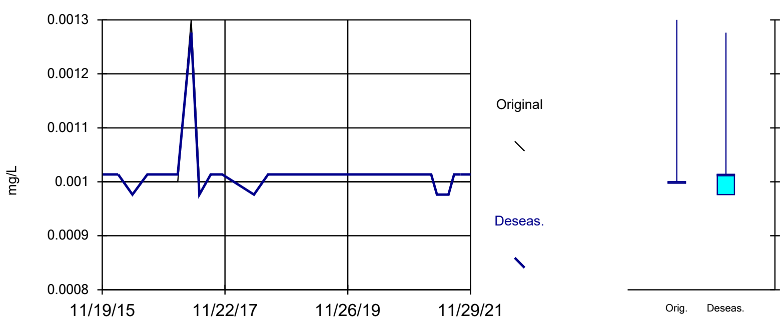
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.7799
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.7788
Adjusted Kruskal-Wallis statistic (H') = 0.7799



Constituent: Barium Analysis Run 2/28/2022 1:28 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Seasonality: MW-17 (bg)

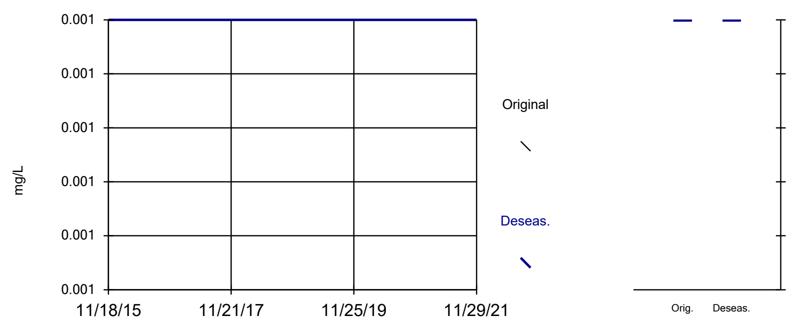
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 1.75
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.2283
Adjusted Kruskal-Wallis statistic (H') = 1.75



Constituent: Beryllium Analysis Run 2/28/2022 1:28 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Seasonality: MW-15 (bg)

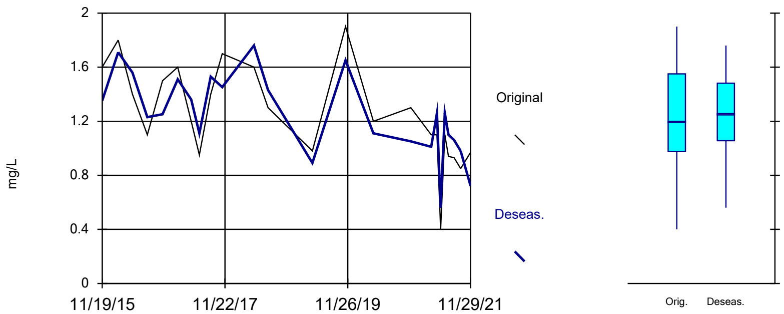
Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).



Constituent: Beryllium Analysis Run 2/28/2022 1:28 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Seasonality: MW-17 (bg)

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 5.67
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 5 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 5.628
Adjusted Kruskal-Wallis statistic (H') = 5.67



Constituent: Boron Analysis Run 2/28/2022 1:28 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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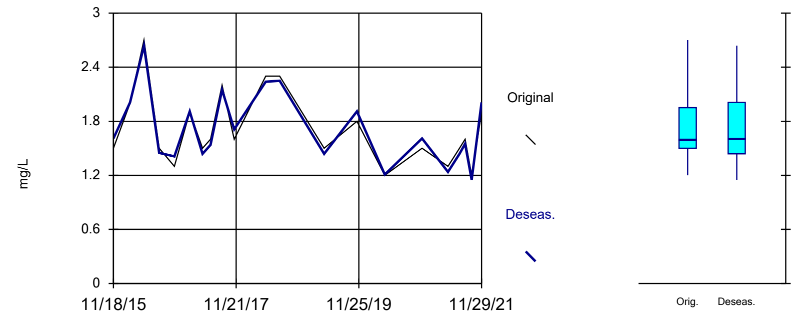
Seasonality: MW-15 (bg)

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.2433
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 6 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.2365
Adjusted Kruskal-Wallis statistic (H') = 0.2433



Constituent: Boron Analysis Run 2/28/2022 1:28 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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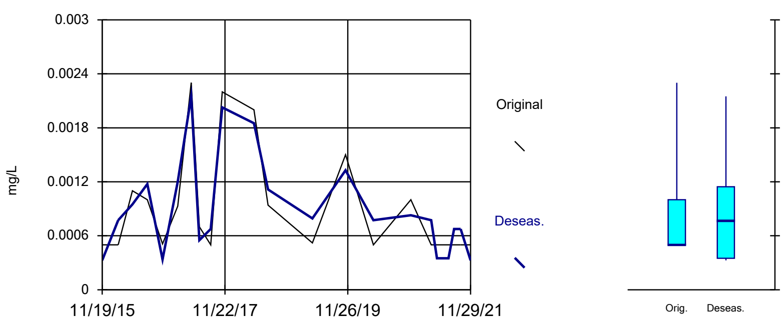
Seasonality: MW-17 (bg)

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 1.864
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 1.631
Adjusted Kruskal-Wallis statistic (H') = 1.864



Constituent: Cadmium Analysis Run 2/28/2022 1:28 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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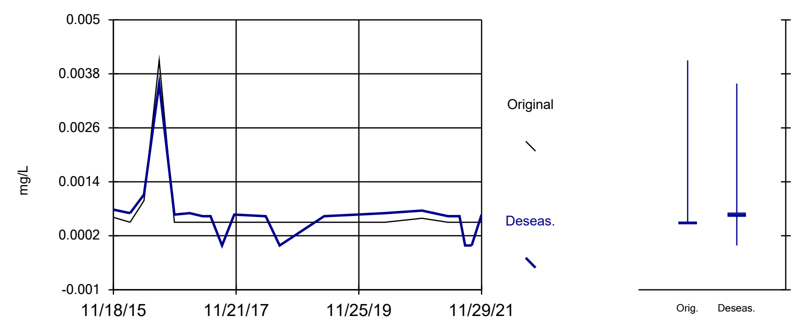
Seasonality: MW-15 (bg)

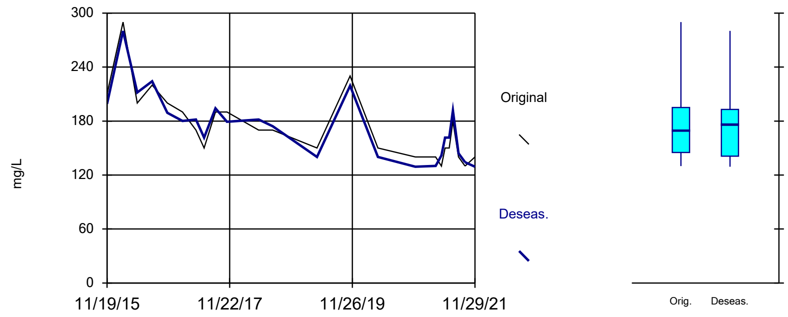
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 1.229
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.578
Adjusted Kruskal-Wallis statistic (H') = 1.229



Constituent: Cadmium Analysis Run 2/28/2022 1:28 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Seasonality: MW-17 (bg)

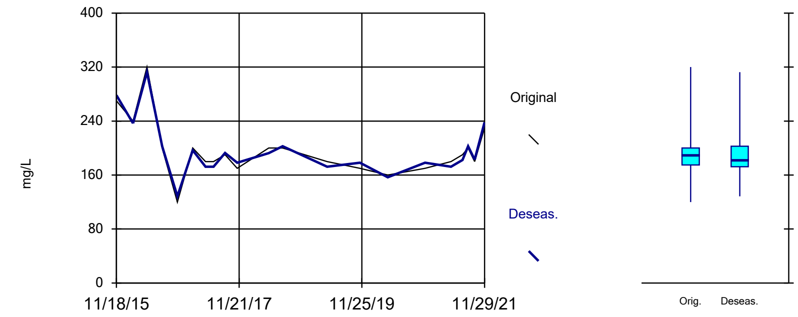
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 1.108
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 6 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 1.088
Adjusted Kruskal-Wallis statistic (H') = 1.108



Constituent: Calcium Analysis Run 2/28/2022 1:28 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Seasonality: MW-15 (bg)

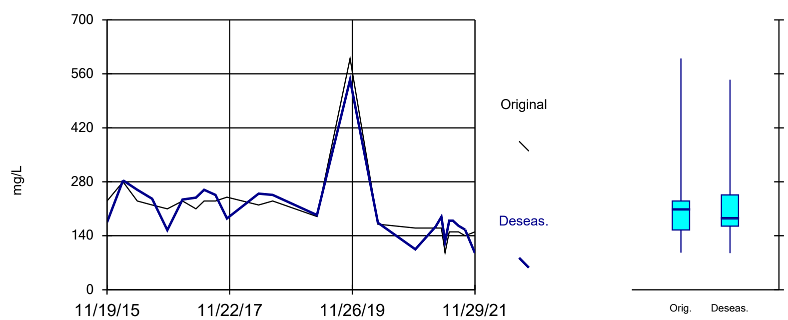
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 1.59
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 1.544
Adjusted Kruskal-Wallis statistic (H') = 1.59



Constituent: Calcium Analysis Run 2/28/2022 1:28 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Seasonality: MW-17 (bg)

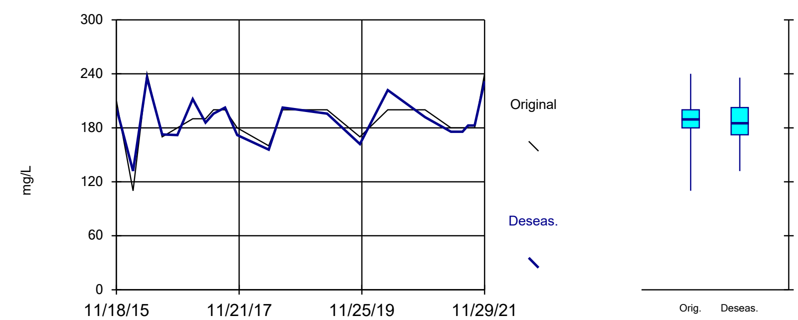
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 1.89
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 5 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 1.848
Adjusted Kruskal-Wallis statistic (H') = 1.89



Constituent: Chloride Analysis Run 2/28/2022 1:28 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Seasonality: MW-15 (bg)

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.6829
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 5 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.6505
Adjusted Kruskal-Wallis statistic (H') = 0.6829



Constituent: Chloride Analysis Run 2/28/2022 1:28 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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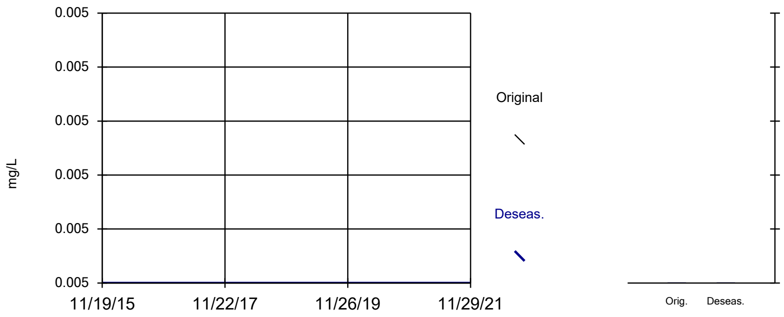
Seasonality: MW-17 (bg)

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0
Tabulated Chi-Squared value = 0 with 3 degrees of freedom at the 5% significance level.
There were 5 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0
Adjusted Kruskal-Wallis statistic (H') = 0



Constituent: Chromium Analysis Run 2/28/2022 1:28 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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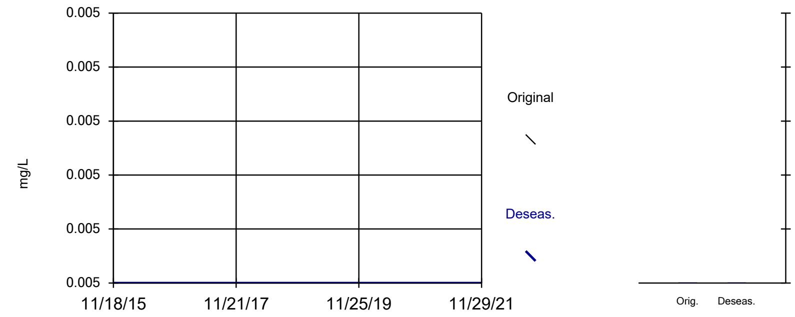
Seasonality: MW-15 (bg)

Data set is of insufficient size to test for seasonality (non-parametric ANOVA requires a minimum of three observations per group, i.e. season).

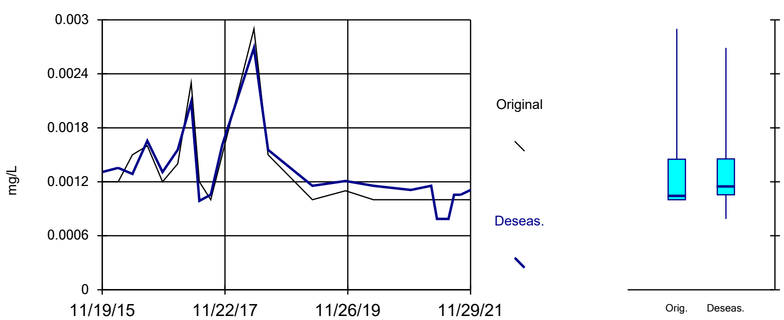


Constituent: Chromium Analysis Run 2/28/2022 1:28 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-17 (bg)

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.6428
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.559
Adjusted Kruskal-Wallis statistic (H') = 0.6428

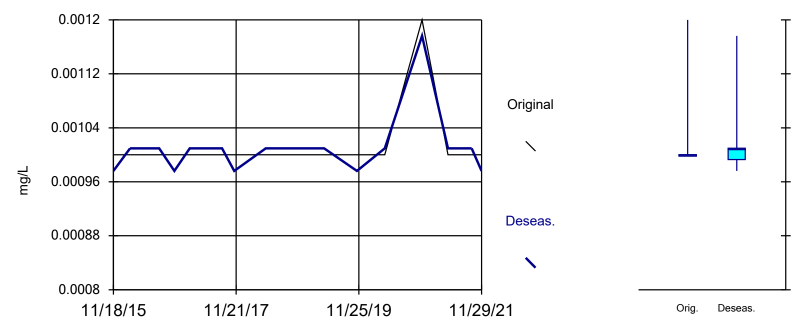


Constituent: Cobalt Analysis Run 2/28/2022 1:28 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-15 (bg)

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 2.5
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.3409
Adjusted Kruskal-Wallis statistic (H') = 2.5



Constituent: Cobalt Analysis Run 2/28/2022 1:29 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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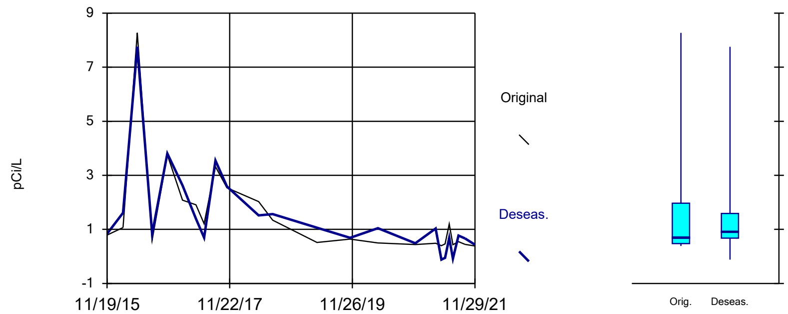
Seasonality: MW-17 (bg)

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.1318
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

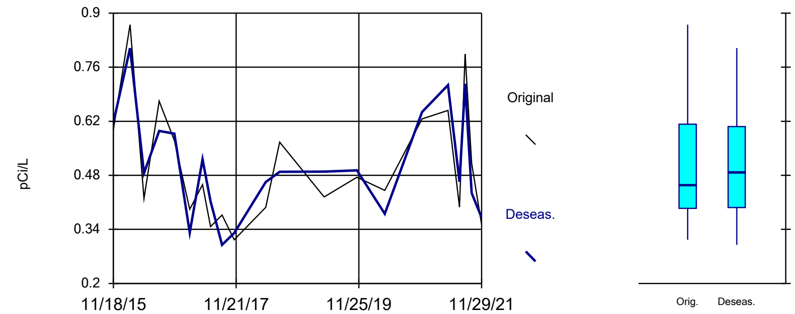


Constituent: Combined Radium 226 + 228 Analysis Run 2/28/2022 1:29 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-15 (bg)

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 2.214
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.

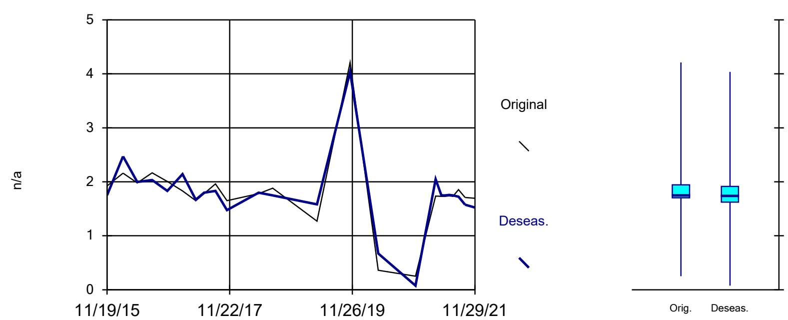


Constituent: Combined Radium 226 + 228 Analysis Run 2/28/2022 1:29 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-17 (bg)

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 2.137
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 2.132
Adjusted Kruskal-Wallis statistic (H') = 2.137

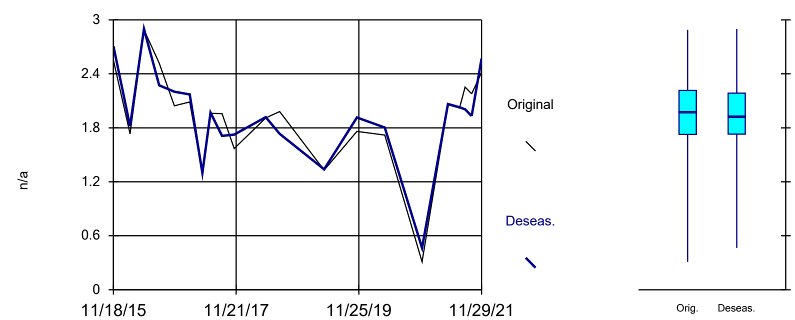


Constituent: Conductivity Analysis Run 2/28/2022 1:29 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-15 (bg)

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 2.146
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 0 groups of ties in the data, so no adjustment to the Kruskal-Wallis statistic (H) was necessary.



Constituent: Conductivity Analysis Run 2/28/2022 1:29 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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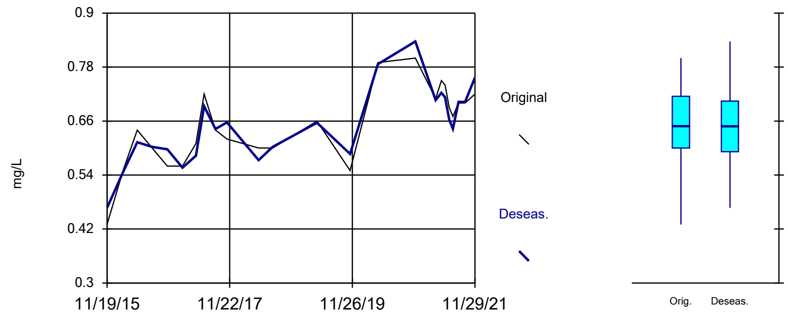
Seasonality: MW-17 (bg)

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 1.589
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 6 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 1.583
Adjusted Kruskal-Wallis statistic (H') = 1.589

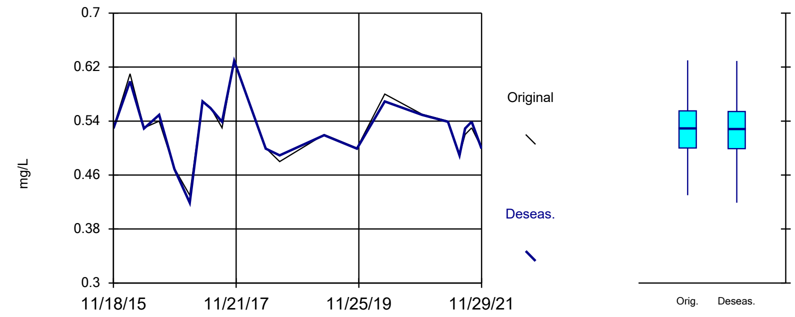


Constituent: Fluoride Analysis Run 2/28/2022 1:29 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-15 (bg)

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.6947
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.6875
Adjusted Kruskal-Wallis statistic (H') = 0.6947



Constituent: Fluoride Analysis Run 2/28/2022 1:29 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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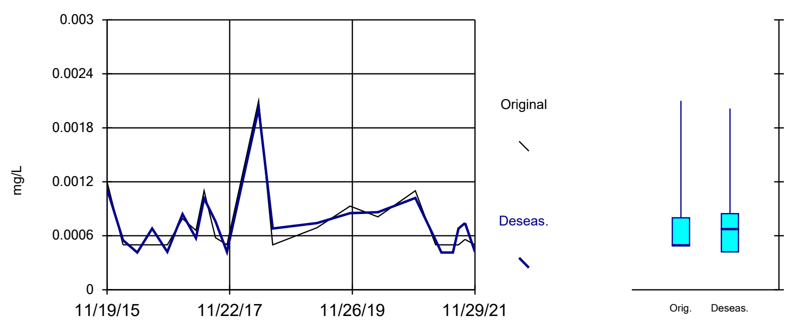
Seasonality: MW-17 (bg)

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 1.36
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 1.144
Adjusted Kruskal-Wallis statistic (H') = 1.36



Constituent: Lead Analysis Run 2/28/2022 1:29 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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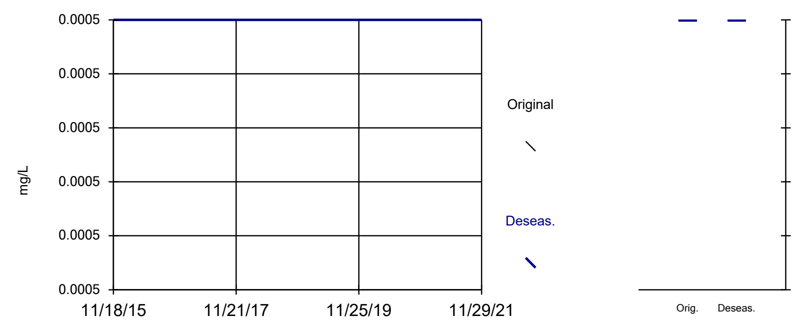
Seasonality: MW-15 (bg)

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0
Tabulated Chi-Squared value = 0 with 3 degrees of freedom at the 5% significance level.
There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0
Adjusted Kruskal-Wallis statistic (H') = 0



Constituent: Lead Analysis Run 2/28/2022 1:29 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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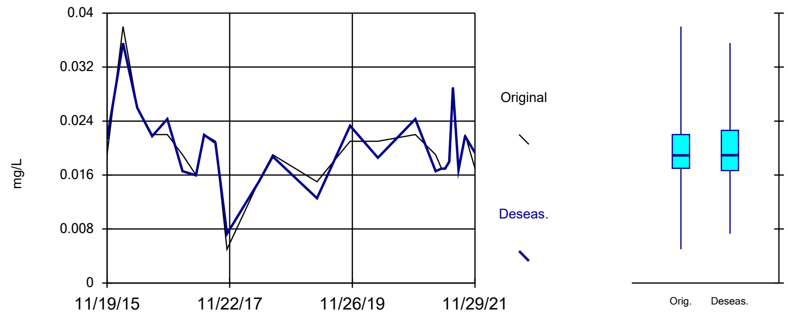
Seasonality: MW-17 (bg)

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.4851
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 5 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.4756
Adjusted Kruskal-Wallis statistic (H') = 0.4851



Constituent: Lithium   Analysis Run 2/28/2022 1:29 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

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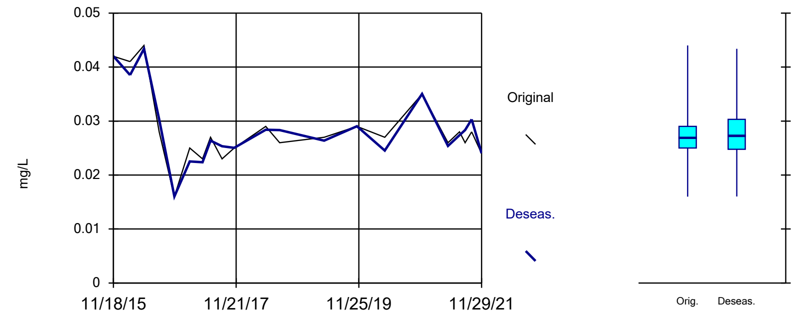
Seasonality: MW-15 (bg)

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.6216
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 6 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.6156
Adjusted Kruskal-Wallis statistic (H') = 0.6216



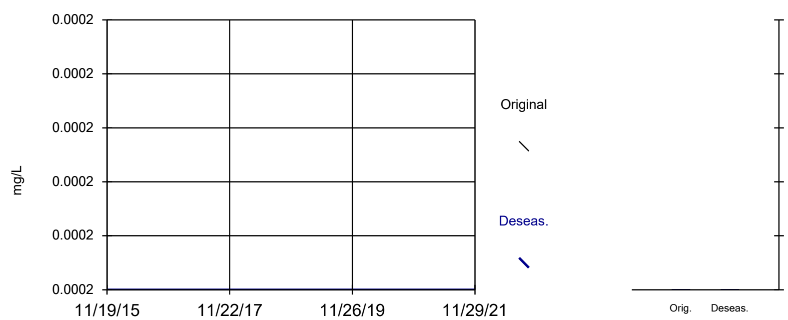
Constituent: Lithium   Analysis Run 2/28/2022 1:29 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-17 (bg)

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0
Tabulated Chi-Squared value = 0 with 3 degrees of freedom at the 5% significance level.
There were 6 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0
Adjusted Kruskal-Wallis statistic (H') = 0



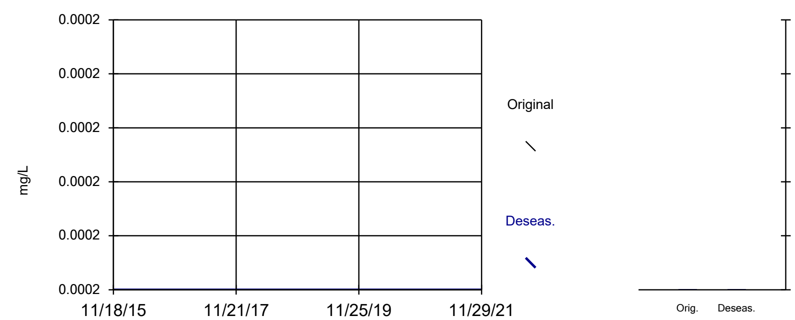
Constituent: Mercury   Analysis Run 2/28/2022 1:29 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-15 (bg)

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0
Tabulated Chi-Squared value = 0 with 3 degrees of freedom at the 5% significance level.
There were 6 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0
Adjusted Kruskal-Wallis statistic (H') = 0



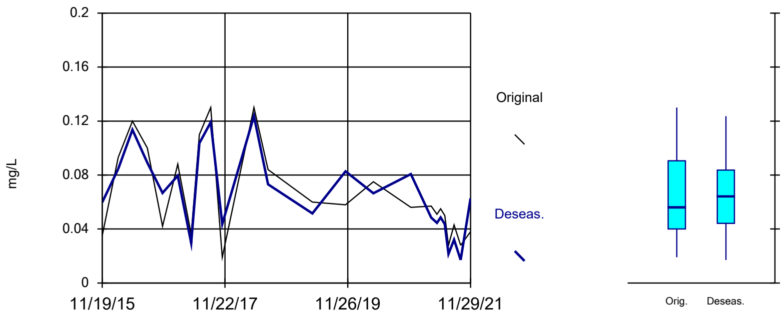
Constituent: Mercury   Analysis Run 2/28/2022 1:29 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-17 (bg)

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 4.906
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 4.901
Adjusted Kruskal-Wallis statistic (H') = 4.906



Constituent: Molybdenum Analysis Run 2/28/2022 1:29 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

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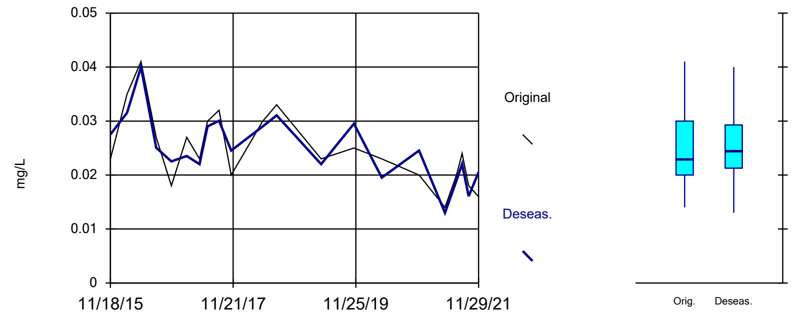
Seasonality: MW-15 (bg)

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 4.809
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 5 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 4.755
Adjusted Kruskal-Wallis statistic (H') = 4.809

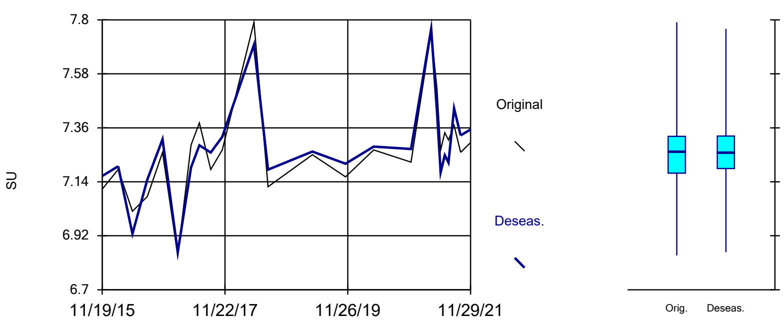


Constituent: Molybdenum Analysis Run 2/28/2022 1:29 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-17 (bg)

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 5.018
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 5.005
Adjusted Kruskal-Wallis statistic (H') = 5.018

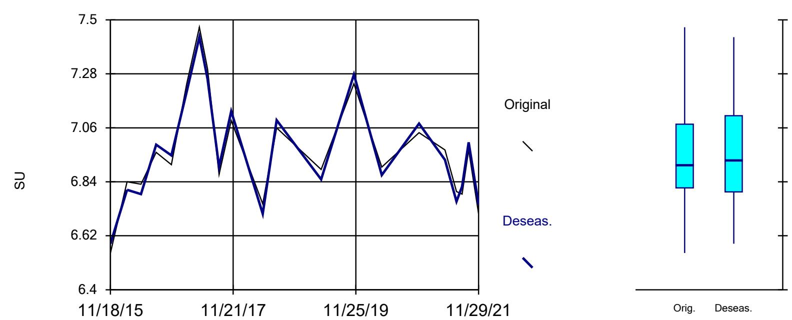


Constituent: pH Analysis Run 2/28/2022 1:29 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Seasonality: MW-15 (bg)

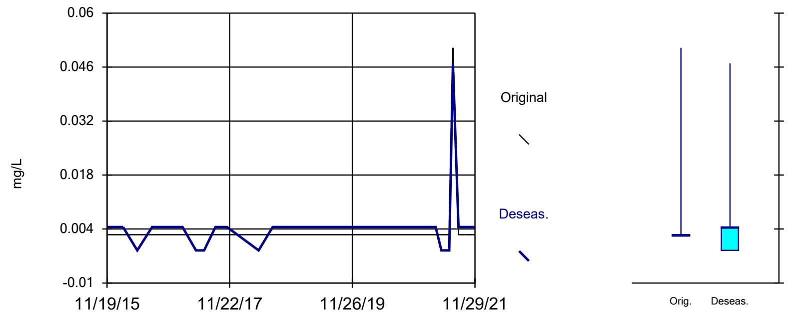
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.07657
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.07647
Adjusted Kruskal-Wallis statistic (H') = 0.07657



Constituent: pH Analysis Run 2/28/2022 1:29 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Seasonality: MW-17 (bg)

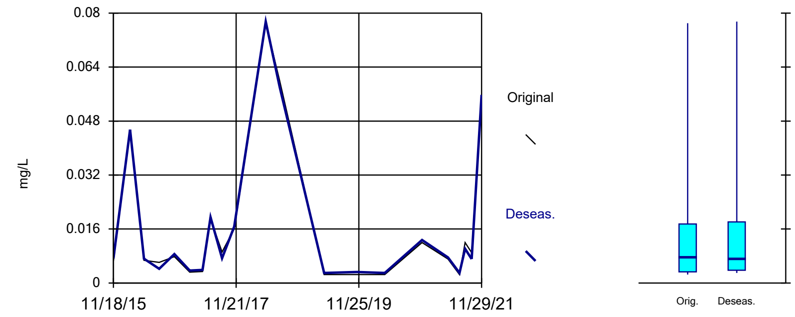
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 2
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.24
Adjusted Kruskal-Wallis statistic (H') = 2



Constituent: Selenium Analysis Run 2/28/2022 1:29 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Seasonality: MW-15 (bg)

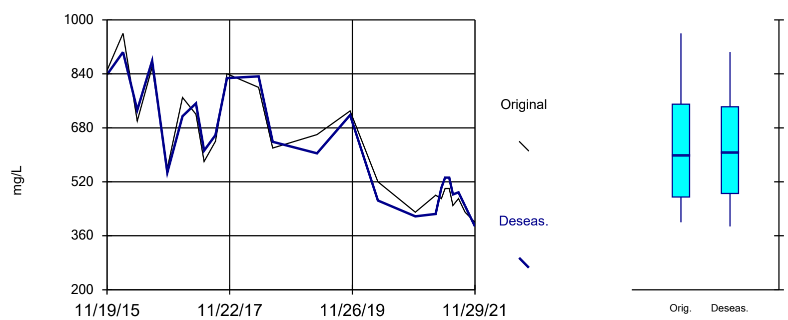
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 1.594
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 1.583
Adjusted Kruskal-Wallis statistic (H') = 1.594



Constituent: Selenium Analysis Run 2/28/2022 1:29 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Seasonality: MW-17 (bg)

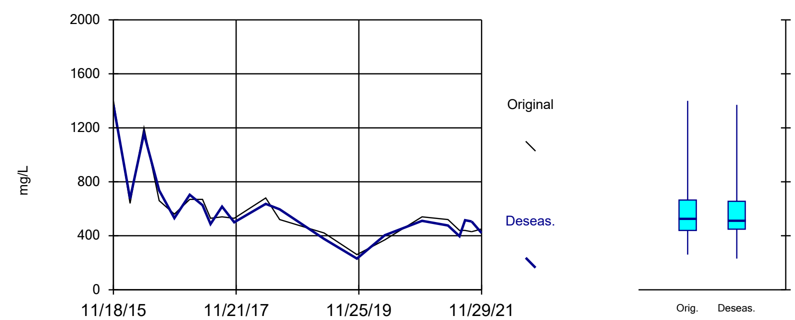
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.8886
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.8875
Adjusted Kruskal-Wallis statistic (H') = 0.8886



Constituent: Sulfate Analysis Run 2/28/2022 1:29 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Seasonality: MW-15 (bg)

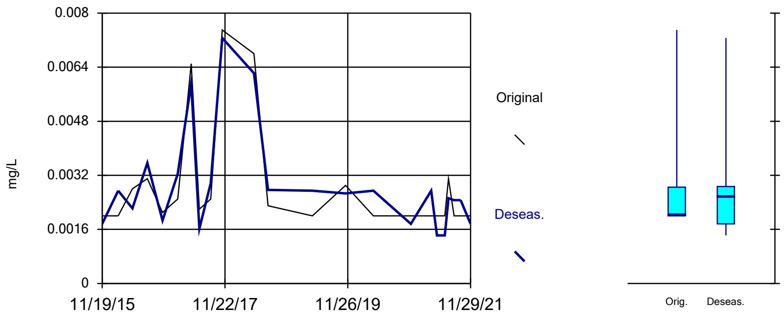
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.5785
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 5 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.5766
Adjusted Kruskal-Wallis statistic (H') = 0.5785



Constituent: Sulfate Analysis Run 2/28/2022 1:29 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Seasonality: MW-17 (bg)

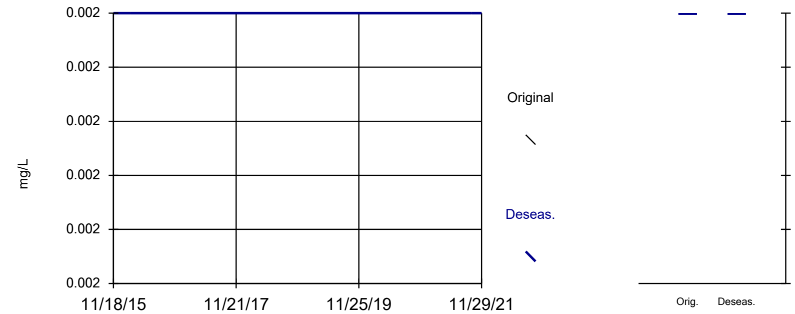
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 2.684
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 2.348
Adjusted Kruskal-Wallis statistic (H') = 2.684



Constituent: Thallium Analysis Run 2/28/2022 1:29 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Seasonality: MW-15 (bg)

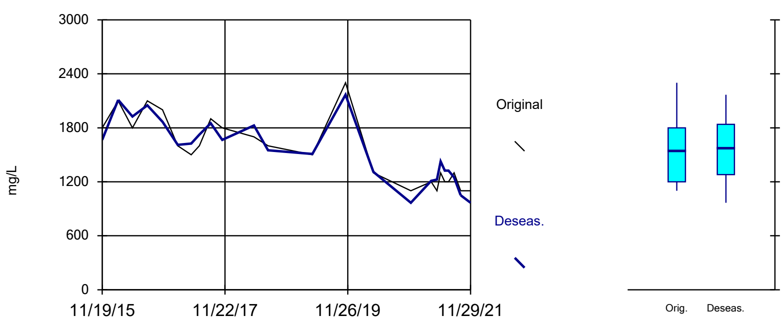
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0
Tabulated Chi-Squared value = 0 with 3 degrees of freedom at the 5% significance level.
There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0
Adjusted Kruskal-Wallis statistic (H') = 0



Constituent: Thallium Analysis Run 2/28/2022 1:29 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Seasonality: MW-17 (bg)

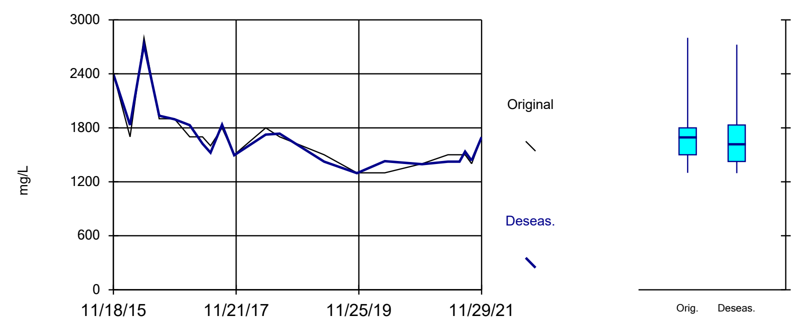
For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 1.263
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 7 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 1.248
Adjusted Kruskal-Wallis statistic (H') = 1.263



Constituent: Total Dissolved Solids Analysis Run 2/28/2022 1:29 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Seasonality: MW-15 (bg)

For the selected data, the Kruskal-Wallis test indicates NO SEASONALITYat the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no season has a significantly different median concentration of this constituent than any other season.
Calculated Kruskal-Wallis statistic = 0.4403
Tabulated Chi-Squared value = 7.815 with 3 degrees of freedom at the 5% significance level.
There were 6 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.4277
Adjusted Kruskal-Wallis statistic (H') = 0.4403

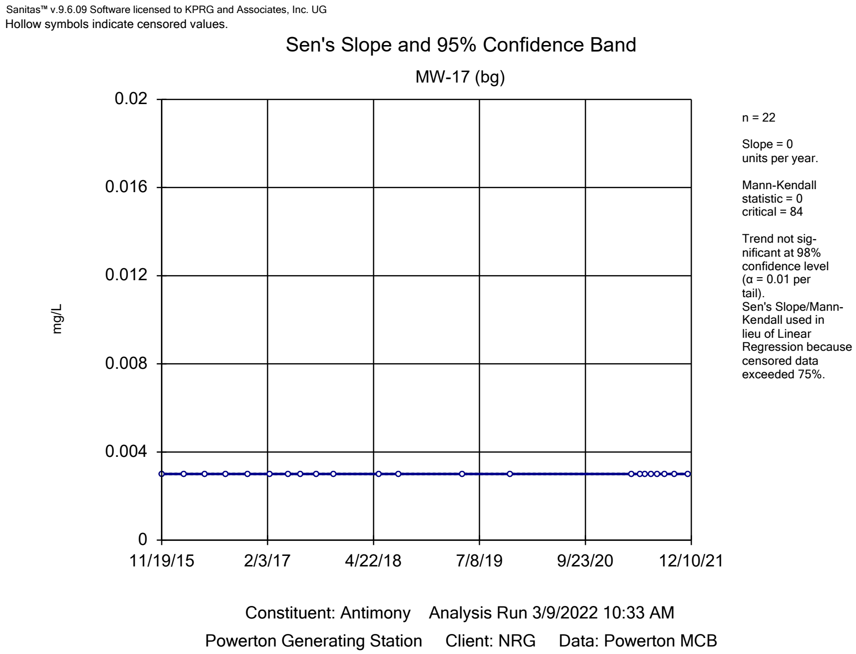


Constituent: Total Dissolved Solids Analysis Run 2/28/2022 1:29 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

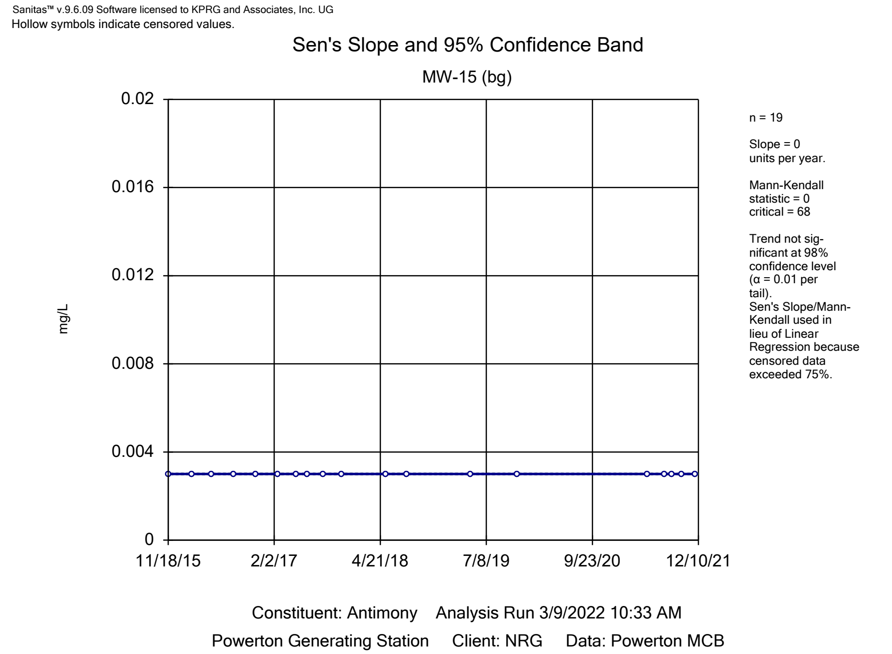
Trend Test Powerton MCB UG Wells MW-15/MW-17 All Data

Powerton Generating Station   Client: NRG   Data: Powerton MCB   Printed 3/9/2022, 10:38 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Antimony (mg/L)	MW-17 (bg)	0	0	84	No	22	100	n/a	n/a	0.02	NP (NDs)
Antimony (mg/L)	MW-15 (bg)	0	0	68	No	19	100	n/a	n/a	0.02	NP (NDs)
Arsenic (mg/L)	**MW-17 (bg)**	**-0.042**	**-127**	**-95**	**Yes**	**24**	**0**	**n/a**	**n/a**	**0.02**	**NP (Nor...**
Arsenic (mg/L)	**MW-15 (bg)**	**-0.3041**	**-3.116**	**-2.205**	**Yes**	**21**	**0**	**Yes**	**natura...**	**0.02**	**Param.**
Barium (mg/L)	**MW-17 (bg)**	**-0.01769**	**-161**	**-95**	**Yes**	**24**	**0**	**n/a**	**n/a**	**0.02**	**NP (Nor...**
Barium (mg/L)	MW-15 (bg)	-0.00...	-0.6232	2.205	No	21	0	Yes	no	0.02	Param.
Beryllium (mg/L)	MW-17 (bg)	0	-9	-84	No	22	95.45	n/a	n/a	0.02	NP (NDs)
Beryllium (mg/L)	MW-15 (bg)	0	0	68	No	19	100	n/a	n/a	0.02	NP (NDs)
Boron (mg/L)	**MW-17 (bg)**	**-0.09925**	**-3.576**	**-2.183**	**Yes**	**24**	**0**	**Yes**	**no**	**0.02**	**Param.**
Boron (mg/L)	MW-15 (bg)	-0.06936	-1.687	2.205	No	21	0	Yes	no	0.02	Param.
Cadmium (mg/L)	MW-17 (bg)	-0.00...	-83	-95	No	24	50	n/a	n/a	0.02	NP (Nor...
Cadmium (mg/L)	MW-15 (bg)	0	-40	-78	No	21	80.95	n/a	n/a	0.02	NP (NDs)
Calcium (mg/L)	**MW-17 (bg)**	**-12.2**	**-170**	**-95**	**Yes**	**24**	**0**	**n/a**	**n/a**	**0.02**	**NP (Nor...**
Calcium (mg/L)	MW-15 (bg)	-0.2015	-1.356	2.205	No	21	0	Yes	square...	0.02	Param.
Chloride (mg/L)	**MW-17 (bg)**	**-16.28**	**-166**	**-95**	**Yes**	**24**	**0**	**n/a**	**n/a**	**0.02**	**NP (Nor...**
Chloride (mg/L)	MW-15 (bg)	1.779	0.6054	2.205	No	21	0	Yes	no	0.02	Param.
Chromium (mg/L)	MW-17 (bg)	0	0	84	No	22	100	n/a	n/a	0.02	NP (NDs)
Chromium (mg/L)	MW-15 (bg)	0	0	68	No	19	100	n/a	n/a	0.02	NP (NDs)
Cobalt (mg/L)	**MW-17 (bg)**	**-0.00...**	**-125**	**-95**	**Yes**	**24**	**50**	**n/a**	**n/a**	**0.02**	**NP (Nor...**
Cobalt (mg/L)	MW-15 (bg)	0	10	78	No	21	95.24	n/a	n/a	0.02	NP (NDs)
Combined Radium 226 + 228 (pCi/L)	**MW-17 (bg)**	**-0.1015**	**-4.111**	**-2.183**	**Yes**	**24**	**41.67**	**Yes**	**cube root**	**0.02**	**Param.**
Combined Radium 226 + 228 (pCi/L)	MW-15 (bg)	-0.00...	-8	-78	No	21	76.19	n/a	n/a	0.02	NP (NDs)
Fluoride (mg/L)	**MW-17 (bg)**	**0.02978**	**5.008**	**2.183**	**Yes**	**24**	**0**	**Yes**	**no**	**0.02**	**Param.**
Fluoride (mg/L)	MW-15 (bg)	-0.00...	-0.5578	2.205	No	21	0	Yes	no	0.02	Param.
Lead (mg/L)	MW-17 (bg)	0	-37	-95	No	24	54.17	n/a	n/a	0.02	NP (Nor...
Lead (mg/L)	MW-15 (bg)	0	0	78	No	21	100	n/a	n/a	0.02	NP (NDs)
Lithium (mg/L)	MW-17 (bg)	-0.00...	-52	-95	No	24	4.167	n/a	n/a	0.02	NP (Nor...
Lithium (mg/L)	MW-15 (bg)	-0.00...	-1.256	2.205	No	21	0	Yes	no	0.02	Param.
Mercury (mg/L)	MW-17 (bg)	0	0	95	No	24	100	n/a	n/a	0.02	NP (NDs)
Mercury (mg/L)	MW-15 (bg)	0	0	78	No	21	100	n/a	n/a	0.02	NP (NDs)
Molybdenum (mg/L)	**MW-17 (bg)**	**-0.00...**	**-2.5**	**-2.183**	**Yes**	**24**	**0**	**Yes**	**no**	**0.02**	**Param.**
Molybdenum (mg/L)	**MW-15 (bg)**	**-0.00...**	**-3.33**	**-2.205**	**Yes**	**21**	**0**	**Yes**	**no**	**0.02**	**Param.**
pH (SU)	**MW-17 (bg)**	**0.03598**	**105**	**95**	**Yes**	**24**	**0**	**n/a**	**n/a**	**0.02**	**NP (Nor...**
pH (SU)	MW-15 (bg)	-0.01133	-0.4784	2.205	No	21	0	Yes	no	0.02	Param.
Selenium (mg/L)	MW-17 (bg)	0	17	95	No	24	95.83	n/a	n/a	0.02	NP (NDs)
Selenium (mg/L)	MW-15 (bg)	-0.02574	-0.2143	2.205	No	21	19.05	Yes	natura...	0.02	Param.
Sulfate (mg/L)	**MW-17 (bg)**	**-64.23**	**-7.236**	**-2.183**	**Yes**	**24**	**0**	**Yes**	**no**	**0.02**	**Param.**
Sulfate (mg/L)	**MW-15 (bg)**	**-1.507**	**-3.893**	**-2.205**	**Yes**	**21**	**0**	**Yes**	**square...**	**0.02**	**Param.**
Thallium (mg/L)	MW-17 (bg)	-0.00...	-68	-95	No	24	50	n/a	n/a	0.02	NP (Nor...
Thallium (mg/L)	MW-15 (bg)	0	0	78	No	21	100	n/a	n/a	0.02	NP (NDs)
Total Dissolved Solids (mg/L)	**MW-17 (bg)**	**-138.5**	**-168**	**-95**	**Yes**	**24**	**0**	**n/a**	**n/a**	**0.02**	**NP (Nor...**
Total Dissolved Solids (mg/L)	**MW-15 (bg)**	**-0.06067**	**-4.079**	**-2.205**	**Yes**	**21**	**0**	**Yes**	**natura...**	**0.02**	**Param.**
Turbidity (NTU)	MW-17 (bg)	-23.97	-1.506	2.517	No	9	0	Yes	no	0.02	Param.
Turbidity (NTU)	MW-15 (bg)	-4.349	-1.867	2.517	No	9	0	Yes	square...	0.02	Param.



Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.
Sen's Slope and 95% Confidence Band
MW-17 (bg)
0.02
0.016
0.012
0.008
0.004
0
mg/L
11/19/15
2/3/17
4/22/18
7/8/19
9/23/20
12/10/21
n = 22
Slope = 0
units per year.
Mann-Kendall
statistic = 0
critical = 84
Trend not sig-
nificant at 98%
confidence level
(α = 0.01 per
tail).
Sen's Slope/Mann-
Kendall used in
lieu of Linear
Regression because
censored data
exceeded 75%.
Constituent: Antimony Analysis Run 3/9/2022 10:33 AM
Powerton Generating Station Client: NRG Data: Powerton MCB



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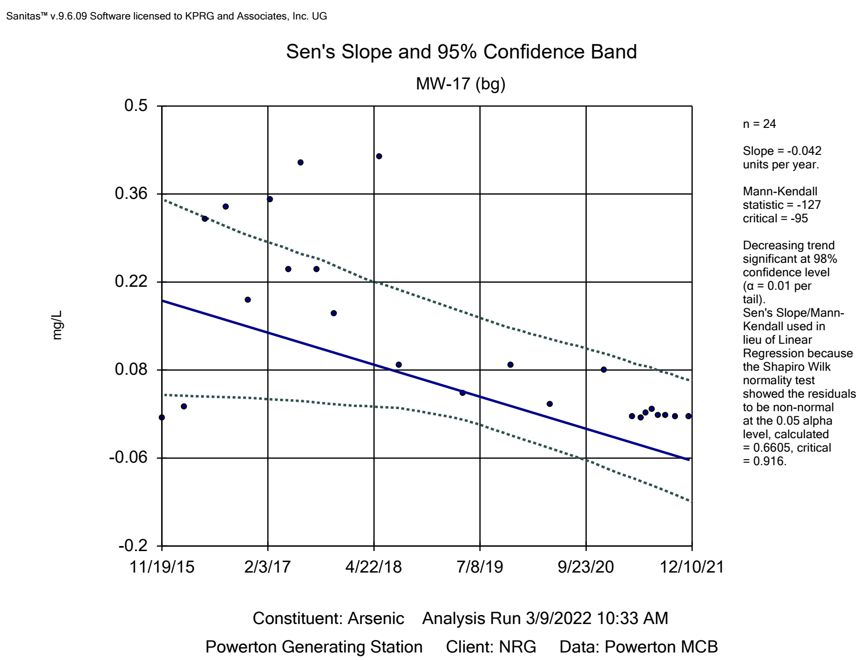
Hollow symbols indicate censored values.
Sen's Slope and 95% Confidence Band
MW-15 (bg)
0.02
0.016
0.012
0.008
0.004
0
mg/L
11/18/15
2/2/17
4/21/18
7/8/19
9/23/20
12/10/21
n = 19
Slope = 0
units per year.
Mann-Kendall
statistic = 0
critical = 68
Trend not sig-
nificant at 98%
confidence level
(α = 0.01 per
tail).
Sen's Slope/Mann-
Kendall used in
lieu of Linear
Regression because
censored data
exceeded 75%.
Constituent: Antimony Analysis Run 3/9/2022 10:33 AM
Powerton Generating Station Client: NRG Data: Powerton MCB



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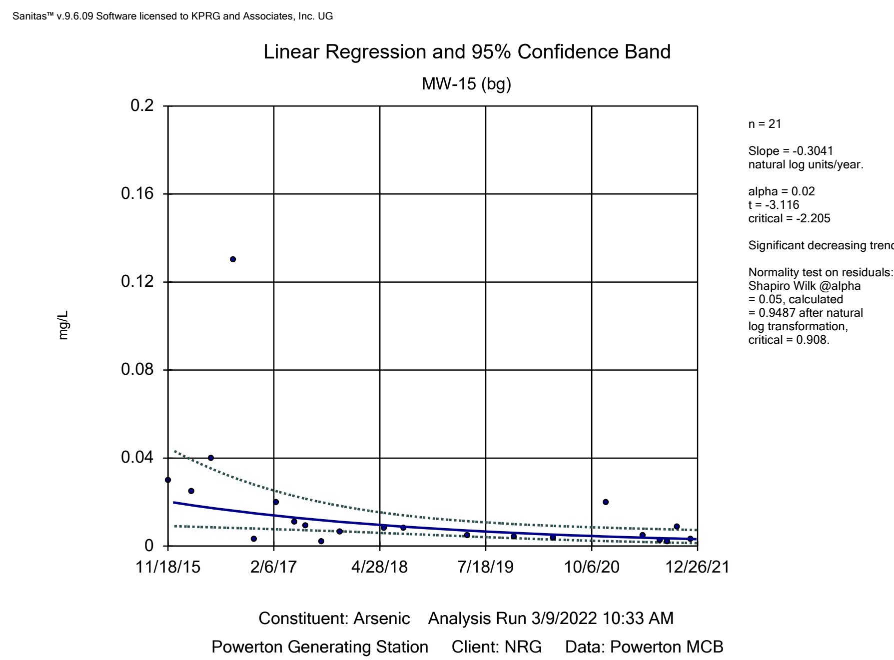
Sen's Slope and 95% Confidence Band
MW-17 (bg)
0.5
0.36
0.22
0.08
-0.06
-0.2
mg/L
11/19/15
2/3/17
4/22/18
7/8/19
9/23/20
12/10/21
n = 24
Slope = -0.042
units per year.
Mann-Kendall
statistic = -127
critical = -95
Decreasing trend
significant at 98%
confidence level
(α = 0.01 per
tail).
Sen's Slope/Mann-
Kendall used in
lieu of Linear
Regression because
the Shapiro Wilk
normality test
showed the residuals
to be non-normal
at the 0.05 alpha
level, calculated
= 0.6605, critical
= 0.916.
Constituent: Arsenic Analysis Run 3/9/2022 10:33 AM
Powerton Generating Station Client: NRG Data: Powerton MCB



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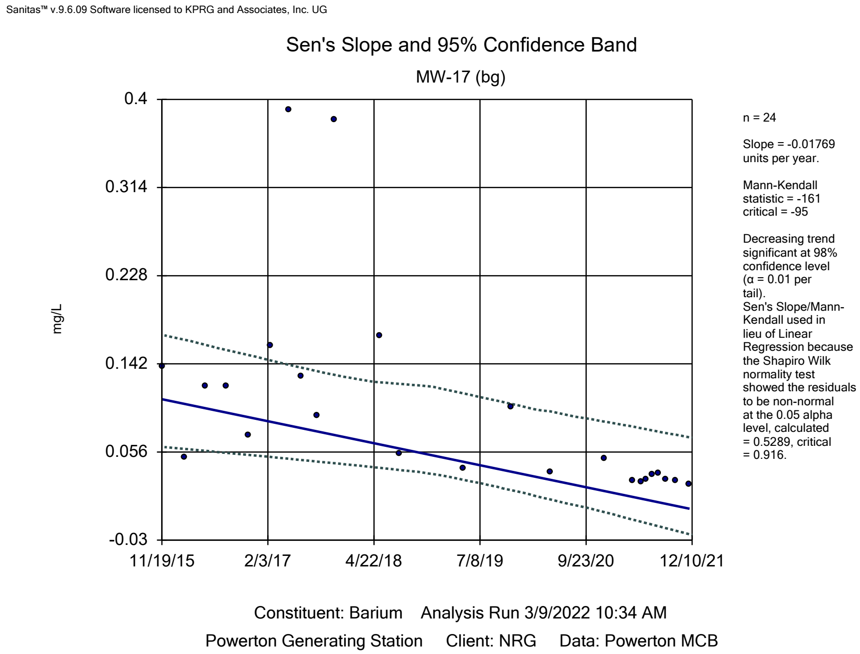
Linear Regression and 95% Confidence Band
MW-15 (bg)
0.2
0.16
0.12
0.08
0.04
0
mg/L
11/18/15
2/6/17
4/28/18
7/18/19
10/6/20
12/26/21
n = 21
Slope = -0.3041
natural log units/year.
alpha = 0.02
t = -3.116
critical = -2.205
Significant decreasing trend.
Normality test on residuals:
Shapiro Wilk @alpha
= 0.05, calculated
= 0.9487 after natural
log transformation,
critical = 0.908.
Constituent: Arsenic Analysis Run 3/9/2022 10:33 AM
Powerton Generating Station Client: NRG Data: Powerton MCB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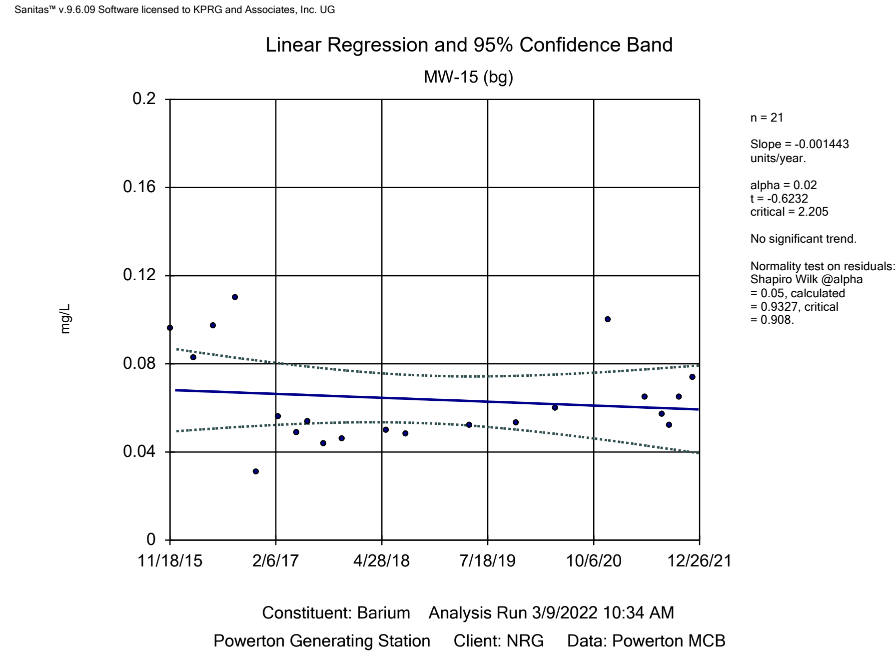
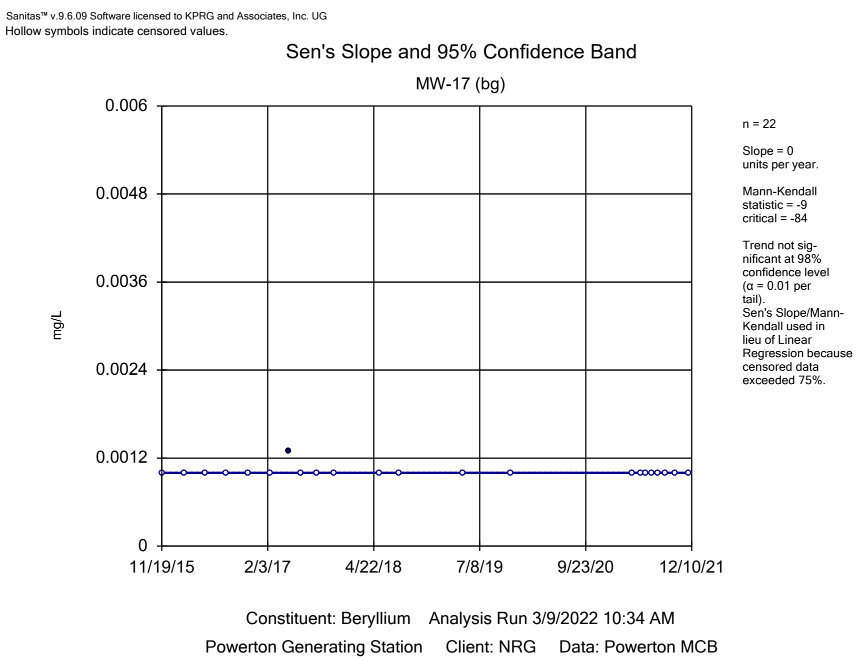
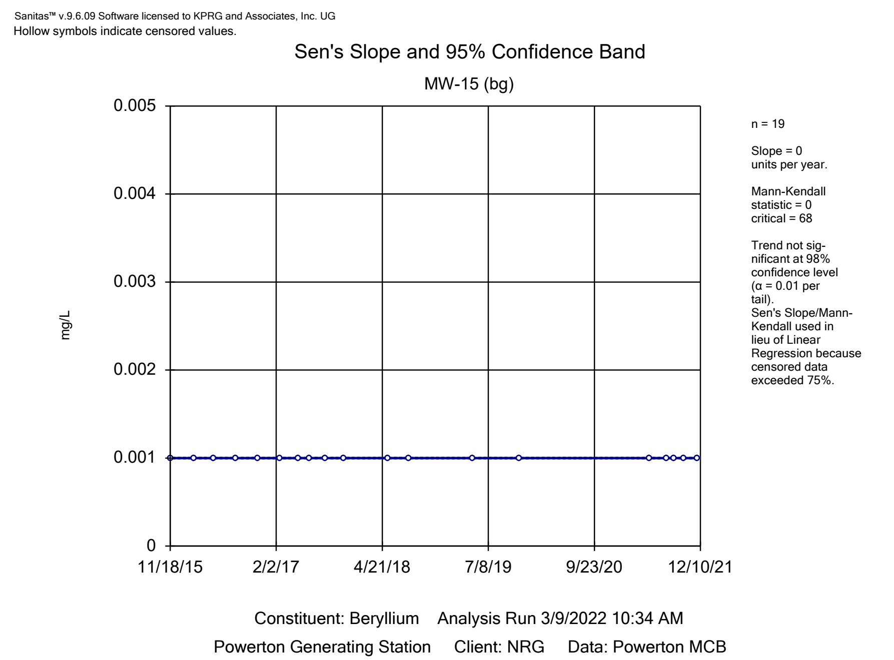
Sen's Slope and 95% Confidence Band
MW-17 (bg)
0.4
0.314
0.228
0.142
0.056
-0.03
mg/L
11/19/15
2/3/17
4/22/18
7/8/19
9/23/20
12/10/21
n = 24
Slope = -0.01769 units per year.
Mann-Kendall statistic = -161 critical = -95
Decreasing trend significant at 98% confidence level (α = 0.01 per tail).
Sen's Slope/Mann-Kendall used in lieu of Linear Regression because the Shapiro Wilk normality test showed the residuals to be non-normal at the 0.05 alpha level, calculated = 0.5289, critical = 0.916.
Constituent: Barium Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station Client: NRG Data: Powerton MCB


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Linear Regression and 95% Confidence Band
MW-15 (bg)
0.2
0.16
0.12
0.08
0.04
0
mg/L
11/18/15
2/6/17
4/28/18
7/18/19
10/6/20
12/26/21
n = 21
Slope = -0.001443 units/year.
alpha = 0.02
t = -0.6232
critical = 2.205
No significant trend.
Normality test on residuals: Shapiro Wilk @alpha = 0.05, calculated = 0.9327, critical = 0.908.
Constituent: Barium Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station Client: NRG Data: Powerton MCB


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.
Sen's Slope and 95% Confidence Band
MW-17 (bg)
0.006
0.0048
0.0036
0.0024
0.0012
0
mg/L
11/19/15
2/3/17
4/22/18
7/8/19
9/23/20
12/10/21
n = 22
Slope = 0 units per year.
Mann-Kendall statistic = -9 critical = -84
Trend not significant at 98% confidence level (α = 0.01 per tail).
Sen's Slope/Mann-Kendall used in lieu of Linear Regression because censored data exceeded 75%.
Constituent: Beryllium Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station Client: NRG Data: Powerton MCB


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.
Sen's Slope and 95% Confidence Band
MW-15 (bg)
0.005
0.004
0.003
0.002
0.001
0
mg/L
11/18/15
2/2/17
4/21/18
7/8/19
9/23/20
12/10/21
n = 19
Slope = 0 units per year.
Mann-Kendall statistic = 0 critical = 68
Trend not significant at 98% confidence level (α = 0.01 per tail).
Sen's Slope/Mann-Kendall used in lieu of Linear Regression because censored data exceeded 75%.
Constituent: Beryllium Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station Client: NRG Data: Powerton MCB

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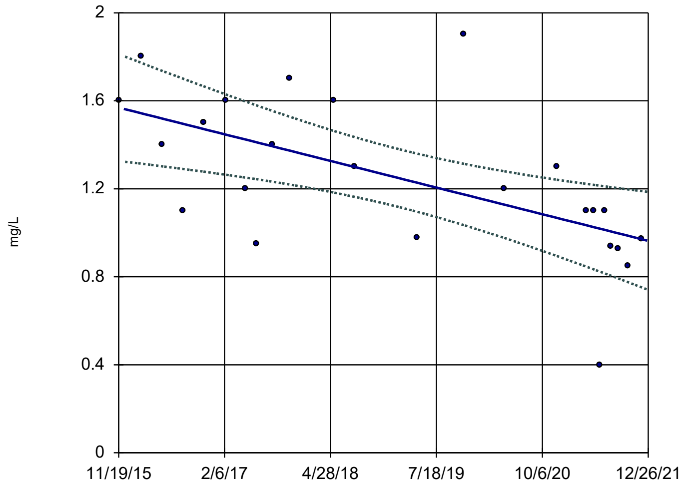
Linear Regression and 95% Confidence Band

MW-17 (bg)



n = 24

Slope = -0.09925 units/year.

alpha = 0.02
t = -3.576
critical = -2.183

Significant decreasing trend.

Normality test on residuals: Shapiro Wilk @alpha = 0.05, calculated = 0.9617, critical = 0.916.

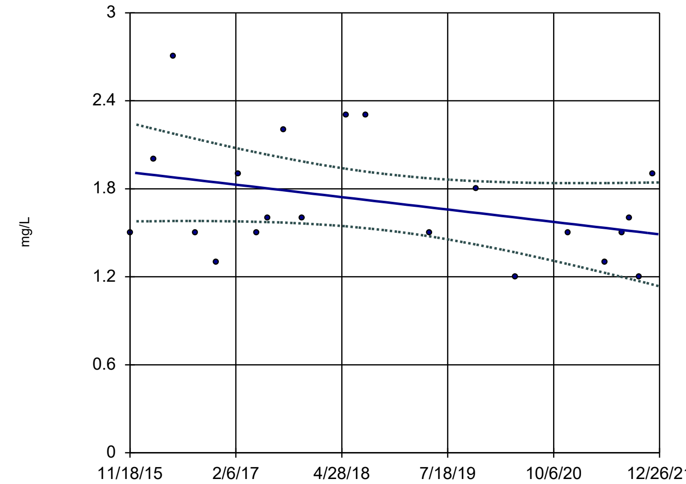
Constituent: Boron   Analysis Run 3/9/2022 10:34 AM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Linear Regression and 95% Confidence Band

MW-15 (bg)



n = 21

Slope = -0.06936 units/year.

alpha = 0.02
t = -1.687
critical = 2.205

No significant trend.

Normality test on residuals: Shapiro Wilk @alpha = 0.05, calculated = 0.9422, critical = 0.908.

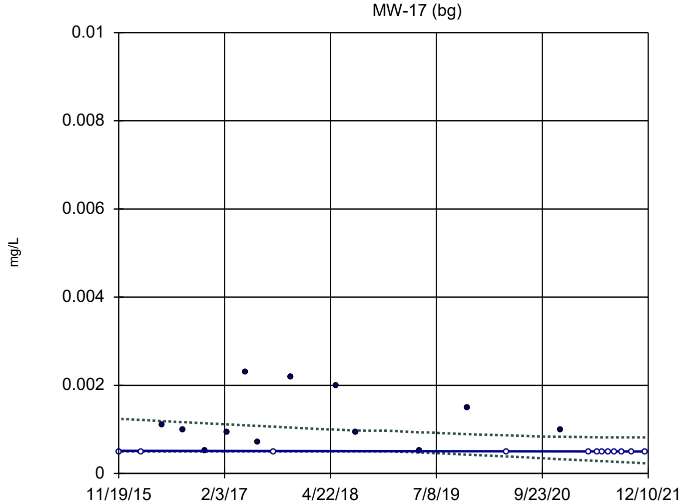
Constituent: Boron   Analysis Run 3/9/2022 10:34 AM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.

Sen's Slope and 95% Confidence Band

MW-17 (bg)



n = 24

Slope = -0.000002585 units per year.

Mann-Kendall statistic = -83
critical = -95

Trend not significant at 98% confidence level (α = 0.01 per tail).
Sen's Slope/Mann-Kendall used in lieu of Linear Regression because the Shapiro Wilk normality test showed the residuals to be non-normal at the 0.05 alpha level, calculated = 0.6321, critical = 0.916.

Constituent: Cadmium   Analysis Run 3/9/2022 10:34 AM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

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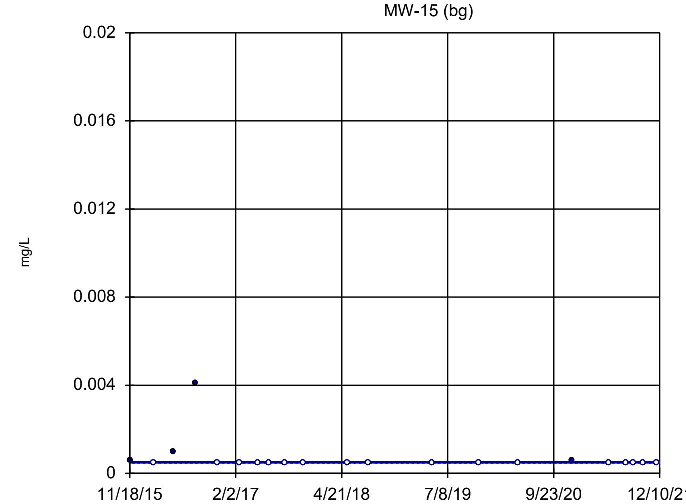
Hollow symbols indicate censored values.

Sen's Slope and 95% Confidence Band

MW-15 (bg)



n = 21

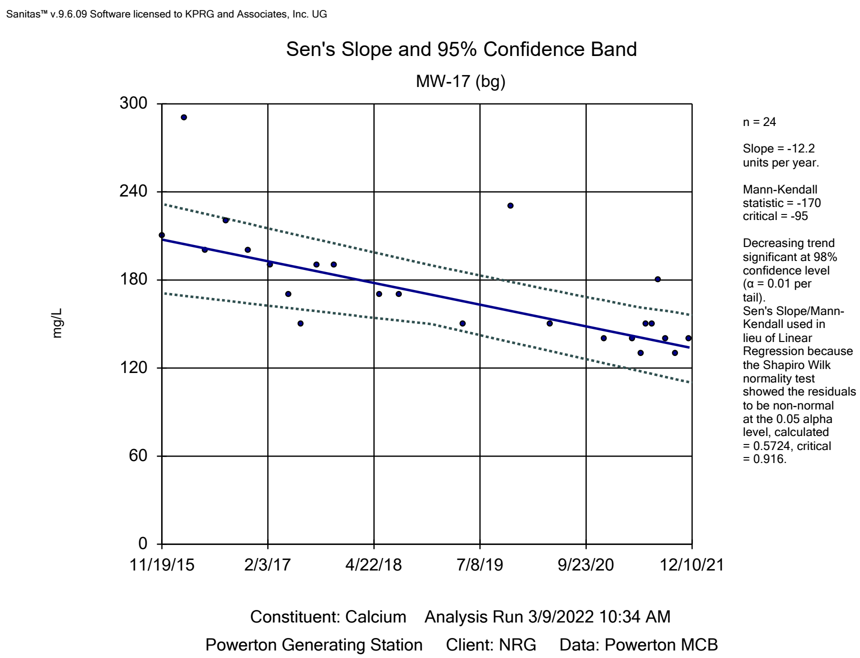
Slope = 0 units per year.

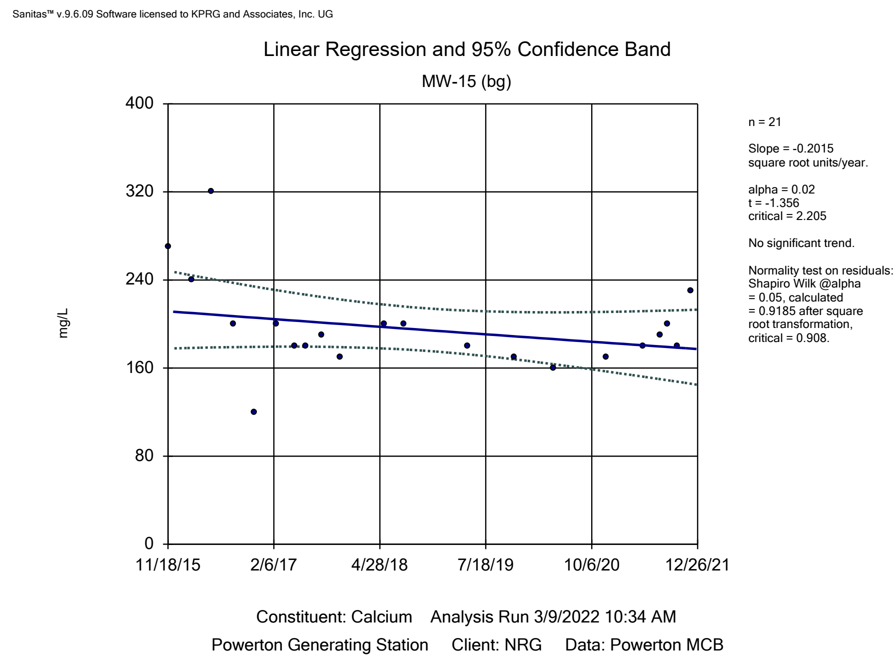
Mann-Kendall statistic = -40
critical = -78

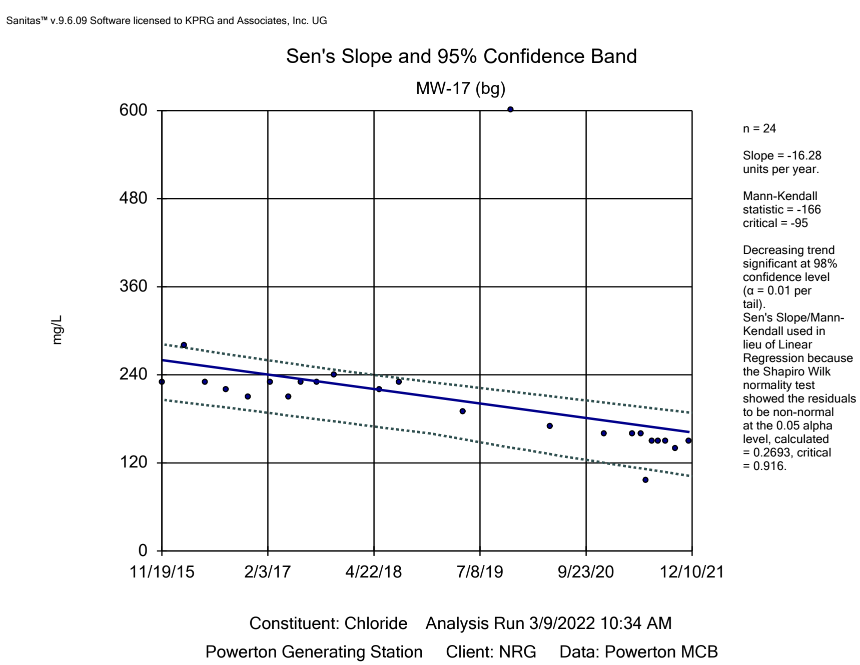
Trend not significant at 98% confidence level (α = 0.01 per tail).
Sen's Slope/Mann-Kendall used in lieu of Linear Regression because censored data exceeded 75%.

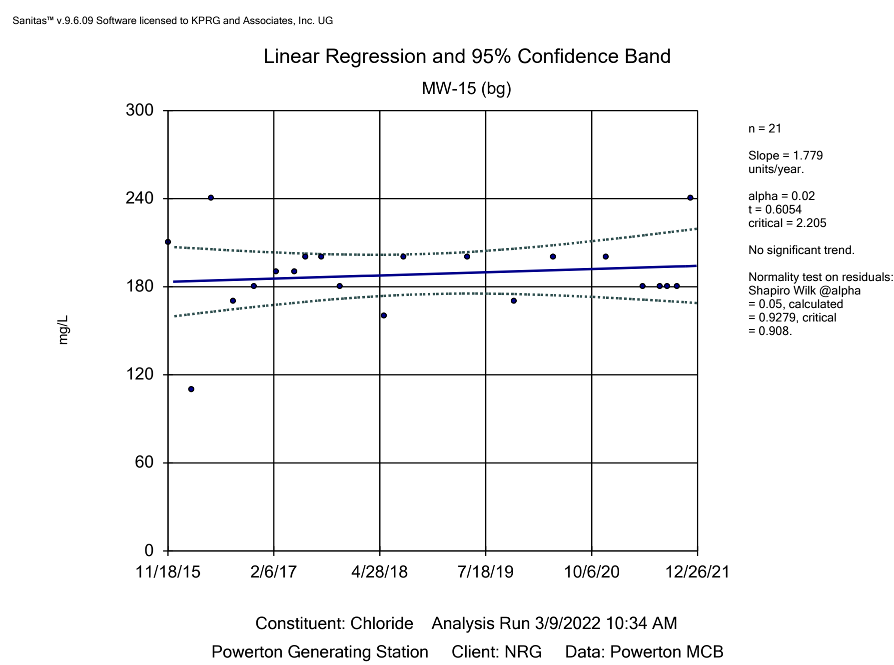
Constituent: Cadmium   Analysis Run 3/9/2022 10:34 AM

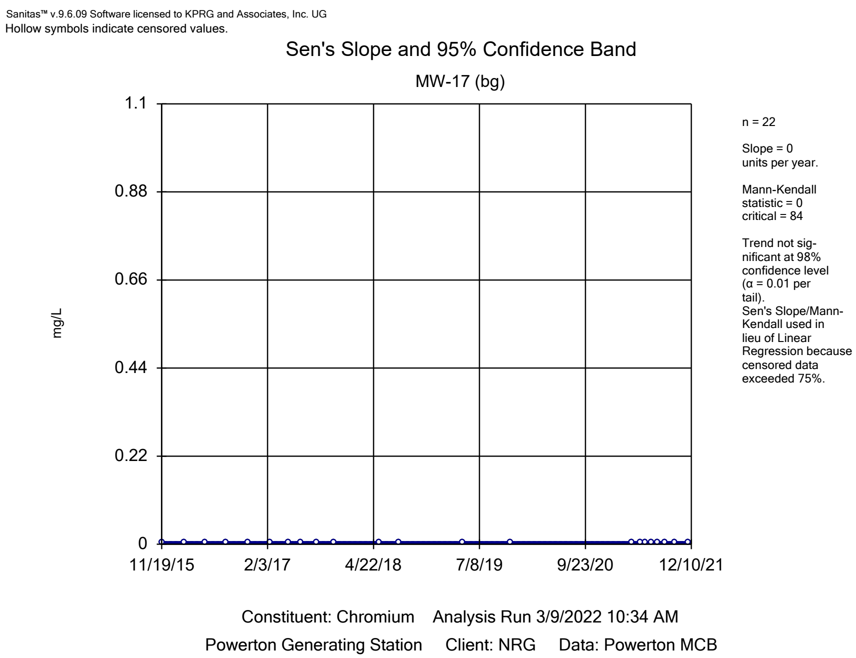
Powerton Generating Station   Client: NRG   Data: Powerton MCB


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Sen's Slope and 95% Confidence Band
MW-17 (bg)
mg/L
300
240
180
120
60
0
11/19/15
2/3/17
4/22/18
7/8/19
9/23/20
12/10/21
n = 24
Slope = -12.2 units per year.
Mann-Kendall statistic = -170 critical = -95
Decreasing trend significant at 98% confidence level (α = 0.01 per tail). Sen's Slope/Mann-Kendall used in lieu of Linear Regression because the Shapiro Wilk normality test showed the residuals to be non-normal at the 0.05 alpha level, calculated = 0.5724, critical = 0.916.
Constituent: Calcium Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station Client: NRG Data: Powerton MCB

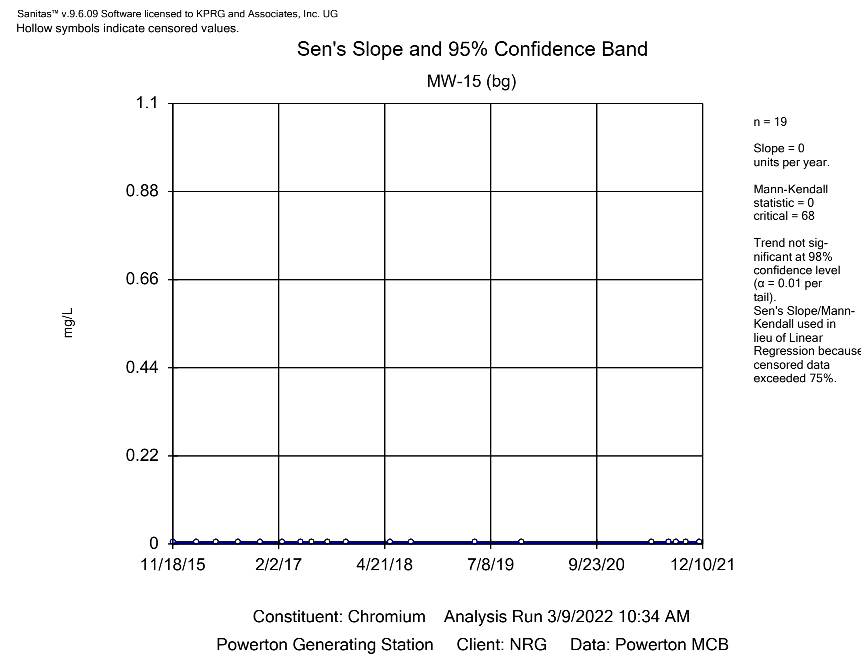

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Linear Regression and 95% Confidence Band
MW-15 (bg)
mg/L
400
320
240
160
80
0
11/18/15
2/6/17
4/28/18
7/18/19
10/6/20
12/26/21
n = 21
Slope = -0.2015 square root units/year.
alpha = 0.02
t = -1.356
critical = 2.205
No significant trend.
Normality test on residuals: Shapiro Wilk @alpha = 0.05, calculated = 0.9185 after square root transformation, critical = 0.908.
Constituent: Calcium Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station Client: NRG Data: Powerton MCB


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Sen's Slope and 95% Confidence Band
MW-17 (bg)
mg/L
600
480
360
240
120
0
11/19/15
2/3/17
4/22/18
7/8/19
9/23/20
12/10/21
n = 24
Slope = -16.28 units per year.
Mann-Kendall statistic = -166 critical = -95
Decreasing trend significant at 98% confidence level (α = 0.01 per tail). Sen's Slope/Mann-Kendall used in lieu of Linear Regression because the Shapiro Wilk normality test showed the residuals to be non-normal at the 0.05 alpha level, calculated = 0.2693, critical = 0.916.
Constituent: Chloride Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station Client: NRG Data: Powerton MCB

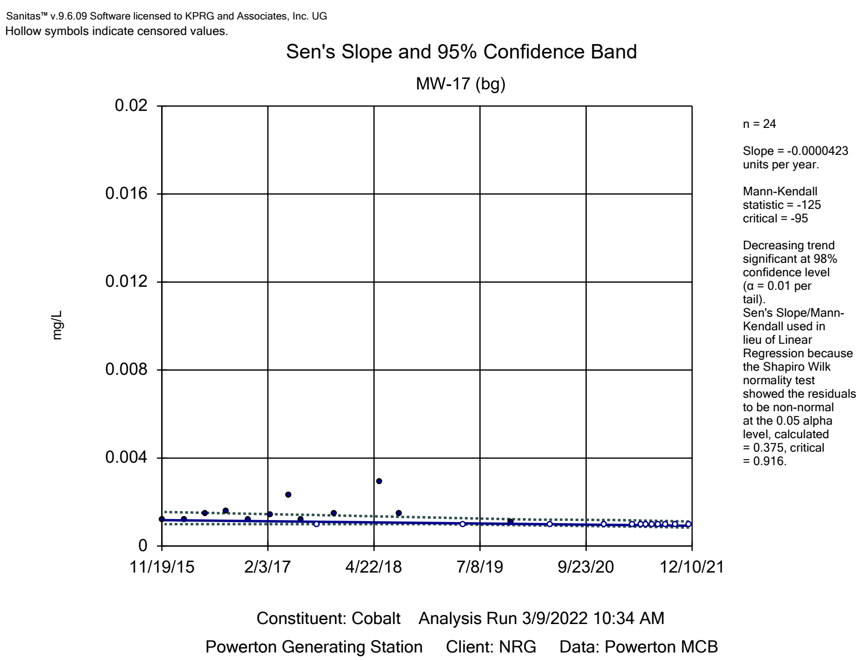

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Linear Regression and 95% Confidence Band
MW-15 (bg)
mg/L
300
240
180
120
60
0
11/18/15
2/6/17
4/28/18
7/18/19
10/6/20
12/26/21
n = 21
Slope = 1.779 units/year.
alpha = 0.02
t = 0.6054
critical = 2.205
No significant trend.
Normality test on residuals: Shapiro Wilk @alpha = 0.05, calculated = 0.9279, critical = 0.908.
Constituent: Chloride Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station Client: NRG Data: Powerton MCB



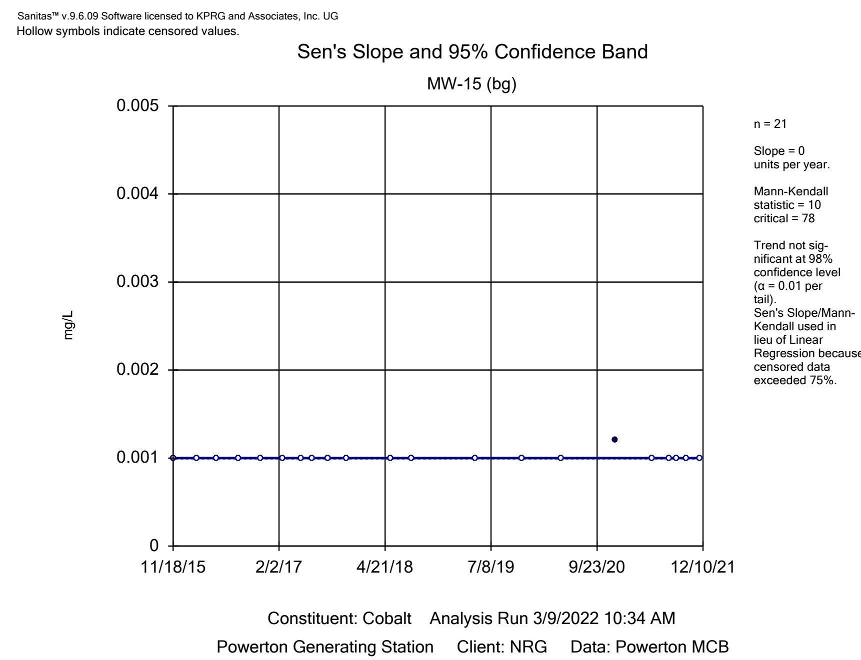
Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.
Sen's Slope and 95% Confidence Band
MW-17 (bg)
mg/L
1.1
0.88
0.66
0.44
0.22
0
11/19/15
2/3/17
4/22/18
7/8/19
9/23/20
12/10/21
n = 22
Slope = 0 units per year.
Mann-Kendall statistic = 0 critical = 84
Trend not significant at 98% confidence level (α = 0.01 per tail).
Sen's Slope/Mann-Kendall used in lieu of Linear Regression because censored data exceeded 75%.
Constituent: Chromium Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station Client: NRG Data: Powerton MCB



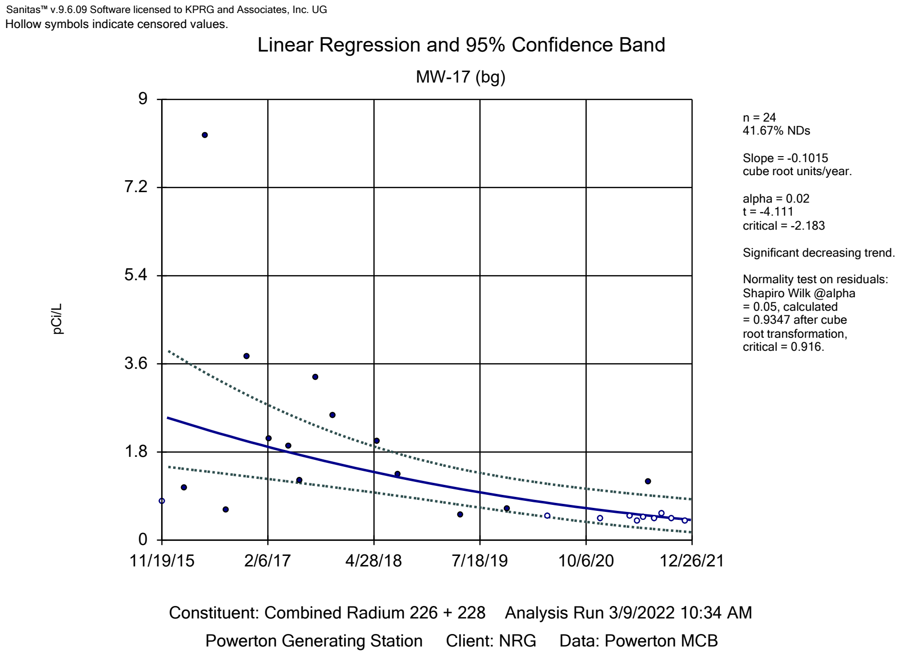
Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.
Sen's Slope and 95% Confidence Band
MW-15 (bg)
mg/L
1.1
0.88
0.66
0.44
0.22
0
11/18/15
2/2/17
4/21/18
7/8/19
9/23/20
12/10/21
n = 19
Slope = 0 units per year.
Mann-Kendall statistic = 0 critical = 68
Trend not significant at 98% confidence level (α = 0.01 per tail).
Sen's Slope/Mann-Kendall used in lieu of Linear Regression because censored data exceeded 75%.
Constituent: Chromium Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station Client: NRG Data: Powerton MCB

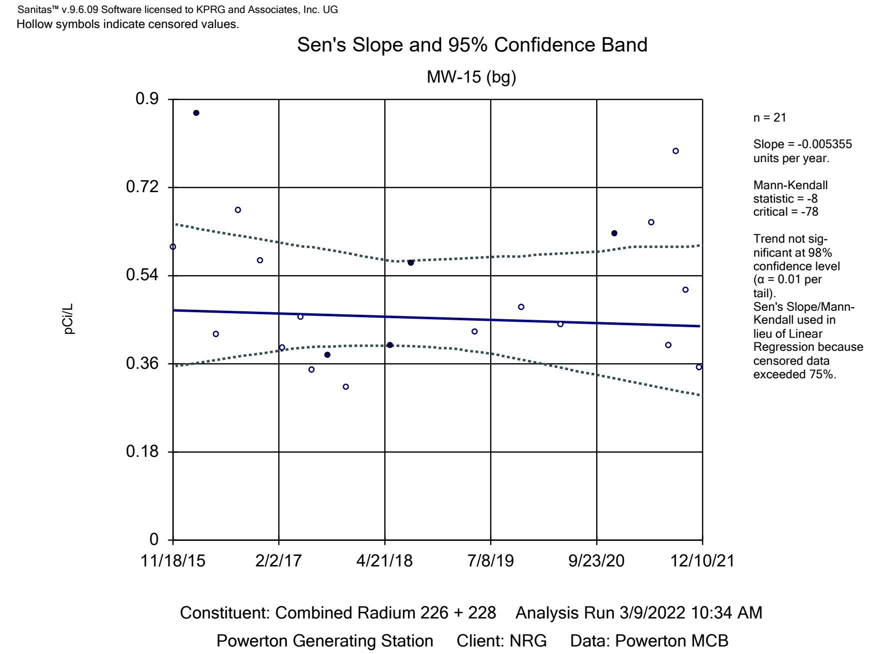


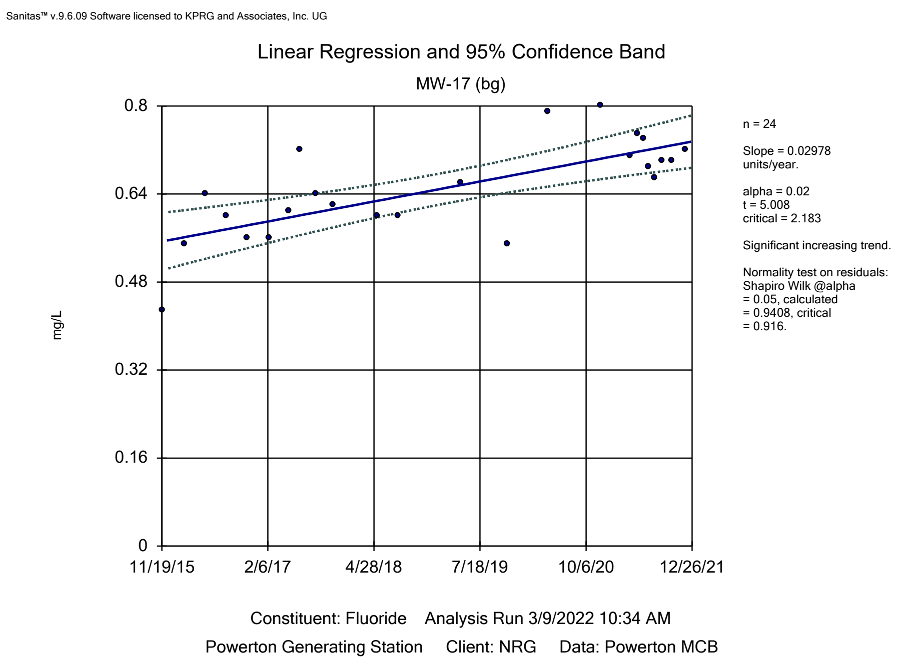
Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.
Sen's Slope and 95% Confidence Band
MW-17 (bg)
mg/L
0.02
0.016
0.012
0.008
0.004
0
11/19/15
2/3/17
4/22/18
7/8/19
9/23/20
12/10/21
n = 24
Slope = -0.0000423 units per year.
Mann-Kendall statistic = -125 critical = -95
Decreasing trend significant at 98% confidence level (α = 0.01 per tail).
Sen's Slope/Mann-Kendall used in lieu of Linear Regression because the Shapiro Wilk normality test showed the residuals to be non-normal at the 0.05 alpha level, calculated = 0.375, critical = 0.916.
Constituent: Cobalt Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station Client: NRG Data: Powerton MCB

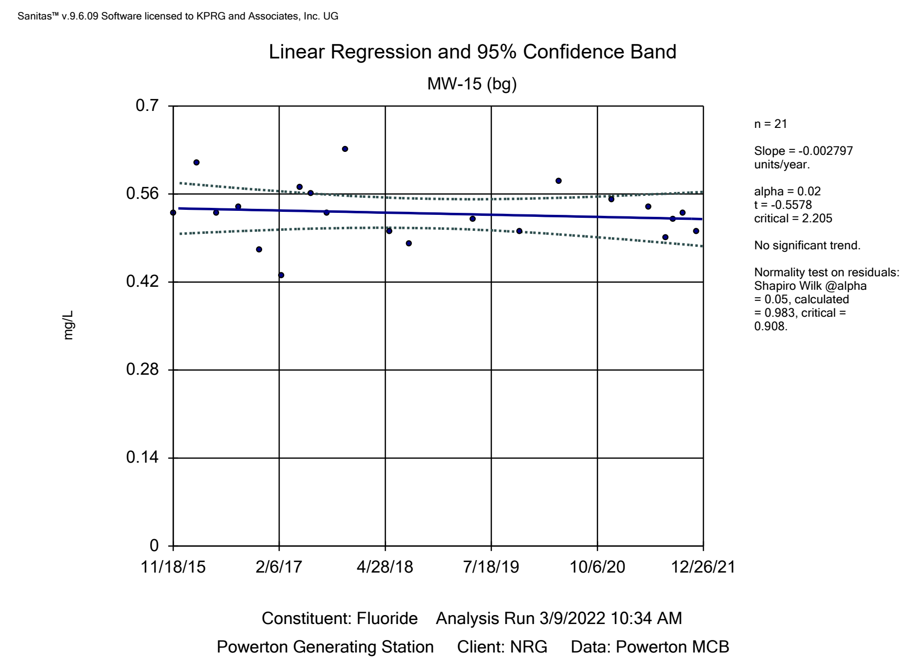


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.
Sen's Slope and 95% Confidence Band
MW-15 (bg)
mg/L
0.005
0.004
0.003
0.002
0.001
0
11/18/15
2/2/17
4/21/18
7/8/19
9/23/20
12/10/21
n = 21
Slope = 0 units per year.
Mann-Kendall statistic = 10 critical = 78
Trend not significant at 98% confidence level (α = 0.01 per tail).
Sen's Slope/Mann-Kendall used in lieu of Linear Regression because censored data exceeded 75%.
Constituent: Cobalt Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station Client: NRG Data: Powerton MCB


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.
Linear Regression and 95% Confidence Band
MW-17 (bg)
pCi/L
9
7.2
5.4
3.6
1.8
0
11/19/15
2/6/17
4/28/18
7/18/19
10/6/20
12/26/21
n = 24
41.67% NDs
Slope = -0.1015
cube root units/year.
alpha = 0.02
t = -4.111
critical = -2.183
Significant decreasing trend.
Normality test on residuals:
Shapiro Wilk @alpha
= 0.05, calculated
= 0.9347 after cube
root transformation,
critical = 0.916.
Constituent: Combined Radium 226 + 228 Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station Client: NRG Data: Powerton MCB


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.
Sen's Slope and 95% Confidence Band
MW-15 (bg)
pCi/L
0.9
0.72
0.54
0.36
0.18
0
11/18/15
2/2/17
4/21/18
7/8/19
9/23/20
12/10/21
n = 21
Slope = -0.005355
units per year.
Mann-Kendall
statistic = -8
critical = -78
Trend not significant at 98%
confidence level
(α = 0.01 per
tail).
Sen's Slope/Mann-Kendall used in
lieu of Linear
Regression because
censored data
exceeded 75%.
Constituent: Combined Radium 226 + 228 Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station Client: NRG Data: Powerton MCB

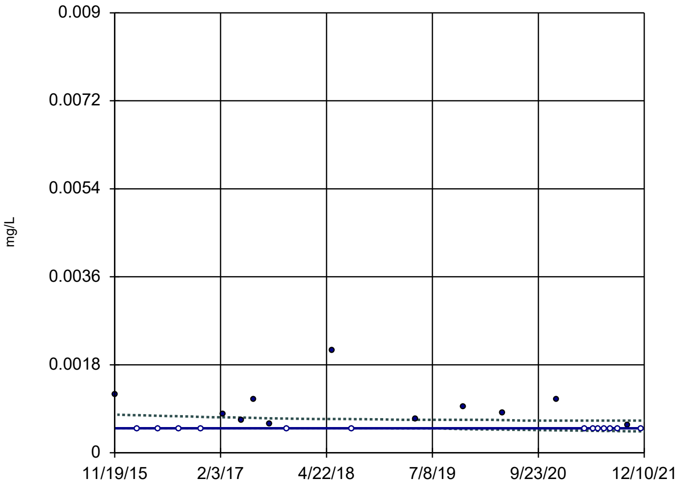

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Linear Regression and 95% Confidence Band
MW-17 (bg)
mg/L
0.8
0.64
0.48
0.32
0.16
0
11/19/15
2/6/17
4/28/18
7/18/19
10/6/20
12/26/21
n = 24
Slope = 0.02978
units/year.
alpha = 0.02
t = 5.008
critical = 2.183
Significant increasing trend.
Normality test on residuals:
Shapiro Wilk @alpha
= 0.05, calculated
= 0.9408, critical
= 0.916.
Constituent: Fluoride Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station Client: NRG Data: Powerton MCB


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Linear Regression and 95% Confidence Band
MW-15 (bg)
mg/L
0.7
0.56
0.42
0.28
0.14
0
11/18/15
2/6/17
4/28/18
7/18/19
10/6/20
12/26/21
n = 21
Slope = -0.002797
units/year.
alpha = 0.02
t = -0.5578
critical = 2.205
No significant trend.
Normality test on residuals:
Shapiro Wilk @alpha
= 0.05, calculated
= 0.983, critical =
0.908.
Constituent: Fluoride Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station Client: NRG Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.

Sen's Slope and 95% Confidence Band

MW-17 (bg)



n = 24

Slope = 0
units per year.

Mann-Kendall
statistic = -37
critical = -95

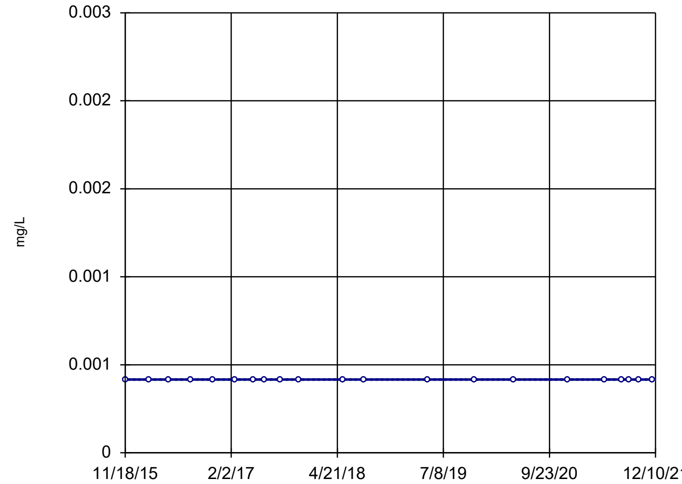
Trend not significant at 98% confidence level (α = 0.01 per tail).
Sen's Slope/Mann-Kendall used in lieu of Linear Regression because the Shapiro Wilk normality test showed the residuals to be non-normal at the 0.05 alpha level, calculated = 0.2822, critical = 0.916.

Constituent: Lead   Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station   Client: NRG   Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.

Sen's Slope and 95% Confidence Band

MW-15 (bg)



n = 21

Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 78

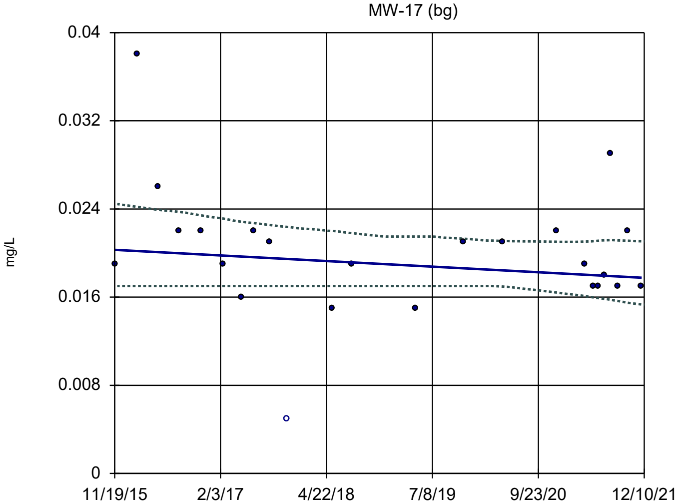
Trend not significant at 98% confidence level (α = 0.01 per tail).
Sen's Slope/Mann-Kendall used in lieu of Linear Regression because censored data exceeded 75%.

Constituent: Lead   Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station   Client: NRG   Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.

Sen's Slope and 95% Confidence Band

MW-17 (bg)



n = 24

Slope = -0.0004174
units per year.

Mann-Kendall
statistic = -52
critical = -95

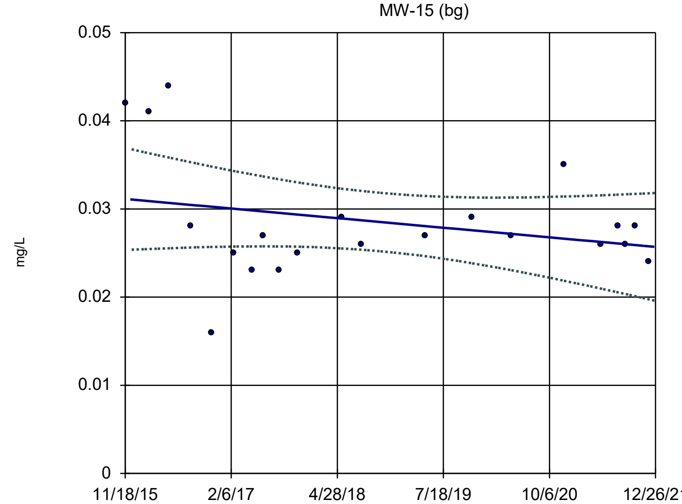
Trend not significant at 98% confidence level (α = 0.01 per tail).
Sen's Slope/Mann-Kendall used in lieu of Linear Regression because the Shapiro Wilk normality test showed the residuals to be non-normal at the 0.05 alpha level, calculated = 0.5163, critical = 0.916.

Constituent: Lithium   Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station   Client: NRG   Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Linear Regression and 95% Confidence Band

MW-15 (bg)



n = 21

Slope = -0.0008914
units/year.

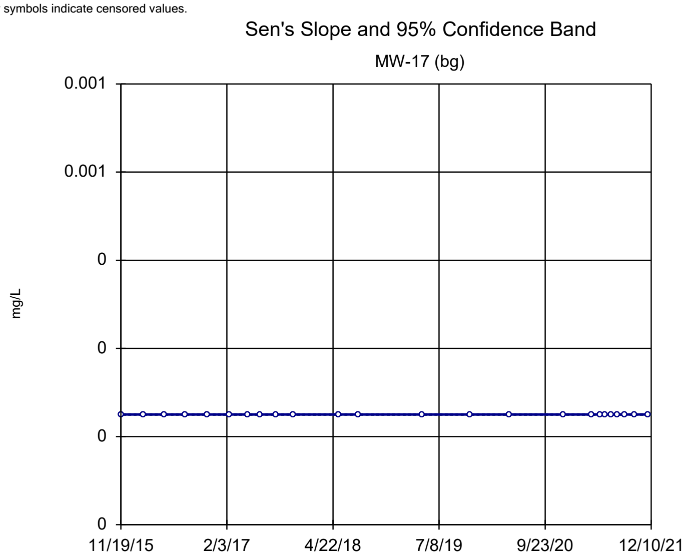
alpha = 0.02
t = -1.256
critical = 2.205

No significant trend.

Normality test on residuals:
Shapiro Wilk @alpha = 0.05, calculated = 0.9411, critical = 0.908.

Constituent: Lithium   Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station   Client: NRG   Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.



n = 24

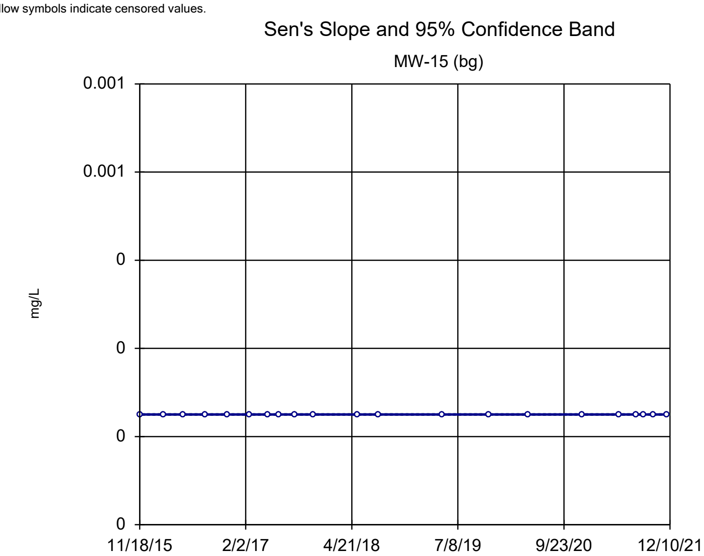
Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 95

Trend not significant at 98% confidence level (α = 0.01 per tail).
Sen's Slope/Mann-Kendall used in lieu of Linear Regression because censored data exceeded 75%.

Constituent: Mercury   Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station   Client: NRG   Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.



n = 21

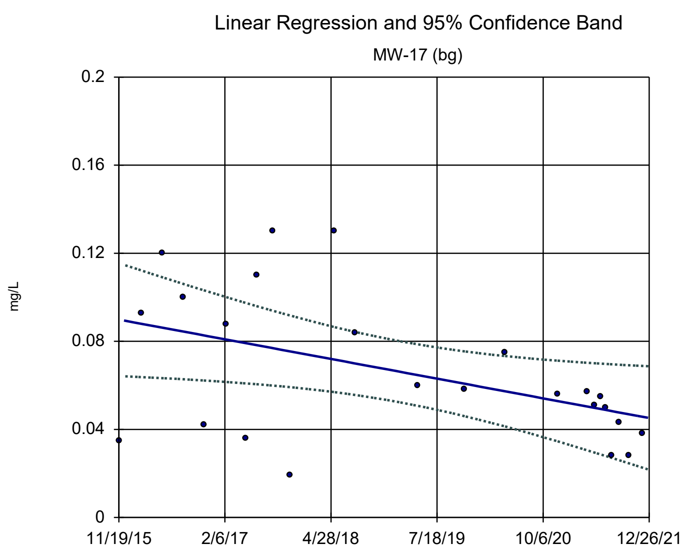
Slope = 0
units per year.

Mann-Kendall
statistic = 0
critical = 78

Trend not significant at 98% confidence level (α = 0.01 per tail).
Sen's Slope/Mann-Kendall used in lieu of Linear Regression because censored data exceeded 75%.

Constituent: Mercury   Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station   Client: NRG   Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG



n = 24

Slope = -0.007324
units/year.

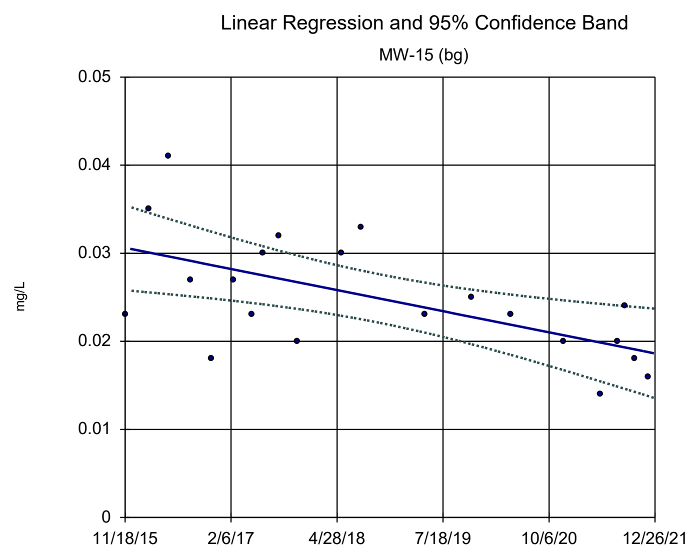
alpha = 0.02
t = -2.5
critical = -2.183

Significant decreasing trend.

Normality test on residuals: Shapiro Wilk @alpha = 0.05, calculated = 0.9526, critical = 0.916.

Constituent: Molybdenum   Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station   Client: NRG   Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG



n = 21

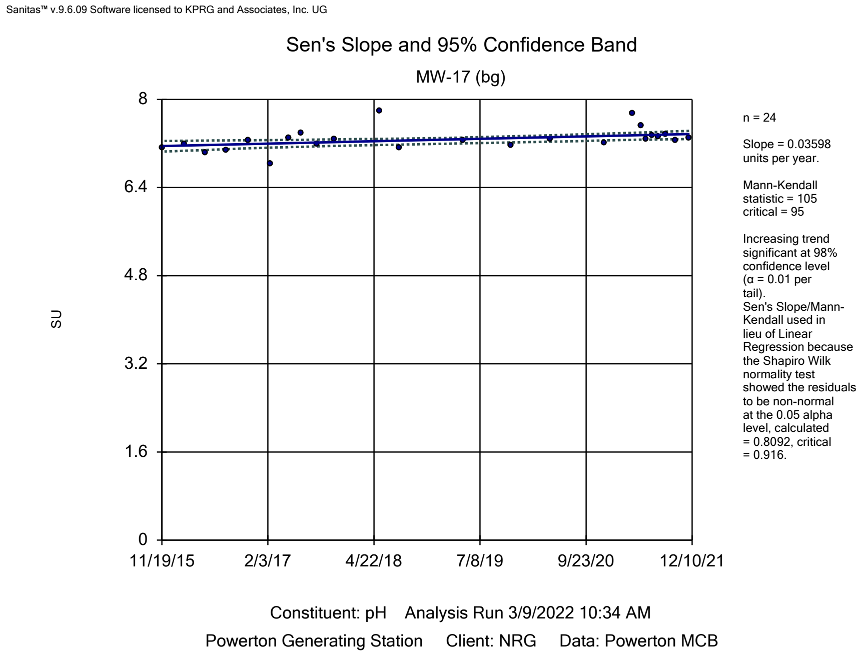
Slope = -0.001965
units/year.

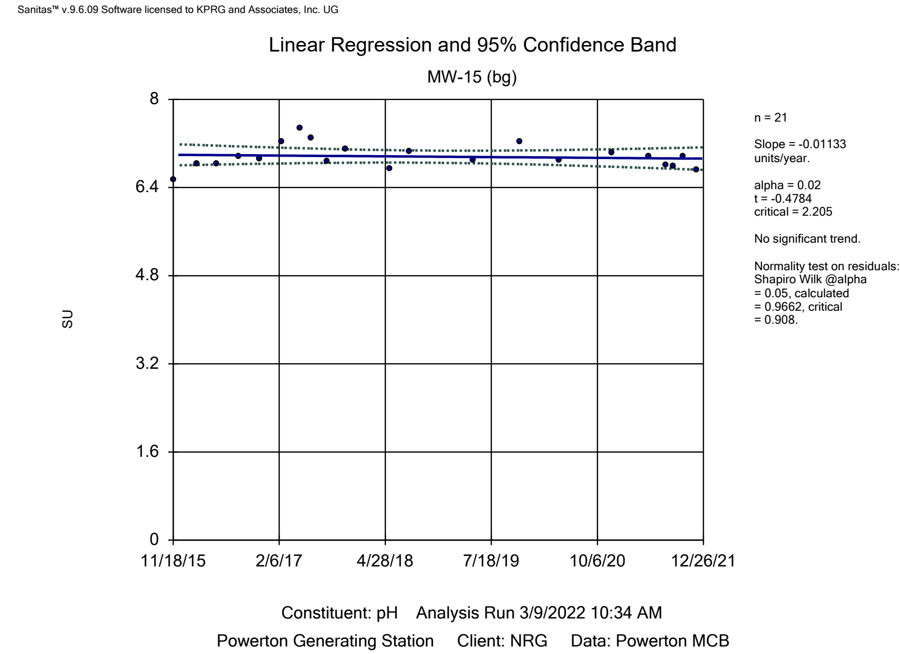
alpha = 0.02
t = -3.33
critical = -2.205

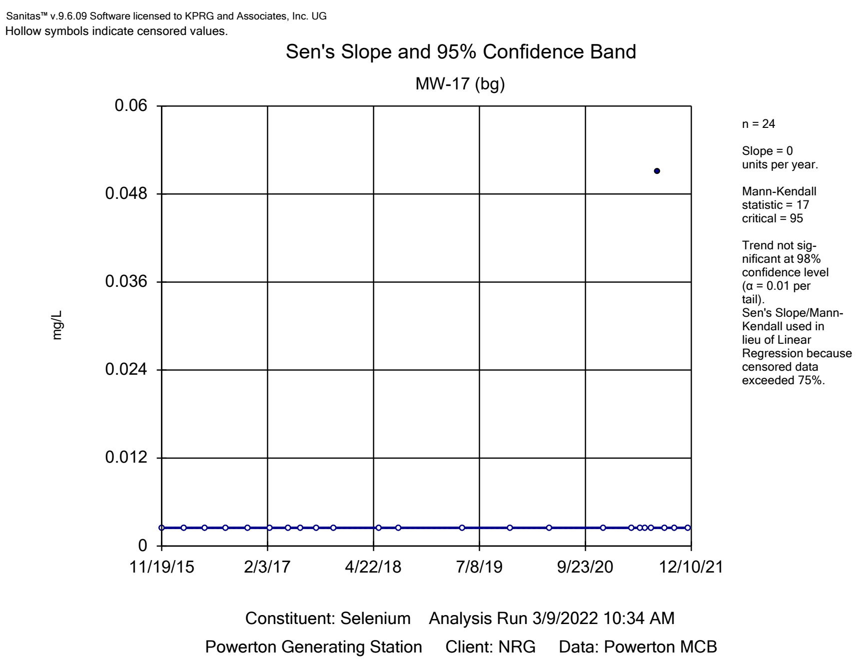
Significant decreasing trend.

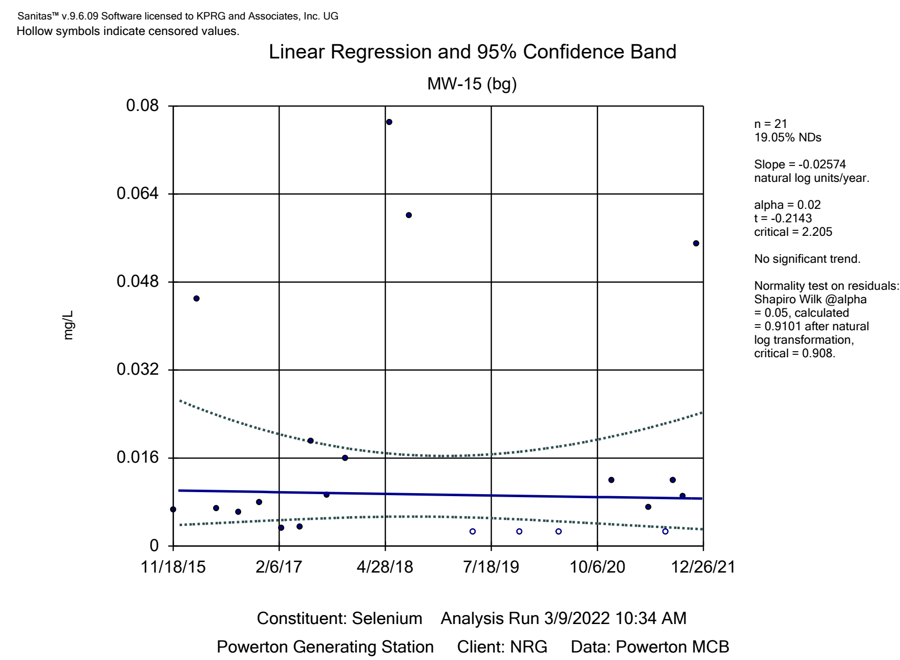
Normality test on residuals: Shapiro Wilk @alpha = 0.05, calculated = 0.9893, critical = 0.908.

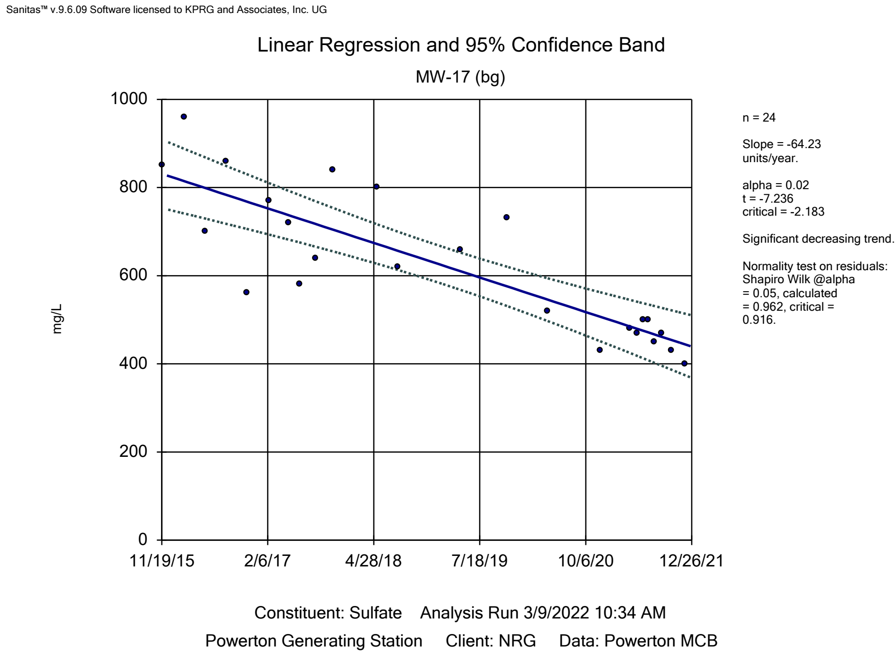
Constituent: Molybdenum   Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station   Client: NRG   Data: Powerton MCB


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Sen's Slope and 95% Confidence Band
MW-17 (bg)
SU
8
6.4
4.8
3.2
1.6
0
11/19/15
2/3/17
4/22/18
7/8/19
9/23/20
12/10/21
n = 24
Slope = 0.03598 units per year.
Mann-Kendall statistic = 105 critical = 95
Increasing trend significant at 98% confidence level (α = 0.01 per tail).
Sen's Slope/Mann-Kendall used in lieu of Linear Regression because the Shapiro Wilk normality test showed the residuals to be non-normal at the 0.05 alpha level, calculated = 0.8092, critical = 0.916.
Constituent: pH Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station Client: NRG Data: Powerton MCB

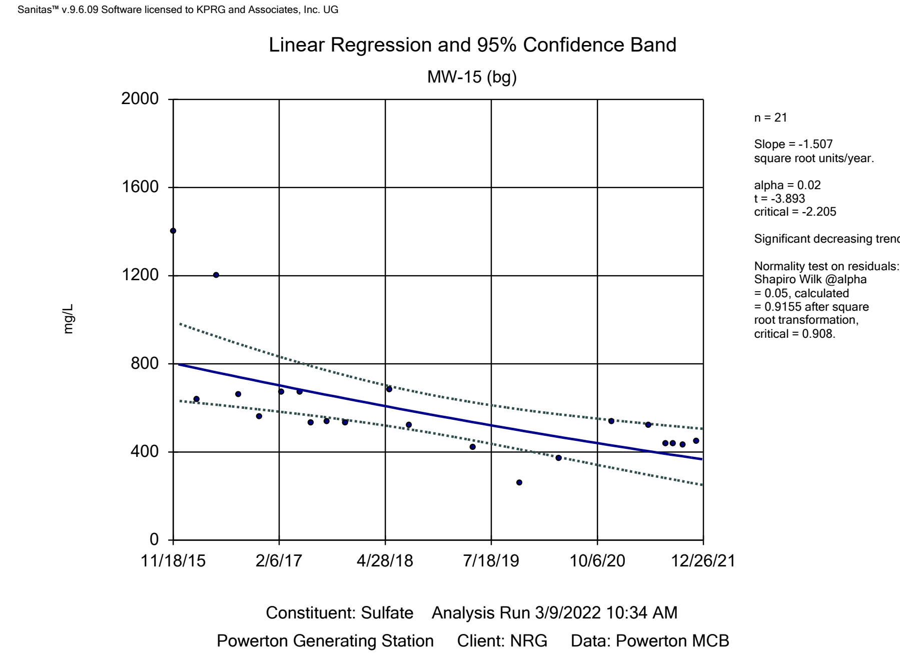

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Linear Regression and 95% Confidence Band
MW-15 (bg)
SU
8
6.4
4.8
3.2
1.6
0
11/18/15
2/6/17
4/28/18
7/18/19
10/6/20
12/26/21
n = 21
Slope = -0.01133 units/year.
alpha = 0.02
t = -0.4784
critical = 2.205
No significant trend.
Normality test on residuals: Shapiro Wilk @alpha = 0.05, calculated = 0.9662, critical = 0.908.
Constituent: pH Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station Client: NRG Data: Powerton MCB


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.
Sen's Slope and 95% Confidence Band
MW-17 (bg)
mg/L
0.06
0.048
0.036
0.024
0.012
0
11/19/15
2/3/17
4/22/18
7/8/19
9/23/20
12/10/21
n = 24
Slope = 0 units per year.
Mann-Kendall statistic = 17 critical = 95
Trend not significant at 98% confidence level (α = 0.01 per tail).
Sen's Slope/Mann-Kendall used in lieu of Linear Regression because censored data exceeded 75%.
Constituent: Selenium Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station Client: NRG Data: Powerton MCB

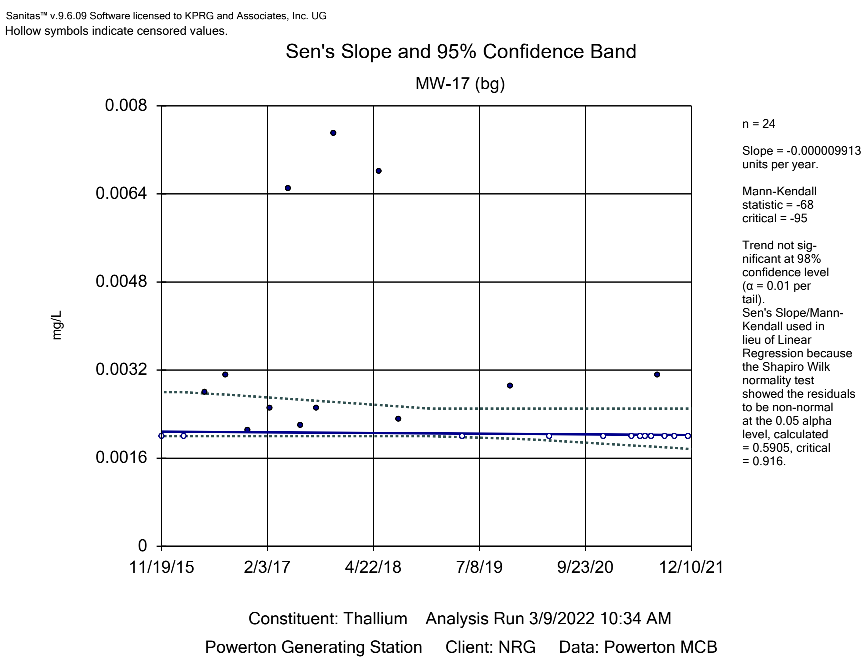

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.
Linear Regression and 95% Confidence Band
MW-15 (bg)
mg/L
0.08
0.064
0.048
0.032
0.016
0
11/18/15
2/6/17
4/28/18
7/18/19
10/6/20
12/26/21
n = 21
19.05% NDs
Slope = -0.02574 natural log units/year.
alpha = 0.02
t = -0.2143
critical = 2.205
No significant trend.
Normality test on residuals: Shapiro Wilk @alpha = 0.05, calculated = 0.9101 after natural log transformation, critical = 0.908.
Constituent: Selenium Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station Client: NRG Data: Powerton MCB



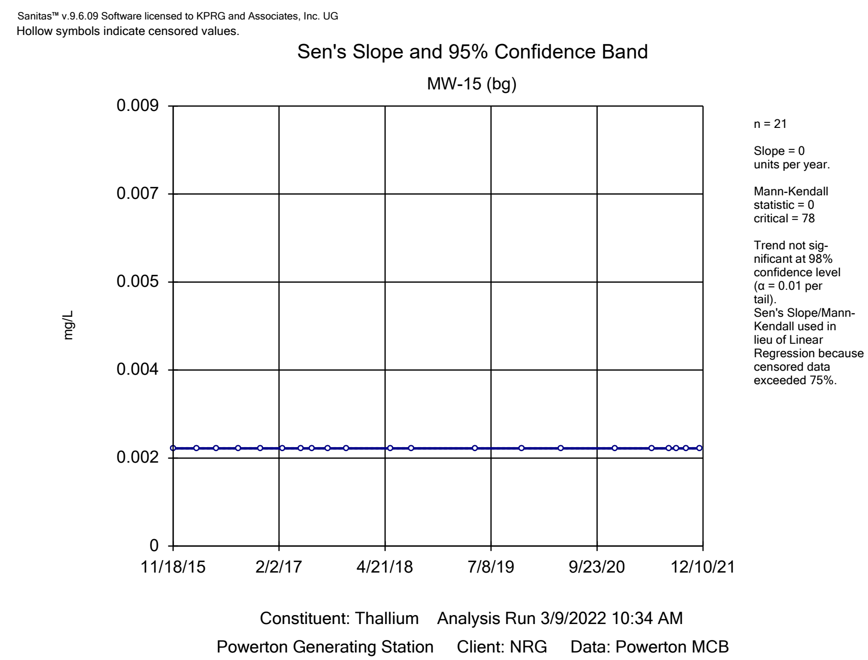
Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Linear Regression and 95% Confidence Band
MW-17 (bg)
mg/L
1000
800
600
400
200
0
11/19/15
2/6/17
4/28/18
7/18/19
10/6/20
12/26/21
n = 24
Slope = -64.23 units/year.
alpha = 0.02
t = -7.236
critical = -2.183
Significant decreasing trend.
Normality test on residuals: Shapiro Wilk @alpha = 0.05, calculated = 0.962, critical = 0.916.
Constituent: Sulfate Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station Client: NRG Data: Powerton MCB



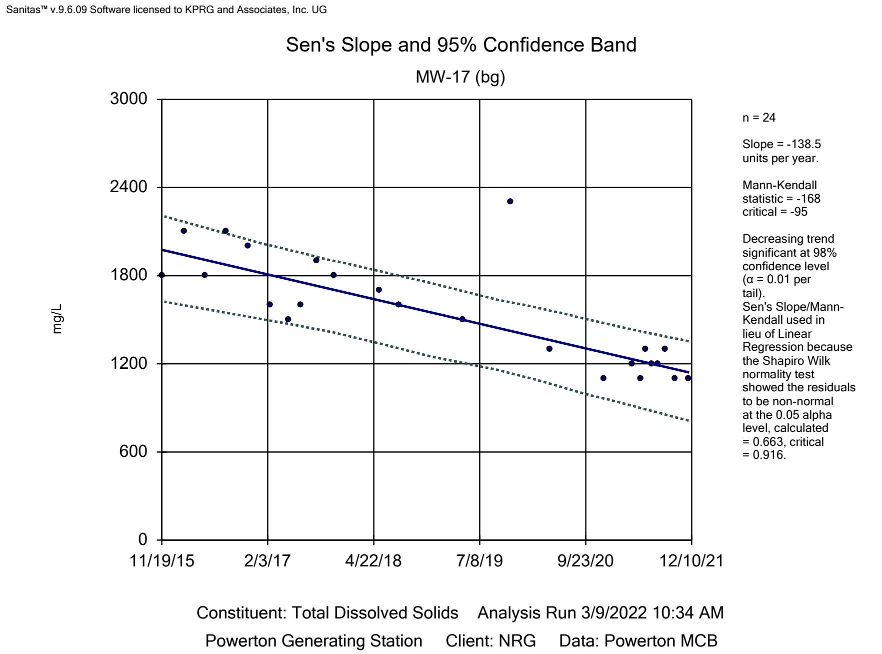
Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Linear Regression and 95% Confidence Band
MW-15 (bg)
mg/L
2000
1600
1200
800
400
0
11/18/15
2/6/17
4/28/18
7/18/19
10/6/20
12/26/21
n = 21
Slope = -1.507 square root units/year.
alpha = 0.02
t = -3.893
critical = -2.205
Significant decreasing trend.
Normality test on residuals: Shapiro Wilk @alpha = 0.05, calculated = 0.9155 after square root transformation, critical = 0.908.
Constituent: Sulfate Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station Client: NRG Data: Powerton MCB

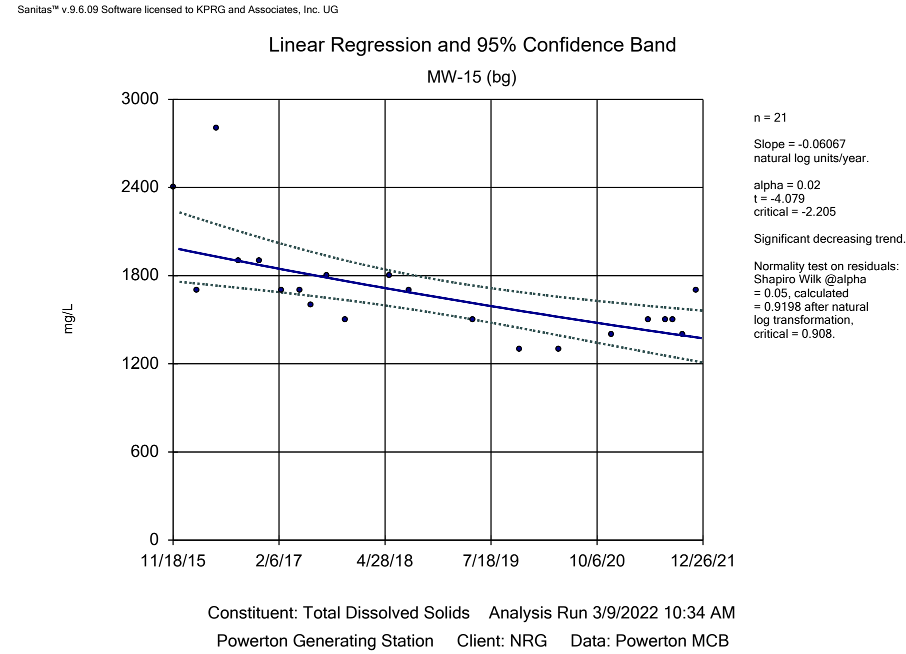


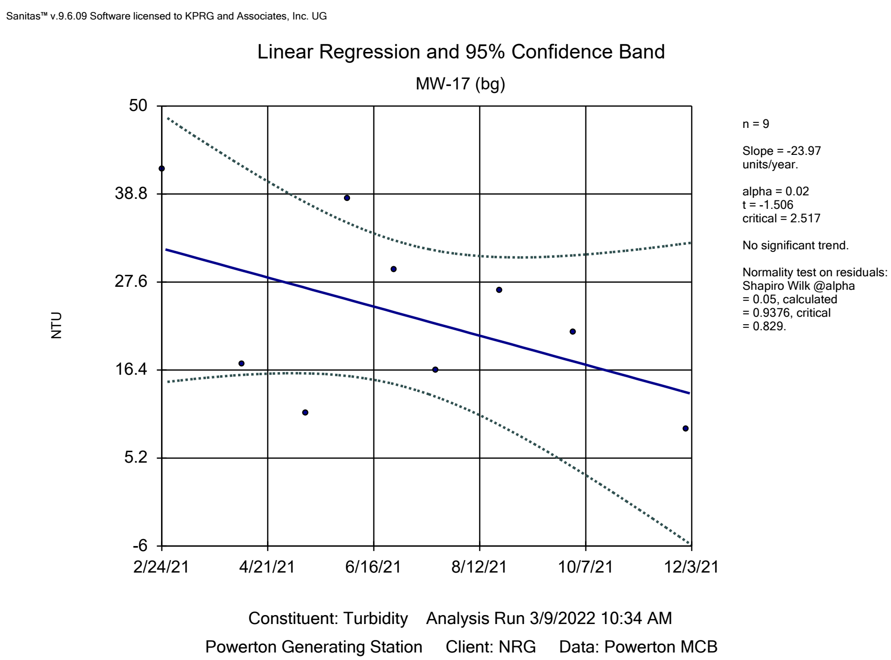
Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.
Sen's Slope and 95% Confidence Band
MW-17 (bg)
mg/L
0.008
0.0064
0.0048
0.0032
0.0016
0
11/19/15
2/3/17
4/22/18
7/8/19
9/23/20
12/10/21
n = 24
Slope = -0.000009913 units per year.
Mann-Kendall statistic = -68
critical = -95
Trend not significant at 98% confidence level (α = 0.01 per tail).
Sen's Slope/Mann-Kendall used in lieu of Linear Regression because the Shapiro Wilk normality test showed the residuals to be non-normal at the 0.05 alpha level, calculated = 0.5905, critical = 0.916.
Constituent: Thallium Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station Client: NRG Data: Powerton MCB

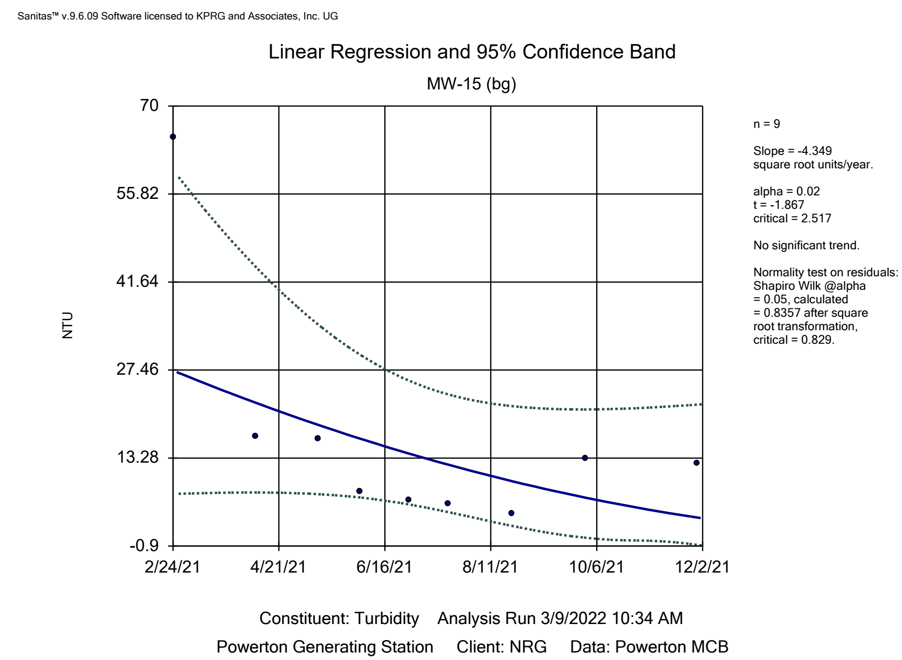


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Hollow symbols indicate censored values.
Sen's Slope and 95% Confidence Band
MW-15 (bg)
mg/L
0.009
0.007
0.005
0.004
0.002
0
11/18/15
2/2/17
4/21/18
7/8/19
9/23/20
12/10/21
n = 21
Slope = 0 units per year.
Mann-Kendall statistic = 0
critical = 78
Trend not significant at 98% confidence level (α = 0.01 per tail).
Sen's Slope/Mann-Kendall used in lieu of Linear Regression because censored data exceeded 75%.
Constituent: Thallium Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station Client: NRG Data: Powerton MCB


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Sen's Slope and 95% Confidence Band
MW-17 (bg)
mg/L
3000
2400
1800
1200
600
0
11/19/15
2/3/17
4/22/18
7/8/19
9/23/20
12/10/21
n = 24
Slope = -138.5 units per year.
Mann-Kendall statistic = -168 critical = -95
Decreasing trend significant at 98% confidence level (α = 0.01 per tail).
Sen's Slope/Mann-Kendall used in lieu of Linear Regression because the Shapiro Wilk normality test showed the residuals to be non-normal at the 0.05 alpha level, calculated = 0.663, critical = 0.916.
Constituent: Total Dissolved Solids Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station Client: NRG Data: Powerton MCB


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Linear Regression and 95% Confidence Band
MW-15 (bg)
mg/L
3000
2400
1800
1200
600
0
11/18/15
2/6/17
4/28/18
7/18/19
10/6/20
12/26/21
n = 21
Slope = -0.06067 natural log units/year.
alpha = 0.02
t = -4.079
critical = -2.205
Significant decreasing trend.
Normality test on residuals: Shapiro Wilk @alpha = 0.05, calculated = 0.9198 after natural log transformation, critical = 0.908.
Constituent: Total Dissolved Solids Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station Client: NRG Data: Powerton MCB

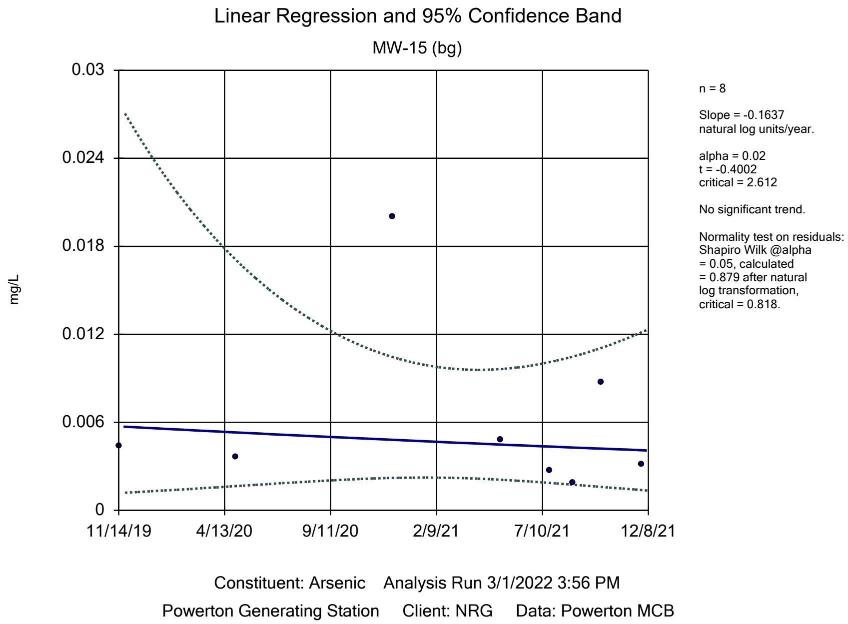

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Linear Regression and 95% Confidence Band
MW-17 (bg)
NTU
50
38.8
27.6
16.4
5.2
-6
2/24/21
4/21/21
6/16/21
8/12/21
10/7/21
12/3/21
n = 9
Slope = -23.97 units/year.
alpha = 0.02
t = -1.506
critical = 2.517
No significant trend.
Normality test on residuals: Shapiro Wilk @alpha = 0.05, calculated = 0.9376, critical = 0.829.
Constituent: Turbidity Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station Client: NRG Data: Powerton MCB


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Linear Regression and 95% Confidence Band
MW-15 (bg)
NTU
70
55.82
41.64
27.46
13.28
-0.9
2/24/21
4/21/21
6/16/21
8/11/21
10/6/21
12/2/21
n = 9
Slope = -4.349 square root units/year.
alpha = 0.02
t = -1.867
critical = 2.517
No significant trend.
Normality test on residuals: Shapiro Wilk @alpha = 0.05, calculated = 0.8357 after square root transformation, critical = 0.829.
Constituent: Turbidity Analysis Run 3/9/2022 10:34 AM
Powerton Generating Station Client: NRG Data: Powerton MCB

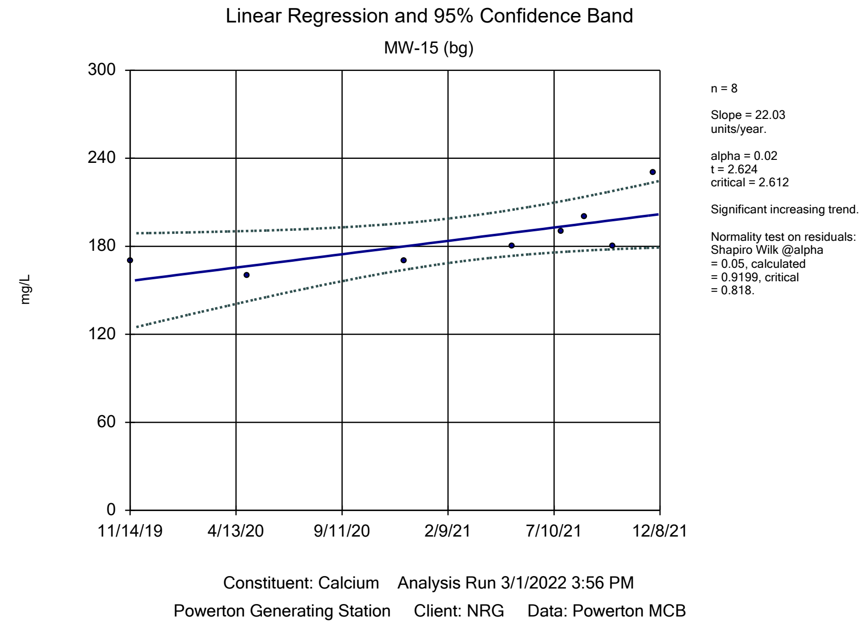
Trend Test Powerton MCB UG Well MW-15 Last 8 Rounds SO4, TDS, As, Mo, Ca, Li

Powerton Generating Station   Client: NRG   Data: Powerton MCB   Printed 3/1/2022, 3:57 PM

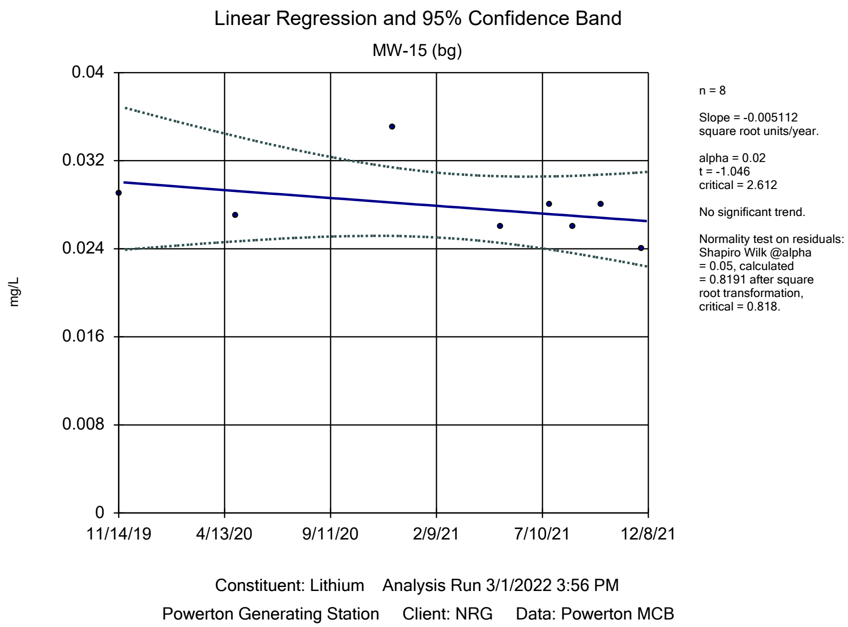
Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Arsenic (mg/L)	MW-15 (bg)	-0.1637	-0.4002	2.612	No	8	0	Yes	natura...	0.02	Param.
Calcium (mg/L)	**MW-15 (bg)**	**22.03**	**2.624**	**2.612**	**Yes**	**8**	**0**	**Yes**	**no**	**0.02**	**Param.**
Lithium (mg/L)	MW-15 (bg)	-0.00...	-1.046	2.612	No	8	0	Yes	square...	0.02	Param.
Molybdenum (mg/L)	MW-15 (bg)	-0.00...	-1.946	2.612	No	8	0	Yes	no	0.02	Param.
Sulfate (mg/L)	MW-15 (bg)	76.46	2.045	2.612	No	8	0	Yes	no	0.02	Param.
Total Dissolved Solids (mg/L)	**MW-15 (bg)**	**144.5**	**3.352**	**2.612**	**Yes**	**8**	**0**	**Yes**	**no**	**0.02**	**Param.**



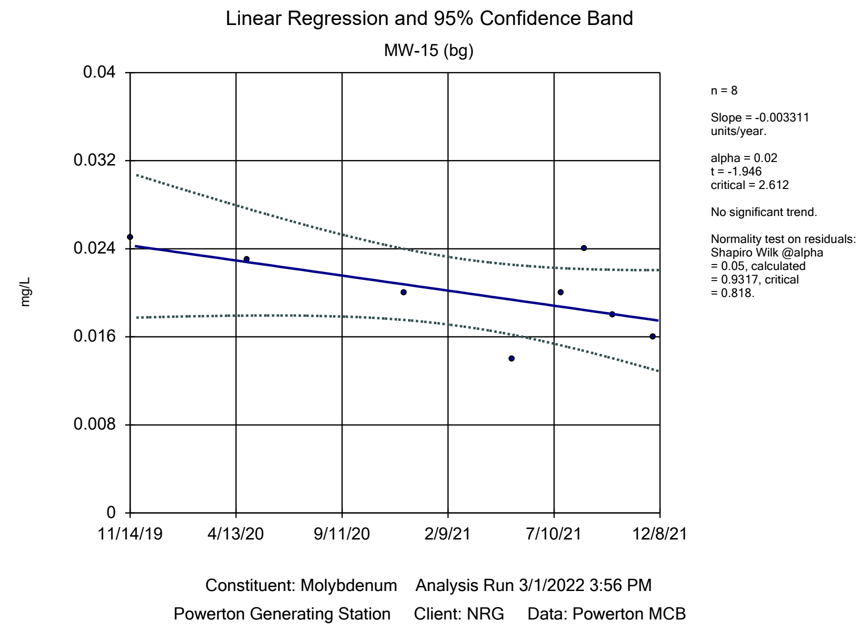
Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

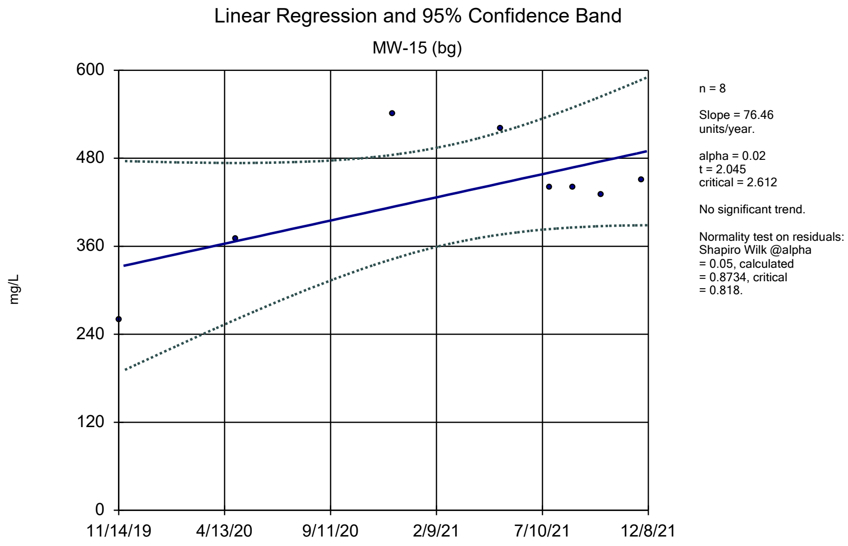


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

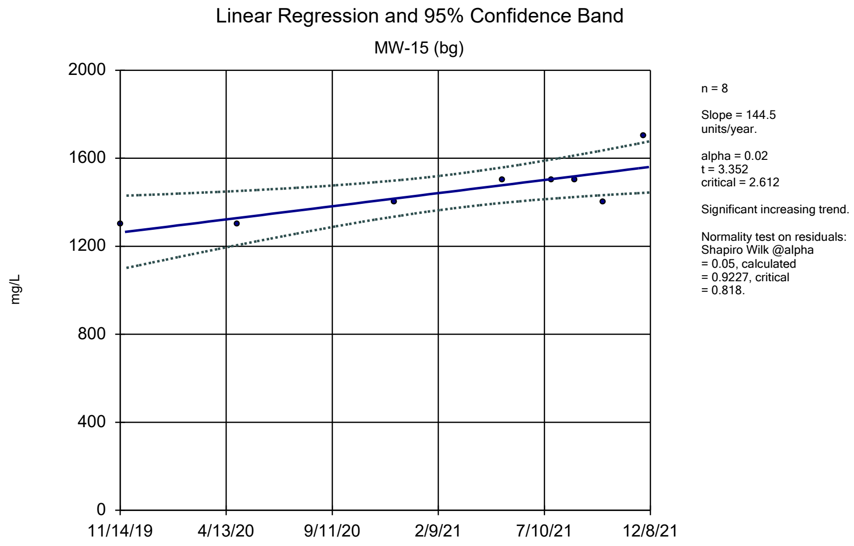


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG





Constituent: Sulfate Analysis Run 3/1/2022 3:56 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

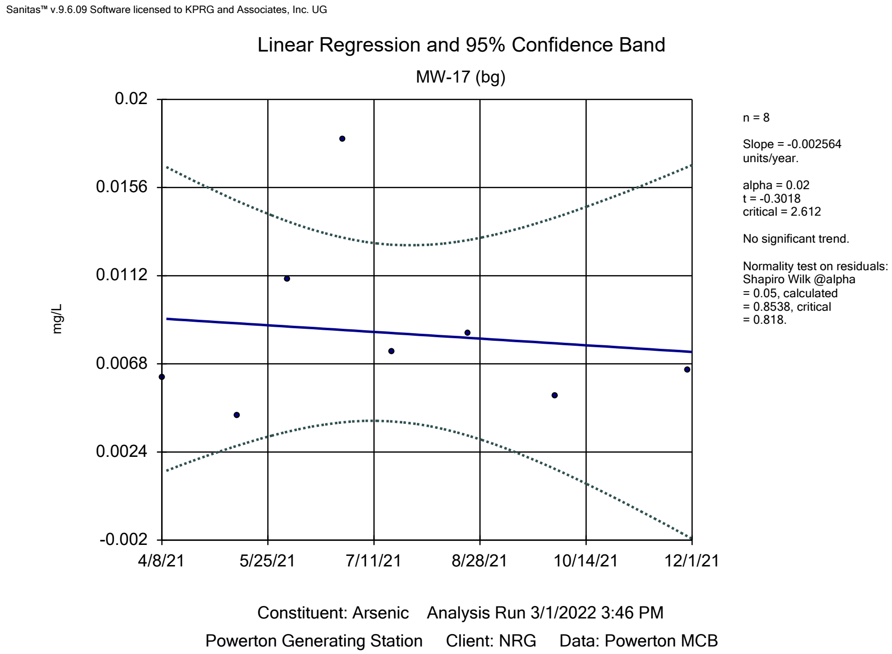


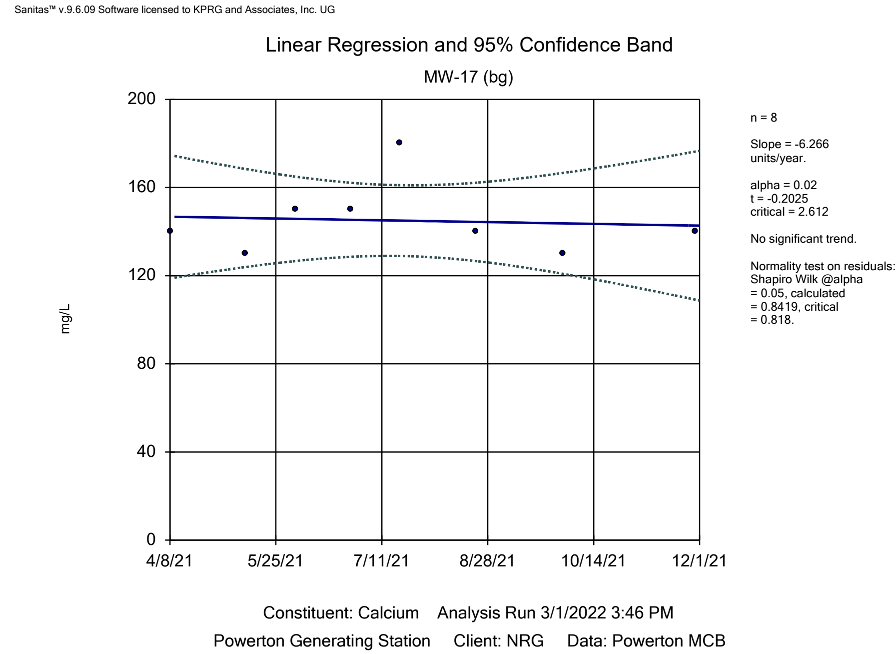
Constituent: Total Dissolved Solids Analysis Run 3/1/2022 3:56 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

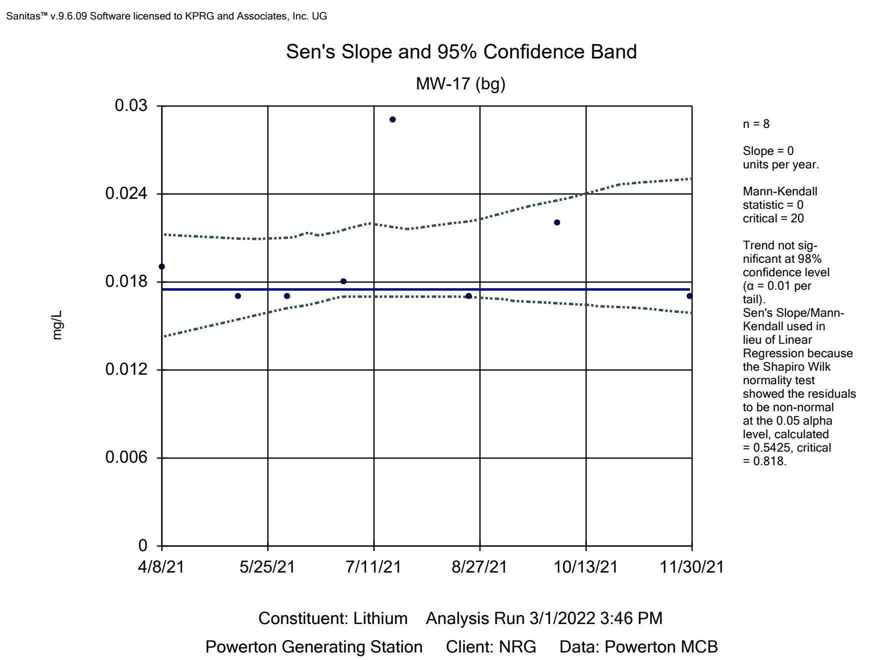
Trend Test Powerton MCB UG Well MW-17 Last 8 Rounds SO4, TDS, As, Mo, Ca, Li

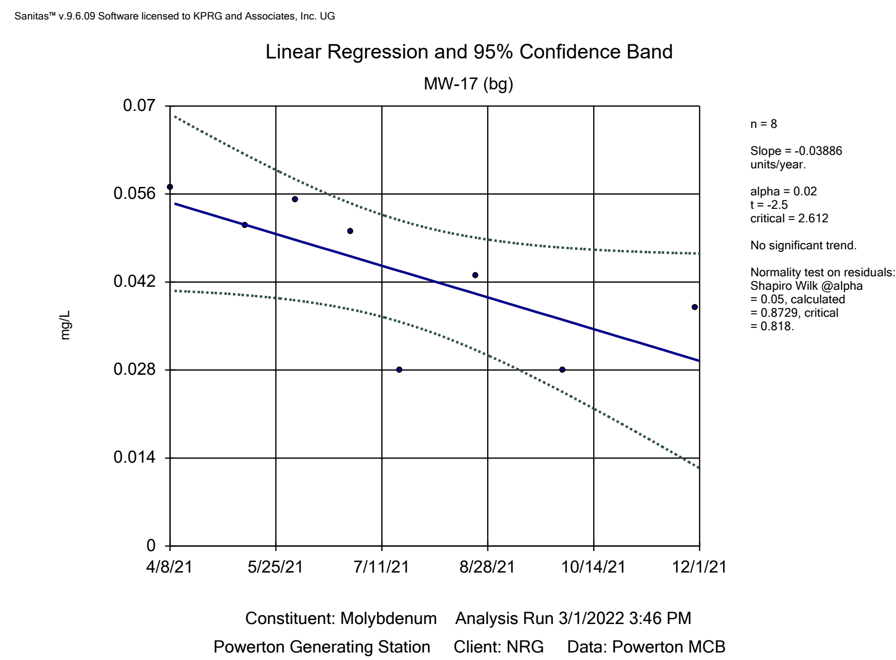
Powerton Generating Station   Client: NRG   Data: Powerton MCB   Printed 3/1/2022, 3:50 PM

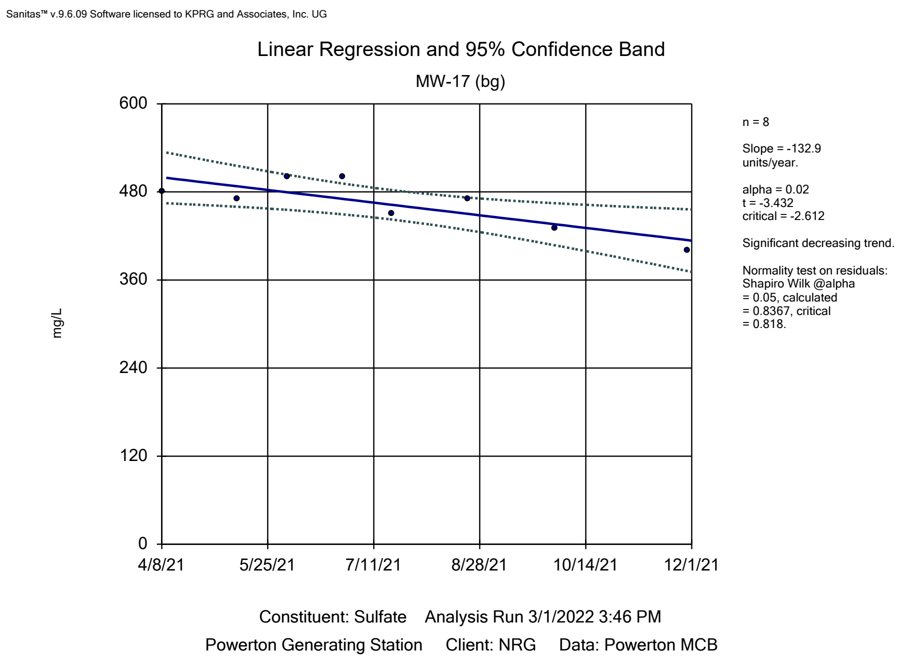
Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Arsenic (mg/L)	MW-17 (bg)	-0.00...	-0.3018	2.612	No	8	0	Yes	no	0.02	Param.
Calcium (mg/L)	MW-17 (bg)	-6.266	-0.2025	2.612	No	8	0	Yes	no	0.02	Param.
Lithium (mg/L)	MW-17 (bg)	0	0	20	No	8	0	n/a	n/a	0.02	NP (Nor...
Molybdenum (mg/L)	MW-17 (bg)	-0.03886	-2.5	2.612	No	8	0	Yes	no	0.02	Param.
Sulfate (mg/L)	**MW-17 (bg)**	**-132.9**	**-3.432**	**-2.612**	**Yes**	**8**	**0**	**Yes**	**no**	**0.02**	**Param.**
Total Dissolved Solids (mg/L)	MW-17 (bg)	-129.9	-0.8515	2.612	No	8	0	Yes	no	0.02	Param.


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Linear Regression and 95% Confidence Band
MW-17 (bg)
mg/L
0.02
0.0156
0.0112
0.0068
0.0024
-0.002
4/8/21
5/25/21
7/11/21
8/28/21
10/14/21
12/1/21
n = 8
Slope = -0.002564 units/year.
alpha = 0.02
t = -0.3018
critical = 2.612
No significant trend.
Normality test on residuals: Shapiro Wilk @alpha = 0.05, calculated = 0.8538, critical = 0.818.
Constituent: Arsenic Analysis Run 3/1/2022 3:46 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

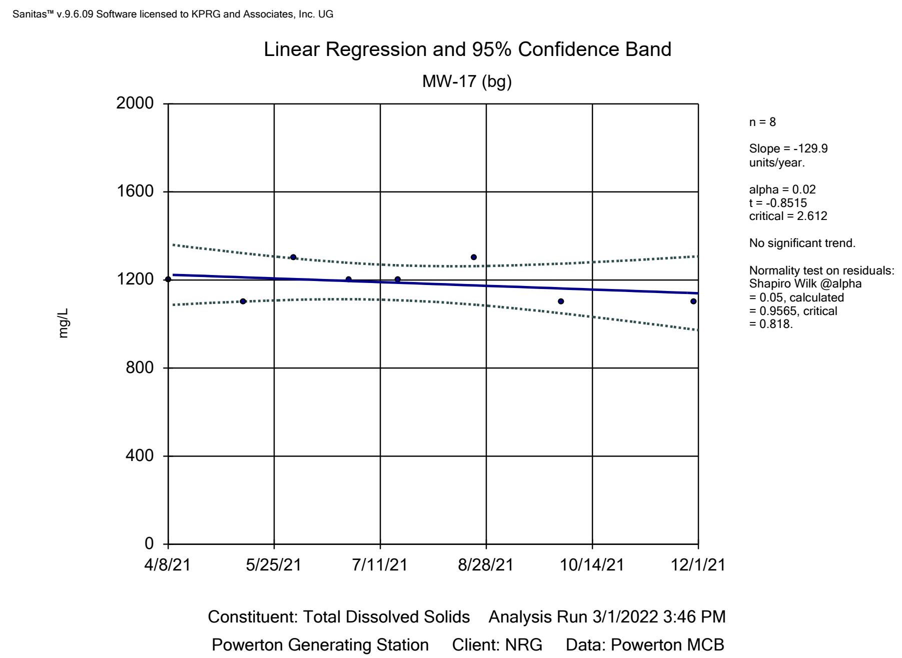

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Linear Regression and 95% Confidence Band
MW-17 (bg)
mg/L
200
160
120
80
40
0
4/8/21
5/25/21
7/11/21
8/28/21
10/14/21
12/1/21
n = 8
Slope = -6.266 units/year.
alpha = 0.02
t = -0.2025
critical = 2.612
No significant trend.
Normality test on residuals: Shapiro Wilk @alpha = 0.05, calculated = 0.8419, critical = 0.818.
Constituent: Calcium Analysis Run 3/1/2022 3:46 PM
Powerton Generating Station Client: NRG Data: Powerton MCB


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Sen's Slope and 95% Confidence Band
MW-17 (bg)
mg/L
0.03
0.024
0.018
0.012
0.006
0
4/8/21
5/25/21
7/11/21
8/27/21
10/13/21
11/30/21
n = 8
Slope = 0 units per year.
Mann-Kendall statistic = 0
critical = 20
Trend not significant at 98% confidence level (α = 0.01 per tail).
Sen's Slope/Mann-Kendall used in lieu of Linear Regression because the Shapiro Wilk normality test showed the residuals to be non-normal at the 0.05 alpha level, calculated = 0.5425, critical = 0.818.
Constituent: Lithium Analysis Run 3/1/2022 3:46 PM
Powerton Generating Station Client: NRG Data: Powerton MCB


Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Linear Regression and 95% Confidence Band
MW-17 (bg)
mg/L
0.07
0.056
0.042
0.028
0.014
0
4/8/21
5/25/21
7/11/21
8/28/21
10/14/21
12/1/21
n = 8
Slope = -0.03886 units/year.
alpha = 0.02
t = -2.5
critical = 2.612
No significant trend.
Normality test on residuals: Shapiro Wilk @alpha = 0.05, calculated = 0.8729, critical = 0.818.
Constituent: Molybdenum Analysis Run 3/1/2022 3:46 PM
Powerton Generating Station Client: NRG Data: Powerton MCB



Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Linear Regression and 95% Confidence Band
MW-17 (bg)
mg/L
600
480
360
240
120
0
4/8/21
5/25/21
7/11/21
8/28/21
10/14/21
12/1/21
n = 8
Slope = -132.9
units/year.
alpha = 0.02
t = -3.432
critical = -2.612
Significant decreasing trend.
Normality test on residuals:
Shapiro Wilk @alpha
= 0.05, calculated
= 0.8367, critical
= 0.818.
Constituent: Sulfate Analysis Run 3/1/2022 3:46 PM
Powerton Generating Station Client: NRG Data: Powerton MCB



Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG
Linear Regression and 95% Confidence Band
MW-17 (bg)
mg/L
2000
1600
1200
800
400
0
4/8/21
5/25/21
7/11/21
8/28/21
10/14/21
12/1/21
n = 8
Slope = -129.9
units/year.
alpha = 0.02
t = -0.8515
critical = 2.612
No significant trend.
Normality test on residuals:
Shapiro Wilk @alpha
= 0.05, calculated
= 0.9565, critical
= 0.818.
Constituent: Total Dissolved Solids Analysis Run 3/1/2022 3:46 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

ANOVA Powerton MCB UG Wells MW-15/MW-17 All Data

Powerton Generating Station   Client: NRG   Data: Powerton MCB   Printed 3/9/2022, 11:12 AM

Constituent	Well	Calc.	Crit.	Sig.	Alpha	Transform	ANOVA Sig.	Alpha	Method
Arsenic (mg/L)	n/a	n/a	n/a	n/a	n/a	No	Yes	0.05	NP (eq. var.)
Barium (mg/L)	n/a	n/a	n/a	n/a	n/a	No	No	0.05	NP (eq. var.)
Beryllium (mg/L)	n/a	n/a	n/a	n/a	n/a	No	No	0.05	NP (NDs)
Boron (mg/L)	n/a	n/a	n/a	n/a	n/a	No	Yes	0.05	Param.
Cadmium (mg/L)	n/a	n/a	n/a	n/a	n/a	No	Yes	0.05	NP (normality)
Calcium (mg/L)	n/a	n/a	n/a	n/a	n/a	sqrt(x)	No	0.05	Param.
Chloride (mg/L)	n/a	n/a	n/a	n/a	n/a	No	No	0.05	NP (normality)
Cobalt (mg/L)	n/a	n/a	n/a	n/a	n/a	No	Yes	0.05	NP (normality)
Combined Radium 226 + 228 (pCi/L)	n/a	n/a	n/a	n/a	n/a	No	Yes	0.05	NP (eq. var.)
Fluoride (mg/L)	n/a	n/a	n/a	n/a	n/a	No	Yes	0.05	NP (eq. var.)
Lead (mg/L)	n/a	n/a	n/a	n/a	n/a	No	Yes	0.05	NP (NDs)
Lithium (mg/L)	n/a	n/a	n/a	n/a	n/a	No	Yes	0.05	NP (eq. var.)
Molybdenum (mg/L)	n/a	n/a	n/a	n/a	n/a	No	Yes	0.05	NP (eq. var.)
pH (SU)	n/a	n/a	n/a	n/a	n/a	No	Yes	0.05	Param.
Selenium (mg/L)	n/a	n/a	n/a	n/a	n/a	No	Yes	0.05	NP (normality)
Sulfate (mg/L)	n/a	n/a	n/a	n/a	n/a	x^(1/3)	No	0.05	Param.
Thallium (mg/L)	n/a	n/a	n/a	n/a	n/a	No	Yes	0.05	NP (normality)
Total Dissolved Solids (mg/L)	n/a	n/a	n/a	n/a	n/a	sqrt(x)	No	0.05	Param.
Turbidity (NTU)	n/a	n/a	n/a	n/a	n/a	x^(1/3)	No	0.05	Param.

Non-Parametric ANOVA

Constituent: Arsenic   Analysis Run 3/9/2022 11:12 AM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

For observations made between 11/18/2015 and 11/29/2021, the non-parametric analysis of variance test indicates a DIFFERENCE between the medians of the groups tested at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one group has a significantly different median concentration of this constituent when compared to another group.

Calculated Kruskal-Wallis statistic = 10.15

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 10.14
Adjusted Kruskal-Wallis statistic (H') = 10.15

Non-Parametric ANOVA

Constituent: Barium   Analysis Run 3/9/2022 11:12 AM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

For observations made between 11/18/2015 and 11/29/2021, the non-parametric analysis of variance test indicates NO DIFFERENCE between the medians of the groups tested at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no group has a significantly different median concentration of this constituent when compared to another group.

Calculated Kruskal-Wallis statistic = 0.02537

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 7 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.02536
Adjusted Kruskal-Wallis statistic (H') = 0.02537

Non-Parametric ANOVA

Constituent: Beryllium Analysis Run 3/9/2022 11:12 AM
Powerton Generating Station Client: NRG Data: Powerton MCB

For observations made between 11/18/2015 and 11/29/2021, the non-parametric analysis of variance test indicates NO DIFFERENCE between the medians of the groups tested at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no group has a significantly different median concentration of this constituent when compared to another group.

Calculated Kruskal-Wallis statistic = 0.8636

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.06169
Adjusted Kruskal-Wallis statistic (H') = 0.8636

Parametric ANOVA

Constituent: Boron Analysis Run 3/9/2022 11:12 AM
Powerton Generating Station Client: NRG Data: Powerton MCB

For observations made between 11/18/2015 and 11/29/2021 the parametric analysis of variance test indicates VARIATION at the 5% significance level. Because the calculated F statistic is greater than the tabulated F statistic, the hypothesis of a single homogeneous population is rejected.

Calculated F statistic = 17.02

Tabulated F statistic = 4.068 with 1 and 43 degrees of freedom at the 5% significance level.

ONE-WAY PARAMETRIC ANOVA TABLE

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Groups	0.8876	1	0.8876	2.393
Error Within Groups	5.936	16	0.371	
Total	6.823	17		

The Shapiro Wilk normality test on the residuals passed on the raw data. Alpha = 0.01, calculated = 0.969, critical = 0.926. Levene's Equality of Variance test passed. Calculated = 0.4829, tabulated = 4.068.

Non-Parametric ANOVA

Constituent: Cadmium   Analysis Run 3/9/2022 11:12 AM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

For observations made between 11/18/2015 and 11/29/2021, the non-parametric analysis of variance test indicates a DIFFERENCE between the medians of the groups tested at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one group has a significantly different median concentration of this constituent when compared to another group.

Calculated Kruskal-Wallis statistic = 4.636

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 3.396
Adjusted Kruskal-Wallis statistic (H') = 4.636

Parametric ANOVA

Constituent: Calcium   Analysis Run 3/9/2022 11:12 AM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

For observations made between 11/18/2015 and 11/29/2021 the parametric analysis of variance test (after square root transformation) indicates NO VARIATION at the 5% significance level. Because the calculated F statistic is less than or equal to the tabulated F statistic, the hypothesis of a single homogeneous population is accepted.

Calculated F statistic = 3.906

Tabulated F statistic = 4.068 with 1 and 43 degrees of freedom at the 5% significance level.

ONE-WAY PARAMETRIC ANOVA TABLE

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Groups	0.8876	1	0.8876	2.393
Error Within Groups	5.936	16	0.371	
Total	6.823	17		

The Shapiro Wilk normality test on the residuals passed after square root transformation. Alpha = 0.01, calculated = 0.9335, critical = 0.926. Levene's Equality of Variance test passed. Calculated = 0.2922, tabulated = 4.068.

Non-Parametric ANOVA

Constituent: Chloride   Analysis Run 3/9/2022 11:12 AM
Powerton Generating Station   Client: NRG   Data: Powerton MCB

For observations made between 11/18/2015 and 11/29/2021, the non-parametric analysis of variance test indicates NO DIFFERENCE between the medians of the groups tested at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no group has a significantly different median concentration of this constituent when compared to another group.

Calculated Kruskal-Wallis statistic = 0.2645

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 10 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.262
Adjusted Kruskal-Wallis statistic (H') = 0.2645

Non-Parametric ANOVA

Constituent: Cobalt   Analysis Run 3/9/2022 11:12 AM
Powerton Generating Station   Client: NRG   Data: Powerton MCB

For observations made between 11/18/2015 and 11/29/2021, the non-parametric analysis of variance test indicates a DIFFERENCE between the medians of the groups tested at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one group has a significantly different median concentration of this constituent when compared to another group.

Calculated Kruskal-Wallis statistic = 11.09

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 7.085
Adjusted Kruskal-Wallis statistic (H') = 11.09

Non-Parametric ANOVA

Constituent: Combined Radium 226 + 228   Analysis Run 3/9/2022 11:12 AM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

For observations made between 11/18/2015 and 11/29/2021, the non-parametric analysis of variance test indicates a DIFFERENCE between the medians of the groups tested at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one group has a significantly different median concentration of this constituent when compared to another group.

Calculated Kruskal-Wallis statistic = 8.815

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 1 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 8.815
Adjusted Kruskal-Wallis statistic (H') = 8.815

Non-Parametric ANOVA

Constituent: Fluoride Analysis Run 3/9/2022 11:12 AM

Powerton Generating Station Client: NRG Data: Powerton MCB

For observations made between 11/18/2015 and 11/29/2021, the non-parametric analysis of variance test indicates a DIFFERENCE between the medians of the groups tested at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one group has a significantly different median concentration of this constituent when compared to another group.

Calculated Kruskal-Wallis statistic = 21.38

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 12 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 21.33
Adjusted Kruskal-Wallis statistic (H') = 21.38

Non-Parametric ANOVA

Constituent: Lead   Analysis Run 3/9/2022 11:12 AM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

For observations made between 11/18/2015 and 11/29/2021, the non-parametric analysis of variance test indicates a DIFFERENCE between the medians of the groups tested at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one group has a significantly different median concentration of this constituent when compared to another group.

Calculated Kruskal-Wallis statistic = 12.14

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 6.905
Adjusted Kruskal-Wallis statistic (H') = 12.14

Non-Parametric ANOVA

Constituent: Lithium   Analysis Run 3/9/2022 11:12 AM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

For observations made between 11/18/2015 and 11/29/2021, the non-parametric analysis of variance test indicates a DIFFERENCE between the medians of the groups tested at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one group has a significantly different median concentration of this constituent when compared to another group.

Calculated Kruskal-Wallis statistic = 19.37

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 12 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 19.28
Adjusted Kruskal-Wallis statistic (H') = 19.37

Non-Parametric ANOVA

Constituent: Molybdenum   Analysis Run 3/9/2022 11:12 AM
Powerton Generating Station   Client: NRG   Data: Powerton MCB

For observations made between 11/18/2015 and 11/29/2021, the non-parametric analysis of variance test indicates a DIFFERENCE between the medians of the groups tested at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one group has a significantly different median concentration of this constituent when compared to another group.

Calculated Kruskal-Wallis statistic = 24.97

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 8 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 24.94
Adjusted Kruskal-Wallis statistic (H') = 24.97

Parametric ANOVA

Constituent: pH   Analysis Run 3/9/2022 11:12 AM
Powerton Generating Station   Client: NRG   Data: Powerton MCB

For observations made between 11/18/2015 and 11/29/2021 the parametric analysis of variance test indicates VARIATION at the 5% significance level. Because the calculated F statistic is greater than the tabulated F statistic, the hypothesis of a single homogeneous population is rejected.

Calculated F statistic = 24.76

Tabulated F statistic = 4.068 with 1 and 43 degrees of freedom at the 5% significance level.

ONE-WAY PARAMETRIC ANOVA TABLE

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Groups	0.8876	1	0.8876	2.393
Error Within Groups	5.936	16	0.371	
Total	6.823	17		

The Shapiro Wilk normality test on the residuals passed on the raw data. Alpha = 0.01, calculated = 0.9368, critical = 0.926. Levene's Equality of Variance test passed. Calculated = 0.5581, tabulated = 4.068.

Non-Parametric ANOVA

Constituent: Selenium   Analysis Run 3/9/2022 11:12 AM
Powerton Generating Station   Client: NRG   Data: Powerton MCB

For observations made between 11/18/2015 and 11/29/2021, the non-parametric analysis of variance test indicates a DIFFERENCE between the medians of the groups tested at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one group has a significantly different median concentration of this constituent when compared to another group.

Calculated Kruskal-Wallis statistic = 23.33

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 18.29
Adjusted Kruskal-Wallis statistic (H') = 23.33

Parametric ANOVA

Constituent: Sulfate   Analysis Run 3/9/2022 11:12 AM
Powerton Generating Station   Client: NRG   Data: Powerton MCB

For observations made between 11/18/2015 and 11/29/2021 the parametric analysis of variance test (after cube root transformation) indicates NO VARIATION at the 5% significance level. Because the calculated F statistic is less than or equal to the tabulated F statistic, the hypothesis of a single homogeneous population is accepted.

Calculated F statistic = 0.5757

Tabulated F statistic = 4.068 with 1 and 43 degrees of freedom at the 5% significance level.

ONE-WAY PARAMETRIC ANOVA TABLE

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Groups	0.8876	1	0.8876	2.393
Error Within Groups	5.936	16	0.371	
Total	6.823	17		

The Shapiro Wilk normality test on the residuals passed after cube root transformation. Alpha = 0.01, calculated = 0.9389, critical = 0.926. Levene's Equality of Variance test passed. Calculated = 0.1863, tabulated = 4.068.

Non-Parametric ANOVA

Constituent: Thallium   Analysis Run 3/9/2022 11:12 AM
Powerton Generating Station   Client: NRG   Data: Powerton MCB

For observations made between 11/18/2015 and 11/29/2021, the non-parametric analysis of variance test indicates a DIFFERENCE between the medians of the groups tested at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one group has a significantly different median concentration of this constituent when compared to another group.

Calculated Kruskal-Wallis statistic = 13.57

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 8.217
Adjusted Kruskal-Wallis statistic (H') = 13.57

Parametric ANOVA

Constituent: Total Dissolved Solids   Analysis Run 3/9/2022 11:12 AM
Powerton Generating Station   Client: NRG   Data: Powerton MCB

For observations made between 11/18/2015 and 11/29/2021 the parametric analysis of variance test (after square root transformation) indicates NO VARIATION at the 5% significance level. Because the calculated F statistic is less than or equal to the tabulated F statistic, the hypothesis of a single homogeneous population is accepted.

Calculated F statistic = 2.079

Tabulated F statistic = 4.068 with 1 and 43 degrees of freedom at the 5% significance level.

ONE-WAY PARAMETRIC ANOVA TABLE

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Groups	0.8876	1	0.8876	2.393
Error Within Groups	5.936	16	0.371	
Total	6.823	17		

The Shapiro Wilk normality test on the residuals passed after square root transformation. Alpha = 0.01, calculated = 0.9437, critical = 0.926. Levene's Equality of Variance test passed. Calculated = 2.222, tabulated = 4.068.

Parametric ANOVA

Constituent: Turbidity   Analysis Run 3/9/2022 11:12 AM
Powerton Generating Station   Client: NRG   Data: Powerton MCB

For observations made between 2/24/2021 and 11/30/2021 the parametric analysis of variance test (after cube root transformation) indicates NO VARIATION at the 5% significance level. Because the calculated F statistic is less than or equal to the tabulated F statistic, the hypothesis of a single homogeneous population is accepted.

Calculated F statistic = 2.393

Tabulated F statistic = 4.49 with 1 and 16 degrees of freedom at the 5% significance level.

ONE-WAY PARAMETRIC ANOVA TABLE

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Groups	0.8876	1	0.8876	2.393
Error Within Groups	5.936	16	0.371	
Total	6.823	17		

The Shapiro Wilk normality test on the residuals passed after cube root transformation. Alpha = 0.05, calculated = 0.9025, critical = 0.897. Levene's Equality of Variance test passed. Calculated = 0.1759, tabulated = 4.49.

Shapiro-Wilk Normality Test

Constituent: Antimony   Analysis Run 3/9/2022 11:49 AM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-17 (bg) (n = 22, alpha = 0.05)				
	no	-1	0.911	No
	square root	-1	0.911	No
	square	-1	0.911	No
	cube root	0	0.911	No
	cube	-1	0.911	No
	natural log	0	0.911	No
	x^4	-1	0.911	No
	x^5	-1	0.911	No
	x^6	-1	0.911	No
MW-15 (bg) (n = 19, alpha = 0.05)				
	no	-1	0.901	No
	square root	0	0.901	No
	square	-1	0.901	No
	cube root	0	0.901	No
	cube	-1	0.901	No
	natural log	0	0.901	No
	x^4	-1	0.901	No
	x^5	-1	0.901	No
	x^6	-1	0.901	No
Pooled Background (bg) (n = 41, alpha = 0.05)				
	no	-1	0.941	No
	square root	0	0.941	No
	square	-1	0.941	No
	cube root	0	0.941	No
	cube	-1	0.941	No
	natural log	0	0.941	No
	x^4	-1	0.941	No
	x^5	-1	0.941	No
	x^6	-1	0.941	No

Shapiro-Wilk Normality Test

Constituent: Arsenic   Analysis Run 3/9/2022 11:49 AM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-17 (bg) (n = 24, alpha = 0.05)				
	no	0.8044	0.916	No
	square root	0.8662	0.916	No
	square	0.7025	0.916	No
	cube root	0.8833	0.916	No
	cube	0.6309	0.916	No
	natural log	0.8998	0.916	No
	x^4	0.5763	0.916	No
	x^5	0.5327	0.916	No
	x^6	0.4972	0.916	No
MW-15 (bg) (n = 21, alpha = 0.05)				
	no	0.5159	0.908	No
	square root	0.7563	0.908	No
	square	0.2927	0.908	No
	cube root	0.8362	0.908	No
	cube	0.2426	0.908	No
	natural log	0.9485	0.908	Yes
	x^4	0.2306	0.908	No
	x^5	0.2275	0.908	No
	x^6	0.2267	0.908	No
Pooled Background (bg) (n = 45, alpha = 0.05)				
	no	0.649	0.945	No
	square root	0.769	0.945	No
	square	0.5227	0.945	No
	cube root	0.8173	0.945	No
	cube	0.457	0.945	No
	natural log	0.9034	0.945	No
	x^4	0.4126	0.945	No
	x^5	0.3793	0.945	No
	x^6	0.353	0.945	No

Shapiro-Wilk Normality Test

Constituent: Barium Analysis Run 3/9/2022 11:49 AM

Powerton Generating Station Client: NRG Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-17 (bg) (n = 24, alpha = 0.05)				
	no	0.7002	0.916	No
	square root	0.8267	0.916	No
	square	0.4788	0.916	No
	cube root	0.8594	0.916	No
	cube	0.3797	0.916	No
	natural log	0.9027	0.916	No
	x^4	0.3431	0.916	No
	x^5	0.3297	0.916	No
	x^6	0.325	0.916	No
MW-15 (bg) (n = 21, alpha = 0.05)				
	no	0.8888	0.908	No
	square root	0.9199	0.908	Yes
	square	0.8158	0.908	No
	cube root	0.9284	0.908	Yes
	cube	0.7469	0.908	No
	natural log	0.9408	0.908	Yes
	x^4	0.689	0.908	No
	x^5	0.6411	0.908	No
	x^6	0.6009	0.908	No
Pooled Background (bg) (n = 45, alpha = 0.05)				
	no	0.6374	0.945	No
	square root	0.8087	0.945	No
	square	0.3789	0.945	No
	cube root	0.8579	0.945	No
	cube	0.2783	0.945	No
	natural log	0.9299	0.945	No
	x^4	0.2445	0.945	No
	x^5	0.2329	0.945	No
	x^6	0.229	0.945	No

Shapiro-Wilk Normality Test

Constituent: Beryllium   Analysis Run 3/9/2022 11:49 AM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-17 (bg) (n = 22, alpha = 0.05)				
	no	0.2207	0.911	No
	square root	0.2207	0.911	No
	square	0.2207	0.911	No
	cube root	0.2207	0.911	No
	cube	0.2207	0.911	No
	natural log	0.2207	0.911	No
	x^4	0.2207	0.911	No
	x^5	0.2207	0.911	No
	x^6	0.2207	0.911	No
MW-15 (bg) (n = 19, alpha = 0.05)				
	no	-1	0.901	No
	square root	0	0.901	No
	square	-1	0.901	No
	cube root	0	0.901	No
	cube	-1	0.901	No
	natural log	-1	0.901	No
	x^4	-1	0.901	No
	x^5	-1	0.901	No
	x^6	-1	0.901	No
Pooled Background (bg) (n = 41, alpha = 0.05)				
	no	0.1591	0.941	No
	square root	0.1591	0.941	No
	square	0.1591	0.941	No
	cube root	0.1591	0.941	No
	cube	0.1591	0.941	No
	natural log	0.1591	0.941	No
	x^4	0.1591	0.941	No
	x^5	0.1591	0.941	No
	x^6	0.1591	0.941	No

Shapiro-Wilk Normality Test

Constituent: Boron   Analysis Run 3/9/2022 11:49 AM
Powerton Generating Station   Client: NRG   Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-17 (bg) (n = 24, alpha = 0.05)				
	no	0.9685	0.916	Yes
	square root	0.9454	0.916	Yes
	square	0.9471	0.916	Yes
	cube root	0.9298	0.916	Yes
	cube	0.8928	0.916	No
	natural log	0.8852	0.916	No
	x^4	0.8339	0.916	No
	x^5	0.7771	0.916	No
	x^6	0.724	0.916	No
MW-15 (bg) (n = 21, alpha = 0.05)				
	no	0.907	0.908	No
	square root	0.9267	0.908	Yes
	square	0.8547	0.908	No
	cube root	0.9321	0.908	Yes
	cube	0.7905	0.908	No
	natural log	0.9411	0.908	Yes
	x^4	0.7212	0.908	No
	x^5	0.6524	0.908	No
	x^6	0.588	0.908	No
Pooled Background (bg) (n = 45, alpha = 0.05)				
	no	0.9752	0.945	Yes
	square root	0.98	0.945	Yes
	square	0.8937	0.945	No
	cube root	0.9727	0.945	Yes
	cube	0.7776	0.945	No
	natural log	0.9409	0.945	No
	x^4	0.6613	0.945	No
	x^5	0.559	0.945	No
	x^6	0.4751	0.945	No

Shapiro-Wilk Normality Test

Constituent: Cadmium   Analysis Run 3/9/2022 11:49 AM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-17 (bg) (n = 24, alpha = 0.05)				
	no	0.6851	0.916	No
	square root	0.7194	0.916	No
	square	0.6005	0.916	No
	cube root	0.7282	0.916	No
	cube	0.5284	0.916	No
	natural log	0.741	0.916	No
	x^4	0.4803	0.916	No
	x^5	0.4499	0.916	No
	x^6	0.4299	0.916	No
MW-15 (bg) (n = 21, alpha = 0.05)				
	no	0.284	0.908	No
	square root	0.3202	0.908	No
	square	0.244	0.908	No
	cube root	0.3344	0.908	No
	cube	0.231	0.908	No
	natural log	0.3646	0.908	No
	x^4	0.2275	0.908	No
	x^5	0.2266	0.908	No
	x^6	0.2264	0.908	No
Pooled Background (bg) (n = 45, alpha = 0.05)				
	no	0.5083	0.945	No
	square root	0.5739	0.945	No
	square	0.3587	0.945	No
	cube root	0.591	0.945	No
	cube	0.2564	0.945	No
	natural log	0.617	0.945	No
	x^4	0.2041	0.945	No
	x^5	0.1785	0.945	No
	x^6	0.1657	0.945	No

Shapiro-Wilk Normality Test

Constituent: Calcium   Analysis Run 3/9/2022 11:49 AM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-17 (bg) (n = 24, alpha = 0.05)				
	no	0.8862	0.916	No
	square root	0.9129	0.916	No
	square	0.8117	0.916	No
	cube root	0.9201	0.916	Yes
	cube	0.7167	0.916	No
	natural log	0.9323	0.916	Yes
	x^4	0.6159	0.916	No
	x^5	0.5231	0.916	No
	x^6	0.446	0.916	No
MW-15 (bg) (n = 21, alpha = 0.05)				
	no	0.8561	0.908	No
	square root	0.8882	0.908	No
	square	0.7682	0.908	No
	cube root	0.8962	0.908	No
	cube	0.6716	0.908	No
	natural log	0.9071	0.908	No
	x^4	0.5829	0.908	No
	x^5	0.5085	0.908	No
	x^6	0.4487	0.908	No
Pooled Background (bg) (n = 45, alpha = 0.05)				
	no	0.9123	0.945	No
	square root	0.944	0.945	No
	square	0.8229	0.945	No
	cube root	0.9522	0.945	Yes
	cube	0.7154	0.945	No
	natural log	0.9649	0.945	Yes
	x^4	0.6098	0.945	No
	x^5	0.5186	0.945	No
	x^6	0.4453	0.945	No

Shapiro-Wilk Normality Test

Constituent: Chloride   Analysis Run 3/9/2022 11:49 AM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-17 (bg) (n = 24, alpha = 0.05)				
	no	0.645	0.916	No
	square root	0.7707	0.916	No
	square	0.4243	0.916	No
	cube root	0.8077	0.916	No
	cube	0.3042	0.916	No
	natural log	0.8669	0.916	No
	x^4	0.2505	0.916	No
	x^5	0.2276	0.916	No
	x^6	0.2178	0.916	No
MW-15 (bg) (n = 21, alpha = 0.05)				
	no	0.885	0.908	No
	square root	0.8597	0.908	No
	square	0.9002	0.908	No
	cube root	0.8487	0.908	No
	cube	0.8773	0.908	No
	natural log	0.8229	0.908	No
	x^4	0.8321	0.908	No
	x^5	0.7777	0.908	No
	x^6	0.7224	0.908	No
Pooled Background (bg) (n = 45, alpha = 0.05)				
	no	0.6407	0.945	No
	square root	0.7815	0.945	No
	square	0.3859	0.945	No
	cube root	0.8215	0.945	No
	cube	0.2502	0.945	No
	natural log	0.8829	0.945	No
	x^4	0.1923	0.945	No
	x^5	0.1684	0.945	No
	x^6	0.1586	0.945	No

Shapiro-Wilk Normality Test

Constituent: Chromium   Analysis Run 3/9/2022 11:49 AM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-17 (bg) (n = 22, alpha = 0.05)				
	no	-1	0.911	No
	square root	0	0.911	No
	square	-1	0.911	No
	cube root	0	0.911	No
	cube	-1	0.911	No
	natural log	0	0.911	No
	x^4	-1	0.911	No
	x^5	-1	0.911	No
	x^6	-1	0.911	No
MW-15 (bg) (n = 19, alpha = 0.05)				
	no	-1	0.901	No
	square root	-1	0.901	No
	square	-1	0.901	No
	cube root	0	0.901	No
	cube	-1	0.901	No
	natural log	0	0.901	No
	x^4	-1	0.901	No
	x^5	-1	0.901	No
	x^6	-1	0.901	No
Pooled Background (bg) (n = 41, alpha = 0.05)				
	no	-1	0.941	No
	square root	0	0.941	No
	square	-1	0.941	No
	cube root	0	0.941	No
	cube	-1	0.941	No
	natural log	0	0.941	No
	x^4	-1	0.941	No
	x^5	-1	0.941	No
	x^6	-1	0.941	No

Shapiro-Wilk Normality Test

Constituent: Cobalt Analysis Run 3/9/2022 11:49 AM
Powerton Generating Station Client: NRG Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-17 (bg) (n = 24, alpha = 0.05)				
	no	0.6478	0.916	No
	square root	0.6951	0.916	No
	square	0.5445	0.916	No
	cube root	0.7093	0.916	No
	cube	0.4517	0.916	No
	natural log	0.7349	0.916	No
	x^4	0.3818	0.916	No
	x^5	0.3334	0.916	No
	x^6	0.3005	0.916	No
MW-15 (bg) (n = 21, alpha = 0.05)				
	no	0.2264	0.908	No
	square root	0.2264	0.908	No
	square	0.2264	0.908	No
	cube root	0.2264	0.908	No
	cube	0.2264	0.908	No
	natural log	0.2264	0.908	No
	x^4	0.2264	0.908	No
	x^5	0.2264	0.908	No
	x^6	0.2264	0.908	No
Pooled Background (bg) (n = 45, alpha = 0.05)				
	no	0.4932	0.945	No
	square root	0.5307	0.945	No
	square	0.4105	0.945	No
	cube root	0.5421	0.945	No
	cube	0.3358	0.945	No
	natural log	0.5625	0.945	No
	x^4	0.2798	0.945	No
	x^5	0.2417	0.945	No
	x^6	0.2165	0.945	No

Shapiro-Wilk Normality Test

Constituent: Combined Radium 226 + 228   Analysis Run 3/9/2022 11:49 AM
Powerton Generating Station   Client: NRG   Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-17 (bg) (n = 24, alpha = 0.05)				
	no	0.6416	0.916	No
	square root	0.7973	0.916	No
	square	0.3785	0.916	No
	cube root	0.8369	0.916	No
	cube	0.2721	0.916	No
	natural log	0.8893	0.916	No
	x^4	0.2346	0.916	No
	x^5	0.2204	0.916	No
	x^6	0.2147	0.916	No
MW-15 (bg) (n = 21, alpha = 0.05)				
	no	0.9163	0.908	Yes
	square root	0.9424	0.908	Yes
	square	0.8462	0.908	No
	cube root	0.9495	0.908	Yes
	cube	0.7625	0.908	No
	natural log	0.9613	0.908	Yes
	x^4	0.6778	0.908	No
	x^5	0.6012	0.908	No
	x^6	0.5369	0.908	No
Pooled Background (bg) (n = 45, alpha = 0.05)				
	no	0.5221	0.945	No
	square root	0.6895	0.945	No
	square	0.2833	0.945	No
	cube root	0.7402	0.945	No
	cube	0.1976	0.945	No
	natural log	0.8241	0.945	No
	x^4	0.1691	0.945	No
	x^5	0.1586	0.945	No
	x^6	0.1545	0.945	No

Shapiro-Wilk Normality Test

Constituent: Fluoride   Analysis Run 3/9/2022 11:49 AM
Powerton Generating Station   Client: NRG   Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-17 (bg) (n = 24, alpha = 0.05)				
	no	0.9711	0.916	Yes
	square root	0.96	0.916	Yes
	square	0.9796	0.916	Yes
	cube root	0.9552	0.916	Yes
	cube	0.9735	0.916	Yes
	natural log	0.9438	0.916	Yes
	x^4	0.9571	0.916	Yes
	x^5	0.9336	0.916	Yes
	x^6	0.9058	0.916	No
MW-15 (bg) (n = 21, alpha = 0.05)				
	no	0.9783	0.908	Yes
	square root	0.9801	0.908	Yes
	square	0.9686	0.908	Yes
	cube root	0.9803	0.908	Yes
	cube	0.9517	0.908	Yes
	natural log	0.9798	0.908	Yes
	x^4	0.9289	0.908	Yes
	x^5	0.9015	0.908	No
	x^6	0.8707	0.908	No
Pooled Background (bg) (n = 45, alpha = 0.05)				
	no	0.9556	0.945	Yes
	square root	0.9636	0.945	Yes
	square	0.9322	0.945	No
	cube root	0.9656	0.945	Yes
	cube	0.901	0.945	No
	natural log	0.9686	0.945	Yes
	x^4	0.8645	0.945	No
	x^5	0.8251	0.945	No
	x^6	0.7843	0.945	No

Shapiro-Wilk Normality Test

Constituent: Lead   Analysis Run 3/9/2022 11:49 AM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-17 (bg) (n = 24, alpha = 0.05)				
	no	0.6349	0.916	No
	square root	0.6944	0.916	No
	square	0.4894	0.916	No
	cube root	0.7102	0.916	No
	cube	0.3681	0.916	No
	natural log	0.7353	0.916	No
	x^4	0.2943	0.916	No
	x^5	0.2546	0.916	No
	x^6	0.2339	0.916	No
MW-15 (bg) (n = 21, alpha = 0.05)				
	no	-1	0.908	No
	square root	0	0.908	No
	square	-1	0.908	No
	cube root	0	0.908	No
	cube	-1	0.908	No
	natural log	0	0.908	No
	x^4	-1	0.908	No
	x^5	-1	0.908	No
	x^6	-1	0.908	No
Pooled Background (bg) (n = 45, alpha = 0.05)				
	no	0.4669	0.945	No
	square root	0.509	0.945	No
	square	0.3613	0.945	No
	cube root	0.5202	0.945	No
	cube	0.2704	0.945	No
	natural log	0.5383	0.945	No
	x^4	0.2143	0.945	No
	x^5	0.1843	0.945	No
	x^6	0.1687	0.945	No

Shapiro-Wilk Normality Test

Constituent: Lithium   Analysis Run 3/9/2022 11:49 AM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-17 (bg) (n = 24, alpha = 0.05)				
	no	0.8751	0.916	No
	square root	0.8625	0.916	No
	square	0.751	0.916	No
	cube root	0.8405	0.916	No
	cube	0.595	0.916	No
	natural log	0.7712	0.916	No
	x^4	0.4741	0.916	No
	x^5	0.3902	0.916	No
	x^6	0.3336	0.916	No
MW-15 (bg) (n = 21, alpha = 0.05)				
	no	0.8477	0.908	No
	square root	0.8745	0.908	No
	square	0.7768	0.908	No
	cube root	0.8809	0.908	No
	cube	0.7053	0.908	No
	natural log	0.8888	0.908	No
	x^4	0.645	0.908	No
	x^5	0.5976	0.908	No
	x^6	0.5612	0.908	No
Pooled Background (bg) (n = 45, alpha = 0.05)				
	no	0.938	0.945	No
	square root	0.9488	0.945	Yes
	square	0.8294	0.945	No
	cube root	0.9382	0.945	No
	cube	0.7062	0.945	No
	natural log	0.8885	0.945	No
	x^4	0.6035	0.945	No
	x^5	0.5258	0.945	No
	x^6	0.4693	0.945	No

Shapiro-Wilk Normality Test

Constituent: Mercury   Analysis Run 3/9/2022 11:49 AM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-17 (bg) (n = 24, alpha = 0.05)				
	no	-1	0.916	No
	square root	0	0.916	No
	square	-1	0.916	No
	cube root	-1	0.916	No
	cube	-1	0.916	No
	natural log	0	0.916	No
	x^4	-1	0.916	No
	x^5	-1	0.916	No
	x^6	-1	0.916	No
MW-15 (bg) (n = 21, alpha = 0.05)				
	no	-1	0.908	No
	square root	0	0.908	No
	square	-1	0.908	No
	cube root	0	0.908	No
	cube	-1	0.908	No
	natural log	0	0.908	No
	x^4	-1	0.908	No
	x^5	-1	0.908	No
	x^6	-1	0.908	No
Pooled Background (bg) (n = 45, alpha = 0.05)				
	no	-1	0.945	No
	square root	0	0.945	No
	square	-1	0.945	No
	cube root	0	0.945	No
	cube	-1	0.945	No
	natural log	-1	0.945	No
	x^4	-1	0.945	No
	x^5	-1	0.945	No
	x^6	-1	0.945	No

Shapiro-Wilk Normality Test

Constituent: Molybdenum   Analysis Run 3/9/2022 11:49 AM
Powerton Generating Station   Client: NRG   Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-17 (bg) (n = 24, alpha = 0.05)				
	no	0.9193	0.916	Yes
	square root	0.9552	0.916	Yes
	square	0.823	0.916	No
	cube root	0.9626	0.916	Yes
	cube	0.7331	0.916	No
	natural log	0.9677	0.916	Yes
	x^4	0.6611	0.916	No
	x^5	0.605	0.916	No
	x^6	0.561	0.916	No
MW-15 (bg) (n = 21, alpha = 0.05)				
	no	0.9651	0.908	Yes
	square root	0.9819	0.908	Yes
	square	0.9043	0.908	No
	cube root	0.985	0.908	Yes
	cube	0.8205	0.908	No
	natural log	0.9875	0.908	Yes
	x^4	0.7294	0.908	No
	x^5	0.6422	0.908	No
	x^6	0.565	0.908	No
Pooled Background (bg) (n = 45, alpha = 0.05)				
	no	0.8139	0.945	No
	square root	0.8847	0.945	No
	square	0.6697	0.945	No
	cube root	0.9049	0.945	No
	cube	0.5617	0.945	No
	natural log	0.9373	0.945	No
	x^4	0.489	0.945	No
	x^5	0.439	0.945	No
	x^6	0.4027	0.945	No

Shapiro-Wilk Normality Test

Constituent: pH   Analysis Run 3/9/2022 11:49 AM
Powerton Generating Station   Client: NRG   Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-17 (bg) (n = 24, alpha = 0.05)				
	no	0.9049	0.916	No
	square root	0.9088	0.916	No
	square	0.8964	0.916	No
	cube root	0.9101	0.916	No
	cube	0.887	0.916	No
	natural log	0.9125	0.916	No
	x^4	0.8767	0.916	No
	x^5	0.8656	0.916	No
	x^6	0.8539	0.916	No
MW-15 (bg) (n = 21, alpha = 0.05)				
	no	0.9644	0.908	Yes
	square root	0.967	0.908	Yes
	square	0.9587	0.908	Yes
	cube root	0.9678	0.908	Yes
	cube	0.9524	0.908	Yes
	natural log	0.9694	0.908	Yes
	x^4	0.9453	0.908	Yes
	x^5	0.9376	0.908	Yes
	x^6	0.9294	0.908	Yes
Pooled Background (bg) (n = 45, alpha = 0.05)				
	no	0.9723	0.945	Yes
	square root	0.9738	0.945	Yes
	square	0.9685	0.945	Yes
	cube root	0.9742	0.945	Yes
	cube	0.9633	0.945	Yes
	natural log	0.9749	0.945	Yes
	x^4	0.9569	0.945	Yes
	x^5	0.9492	0.945	Yes
	x^6	0.9401	0.945	No

Shapiro-Wilk Normality Test

Constituent: Selenium   Analysis Run 3/9/2022 11:49 AM
Powerton Generating Station   Client: NRG   Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-17 (bg) (n = 24, alpha = 0.05)				
	no	0.2106	0.916	No
	square root	0.2106	0.916	No
	square	0.2106	0.916	No
	cube root	0.2106	0.916	No
	cube	0.2106	0.916	No
	natural log	0.2106	0.916	No
	x^4	0.2106	0.916	No
	x^5	0.2106	0.916	No
	x^6	0.2106	0.916	No
MW-15 (bg) (n = 21, alpha = 0.05)				
	no	0.688	0.908	No
	square root	0.8068	0.908	No
	square	0.5497	0.908	No
	cube root	0.8478	0.908	No
	cube	0.4793	0.908	No
	natural log	0.911	0.908	Yes
	x^4	0.4249	0.908	No
	x^5	0.3793	0.908	No
	x^6	0.3425	0.908	No
Pooled Background (bg) (n = 45, alpha = 0.05)				
	no	0.5239	0.945	No
	square root	0.6138	0.945	No
	square	0.4144	0.945	No
	cube root	0.6432	0.945	No
	cube	0.3586	0.945	No
	natural log	0.6881	0.945	No
	x^4	0.3134	0.945	No
	x^5	0.2745	0.945	No
	x^6	0.2432	0.945	No

Shapiro-Wilk Normality Test

Constituent: Sulfate Analysis Run 3/9/2022 11:49 AM

Powerton Generating Station Client: NRG Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-17 (bg) (n = 24, alpha = 0.05)				
	no	0.9339	0.916	Yes
	square root	0.9418	0.916	Yes
	square	0.9077	0.916	No
	cube root	0.9436	0.916	Yes
	cube	0.8691	0.916	No
	natural log	0.946	0.916	Yes
	x^4	0.8214	0.916	No
	x^5	0.7685	0.916	No
	x^6	0.7138	0.916	No
MW-15 (bg) (n = 21, alpha = 0.05)				
	no	0.7489	0.908	No
	square root	0.8366	0.908	No
	square	0.5827	0.908	No
	cube root	0.8625	0.908	No
	cube	0.4706	0.908	No
	natural log	0.9042	0.908	No
	x^4	0.4049	0.908	No
	x^5	0.3664	0.908	No
	x^6	0.3421	0.908	No
Pooled Background (bg) (n = 45, alpha = 0.05)				
	no	0.8713	0.945	No
	square root	0.9343	0.945	No
	square	0.7055	0.945	No
	cube root	0.9501	0.945	Yes
	cube	0.5435	0.945	No
	natural log	0.9722	0.945	Yes
	x^4	0.4211	0.945	No
	x^5	0.3394	0.945	No
	x^6	0.287	0.945	No

Shapiro-Wilk Normality Test

Constituent: Thallium   Analysis Run 3/9/2022 11:49 AM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-17 (bg) (n = 24, alpha = 0.05)				
	no	0.5698	0.916	No
	square root	0.6123	0.916	No
	square	0.5008	0.916	No
	cube root	0.627	0.916	No
	cube	0.4574	0.916	No
	natural log	0.6562	0.916	No
	x^4	0.4325	0.916	No
	x^5	0.4173	0.916	No
	x^6	0.4057	0.916	No
MW-15 (bg) (n = 21, alpha = 0.05)				
	no	-1	0.908	No
	square root	0	0.908	No
	square	-1	0.908	No
	cube root	0	0.908	No
	cube	-1	0.908	No
	natural log	0	0.908	No
	x^4	-1	0.908	No
	x^5	-1	0.908	No
	x^6	-1	0.908	No
Pooled Background (bg) (n = 45, alpha = 0.05)				
	no	0.4139	0.945	No
	square root	0.4467	0.945	No
	square	0.36	0.945	No
	cube root	0.4579	0.945	No
	cube	0.3258	0.945	No
	natural log	0.4801	0.945	No
	x^4	0.3064	0.945	No
	x^5	0.2949	0.945	No
	x^6	0.2866	0.945	No

Shapiro-Wilk Normality Test

Constituent: Total Dissolved Solids   Analysis Run 3/9/2022 11:49 AM
Powerton Generating Station   Client: NRG   Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-17 (bg) (n = 24, alpha = 0.05)				
	no	0.9275	0.916	Yes
	square root	0.9305	0.916	Yes
	square	0.9099	0.916	No
	cube root	0.9307	0.916	Yes
	cube	0.8778	0.916	No
	natural log	0.9299	0.916	Yes
	x^4	0.8346	0.916	No
	x^5	0.7848	0.916	No
	x^6	0.7325	0.916	No
MW-15 (bg) (n = 21, alpha = 0.05)				
	no	0.8113	0.908	No
	square root	0.8527	0.908	No
	square	0.7192	0.908	No
	cube root	0.8654	0.908	No
	cube	0.6267	0.908	No
	natural log	0.8888	0.908	No
	x^4	0.5444	0.908	No
	x^5	0.4767	0.908	No
	x^6	0.4235	0.908	No
Pooled Background (bg) (n = 45, alpha = 0.05)				
	no	0.9379	0.945	No
	square root	0.9578	0.945	Yes
	square	0.8671	0.945	No
	cube root	0.962	0.945	Yes
	cube	0.7657	0.945	No
	natural log	0.967	0.945	Yes
	x^4	0.6535	0.945	No
	x^5	0.5485	0.945	No
	x^6	0.46	0.945	No

Shapiro-Wilk Normality Test

Constituent: Turbidity   Analysis Run 3/9/2022 11:49 AM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-17 (bg) (n = 9, alpha = 0.05)				
	no	0.9454	0.829	Yes
	square root	0.9627	0.829	Yes
	square	0.8751	0.829	Yes
	cube root	0.9642	0.829	Yes
	cube	0.7965	0.829	No
	natural log	0.9598	0.829	Yes
	x^4	0.7312	0.829	No
	x^5	0.6817	0.829	No
	x^6	0.6447	0.829	No
MW-15 (bg) (n = 9, alpha = 0.05)				
	no	0.6195	0.829	No
	square root	0.7683	0.829	No
	square	0.4557	0.829	No
	cube root	0.821	0.829	No
	cube	0.407	0.829	No
	natural log	0.9116	0.829	Yes
	x^4	0.3943	0.829	No
	x^5	0.3911	0.829	No
	x^6	0.3903	0.829	No
Pooled Background (bg) (n = 18, alpha = 0.05)				
	no	0.8335	0.897	No
	square root	0.937	0.897	Yes
	square	0.6082	0.897	No
	cube root	0.9613	0.897	Yes
	cube	0.4569	0.897	No
	natural log	0.987	0.897	Yes
	x^4	0.3711	0.897	No
	x^5	0.3228	0.897	No
	x^6	0.2951	0.897	No

Shapiro-Wilk Normality Test

Constituent: Arsenic   Analysis Run 3/1/2022 3:42 PM
Powerton Generating Station   Client: NRG   Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-15 (bg) (n = 8, alpha = 0.05)				
	no	0.6991	0.818	No
	square root	0.8122	0.818	No
	square	0.5415	0.818	No
	cube root	0.8506	0.818	Yes
	cube	0.4696	0.818	No
	natural log	0.92	0.818	Yes
	x^4	0.4399	0.818	No
	x^5	0.4276	0.818	No
	x^6	0.4224	0.818	No

Shapiro-Wilk Normality Test

Constituent: Calcium Analysis Run 3/1/2022 3:42 PM
Powerton Generating Station Client: NRG Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-15 (bg) (n = 8, alpha = 0.05)				
	no	0.9008	0.818	Yes
	square root	0.9155	0.818	Yes
	square	0.8683	0.818	Yes
	cube root	0.9202	0.818	Yes
	cube	0.833	0.818	Yes
	natural log	0.929	0.818	Yes
	x^4	0.7961	0.818	No
	x^5	0.759	0.818	No
	x^6	0.7229	0.818	No

Shapiro-Wilk Normality Test

Constituent: Lithium   Analysis Run 3/1/2022 3:42 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-15 (bg) (n = 8, alpha = 0.05)				
	no	0.8571	0.818	Yes
	square root	0.8766	0.818	Yes
	square	0.8155	0.818	No
	cube root	0.8828	0.818	Yes
	cube	0.7722	0.818	No
	natural log	0.8947	0.818	Yes
	x^4	0.7293	0.818	No
	x^5	0.6884	0.818	No
	x^6	0.6506	0.818	No

Shapiro-Wilk Normality Test

Constituent: Molybdenum   Analysis Run 3/1/2022 3:42 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-15 (bg) (n = 8, alpha = 0.05)				
	no	0.9547	0.818	Yes
	square root	0.9513	0.818	Yes
	square	0.9535	0.818	Yes
	cube root	0.9496	0.818	Yes
	cube	0.9436	0.818	Yes
	natural log	0.9451	0.818	Yes
	x^4	0.9275	0.818	Yes
	x^5	0.908	0.818	Yes
	x^6	0.887	0.818	Yes

Shapiro-Wilk Normality Test

Constituent: Sulfate   Analysis Run 3/1/2022 3:42 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-15 (bg) (n = 8, alpha = 0.05)				
	no	0.9116	0.818	Yes
	square root	0.8861	0.818	Yes
	square	0.9417	0.818	Yes
	cube root	0.8762	0.818	Yes
	cube	0.9441	0.818	Yes
	natural log	0.8547	0.818	Yes
	x^4	0.9256	0.818	Yes
	x^5	0.8953	0.818	Yes
	x^6	0.8605	0.818	Yes

Shapiro-Wilk Normality Test

Constituent: Arsenic   Analysis Run 3/1/2022 3:44 PM
Powerton Generating Station   Client: NRG   Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-17 (bg) (n = 8, alpha = 0.05)				
	no	0.8253	0.818	Yes
	square root	0.8962	0.818	Yes
	square	0.6846	0.818	No
	cube root	0.9174	0.818	Yes
	cube	0.5798	0.818	No
	natural log	0.9538	0.818	Yes
	x^4	0.5137	0.818	No
	x^5	0.4744	0.818	No
	x^6	0.4515	0.818	No

Shapiro-Wilk Normality Test

Constituent: Calcium   Analysis Run 3/1/2022 3:44 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-17 (bg) (n = 8, alpha = 0.05)				
	no	0.8163	0.818	No
	square root	0.8316	0.818	Yes
	square	0.7835	0.818	No
	cube root	0.8366	0.818	Yes
	cube	0.7492	0.818	No
	natural log	0.8461	0.818	Yes
	x^4	0.7147	0.818	No
	x^5	0.6809	0.818	No
	x^6	0.649	0.818	No

Shapiro-Wilk Normality Test

Constituent: Lithium   Analysis Run 3/1/2022 3:44 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-17 (bg) (n = 8, alpha = 0.05)				
	no	0.6899	0.818	No
	square root	0.7077	0.818	No
	square	0.6525	0.818	No
	cube root	0.7135	0.818	No
	cube	0.6151	0.818	No
	natural log	0.7246	0.818	No
	x^4	0.5798	0.818	No
	x^5	0.5484	0.818	No
	x^6	0.5214	0.818	No

Shapiro-Wilk Normality Test

Constituent: Molybdenum   Analysis Run 3/1/2022 3:44 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-17 (bg) (n = 8, alpha = 0.05)				
	no	0.8952	0.818	Yes
	square root	0.8808	0.818	Yes
	square	0.9147	0.818	Yes
	cube root	0.8754	0.818	Yes
	cube	0.922	0.818	Yes
	natural log	0.8638	0.818	Yes
	x^4	0.9191	0.818	Yes
	x^5	0.909	0.818	Yes
	x^6	0.8944	0.818	Yes

Shapiro-Wilk Normality Test

Constituent: Sulfate   Analysis Run 3/1/2022 3:44 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-17 (bg) (n = 8, alpha = 0.05)				
	no	0.9253	0.818	Yes
	square root	0.9204	0.818	Yes
	square	0.9335	0.818	Yes
	cube root	0.9186	0.818	Yes
	cube	0.9395	0.818	Yes
	natural log	0.915	0.818	Yes
	x^4	0.9435	0.818	Yes
	x^5	0.9454	0.818	Yes
	x^6	0.9454	0.818	Yes

Shapiro-Wilk Normality Test

Constituent: Total Dissolved Solids   Analysis Run 3/1/2022 3:44 PM
Powerton Generating Station   Client: NRG   Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-17 (bg) (n = 8, alpha = 0.05)				
	no	0.8349	0.818	Yes
	square root	0.8351	0.818	Yes
	square	0.8337	0.818	Yes
	cube root	0.8351	0.818	Yes
	cube	0.8314	0.818	Yes
	natural log	0.835	0.818	Yes
	x^4	0.828	0.818	Yes
	x^5	0.8236	0.818	Yes
	x^6	0.8182	0.818	Yes

Shapiro-Wilk Normality Test

Constituent: Total Dissolved Solids   Analysis Run 3/1/2022 3:42 PM

Powerton Generating Station   Client: NRG   Data: Powerton MCB

Well	Transformation	Calculated	Critical	Normal
MW-15 (bg) (n = 8, alpha = 0.05)				
	no	0.8987	0.818	Yes
	square root	0.9044	0.818	Yes
	square	0.8843	0.818	Yes
	cube root	0.9061	0.818	Yes
	cube	0.866	0.818	Yes
	natural log	0.909	0.818	Yes
	x^4	0.8445	0.818	Yes
	x^5	0.8204	0.818	Yes
	x^6	0.7945	0.818	No

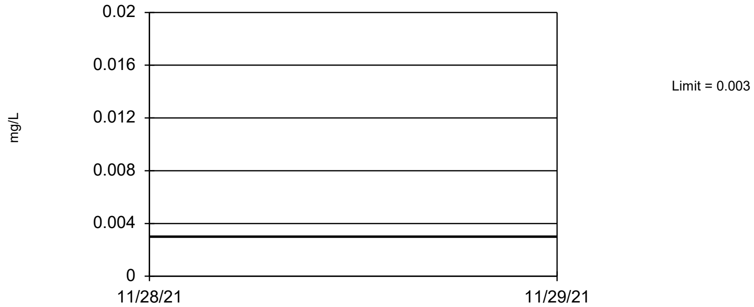
Interwell Prediction Limit Powerton MCB UG Wells MW-15/17 All Data Pooled

Powerton Generating Station   Client: NRG   Data: Powerton MCB   Printed 3/1/2022, 4:42 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Antimony (mg/L)	n/a	0.003	n/a	n/a	3 future	n/a	41	100	n/a	0.001091	NP Inter (NDs) 1 of 2
Beryllium (mg/L)	n/a	0.0013	n/a	n/a	3 future	n/a	41	97.56	n/a	0.001091	NP Inter (NDs) 1 of 2
Chromium (mg/L)	n/a	0.005	n/a	n/a	3 future	n/a	41	100	n/a	0.001091	NP Inter (NDs) 1 of 2
Mercury (mg/L)	n/a	0.0002	n/a	n/a	3 future	n/a	45	100	n/a	0.000...	NP Inter (NDs) 1 of 2

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. All background values (n = 41) were censored; limit is most recent reporting limit. Annual per-constituent alpha = 0.01301. Individual comparison alpha = 0.001091 (1 of 2). Assumes 3 future values. Seasonality was not detected with 95% confidence.

Constituent: Antimony Analysis Run 3/1/2022 4:40 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

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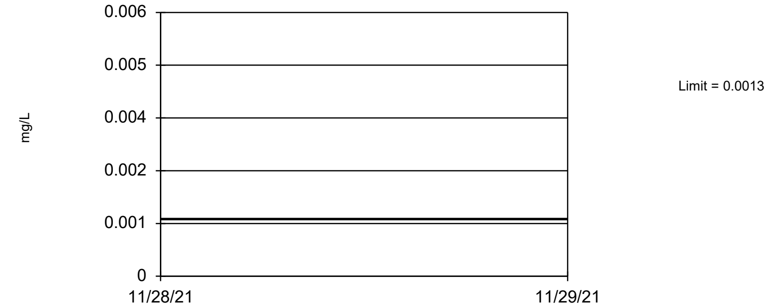
Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 41 background values. 97.56% NDs. Annual per-constituent alpha = 0.01301. Individual comparison alpha = 0.001091 (1 of 2). Assumes 3 future values. Seasonality was not detected with 95% confidence.

Constituent: Beryllium Analysis Run 3/1/2022 4:40 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

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Prediction Limit

Interwell Non-parametric

Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. All background values (n = 41) were censored; limit is most recent reporting limit. Annual per-constituent alpha = 0.01301. Individual comparison alpha = 0.001091 (1 of 2). Assumes 3 future values. Seasonality was not detected with 95% confidence.

Constituent: Chromium Analysis Run 3/1/2022 4:40 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

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Prediction Limit

Interwell Non-parametric

Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. All background values (n = 45) were censored; limit is most recent reporting limit. Annual per-constituent alpha = 0.01116. Individual comparison alpha = 0.0009347 (1 of 2). Assumes 3 future values. Seasonality was not detected with 95% confidence.

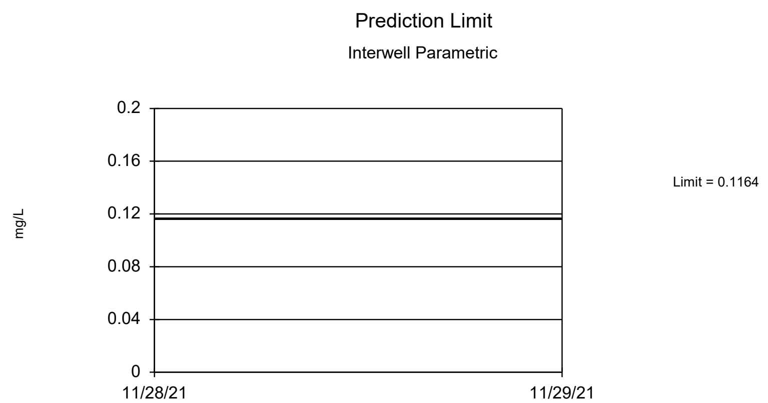
Constituent: Mercury Analysis Run 3/1/2022 4:40 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

Interwell Prediction Limit Powerton MCB UG Well MW-15 All Data

Powerton Generating Station Client: NRG Data: Powerton MCB Printed 3/1/2022, 4:38 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Barium (mg/L)	n/a	0.1164	n/a	n/a	3 future	n/a	21	0	No	0.000399	Param Inter 1 of 2
Boron (mg/L)	n/a	2.698	n/a	n/a	3 future	n/a	21	0	No	0.000399	Param Inter 1 of 2
Cadmium (mg/L)	n/a	0.0041	n/a	n/a	3 future	n/a	21	80.95	n/a	0.003707	NP Inter (NDs) 1 of 2
Chloride (mg/L)	n/a	255.1	n/a	n/a	3 future	n/a	21	0	No	0.000399	Param Inter 1 of 2
Cobalt (mg/L)	n/a	0.0012	n/a	n/a	3 future	n/a	21	95.24	n/a	0.003707	NP Inter (NDs) 1 of 2
Combined Radium 226 + 228 (pCi/L)	n/a	0.87	n/a	n/a	3 future	n/a	21	76.19	n/a	0.003707	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	n/a	0.6424	n/a	n/a	3 future	n/a	21	0	No	0.000399	Param Inter 1 of 2
Lead (mg/L)	n/a	0.0005	n/a	n/a	3 future	n/a	21	100	n/a	0.003707	NP Inter (NDs) 1 of 2
pH (SU)	n/a	7.495	6.427	n/a	3 future	n/a	21	0	No	0.000...	Param Inter 1 of 2
Selenium (mg/L)	n/a	0.077	n/a	n/a	3 future	n/a	21	19.05	n/a	0.003707	NP Inter (xform) 1 of 2
Thallium (mg/L)	n/a	0.002	n/a	n/a	3 future	n/a	21	100	n/a	0.003707	NP Inter (NDs) 1 of 2



Background Data Summary: Mean=0.0639, Std. Dev.=0.02135, n=21. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8888, critical = 0.873. Kappa = 2.457 (c=22, w=3, 1 of 2, event alpha = 0.026). Report alpha = 0.001197. Individual comparison alpha = 0.000399. Assumes 3 future values.

Constituent: Barium Analysis Run 3/1/2022 4:36 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

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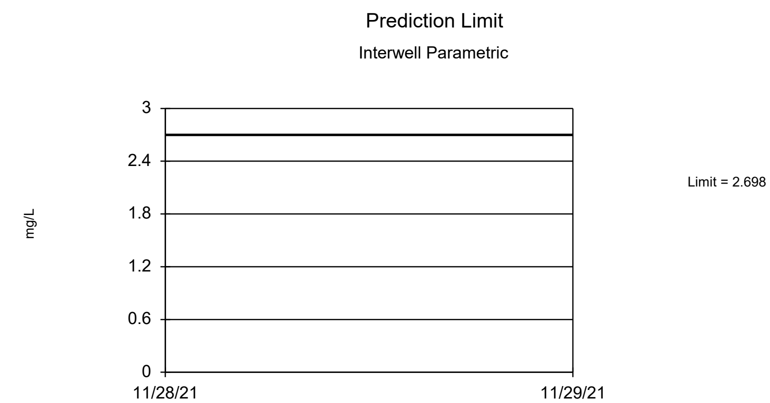

Background Data Summary: Mean=1.71, Std. Dev.=0.4024, n=21. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.907, critical = 0.873. Kappa = 2.457 (c=22, w=3, 1 of 2, event alpha = 0.026). Report alpha = 0.001197. Individual comparison alpha = 0.000399. Assumes 3 future values.

Constituent: Boron Analysis Run 3/1/2022 4:36 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

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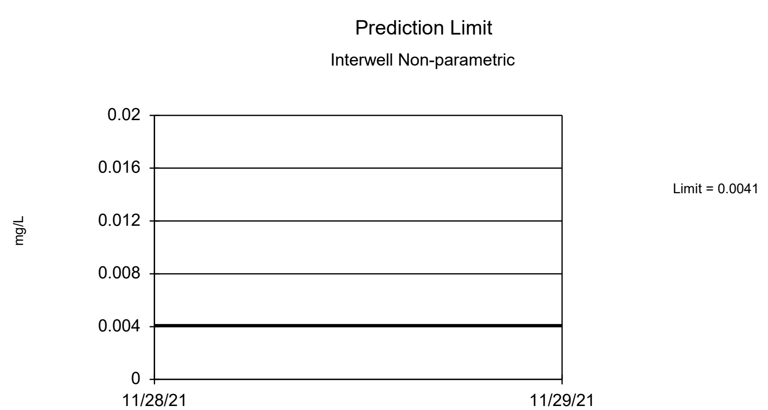

Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 21 background values. 80.95% NDs. Annual per-constituent alpha = 0.04358. Individual comparison alpha = 0.003707 (1 of 2). Assumes 3 future values. Seasonality was not detected with 95% confidence.

Constituent: Cadmium Analysis Run 3/1/2022 4:36 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

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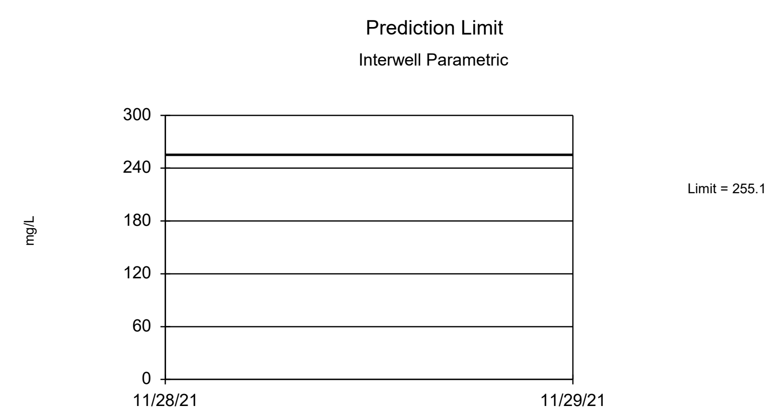

Background Data Summary: Mean=188.6, Std. Dev.=27.07, n=21. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.885, critical = 0.873. Kappa = 2.457 (c=22, w=3, 1 of 2, event alpha = 0.026). Report alpha = 0.001197. Individual comparison alpha = 0.000399. Assumes 3 future values.

Constituent: Chloride Analysis Run 3/1/2022 4:36 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

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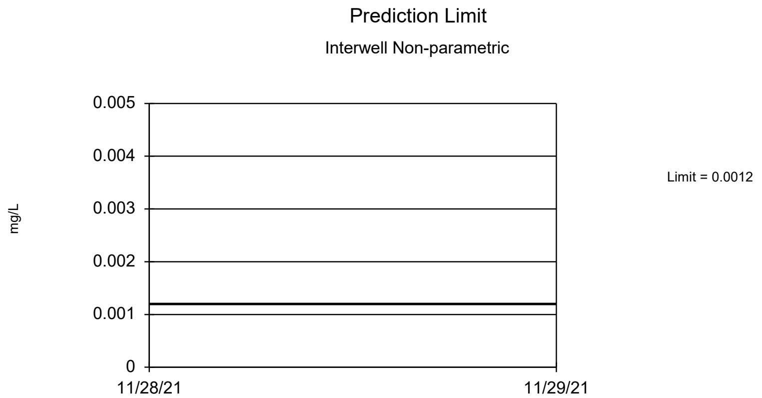

Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 21 background values. 95.24% NDs. Annual per-constituent alpha = 0.04358. Individual comparison alpha = 0.003707 (1 of 2). Assumes 3 future values. Seasonality was not detected with 95% confidence.

Constituent: Cobalt Analysis Run 3/1/2022 4:36 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

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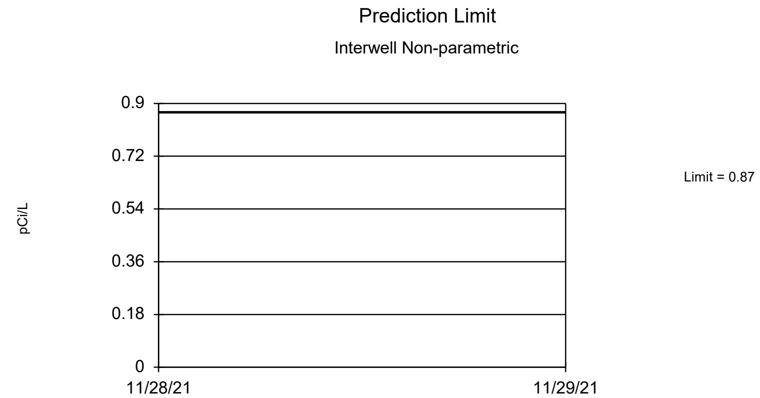

Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 21 background values. 76.19% NDs. Annual per-constituent alpha = 0.04358. Individual comparison alpha = 0.003707 (1 of 2). Assumes 3 future values. Seasonality was not detected with 95% confidence.

Constituent: Combined Radium 226 + 228 Analysis Run 3/1/2022 4:36 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

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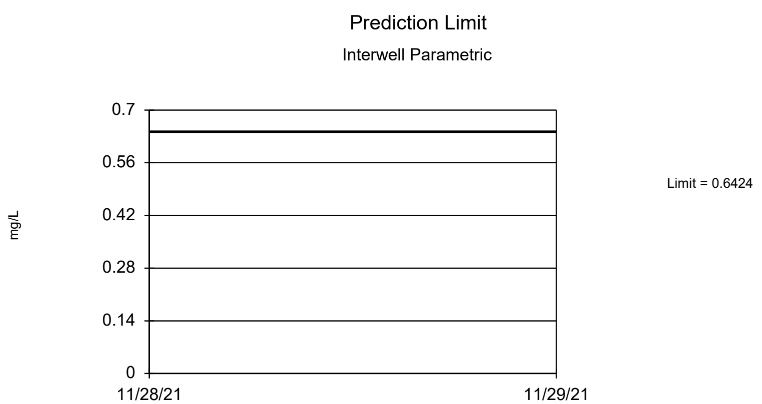
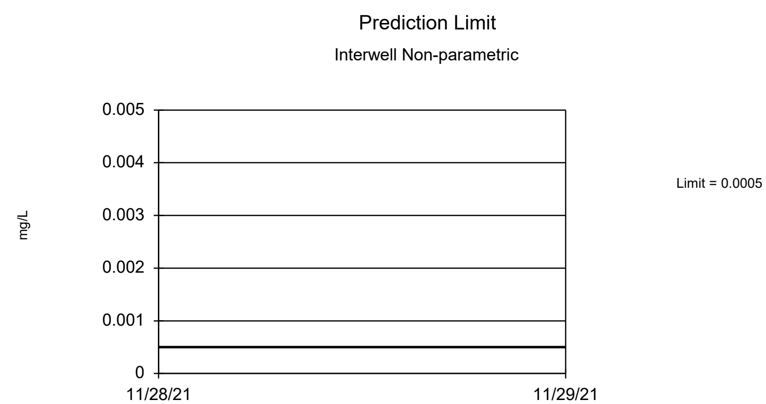


Background Data Summary: Mean=0.529, Std. Dev.=0.04614, n=21. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9783, critical = 0.873. Kappa = 2.457 (c=22, w=3, 1 of 2, event alpha = 0.026). Report alpha = 0.001197. Individual comparison alpha = 0.000399. Assumes 3 future values.

Constituent: Fluoride Analysis Run 3/1/2022 4:36 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG



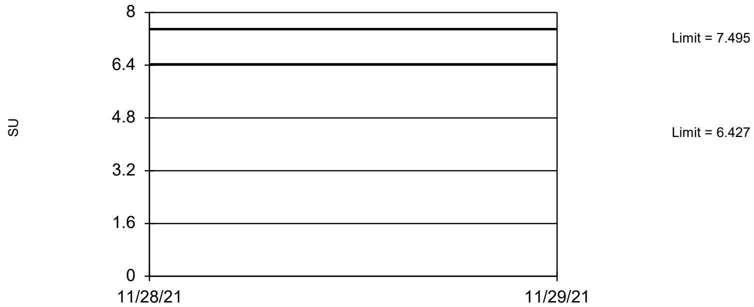
Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. All background values (n = 21) were censored; limit is most recent reporting limit. Annual per-constituent alpha = 0.04358. Individual comparison alpha = 0.003707 (1 of 2). Assumes 3 future values. Seasonality was not detected with 95% confidence.

Constituent: Lead Analysis Run 3/1/2022 4:36 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=6.961, Std. Dev.=0.2174, n=21. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9644, critical = 0.873. Kappa = 2.457 (c=22, w=3, 1 of 2, event alpha = 0.026). Report alpha = 0.001197. Individual comparison alpha = 0.0001995. Assumes 3 future values.

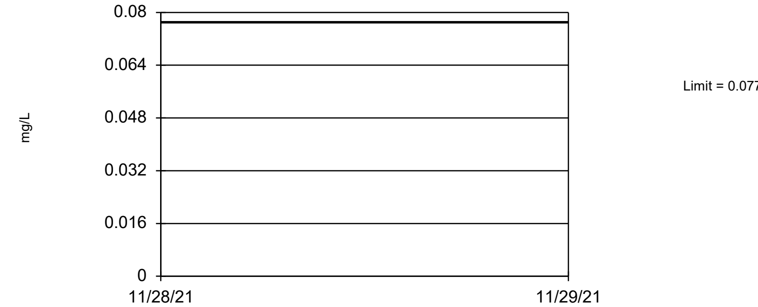
Constituent: pH Analysis Run 3/1/2022 4:36 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

Sanitas™ v.9.6.09 Software licensed to KPRG and Associates, Inc. UG

Prediction Limit

Interwell Non-parametric



Non-parametric test used after natural log transformation resulted in a parametric limit of 3.641, which exceeds 10 times the highest background value (user-adjustable cutoff). Limit is highest of 21 background values. 19.05% NDs. Annual per-constituent alpha = 0.04358. Individual comparison alpha = 0.003707 (1 of 2). Assumes 3 future values. Seasonality was not detected with 95% confidence.

Constituent: Selenium Analysis Run 3/1/2022 4:36 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

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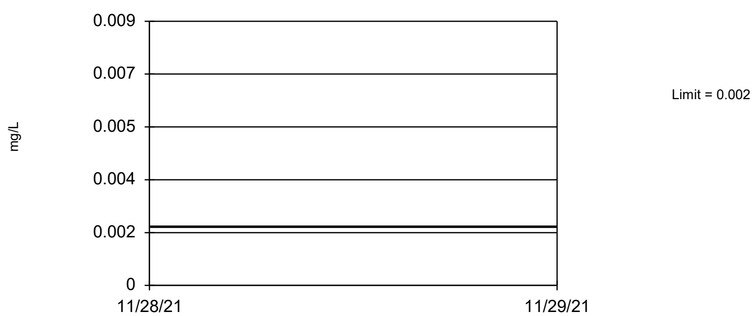
Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. All background values (n = 21) were censored; limit is most recent reporting limit. Annual per-constituent alpha = 0.04358. Individual comparison alpha = 0.003707 (1 of 2). Assumes 3 future values. Seasonality was not detected with 95% confidence.

Constituent: Thallium Analysis Run 3/1/2022 4:36 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

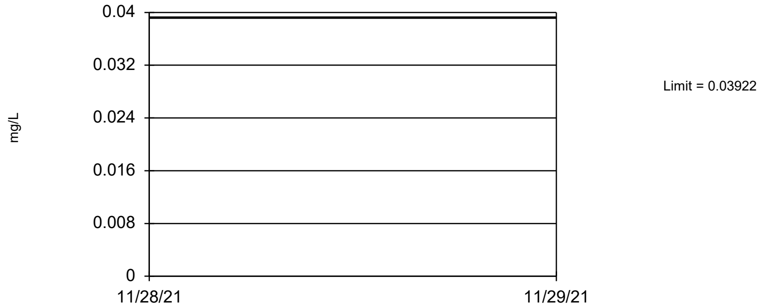
Interwell Prediction Limit Powerton MCB UG Well MW-15 Last 8 Rounds Data

Powerton Generating Station   Client: NRG   Data: Powerton MCB   Printed 3/1/2022, 4:34 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Lithium (mg/L)	n/a	0.03922	n/a	n/a	3 future	n/a	8	0	No	0.000399	Param Inter 1 of 2
Sulfate (mg/L)	n/a	733.9	n/a	n/a	3 future	n/a	8	0	No	0.000399	Param Inter 1 of 2

Prediction Limit

Interwell Parametric



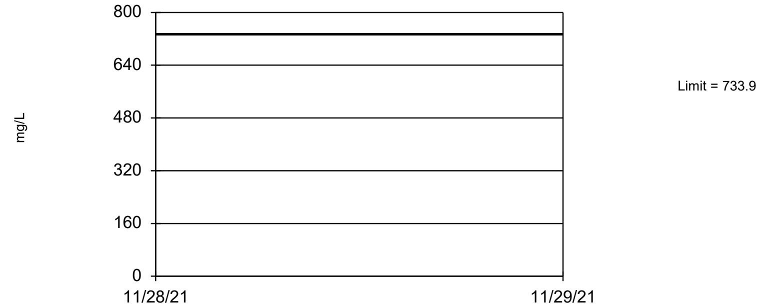
Background Data Summary: Mean=0.02788, Std. Dev.=0.003271, n=8. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8571, critical = 0.749. Kappa = 3.469 (c=22, w=3, 1 of 2, event alpha = 0.026). Report alpha = 0.001197. Individual comparison alpha = 0.000399. Assumes 3 future values.

Constituent: Lithium Analysis Run 3/1/2022 4:31 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=431.3, Std. Dev.=87.25, n=8. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9116, critical = 0.749. Kappa = 3.469 (c=22, w=3, 1 of 2, event alpha = 0.026). Report alpha = 0.001197. Individual comparison alpha = 0.000399. Assumes 3 future values.

Constituent: Sulfate Analysis Run 3/1/2022 4:32 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

Interwell Prediction Limit Powerton MCB UG Well MW-17 Last 8 Rounds Data

Powerton Generating Station   Client: NRG   Data: Powerton MCB   Printed 3/1/2022, 4:47 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Arsenic (mg/L)	n/a	0.02367	n/a	n/a	3 future	n/a	8	0	No	0.000399	Param Inter 1 of 2
Calcium (mg/L)	n/a	200.6	n/a	n/a	3 future	n/a	8	0	No	0.000399	Param Inter 1 of 2
Molybdenum (mg/L)	n/a	0.08359	n/a	n/a	3 future	n/a	8	0	No	0.000399	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	n/a	1477	n/a	n/a	3 future	n/a	8	0	No	0.000399	Param Inter 1 of 2
Turbidity (NTU)	n/a	55.15	n/a	n/a	3 future	n/a	8	0	No	0.000399	Param Inter 1 of 2

Prediction Limit

Interwell Parametric

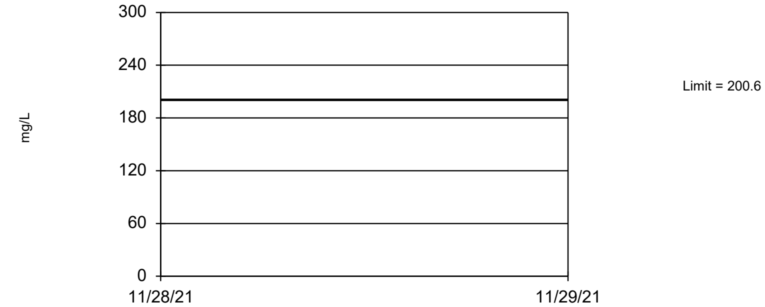
Background Data Summary: Mean=0.008338, Std. Dev.=0.004419, n=8. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8253, critical = 0.749. Kappa = 3.469 (c=22, w=3, 1 of 2, event alpha = 0.026). Report alpha = 0.001197. Individual comparison alpha = 0.000399. Assumes 3 future values.

Constituent: Arsenic Analysis Run 3/1/2022 4:45 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=145, Std. Dev.=16.04, n=8. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8163, critical = 0.749. Kappa = 3.469 (c=22, w=3, 1 of 2, event alpha = 0.026). Report alpha = 0.001197. Individual comparison alpha = 0.000399. Assumes 3 future values.

Constituent: Calcium Analysis Run 3/1/2022 4:45 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

Prediction Limit

Interwell Parametric

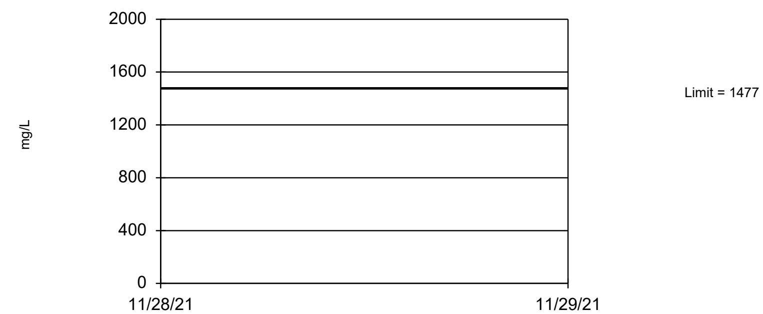
Background Data Summary: Mean=0.04375, Std. Dev.=0.01149, n=8. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8952, critical = 0.749. Kappa = 3.469 (c=22, w=3, 1 of 2, event alpha = 0.026). Report alpha = 0.001197. Individual comparison alpha = 0.000399. Assumes 3 future values.

Constituent: Molybdenum Analysis Run 3/1/2022 4:45 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

Prediction Limit

Interwell Parametric



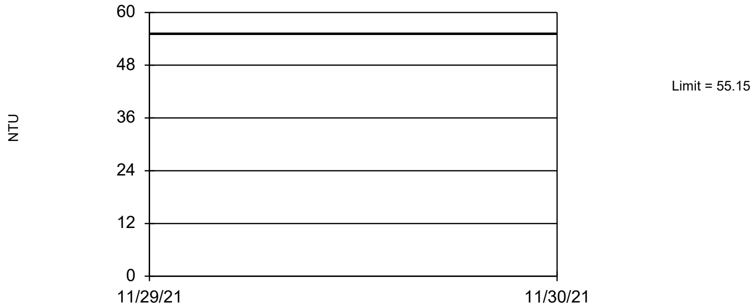
Background Data Summary: Mean=1188, Std. Dev.=83.45, n=8. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8349, critical = 0.749. Kappa = 3.469 (c=22, w=3, 1 of 2, event alpha = 0.026). Report alpha = 0.001197. Individual comparison alpha = 0.000399. Assumes 3 future values.

Constituent: Total Dissolved Solids Analysis Run 3/1/2022 4:45 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=21.04, Std. Dev.=9.834, n=8. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9606, critical = 0.749. Kappa = 3.469 (c=22, w=3, 1 of 2, event alpha = 0.026). Report alpha = 0.001197. Individual comparison alpha = 0.000399. Assumes 3 future values.

Constituent: Turbidity Analysis Run 3/1/2022 4:45 PM

Powerton Generating Station Client: NRG Data: Powerton MCB

ATTACHMENT 10
PRELIMINARY CLOSURE PLAN

PRELIMINARY CLOSURE PLAN
METAL CLEANING BASIN
POWERTON STATION
MARCH 2022

This closure plan has been prepared in accordance with Ill. Adm. Code Title 35 Part 845.720(a) for the Metal Cleaning Basin (MCB) at the Powerton Station, operated by Midwest Generation, LLC (Midwest Generation) in Pekin, IL. This closure plan describes the schedule and steps necessary for closure and methods for compliance with closure requirements for final closure of the MCB.

1.0 Closure Narrative [845.720(a)(1)(A)]

The closure of the MCB will be by removal of the CCR in accordance with Ill. Adm. Code 35 Part 845.740(a).

2.0 CCR Removal and Decontamination [845.720(a)(1)(B)]

Closure of the MCB will be through removal of CCR. The basin will be dewatered to allow for the excavation of any CCR remnants. First, the basin will be allowed to naturally dewater to a water level equal with the elevation of the existing outlet structure. At this point, the water will be pumped into the existing outlet structure.

The CCR will be removed through mechanical excavation once the basin has been sufficiently dewatered. A mechanical excavator will excavate the CCR from the basin and load it into dump trucks. Once the CCR has been mechanically loaded it will be hauled for disposal at a regulated facility. Any CCR remnants will be removed through washing/rinsing and/or vacuuming. In addition, all CCR will be removed from the basin inlet and outlet structures through mechanical means and also by washing/rinsing any remaining CCR remnants. The CCR that is removed from the inlet and outlet structures will be taken for disposal at a regulated facility.

CCR removal and decontamination will be considered complete when CCR has been removed from the basin and from any areas that may have been affected by releases from the basin and groundwater monitoring concentrations do not exceed the groundwater protection standards established in Ill. Adm. Code Title 35 Part 845.650(a) for two consecutive sampling events using the statistical procedures in §845.640(g).

3.0 Closure with CCR Left in Place [845.720(a)(1)(C)]

Closure of the MCB will be through removal of CCR and decontamination of areas affected by CCR. Therefore this requirement is not applicable.

4.0 Maximum Inventory of CCR [845.720(a)(1)(D)]

The estimated maximum inventory of CCR on-site contained in the MCB is approximately 3,460 cubic yards based upon the discharge weir height of two feet and the CCR being contained from the top of the sand warning layer to the top height of the weir.

5.0 Largest Area of CCR Requiring a Final Cover [845.720(a)(1)(E)]

The MCB will be closed by removing the CCR in accordance with 845.740(a); therefore, this section is not applicable to this closure plan.

6.0 Closure Schedule [845.720(a)(1)(F)]

Implementation of closure through removal of CCR is estimated to require 30 months. Closure is anticipated to begin in 2023 or 2024 and estimated to be completed by the end of 2024. Prior to initiation of closure, a notice of intent to close will be prepared in accordance with §845.730(d). If necessary, closure design documents will be prepared to support applications for required local, state, and federal permits. Closure construction design documents may include construction drawings for closure, technical specifications, and adequate CCR removal confirmation procedures. The permits required for closure construction will be evaluated at the time of closure, and may include permits from the Illinois Environmental Protection Agency (IEPA), Illinois Department of Natural Resources (IDNR), and Will County. A preliminary schedule of anticipated closure activities is included below.

Closure Schedule

Closure Activity	Schedule
Prepare Closure Construction Design Documents	5 Months
Obtain Closure Construction Permit	11 Months
Hire Closure Contractor	4 Months
Draw Down Water & Dewater Basin	1 Month
Excavate CCR	4 Months
Decontaminate Pond Liner	2 Months
Decontaminate Pond Inlet & Outlet Structures	1 Months
Closure Certification	2 Months

7.0 Closure Activities Initiation [845.730]

Closure activities will commence when one or more of the following conditions have occurred:

- No later than 30 days after the date on which the CCR unit received the known final receipt of CCR or non-CCR waste;
- No later than 30 days after the removal of the known final volumen of CCR for the purpose of beneficial use;
- Within two years of the last receipt of waste for a unit that has not received CCR or non-CCR waste; or
- Within two years of the last removal of CCR material for the purposes of beneficial use.

In accordance with 845.760(f), notification of closure of a CCR unit will be made within 30 days of the completion of closure of the CCR unit. The notification will include certification from a qualified profesional engineer, as required by 845.760(e)(2).

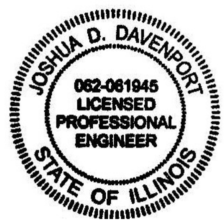
8.0 Closure Plan Amendments [845.720(a)(3)]

This Closure Plan will be amended in accordance with 845.720(a)(3). If a change in the operation of Pond 2 would be substantially affect the content of this Closure Plan or if unanticipated events necessitate revision of the plan. If a change in operation requires amendment to the Closure Plan, the plan will be amended no later than 60 days prior to the change in operation being implemented. If an unexpected event occurs that requires amendment of the Closure Plan, the plan will be amended within 60 days of the unexpected event or within 30 days of the unexpected event if the event occurs after closure activities have commenced. Amendments to this Closure Plan will be certified by a professional engineer registered in the State of Illinois in accordance with 845.720(a)(4).

9.0 Professional Engineer's Certification [845.720(a)(4)]

This Closure Plan has been prepared to meet the requirements of Ill. Adm. Code Title 35 845.720(a).

Joshua D. Davenport, P.E.
Illinois Professional Engineer



ATTACHMENT 11
POST-CLOSURE PLAN

Attachment 11 – No Attachment

<u>ATTACHMENT 12</u>
<u>LINER CERTIFICATION</u>

Powerton Metal Cleaning Basin

Darcy's Law for Gravity Flow through Porous Media

Q/A = q = k((h/t)+1)

Q= flow rate (cubic centimeters/second)

A = Surface area of the liner (squared centimeters)

q = flow rate per unit area (cubic centimeters/second/squared centimeter)

k = hydraulic conductivity of the liner (centimeters/second)

h = hydraulic head above the liner (centimeters)

t = thickness of the liner (centimeters)

Section 845.400(c) Comparison Flow Rate

Q/A = q = k((h/t)+1)

Q= calculated

A = 41013.2 ft^2 = 38102509.6 cm^2 Based on surface area at toe of embankment

q = calculated

k = 1.00E-07 cm/s

h = 7.5 ft = 228.6 cm

t = 2 ft = 60.96 cm

Q = 1.00E-07 (228.6 / 60.96 +1) * 38,102,509.60

Q = 18.10 cm^3/s Compare to Surface Impoundment Flow Rate

Pond Profile

Layers	Depth (ft)	Elevation(ft msl) From	To	Layer Description	Permeability (cm/s)	Layer Thickness (inch)	Layer Thickness (cm)	Product of Permeability & Layer Thickness
Pond	0	468	457.5	Pond embankment crest	--	--	--	--
	10.5	457.5	457.5	Pond bottom	--	--	--	--
Upper Liner Component	10.5-10.56	457.5	457.44	60-mil HDPE geomembrane	1E-11	0.06	0.1524	1.524E-12
Lower Liner Component	10.56'-11.56'	457.44	456.44	Poz-O-Pac	3.12E-05	12	30.48	9.51E-04
	11.56'-15'	456.44	453	sand with silt and gravel, dark brown and black, some cinders, metal shavings	1.27E-02	41.28	104.8512	1.33E+00

Totals	135.4836	1.33E+00

Permeability (weighted) = 9.80E-03

Powerton Metal Cleaning Basin *Flow Rate Calculation*

Q/A = q = k((h/t)+1)

Q= calculated

A = 41013.2 ft^2 = 38,102,509.60 cm^2 Based on surface area at toe of embankment

q = calculated

k = 9.80E-03 cm/s

h = 7.5 ft = 228.6 cm

t = 4.5 ft = 137.16 cm

Q = 9.80E-03 (228.6 / 137.16 +1) * 38,102,509.60

Q = 995,430.13 cm^3/s Compare to Section 845.400(c) Comparison Flow Rate

Comparison of Surface Impoundment Flow Rate vs Section 845.400(c) Flow Rate

Is the Surface Impoundment Flow Rate of 995,430.13 less than the Section 845.400(c) Comparison Flow Rate of 18.10 **NO**

ATTACHMENT 13
HISTORY OF KNOWN EXCEEDANCES

Attachment 13 – No Attachment

ATTACHMENT 14
FINANCIAL ASSURANCE

CERTIFICATION
35 Ill. Adm. Code 845 Subpart I

In accordance with Section 35 Ill. Adm. Code 845.230(a)(17), Midwest Generation, LLC meets the financial assurance requirements of 35 Ill. Adm. Code 845 Subpart I: Financial Assurance for the Powerton Generating Station. The performance bond is attached.

PERFORMANCE BOND

Date bond executed:	06/21/2021

Effective date:	06/21/2021

Principal:	NRG Energy, Inc. on behalf of Midwest Generation, LLC

Type of organization:	Corporation

State of incorporation:	Delaware

Surety:	Arch Insurance Company

Site Powerton

Name	Powerton Generating Station

Address	13082 E. Manito Road

City	Pekin, IL 61554

Amount guaranteed by this bond:	$11,951,599.78		

Name	

Address	

City	

Amount guaranteed by this bond:	$		

Please attach a separate page if more space is needed for all sites.

Total penal sum of bond:	$ 11,951,599.78	

Surety's bond number:	SU1174124	

The Principal and the Surety promise to pay the Illinois Environmental Protection Agency ("IEPA") the above penal sum unless the Principal or Surety provides closure and post-closure care for each site in accordance with the closure and post-closure care plans for that site. To the payment of this obligation the Principal and Surety jointly and severally bind themselves, their heirs, executors, administrators, successors and assigns.

Whereas the Principal is required, under Section 21(d) of the Environmental Protection Act [415 ILCS 5/21(d)], to have a permit to conduct a waste disposal operation;

Whereas the Principal is required, under Section 21.1 of the Environmental Protection Act [415 ILCS 5/21.1], to provide financial assurance for closure and post-closure care;

Whereas the Surety is licensed by the Illinois Department of Insurance or is licensed to transact the business of insurance, or approved to provide insurance as an excess or surplus lines insurer, by the insurance department in one or more states; and

Whereas the Principal and Surety agree that this bond shall be governed by the laws of the State of Illinois;

The Surety shall pay the penal sum to the IEPA or provide closure and post-closure care in accordance with the closure and post-closure care plans for the site if, during the term of the bond, the Principal fails to provide closure or post-closure care for any site in accordance with the closure and post-closure care plans for that site as guaranteed by this bond. The Principal fails to so provide when the Principal:

a) Abandons the site;

b) Is adjudicated bankrupt;

c) Fails to initiate closure of the site or post-closure care when ordered to do so by the Illinois Pollution Control Board or a court of competent jurisdiction;

d) Notifies the IEPA that it has initiated closure, or initiates closure, but fails to close the site or provide post-closure care in accordance with the closure and post-closure care plans; or

e) Fails to provide alternate financial assurance and obtain the IEPA written approval of the assurance provided within 90 days after receipt by both the Principal and the IEPA of a notice from the Surety that the bond will not be renewed for another term.

The Surety shall pay the penal sum of the bond to the IEPA or notify the IEPA that it intends to provide closure and post-closure care in accordance with the closure and post-closure care plans for the site within 30 days after the IEPA mails notice to the Surety that the Principal has met one or more of the conditions described above. Payment shall be made by check or draft payable to the State of Illinois, Landfill Closure and Post-Closure Fund.

If the Surety notifies the IEPA that it intends to provide closure and post-closure care, then the Surety must initiate closure and post-closure care within 60 days after the IEPA mailed notice to the Surety that the Principal met one or more of the conditions described above. The Surety must complete closure and post-closure care in accordance with the closure and post-closure care plans, or pay the penal sum.

The liability of the Surety shall not be discharged by any payment or succession of payments unless and until such payment or payments shall amount in the aggregate to the penal sum of the bond. In no event shall the obligation of the Surety exceed the amount of the penal sum.

This bond shall expire on the __21st day of June__________, 2022 [date]; but such expiration date shall be automatically extended for a period of One [at least one year] on __21st day of June, 2022____ [date] and on each successive expiration date, unless, at least 120 days before the current expiration date, the Surety notifies both the IEPA and the Principal by certified mail that the Surety has decided not to extend the term of this surety bond beyond the current expiration date. The 120 days will begin on the date when both the Principal and the IEPA have received the notice, as evidenced by the return receipts.

The Principal may terminate this bond by sending written notice to the Surety; provided, however, that no such notice shall become effective until the Surety receives written authorization for termination of the bond from the IEPA in accordance with 35 Ill. Adm. Code 807.604.

In Witness Whereof, the Principal and Surety have executed this Performance Bond and have affixed their seals on the date set forth above.

The persons whose signatures appear below certify that they are authorized to execute this surety bond on behalf of the Principal and Surety and that the wording of this surety bond is identical to the wording specified in 35 Ill. Adm. Code 807.Appendix A, Illustration D as such regulation was constituted on the date this bond was executed.

Principal: NRG Energy, Inc. on behalf of Midwest Generation, LLC		Corporate Surety		
Signature		Name: Arch Insurance Company		
Typed Name [illegible]		Address: Harborside 3, 210 Hudson Street, Suite 300, Jersey City, NJ 07311-1107		
Title Vice President		State of Incorporation: Missourt		
Date 6/21/2021		Signature		
		Typed Name: Mark W. Edwards, II		
		Title-Attorney-in-Fact		
Corporate seal		Corporate seal		
		Bond premium:	$	83,662.00

(Source: Amended at 35 Ill. Reg. 18867, effective October 24, 2011)

Section 807.APPENDIX A Financial Assurance Forms

This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated. Not valid for Note, Loan, Letter of Credit, Currency Rate, Interest Rate or Residential Value Guarantees.

POWER OF ATTORNEY

Know All Persons By These Presents:

That the Arch Insurance Company, a corporation organized and existing under the laws of the State of Missouri, having its principal administrative office in Jersey City, New Jersey (hereinafter referred to as the "Company") does hereby appoint:

Alisa B. Ferris, Anna Childress, Jeffrey M. Wilson, Mark W. Edwards II, Richard H. Mitchell, Robert R. Freel and William M. Smith of Birmingham, AL (EACH)

R. E. Daniels and Shelby E. Daniels of Pensacola, FL (EACH)

its true and lawful Attorney(s)in-Fact, to make, execute, seal, and deliver from the date of issuance of this power for and on its behalf as surety, and as its act and deed:
Any and all bonds, undertakings, recognizances and other surety obligations, in the penal sum not exceeding Ninety Million Dollars ($90,000,000.00).
This authority does not permit the same obligation to be split into two or more bonds In order to bring each such bond within the dollar limit of authority as set forth herein.

The execution of such bonds, undertakings, recognizances and other surety obligations in pursuance of these presents shall be as binding upon the said Company as fully and amply to all intents and purposes, as if the same had been duly executed and acknowledged by its regularly elected officers at its principal administrative office in Jersey City, New Jersey.

This Power of Attorney is executed by authority of resolutions adopted by unanimous consent of the Board of Directors of the Company on December 10, 2020, true and accurate copies of which are hereinafter set forth and are hereby certified to by the undersigned Secretary as being in full force and effect:
"**VOTED**, That the Chairman of the Board, the President, or the Executive Vice President, or any Senior Vice President, of the Surety Business Division, or their appointees designated in writing and filed with the Secretary, or the Secretary shall have the power and authority to appoint agents and attorneys-in-fact, and to authorize them subject to the limitations set forth in their respective powers of attorney, to execute on behalf of the Company, and attach the seal of the Company thereto, bonds, undertakings, recognizances and other surety obligations obligatory in the nature thereof, and any such officers of the Company may appoint agents for acceptance of process."

This Power of Attorney is signed, sealed and certified by facsimile under and by authority of the following resolution adopted by the unanimous consent of the Board of Directors of the Company on December 10, 2020:

VOTED, That the signature of the Chairman of the Board, the President, or the Executive Vice President, or any Senior Vice President, of the Surety Business Division, or their appointees designated in writing and filed with the Secretary, and the signature of the Secretary, the seal of the Company, and certifications by the Secretary, may be affixed by facsimile on any power of attorney or bond executed pursuant to the resolution adopted by the Board of Directors on December 10, 2020, and any such power so executed, sealed and certified with respect to any bond or undertaking to which it is attached, shall continue to be valid and binding upon the Company. **In Testimony Whereof**, the Company has caused this instrument to be signed and its corporate seal to be affixed by their authorized officers, this **23rd day of April, 2021**.

Attested and Certified

Arch Insurance Company CORPORATE SEAL 1971 Missouri

Arch Insurance Company

Regan A. Shulman, Secretary

Stephen C. Ruschak, Executive Vice President

STATE OF PENNSYLVANIA SS
COUNTY OF PHILADELPHIA SS

I, **Michele Tripodi**, a Notary Public, do hereby certify that Regan A. Shulman and Stephen C. Ruschak personally known to me to be the same persons whose names are respectively as Secretary and Executive Vice President of the Arch Insurance Company, a Corporation organized and existing under the laws of the State of Missouri, subscribed to the foregoing instrument, appeared before me this day in person and severally acknowledged that they being thereunto duly authorized signed, sealed with the corporate seal and delivered the said instrument as the free and voluntary act of said corporation and as their own free and voluntary acts for the uses and purposes therein set forth.

COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
MICHELE TRIPODI, Notary Public
City of Philadelphia, Phila. County
My Commission Expires July 31, 2021

Michele Tripodi, Notary Public
My commission expires 07/31/2021

CERTIFICATION

I, **Regan A. Shulman**, Secretary of the Arch Insurance Company, do hereby certify that the attached **Power of Attorney dated April 23, 2021** on behalf of the person(s) as listed above is a true and correct copy and that the same has been in full force and effect since the date thereof and is in full force and effect on the date of this certificate; and I do further certify that the said Stephen C. Ruschak, who executed the Power of Attorney as Executive Vice President, was on the date of execution of the attached Power of Attorney the duly elected Executive Vice President of the Arch Insurance Company.
IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed the corporate seal of the Arch Insurance Company on this 21st day of June, 20 21.

Regan A. Shulman, Secretary

This Power of Attorney limits the acts of those named therein to the bonds and undertakings specifically named therein and they have no authority to bind the Company except in the manner and to the extent herein stated.

PLEASE SEND ALL CLAIM INQUIRIES RELATING TO THIS BOND TO THE FOLLOWING ADDRESS:
Arch Insurance – Surety Division
3 Parkway, Suite 1500
Philadelphia, PA 19102

Arch Insurance Company CORPORATE SEAL 1971 Missouri

To verify the authenticity of this Power of Attorney, please contact Arch Insurance Company at SuretyAuthentic@archinsurance.com
Please refer to the above named Attorney-in-Fact and the details of the bond to which the power is attached.

ATTACHMENT 15
HAZARD POTENTIAL CLASSIFICATION ASSESSMENT

HAZARD POTENTIAL CLASSIFICATION ASSESSMENT REPORT
METAL CLEANING BASIN
POWERTON STATION
SEPTEMBER 2021

This initial Hazard Potential Classification Assessment Report has been prepared pursuant to the coal combustion residuals (CCR) rule codified in Title 35 of the Illinois Administrative Code, Section 845.440(a) effective as of April 21, 2021, for the Metal Cleaning Basin (Basin) at Powerton Station in Pekin, Illinois (Station). The purpose of this project is to perform the hazard potential classification assessment by a licensed professional engineer to document the hazard potential classification as either a Class 1 or a Class 2 surface impoundment including the basis for the determination. Civil & Environmental Consultants, Inc. (CEC) completed this hazard potential classification assessment by considering the possible adverse incremental consequences that result from the release of water or stored contents due to failure of the diked section or mis-operation of the diked basin or its appurtenances. The hazardous potential classifications considered include either Class 1 or Class 2, defined as follows:

Class 1: CCR surface impoundment means a diked surface impoundment where failure or mis-operation will probably cause loss of human life.

Class 2: CCR surface impoundment means a diked surface impoundment where failure or mis-operation results in no probable loss of human life, but can cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns.

The following sections provide a description of physical and operational features followed by an evaluation of potential failure scenarios that show the Basin is a Class 2 CCR surface impoundment.

1.0 SITE DESCRIPTION

The Basin is located at Powerton Station (Station) in Pekin, Illinois, situated northeast of the main power building, south of the Wastewater Building and between the Ash Surge Basin and former Cooling Water Intake Channel, see Figure 1. Measuring 422 feet long and 192 feet wide, the Basin is lined with a 60 mil high-density polyethylene liner. Gravel access roads are located along the north, east, and west sides.

The Basin is a partially incised impoundment with the north, south, and east boundary of the Basin at grade. The west boundary of the Basin is constructed with an earthen embankment. As shown in Figure 1, the former cooling water intake channel is located approximately 75 feet west of the

Basin. Except for an above grade pipe rack and piping, the area between the Basin and former intake channel has no structures or buildings.

Based on information provided by station personnel, the Basin was approved for construction in 1977 and constructed shortly thereafter. Although relined in 2009, the Basin has not undergone significant changes in the geometry. The original operation of the Metal Cleaning Waste System was to collect wash water from the air heaters and boilers, transport the wash water to the metal cleaning waste basin and treat the basin discharge for the removal of dissolved metals and suspended solids to produce an acceptable effluent for discharge to the Ash Surge Basin under the Station's National Pollutant Discharge Elimination System (NPDES) permit. Solids that settle in the Basin are periodically hauled off-site.

Operation of the Basin has changed to also periodically receive dry bottom ash and fly ash from maintenance activities into the Basin for temporary storage. Wastewater is periodically pumped from the Basin (when dry ash is not in the Basin), treated to remove dissolved metals and suspended solids, and discharged into the Ash Surge Basin under the Station's NPDES permit. Other than boiler wastes and precipitation falling on the Basin, the Basin has no inflow. The Basin is inspected weekly by the environmental specialist including checking that the water level is maintained no higher than the weir elevation, which represents approximately 2 feet of water depth.

2.0 FAILURE EVALUATION

To evaluate the Basin hazard classification, impacts as a result of failure or mis-operation of the Basin were evaluated. The following features were considered in the determining the classification.

- Relatively small in size, the volume of water and ash is controlled at low levels through continued maintenance and inspection.
- Other than boiler wash and precipitation falling on the Basin, the Basin has no inflow.
- A flexible membrane liner prevents water from seeping through the earthen embankment thereby preventing potential failure due to loss of embankment through piping.
- The north, south and east sides are incised and not susceptible to a release from the Basin due to catastrophic failure or mis-operation.
- The west side is constructed with an earthen embankment. In the event of catastrophic failure or mis-operation, the downstream inundation area between the Basin and former intake channel have no buildings and is infrequently entered.
- In the event of catastrophic failure or mis-operation, the downstream inundation area is within the former intake channel and fully contained on uninhabited areas on the Powerton Station property.

3.0 HAZARD POTENTIAL CLASSIFICATION ASSESSMENT

Based on our assessment of the Basin and surrounding site features, the Basin can be classified as a Class 2 CCR surface impoundment. Potential downstream inundation areas that could be impacted by a failure or mis-operation the Basin have no buildings and are only occasionally accessed for mowing and inspection purposes that result in no probable loss of human life. Potential economic loss, environmental damage, disruption of lifeline facilities, and impact other concerns are allowed under this classification.

4.0 LIMITATIONS AND CERTIFICATION

This Initial Hazard Potential Classification Assessment Report has been prepared pursuant to the CCR rule codified in Title 35 of the Illinois Administrative Code, Section 845.440(a) and was prepared under the direction of Mr. M. Dean Jones, P.E.

By affixing my seal to this, I do hereby certify to the best of my knowledge, information, and belief that the information contained in this report is true and correct. I further certify I am licensed to practice in the State of Illinois and that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment.

Seal:

Signature: ______________________

Name: M. Dean Jones, P.E.

Date of Certification: September 22, 2021

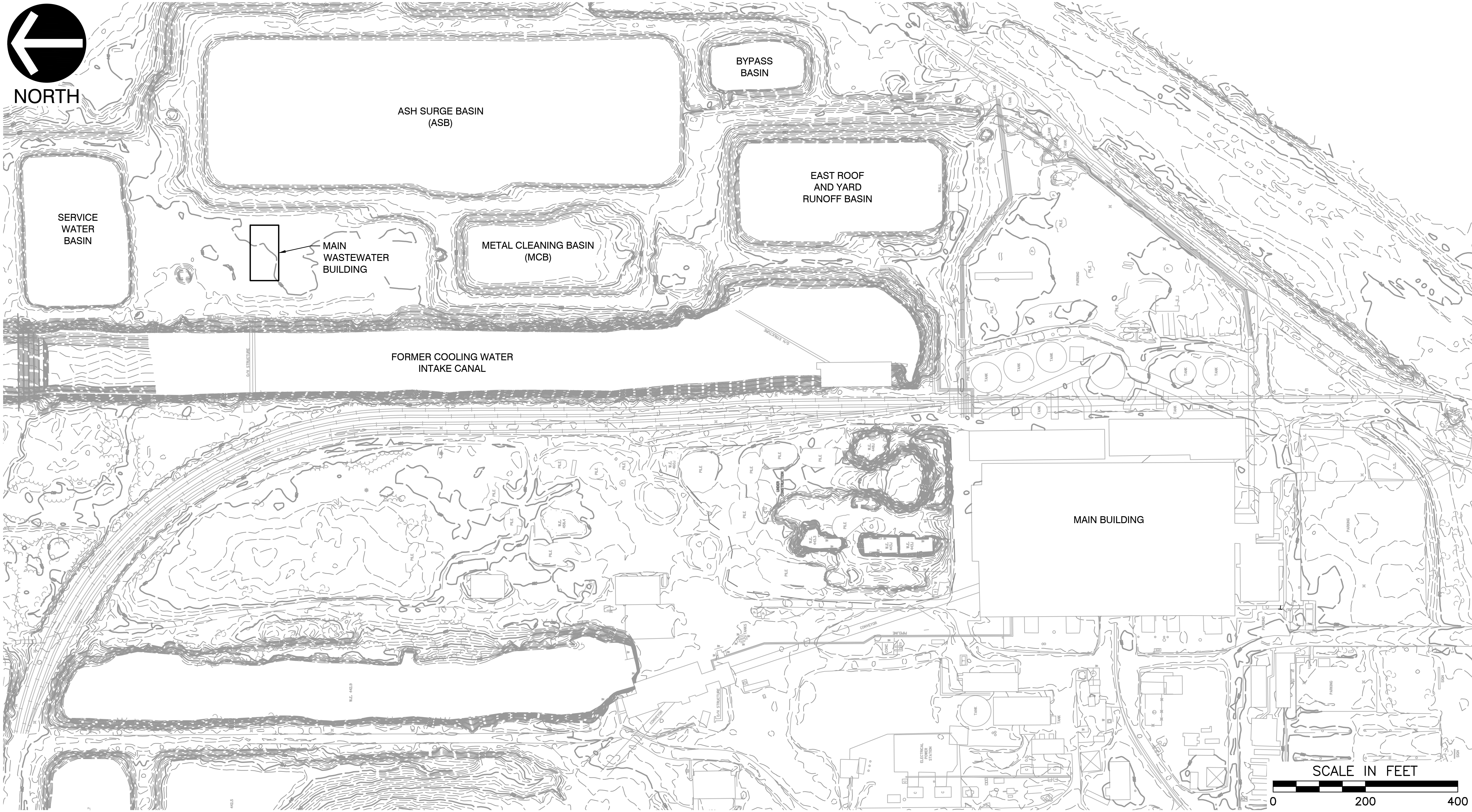
Illinois Professional Engineer No.: 062-051317

Expiration Date: November 30, 2021

Enclosure: Figure 1 - Site Plan

FIGURE 1

SITE PLAN



P:\310-000\312-192\-CADD\Dwg\CV02 Powerton - MCB\312192-CV02-MCB Site Map.dwg{LAYOUT1} LS:(9/23/2021 - ccase) - LP: 9/29/2021 2:23 PM

REFERENCE

1. TOPOGRAPHIC INFORMATION SOUTH OF SECONDARY ASH SETTLING BASIN AND FAB IS BASED ON AERIAL SURVEY PERFORMED BY AEROMETRIC, INC. DATED JUNE 19, 2008. TOPOGRAPHIC INFORMATION NORTH OF ASH SURGE BASIN IS BASED ON SURVEY BY RIDGELINE CONSULTANTS, PERFORMED IN FEBRUARY AND MARCH, 2016.

*HAND SIGNATURE ON FILE

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630-963-6026 · 877-963-6026
www.cecinc.com

MIDWEST GENERATION LLC
POWERTON STATION
METAL CLEANING BASIN HAZARD POTENTIAL
PEKIN, TAZEWELL COUNTY, ILLINOIS

SITE PLAN

DRAWN BY: CAC	CHECKED BY:	MDJ	APPROVED BY:	MDJ*	FIGURE NO.:	
DATE: SEPTEMBER 2021	DWG SCALE:	1"=200'	PROJECT NO:	312-192		1

ATTACHMENT 16
STRUCTURAL STABILITY ASSESSMENT

STRUCTURAL STABILITY AND FACTOR OF SAFETY ASSESSMENT
METAL CLEANING BASIN
POWERTON STATION
JUNE 2021

This report has been prepared for the Metal Cleaning Basin (herein referred to as the Basin) at Powerton Station pursuant to Sections 845.450 Structural Stability Assessment and 845.460 Safety Factor Assessment of Title 35 Subtitle G Subchapter I Subchapter j Coal Combustion Waste Surface Impoundments. The purpose of this project is to perform the initial structural stability and factor of safety assessments for the Basin by a licensed professional engineer. Civil & Environmental Consultants, Inc. (CEC) completed this structural stability and factor of safety assessment as described in the following sections.

1.0 REGULATION REQUIREMENTS 845.450 AND 845.460

In accordance with Sections 845.450 and 845.460, owners or operator of a coal combustion residuals (CCR) impoundment are required to conduct initial and annual structural stability assessments to 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; and 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.

2.0 SITE CONDITIONS

The Basin is located at Powerton Station in Pekin, Illinois situated northeast of the main power building, south of the Wastewater Building and between the Ash Surge Basin and former Cooling Water Intake Canal, See Figure 1. Measuring 450 feet long and 225 feet wide, approximately 2.3 acres in size, the Basin is lined with a 60-mil high-density polyethylene (HDPE) liner. Gravel access roads are located along the north, east, and west sides.

Based on information provided by station personnel, the Basin was constructed in the late 1970s or early 1980s, and has not undergone significant changes in the geometry. The original operation was designed to receive bottom ash and, twice a year, boiler wash via sluicing with wastewater treated in the wastewater treatment plant. Operation of the basin has changed to also receive bottom ash and fly ash by end dumping into the basin. Wastewater is periodically pumped from the Basin, treated to remove elevated metal concentrations, and discharged into the Ash Surge Basin. The Basin is inspected weekly by the environmental specialist including checking water level in the Basin.

3.0 STRUCTURAL STABILITY ASSESSMENT - SECTION 845.540

The following sections describe the structural stability assessment.

3.1 Stable Foundation and Abutments - 845.450(a)(1)

This assessment indicates the soils forming the Basin foundation are stable. Soils data from within the vicinity of the Basin shows up to 28 feet of clay soils overlying approximately 35 to 40 feet of loose to very dense poorly graded sand and silty sand with some gravel. Soil data developed from soil borings completed for this assessment are consistent with the above soil descriptions.

Inspection of the Basin did not show signs of distress due to settlement of the underlying foundation soils. Furthermore both elastic settlement and primary consolidation settlement of the underlying soils would have occurred soon after construction of the basin in the late 1970s or early 1980s, and the secondary consolidation settlement, which would have been expected to be minimal considering the type of soils and associated loading, would also have occurred. Without significant changes in the operation of the Basin that would significantly increase loading on the foundation material, there should be no significant settlement of the foundation soils.

The Basin is partially incised and supported by earthen embankment on the west. This type of basin constructed with earthen berms does not require abutments, and therefore consideration of abutment design, construction, and operation is not required.

3.2 Adequate Slope Protection - 845.450(a)(2)

The Basin is constructed with a 60-mil HDPE liner that provides adequate protection of the interior slopes against surface erosion, wave action, and adverse effects of sudden drawdown.

3.3 Dike Compaction - 845.450(a)(3)

As-built construction documents for the Basin are unavailable. It would be standard practice for the dikes to be mechanically compacted to a density sufficient to withstand the range of loading conditions in the Basin. This is supported by the consideration that the Basin has been in operation since the 1980s, and that the station has no record of observed distress or repair. Furthermore, the initial inspection of the dike did not shows signs of distress that would be indicative of improperly placed and/or loosely compacted soils.

3.4 Downstream Slope Protection - 845.450(a)(4)

Consistent with Section 845.430, the Basin slope protection consists of vegetative cover over the downstream slopes and pertinent surrounding areas. Inspection shows the grassy vegetation is well maintained; protective against surface erosion, wave action, and adverse effect of rapid drawdown; easily observable and accessible; and free of woody vegetation. At the time of inspection, the vegetation did not exceed 12 inches in height.

3.5 Spillway - 845.450(a)(5)

Section 845.450 specifies a single spillway or a combination of spillways configured as specified in subsection (a)(5)(A) and that the combined capacity of all spillways must be designed, constructed, operated, and maintained to adequately manage flow during and following the peak discharge from the event specified in subsection (a)(5)(B). Our inspection shows the Basin was designed and has been operated without an emergency spillway.

Although the Basin has been designed, constructed and operated for more than forty years without an emergency spillway, and the basin is inspected weekly by the environmental specialst with the intent to maintain the water level no higher than the weir elevation, not having an emergency spillway is considered a deficiency in accordance with the Section 845.450(a)(5).

3.6 Structural Integrity Of Hydraulic Structures - 845.450(a)(6)

A hydraulic structure, 24-inch pipe, passes through the dike between the north, incised end of the Basin and the Basin Discharge Sump. At the time of our inspection, the water level in the Basin was over the top of the pipe and a thorough inspection could not be conducted. Evidence showing the structural integrity of the pipe free of significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, and debris could not be made. At the time of this report, inspection report for the pipe were unavailable.

3.7 Down Stream Slopes Adjacent To Water Bodies - 845.450(a)(7)

The former Cooling Water Intake is downstream of the Basin and a stability analysis was performed for both a low pool and rapid draw down condition. Stability analysis shows that the embankment is designed and constructed to maintain stability during both low pool and rapid draw down conditions.

3.8 Structural Stability Assessment Deficiencies

Structural deficiencies associated with the Basin were identified in the initial structural stability assessment, and the following corrective actions are required:

1) The Basin has been designed, constructed, and operated for more than forty years without an emergency spillway. Furthermore the basin is inspected weekly by the environmental specialist, who observes the water level in the pond with the intent to maintain the water level no higher than the weir elevation (approximately 658.0 mean sea level). Although the basin is out of compliance with Section 845.450, the probability of storm water over flowing the basin dike is low.

2) The 24-inch diameter pipe between Basin and the Discharge Sump could not be inspected for signs of distress at the time of inspection. Although our inspection did not identify distress that would suggest the existence of a structural deficiency, the 24-inch diameter pipe should be inspected in accordance with 845.450(a)(6).

3.9 Annual Inspection Requirement

In completing the structural stability assessment, the Basin was inspected for signs of distress that would have the potential to disrupt operation and safety. This inspection can suffice for the 2021 inspection.

4.0 SAFETY FACTOR ASSESSMENT - SECTION 845.460

In accordance with Section 845.460, the owner or operator of a CCR surface impoundment must conduct initial and annual safety factor assessments 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. The critical cross section is the cross section anticipated to be the most susceptible of all cross sections to structural failure based on appropriate engineering considerations, including loading conditions. The safety factor assessments must be supported by appropriate engineering calculations.

4.1 Slope Stability Methodology

Slope stability software Slide2 was used to calculate the minimum factor of safety (FS) at Cross Section A-A. The program uses 2D limit equilibrium methods to determine the minimum FS against slope instability. The auto-refine, non-circular search method with optimization was used utilizing Spencer's method to calculate the FS for each design criteria scenario, as discussed below. For each section analyzed, the program searches for the sliding surface that procures the lowest FS which is defined as the ratio of the shear forces and moment resisting movement along the sliding surface to the forces and moments driving the instability.

Soil data obtained by CEC and supplemented with available soil information provided by the Station was used to develop soil properties for the slope stability analysis. The soil properties were confirmed and modified using the subsurface data obtained by CEC in 2021. The data shows the soil materials in the vicinity of the Basin consists of up to 28 feet of clay soils overlying approximately 35 to 40 feet of loose to very dense, poorly graded sand and silty sand with some gravel.

4.2 Slope Stability Analysis - 845.460

Four cases were analyzed to satisfy the safety factor assessment as per Section 845.460(a)(2) through (a)(4).

4.2.1 Static, Long-Term - 845.460(a)(2)

The static, long-term condition with the maximum surcharge loading on the embankment was evaluated. The static, long-term analysis included a pool elevation at 458 feet mean sea level and a groundwater elevation at 440 feet mean sea level.

4.2.2 Static, Maximum Storage Pool - 845.460(a)(3)

The static, long-term, maximum storage pool condition with the maximum surcharge loading on the embankment was evaluated. The static, long-term analysis included a pool elevation set at the lowest points of the embankment crest, 466 feet mean sea level, and a groundwater elevation at 440 feet mean sea level.

4.2.3 Seismic - 845.460(a)(4)

Seismic analysis was performed by incorporating pseudo static seismic loading scenarios in the long-term global stability analysis calculations. A pseudo-static seismic horizontal load was applied to the long-term maximum storage pool loading condition model.

The seismic factor of safety is defined in the proposed CCR regulations as “the factor of safety (safety factor) determined using analysis under earthquake conditions using the peak ground acceleration (PGA) for a seismic event with a 2% probability of exceedance in 50 years, equivalent to a return period of approximately 2,500 years, based on the U.S. Geological Survey (USGS) seismic hazard maps for seismic events with this return period for the region where the CCR surface impoundment is located”.

4.2.4 Liquefaction - 845.460(a)(5)

For dikes constructed of soils susceptible to liquefaction, the calculated liquefaction factor of safety must equal or exceed 1.20. Soils with potential for liquefaction typically consist of poorly drained fine-grained soils. Soil borings indicate that the embankment for the Basin was constructed with a well-graded, well-drained sand with silt and gravel material, which is not typically susceptible to liquefaction. Additionally, the geomembrane liner system makes it unlikely the embankment would become saturated or inundated. Because the likelihood of liquefaction and associated shear strength loss of the embankment soils is very low, the liquefaction condition is represented by the static factor of safety analysis and a separate analyses was not performed.

4.3 Factor of Safety Assessment Results

Results of the slope stability analysis for the critical cross section of the Basin are summarized in Table 1, below, and presented in Figures 2, 3, and 4. The results meet the factor of safety requirements presented in 845.460(a)(2) through (4).

Table 1: Safety Factor Results

Loading Condition	Required FS	Calculated FS
Static, Long Term - 845.460(a)(2)	1.50	1.50
Static, Maximum Storage Pool - 845.460(a)(3)	1.40	1.50
Seismic - 845.460(a)(4)	1.00	1.28
Liquefaction - 845.460(a)(5)	1.20	>1.20

5.0 LIMITATIONS AND CERTIFICATION

This Initial Structural Stability and Factor of Safety Assessment was prepared to meet the requirements of Parts 845.450 and 845.460 of draft Title 35 Subtitle G Subchapter I Subchapter j Coal Combustion Waste Surface Impoundments, and was prepared under the direction of Mr. M. Dean Jones, P.E.

By affixing my seal to this, I do hereby certify to the best of my knowledge, information, and belief that the information contained in this report is true and correct. I further certify I am licensed to practice in the State of Illinois and that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment.

Seal:

MAURICE DEAN JONES, JR.
062-051317
REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS

Signature: ______________________

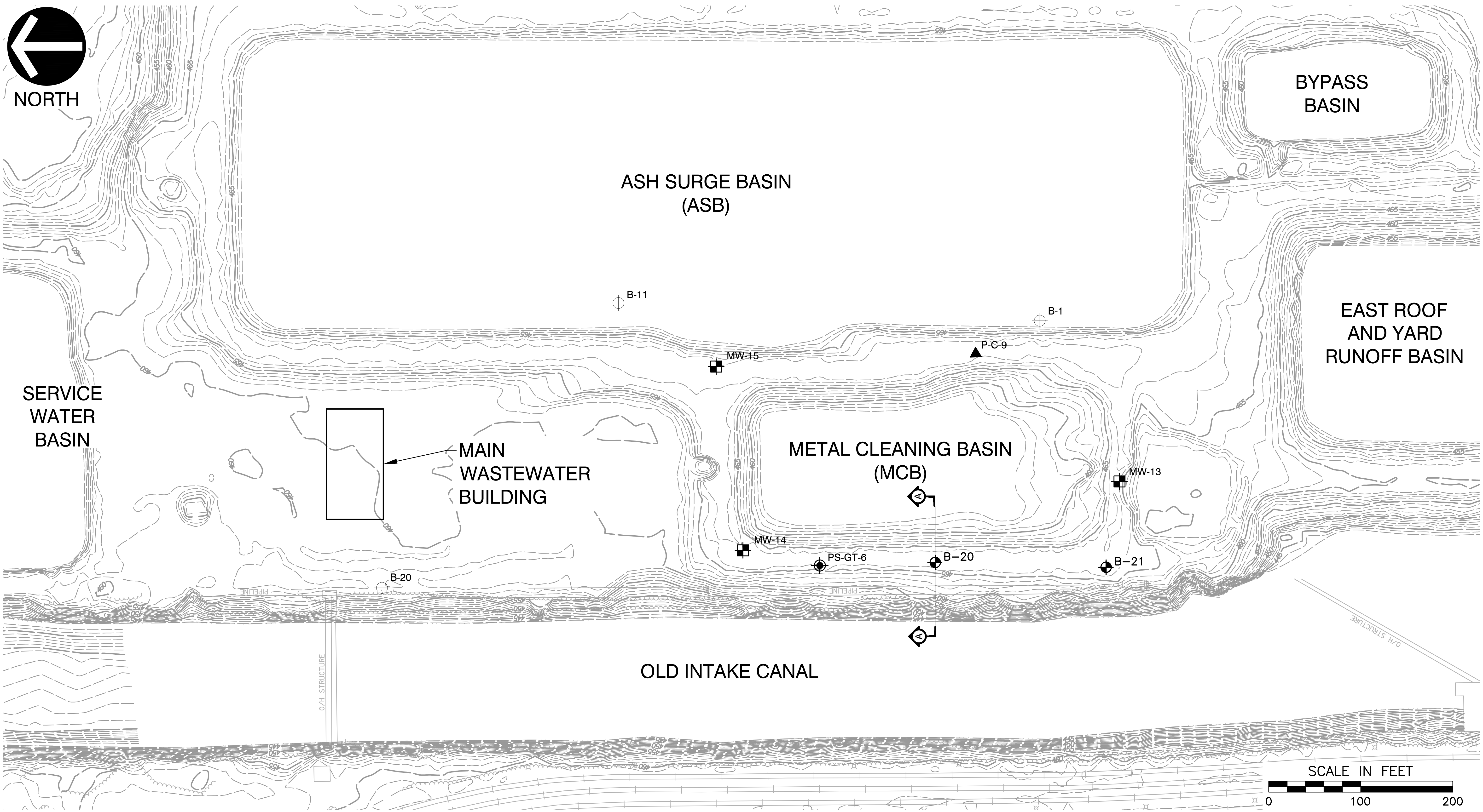
Name: M. Dean Jones, P.E.

Date of Certification: June 8, 2021

Illinois Professional Engineer No.: 062-051317

Expiration Date: November 30, 2021

FIGURES



REFERENCE

1. TOPOGRAPHIC INFORMATION SOUTH OF SECONDARY ASH SETTLING BASIN AND FAB IS BASED ON AERIAL SURVEY PERFORMED BY AEROMETRIC, INC. DATED JUNE 19, 2008. TOPOGRAPHIC INFORMATION NORTH OF ASH SURGE BASIN IS BASED ON SURVEY BY RIDGELINE CONSULTANTS, PERFORMED IN FEBRUARY AND MARCH, 2016.

LEGEND

- B-1 — APPROXIMATE SOIL BORING LOCATION (1978)
- P-C-9 — APPROXIMATE CPT SOUNDING LOCATION (GEOSYNTEC, 2016)
- B-21 — SOIL BORING LOCATION (2021)
- PS-GT-6 — APPROXIMATE SOIL BORING LOCATION (KPRG, 2005)
- MW-13 — APPROXIMATE EXISTING MONITORING WELL LOCATION (PATRICK, 2011)
- A–A — SLOPE STABILITY CROSS SECTION

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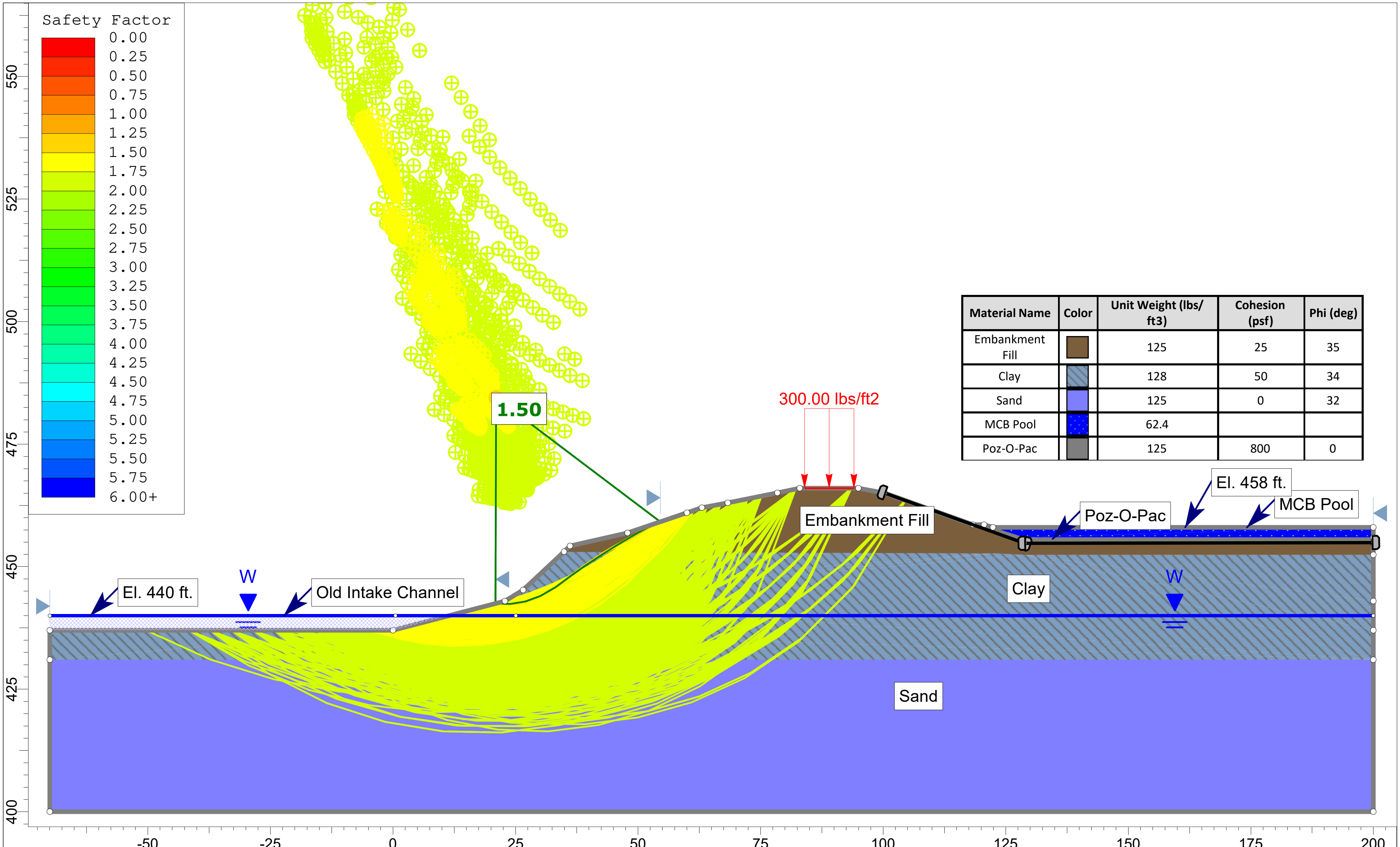
NRG/MIDWEST GENERATION LLC
POWERTON STATION
METAL CLEANING BASIN SLOPE STABILITY
PEKIN, TAZEWELL COUNTY, ILLINOIS

SITE PLAN WITH CROSS-SECTION

DRAWN BY: CAC	CHECKED BY: MDB	APPROVED BY: MDJ	FIGURE NO.:
DATE: 05/13/2021	DWG SCALE: 1"=60'	PROJECT NO: 310-533	1

P:\310-000\310-533\–CADD\Dwg\CV01\CV01 MCB Powerton\310533–CV01–MCB Site Map.dwg{LAYOUT1} LS:(5/13/2021 – ccase) – LP: 5/13/2021 2:10 PM



Material Name	Color	Unit Weight (lbs/ft3)	Cohesion (psf)	Phi (deg)
Embankment Fill		125	25	35
Clay		128	50	34
Sand		125	0	32
MCB Pool		62.4		
Poz-O-Pac		125	800	0

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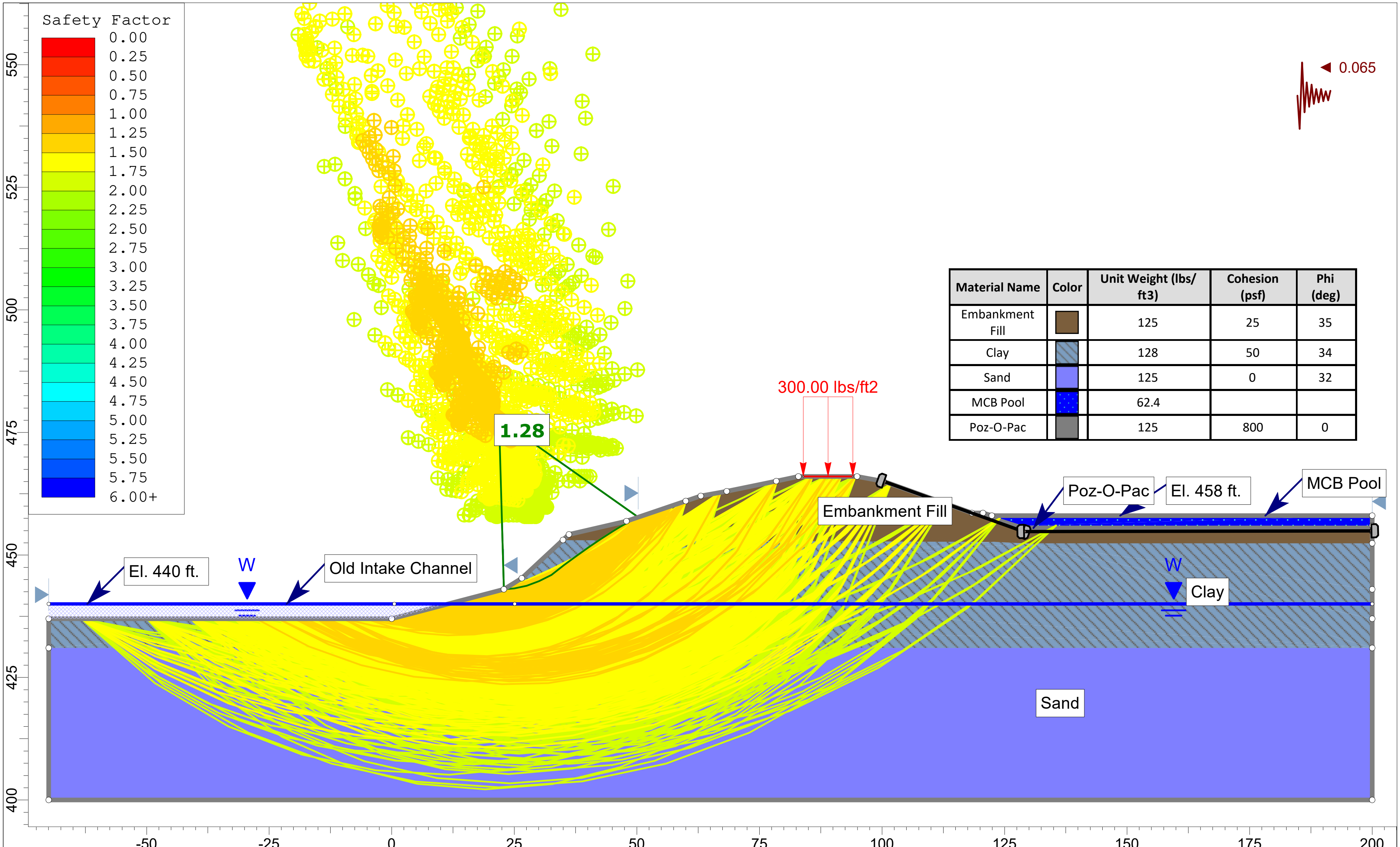
Civil & Environmental Consultants, Inc.

SLIDEINTERPRET 9.009

Project Metal Cleaning Basin Slope Stability Analysis			
Analysis Spencer	*Scale:* 1:325		*Scenario* Figure 2: Long-Term; Maximum Storage - Static
Drawn By CAC	*Checked By:* MDJ	*Approved By:* MDJ	*Company* Civil & Environmental Consultants, Inc.
Date 05/06/2021	*Date:* 05/19/2021	*Date:* 05/19/2021	*File Name* 310-533 MCB Slope Stability-long term.slmd



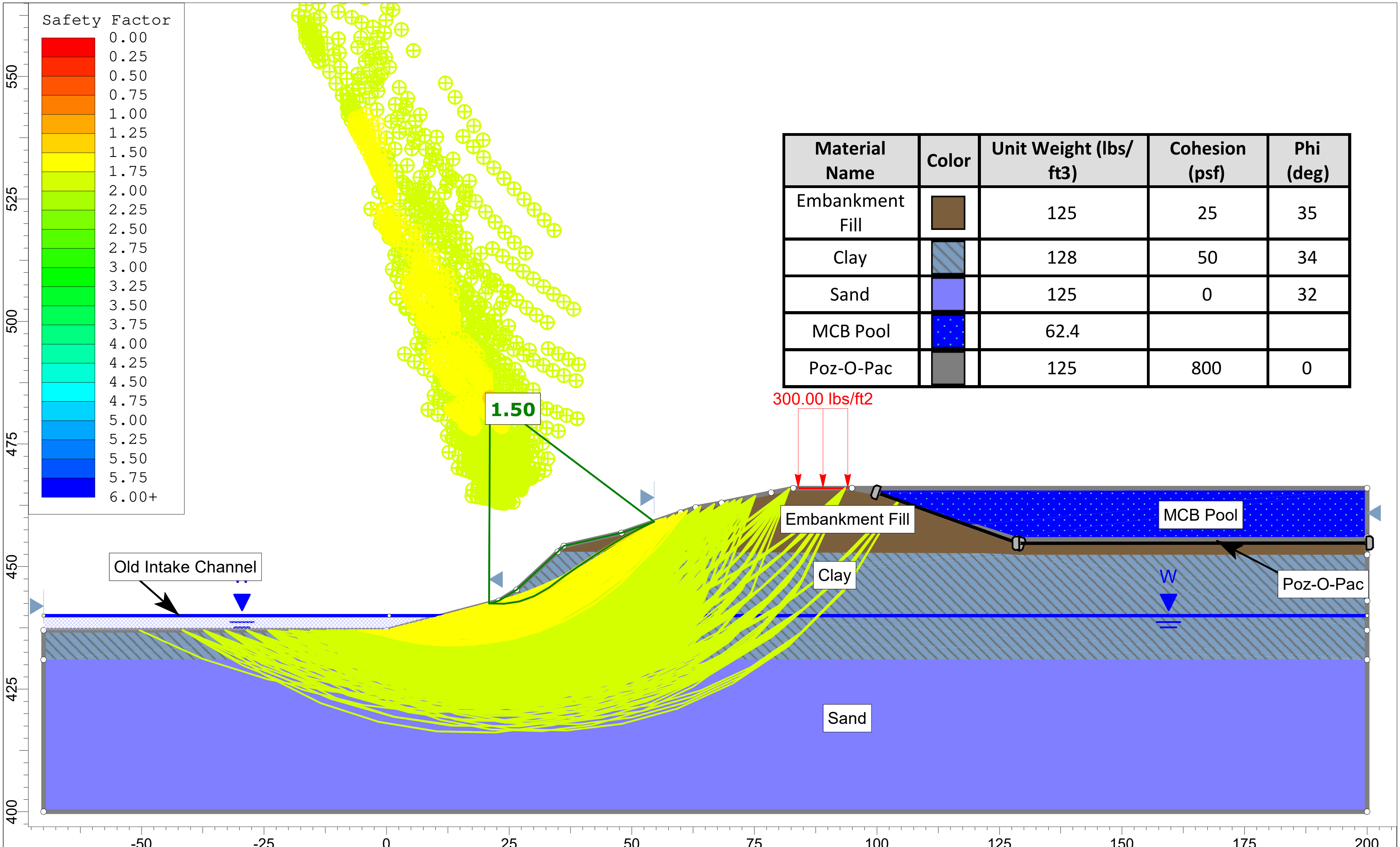
Material Name	Color	Unit Weight (lbs/ft3)	Cohesion (psf)	Phi (deg)
Embankment Fill		125	25	35
Clay		128	50	34
Sand		125	0	32
MCB Pool		62.4		
Poz-O-Pac		125	800	0

CEC

Civil & Environmental Consultants, Inc.

SLIDEINTERPRET 9.009

Project Metal Cleaning Basin Slope Stability Analysis			
Analysis Spencer	*Scale:* 1:325		*Scenario* Figure 3: Long-Term; Maximum Storage - Seismic
Drawn By CAC	*Checked By:* MDJ	*Approved By:* MDJ	*Company* Civil & Environmental Consultants, Inc.
Date 05/06/2021	*Date:* 05/19/2021	*Date:* 05/19/2021	*File Name* 310-533 MCB Slope Stability-long term.slmd



Material Name	Color	Unit Weight (lbs/ ft3)	Cohesion (psf)	Phi (deg)
Embankment Fill		125	25	35
Clay		128	50	34
Sand		125	0	32
MCB Pool		62.4		
Poz-O-Pac		125	800	0

CEC

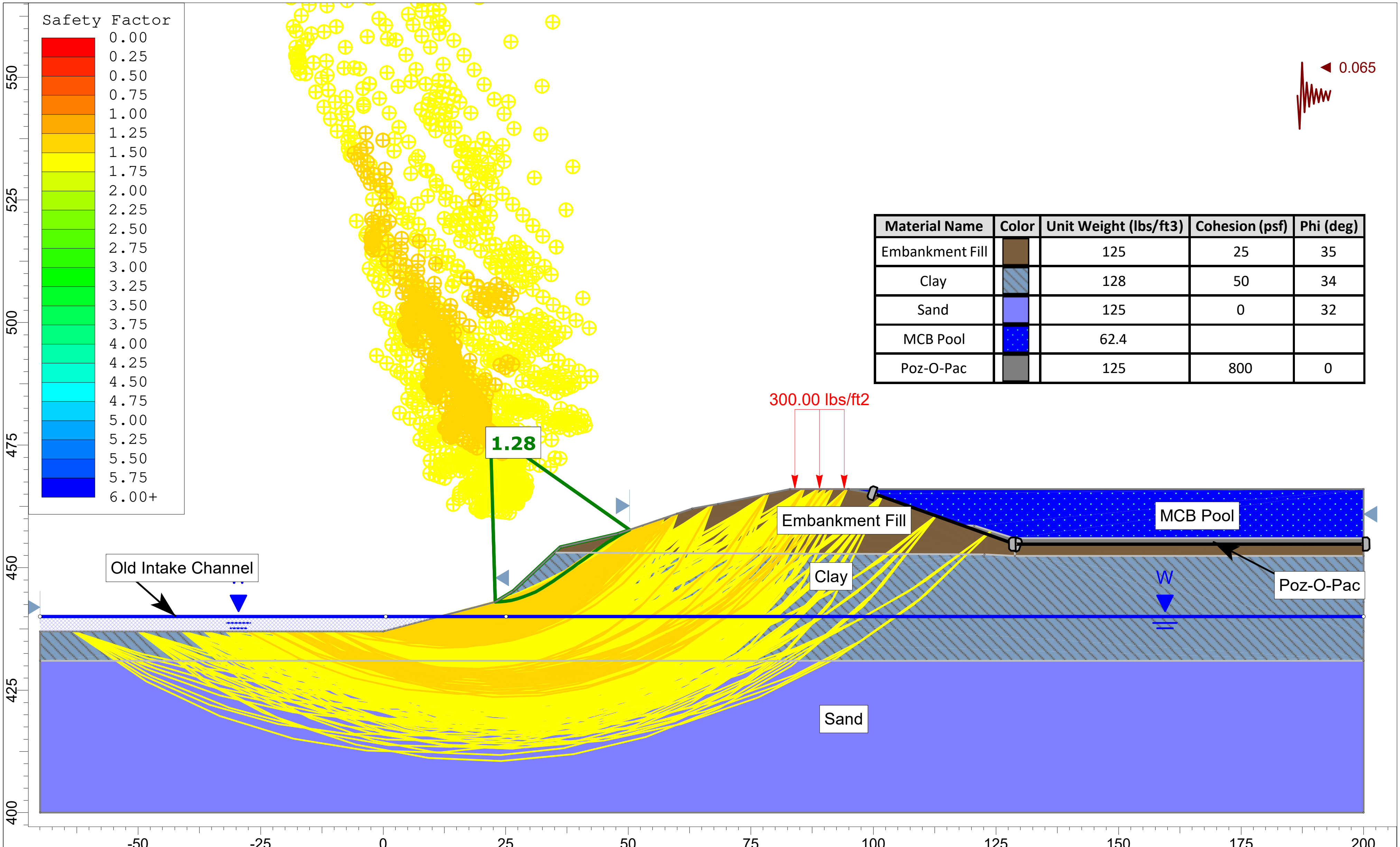
Civil & Environmental Consultants, Inc.

SLIDEINTERPRET 9.009

Project

Metal Cleaning Basin Slope Stability Analysis

Analysis	Spencer	*Scale:*	1:325	*Scenario*	Figure 4: Long-Term; Maximum Surcharge Pool - Static		
Drawn By	CAC	*Checked By:*	MDJ	*Approved By:*	MDJ	*Company*	Civil & Environmental Consultants, Inc.
Date	05/06/2021	*Date:*	05/19/2021	*Date:*	05/19/2021	*File Name*	310-533 MCB Slope Stability-long term.slmd



Material Name	Color	Unit Weight (lbs/ft3)	Cohesion (psf)	Phi (deg)
Embankment Fill		125	25	35
Clay		128	50	34
Sand		125	0	32
MCB Pool		62.4		
Poz-O-Pac		125	800	0

CEC
Civil & Environmental Consultants, Inc.

SLIDEINTERPRET 9.009

Project	**Metal Cleaning Basin Slope Stability Analysis**		
Analysis Spencer	*Scale:* 1:325	*Scenario* Figure 5: Long-Term; Maximum Surcharge Pool - Seismic	
Drawn By CAC	*Checked By:* MDJ	*Approved By:* MDJ	*Company* Civil & Environmental Consultants, Inc.
Date 05/06/2021	*Date:* 05/19/2021	*Date:* 05/19/2021	*File Name* 310-533 MCB Slope Stability-long term.slmd

ATTACHMENT 17
SAFETY FACTOR ASSESSMENT

Attachment 17 – No Attachment

ATTACHMENT 18
INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN

MWG

Midwest Generation, LLC

Powerton Generating Station

2022 Inflow Design Flood Control System Plan for Metal Cleaning Basin

Revision 0

March 29, 2022

Issue Purpose: Use

Project No.: 12661-130

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

Sargent & Lundy

TABLE OF CONTENTS

1.0 PURPOSE

The Metal Cleaning Basin at Midwest Generation, LLC's (MWG) Powerton Generating Station ("Powerton" or the "Station") is a basin that is regulated as an existing coal combustion residual (CCR) surface impoundment under the Illinois Pollution Control Board's "Standards for the Disposal of Coal Combustion Residuals in CCR Surface Impoundment." These regulations are codified in Part 845 to Title 35 of the Illinois Administrative Code (35 Ill. Adm. Code 845, Ref. 1) and are also referred to herein as the "Illinois CCR Rule." Pursuant to 35 Ill. Adm. Code 845.510(c)(1), MWG must prepare an inflow design flood control system plan that documents how the inflow design flood control systems for the Metal Cleaning Basin have been designed and constructed to meet the hydrologic and hydraulic capacity requirements for CCR surface impoundment promulgated by 35 Ill. Adm. Code 845.510.

This report documents the 2022 inflow design flood control system plan prepared in accordance with the Illinois CCR Rule by Sargent & Lundy (S&L) on behalf of MWG for the Metal Cleaning Basin at Powerton. This report:

- Lists the inputs and assumptions used to determine whether the Metal Cleaning Basin can manage the inflow design flood,
- Discusses the methodology used to determine whether the Metal Cleaning Basin can manage the inflow design flood, and
- Summarizes the results of the hydrologic and hydraulic calculations performed to support the conclusion of whether the Metal Cleaning Basin meet the hydrologic and hydraulic requirements for CCR surface impoundments promulgated by the Illinois CCR Rule.

2.0 INPUTS

Inflow Design Flood Control System

Powerton primarily uses the Metal Cleaning Basin for temporarily storing gas-side boiler cleaning wash water prior to treatment in the Station's Metal Cleaning Treatment System for the removal of dissolved metals and suspended solids. As shown on the as-built construction plans of the Metal Cleaning Basin in Appendix A, which depict how the basin was lined with its existing high-density polyethylene geomembrane liner circa 2011, wash water from the Station enters the basin via three concrete aprons along the basin's southern embankment. Effluent from the basin overflows a concrete weir wall at the northern end of the basin and flows into a 30-in.-diameter reinforced concrete pipe that discharges into a sump north of and adjacent to the basin. The Metal Cleaning Basin does not have an emergency spillway.

Inflow Design Flood Event

Per the basin's 2021 hazard potential classification assessment (Ref. 2), The Metal Cleaning Basin is classified as a Class 2 CCR surface impoundment pursuant to 35 Ill. Adm. Code 845.440(a)(1). Therefore, the inflow design flood event used in this hydrologic and hydraulic assessment of the Metal Cleaning Basin is based on the 1,000-year storm (Ref. 1, § 845.510(a)(3)). Per the National Oceanic and Atmospheric Administration's Atlas 14 (Ref. 3), the precipitation depth for the 1,000-year, 24-hour storm event at the Powerton site is 9.00 inches.

Site Topography

Topographic data for the Metal Cleaning Basin and the surrounding areas was obtained from Sheet No. C-020 in Appendix A.

Metal Cleaning Basin Conditions

The physical conditions for the Metal Cleaning Basin was based on discussions with MWG personnel and the as-built construction plans in Appendix A.

3.0 ASSUMPTIONS

There are no assumptions in this document that require verification.

4.0 HYDROLOGIC & HYDRAULIC ASSESSMENT

4.1 METHODOLOGY

PondPack (Ref. 6) was used to analyze the abilities of the Metal Cleaning Basin to manage direct precipitation and stormwater runoff from the 1000-year, 24-hour storm event. The analysis conservatively assumed that the outlet pipe was full at the time of the storm event and, therefore, the Metal Cleaning Basin would need to contain the inflow design flood without water overtopping the basin's dikes (EL. 467.00 feet). The surface water depth in the basin at the time of the design storm event was assumed to be 4.5 feet (EL. 462.00 feet), which is 2.5 feet higher than the basin's normal operating level (Ref. 2, p. 2) . This operating level is conservative and accounts for unanticipated transient discharges. Finally, the time of concentration for this hydrologic and hydraulic assessment was assumed to be 5 minutes in accordance with the minimum time of concentration recommended in the U.S. Department of Agriculture's Technical Release No. 55, *Urban Hydrology for Small Watersheds* (Ref. 7).

4.2 RESULTS

Table 4-1 summarizes the results from the hydrologic and hydraulic calculations performed for the Metal Cleaning Basin (Ref. 8). Based on these results, water entering the Metal Cleaning Basin during the inflow design flood event will not overtop the basin. The water level in the Metal Cleaning Basin during the design event was estimated to be 3.85 feet below the basin's dikes.

Table 4-1 – Summary of Hydrologic & Hydraulic Assessment Results for the Metal Cleaning Basin

CCR Surface Impoundment	Illinois Hazard Potential Classification	Inflow Design Flood	Maximum Surface Water Elevation	Basin Crest Elevation
Metal Cleaning Basin	Class 2	1,000 Year	463.15 feet	467.00 feet

5.0 CONCLUSIONS

Based on the hydrologic and hydraulic calculations performed for the Metal Cleaning Basin (Ref. 8), the basin has adequate hydraulic capacity to retain the 1000-year flood event without water overtopping the surrounding dikes. Therefore, the Metal Cleaning Basin is able to collect and control the inflow design flood event specified in 35 Ill. Adm. Code 845.510(a)(3).

6.0 CERTIFICATION

I certify that:

- This inflow design flood control system plan was prepared by me or under my direct supervision.
- The work was conducted in accordance with the requirements of 35 Ill. Adm. Code 845.510.
- I am a registered professional engineer under the laws of the State of Illinois.

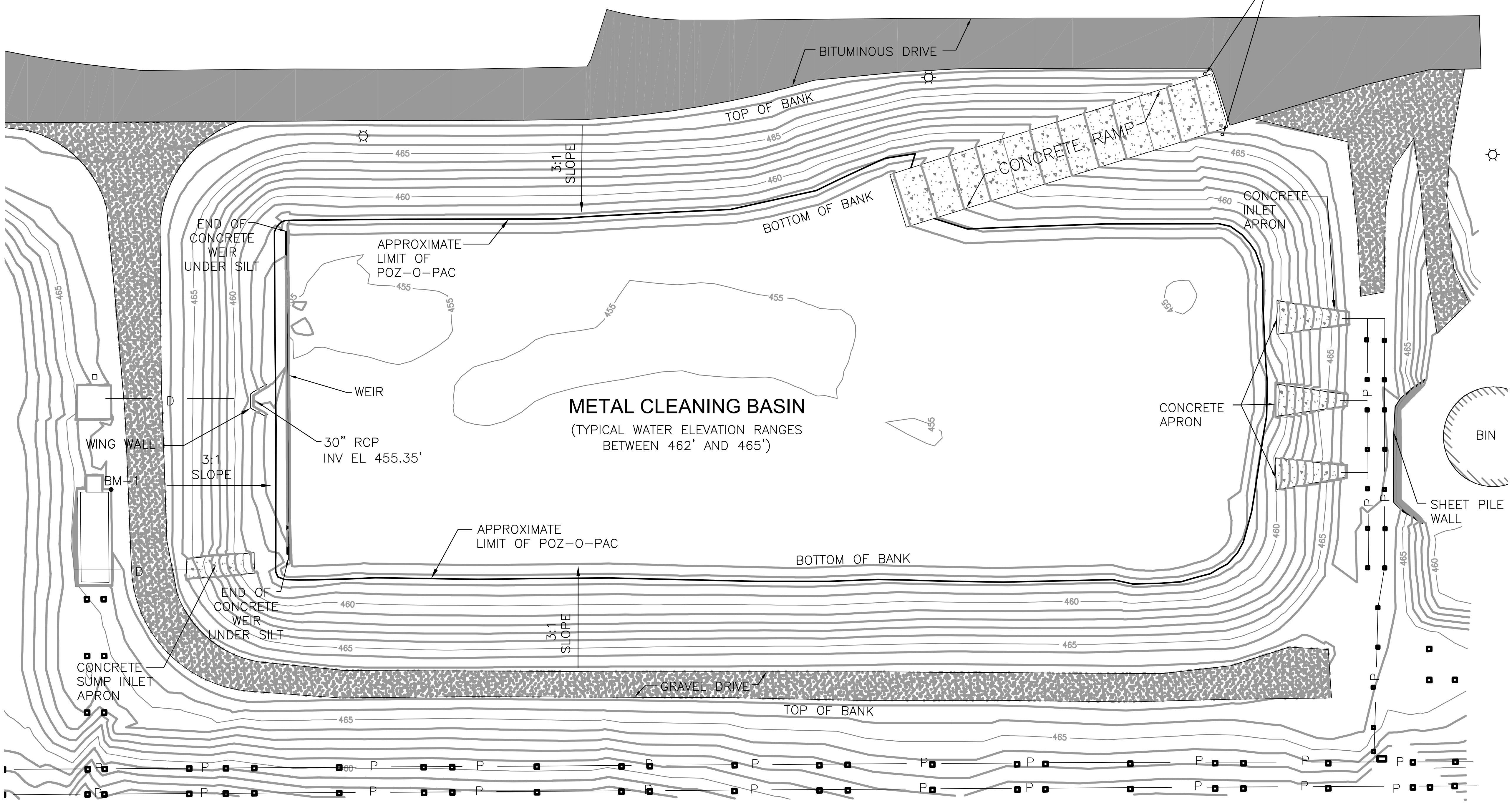
Certified By: Thomas Dehlin, P.E.   Date: 03-29-2022

Seal:

7.0 REFERENCES

1. Illinois Pollution Control Board. “Standards for Disposal of Coal Combustion Residuals in CCR Surface Impoundments.” 35 Ill. Adm. Code 845. Accessed March 29, 2022.
2. Civil & Environmental Consultants, Inc. “Hazard Potential Classification Assessment Report, Metal Cleaning Basin, Powerton Station.” CEC Project No. 312-192.0120. September 2021.
3. National Oceanic and Atmospheric Administration. “Point Precipitation Frequency Estimates.” NOAA Atlas 14, Volume 11, Version 3.
4. Bentley PondPack V8i Version 10.02.00.01.
5. U.S. Department of Agriculture. *Urban Hydrology for Small Watersheds*. Technical Release No. 55. 1986.
6. Sargent & Lundy. “Metal Cleaning Basin Hydraulic Capacity Calculation.” S&L Calc. No. MG-PS-C002, Rev. A. S&L Project No. 12661-130. March 2022.

APPENDIX A – 2011 AS-BUILT CONSTRUCTION PLANS



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

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
REVISION:		DATE:	APP'D BY:

NATURAL RESOURCE TECHNOLOGY

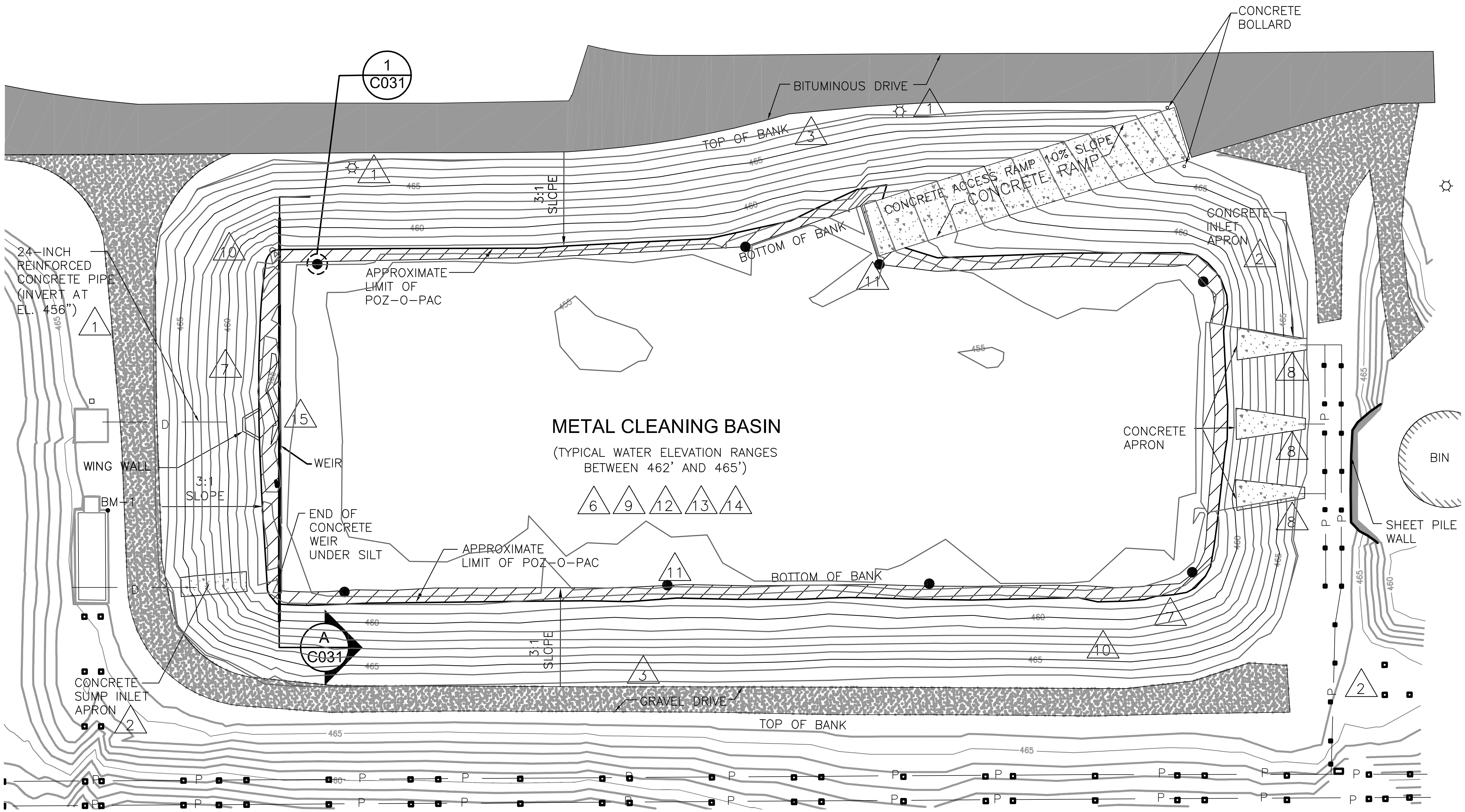
PROJECT NO. 1965/4.0
DRAWN BY: RLH/KNW 07/17/09
CHECKED BY: RJG 07/17/09
APPROVED BY: HMS 07/27/09

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:

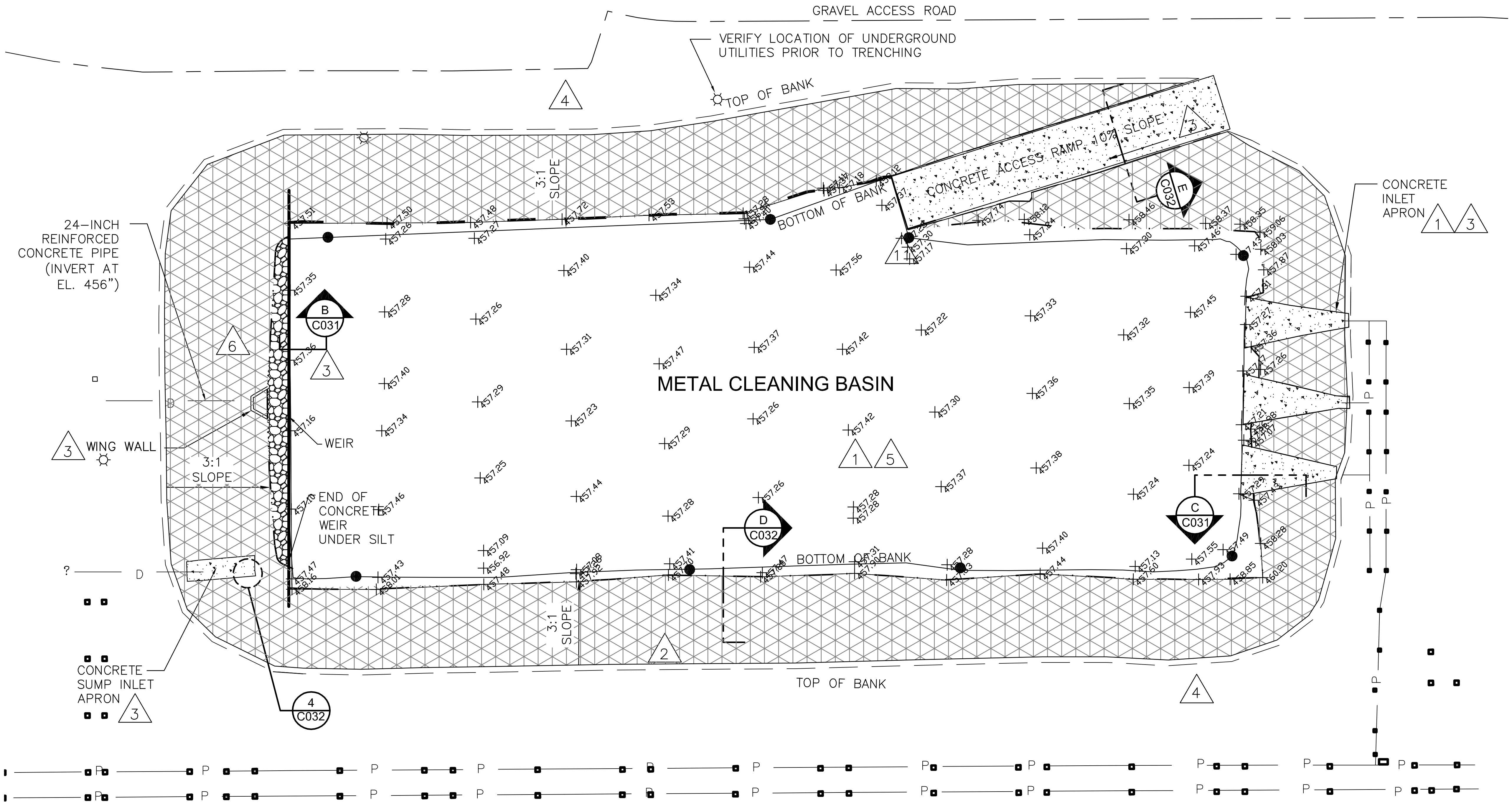
NATURAL RESOURCE TECHNOLOGY

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

LINER SUBGRADE PREPARATION

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

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:

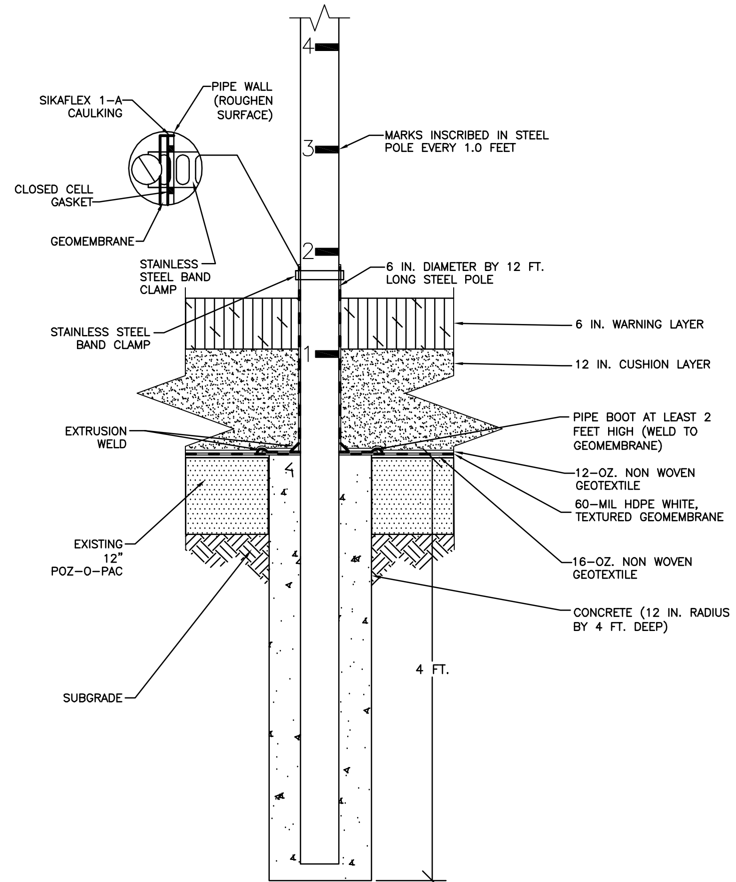
THIS DRAWING WAS DEVELOPED FROM A SURVEY BY MAURER-STUTZ, INC. DATED 10/20/09, DRAWING NO. 23209009.

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.

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:

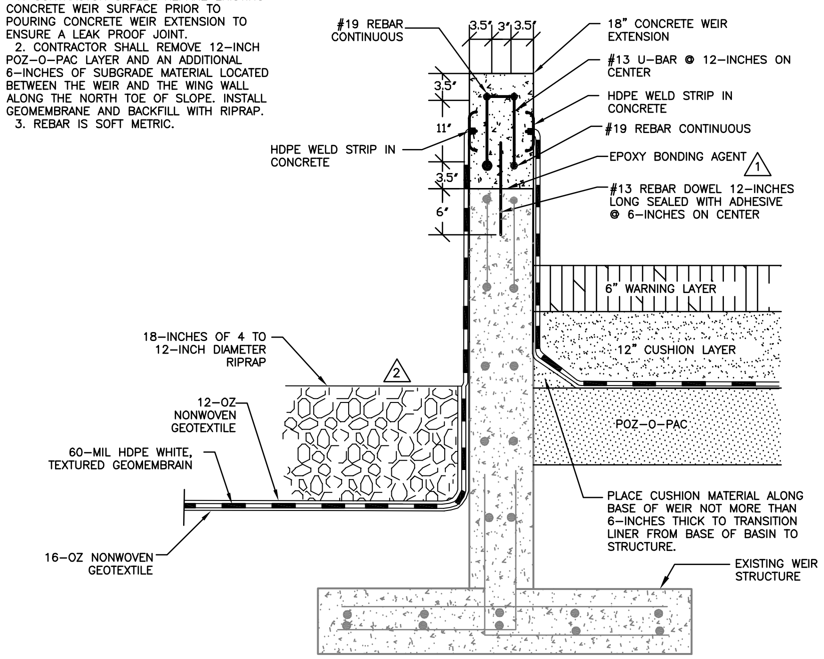
NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1965/4.0	WARNING LAYER
DRAWN BY: KNW 08/25/09	METAL CLEANING BASIN LINER REPLACEMENT MIDWEST GENERATION POWERTON POWER STATION PEKIN, ILLINOIS
CHECKED BY: RJG 10/05/09	
APPROVED BY: HMS 10/05/09	DRAWING NO: D1965C030-03 REFERENCE: -
SHEET NO.	C030

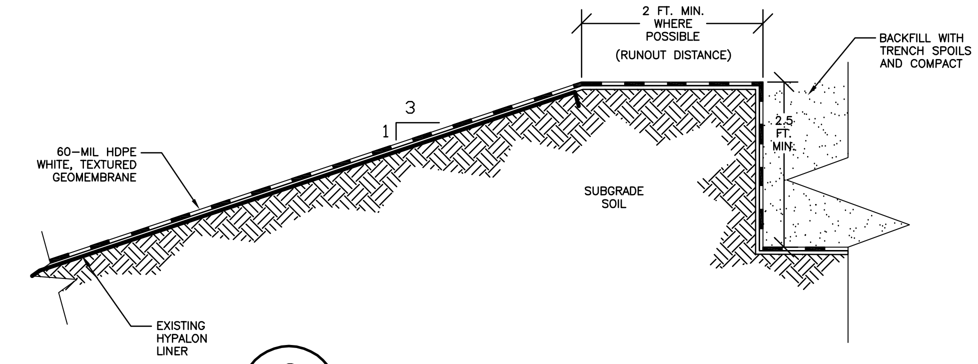


1 C020 MARKER POST DETAIL
NOT TO SCALE

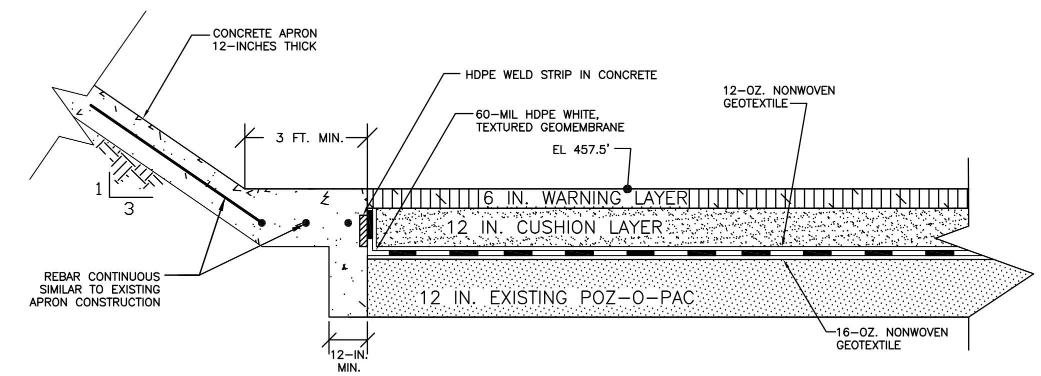
CONTRACTOR NOTES: 1
1. CONTRACTOR SHALL PREPARE EXISTING CONCRETE WEIR SURFACE PRIOR TO POURING CONCRETE WEIR EXTENSION TO ENSURE A LEAK PROOF JOINT.
2. CONTRACTOR SHALL REMOVE 12-INCH POZ-O-PAC LAYER AND AN ADDITIONAL 6-INCHES OF SUBGRADE MATERIAL LOCATED BETWEEN THE WEIR AND THE WING WALL ALONG THE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



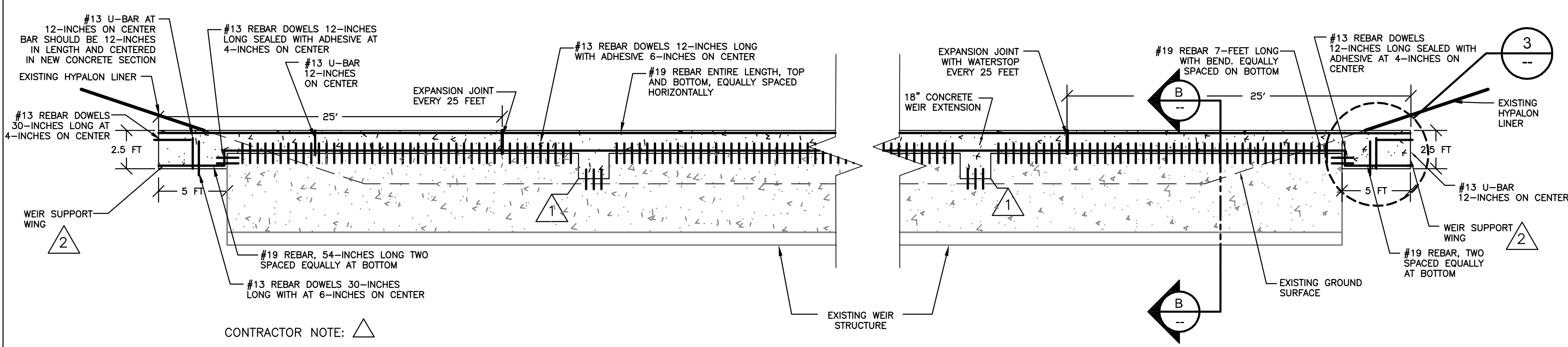
B -- CONCRETE WEIR EXTENSION DETAIL
NOT TO SCALE



2 C030 ANCHOR TRENCH SECTION
NOT TO SCALE



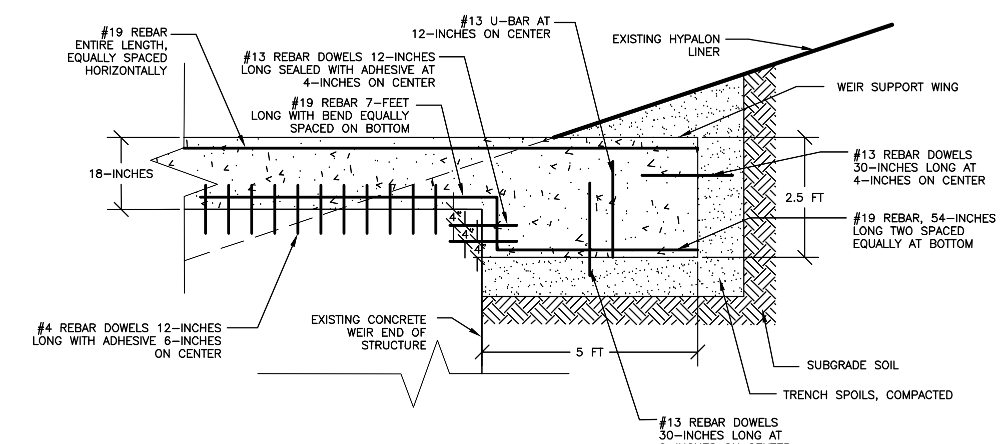
C C030 CONCRETE INLET APRON SECTION
NOT TO SCALE



CONTRACTOR NOTE: △

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

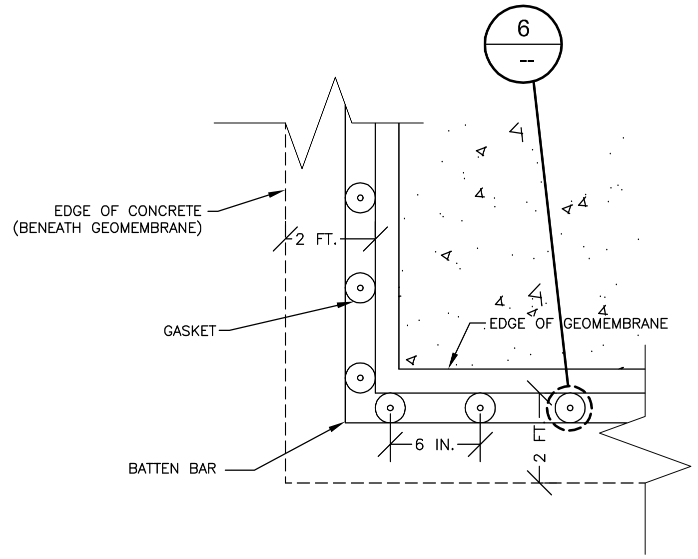


3 - WEIR SUPPORT WING DETAIL
NOT TO SCALE

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:

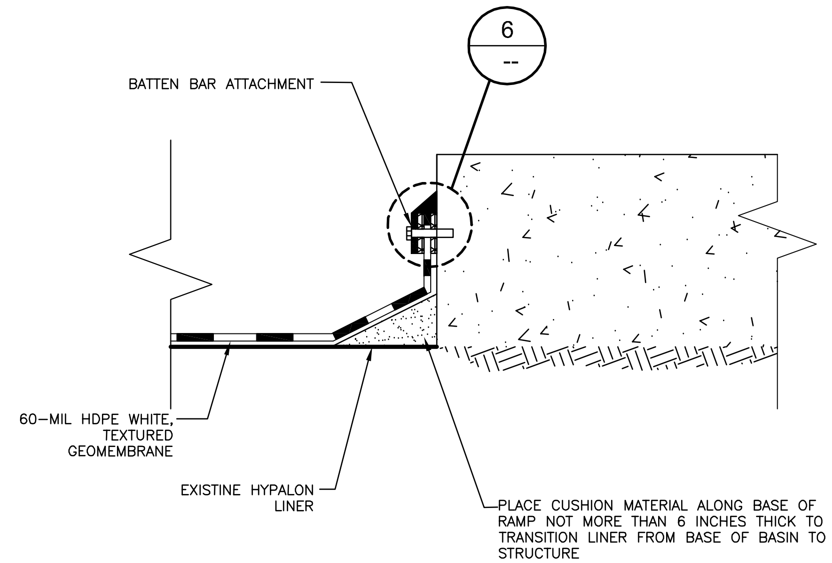
NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1965/4.0	**DETAILS AND SECTIONS**
DRAWN BY: KNW 08/12/09	METAL CLEANING BASIN LINER REPLACEMENT MIDWEST GENERATION POWERTON POWER STATION PEKIN, ILLINOIS
CHECKED BY: RJG 10/05/09	
APPROVED BY: HMS 10/05/09	DRAWING NO: D1965C031-03 REFERENCE:. SHEET NO. C031



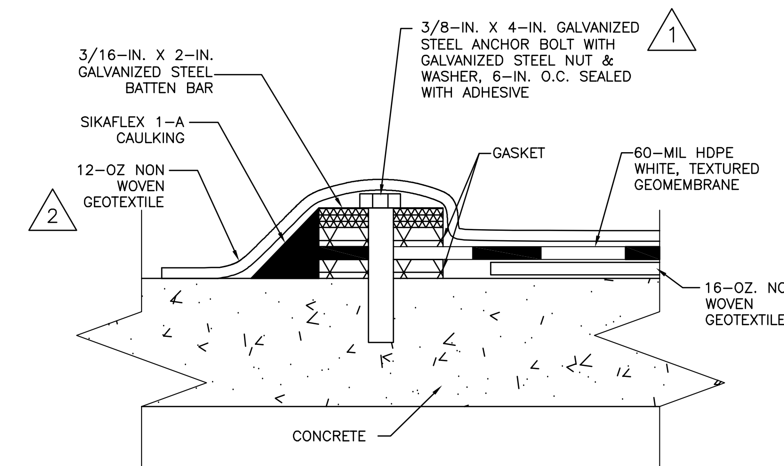
4 / C030 SUMP INLET APRON DETAIL

NOT TO SCALE



5 / ._. CONCRETE RAMP CONNECTION DETAIL

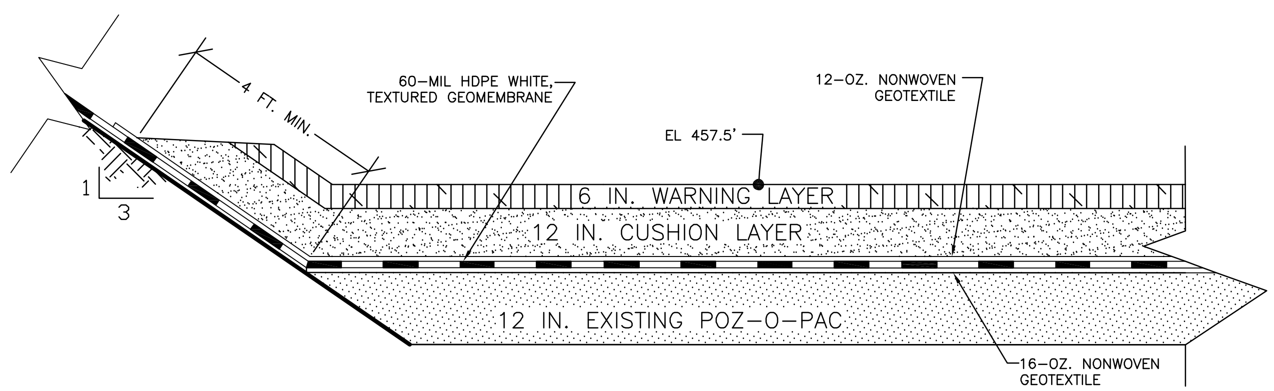
NOT TO SCALE



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

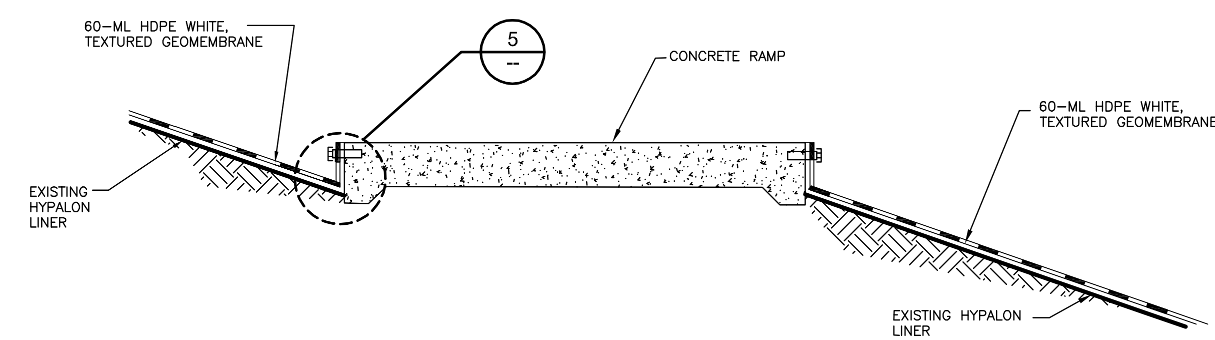
NOT TO SCALE



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

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

ATTACHMENT 19
SAFETY AND HEALTH PLAN

1.0 **SAFETY REQUIREMENTS**

1.1 The entire performance of the Work shall comply with the standards authorized by the latest issue of the U.S. Department of Labor Occupational Safety and Health Act (OSHA), as well as state and local jurisdictional requirements.

1.2 CONTRACTORS SAFETY MANUAL

A. The Contractor shall have on file with the Midwest Generation corporate safety office a copy of the most current Safety and Industrial Hygiene Manual. As a minimum, this Manual must address the following items when applicable to their trade: OSHA Compliance, Accident Investigation, Corrective Action, First Aid Treatment, Inspections and Reporting of Deficiencies, Material Handling and Rigging, Performance and Accountability, Personal Safety Equipment, Safety Guidelines, Safety Meetings, Training, Housekeeping, Hearing Protection, Respiratory Protection, Fire Prevention, Grounding Program, Confined Space Entry, Hazard Communication, Fall Protection, Working on or near water and Trenching and Shoring.

B. The Contractor's superintendent or other responsible person must have a copy of the Contractor's most current Safety and Industrial Hygiene Manual available at the job site.

1.3 PRE-MOBILIZATION MEETING

A. The Contractor shall meet with the Purchasers Representative(s) for a pre-mobilization meeting. The pre-mobilization meeting will include a review of safety requirements, job hazard identification, a job specific safety plan (to be developed by the Contractor and provided to Midwest Generation), and submittal requirements for health & safety records, scope and schedule. Hazard identification and assessment will include all chemical constituents found present in the analyses of the CCR and/or other waste streams within the impoundment(s). Recommendations within the NIOSH Pocket Guide to Chemical Hazards will be reviewed and considered. Applicable safety data sheets will be provided, as necessary.

B. Prior to the start of the work at the job site, the Contractor shall contact Purchaser's Representative to arrange to receive Purchasers site safety orientation. This session will last approximately 2 hours. The Contractor will be provided with information on the potential hazardous constituents of the CCR

C. Contractor shall provide his employees with orientation in all Contractor, and job specific safety requirements related to their work area. Contractor shall provide Purchaser with completed training documents showing date of training and each employees craft related training as it relates to OSHA requirements. (i.e. competent person, scaffold builder, fork truck and crane operators)

D. The Contractor Shall provide proof of training for all on site personnel in the following:
- HAZWOPER 29CFR1910.120/29CFR1926.65.
- OSHA 10 Hour or 30 Hour Voluntary Compliance Training for Construction.
- Hazard Communication 29 CFR 1910.1200.
- Contractor's Safety Plan.

E. A Competent Person shall be identified by name for Excavations, Fall Protection, etc. if applicable.

1.4 FITNESS FOR DUTY

A. The Contractor/Sub-Contractor/Supplier is required to have a drug and alcohol-screening program for all employees assigned to work on Purchaser's property. The program must provide screening for pre-access testing, "for cause" testing and random testing. The Contractor/Sub-Contractor/Supplier shall certify that their employees have passed the appropriate screening test in accordance with their programs.

B. Personnel covered by this program shall be denied access to, or may be required to leave the Purchaser's location if there are reasonable grounds to believe that the individual is:

1. Under the influence of using, possessing, buying, selling, or otherwise exchanging (whether or not for profit) controlled substances or drug paraphernalia.

2. Under the influence of consuming, possessing, buying, selling, or otherwise exchanging (whether or not for profit) alcoholic beverages.

1.5 PERSONNEL PROTECTIVE EQUIPMENT (PPE)

A. Prior to starting work, the contractor shall perform a Hazard assessment for PPE

1. The Contractor will conduct a walk-through survey of each work area to identify sources of work hazards. Each survey will be documented in which it will identify the work area surveyed, the relevant task, the person conducting the survey, findings of potential hazards, control measures, and date of the survey.

2. The Contractor will conduct, review, and update the hazard assessment for PPE whenever:

   - A job changes
   - New equipment or process is installed
   - There has been an accident
   - Whenever a supervisor or employee requests it
   - Or at least every year

- o Any new PPE requirements that are developed will be added into the Contractors written
- o safety program

B. Head Protection/Hard Hats: Hardhats shall be worn in all work areas.

1. Hard hats must not be more than 5 years old, and the harness shall not be more than 1 year old.

2. Hard hats must be worn with brim forward.

3. Hard hats must be assigned and used in accordance with ANSI/ISEA Z89.1-2014(R2019).

4. Hard Hats must be cleaned and maintained in accordance with the manufacturer's instruction.

C. Eye Protection: Eye protection shall be worn in all work areas.

1. At a minimum, ANSI Z87-1-2020 compliant Safety Glasses shall be worn.

2. Goggles and face shields shall be used for splash hazards.

3. Fogging potential shall be considered for humid conditions and appropriate anti-fog materials may be used.

4. Detachable side protectors (e.g. clip-on or slide on side shields) that meet OSHA Rule 29 CFR Part 1910.133 and ANSI Z87.1 specifications are also acceptable to wear with prescription glasses. Prescription glasses used with detachable side shields must conform to ANSI Z87.1.

5. Employees must keep eyewear in clean condition and fit for use at all times.

D. Protection Foot Wear

1. All footwear must be compliant with ASTM F2413-18: Performance Requirements For Protective (Safety) Toe Cap Footwear.

2. For work on or near the CCR impoundments, consideration shall be given to traction and slip issues.

3. Safety shoes must be maintained and cleaned in accordance with the manufacturer's guidelines.

4. Boot covers or Rubber boots shall be used in all areas that do or may contain CCR. These covers or boots must be cleaned or disposed of prior to leaving the work area.

E. Hand Protection

1. Employers shall base the selection of the appropriate hand protection on an evaluation of the performance characteristics of the hand protection relative to the task(s) to be performed, conditions present, duration of use, and the hazards and potential hazards identified.

2. Impervious disposable gloves shall be used when working with CCR. Leather, Cotton or other readily absorbable gloves shall not be used.

F. Personal Flotation Devices

1. When working with 10 feet of the water in the impoundments the following shall apply:
   a. All personnel shall wear a Coast Guard Approved PFD
      - Type I: Off-Shore Life Jacket; effective for all waters or where rescue may be delayed.
      - Type II: Near-Shore Buoyant Vest; intended for calm, inland water or where there is a good chance of quick rescue.
      - Type III: Flotation aid; good for calm, inland water, or where there is a good chance of rescue.
      - Type IV: PFD's are throwable devices. They are used to aid persons who have fallen into the water.
      - Type V: Flotation aids such as boardsailing vests, deck suits, work vests, and inflatable PFD's marked for commercial use.

2. Serviceable condition: A PFD is considered to be in serviceable condition only if the following conditions are met.
   a. No PFD may exhibit deterioration that could diminish the performance of the PFD, including:

      1. Metal or plastic hardware used to secure the PFD on the wearer that is broken, deformed, or weakened by corrosion.

      2. Webbings or straps used to secure the PFD on the wearer that are ripped, torn, or which have become separated from an attachment point on the PFD; or

      3. Any other rotted or deteriorated structural component that fails when tugged.

      4. Rips, tears, or open seams in fabric or coatings, that are large enough to allow the loss of buoyant material.

      5. Buoyant material that has become hardened, non-resilient, permanently compressed, waterlogged, oil-soaked, or which shows evidence of fungus or mildew; or

6. Loss of buoyant material or buoyant material that is not securely held in position.

1.6 EXISTING PLANT FACILITIES

A. Contractor shall be aware that Work may be performed in and around operating equipment.

B. The Contractor shall give proper notices, make all necessary arrangements, and perform all other services required to avoid damage to all utilities, including gas mains, water pipes, sewer pipes, electric cables, fire hydrants, lamp posts, etc., for which Purchaser could be held liable.

C. The Contractor shall barricade or cover any opening created during the course of work for excavations, or grating removal. Barricades shall be a “hard” barrier such as cable or pipe and clamp, safety barrier tape is unacceptable. In addition, any openings creating a fall hazard of 4 feet or more must have a permit authorized before the barrier can be removed. See section 11.4 below for permit requirements.

D. Housekeeping, walkways and tripping hazards

All equipment and material must be kept in an orderly manner. Aisles, exits, stairways, and emergency equipment must never be obstructed. Hoses and welding cables must be tied above walkways so as to not pose as a trip hazard. Barricades, signs and notifications provided by the contractor when required. The owner and contractor will conduct periodic housekeeping audits to assure compliance.

E. Contractor's personnel shall observe all safety, warning, equipment identification instructional signs and tags. Do not remove any tag without prior consent of Purchaser's Representative.

F. When work has been completed, and Contractor decides equipment is ready to be returned to service, Contractor employees shall have all of their employees (working party members) sign off the permit. Contractor shall notify Purchaser's Representative in whose name the outage is being held.

1.7 WELDING, CUTTING and BURNING PERMITS

A. Contractor shall not start welding or cutting operations without a "Welding and Cutting (Hot Works) Permit". Permits shall be obtained from Purchaser and posted in accordance with Station site-specific Safety Training requirements.

B. Contractor shall use non-asbestos, fire retardant blankets as required to protect Purchaser's equipment, cable trays, coal transport and storage areas, etc. and to cover gratings (for personnel safety) when welding, grinding and flame cutting processes are used overhead or in such close proximity as to pose a hazard.

C. Contractor shall supply appropriate portable fire extinguishers in welding and cutting areas.

D. Contractor shall furnish a designated “Fire-watch” employee to monitor the area above to the sides and below the cutting and burning area. The fire-watch is to extinguish fires started by sparks from the acts of cutting or welding. The fire-watch employee is to continue monitoring on the job 30 minutes after cutting or burning has been completed.

1.8 SAFETY DATA SHEETS

A. The Purchaser shall make Safety Data Sheets (SDS's) readily available to the Contractor for those substances to which the Contractor’s employees may be exposed during normal working conditions and which are under the Purchaser’s control.

B. The Contractor shall make Safety Data Sheets (SDS's) readily available to the Purchaser for those substances which are furnished by and under the control of the Contractor. These are to be available at the time of delivery of the substance to the Purchaser’s Premises.

C. It is the responsibility of the Contractor to train their employees on SDS's.

1.9 CHEMICALS, SOLVENTS AND GASES

A. Contractor shall comply with all federal, state and local regulations and codes pertaining to handling and storage of flammable liquids and gases.

B. Cleaning agents, solvents, or other substances brought by Contractor onto any of Purchaser's properties by Contractor shall be stored, handled and used in accordance with applicable standards.

C. Contractor shall ensure that liquids or solids will not be poured (disposed of) into Purchaser's drain, sewer systems, lake (where applicable), or onto ground. Contractor shall be liable for any damage and cleanup of improperly disposed liquids or solids.

D. The Contractor is to provide the Purchaser with the name and quantity of usage of any listed Section 313 Toxic Chemical of the Emergency Planning and Community Right-to-Know Act of 1986 (40CFR372).

E. Signage must be posted detailing the presence of and hazards of CCR.

1.10 DISTURBANCE OF DUST

Contractor's work practices shall minimize dust generated while working with CCR. A fugitive dust mitigation plan shall be submitted to the facility prior to activities beginning.

1.11 FALL PROTECTION

Mandatory fall protection is required when working near and area where a fall hazard of **four (4)** feet or more exists.

1.12 BARRIERS AND WARNING SYSTEMS

A. Warning and barricade systems shall be used to divert personnel from a work area. All warning barriers shall be tagged with yellow "Caution Cards". The caution card shall state the hazard, the date erected and a contact name, company and phone number. There are two levels of barricade systems. The barricade systems shall be taken down immediately when the hazard has been removed or at the end of the work shift.

B. A conditional warning is designated with 'Yellow" safety warning tape. This is used to warn workers of a hazard such as wet floors, welding and cutting in an area, or other hazards that with an awareness and proper PPE can be approached.

C. An Unconditional warning is designated with "Red" safety warning tape. This is used to worn workers of a hazard such as a crane lift or overhead work. Red safety tape barriers cannot be access or removed until permission is granted from the person responsible for installing it.

D. Fire and Evacuation warning sirens. Each plant has a siren for fire notification and evacuation notification. The response location and procedure will be addressed in the pre-mobilization meeting and plant site-specific orientation.

1.13 For Contractor's and subcontractor's employees, visitors and any other individuals: Smoking is prohibited on the work site.

1.14 The Contractor is expected to pre-arrange medical emergency services for on-site and off-site treatment. This includes, but is not limited to, first aid and confined space rescue.

1.15 WORKING ON OR NEAR WATER:

A. Life jackets and work vests shall be inspected before and after each use.

B. Ring buoys or Class IV rescue device with at least 90 feet of line shall be provided and readily available for employee rescue operations.

C. The distance from ring buoys to each worker shall not exceed 200 feet.

D. At least one lifesaving skiff shall be immediately available at locations where employees are working over water and/or the local coast guard shall be notified when working in navigable waterways.

E. Under no circumstances will team members enter water bodies without protective clothing (e.g.; waders, wet suit).

F. At least one person should remain on shore as a lookout if other methods of rescue are not available.

1.16 EXCAVATIONS

A. A Competent person shall determine the proper slope or identify engineering controls for all excavations in the CCR area.

B. An inspection of the banks shall be made and documented at least daily to determine any impact of the excavation.

2.0 **CONTRACTOR'S FACILITIES**

2.1 Temporary chemical toilet accommodations shall be furnished and maintained by Contractor for the use of his employees. Location shall be as directed by Purchaser's Representative. Use of Purchaser's toilet facilities by Contractor's employees is not permitted.

2.2 Contractor shall provide his own storage vessels, coolers, ice, water containers, etc., as required for his own drinking water use. Contractor shall supply a trash can with each drinking water container to receive used paper cups. Contractor shall maintain drinking water container, supply suitable water cups and dispose of trash as required. Open drinking cups and containers in the plant areas are not permitted.

2.3 Each Contractor is expected to pre-arrange medical emergency services for on-site and off-site treatment. This includes, but is not limited to, first aid and confined space rescue.

2.4 FIRE PROTECTION FACILITIES

A. Contractor shall provide his own temporary fire protection facilities for the equipment and materials furnished by him or by Purchaser and for his temporary construction buildings and structures. This equipment shall be maintained and inspected in accordance with applicable NFPA codes.

B. Furnish a suitable quantity and type of portable fire extinguishers and equipment, to meet OSHA and applicable codes.

2.5 Purchaser will not furnish any additional illumination of aisles, passages in the buildings, floodlighting of outdoor areas or lighting inside equipment other than that which is existing. Any additional lighting required by the Contractor shall be provided by the Contractor.

2.6 Contractor shall provide and maintain suitably located distribution centers with fused switching equipment and Ground Fault Interruption protection. The equipment supplied shall comply with OSHA regulations and standards.

2.7 Contractor shall supply all adapters and equipment required to connect to station air, water, and electrical systems. All air hoses shall be safety clipped together.

2.8 Any heating facilities required for the performance of the Work shall be furnished, maintained, and removed by Contractor. Open fires WILL NOT BE PERMITTED at any time. Heating equipment shall be as approved by Purchaser's Representative.

3.0 **CONTRACTOR'S TOOLS AND EQUIPMENT**

3.1 TOOLS AND EQUIPMENT

A. Contractor shall maintain, inspect and store tools and equipment for safe and proper use. This includes guards, shields, safety switches and electrical cords.

B. Contractor shall provide hoisting equipment as required to perform the Work. Provide all the necessary guards, signals, and safety devices required for its safe operation. Construction and operation of hoisting equipment shall comply with all applicable requirements of ANSI A10.5, the AGC Manual of Accident Prevention in Construction, and to all applicable federal, state, and local codes. Hoisting equipment shall not be used to transport personnel.

3.2 RIGGING

A. Contractor shall design, furnish, and maintain rigging required for the Work. All rigging plans must be designed by an Illinois licensed structural engineer.

B. Purchaser reserves the right to examine Contractor's design calculations, engineering data, plans, and procedures. Contractor shall submit any documentation requested by the Purchaser for the purpose of this review, including, but not limited to, calculations, diagrams and documents associated with computer-aided analyses and programs. If requested information is considered proprietary by Contractor, Contractor shall allow the Purchaser to review the information at Contractor's offices with the understanding that no copies of proprietary information will be given to the Purchaser. Purchaser's review and approval of submitted information is for general detail only and will not relieve the Contractor of responsibility for meeting all requirements and for accuracy.

C. Lifting and rigging areas shall have the target area and corresponding personnel access landings barricaded with "red" safety tape or hard barriers. No one is allowed under the load or in the target area during lifts.

D. All cranes, hoists, or derricks shall be operated in compliance with existing State and Federal regulations or orders. Cranes and hoists shall be inspected in accordance with OSHA and ANSI requirements. Cranes and hoists shall not be operated near high voltage lines or equipment until a safe operating clearance plan has been established.

ATTACHMENT 20
CLOSURE PRIORITY CATEGORIZATION

Attachment 20 - No Attachment