



GROUNDWATER MONITORING NETWORK EVALUATION REPORT, BOTTOM ASH PONDS

American Electric Power Service Corporation
Rockport Generating Station, Rockport, Spencer County, Indiana
Wood Project No. 7362182624

Prepared for:

American Electric Power Service Corporation
1 Riverside Plaza, Columbus, Ohio 43215

14 September 2017
Rev 1 - 14 February 2019



14 February 2019

Mr. David Miller
Director, Land Environment & Remediation Services
American Electric Power Service Corporation
1 Riverside Plaza
Columbus, OH 43215
Email: damiller@aep.com

Wood Environment & Infrastructure Solutions, Inc.
2456 Fortune Drive
Suite 100
Lexington, KY 40509
USA
T: 859-255-3308
www.woodplc.com

Subject: Updated Groundwater Monitoring Network Evaluation Report
AEP Rockport Plant, Bottom Ash Ponds
Wood Project No. 7362182624

Dear Mr. Miller:

Wood Environment & Infrastructure Solutions, Inc. (Wood) has prepared this update to the *Groundwater Monitoring Network Evaluation Report, Bottom Ash Ponds* dated 14 September 2017. The report has been updated to incorporate additional background monitoring wells installed in 2017. The structure and content of the original report has remained unchanged except where discussion of the new wells have been added. We are available to discuss the details of this report at your convenience should you require additional information.

Sincerely,
Wood Environment & Infrastructure Solutions, Inc.

Thomas M. Reed, PG
Senior Hydrogeologist

Kathleen D. Regan, PE
Associate Engineer

Enclosures



**AMERICAN ELECTRIC POWER SERVICE CORPORATION
ROCKPORT GENERATING STATION
ROCKPORT, INDIANA**

**GROUNDWATER MONITORING NETWORK
EVALUATION REPORT, BOTTOM ASH PONDS**

RECORD OF CHANGES

REVISION 1:

This report, originally dated September 14, 2017, was revised on February 14, 2019 to incorporate installation details and sampling results for six additional background groundwater monitoring wells at the bottom ash ponds. The six wells are designated as MW 1701 shallow, intermediate, and deep (S,I,D) and MW 1702 S,I,D. The report includes the well locations, boring logs, and monitoring well installation details.

There were no changes to the information contained in the original report. This revision simply added six additional background groundwater well drilling and installation details.

GROUNDWATER MONITORING NETWORK EVALUATION REPORT, BOTTOM ASH PONDS

American Electric Power Service Corporation
Rockport Generating Station, Rockport, Spencer County, Indiana
Wood Project No. 7362182624

Prepared for:

American Electric Power Service Corporation
1 Riverside Plaza, Columbus, Ohio 43215

Prepared by:

Wood Environment & Infrastructure Solutions, Inc.
2456 Fortune Drive
Suite 100
Lexington, KY 40509
USA
T: 859-255-3308

14 February 2019

Copyright and non-disclosure notice

The contents and layout of this report are subject to copyright owned by Wood (© Wood Environment & Infrastructure Solutions, Inc.) save to the extent that copyright has been legally assigned by us to another party or is used by Wood under license. To the extent that we own the copyright in this report, it may not be copied or used without our prior written agreement for any purpose other than the purpose indicated in this report. The methodology (if any) contained in this report is provided to you in confidence and must not be disclosed or copied to third parties without the prior written agreement of Wood. Disclosure of that information may constitute an actionable breach of confidence or may otherwise prejudice our commercial interests. Any third party who obtains access to this report by any means will, in any event, be subject to the Third Party Disclaimer set out below.

Third-party disclaimer

Any disclosure of this report to a third party is subject to this disclaimer. The report was prepared by Wood at the instruction of, and for use by, our client named on the front of the report. It does not in any way constitute advice to any third party who is able to access it by any means. Wood excludes to the fullest extent lawfully permitted all liability whatsoever for any loss or damage howsoever arising from reliance on the contents of this report. We do not however exclude our liability (if any) for personal injury or death resulting from our negligence, for fraud or any other matter in relation to which we cannot legally exclude liability.

Executive Summary

The Groundwater Monitoring Network Evaluation was conducted to evaluate the adequacy of the existing monitoring well network and, if applicable, to make recommendations for additional well installations. Specifically, the existing monitoring well network at the BA Ponds was evaluated for compliance with the coal combustion residuals (CCR) Final Rule issued by the U.S. Environmental Protection Agency (USEPA) on 17 April 2015. Regulations pertaining to Groundwater Monitoring and Corrective Action are contained in the Code of Federal Regulations (CFR) 40 CFR Sections (§) 257.90 through 98. The focus of this evaluation was on §257.91 (Groundwater Monitoring Systems). The major elements of the evaluation are summarized below.

Description of the CCR Unit

The CCR unit referred to as the BA Ponds is located at the north end of the wastewater pond complex for the plant (**Figure 3**). It consists of two contiguous ponds, referred to as the East and West BA Ponds, which receive CCR. Other ponds in the complex include the east and west wastewater ponds, the reclaim pond, and the clearwater pond. The wastewater pond complex has a total surface area of 137 acres and a design storage capacity of 1,640 acre-feet (O&G 2011).

Water from the BA ponds drains to the two wastewater ponds, and stormwater from several stormwater collection ponds located at the perimeter of the generating station is also routed to the wastewater ponds. From the wastewater ponds, wastewater flows to the reclaim pond. If needed, water can be recirculated into the sluice water system from the reclaim pond. Excess water flows from the reclaim pond to the clearwater pond, and discharges from there to the Ohio River via a fixed weir outlet and a 66-inch CMP pipe. The discharge is permitted under National Pollution Discharge Elimination System (NPDES) permit number IN 0051845.

Hydrogeology

Groundwater flows into the project area from the north, northwest and west, and continues flowing under the site generally to the southeast. Drainage in the area is provided by the Ohio River, which is adjacent to the plant property on the southeast, is over 2,000 feet wide in the vicinity of the plant, and flows to the southwest toward Owensboro, Kentucky. The plant property slopes gently across a terraced surface from elevations greater than 410 feet on its northern edge, where it is bordered by low hills and an upper terrace, to about 390 feet along the top of the bank of the Ohio River. Much of the property is drained by Honey Creek, which flows south-southeast to the Ohio River and is incised down to an elevation of about 380 feet. The power generation plant is located on a watershed divide between Honey Creek and an unnamed tributary offsite to the southwest. At times the groundwater flow direction and velocity can be impacted by the stage in the Ohio River and Honey Creek, which cause temporary and short duration flow reversals during high river stage events. While these events generate a water level response in the background wells for the BA Ponds, they are not likely to have a water quality impact on those wells.

Hydrostratigraphic Unit

Consistent with the definition in the CCR Rule, the hydrostratigraphic unit identified as the uppermost aquifer in this case is the saturated granular outwash deposit that underlies the Rockport Plant property including the BA Ponds. The top of this unit would be the typical seasonal high water level of 372 feet, 27 feet below the crest elevation of the pond embankments (399 feet). The bottom of the unit would be the top of bedrock. The shale bedrock underlying the granular outwash deposits does not represent a significant groundwater flow zone. The bedrock surface in the vicinity of the pond is irregular, generally sloping to the southeast, and occurs at elevations of 274 to 300 feet (111 to 126 feet immediately below

the BA Pond embankment crest level). The saturated thickness of this unit, therefore, is expected to range from 70 to 100 feet, thickening to the southeast.

General CCR Requirements

In summary, the performance standard for groundwater monitoring systems in the CCR Rule (§257.91) states that the system should consist of a sufficient number of wells, installed at appropriate locations and depths, to yield groundwater samples from the uppermost aquifer that:

- Accurately represent the quality of background groundwater, and
- Accurately represent the quality of the groundwater passing the waste boundary of the CCR unit in the uppermost aquifer, and
- Monitor all potential contaminant pathways.

Monitoring Network Evaluation

Four shallow monitoring wells (MW-1001 through MW-1004) were installed in 2010 at the perimeter of the wastewater pond complex. Three of the wells are located adjacent or close to the BA Ponds; MW-1004 is located farther downgradient, at the southeast corner of the wastewater pond complex. A review of the available groundwater monitoring network for the BA Ponds was made in late 2015. As a result of the review, it was recommended that MW-1002 be included in the downgradient monitoring network, and that the other three wells (MW-1001, MW-1003, and MW-1004) be retained for use as piezometers, to monitor groundwater levels and aid in the interpretation of flow directions.

Twenty new wells were installed in January-March 2016, in seven three-well clusters that include MW-1002. The clusters are designated MW-1600 through MW-1606. Three wells are included in each cluster, finished at shallow (S), intermediate (I) and deep (D) levels. The background well clusters, designated MW-1600S/I/D and MW-1601S/I/D, are located approximately 1,000 feet and 850 feet, respectively, from the edge of the BA Ponds. Downgradient monitoring wells are designated by cluster as MW-1602 through MW-1606, with MW-1002 included as the shallow well in the MW-1602 cluster. The downgradient monitoring well clusters were installed on the perimeter segments of the ponds in the dominant downgradient directions (east and south). The downgradient wells were located as close as practical to the edge of the BA Ponds, just outside the road at the crest of the embankment, in order to be as close as possible to the *waste boundary* (defined in the CCR Rule as “the vertical surface located at the downgradient limit of the CCR unit, that extends down into the uppermost aquifer”).

Six new monitoring wells were installed in September through October 2017, in two three-well clusters. The clusters are designated MW-1701 and MW-1702. Three wells are included in each cluster, finished at shallow (S), intermediate (I), and deep (D) levels. Water level data collected since November 2017 demonstrate that well clusters MW-1701 and MW-1702 are hydraulically upgradient of waste boundary wells at the BA Ponds. Well clusters MW-1701 and MW-1702 are located approximately 925 feet and 2,700 feet, respectively, from the BA Ponds.

Based on the information reviewed and presented in this report (including appendices), the groundwater monitoring network currently installed at the BA Ponds at the AEP Rockport plant can be considered appropriate under the requirements of the CCR Rule as a multiunit system for detection monitoring in the uppermost aquifer at the waste boundary.

Table of contents

1.0	Objective	6
2.0	Background Information.....	6
2.1	Facility Location and Description.....	6
2.2	Description of the CCR Unit.....	7
2.2.1	General	7
2.2.2	Embankment Configuration.....	7
2.2.3	Area/Volume	8
2.2.4	Construction and Operational History.....	8
2.2.5	Surface Water Control.....	8
2.3	Previous Investigations.....	8
2.4	Hydrogeologic Setting.....	9
2.4.1	Climate and Water Budget.....	9
2.4.2	Regional and Local Geologic Setting	9
2.4.3	Surface Water and Surface Water-Groundwater Interactions.....	12
2.4.4	Water Users	12
3.0	Monitoring Network Evaluation.....	14
3.1	Hydrostratigraphic Units.....	14
3.1.1	Horizontal and Vertical Position Relative to the CCR Unit.....	14
3.1.2	Piezometric Conditions.....	15
3.1.3	Overall Flow Conditions.....	16
3.2	Uppermost Aquifer.....	16
3.2.1	CCR Rule Definition	16
3.2.2	Identified Onsite Hydrostratigraphic Unit	16
3.3	Review of Existing Monitoring Network	17
3.3.1	General CCR Rule Requirements.....	17
3.3.2	Monitoring Wells Installed in 2010	17
3.3.3	Monitoring Wells Installed in 2016	17
3.3.4	Monitoring Wells Installed in 2017	18
3.3.5	Vertical Screening Levels.....	19
3.3.6	Monitoring Well Construction and Maintenance.....	19
3.3.7	Summary.....	20
4.0	P.E. Certification.....	20
5.0	References	21

List of Tables

Table 1	Monitoring Well Construction Details
---------	--------------------------------------

List of Figures

Figure 1	Site Location Map
Figure 2	Site Layout Map
Figure 3	Wastewater Pond Complex Layout
Figure 4	Topographic Map
Figure 5	Surface Geology Map



Appendices

Appendix A	Map and Boring Logs, 1977 Soil Borings at Wastewater Pond Complex
Appendix B	Well Construction and Lithologic Logs, 2010 Wastewater Pond Complex Monitoring Wells
Appendix C	Piezometric Data
	C-1 Ohio River Hydrograph, 2010-2015
	C-2 Wastewater Pond Complex Monitoring Well Piezometric Data
	C-3 Wastewater Pond Complex Monitoring Well Hydrographs
	C-4 Wastewater Pond Complex Monitoring Well Piezometric Maps
Appendix D	2016 Monitoring Well Installation Report
Appendix E	2017 Monitoring Well Installation Data
	E-1 Monitoring Well Location Map
	E-2 Well Construction Summary
	E-3 Water Level Data Summary
	E-4 Boring and Well Construction Logs

1.0 Objective

This Groundwater Monitoring Network Evaluation Report has been prepared by Wood Environment & Infrastructure, Inc. (Wood), on behalf of American Electric Power Service Corporation (AEP), to document the results of the monitoring well network evaluation conducted for the Bottom Ash (BA) Ponds, at the Rockport Plant in Rockport, Indiana. The Groundwater Monitoring Network Evaluation was conducted to evaluate the adequacy of the existing monitoring well network and, if applicable, to make recommendations for additional well installations.

Specifically, the existing monitoring well network at the BA Ponds was evaluated for compliance with the coal combustion residuals (CCR) Final Rule issued by the U.S. Environmental Protection Agency (USEPA) on 17 April 2015. Regulations pertaining to Groundwater Monitoring and Corrective Action are contained in the Code of Federal Regulations (CFR) 40 CFR Sections (§) 257.90 through 98. The focus of this evaluation was on §257.91 (Groundwater Monitoring Systems).

2.0 Background Information

2.1 Facility Location and Description

The Rockport Power Plant is located in southwest Indiana (**Figure 1**) in Spencer County, on property extending into three Townships: Ohio, Hammond and Grass. The plant is situated on the north bank of the Ohio River, just northeast of the intersection of State Route (SR) 66, and United States (US) Highway 231. SR 66 runs along the river between the Town of Grandview (about 1.5 miles to the east) and the City of Rockport (about 1 mile to the southwest), and US 231 runs south from Interstate 64 (about 20 miles north of the plant), crossing the Ohio River into Kentucky via the William H. Natcher Bridge just southwest of the Power Plant.

The site is owned and operated by Indiana-Michigan Power Company, a regional unit of AEP. The property was developed in the late 1970s and early 1980s. The facility consists of two coal-fired 1,300-megawatt (MW) power generating units. The first unit went into operation in December 1984, and the second in December 1989. The facility has two existing CCR storage/disposal units, consisting of a landfill located north-northeast of the generating plant, and two adjacent bottom ash (BA) ponds located near the generating plant at the north end of a wastewater pond complex. The general layout of the property and the locations of the CCR units are shown on **Figure 2**.

The following description of CCR generation and handling processes at the Rockport Plant is summarized from a letter sent by AEP to the Indiana Department of Environmental Management (IDEM) on 6 May 2009:

The plant burns about 9-10 million tons of coal per year. The coal, delivered by barge, is off-loaded to the coal storage yard then transported by conveyor into one of the two generating units, where it is pulverized to a powder then injected and burned. The heat produced in burning coal converts water to steam used to drive the turbine generators which produce electricity. The burning of coal produces two types of ash - fly ash and bottom ash. The Rockport Plant produces about 400,000 tons of fly ash and 140,000 tons of bottom ash per year.

Fly ash is the fine particulate matter entrained in the hot flue gases. To remove the fly ash prior to the gases exiting through the plant stack, the flue gas is routed through an electrostatic precipitator (ESP), where the ash particles adhere to electrically charged plates. Mechanical

rappers knock the fly ash off the plates down into a series of collection hoppers. From the hoppers, the fly ash is pneumatically conveyed to a storage silo. From the silo, the ash is either loaded dry into closed trucks and shipped offsite for various uses, or conditioned with a small quantity of water and hauled by truck to the onsite landfill for disposal.

Bottom ash (BA) includes the heavier coal ash particles that fall to the bottom of the steam generator and are collected into refractory-lined hoppers. The hoppers are kept full of water to protect the lining and break the fall of large pieces of hot slag which shatter upon contact with the relatively cool water. From the hoppers, the BA-water mixture is routed to a crusher station where the ash is crushed to a size suitable for pumping. The BA is then pumped to one of the BA ponds located in the wastewater pond complex, where it precipitates out and can be reclaimed after the pond is drained.

2.2 Description of the CCR Unit

2.2.1 General

The CCR unit referred to as the BA Ponds is located at the north end of the wastewater pond complex for the plant (**Figure 3**). It consists of two contiguous ponds, referred to as the East and West BA Ponds, which receive CCR. Other ponds in the complex include the east and west wastewater ponds, the reclaim pond, and the clearwater pond. The wastewater pond complex has a total surface area of 137 acres and a design storage capacity of 1,640 acre-feet (O&G 2011).

Water from the BA ponds drains to the two wastewater ponds, and stormwater from several stormwater collection ponds located at the perimeter of the generating station is also routed to the wastewater ponds. From the wastewater ponds, wastewater flows to the reclaim pond. If needed, water can be recirculated into the sluice water system from the reclaim pond. Excess water flows from the reclaim pond to the clearwater pond, and discharges from there to the Ohio River via a fixed weir outlet and a 66-inch CMP pipe. The discharge is permitted under National Pollution Discharge Elimination System (NPDES) permit number IN 0051845.

Two small metal cleaning waste ponds were formerly located east of the East BA Pond. The northernmost of these two ponds was backfilled prior to 1998 and was replaced with a single aboveground tank located in a containment area above the former pond location. The south pond was backfilled in 2014-2015. A stormwater pond (the West Stormwater Pond) was constructed west of the west dike (between the BA Ponds and US 231) in 2006 or early 2007 (based on historical aerial photography available through GoogleEarth).

2.2.2 Embankment Configuration

The wastewater pond complex is a combination incised and diked earthen embankment impoundment. It is incised below grade along most of its perimeter, and is diked only on the west side of the West BA Pond, where the topography decreases in elevation toward a remnant drainage channel.

The embankments, including the west dike, have a crest elevation of 399 feet, and are approximately 30 feet wide. The west dike has a maximum height (from crest to outboard toe) of 13 feet. The inboard slope was constructed at a slope of 2 horizontal to 1 vertical (2H:1V), and the outboard slope at 2.5H:1V. The outer west dike, and the internal splitter dikes (constructed between the BA Ponds, and between each of the BA Ponds and the wastewater ponds to the south) were constructed of natural clayey soils excavated from the interior of the ponds. The inboard slopes were armored with rock riprap. Reportedly,

no engineered liner systems are present in the BA Ponds or the other ponds in the wastewater pond complex.

2.2.3 Area/Volume

The East and West BA Ponds each have rough dimensions (at the crest) of 2,000 feet x 650 feet, corresponding to a surface area of approximately 30 acres each (60 acres total). The East BA Pond is deeper than the West BA Pond. The design bottom elevations in the ponds are: 386 feet, or 13 feet below crest elevation in the West BA Pond; and 377 feet, or 22 feet below crest elevation in the East BA Pond.

Assuming two feet of freeboard, the West BA Pond has a design capacity of approximately 310 acre-feet (500,000 cubic yards, or CY), compared to 540 acre-feet (870,000 CY) in the East BA Pond.

2.2.4 Construction and Operational History

The wastewater pond complex was constructed in the late 1970s, commissioned in 1981, and has not been significantly modified since original construction (O&G 2011).

The East and West BA Ponds are used alternately. Bottom ash generated at the plant is hydraulically sluiced to one of the ponds (the active pond) until it is close to full. Bottom ash in the inactive pond is drained and dewatered, and then moved by bulldozer to stockpiles on the north end of the pond. Dry ash in the stockpiles is loaded into trucks and transported to other locations for beneficial reuse. It typically takes approximately six months for the active pond to fill, at which time the second pond (which has been emptied of bottom ash) becomes the active pond, and the first pond is drained.

2.2.5 Surface Water Control

Both BA ponds have two outlet structures: a surface water adjustable weir outlet structure for use during sluicing, as the pond is filling, and a low-level outlet structure used after flow into the pond has stopped, to dewater the accumulated bottom ash. Water from both of these outlets gravity drains to the wastewater ponds.

2.3 Previous Investigations

Site investigations were performed on the Plant property in the late 1970s and early 1980s to support design, construction and permitting in advance of plant start-up, which occurred in December 1984. The following documents were provided by AEP for this review:

- Portions of a report titled *Foundation Investigations for Rockport Site*, by Casagrande Consultants, dated 25 April 1977. The portions provided included a boring location map and boring logs for nine soil borings (BH-361 to BH-369) performed in March 1977 along the proposed alignment for the perimeter and splitter dikes in the wastewater pond complex. The boring location map and boring logs are provided in **Appendix A**.
- AEP design drawing 12-30013-15 titled *Unit No. 1 & 2 Wastewater & Bottom Ash Pond Area - Grading & Drainage*, originally dated 18 July 1977, with revisions through 16 January 1990.
- AEP design drawing 12-30018-1 titled *Unit No. 1 & 2 Wastewater & Bottom Ash Pond Area – Sections and Details*, originally dated 18 July 1977, with revisions through 10 January 1979.
- An AEP Internal Memo titled *Stability Analysis of Bottom Ash Pond West Dike*, dated 21 June 2010, which included the three items listed above.

- Well construction and lithologic logs for four monitoring wells installed by AEP on the perimeter of the wastewater pond complex in June-July 2010. Copies of these logs are provided in **Appendix B**.
- A drawing titled *Boring Location Overall Plan*, by WorleyParsons, dated 7 November 2011.
- A report titled *Dam Safety Assessment of CCW Impoundments, Rockport Power Plant*. Report prepared for USEPA by O'Brien & Gere Engineers, Inc., 24 March 2011 (O&G 2011).

In addition, AEP provided a Landfill Application Package (AEP 1984) containing the methods and findings from a Site Investigation performed in 1983 by AEP Civil Engineering personnel of the northern portion of the plant property, to support permitting of two CCR stockpiles and landfilling areas.

2.4 Hydrogeologic Setting

The following sections provide information on the hydrogeologic setting of the AEP Rockport Plant, including climate, physiography and drainage, geology, hydraulic properties of the principal groundwater flow zone, surface water and interactions between surface water and groundwater, and water users.

2.4.1 Climate and Water Budget

The area of Rockport has a continental climate regime. As described by Ray (1965), summers are long, hot and humid, and winters are damp and relatively mild, with brief periods of intense cold. Mean monthly temperatures vary from 35 degrees Fahrenheit (°F) in January to 79°F in July.

The closest meteorological station with long-term data is Owensboro, Kentucky. Based on National Climatic Data Center (NCDC) data for the period from 1971 through 2000, as reported by the Midwest Regional Climate Center (MRCC, <http://mrcc.isws.illinois.edu/>), the normal annual precipitation in Owensboro is 45.07 inches. Precipitation is well distributed throughout the year, on average, but can be highly variable from month-to-month. Monthly normal precipitation varies from 2.67 inches in October to 4.66 inches in May. However, monthly extremes during the period from 1928 through 1990 ranged from 0.06 inches in October 1987 to 16.15 inches in March 1964.

Mean annual potential evapotranspiration in Owensboro is between 31 and 33 inches, according to mapped data available from the Kentucky Climate Center (<http://www.kyclimate.org/index.html>). The adjusted annual potential evaporation estimated in the Landfill Application Package (AEP 1984, Table 10), based on climatic data from Tell City, was 32.22 inches per year. The mean monthly water balance developed for the landfill resulted in the following breakdown (AEP 1984, Table 11) for an estimated annual precipitation of 44.27 Inches:

- Surface Runoff – 13.23 inches (30%);
- Actual Evapotranspiration – 25.69 inches (58%);
- Percolation (groundwater recharge) – 5.44 inches (12%).

2.4.2 Regional and Local Geologic Setting

2.4.2.1 Physiography and Drainage

The area of Rockport lies in the western Interior Low Plateau physiographic province of the United States, in a subarea referred to as the Wabash Lowland. It is an area of broad alluviated valleys and dissected uplands of rolling to hilly terrain with gentle slopes and moderate relief (Ray 1965). The topography in the vicinity of the Rockport Plant is shown on the U.S. Geological Survey (USGS) topographic map

reproduced in **Figure 4**. Elevations on the map are shown relative to Mean Seal Level (MSL, also known as the National Geodetic Vertical Datum of 1929, or NGVD29).

Drainage in the area is provided by the Ohio River, which is adjacent to the plant property on the southeast, is over 2,000 feet wide in the vicinity of the plant, and flows to the southwest toward Owensboro, Kentucky. The plant property slopes gently across a terraced surface from elevations greater than 410 feet on its northern edge, where it is bordered by low hills and an upper terrace, to about 390 feet along the top of the bank of the Ohio River. Much of the property is drained by Honey Creek, which flows south-southeast to the Ohio River and is incised down to an elevation of about 380 feet. The power generation plant was developed on the portion of the property between US 231 on the west and Honey Creek on the east. It is located on a watershed divide between Honey Creek and an unnamed tributary offsite to the southwest.

The natural topography over most of the property (outside the channel of Honey Creek) prior to development of the power plant consisted of a relatively flat terrace surface marked by east-west oriented crests and swales. Multiple low-gradient drainage ditches crossed the area, connecting the two watersheds (Honey Creek and the watershed to the west). Regrading for development of the power plant and associated facilities (including construction of the wastewater pond complex) disrupted some of the existing natural drainage as well as the man-made drainage that existed on the surface of the terrace and is still depicted on the USGS topographic map in **Figure 4**.

2.4.2.2 Geology

The area of the site lies in the southern portion of a broad shallow downwarp structure referred to as the Illinois Basin (also known as the Eastern Interior Basin), and is underlain by sedimentary bedrock of Pennsylvanian age. The bedrock underlying the site and most of Spencer County is the Pennsylvanian age Raccoon Group, consisting of sandstone and shale with minor amounts of mudstone, coal and limestone (Grove 2006). The rock reported from onsite borings that extended through the unconsolidated overburden into bedrock has been described primarily as shale. The boring for bedrock wells finished at the MW-5 location (at the landfill) encountered interbedded sandy claystone, sandy shale, limestone, coal and claystone.

The bedrock surface beneath the overburden is uneven, and includes rounded hills, ridges and valleys (draining southeast) representing the erosional surface that existed prior to filling of the valley with glaciofluvial sediments.

The geology of the near-surface unconsolidated Quaternary sediments associated with the Ohio River valley is depicted on the geology map in **Figure 5** (which excludes the far east portion of the Plant property), and is described in detail by Ray (1965). These sediments range in thickness from about 20 feet on northern sections of the property, to as much as 130 feet along the Ohio River west of the mouth of Honey Creek. They include windblown sediments (loess) up to 30 feet thick that mantle bedrock on the northeast perimeter of the property, possibly merging with lacustrine deposits in the tributary valley at the northwest corner of the property, and two series of Wisconsin age valley-train deposits (Tazewell and Cary) under most of the property. The valley-train sediments that fill the broad river valley were deposited by meltwater from retreating continental glaciers to the north and northeast, and were subsequently reworked by modern drainage systems, including the Ohio River and the Honey Creek drainage on the plant property.

Generally, the valley train deposits thicken and coarsen to the southeast, from the loess-mantled bedrock hills along the valley wall, toward and beyond the course of the modern Ohio River. In the subsurface, the valley train sediments typically coarsen downward, and can be classified generally into finer-grained

sediments near the surface (including silt, sandy silt, silty clay and clay), and coarser-grained sediments (fine to coarse sand and some gravel) at depth.

Interpretive cross-sections of the subsurface were generated by AEP from data collected in the 1983 Site Investigation of the landfill area. In the report of the Site Investigation included in the Landfill Application Package (AEP 1984), the unconsolidated sediments encountered above bedrock were grouped into four units, described below in descending order:

- Unit No. 1 – surficial silt and clay. This unit was found to be 2 to more than 15 feet thick. The upper section is predominantly silty, sandy clay that is stiff, and of low to medium plasticity. Very fine-grained sand and silt are stratified with the clay toward the bottom of the unit, suggesting a lacustrine depositional environment where these finer-grained deposits are thickest.
- Unit No.2 – well sorted sand. This unit, where present, was found to extend from the bottom of the fine-grained surficial unit to elevations of 373-376 feet. It was found to consist of fine to medium-grained, well-sorted subangular to subrounded quartz sand.
- Unit No. 3 – poorly sorted sand. This lower sand unit, consisting of poorly sorted, very fine to very coarse-grained sand, is the dominant unit between elevations of 373-376 feet and the underlying bedrock, which is typically found at elevations of 290 to 300 feet under most of the property, and at shallower depths in the north and northwest portions.
- Unit No. 4 – sand and gravel. Unit No. 4, consisting of poorly sorted sand, gravel and gravelly sand, was found to be gradational with Unit No. 3, and to occur as lenses within Unit No. 3. Gravel in this unit is subangular to rounded, ranges in size from 3/8 to 1 inch in diameter, and commonly contains coal particles.

In 2010, AEP installed four monitoring wells at the perimeter of the wastewater pond complex. The lithologic borings for those wells were extended 39 to 46 feet below ground surface (BGS), at elevations of 351 to 359 feet, and did not encounter bedrock. The surficial silt and clay in these borings was found to be 16 to 24 feet thick, extending down to elevations of 373 to 381 feet. The underlying sand was described as primarily fine, grading downward to medium in one boring, and with gravel occurring in the sandy matrix below depths of 28 to 40 feet BGS in three borings.

Monitoring wells installed in 2016 and 2017 around the BA Ponds extended to bedrock and confirmed the lithology described above. Details of the 2016 well installations, along with interpretive cross-sections, are provided in the report in **Appendix D**. Boring logs and monitoring well construction logs for the 2017 well installations are provided in **Appendix E**. Based on the data available from the 2016 and 2017 subsurface explorations the fine-grained sediments corresponding to Unit No. 1 extend down to elevations of 369 to 385 feet in the vicinity of the ponds. The well-sorted sand unit corresponding to Unit No. 2 occurs below the fine-grained surficial sediments, extending down to elevations of 356 to 369 feet. Units No. 3 and 4 (interlayered) were found to extend down to shale bedrock at elevations of 274 to 299 feet.

2.4.2.3 Hydraulic Properties of Principal Groundwater Flow Zone

The saturated section of the unconsolidated sand and sand and gravel body comprising subsurface Unit Nos. 2, 3 and 4 (as described in the preceding section) makes up the principal groundwater flow zone underlying the site. This zone is hydraulically connected to the Ohio River but the connection is buffered by lower-permeability sediments that line the river bottom. Because of its relatively high permeability and its connection to the Ohio River, this zone represents an aquifer capable of supplying large yields to pumping wells. The depth to water in this zone typically ranges from 20 to 35 feet BGS, and the saturated thickness (which generally increases toward the river) ranges from less than 15 feet to more than 80 feet.

Groundwater occurs in this zone under unconfined conditions, or semi-confined conditions where the surficial silt and clay directly overlies the saturated zone.

AEP provided information concerning pumping tests of varying lengths performed in this zone using onsite supply wells, including a pumping test performed in 1977 that was documented in the Landfill Application Package (AEP 1984), a pumping test performed in 2004 at a new supply well installed at the landfill for flow augmentation, and yield tests performed in 2011 and 2012 at two new replacement wells used for fire water supply. Based on the information reviewed, the principal groundwater flow zone underlying the site has a transmissivity ranging from 126,000 to 250,000 gallons per day per foot (gpd/ft), corresponding to 17,000 to 34,000 square feet per day (ft²/day). The hydraulic conductivity of the formation ranges from 420 to 560 feet per day (ft/day), and the storage capacity (specific yield) ranges from 0.07 to 0.22. Pumping well yields range up to 1,000 gallons per minute (gpm), and specific capacities range from 48 to 121 gpm per foot of drawdown (gpm/ft).

2.4.3 Surface Water and Surface Water-Groundwater Interactions

The Ohio River at Owensboro drains a watershed of 97,000 square miles and the average flow is 121,200 cubic feet per second (cfs), according to Ray (1965). The stage in this section of the river is maintained by a downstream dam in Newburgh, Indiana above a minimum pool elevation of about 357.4 feet MSL (358 feet relative to the Ohio River Datum). The AEP Rockport Plant, located at River Mile (RM) 744-745, is halfway between the Newburgh Dam (RM 776) and the upstream Dam at Cannelton (RM 721). The river level at the Rockport Plant can be estimated by averaging the gauge data reported by the US Army Corps of Engineers (USACE) at Newburgh and Cannelton. A hydrograph (graph of water level over time) of the estimated daily stage in the Ohio River at the Rockport Plant from 2010 through 2015 is provided in **Appendix C-1**.

The water level in the Ohio River typically remains close to pool elevation in the summer and fall, and fluctuates at a relatively high frequency (for a few days to weeks), up to 20 feet above pool elevation, in the winter and spring months. The river stage typically reaches an elevation of 377 feet at least once in most years. The elevation of the 10-year flood is 387.7 feet, the 100-year flood level is 392 feet, and the level of the highest flood of record in the area (the flood of 1937) is 397 feet.

Groundwater levels and gradients in the glaciofluvial (valley train) sediments that fill the valley are strongly influenced by the Ohio River. Under low-water (pool) conditions, groundwater in the sediments flows under a low gradient toward the Ohio River. As the river level fluctuates in winter and spring, groundwater levels fluctuate along with it, although the effects are increasingly dampened with distance from the river. During rapid rises in river level, the groundwater gradient can be temporarily reversed to some distance from the river bank, resulting in excess groundwater being stored in the sediment (bank storage), and then draining slowly back toward the river again as the river stage falls.

2.4.4 Water Users

The Indiana Department of Natural Resources (IDNR) Division of Water maintains an online database of Significant Water Withdrawal Facilities (<http://www.in.gov/dnr/water/4841.htm>). A Significant Water Withdrawal Facility (SWWF) is defined as a facility that has the capacity to withdraw more than 100,000 gallons per day (gpd) in aggregate from surface water and/or groundwater, through one or more registered "sources" (individual pumping wells or stations). There are 10 SWWFs registered in Spencer County, of which the AEP Rockport Plant has the highest capacity.

2.4.4.1 Onsite Water Use

The main source of water used at the plant is the Ohio River. The plant's registered capacity for surface water is 80,000 gpm. According to the IDNR database, in 2011 the plant's actual average usage of river water was 22.3 million gallons per day (mgd), corresponding to an average surface water withdrawal of 15,500 gpm.

The plant also has seven registered water withdrawal wells. The locations of these supply wells are shown on **Figure 2**. The combined average withdrawal from these wells in 2011 was 0.59 mgd (410 gpm). Information available for the onsite water supply wells is summarized below (withdrawal rates are based on 2011 data available in the IDNR database):

- Wells PW-1 and PW-2 are used for plant potable supply. The combined average withdrawal rate for these two wells is approximately 120 gpm.
- Wells PW-3 and PW-4 are used for fire water supply as well as industrial supply. The combined average withdrawal rate for these two wells is approximately 120 gpm.
- Well PW-5 was installed on the west side of US 231 and was intended to be used for landscape watering around an energy education center constructed by AEP at that location. The well is inactive (no withdrawals since it was installed).
- PW-6 is a well installed immediately east of the landfill to fill water trucks used for dust control. The average water withdrawal rate for this well is 17 gpm.
- PW-7 is a well installed southeast of the landfill to provide water for treating landfill leachate through flow augmentation prior to discharge, as required under the plant's NPDES permit. The average water withdrawal rate for this well is 39 gpm.

2.4.4.2 Offsite Water Users

The other nine SWWFs in Spencer County include the following:

- The City of Rockport public supply (five wells with a combined capacity of 1,163 gpm).
- The Town of Grandview public supply (two wells with a combined capacity of 970 gpm).
- Reo Water, Inc., public supply for the City of Richland, west of Rockport (five wells with a combined capacity of 1,130 gpm).
- The City of Boonville public supply, northwest of Rockport (four wells with a combined capacity of 2,050 gpm).
- Corn Island Shipyard, a marine barge manufacturer on the Ohio River in Grandview (one well with a capacity of 450 gpm).
- Three agricultural irrigation users (Christmas Lake GC, Loehr Farms and Allen Gray LP II), all located remotely from the AEP Rockport Plant.
- One coal washing operation (Buckhorn Processing) using surface water, located in Lamar, Indiana north-northwest of the AEP Plant.

The Ohio River navigation charts (USACE 2014) show surface water intakes and other major structures along the river. The charts for sections of the river adjacent to and immediately downstream of the AEP Rockport Plant show the industrial intakes for the AEP plant and Rockport Terminals (a coal barging facility), and shoreline facilities in Rockport for one commercial marina, two crushed stone operations, and two loading facilities (ADM and Coal Inland).

3.0 Monitoring Network Evaluation

3.1 Hydrostratigraphic Units

Based on the available information, two generalized hydrostratigraphic units can be distinguished within the unconsolidated subsurface materials of the AEP Rockport Plant.

The upper unit (corresponding to the unit identified as Unit No. 1 in previous work by AEP, discussed above in Section 2.4.2.2), consists of surficial silt and clay (locally containing sand). It is typically 8 to 25 feet thick, and is generally not saturated. However, it can serve as a perching layer above which water can accumulate in surface depressions or in more permeable surface fill. Soil sampling and permeability testing performed as part of the 1983 landfill Site Investigation indicates the bulk vertical permeability of the material in this unit is on the order of 10^{-7} to 10^{-6} centimeters per second (cm/sec), or 0.003 to 0.0003 ft/day.

The lower unit (corresponding to combined Unit Nos. 2, 3 and 4, as discussed above in Section 2.4.2.2) extends from the bottom of the surficial silt and clay to the top of bedrock, and consists of granular outwash deposits. These deposits consist primarily of sand, ranging from well-sorted fine sand to poorly-sorted fine to coarse sand, with lenses of gravelly sand and sandy gravel. This unit has an uneven bottom surface, but generally thickens to the southeast, toward the Ohio River. The lower section of this unit is saturated and represents the principal groundwater flow zone beneath the property. The saturated thickness in this unit ranges from less than 15 to more than 80 feet, and the bulk horizontal permeability (hydraulic conductivity) of this unit is on the order of 500 ft/day.

Bedrock underlying the unconsolidated deposits consists predominantly of shale, and is expected to have low permeability. Bedrock in the area of the Rockport Plant does not represent a significant medium for flow or storage of recently recharged (meteoric) groundwater, and is not a reliable source of fresh water supply, relative to the much more available source in the sandy overburden.

3.1.1 Horizontal and Vertical Position Relative to the CCR Unit

The BA Ponds have design bottom elevations of 386 feet (West BA Pond) and 377 feet (East BA Pond). This is the reported elevation of the interface between CCR and the underlying material. The underlying material consists of native sediments, locally supplemented with addition of clay soil excavated from the interior of the ponds and used to line the sides and possibly the bottom of the ponds (if needed).

Stratigraphic information for the subsurface in the area of the wastewater pond complex is provided in the logs available for several soil borings advanced in 1977 (**Appendix A**), 2010 (**Appendix B**), early 2016 (**Appendix D**), and 2017 (**Appendix E**). Subsurface stratigraphy is also illustrated in the cross-sections developed from the boring logs for the new monitoring wells installed in 2016 (**Figures 5-7 in Appendix D**).

The interface between the two uppermost native hydrostratigraphic units (surficial silt and clay, and underlying sand) is transitional, usually encompassing several feet of interlayered sandy and silty beds. However, it is apparent that the interface slopes to the south, from approximate elevations of 380-386 feet on the north and east (MW-1600, MW-1601, MW-1602 and MW-1002, MW-1603, MW-1001, BH-363, BH-366) to elevations of 369-377 feet on the south and southwest (MW-1606, MW-1605, MW-1606, MW-1003, MW-1004, BH-364, BH-365). A comparison of the reported pond bottom elevations to these data indicates there is at least 9 feet of native fine-grained sediments underlying the south end of the West BA Pond, and 4 feet under the north end of the West BA Pond. However, native fine-grained sediments may be thin or absent below the south end of the East BA Pond, which has a design bottom elevation of 377 feet.

3.1.2 Piezometric Conditions

Groundwater level data are available from piezometric measurements made from 2010 to 2016 in four monitoring wells (MW-1001 through MW-1004) installed in 2010 at the perimeter of the wastewater pond complex. Well construction details are summarized in **Table 1**, and well construction logs are provided in **Appendix B**. The wells are finished at depths of 38.0 to 45.5 feet BGS, with 10 feet of screen set close to the top of the lower sandy unit (approximately 10 feet below the bottom of the silt and clay deposits). The well piezometric data are provided in **Appendix C**, along with hydrographs (graphs of water levels over time) for the wells and the Ohio River, and piezometric maps for selected events. The available data include eight monitoring events conducted semi-annually in May and November, from May 2011 to May 2015 (except for May 2012, for which piezometric data are missing). In **Appendix D (Table 2 and Attachment 3)**, the piezometric data set has been updated with water level readings collected by Wood in early 2016 (in January in the 2010 wells, and on March 17 in the 2010 and 2016 wells). In **Appendix E**, the piezometric data set has been updated with water level readings collected by Wood following installation of additional wells in 2017.

The piezometric data for the four initial monitoring wells installed in 2010 show that water levels vary seasonally, typically fluctuating between 1 and 2.5 feet in an individual well, with higher water levels in May and lower water levels in November. This is consistent with river levels, which are low in summer and fall, and spike to higher levels for short periods in winter and spring. In the three wells closest to the BA Ponds (MW-1001 through MW-1003), groundwater levels occur most commonly between elevations of 367 and 370 feet, in sand or sand and gravel below the surficial silts and clays (see **Figures 5-7 in Appendix D**). This is more than 7 feet below the design bottom of the East BA Pond (the deeper pond), and more than 9 feet above the river low pool elevation of 357.4 feet. In six of the eight monitoring events between collected from 2011 to 2015, the hydraulic gradient was toward the river, to the east-southeast, with water elevations occurring in descending order in the wells as follows: MW-1001, MW-1003, MW-1002, and MW-1004. In the last event (7 May 2015), the water level elevations in all four wells were within 0.60 feet of each other, and the highest water levels were observed in the middle wells (MW-1003 and MW-1002), reflecting a shallow divide most likely related to a spike in river level that was subsiding at the time of the monitoring (river gauge data not available for that period). The first event (17 May 2011) was conducted during a period of very high river levels: the Ohio River had spiked at 387.7 feet (the 10-year flood level) on April 28, and had dropped to 366.6 feet on 17 May. The water levels in the wells were lagging slightly behind the river, ranging from 376.13 feet in MW-1004 (closest to the river) to 371.61 feet in MW-1001 (farthest from the river), with the middle wells MW-1002 and MW-1003 (closer to the BA Ponds than MW-1004) having water levels of 373.20 and 373.72 feet respectively.

In early 2016, 20 new monitoring wells were installed in seven clusters of three wells each (including well MW-1002 installed in 2010). Water level elevations measured between January and March 2016 ranged between approximately 368 and 370 feet. A round of water level measurements was made after well construction was completed, on 17 March 2016 (**Table 2 and Figure 3 in Appendix D**). Piezometric levels measured on that date ranged between 369.09 and 370.20 feet, corresponding to a slight gradient to the east. Differences in water level elevations between wells in a single cluster were small, ranging from 0.01 to 0.33 feet, and averaging 0.08 feet.

Based on the available data and the analysis described above, a water level elevation of 374 feet can be considered a high groundwater level, and a level of 372 feet can be considered a typical seasonal high water level, in the sandy outwash deposits beneath the BA Ponds.

3.1.3 Overall Flow Conditions

The principal groundwater flow zone underlying the ponds is the lower overburden unit consisting of granular outwash deposits (poorly sorted sand with interlayered sand and gravel). Recharge into this unit occurs laterally from hills and buried tributary valleys to the north-northwest. Recharge also occurs from the Ohio River to the southeast during relatively brief periods (spikes) of high water level in the river. Areal recharge also occurs vertically from the surface. The rate of areal recharge varies locally according to the thickness and bulk permeability of the overlying silt and clay unit. Artificial recharge can also occur from units containing standing surface water, such as the wastewater pond complex including the BA Ponds (when they contain water), depending on the hydraulic separation provided by natural materials and engineered soil lining the bottoms of these units.

Groundwater flow in this zone is predominantly to the east-southeast, toward the Ohio River. Flow reversals occur during brief periods of high river level, but are temporary, without long-term effects on flow or migration of constituents in groundwater. Supply wells are present to the north and northeast of the BA Ponds, but these wells pump intermittently, at rates that are insufficient to affect flow directions at significant distances from the pumping centers.

Based on available data, the estimated hydraulic gradient (i) under typical flow conditions is 0.0015 feet/foot, and the hydraulic conductivity (K) is on the order of 500 ft/day. Assuming an effective porosity (n) of 0.20, the average flow velocity (v) can be estimated from the Darcy flow equation [$v = (Ki)/n$] as 3.75 ft/day, or 1,370 ft/year. Given the occurrence of temporary flow reversals in most years, the actual rate of groundwater flow toward the river would be expected to be somewhat less.

3.2 Uppermost Aquifer

3.2.1 CCR Rule Definition

As defined in the federal CCR Rule (§257.53 Definitions):

- *Aquifer* means a geologic formation, group of formations, or portion of a formation capable of yielding usable quantities of groundwater to wells or springs.
- *Groundwater* means water below the land surface in a zone of saturation.
- *Uppermost aquifer* means the geologic formation nearest the natural ground surface that is an aquifer, as well as lower aquifers that are hydraulically interconnected with this aquifer within the facility's property boundary. Upper limit is measured at a point nearest to the natural ground surface to which the aquifer rises during the wet season.

3.2.2 Identified Onsite Hydrostratigraphic Unit

Consistent with the definition in the CCR Rule, the hydrostratigraphic unit identified as the uppermost aquifer in this case is the saturated granular outwash deposit that underlies the Rockport Plant property including the BA Ponds. The top of this unit would be the typical seasonal high water level of 372 feet, 27 feet below the crest elevation of the pond embankments (399 feet).

The bottom of the unit would be the top of bedrock. The shale bedrock underlying the granular outwash deposits does not represent a significant groundwater flow zone. The bedrock surface in the vicinity of the pond is irregular, generally sloping to the southeast, and occurs at elevations of 274 to 300 feet (111 to 126 feet immediately below the BA Pond embankment crest level). The saturated thickness of this unit, therefore, is expected to range from 70 to 100 feet, thickening to the southeast.

3.3 Review of Existing Monitoring Network

3.3.1 General CCR Rule Requirements

In summary, the performance standard for groundwater monitoring systems in the CCR Rule (§257.91) states that the system should consist of a sufficient number of wells, installed at appropriate locations and depths, to yield groundwater samples from the uppermost aquifer that:

- Accurately represent the quality of background groundwater, and
- Accurately represent the quality of the groundwater passing the waste boundary of the CCR unit in the uppermost aquifer, and
- Monitor all potential contaminant pathways.

The following sections review the existing groundwater monitoring network at the BA Ponds in terms of these requirements.

3.3.2 Monitoring Wells Installed in 2010

Four shallow monitoring wells (MW-1001 through MW-1004) were installed in 2010 at the perimeter of the wastewater pond complex. Three of the wells are located adjacent or close to the BA Ponds; MW-1004 is located farther downgradient, at the southeast corner of the wastewater pond complex.

Well construction details are summarized in **Table 1**, and well construction logs are provided in **Appendix B**. Well piezometric data are provided in **Appendix C**. The 2010 monitoring wells are finished at depths of 38.0 to 45.5 feet BGS, with 10 feet of screen set approximately 10 feet below the bottom of the silt and clay deposits, and close to the top of the uppermost aquifer. Well bottom elevations range from 360 feet in MW-1001 to 353 and 352 in MW-1002 and MW-1003 respectively.

A review of the available groundwater monitoring network for the BA Ponds was made in late 2015, and identified the following gaps:

- MW-1001, although located in an upgradient position relative to the BA Ponds, is not a suitable background monitoring well because it is installed through CCR (bottom ash in a thin layer at 9-10 ft BGS), and is located too close to the ponds given the occasional temporary reversals in groundwater flow direction.
- MW-1004 is located remotely from the BA Ponds, and MW-1003 is also offset from the waste boundary. Therefore, only one well (MW-1002) was located at a downgradient boundary, and a minimum of three downgradient wells are required by the CCR rule.
- There were no wells intercepting deeper flow zones within the uppermost aquifer (between elevations of 350 and 280 feet).

As a result of the review, it was recommended that MW-1002 be included in the downgradient monitoring network, and that the other three wells (MW-1001, MW-1003, and MW-1004) be retained for use as piezometers, to monitor groundwater levels and aid in the interpretation of flow directions.

3.3.3 Monitoring Wells Installed in 2016

Twenty new wells were installed in January-March 2016, in seven three-well clusters that include MW-1002. The clusters are designated MW-1600 through MW-1606, and locations are shown on the monitoring network layout map (**Figure 1** in **Appendix D**). Three wells are included in each cluster, finished at shallow (S), intermediate (I) and deep (D) levels. Well construction details for the monitoring wells installed in 2016 are provided in **Table 1** and **Attachment 1** of **Appendix D**.

3.3.3.1 Background Monitoring Well Locations

A significant challenge in monitoring this site is the occurrence of temporary flow reversals in the uppermost aquifer that underlies the BA Ponds. Data available for the existing wells indicate that the dominant flow direction in the uppermost aquifer is to the southeast, toward the Ohio River. However, during short-term spikes in river level, the direction of groundwater flow can be temporarily reversed so that, for a short period, groundwater under the BA Ponds will flow northwest, followed by a flattening of the gradient, and then a return to the dominant flow direction. In eight monitoring events over five years, the groundwater hydraulic gradient was to the southeast in six events, transitional (with a divide under the ponds) in one event (May 2015), and fully reversed under the full length of the wastewater pond complex in one event (May 2011).

Another short-term influence on groundwater flow direction is pumping from the plant's supply wells, which are located north and northeast of the BA Ponds. However, based on distance, intermittent pumping schedule, and relatively low rates of pumping from these wells (see Section 2.4.1.1 above), they are not expected to exert a significant influence on groundwater flow directions under the BA Ponds in the way that the river does. Based on review of river stage data, and experience at similar sites elsewhere along the Ohio River, flow reversals related to river stage would not be expected to last longer than two to three weeks. Based on the groundwater velocity estimated above in Section 3.1.3 (3.75 ft/day), contaminants would be unlikely to travel more than approximately 75 feet from the pond during a three-week flow reversal, even using liberal estimates of migration (not subject to adsorption in the formation matrix). However, to be conservative and account for dispersion, it was recommended that background monitoring wells be located at least 200 feet north-northwest of the BA Ponds. Final locations for the two sets of upgradient monitoring wells are shown on **Figure 1 in Appendix D**. The background well clusters, designated MW-1600S/I/D and MW-1601S/I/D, are located approximately 1,000 feet and 850 feet, respectively, from the edge of the BA Ponds.

3.3.3.2 Downgradient Monitoring Well Locations

The East and West BA Ponds each have rough dimensions of 2,000 feet x 650 feet, corresponding to a surface area of approximately 30 acres each (60 acres total). The two BA Ponds are currently monitored as a single (multiunit) system. Downgradient monitoring wells are designated by cluster as MW-1602 through MW-1606, with MW-1002 included as the shallow well in the MW-1602 cluster. The downgradient monitoring well clusters were installed on the perimeter segments of the ponds in the dominant downgradient directions (east and south), as shown on **Figure 1 in Appendix D**.

The downgradient wells were located as close as practical to the edge of the BA Ponds, just outside the road at the crest of the embankment, in order to be as close as possible to the *waste boundary* (defined in the CCR Rule as "the vertical surface located at the downgradient limit of the CCR unit, that extends down into the uppermost aquifer").

3.3.4 Monitoring Wells Installed in 2017

Six new monitoring wells were installed in September through October 2017, in two three-well clusters. The clusters are designated MW-1701 and MW-1702, and locations are shown on the monitoring network layout map (**Figure 1 in Appendix E**). Three wells are included in each cluster, finished at shallow (S), intermediate (I), and deep (D) levels. Well construction details for the monitoring wells are provided in **Table 1 of Appendix E**.

Water level data collected since November 2017 (**Table 2 in Appendix E**) demonstrate that well clusters MW-1701 and MW-1702 are hydraulically upgradient of waste boundary wells at the BA Ponds, as

discussed in Section 2.1.1, and confirm the previously documented dominant flow direction to the southeast, toward the Ohio River. As discussed in previous reports, a challenge in monitoring this site is the occurrence of temporary flow reversals during short-term spikes in river level with a flow velocity of approximately 3.75 ft/day in the north and westerly direction. Flow reversal duration is usually on the order of 2 to 3 weeks. Assuming a flow velocity of 3.75 ft/day, contamination would travel approximately 75 feet from the BA Ponds during a typical flow reversal. Background well clusters MW-1600 and MW-1601 are located approximately 1,000 feet and 850 feet, respectively, from the edge of the BA Ponds. Well clusters MW-1701 and MW-1702 are located approximately 925 feet and 2,700 feet, respectively, from the BA Ponds.

3.3.5 Vertical Screening Levels

The saturated thickness of the upper aquifer in the vicinity of the BA Ponds is 70 to 100 feet. The 2010 monitoring wells are screened across 10 feet in the top 20 feet of the saturated zone.

In order to monitor all potential contaminant pathways in the upper aquifer, the groundwater monitoring system includes monitoring wells at three depths (shallow, intermediate and deep) at each of the seven cluster locations (including the two upgradient locations and the five downgradient locations), for a total of 21 wells that can serve as piezometric and/or water quality monitoring points. This protocol was continued for the MW-1701 and MW-1702 well clusters bringing the total number of wells in the monitoring network to 27. The 27 clustered monitoring wells are supplemented by three shallow wells installed in 2010 (MW1001, MW-1003 and MW-1004), which can serve as additional piezometric monitoring points, to improve interpretation of groundwater flow directions.

Screen lengths in all of the wells are 10 feet (the maximum allowable screen length for clustered wells in the Indiana waste regulations), installed approximately at the following elevations: just above the bedrock surface (D level, between elevations of 275 and 309 feet), at a level approximately midway up in the saturated zone (I level, between elevations of 321 to 333 feet, and at a shallow level near the top of the saturated zone (S level, between elevations of 353 and 364 feet). The screen elevation at MW-1701D and MW-1702D are shallower than the deep interval screens in the rest of the well network due to bedrock elevations increasing to the north and west of the BA Ponds. This variation necessitated raising the intermediate screen level for MW-1701 and MW-1702 by approximately 10 feet in comparison to the rest of the monitoring network. The shallow screen intervals are generally consistent with the rest of the monitoring network.

3.3.6 Monitoring Well Construction and Maintenance

The monitoring wells are constructed of 2-inch flush-threaded Schedule 40 PVC riser and 10-slot screen. Monitoring well construction has been documented in detail in the report in **Appendix D**.

Monitoring wells should be maintained consistent with minimum Indiana requirements as well as the requirements of §257.91(e) of the CCR Rule, including:

- Monitoring wells and piezometers should be maintained to insure continued performance through the life of the monitoring program.
- Design, installation and development of any new wells, and repair of existing wells, should be documented, and documentation maintained in the operating record for the unit.
- All new wells, and existing wells having modifications made to the wellhead at the surface, should be surveyed to determine ground surface elevation and a reference point elevation for piezometric monitoring

- Abandonment or decommissioning of any wells or piezometers should be documented, and documentation maintained in the operating record for the unit.

3.3.7 Summary

Based on the information reviewed and presented in this report (including appendices), the groundwater monitoring network currently installed at the BA Ponds at the AEP Rockport plant can be considered appropriate under the requirements of the CCR Rule as a multiunit system for detection monitoring in the uppermost aquifer at the waste boundary.

4.0 P.E. Certification

By means of this certification, I certify that I have reviewed the available documents (discussed in this report) for the groundwater monitoring system at the existing BA Ponds at the AEP Rockport Plant located in Spencer County, Indiana, and have found that it meets the requirements in 40 CFR §257.91.



Kathleen D. Regan
Printed Name of Registered Professional Engineer

Kathleen D. Regan
Signature

11400182 Indiana 13 February 2019
Registration No. Registration State Date

5.0 References

- American Electric Power Company (AEP), 18 July 1977. Design drawings No. 12-30013-15 and 12-30018-1 from *Unit No. 1 & 2 Wastewater & Bottom Ash Pond Area* (AEP 1977).
- AEP, April 1984. *Application Package for Construction/Operating Permit for Solid Waste Management Facilities for Indiana and Michigan Electric Company's Ash Disposal Landfill for the Rockport Plant*. Submitted to Indiana Environmental Management Board. (AEP 1984).
- AEP, 21 June 2010. *Stability Analysis of Bottom Ash Pond West Dike*, AEP Internal Memo. (AEP 2010).
- Casagrande Consultants, 25 April 1977. *Foundation Investigations for Rockport Site*. Report prepared for AEP (Casagrande 1977).
- Federal Emergency Management Agency (FEMA) National Flood Insurance Program (NFIP), March 18, 2015. *Flood Insurance Rate Map, Spencer County Indiana and Incorporated Areas. Panels 245C and 250C of 375 (Map Nos. 18147C0245C and 18147C0250C)*. (FEMA 2015).
- Grove, Glenn E., May 2006. *Bedrock Aquifer Systems of Spencer County, Indiana*. Indiana Department of Natural Resources (IDNR) map. (Grove, 2006).
- O'Brien & Gere Engineers, Inc. (O&G), 24 March 2011. *Dam Safety Assessment of CCW Impoundments, Rockport Power Plant*. Report prepared for USEPA. (O&G 2011).
- Ray, Louis L., 1965. *Geomorphology and Quaternary Geology of Owensboro Quadrangle, Indiana and Kentucky*. U.S. Geological Survey (USGS) Professional Paper 488, 72 p. (Ray 1965).
- United States Army Corps of Engineers (USACE), March 2014. *Ohio River Navigation Charts - Cairo, Illinois to Foster, Kentucky*. (USACE 2014)
- United States Department of Agriculture–Soil Conservation Service (USDA-SCS), 1973. *Soil Survey of Spencer County, Indiana*. (USDA 1973).
- WorleyParsons, 7 November 2011. Design drawing No. 12-300410, *Boring Location – Overall Plan*. (WP 2011).



wood.

Table



**Table 1
Monitoring Well Construction Details
Wastewater Pond Complex
AEP Rockport Plant, Rockport, Indiana**

Well ID	Date Installed	Northing SPCS NAD27	Easting SPCS NAD27	Length of Screen	Casing Type	Casing Diameter	Borehole Diameter	Total Depth to Bottom of Well	Total Depth to Bottom of Well	Total Depth of Bore Hole	Depth to Bedrock
		(ft)	(ft)	(ft)		(in)	(in)	(ft BMP)	(ft BGS)	(ft BGS)	(ft BGS)
MW-1001	6/2/2010	153488.0	513047.6	9.7	PVC	2	6.25	42.3	40.0	41	no refusal
MW-1002	6/2/2010	152307.4	514231.0	9.7	PVC	2	6.25	47.8	45.5	46.5	no refusal
MW-1003	6/2/2010	151208.1	512820.7	9.7	PVC	2	6.25	40.4	38.0	39	no refusal
MW-1004	6/3/2010	150013.4	514264.7	9.7	PVC	2	6.25	44.8	42.5	43.5	no refusal

Well ID	Ground Surface Elevation	Top of Casing Elevation	Casing Stickup	Top of Seal Elevation	Top of Sand Elevation	Top of Screen Elevation	Bottom of Screen Elevation	Bottom of Well Elevation	Bottom of Sand Elevation	Bottom of Borehole Elevation	Bedrock Elevation
	(ft APD)	(ft APD)	(ft AGS)	(ft APD)	(ft APD)	(ft APD)	(ft APD)	(ft APD)	(ft APD)	(ft APD)	(ft APD)
MW-1001	400.03	402.35	2.3	374.33	372.33	370.33	360.63	360.03	359.03	359.03	no refusal
MW-1002	399.09	401.42	2.3	368.19	366.09	363.89	354.19	353.59	352.59	352.59	no refusal
MW-1003	390.84	393.23	2.4	368.04	365.14	363.14	353.44	352.84	351.84	351.84	no refusal
MW-1004	394.25	396.55	2.3	366.55	364.55	362.05	352.35	351.75	350.75	350.75	no refusal

Notes:

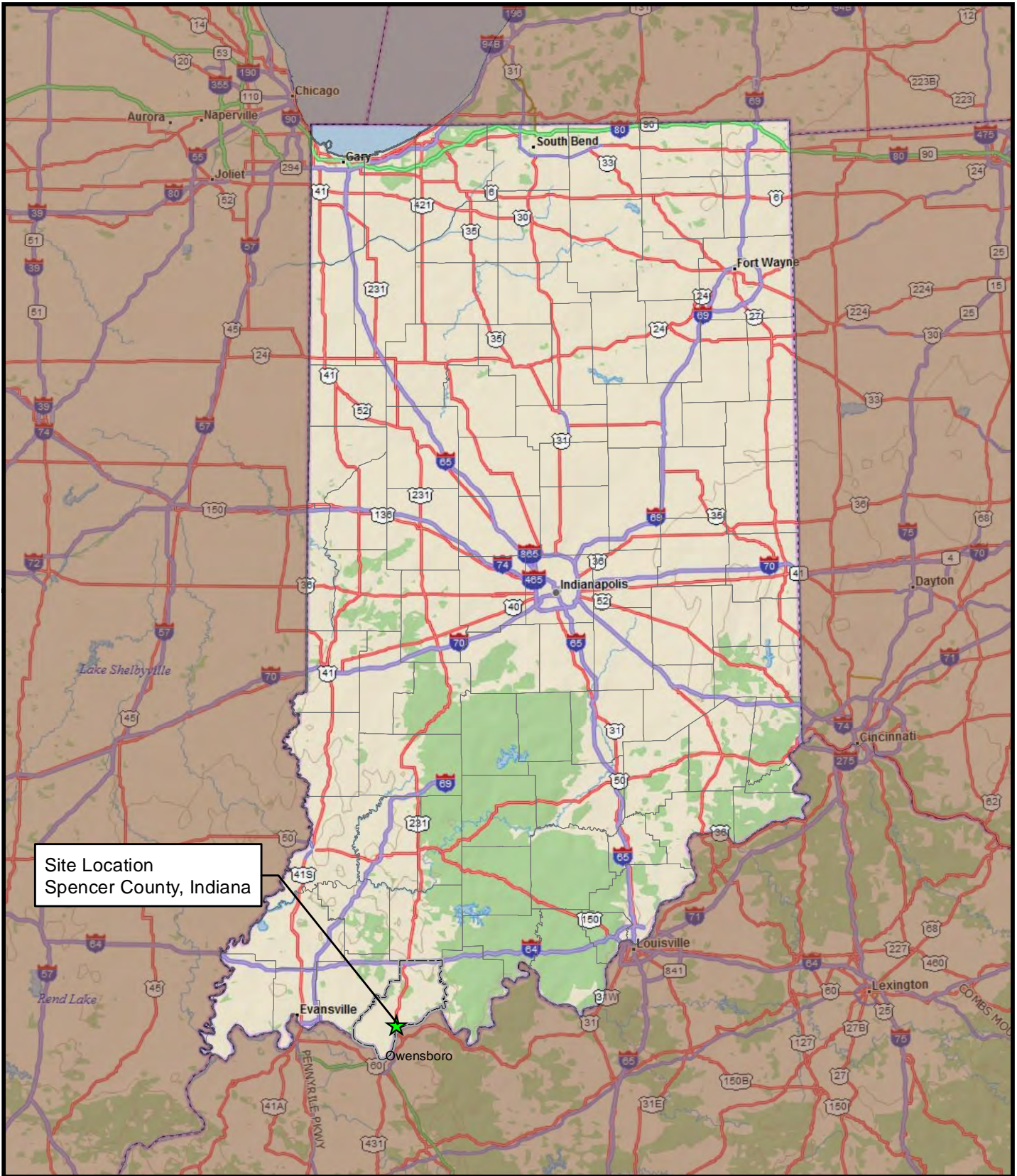
- ft = feet
- in = inches
- BMP = below measuring point (top of casing)
- BGS = below ground surface
- APD = above plant datum
- AGS = above ground surface



wood.

Figures





Site Location
Spencer County, Indiana



Legend
★ Site Location

Service Layer Credits: Copyright © 2015 DeLorme



wood.

2456 Fortune Drive, Suite 100
Lexington, Kentucky 40509
Phone: (859) 255-3308

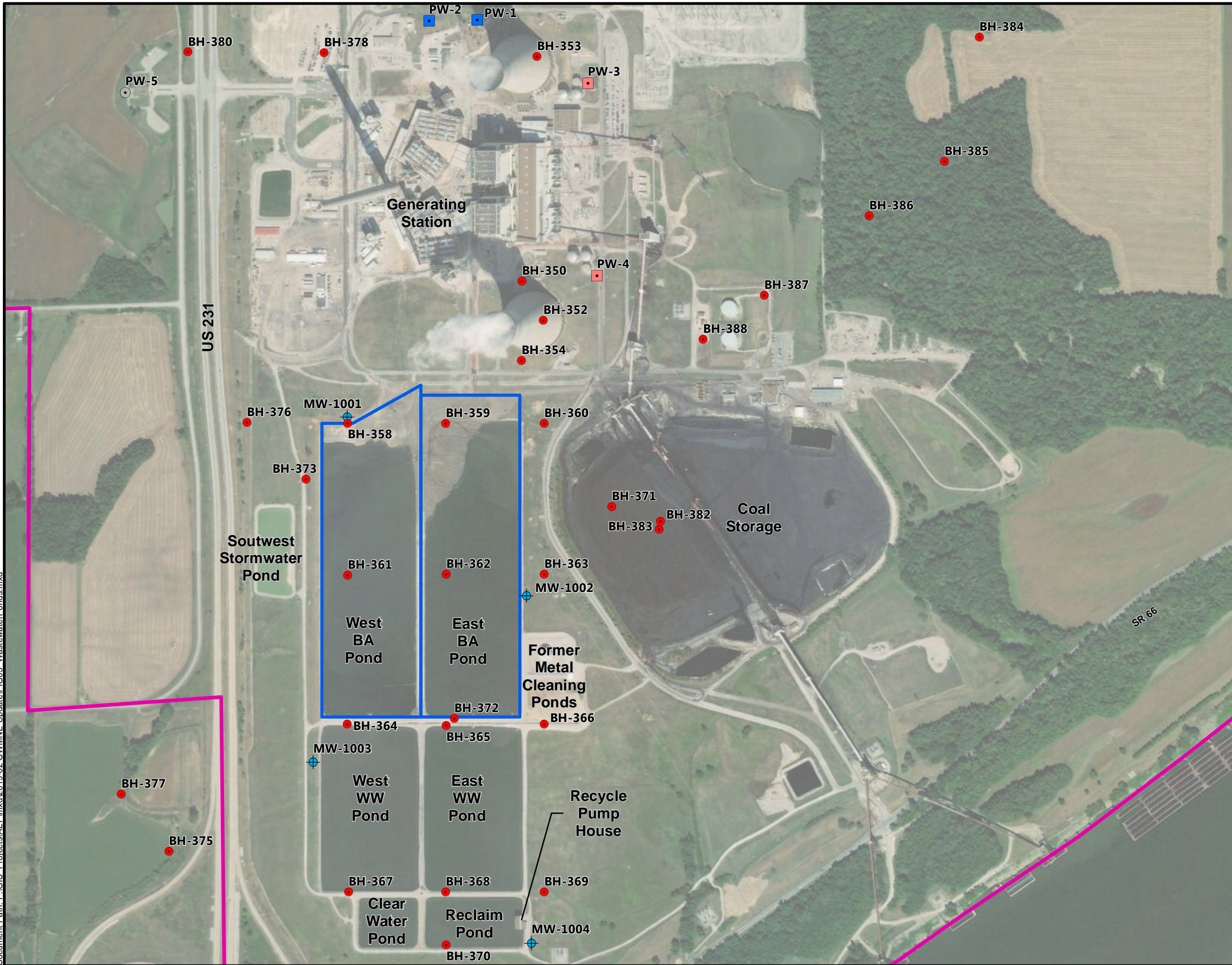
SITE LOCATION MAP

AEP - Rockport, IN

PROJECT NUMBER: 7362182624

SCALE	1" = 40 miles
DATE	2/11/2019
DRAWN BY	TMR
APPROVED BY	KDR

FIG. 1



Legend

- Geo_Borings
- ⊕ BAP - USWAG Monitoring Well
- Plant - Potable Water Supply Well
- Plant - Fire Water Supply Well
- Inactive Water Supply Well
- Property Boundary
- Bottom Ash Ponds (BAP)

Data Sources

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Date of Photography: May-June 2016
 Source of Photography: U.S. Department of Agriculture, National Agriculture Imagery Program (NAIP)



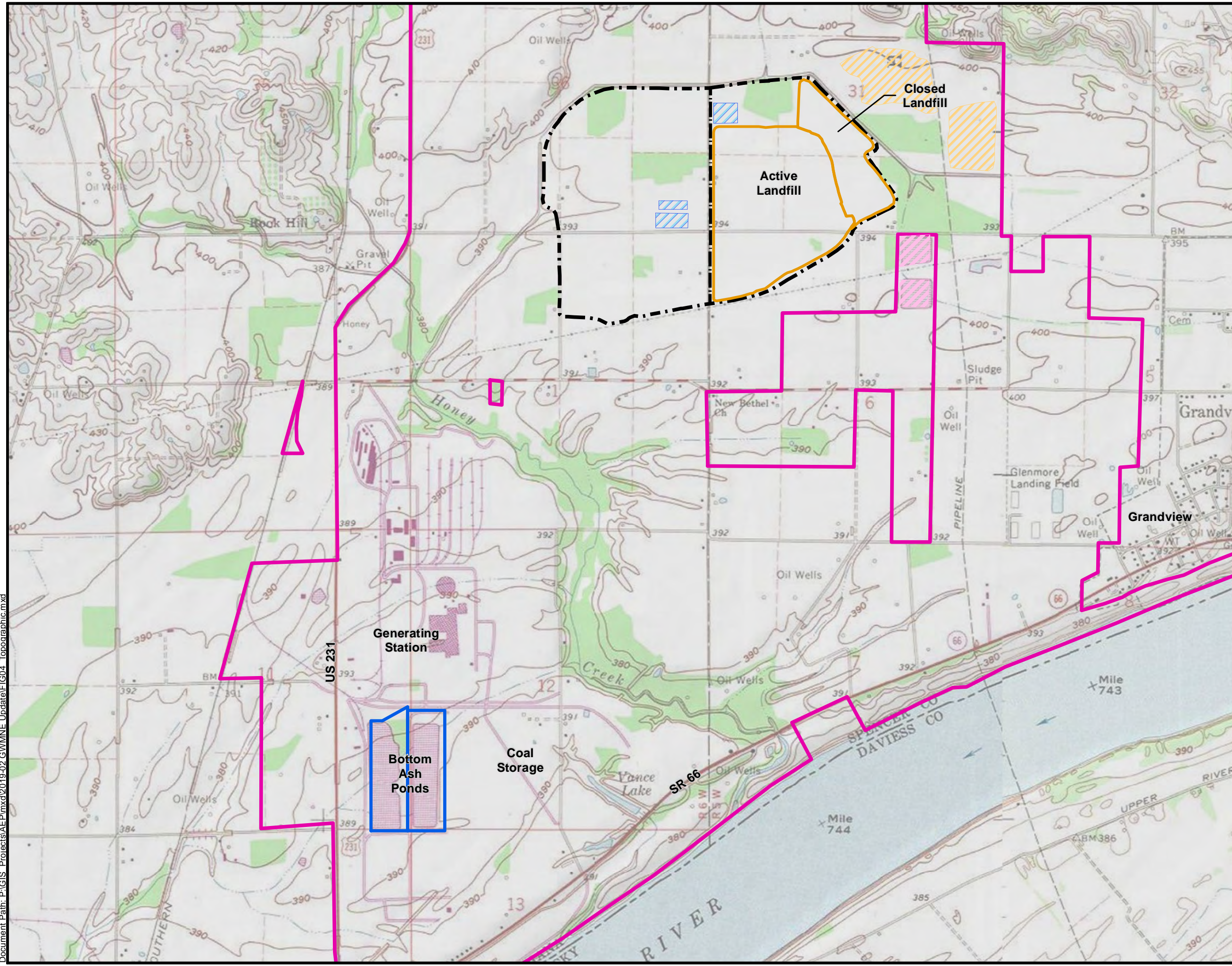
WASTEWATER POND COMPLEX
 AEP - ROCKPORT, IN
 PROJECT NUMBER: 7362182624

SCALE	1" = 600'	FIG. 3
DATE	2/11/2019	
DRAWN BY	TMR	
APPROVED BY	KDR	

wood.

2456 Fortune Drive, Suite 100
 Lexington, Kentucky 40509
 Phone: (859) 255-3308

Document Path: P:\GIS Projects\AEP\mxd\2019-02 GWMNE Update\FIG04_Topoographic.mxd

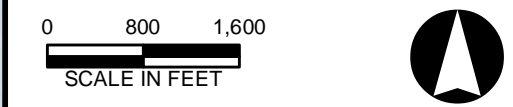


- Legend**
- Stormwater Ponds
 - Landfill Leachate Ponds
 - Grandview Wastewater Ponds
 - Property Boundary
 - Bottom Ash Ponds (BAP)
 - Landfill Area 1A (Active and Closed)
 - 1984 Landfill Permit Boundary (Area 1)

Data Sources

Service Layer Credits: Copyright© 2013 National Geographic Society, i-cubed

Source: USGS Rockport and Lewisport (IN/KY) Topographic Quadrangle Maps, 1964, photorevised 1982



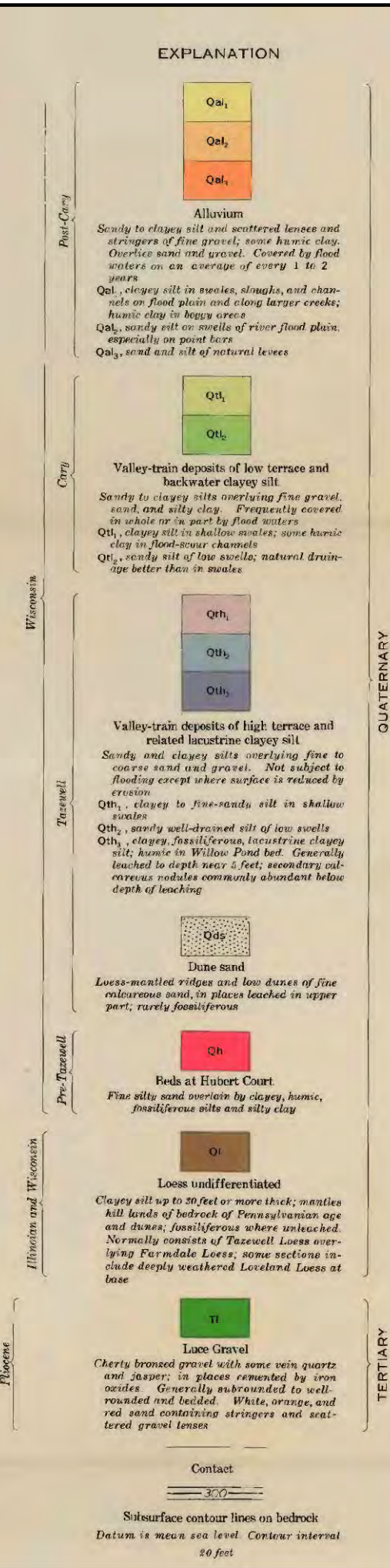
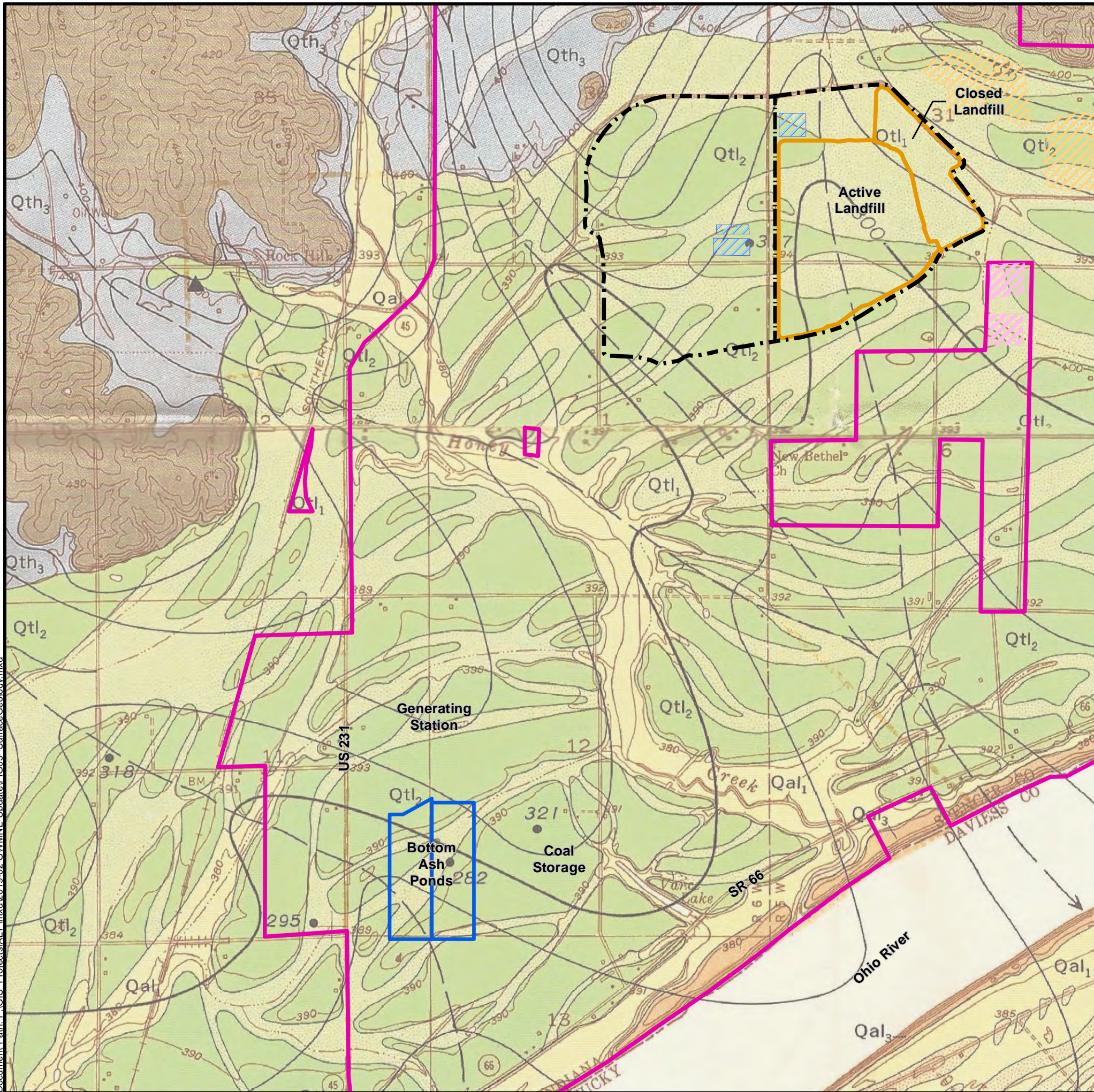
TOPOGRAPHIC MAP
AEP - ROCKPORT, IN
PROJECT NUMBER: 7362182624

SCALE	1" = 1,600'	FIG. 4
DATE	2/11/2019	
DRAWN BY	TMR	
APPROVED BY	KDR	

wood.

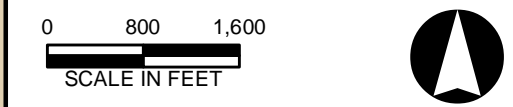
2456 Fortune Drive, Suite 100
Lexington, Kentucky 40509
Phone: (859) 255-3308

Document Path: P:\GIS Projects\AEP\mxd\2019-02 GWMNE Update\FIG05 SurfaceGeology.mxd



- Legend**
- Stormwater Ponds
 - Leachate Ponds
 - Grandview Wastewater Ponds
 - Property Boundary
 - 1984 Landfill Permit Boundary (Area 1)
 - Landfill Area 1A (Active and Closed)
 - Bottom Ash Ponds (BAP)

Data Sources
Source: Geologic Map of the Owensboro Quadrangle, Indiana and Kentucky, USGS Professional Paper 488, 1965



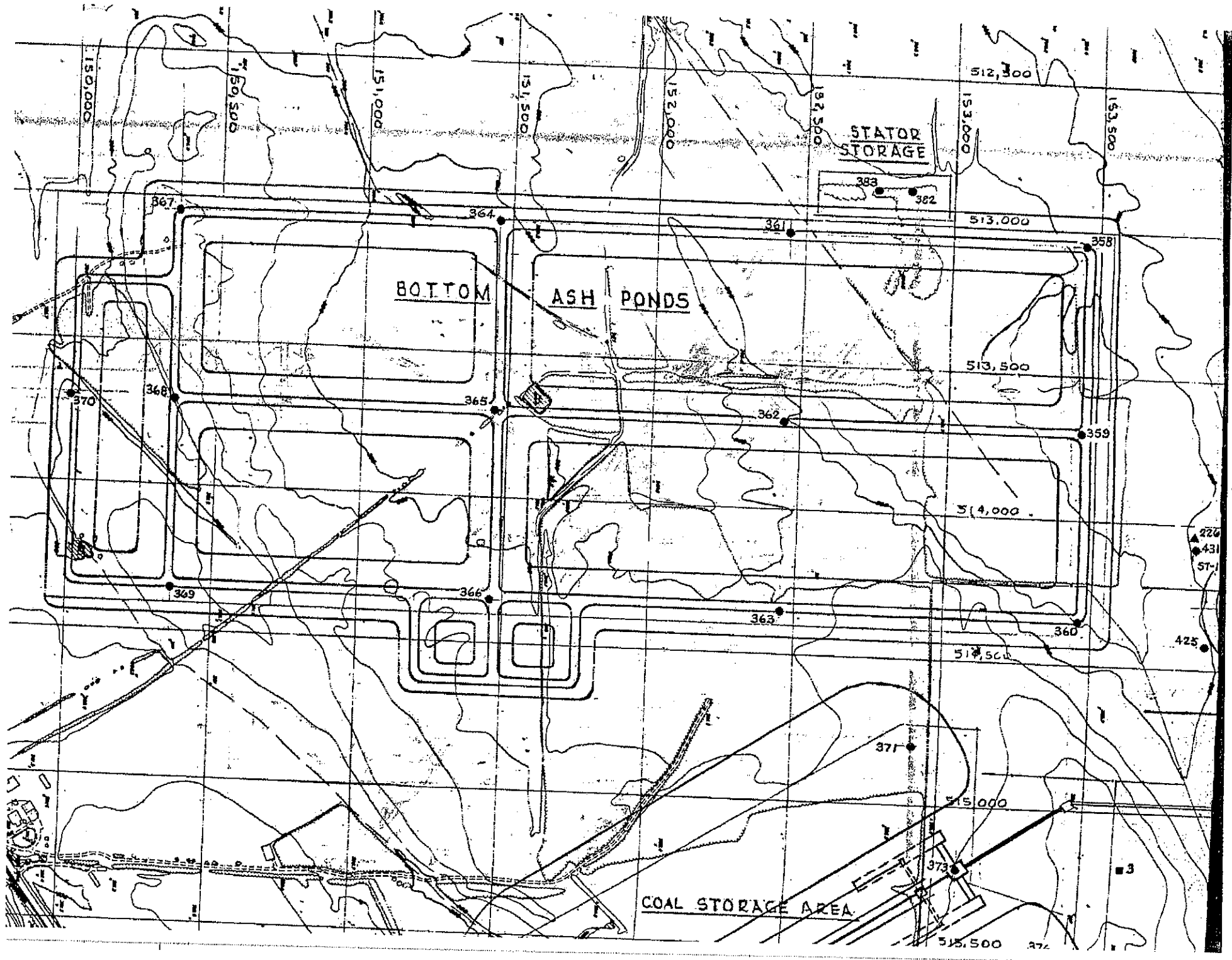
SURFACE GEOLOGY MAP
AEP - ROCKPORT, IN
PROJECT NUMBER: 7362182624

SCALE	1" = 1,600'	FIG. 5
DATE	2/11/2019	
DRAWN BY	TMR	
APPROVED BY	KDR	

wood.
2456 Fortune Drive, Suite 100
Lexington, Kentucky 40509
Phone: (859) 255-3308

Appendix A

Map and Boring Logs, 1977 Soil Borings at Wastewater Pond Complex



PROJECT: Rockport Site PROJECT NO W6-1482 BORING: BH-361
 DATE: 3/17/77 DRILLER: G. Powers CREW: J. Hardman/J. Selbe SURFACE ELEV. _____

DEPTH		SOIL STRATA SOIL DESCRIPTION AND REMARKS	TIME	TYPE	NO.	DEPTH		FIRST 6"	2ND 6"	3RD 6"	REC
FROM	TO					FROM	TO				
		Topsoil									
	1.0										
1.0		Very stiff brown and gray silty clay		SS	1	5.0	6.5	5	8	11	10
		Very stiff brown and gray silty clay		SS	2	10.0	11.5	8	13	14	9
	13.0										
13.0		Firm brown silty fine sand		SS	3	15.0	16.5	5	5	6	8
	19.0										
19.0		Very loose brown silty fine sand		SS	4	20.0	21.5	1	2	2	1
		Very loose brown silty fine sand		SS	5	25.0	26.5	1	2	2	16
	30.0										
30.0		Very dense dark brown silty fine sand		SS	6	30.0	31.5	6	43	30	16
	34.0										
34.0		Firm brown medium to coarse silty sand		SS	7	35.0	36.5	9	10	13	8
	41.0										
41.0		Firm brown silty fine sand		SS	8	40.0	41.5	9	11	13	16
	44.0										
44.0		Firm brown medium and coarse sand		SS	9	45.0	46.5	8	11	19	16
	48.0										
48.0	51.5	Dense grayish brown silty fine to medium sand		SS	10	50.0	51.5	21	21	24	14
		Boring Terminated @ 51.5 3/17/77									

METHOD OF DRILLING (Check One)
 a. ~~WIGER~~ Rod SIZE A
 b. WASH XX WATER MUD XX
 DRILLING SIZE BIT USED 2-7/8" Side Discharge
 BIT SIZE N/W LENGTH 5.0
 TURBED SAMPLES: NO. SIZE
 SAMPLES: NO.
 WATER LOSSES, % DEPTH
 SPECIAL TESTS (Hrs & Explain)

WEATHER Overcast 45 degrees
 NON-DRILLING TIME (Hrs.)
 BORING LAYOUT MOVING
 HAULING WATER STANDBY
 WATER LEVEL: @ DATE TIME
 @ DATE TIME
 CAVE-IN DEPTH: @ DATE TIME

REMARKS: (All remarks should be explained on the back of white copy)
 THIS IS A DRILLER'S LOG AND THE CLASSIFICATIONS HAVE NOT BEEN REVIEWED BY AN ENGINEER

PROJECT: Rockport Site PROJECT NO. W6-1482 BORING: BE-362
 DATE: 3/18/77 DRILLER: G. Powers CREW: J. Hardman/J. Selbe SURFACE ELEV. 392.7

DEPTH		SOIL STRATA SOIL DESCRIPTION AND REMARKS	TIME	TYPE	NO.	DEPTH		FIRST 6"	2ND 6"	3RD 6"	REC
FROM	TO					FROM	TO				
0		Topsoil									
	1.2										
1.2	7.5	Very stiff brown and gray fine sandy silty clay		SS	1	5.0	6.5	7	10	12	15
7.5	13.0	Stiff brown fine sandy silt		SS	2	10.0	11.5	4	4	6	16
13.0		Firm brown silty fine sand		SS	3	15.0	16.5	4	5	6	12
	23.5	Firm brown silty fine sand		SS	4	20.0	21.5	4	5	7	4
23.5	29.0	Loose brown silty fine to medium sand		SS	5	25.0	26.5	4	3	4	5
29.0		Firm brown silty fine to medium sand		SS	6	30.0	31.5	4	5	8	10
	37.0	Firm brown silty fine to medium sand		SS	7	35.0	36.5	7	6	10	9
37.0	44.0	Dense brown medium to coarse sand		SS	8	40.0	41.5	12	14	22	10
44.0		Firm brownish gray fine to medium silty sand		SS	9	45.0	46.5	12	12	11	10
51.5		Firm brownish gray fine to medium silty		SS	10	50.0	51.5	8	8	12	9
		Boring Terminated @ 51.5 3/18/77									

METHOD OF DRILLING (Check One)
 a. ~~XXXXX~~ Rod SIZE A
 b. WASH XX WATER MUD XX
 BORING SIZE _____ BIT USED _____
 CHANGING: SIZE N/W LENGTH 5'
 UNDISTURBED SAMPLES: NO. _____ SIZE _____
 BAG SAMPLES: NO. _____
 WATER LOSSES _____ DEPTH _____
 SPECIAL TESTS (Hrs & Explain) _____

WEATHER 45 degrees Overcast & windy
 NON-DRILLING TIME (Hrs) _____
 BORING LAYOUT _____ MOVING _____
 HAULING WATER _____ STANDBY _____
 WATER LEVEL: @ _____ DATE _____ TIME _____
 @ _____ DATE _____ TIME _____
 GIVE IN DEPTH: @ _____ DATE _____ TIME _____

REMARKS: (All remarks should be explained on the back of white copy) THIS IS A DRILLER'S LOG AND THE CLASSIFICATIONS HAVE NOT BEEN REVIEWED BY AN ENGINEER

PROJECT: Rockport Site PROJECT NO. W6-1482 BORING: BH-363
 DATE: 3/18/77 DRILLER: G. Powers CREW: J. Hardman/J. Selbe SURFACE ELEV. 392

DEPTH		SOIL STRATA SOIL DESCRIPTION AND REMARKS	TIME	TYPE	NO.	DEPTH		FIRST 6"	2ND 6"	3RD 6"	RE
FROM	TO					FROM	TO				
0	0.8	Topsoil									
0.8	8.0	Very stiff brown fine sandy silty clay		SS	1	5.0	6.5	6	9	12	14
8.0		Loose brown silty fine sand		SS	2	10.0	11.5	4	4	5	15
	20.5	Loose brown silty fine sand		SS	3	15.0	16.5	4	5	5	12
20.5	23.5	Firm brown silty fine sand		SS	4	20.0	21.5	2	5	8	10
23.5		Firm brown fine to medium sand		SS	5	25.0	26.5	5	6	6	8
		Firm brown fine to medium sand		SS	6	30.0	31.5	6	7	9	10
	38.0	Firm brown fine to medium sand		SS	7	35.0	26.5	8	8	14	7
38.0		Firm brown medium to coarse sand		SS	8	40.0	41.5	9	10	16	12
		Firm brown medium to coarse sand		SS	9	45.0	46.5	8	14	13	8
	47.0										
47.0	51.5	Firm grayish brown silty fine to medium sand		SS	10	50.0	51.5	7	10	10	12
		Boring Terminated @ 51.5									
		3/18/77									

METHOD OF DRILLING (Check One)
 a. ~~AUX~~ Rod SIZE A
 b. WASH XX WATER MUD XX
 BORING SIZE _____ BIT USED 2-7/8" Side Discharge
 CA 3: SIZE N/W LENGTH 5.0
 UNDISTURBED SAMPLES: NO. _____ SIZE _____
 JAG SAMPLES: NO. _____
 WATER LOSSES % _____ DEPTH _____
 SPECIAL TESTS (Hrs & Explain) _____

WEATHER 45 degrees Overcast Windy
 NON-DRILLING TIME (Hrs) _____
 BORING LAYOUT _____ MOVING _____
 HAULING WATER _____ STANDBY _____
 WATER LEVEL: @ _____ DATE _____ TIME _____
 @ _____ DATE _____ TIME _____
 CAVE-IN DEPTH: @ _____ DATE _____ TIME _____

REMARKS: (All remarks should be explained on the back of white copy) THIS IS A DRILLER'S LOG AND THE CLASSIFICATIONS HAVE

PROJECT: Rockport Site

PROJECT NO. W6-1482

BORING: BH-364

DATE: 3/15/77

DRILLER: G. Powers

CREW: J. Hardman/J. Selbe

SURFACE ELEV. 389.5

DEPTH		SOIL STRATA SOIL DESCRIPTION AND REMARKS	TIME	TYPE	NO.	DEPTH		FIRST 6"	2ND 6"	3RD 6"	REC.
FM	TO					FROM	TO				
0	1.4	Topsoil									
1.4		Stiff brown and gray silty clay traces fine sand		SS	1	5.0	6.5	4	6	7	16
	13.0	Stiff brown and gray silty clay traces fine sand		SS	2	10.0	11.5	3	4	6	12
13.0		Loose brown silty fine sand		SS	3	15.0	16.5	3	4	3	17
	24.0	Loose brown silty fine sand		SS	4	20.0	21.5	3	3	3	8
24.0		Firm brown fine to medium sand		SS	5	25.0	26.5	6	8	8	7
	34.5	Firm brown fine to medium sand		SS	6	30.0	31.5	6	8	9	8
34.5		Firm brown medium to coarse sand		SS	7	35.0	36.5	5	8	10	8
	43.0	Firm brown medium to coarse sand		SS	8	40.0	41.5	5	6	8	7
43.0		Loose brown medium to coarse sand & gravel		SS	9	45.0	46.5	4	3	3	8
	47.0										
47.0	51.5	Firm brown medium to coarse sand traces gravel		SS	10	50.0	51.5	8	9	13	8
		Boring Terminated @ 51.5 3/15/77									

METHOD OF DRILLING (Check One)

a. AUGER Rod SIZE A
 b. WASH XX WATER MUD XX

BIT USED 2-7/8" Side Discharge
 CASING: SIZE NW LENGTH 5'
 UNDISTURBED SAMPLES: NO. SIZE
 BAG SAMPLES: NO.
 WATER LOSSES: DEPTH
 SPECIAL TESTS (List & Explain)

WEATHER 70 degrees clear

NON-DRILLING TIME (Hrs)

BORING LAYOUT MOVING
 HAULING WATER STANDBY
 WATER LEVEL: @ DATE TIME
 @ DATE TIME
 CAVE-IN DEPTH: @ DATE TIME

REMARKS (All remarks should be explained on the back of white copy) THIS IS A DRILLER'S LOG THE CLASSIFICATION

PROJECT: Rockport Site PROJECT NO. W6-1482 BORING: BH=365
 DATE: 3/15/77 DRILLER: G. Powers CREW: J. Hardman/J. Selbe SURFACE ELEV. _____

DEPTH	SOIL STRATA	TIME	TYPE	NO.	DEPTH		FIRST 6"	2ND 6"	3RD 6"	REC.
					FROM	TO				
0	Topsoil									
1.3	Stiff brown and gray silty clay traces		SS	1	5.0	6.5	3	5	9	18
11.0	Stiff brown fine sandy silty tan clay		SS	2	10.0	11.5	4	4	8	18
13.5	Loose brown silty fine sand		SS	3	15.0	16.5	2	3	4	12
19.0	Firm brown fine sand silt traces clay		SS	4	20.0	21.5	3	2	3	14
25.5	Firm brown and gray silty fine sand		SS	5	25.0	26.5	2	5	8	12
28.0	Firm brown silty fine sand		SS	6	30.0	31.5	8	10	10	6
35.5	Firm brown silty medium to coarse sand		SS	7	35.0	36.5	6	11	10	9
40.0	Dense brown silty medium to coarse sand traces gravel		SS	8	40.0	41.5	13	25	25	10
42.0	Firm brown silty medium to coarse sand traces gravel		SS	9	45.0	46.5	10	12	12	8
47.5	Firm gray fine to medium silty sand traces gravel		SS	10	50.0	51.5	8	7	9	8
Boring Terminated @ 51.5 3/15/77										

METHOD OF DRILLING (Check One)
 a. ~~AXXR~~ Rod SIZE A
 b. WASH XX WATER MUD XX
 BORING SIZE BIT USED 2-7/8" Side Discharge
 CASING: SIZE NW LENGTH 5.0'
 UNDISTURBED SAMPLES: NO. SIZE
 BAG SAMPLES: NO.
 WATER LOSSES: % DEPTH
 SPECIAL TESTS (Hrs. & Explain)

WEATHER 65 degrees clear
 NON-DRILLING TIME (Hrs.)
 BORING LAYOUT MOVING
 HAULING WATER STANDBY
 WATER LEVEL: @ DATE TIME
 @ DATE TIME
 CAVE-IN DEPTH: @ DATE TIME

REMARKS: (All remarks should be explained on the back of white copy) THIS IS A DRILLER'S LOG! THE CLASSIFICATIONS HAVE NOT BEEN REVIEWED BY AN ENGINEER

PROJECT: Rockport Site

PROJECT NO. W6-1482

BORING: BH-366

DATE: 3/15/77

DRILLER: G. Powers

CREW: J. Hardman/J. Selbe

SURFACE ELEV. _____

DEPTH FROM	DEPTH TO	SOIL STRATA SOIL DESCRIPTION AND REMARKS	TIME	TYPE	NO.	DEPTH		FIRST 6"	2ND 6"	3RD 6"	RFC
						FROM	TO				
	1.5	Topsoil									
1.5	9.0	Very stiff brown and gray silty clay traces fine sand		SS	1	5.0	6.5	3	7	14	18
9.0	15.0	Firm brown silty fine sand traces clay		SS	2	10.0	11.5	4	5	8	16
15.0	17.0	Loose brown silty fine sand traces clay		SS	3	15.0	16.5	2	4	6	16
17.0	24.0	loose brown silty fine sand		SS	4	20.0	21.5	4	4	6	8
24.0	33.5	Firm brown fine to medium fine sand		SS	5	25.0	26.5	4	7	12	7
33.5	37.0	Firm brown fine to medium fine sand		SS	6	30.0	31.5	5	8	9	7
37.0	47.5	Firm brown fine to medium sand traces		SS	7	35.0	36.5	5	8	9	6
47.5	51.5	Firm brown medium to coarse silty sand		SS	8	40.0	41.5	8	11	12	7
51.5		Firm brown medium to coarse silty sand		SS	9	45.0	46.5	7	12	16	11
51.5		Firm brown medium to coarse sand some gravel		SS	10	50.0	51.5	7	7	9	8
		Boring Terminated @ 51.5 3/15/77									

TYPE OF DRILLING (Check One)
 Rod
 Rod SIZE A
 WATER
 MUD MUD
 BIT USED 2-7/8" Side Discharge
 LENGTH 5.0
 SAMPLES: NO
 SIZE
 DEPTH
 SPECIAL NOTES (List & Explain)

WEATHER 50 degrees overcast
 NON-DRILLING TIME IN
 BORING LAYOUT
 MOVING
 HAULING WATER
 STANDBY
 WATER LEVEL: @
 DATE TIME
 @
 DATE TIME
 CAVE IN DEPTH: @
 DATE TIME
 REMARKS (All remarks should be explained on the back of white copy)

THIS IS A DRILLER'S LOG AND THE CLASSIFICATIONS HAVE NOT BEEN REVIEWED BY AN ENGINEER

PROJECT: Rockport Site PROJECT NO. W6-1482 BORING: Bh-367

DATE: 3/16/77 DRILLER: G. Powers CREW: J. Hardman/J. Selbe SURFACE ELEV. _____

DEPTH		SOIL STRATA SOIL DESCRIPTION AND REMARKS	TIME	TYPE	NO.	DEPTH		FIRST 5"	2ND 5"	3RD 5"	REC
FROM	TO					FROM	TO				
0		Topsoil									
	1.2										
1.2		Firm brown silty fine sand traces clay		SS	1	5.0	6.5	3	4	7	14
	8.0										
8.0		Loose brown silty fine sand		SS	2	10.0	11.5	3	3	5	12
		Loose brown silty fine sand		SS	3	15.0	16.5	3	3	4	10
		Loose brown silty fine sand		SS	4	20.0	21.5	3	5	5	8
	23.0										
23.0		Firm brown silty fine to medium sand		SS	5	25.0	26.5	7	10	14	7
		Firm brown silty fine to medium sand		SS	6	30.0	31.5	7	8	9	6
		Firm brown silty fine to medium sand		SS	7	35.0	36.5	5	7	10	6
		Firm brown silty fine to medium sand		SS	8	40.0	41.5	8	11	14	6
	44.0										
44.0		Firm brown silty medium to coarse sand		SS	9	45.0	46.5	10	15	13	8
		Firm brown silty medium to coarse sand		SS	10	50.0	51.5	7	12	11	10
	51.5										
		Boring Terminated @ 51.5									

METHOD OF DRILLING (Check One)
 a. ~~XXX~~ Rod SIZE A
 b. WASH XX WATER _____ MUD XX
 DRILLING SIZE _____ BIT USED 2-7/8" Side Discharge
 CASINGS: SIZE NW LENGTH 5.0'
 UNL. TURBED SAMPLES: NO. _____ SIZE _____
 TAG SAMPLES: NO. _____
 WATER LOSSES % _____ DEPTH _____
 SPECIAL TESTS (Hrs & Explain) _____

WEATHER Clear 60 degrees
 NON-DRILLING TIME (Hrs.) _____
 BORING LAYOUT _____ MOVING _____
 HAULING WATER _____ STANDBY _____
 WATER LEVEL: @ _____ DATE _____ TIME _____
 @ _____ DATE _____ TIME _____
 CAVE-IN DEPTH: @ _____ DATE _____ TIME _____

REMARKS: (All remarks should be explained on the back of white copy) THIS IS A DRILLER'S LOG AND THE CLASSIFICATIONS HAVE NOT BEEN REVIEWED BY AN ENGINEER

PROJECT: Rockport Site

PROJECT NO. W6-1482

BORING: BH-368

DATE: 3/16/77

DRILLER: G. Powers

CREW: J. Hardman/J. Selbe

SURFACE ELEV. 392.3

DEPTH		SOIL STRATA SOIL DESCRIPTION AND REMARKS	TIME	TYPE	NO.	DEPTH		FIRST 6"	2ND 6"	3RD 6"	REC
FROM	TO					FROM	TO				
J		Topsoil									
	0.7										
0.7		Very stiff brown silty clay		SS	1	5.0	6.5	3	12	15	18
	9.0										
9.0		Firm brown silty fine sand		SS	2	10.0	11.5	7	7	8	14
		Firm brown silty fine sand		SS	3	15.0	16.5	5	5	6	9
		Firm brown silty fine sand		SS	4	20.0	21.5	5	6	8	8
	24.0										
24.0		Firm brown silty fine to medium sand		SS	5	25.0	26.5	8	10	13	6
		Firm brown silty fine to medium sand		SS	6	30.0	31.5	5	7	7	7
	33.0										
33.0		Firm brown medium to coarse sand		SS	7	35.0	36.5	6	6	8	5
	37.5										
37.5		Firm brown fine to medium silty sand		SS	8	40.0	41.5	5	7	8	6
	44.0										
44.0		Firm brown medium to coarse sand		SS	9	45.0	46.5	5	10	13	9
	51.5										
51.5		Firm brown medium to coarse sand		SS	10	50.0	51.5	10	12	12	12
		Boring Terminated @ 51.5'									

METHOD OF DRILLING (Check One)
 a. ~~XXXX~~ Rod SIZE A
 b. WASH XX WATER MUD XX
 BORE SIZE BIT USED 2-7/8" Side Discharge
 CA G: SIZE NW LENGTH 5.0'
 UNDISTURBED SAMPLES: NO. SIZE
 TAG SAMPLES: NO.
 WATER LOSSES, % DEPTH
 SPECIAL TESTS (Hrs. & Explain)

WEATHER Clear 45 degrees
 NON-DRILLING TIME (Hrs.)
 BORING LAYOUT MOVING
 HAULING WATER STANDBY
 WATER LEVEL: @ DATE TIME
 @ DATE TIME
 CAVE-IN DEPTH: @ DATE TIME

REMARKS: (All remarks should be explained on the back of white copy) THIS IS A DRILLER'S LOG AND THE CLASSIFICATIONS HAVE NO BEEN REVIEWED BY ALL ENGINEERS

PROJECT: Rockport Site

PROJECT NO. W6-1482

BORING: BH-369

DATE: 3/18/77 DRILLER: R. Stevens CREW: B. Blackford/D. Woodens SURFACE ELEV. 394.3

DEPTH		SOIL STRATA SOIL DESCRIPTION AND REMARKS	TIME	TYPE	NO.	DEPTH		FIRST 6"	2ND 6"	3RD 6"	REC.
FROM	TO					FROM	TO				
0	12"	Topsoil									
		Very stiff brown and tan clay		SS	1	5	6.5	8	12	15	18
	9.0										
9.0		Loose brown very silty fine sand		SS	2	10	11.5	3	3	4	12
	12.7										
12.7		Firm brown medium sand		SS	3	15	16.5	5	6	7	5
	18.0										
18.0		Loose gray and brown silty fine to medium sand		SS	4	20	21.5	3	4	5	6
	22.1										
22.1		Firm brown medium sand		SS	5	25	26.5	9	10	10	6
	28.5										
28.5		Loose brown medium sand w/traces fine gravel		SS	6	30	31.5	3	4	4	5
	32.0										
32.0		Firm brown medium to coarse sand		SS	7	35	36.5	7	10	16	8
		Firm brown medium to coarse sand		SS	8	40	41.5	10	11	13	7
	44.0										
44.0		Dense brown medium to coarse sand		SS	9	45	46.5	11	15	18	10
	47.5										
47.5		Dense brown medium to coarse sand w/fine gravel		SS	10	50	51.5	11	19	26	10
		Boring Terminated @ 51.5'									

METHOD OF DRILLING (Check One)

a. AIRLIFT Rod SIZE A

b. WASH XX WATER MUD XX

BORING SIZE 2-7/8" BIT USED 2-7/8" Side Discharge

CUTTING: SIZE NW 5" LENGTH

UNDISTURBED SAMPLES: NO. SIZE

TAG SAMPLES: NO.

WATER LOSSES: % DEPTH

SPECIAL TESTS (Hrs. & Explain)

WEATHER Cloudy 50 degrees

NON-DRILLING TIME (Hrs.)

BORING LAYOUT MOVING

HAULING WATER STANDBY

WATER LEVEL: @ DATE TIME

@ DATE TIME

CAVE-IN DEPTH: @ DATE TIME

REMARKS: (All remarks should be explained on the back of white copy) THIS IS A DRILLER'S LOG AND THE CLASSIFICATIONS HAVE NOT BEEN REVIEWED BY AN ENGINEER

Appendix B







Well Construction and Lithologic Logs, 2010 Wastewater Pond Complex Monitoring Wells

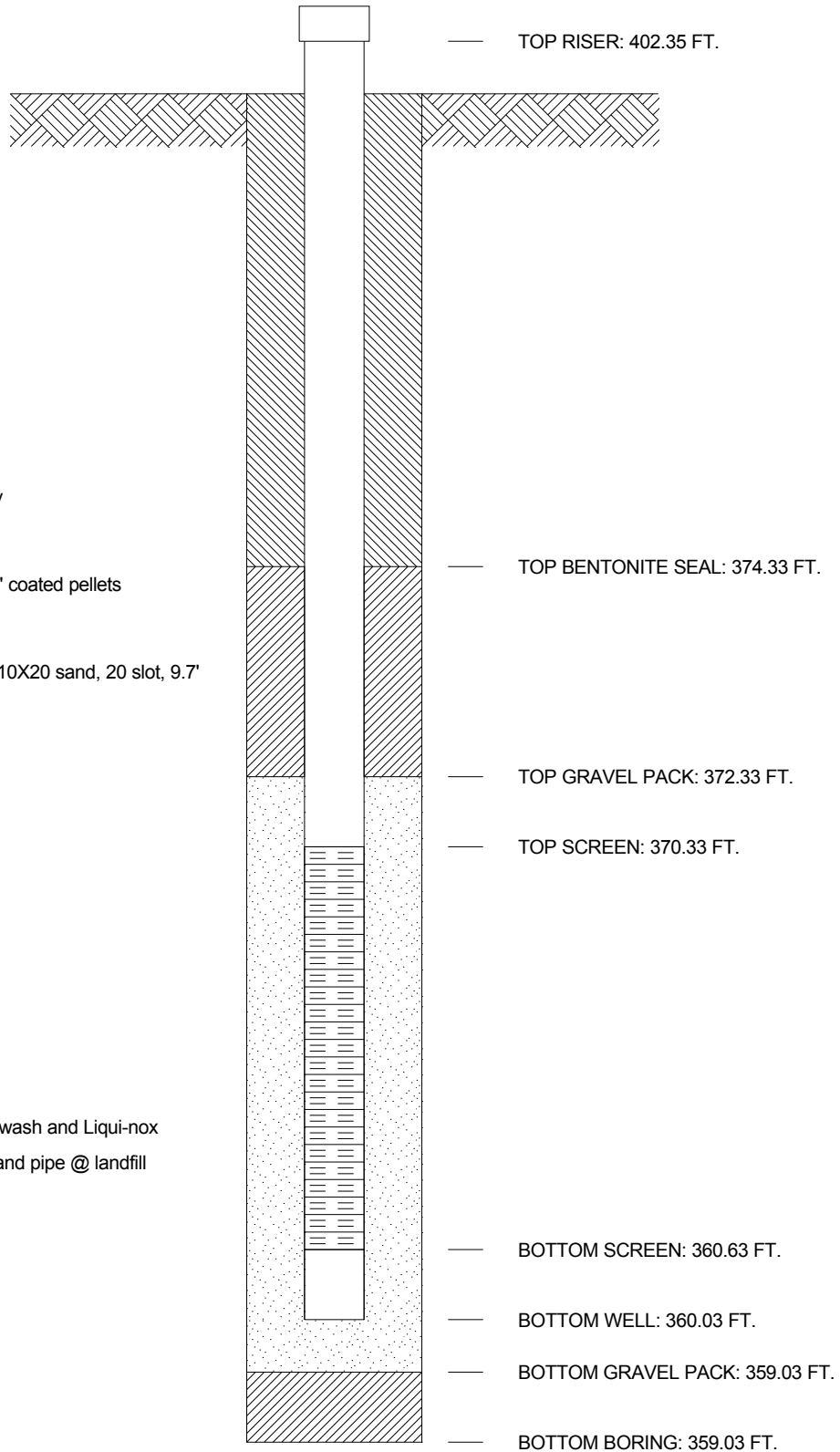
AMERICAN ELECTRIC POWER SERVICE CORPORATION
 AEP CIVIL ENGINEERING LABORATORY
 MONITORING WELL CONSTRUCTION



JOB NUMBER 41510694-01
 COMPANY AMERICAN ELECTRIC POWER WELL No. MW-1001 BORING No. MW-1001 INSTALLED 6/2/10
 PROJECT Rockport Bottom Ash Pond USWAG
 COORDINATES N 153,488.0 E 513,047.6
 SYSTEM State Plane using NAD27/29

GROUND ELEVATION 400.03 FT.

-  GROUT SEAL: 200 gal Volclay
-  BENTONITE SEAL: 75 lbs 3/8" coated pellets
-  SCREEN: 2" dia., Prepacked, 10X20 sand, 20 slot, 9.7'
-  GRAVEL PACK: #5 sand
-  RISER PIPE: 2", dia., PVC
-  SPACERS, DEPTH: 20'









Notes:
 -Deconned with high pressure wash and Liqui-nox
 -Drilled w/ 6.25" augers
 - Drill and decon water from stand pipe @ landfill
 - Well installed 6/2/10
 -SWL @ install = 25.5'

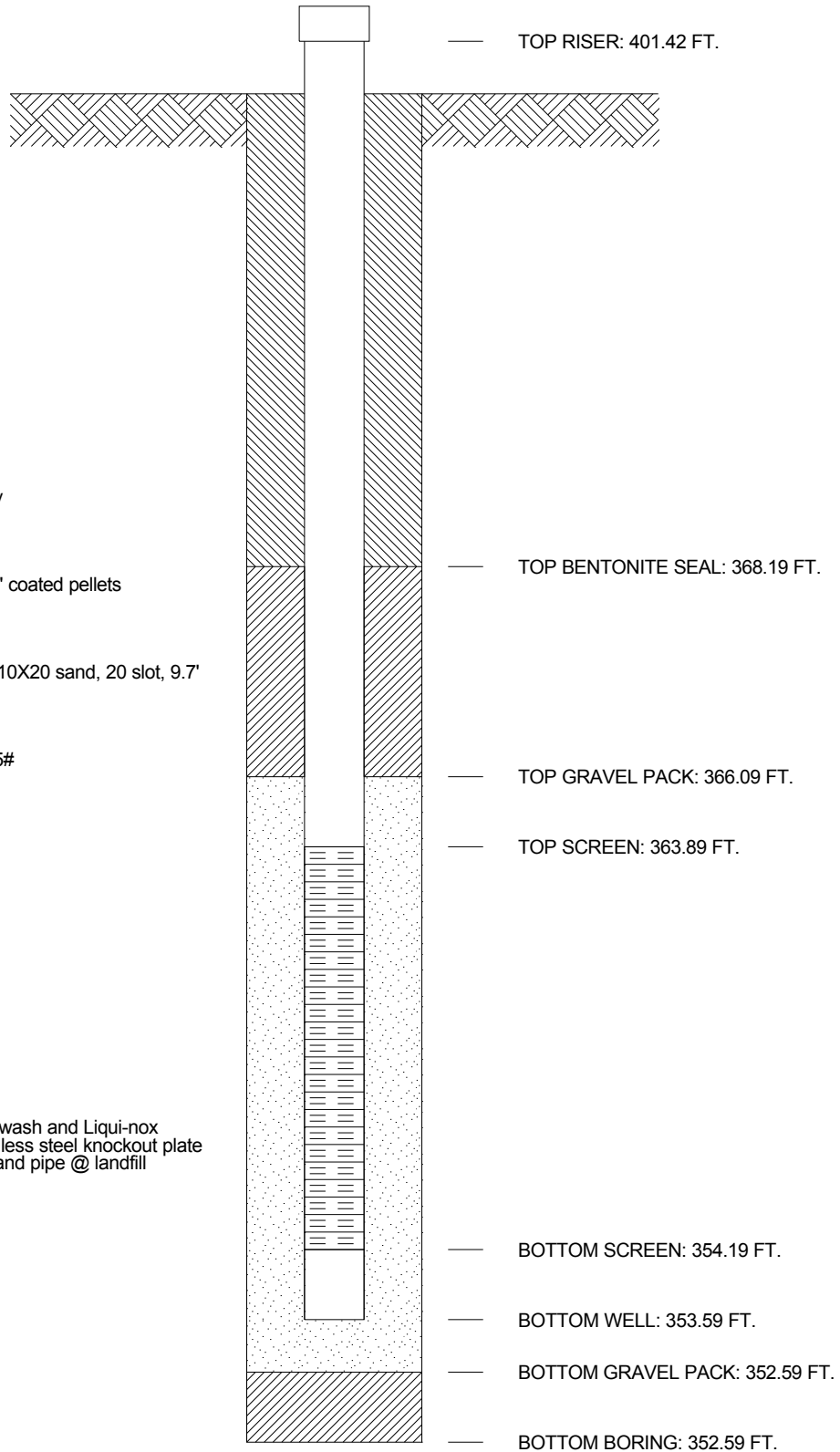
AMERICAN ELECTRIC POWER SERVICE CORPORATION
 AEP CIVIL ENGINEERING LABORATORY
 MONITORING WELL CONSTRUCTION



JOB NUMBER 41510694-01
 COMPANY AMERICAN ELECTRIC POWER WELL No. MW-1002 BORING No. MW-1002 INSTALLED 6/2/10
 PROJECT Rockport Bottom Ash Pond USWAG
 COORDINATES N 152,307.4 E 514,231.0
 SYSTEM State Plane using NAD27/29

GROUND ELEVATION 399.09 FT.

-  GROUT SEAL: 150 gal Volclay
-  BENTONITE SEAL: 50 lbs 3/8" coated pellets
-  SCREEN: 2" dia., Prepacked, 10X20 sand, 20 slot, 9.7'
-  GRAVEL PACK: #5 sand - 375#
-  RISER PIPE: 2", dia., PVC
-  SPACERS, DEPTH: 25'









Notes:
 -Deconned with high pressure wash and Liqui-nox
 -Drilled w/ 6.25" augers & stainless steel knockout plate
 - Drill and decon water from stand pipe @ landfill
 - Well installed 6/2/10
 -SWL @ install = 29.8'

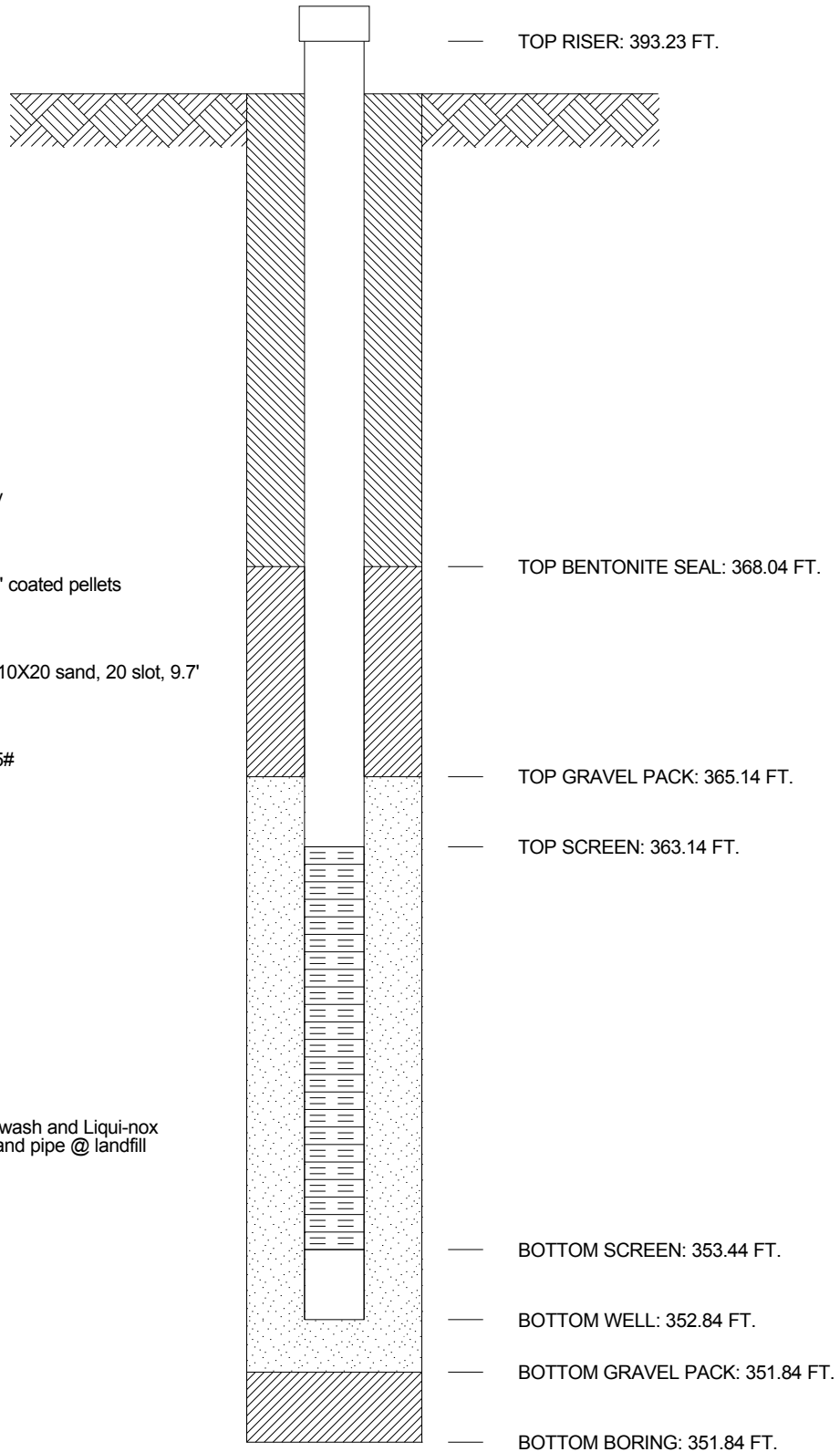
AMERICAN ELECTRIC POWER SERVICE CORPORATION
 AEP CIVIL ENGINEERING LABORATORY
 MONITORING WELL CONSTRUCTION



JOB NUMBER 41510694-01
 COMPANY AMERICAN ELECTRIC POWER WELL No. MW-1003 BORING No. MW-1003 INSTALLED 6/2/10
 PROJECT Rockport Bottom Ash Pond USWAG
 COORDINATES N 151,208.1 E 512,820.7
 SYSTEM State Plane using NAD27/29

GROUND ELEVATION 390.84 FT.

-  GROUT SEAL: 100 gal Volclay
-  BENTONITE SEAL: 75 lbs 3/8" coated pellets
-  SCREEN: 2" dia., Prepacked, 10X20 sand, 20 slot, 9.7'
-  GRAVEL PACK: #5 sand - 375#
-  RISER PIPE: 2", dia., PVC
-  SPACERS, DEPTH: 18'









Notes:
 -Deconned with high pressure wash and Liqui-nox
 - Drill and decon water from stand pipe @ landfill
 - Well installed 6/2/10
 -SWL @ install = 23.5'

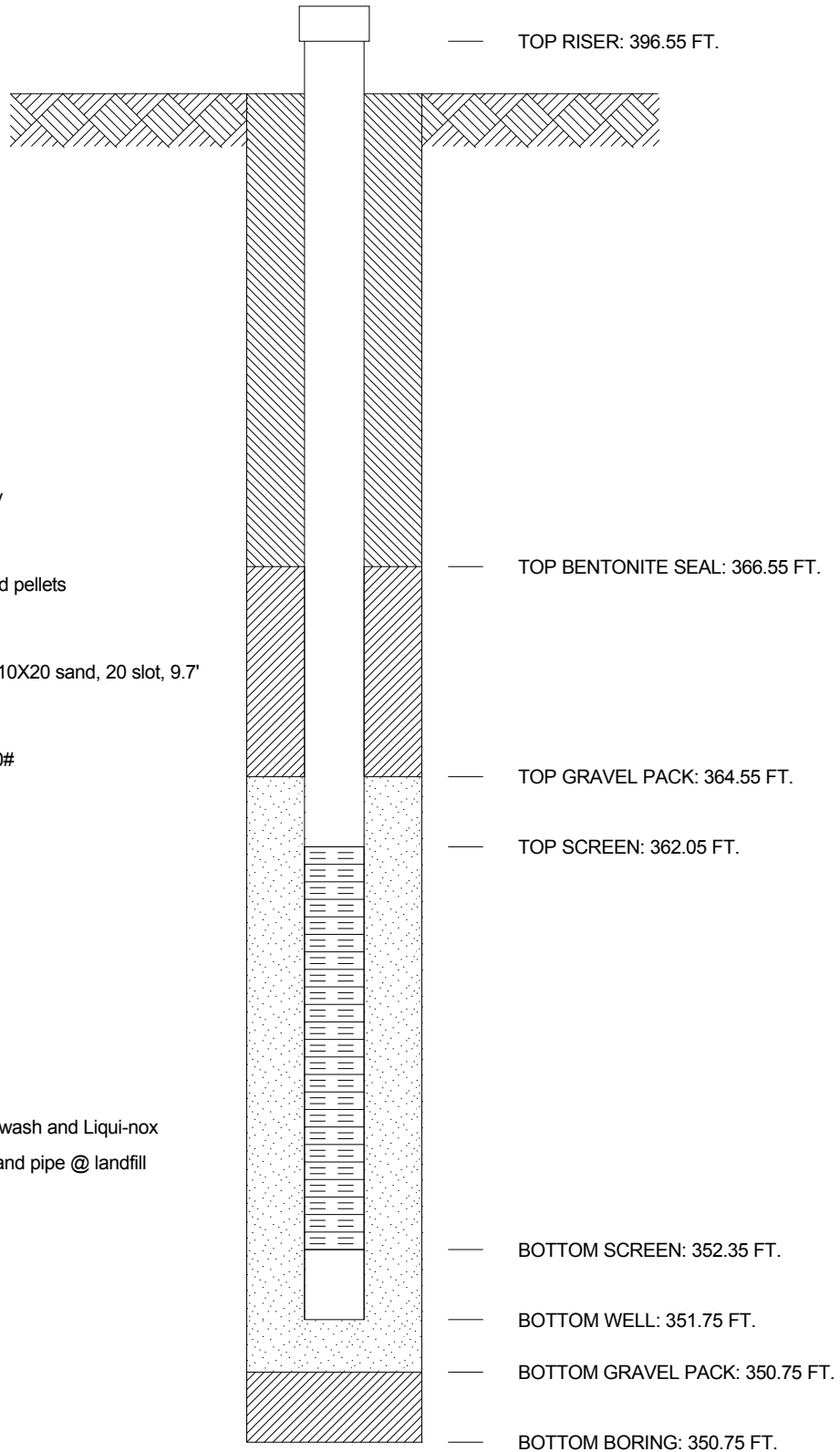
AMERICAN ELECTRIC POWER SERVICE CORPORATION
 AEP CIVIL ENGINEERING LABORATORY
 MONITORING WELL CONSTRUCTION



JOB NUMBER 41510694-01
 COMPANY AMERICAN ELECTRIC POWER WELL No. MW-1004 BORING No. MW-1004 INSTALLED 6/3/10
 PROJECT Rockport Bottom Ash Pond USWAG
 COORDINATES N 150,013.4 E 514,264.7
 SYSTEM State Plane using NAD27/29

GROUND ELEVATION 394.25 FT.

-  GROUT SEAL: 125 gal Volclay
-  BENTONITE SEAL: 3/8" coated pellets
-  SCREEN: 2" dia., Prepacked, 10X20 sand, 20 slot, 9.7'
-  GRAVEL PACK: #5 sand - 350#
-  RISER PIPE: 2", dia., PVC
-  SPACERS, DEPTH: 22'



Notes:
 -Deconned with high pressure wash and Liqui-nox
 -Drilled w/ 6.25" augers
 - Drill and decon water from stand pipe @ landfill
 - Well installed 6/3/10
 -SWL @ install = 27.0'

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **41510694-01**
 COMPANY **AMERICAN ELECTRIC POWER**
 PROJECT **Rockport Bottom Ash Pond USWAG**
 COORDINATES **N 153,488.0 E 513,047.6**
 GROUND ELEVATION **400.0** SYSTEM **State Plane using NAD27/29**

BORING NO. **MW-1001** DATE **7/16/10** SHEET **1** OF **2**
 BORING START **5/25/10** BORING FINISH **6/2/10**
 PIEZOMETER TYPE **NA** WELL TYPE **OW**
 HGT. RISER ABOVE GROUND **2.32** DIA **2"**
 DEPTH TO TOP OF WELL SCREEN **29.7** BOTTOM **39.4**
 WELL DEVELOPMENT _____ BACKFILL **VOLCLAY**
 FIELD PARTY **ZLR / REB** RIG **D-120**

Water Level, ft	▽ 31.5	▼	▼
TIME			
DATE			

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO									
1	SPT	0.0	1.5	4-8-13	1.4					MODERATE YELLOWISH BROWN 10YR 5/4 FINE SAND w/some clay		GROUNDING PROCEDURE NOT IN USE / WATER FROM STANDPIPE @ LANDFILL / DECONEC 05/25/10 / DRILLED w/ 4.25 HSA
2	SPT	1.5	3.0	6-9-10	1.5							
3	SPT	3.0	4.5	3-4-7	1.3					MODERATE YELLOWISH BROWN 10YR 5/4 FINE SAND w/medium stiff clay mixed		
4	SPT	4.5	6.0	3-6-9	1.3		5					
5	SPT	6.0	7.5	2-4-6	1.2					SOFT MODERATE YELLOWISH BROWN 10YR 5/4 CLAY tsf 0.5		
6	SPT	7.5	9.0	3-6-8	1.5					SOFT MODERATE YELLOWISH BROWN 10YR 5/4 CLAY w/some fine sands mixed		
7	SPT	9.0	10.5	3-4-6	1.5					GREENISH GRAY 5G 6/1 BOTTOM ASH		
8	SPT	10.5	12.0	1-1-3	1.4		10			SOFT MODERATE YELLOWISH BROWN 10YR 5/4 CLAY		
9	SPT	12.0	13.5	2-2-4	1.4					SOFT MODERATE YELLOWISH BROWN 10YR 5/4 CLAY tsf 0.5		
10	SPT	13.5	15.0	4-4-6	1.4					SOFT GRAYISH ORANGE 10YR 7/4 CLAY tsf 0.5, wet		
11	SPT	15.0	16.5	4-4-7	1.5		15			MEDIUM STIFF MODERATE YELLOWISH BROWN 10YR 5/4 CLAY tsf 1.5		
12	SPT	16.5	18.0	4-4-8	1.4					MEDIUM STIFF MODERATE YELLOWISH BROWN 10YR 5/4 CLAY tsf 2.0		
13	SPT	18.0	19.5	4-4-4	1.4					MODERATE YELLOWISH BROWN 10YR 5/4 FINE SAND		
14	SPT	19.5	21.0	2-3-4	1.5					SOFT MODERATE YELLOWISH BROWN		

TYPE OF CASING USED	
X	NQ-2 ROCK CORE
	6" x 3.25 HSA
	9" x 6.25 HSA
	HW CASING ADVANCER 4"
	NW CASING 3"
	SW CASING 6"
	AIR HAMMER 8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC

WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER **REB**

AEP ROCKPORT BA POND USWAG.GPJ AEP.GDT 7/16/10

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **41510694-01**

COMPANY **AMERICAN ELECTRIC POWER**

BORING NO. **MW-1001** DATE **7/16/10** SHEET **2** OF **2**

PROJECT **Rockport Bottom Ash Pond USWAG**

BORING START **5/25/10** BORING FINISH **6/2/10**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
15	SPT	21.0	22.5	2-4-7	1.4		25			CLAYEY SAND tsf 1.0		
16	SPT	22.5	24.0	4-5-5	1.5					MODERATE YELLOWISH BROWN 10YR 5/4 FINE SAND		
17	SPT	24.0	25.5	3-6-7	1.5					DARK YELLOWISH ORANGE 10YR 6/6 MEDIUM SAND		
18	SPT	25.5	27.0	3-5-5	1.4		30			DARK YELLOWISH ORANGE 10YR 6/6 MEDIUM SAND		
19	SPT	27.0	28.5	4-4-5	1.5					moist		
20	SPT	28.5	30.0	5-7-7	1.4					DARK YELLOWISH ORANGE 10YR 6/6 MEDIUM SAND		
21	SPT	30.0	31.5	5-7-7	1.5					wet		
22	SPT	31.5	33.0	5-6-8	1.5		35			DARK YELLOWISH ORANGE 10YR 6/6 MEDIUM SAND		
23	SPT	33.0	34.5	4-6-6	1.5					wet		
24	SPT	34.5	36.0	4-6-6	1.5					DARK YELLOWISH ORANGE 10YR 6/6 MEDIUM SAND		
25	SPT	36.0	37.5	5-5-6	1.4		40					
26	SPT	37.5	39.0	6-6-6	1.4							
27	SPT	39.0	40.5	4-4-5	1.5							

AEP ROCKPORT BA POND USWAG.GPJ AEP.GDT 7/16/10

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **41510694-01**
 COMPANY **AMERICAN ELECTRIC POWER**
 PROJECT **Rockport Bottom Ash Pond USWAG**
 COORDINATES **N 152,307.4 E 514,231.0**
 GROUND ELEVATION **399.1** SYSTEM **State Plane using NAD27/29**

BORING NO. **MW-1002** DATE **7/16/10** SHEET **1** OF **3**
 BORING START **5/27/10** BORING FINISH **6/2/10**
 PIEZOMETER TYPE **NA** WELL TYPE **OW**
 HGT. RISER ABOVE GROUND **2.33** DIA **2"**
 DEPTH TO TOP OF WELL SCREEN **35.2** BOTTOM **44.9**
 WELL DEVELOPMENT _____ BACKFILL **VOLCLAY**
 FIELD PARTY **ZLR / REB** RIG **D-120**

Water Level, ft	▽ 30.0	▼	▼
TIME			
DATE			

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO									
1	SPT	0.0	1.5	4-4-6	1.4					YELLOWISH ORANGE 10YR 6/6 SAND CLAY dry		NO GROUNDING PROCEDURE IN USE / WATER FROM STAND PIPE @ LANDFILL / DECON 05/27/10
2	SPT	1.5	3.0	8-10-13	1.3					STIFF MODERATE YELLOWISH BROWN 10YR 5/4 SANDY CLAY dry		
3	SPT	3.0	4.5	4-7-7	1.5					MEDIUM STIFF MODERATE YELLOWISH BROWN 10YR 5/4 SANDY CLAY dry		
4	SPT	4.5	6.0	4-4-7	1.3		5			MEDIUM STIFF MEDIUM LIGHT GRAY N6 CLAY tsf 1.5		
5	SPT	6.0	7.5	4-4-5	1.4					MEDIUM STIFF MODERATE YELLOWISH BROWN 10YR 5/4 SANDY CLAY tsf 1.5, dry		
6	SPT	7.5	9.0	4-4-4	1.3					MEDIUM STIFF MEDIUM LIGHT GRAY N6 CLAY tsf 1.5		
7	SPT	9.0	10.5				10			MEDIUM STIFF MIXTURE OF BROWN & GRAY CLAY tsf 2.0		
8	SPT	10.5	12.0	4-6-6	1.4							
9	SPT	12.0	13.5	5-6-10	1.3					MEDIUM STIFF MODERATE YELLOWISH BROWN 10YR 5/4 SANDY CLAY		
10	SPT	13.5	15.0	5-7-9	1.5					MEDIUM STIFF MODERATE YELLOWISH BROWN 10YR 5/4 W/MIXTURE OF MEDIUM LIGHT GRAY N6 SANDY CLAY		
11	SPT	15.0	16.5	5-6-7	1.4		15			MEDIUM STIFF MODERATE YELLOWISH BROWN 10YR 5/4 SANDY CLAY tsf 1.5		
12	SPT	16.5	18.0	3-3-5	1.5					SOFT MODERATE YELLOWISH BROWN 10YR 5/4 SANDY CLAY tsf 1.0		
13	SPT	18.0	19.5	2-3-4	1.5					SOFT MODERATE YELLOWISH BROWN 10YR 5/4 SANDY CLAY tsf .5		
14	SPT	19.5	21.0	2-2-4	1.3					YELLOWISH ORANGE 10YR 6/6 SAND FINE		

TYPE OF CASING USED

<input type="checkbox"/>	NQ-2 ROCK CORE	
<input checked="" type="checkbox"/>	6" x 3.25 HSA	
<input type="checkbox"/>	9" x 6.25 HSA	
<input type="checkbox"/>	HW CASING ADVANCER	4"
<input type="checkbox"/>	NW CASING	3"
<input type="checkbox"/>	SW CASING	6"
<input type="checkbox"/>	AIR HAMMER	8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC
 WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER **REB**

AMERICAN ELECTRIC POWER SERVICE CORPORATION
 AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **41510694-01**

COMPANY **AMERICAN ELECTRIC POWER**

BORING NO. **MW-1002** DATE **7/16/10** SHEET **2** OF **3**

PROJECT **Rockport Bottom Ash Pond USWAG**

BORING START **5/27/10** BORING FINISH **6/2/10**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
15	SPT	21.0	22.5	2-2-2	1.4		25			SOFT YELLOWISH ORANGE 10YR 6/6 SANDY CLAY tsf .5, moist		
16	SPT	22.5	24.0	2-2-2	1.3							
17	SPT	24.0	25.5	5-6-7	1.2							
18	SPT	25.5	27.0	3-4-7	1.5		30			YELLOWISH ORANGE 10YR 6/6 SAND FINE moist		
19	SPT	27.0	28.5	2-2-4	1.4							
20	SPT	28.5	30.0	2-2-2	1.4							
21	SPT	30.0	31.5	3-3-3	1.2							
22	SPT	31.5	33.0	2-2-4	1.4		35			YELLOWISH ORANGE 10YR 6/6 SAND FINE wet		
23	SPT	33.0	34.5	4-4-4	1.3							
24	SPT	34.5	36.0	5-6-6	1.4							
25	SPT	36.0	37.5	5-5-6	1.4							
26	SPT	37.5	39.0	4-4-8	1.3							
27	SPT	39.0	40.5	4-6-9	1.5		40			YELLOWISH ORANGE 10YR 6/6 SAND FINE w/some pebbles		
28	SPT	40.5	42.0	6-8-10	1.3							
29	SPT	42.0	43.5	7-6-10	1.4							
30	SPT	43.5	45.0	6-8-11	1.4							
31	SPT	45.0	46.5	7-9-11	1.4		45			YELLOWISH ORANGE 10YR 6/6 SAND FINE w/some pebbles		

AEP ROCKPORT BA POND USWAG.GPJ AEP.GDT 7/16/10

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER 41510694-01

COMPANY AMERICAN ELECTRIC POWER

BORING NO. MW-1002 DATE 7/16/10 SHEET 3 OF 3

PROJECT Rockport Bottom Ash Pond USWAG

BORING START 5/27/10 BORING FINISH 6/2/10

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **41510694-01**
 COMPANY **AMERICAN ELECTRIC POWER**
 PROJECT **Rockport Bottom Ash Pond USWAG**
 COORDINATES **N 151,208.1 E 512,820.7**
 GROUND ELEVATION **390.8** SYSTEM **State Plane using NAD27/29**

BORING NO. **MW-1003** DATE **7/16/10** SHEET **1** OF **2**
 BORING START **5/26/10** BORING FINISH **6/2/10**
 PIEZOMETER TYPE **NA** WELL TYPE **OW**
 HGT. RISER ABOVE GROUND **2.39** DIA **2"**
 DEPTH TO TOP OF WELL SCREEN **27.7** BOTTOM **37.4**
 WELL DEVELOPMENT _____ BACKFILL **VOLCLAY**
 FIELD PARTY **ZLR / REB** RIG **D-120**

Water Level, ft	▽ 23.1	▽	▽
TIME			
DATE			

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO									
1	SPT	0.0	1.5	5-12-13	1.5					DARK YELLOWISH ORANGE 10RY 6/6 CLAYSHALE dry		NO GROUNDING IN USE / WATER FROM STAND PIPE @ LANDFILL / DECON 05/26/10
2	SPT	1.5	3.0	4-7-11	1.5					DARK YELLOWISH ORANGE 10RY 6/6 CLAYSHALE		
3	SPT	3.0	4.5	3-4-5	1.4					MEDIUM STIFF DARK YELLOWISH ORANGE 10YR 6/6 SANDY CLAY tsf 2.0		
4	SPT	4.5	6.0	3-4-6	1.4		5			MEDIUM STIFF DARK YELLOWISH ORANGE 10YR 6/6 SANDY CLAY tsf 2.5		
5	SPT	6.0	7.5	2-3-5	1.4					MEDIUM STIFF DARK YELLOWISH ORANGE 10YR 6/6 SANDY CLAY tsf 1.5		
6	SPT	7.5	9.0	3-3-5	1.5							
7	SPT	9.0	10.5	4-4-4	1.5							
8	SPT	10.5	12.0	2-2-4	1.4		10			SOFT DARK YELLOWISH ORANGE 10YR 6/6 SANDY CLAY tsf 1.0		
9	SPT	12.0	13.5	2-3-4	1.5					SOFT DARK YELLOWISH ORANGE 10YR 6/6 SANDY CLAY tsf 1.5		
10	SPT	13.5	15.0	2-2-4	1.5					SOFT DARK YELLOWISH ORANGE 10YR 6/6 SANDY CLAY tsf .5		
11	SPT	15.0	16.5	2-2-2	1.5		15					
12	SPT	16.5	18.0	2-4-6	1.3							
13	SPT	18.0	19.5	4-4-4	1.4							
14	SPT	19.5	21.0	4-4-6	1.5					YELLOWISH ORANGE 10YR 6/6 SAND FINE		

TYPE OF CASING USED	
<input type="checkbox"/>	NQ-2 ROCK CORE
<input checked="" type="checkbox"/>	6" x 3.25 HSA
<input type="checkbox"/>	9" x 6.25 HSA
<input type="checkbox"/>	HW CASING ADVANCER 4"
<input type="checkbox"/>	NW CASING 3"
<input type="checkbox"/>	SW CASING 6"
<input type="checkbox"/>	AIR HAMMER 8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC

WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER **REB**

AEP ROCKPORT BA POND USWAG.GPJ AEP.GDT 7/16/10

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER 41510694-01

COMPANY AMERICAN ELECTRIC POWER

BORING NO. MW-1003 DATE 7/16/10 SHEET 2 OF 2

PROJECT Rockport Bottom Ash Pond USWAG

BORING START 5/26/10 BORING FINISH 6/2/10

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES	
		FROM	TO			%							
15	SPT	21.0	22.5	3-8-10	1.5		25			MODERATE YELLOWISH BROWN 10YR 5/4 SAND FINE moist	▽		
16	SPT	22.5	24.0	4-4-6	1.4								
17	SPT	24.0	25.5	4-6-6	1.5								
18	SPT	25.5	27.0	3-5-7	1.4								
19	SPT	27.0	28.5	4-5-7	1.4								
20	SPT	28.5	30.0	6-6-8	1.4								
21	SPT	30.0	31.5	4-5-9	1.3		30			MODERATE YELLOWISH BROWN 10YR 5/4 SAND FINE w/pebbles, wet			
22	SPT	31.5	33.0	2-2-3	1.4								
23	SPT	33.0	34.5	5-6-8	1.3								
24	SPT	34.5	36.0	5-6-7	1.4								
25	SPT	36.0	37.5	5-5-5	1.3								
26	SPT	37.5	39.0	6-6-6	1.4								
							35						

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **41510694-01**
 COMPANY **AMERICAN ELECTRIC POWER**
 PROJECT **Rockport Bottom Ash Pond USWAG**
 COORDINATES **N 150,013.4 E 514,264.7**
 GROUND ELEVATION **394.3** SYSTEM **State Plane using NAD27/29**

BORING NO. **MW-1004** DATE **7/16/10** SHEET **1** OF **2**
 BORING START **6/3/10** BORING FINISH **6/3/10**
 PIEZOMETER TYPE **NA** WELL TYPE **OW**
 HGT. RISER ABOVE GROUND **2.30** DIA **2"**
 DEPTH TO TOP OF WELL SCREEN **32.2** BOTTOM **41.9**
 WELL DEVELOPMENT _____ BACKFILL **VOLCLAY**
 FIELD PARTY **ZLR / REB** RIG **D-120**

Water Level, ft	▽ 28.8	▼	▼
TIME			
DATE			

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO									
1	SPT	0.0	1.5	10-11-10	1.3					MODERATE YELLOWISH BROWN 10YR 5/6 CLAYSHALE dry		NO GROUNDING IN USE / WATER FROM STAND PIPE @ LANDFILL / DECON 06/03/10
2	SPT	1.5	3.0	5-6-7	1.4					MODERATE YELLOWISH BROWN 10YR 5/6 SANDY CLAY tsf 1.5, dry		
3	SPT	3.0	4.5	4-6-8						MODERATE YELLOWISH BROWN 10YR 5/6 SANDY CLAY tsf 1.5, w/limestone mixed, dry		
4	SPT	4.5	6.0	4-4-6	1.4		5			GRAY N6 CLAY tsf 1.5, dry		
5	SPT	6.0	7.5	3-4-4	1.3					GRAY N6 SANDY CLAY tsf 1.5, dry		
6	SPT	7.5	9.0	4-4-8	1.4					MEDIUM STIFF MODERATE YELLOWISH BROWN 10YR 5/6 SANDY CLAY tsf 2.0		
7	SPT	9.0	10.5	3-6-9	1.4		10			MEDIUM STIFF MODERATE YELLOWISH BROWN 10YR 5/6 SANDY CLAY tsf 3.0		
8	SPT	10.5	12.0	3-6-9	1.4							
9	SPT	12.0	13.5	3-5-8	1.4							
10	SPT	13.5	15.0	4-6-6	1.3							
11	SPT	15.0	16.5	3-5-9	1.5		15					
12	SPT	16.5	18.0	4-4-8	1.3					MEDIUM STIFF MODERATE YELLOWISH BROWN 10YR 5/6 SANDY CLAY tsf 3.0, w/more sand		
13	SPT	18.0	19.5	4-4-6	1.5					MEDIUM STIFF MODERATE YELLOWISH BROWN 10YR 5/6 SANDY CLAY tsf 2.5, moist		
14	SPT	19.5	21.0	2-3-5	1.4					STIFF MODERATE YELLOWISH BROWN		

TYPE OF CASING USED

	NQ-2 ROCK CORE	
X	6" x 3.25 HSA	
	9" x 6.25 HSA	
	HW CASING ADVANCER	4"
	NW CASING	3"
	SW CASING	6"
	AIR HAMMER	8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC
 WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER **REB**

AEP ROCKPORT BA POND USWAG.GPJ AEP.GDT 7/16/10

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **41510694-01**
 COMPANY **AMERICAN ELECTRIC POWER** BORING NO. **MW-1004** DATE **7/16/10** SHEET **2** OF **2**
 PROJECT **Rockport Bottom Ash Pond USWAG** BORING START **6/3/10** BORING FINISH **6/3/10**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
15	SPT	21.0	22.5	2-4-7	1.4		25			10YR 5/6 SANDY CLAY tsf 2.0		
16	SPT	22.5	24.0	2-4-7	1.4					YELLOWISH ORANGE 10YR 6/6 SAND FINE		
17	SPT	24.0	25.5	2-4-6	1.5							
18	SPT	25.5	27.0	3-4-7	1.4		30			YELLOWISH ORANGE 10YR 6/6 SAND FINE w/some pebbles, wet		
19	SPT	27.0	28.5	4-4-8	1.5					YELLOWISH ORANGE 10YR 6/6 SAND FINE		
20	SPT	28.5	30.0	2-3-5	1.2					YELLOWISH ORANGE 10YR 6/6 SAND FINE w/pebbles, wet		
21	SPT	30.0	31.5	5-7-7	1.3					YELLOWISH ORANGE 10YR 6/6 SAND FINE w/pebbles		
22	SPT	31.5	33.0	3-4-6	1.4		35			YELLOWISH ORANGE 10YR 6/6 SAND FINE w/gravels		
23	SPT	33.0	34.5	6-7-9	1.2					YELLOWISH ORANGE 10YR 6/6 SAND FINE w/gravels, wet		
24	SPT	34.5	36.0	4-5-5	1.3					YELLOWISH ORANGE 10YR 6/6 SAND FINE		
25	SPT	36.0	37.5	3-4-6	1.4					YELLOWISH ORANGE 10YR 6/6 SAND FINE w/pebbles, wet		
26	SPT	37.5	39.0	3-4-5	1.2		40			YELLOWISH ORANGE 10YR 6/6 SAND FINE w/pebbles, wet		
27	SPT	39.0	40.5	3-4-4	1.3					YELLOWISH ORANGE 10YR 6/6 SAND FINE wet		
28	SPT	40.5	42.0	3-4-5	1.1							
29	SPT	42.0	43.5	5-6-9								

AEP ROCKPORT BA POND USWAG.GPJ AEP.GDT 7/16/10

Appendix C

Piezometric Data

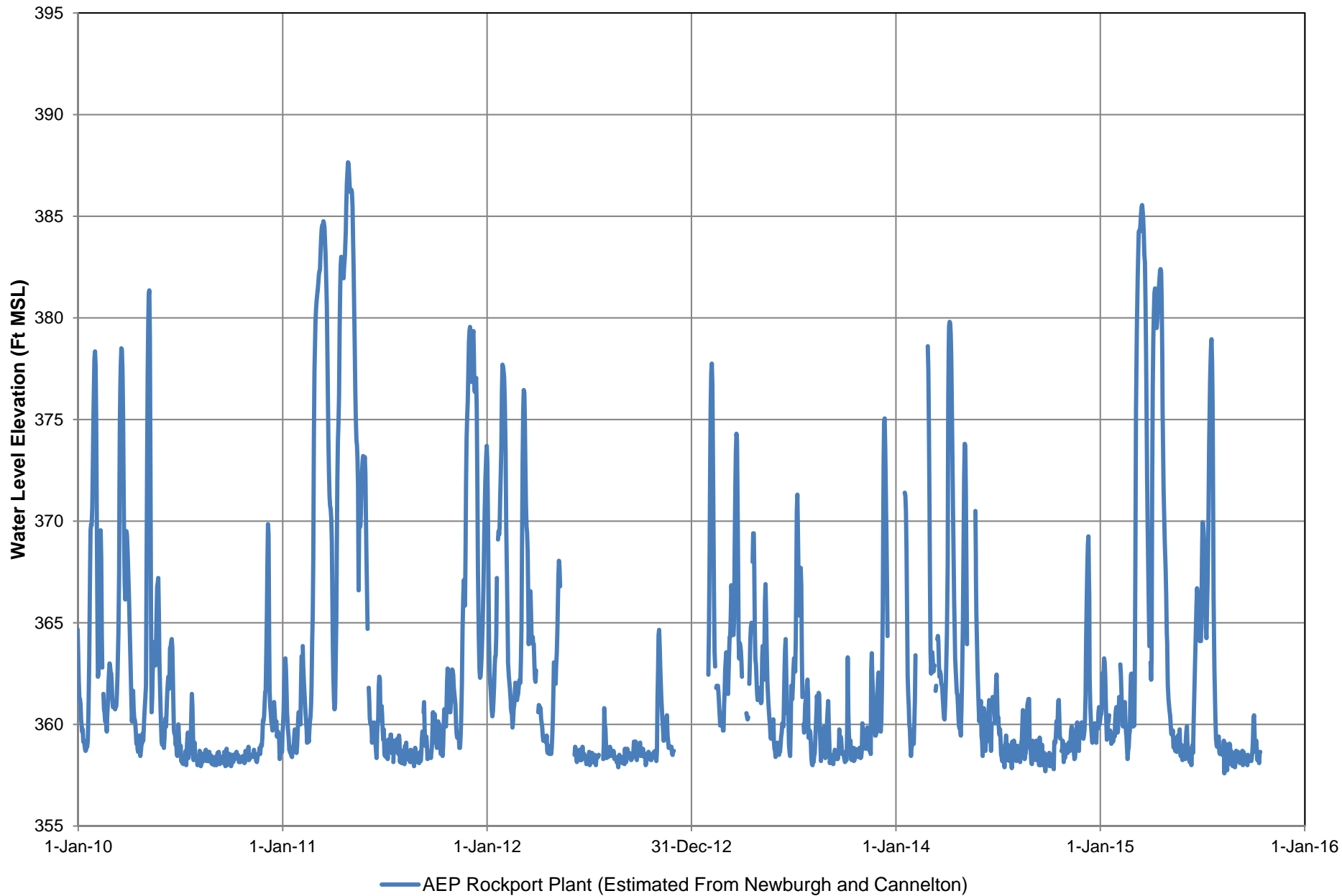
The logo for the company 'wood.' is located in the top right corner. It consists of the word 'wood.' in a dark blue, lowercase, sans-serif font. The period at the end of the word is a solid dot. The background of the page features large, light gray curved shapes that sweep across the top and bottom.

Appendix C-1

Ohio River Hydrograph, 2010-2015

AEP Rockport Plant

Ohio River Hydrograph, 2010-2015



Appendix C-2

Wastewater Pond Complex Monitoring Well Piezometric Data

Appendix C-2
Monitoring Well Piezometric Data
Wastewater Pond Complex
AEP Rockport Plant, Rockport, Indiana

Well:	MW 1001	MW 1002	MW 1003	MW 1004
Maximum:	371.61	373.20	373.72	376.13
Minimum:	368.38	366.99	367.49	365.57
Date:				
5/17/2011	371.61	373.20	373.72	376.13
11/17/2011	370.77	369.17	369.64	367.35
11/15/2012	368.91	367.48	367.83	365.93
5/20/2013	369.11	367.95	368.61	367.38
11/13/2013	368.38	366.99	367.49	366.43
5/12/2014	370.06	369.55	369.93	368.84
11/12/2014	368.57	367.03	367.64	365.57
5/7/2015	370.75	371.16	371.35	370.93

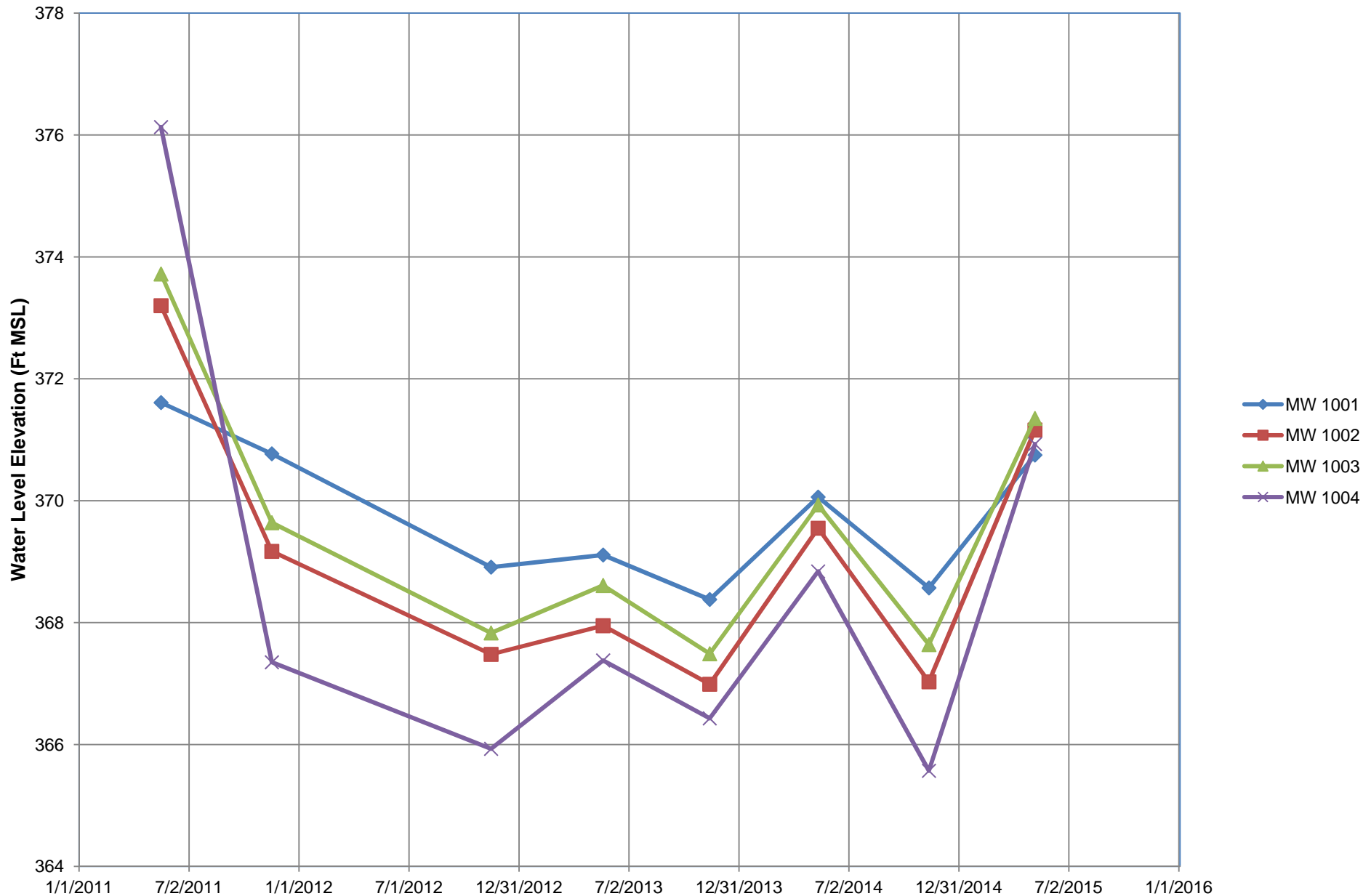
Note: Elevations reported by AEP in feet above Plant datum

Appendix C-3

Wastewater Pond Complex Monitoring Well Hydrographs

AEP Rockport Plant

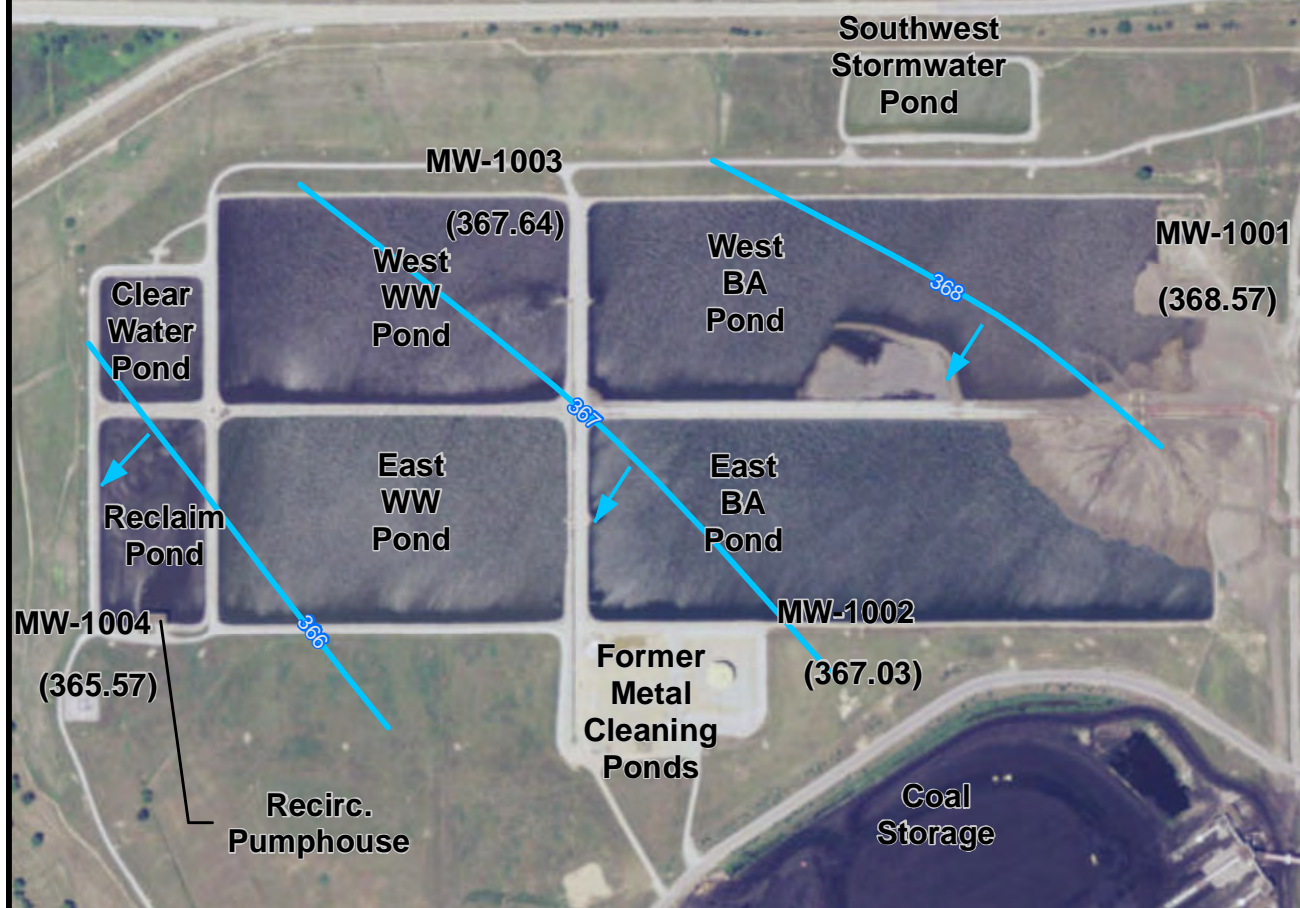
Wastewater Pond Complex - Monitoring Well Hydrographs



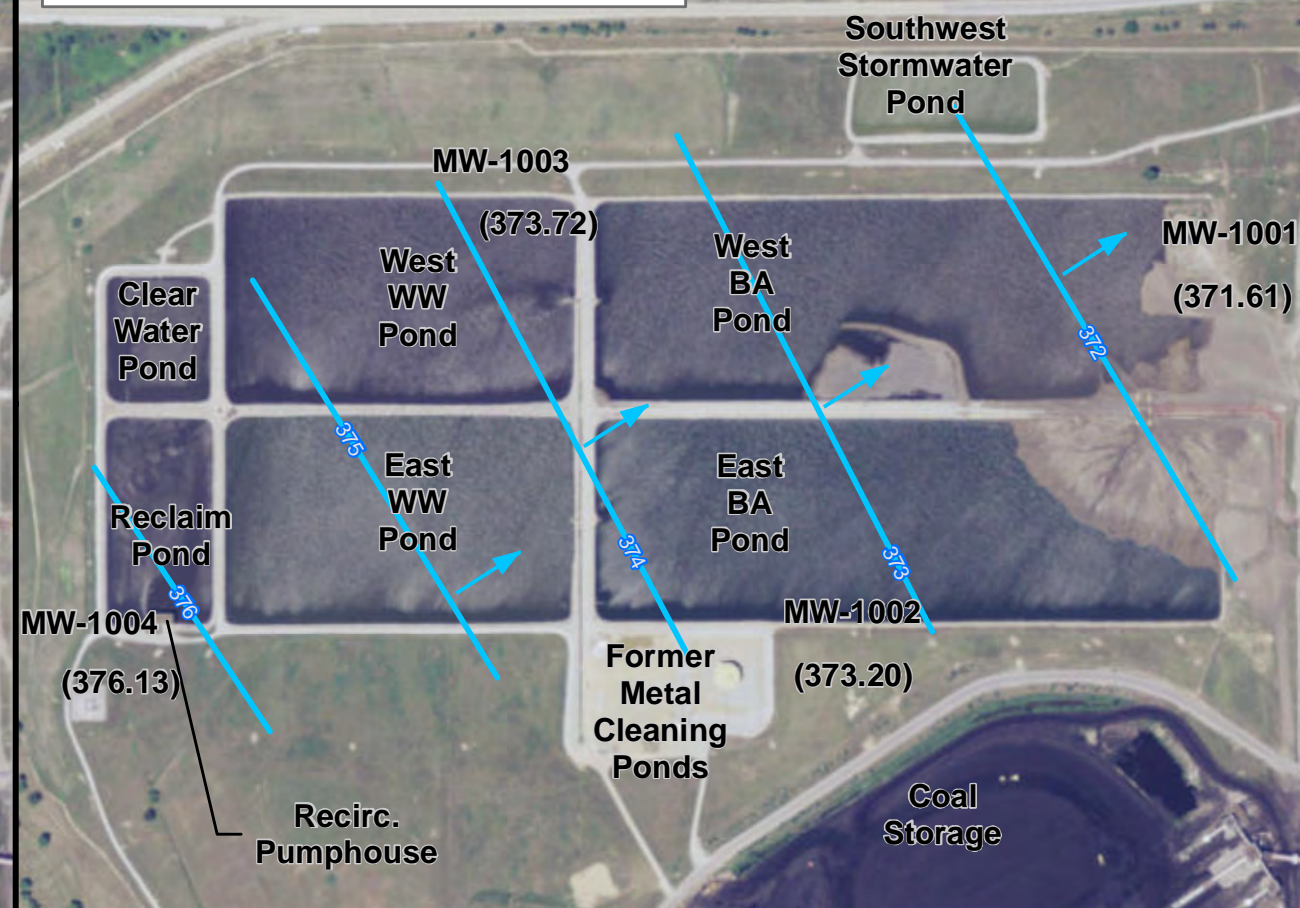
Appendix C-4

Wastewater Pond Complex Monitoring Well Piezometric Maps

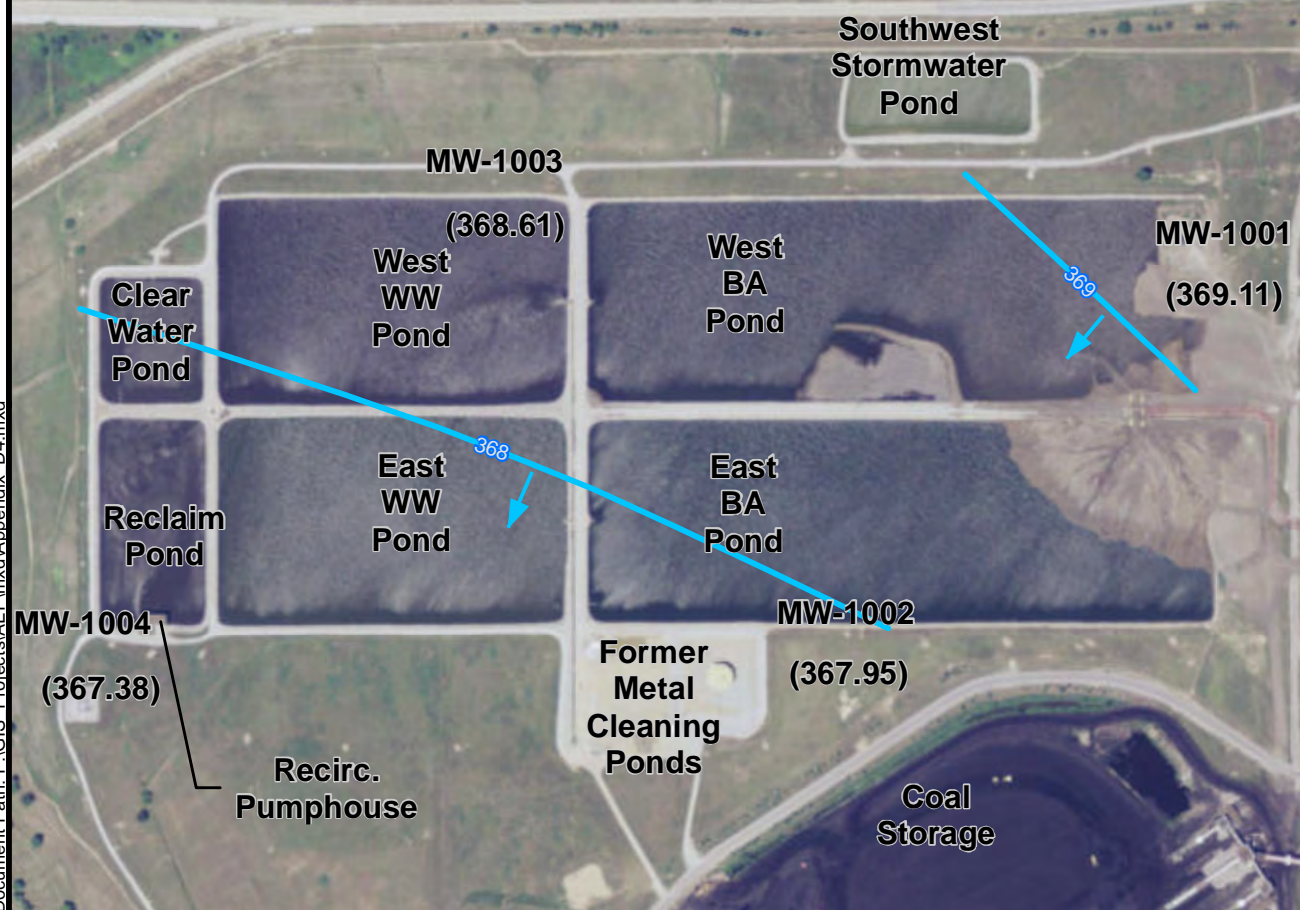
12 November 2014 (Typical Fall)
Ohio River Level: 359.8 feet (2.4 feet above minimum pool)



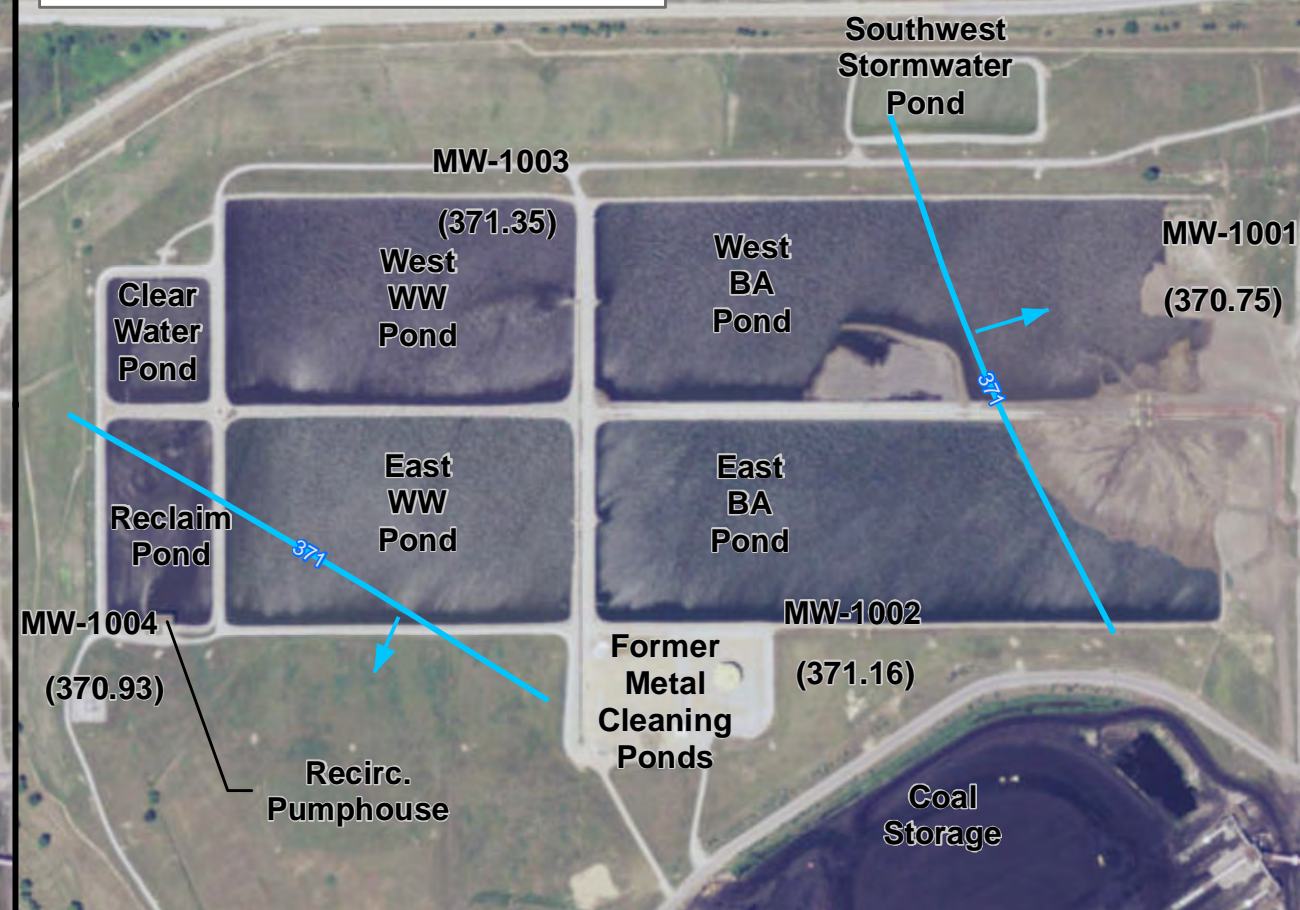
17 May 2011 (Showing Flow Reversal)
Ohio River Level: 370.9 feet (13.5 feet above minimum pool), falling from peak of 387.7 feet on 28 April 2011



20 May 2013 (Typical Spring)
Ohio River Level: 360.3 feet (2.9 feet above minimum pool)



7 May 2015 (Showing Divide)
Ohio River Level: 360.0 feet (2.6 feet above minimum pool), falling from peak of 382.4 feet on 19 April 2015



Legend

- Property Boundary
- Piezometric Surface Contour
- MW-1001 - Well ID
(368.57) - Piezo Elevation

Note:
Elevations in feet NGVD29 (MSL)
Ohio River minimum pool: 357.4 feet MSL

Data Sources

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Date of Photography: July 2014
Source of Photography: U.S. Department of Agriculture, National Agriculture Imagery Program (NAIP)



PIEZOMETRIC SURFACE

AEP - ROCKPORT, IN

PROJECT NUMBER: 7382153161

SCALE	1" = 600'
DATE	6/3/2016
DRAWN BY	TMR
APPROVED BY	ALD

FIG. C-4



2456 Fortune Drive, Suite 100
Lexington, Kentucky 40509
Phone: (859) 255-3308

Appendix D

2016 Monitoring Well Installation Report

2016 MONITORING WELL INSTALLATION REPORT
Bottom Ash Ponds
Rockport Plant
Indiana-Michigan Power Company
Rockport, Indiana

Prepared for:
American Electric Power Service Corporation
and Indiana-Michigan Power Company
1 Riverside Plaza
Columbus, Ohio 43215



Prepared by:
Amec Foster Wheeler Environment & Infrastructure, Inc.
11003 Bluegrass Parkway, Suite 690
Louisville, Kentucky 40299



14 September 2017



TABLE OF CONTENTS

1.0 INTRODUCTION	1
2.0 FIELD ACTIVITIES	1
2.1 Schedule.....	1
2.2 Staking, Surveying and Utility Clearances.....	2
2.3 Drilling and Soil Sampling.....	2
2.4 Geotechnical Sample Testing.....	3
2.5 Monitoring Well Construction.....	3
2.6 Well Development	3
2.7 Water Level Gauging.....	4
2.8 Water Quality Parameters	4
3.0 SUMMARY AND FINDINGS	4

LIST OF TABLES

Table 1	Monitoring Well Construction Details
Table 2	Groundwater Elevation Data Summary
Table 3	Field Water Quality Data Summary

LIST OF FIGURES

Figure 1	Groundwater Monitoring Network
Figure 2	Bedrock Surface Contour Map
Figure 3	Potentiometric Surface Contour Map
Figure 4	Cross Section Location Map
Figure 5	Cross Section A-A'
Figure 6	Cross Section B-B'
Figure 7	Cross Section C-C'

ATTACHMENTS

Attachment 1	Well Construction and Lithologic Logs, 2016 BA Pond Monitoring Wells
Attachment 2	Gradation Curves for Screened Intervals, 2016 BA Pond Monitoring Wells
Attachment 3	Monitoring Well Hydrographs, 2010 BA Pond Monitoring Wells



1.0 INTRODUCTION

Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) was retained by American Electric Power Service Corporation (AEP) to observe and document drilling and monitoring well installation activities in the vicinity of the Bottom Ash (BA) Ponds at the AEP Rockport Plant.

The BA Ponds are located at the north end of the wastewater pond complex for the plant. The two contiguous ponds, referred to as the East and West BA Ponds, receive CCR on an alternating schedule. The ponds each have rough dimensions (at the crest of the embankments) of 2,000 feet x 650 feet, corresponding to a surface area of approximately 30 acres each (60 acres total).

Four shallow monitoring wells (MW-1001 through MW-1004) were installed in 2010 at the perimeter of the wastewater pond complex. Based on data collected from those wells, the dominant direction of groundwater flow beneath the ponds is to the east-southeast.

For the purpose of groundwater monitoring under the federal CCR Rule (40 CFR Part 257), AEP has elected to monitor groundwater at the BA Ponds using a multiunit groundwater monitoring system. The long-term groundwater monitoring network (GWMN) for the BA Ponds (including potentiometric and water quality monitoring) will consist of seven clusters of three wells each, installed at shallow, intermediate and deep levels in the unconsolidated overburden above bedrock. Five locations are along the downgradient sections of the pond perimeter, and two are at upgradient locations north of the BA Ponds. One of the existing shallow wells (MW-1002) has been incorporated into the GWMN. The other three existing wells (MW-1001, MW-1003, and MW-1004) have also been retained for water level monitoring (also known as potentiometric or piezometric monitoring) only. Twenty new monitoring wells were installed in early 2016 to complete the GWMN.

Monitoring well locations are shown on the map in **Figure 1**. Drilling, well construction and well development activities related to the new monitoring wells installed in 2016 are documented in this report.

2.0 FIELD ACTIVITIES

2.1 Schedule

Amec Foster Wheeler along with an AEP drilling crew mobilized to the site to kickoff drilling, well installation, and well development activities on 12 January 2016. A summary of key dates related to specific activities is provided below.

- 1) Amec Foster Wheeler and drill crew personnel attended safety orientation on 12 January 2016.
- 2) All drilling locations were identified and staked on 12 January 2016.
- 3) Locations and ground surface elevations were surveyed on 21 January 2016.



- 4) Drilling and monitoring well installation began on 13 January 2016 and was completed on 3 March 2016.
- 5) Locations, ground surface elevations, and top of casing elevations were surveyed on 3-4 March 2016.
- 6) Well Development began on 8 March 2016 and was completed by AEP on 29 March 2016. Amec Foster Wheeler observed well development activities 17 March 2016.

2.2 Staking, Surveying and Utility Clearances

- 1) All boring and monitoring well locations were staked prior to drilling.
- 2) All boring and monitoring well locations were surveyed both horizontally (northing and easting) and vertically (elevation) before and after installation, by AEP surveyors.
- 3) Coordinates were provided in the North American Datum of 1927 (NAD27), State Plane Coordinate System (SPCS) Indiana West Zone and elevations were provided in the North Geodetic Vertical Datum of 1929 (NGVD29), also known as Mean Sea Level (MSL).
- 4) Ground surface elevations were provided for all boring and monitoring well locations before and after well installation. Top of PVC casing elevations were provided for all monitoring well locations after well installation.
- 5) Prior to drilling activities, AEP located underground utilities near the new boring and monitoring well locations. Amec Foster Wheeler coordinated with onsite AEP personnel and drillers to make sure drilling locations were sufficiently removed from the located utilities to avoid damage.

2.3 Drilling and Soil Sampling

- 1) At each multi-level well location, three monitoring wells (shallow, intermediate, and deep) were installed. Because one shallow monitoring well already existed at the location for MW-1602 (MW-1002), only intermediate and deep wells were installed.
- 2) Drilling and monitoring well installation was performed by a drill rig equipped with hollow-stem augers with an inside diameter of 4¼ inches. Mud-rotary drilling was used below the water table due to running sands infiltrating the auger.
- 3) Continuous standard penetration testing (SPT) was performed from ground surface to refusal at all deep monitoring wells. Blow counts were recorded and used to develop N values for each sampled interval. For SPTs, AEP provided the hammer calibration record for review by Amec Foster Wheeler.
- 4) Recovered samples were described by Amec Foster Wheeler personnel and retained by AEP for laboratory analysis.



- 5) At each location, the deep monitoring well was installed first. Descriptions of subsurface materials recorded during the installation of the deep monitoring well were used to determine the depths of the screened intervals in the shallow and intermediate wells.
- 6) Boring logs including lithologic descriptions, blow counts, N values, and field observations are included as **Attachment 1**.

2.4 Geotechnical Sample Testing

- 1) AEP retained and transported samples collected during drilling to the AEP's Civil Engineering laboratory in Groveport, Ohio for geotechnical testing.
- 2) AEP tested selected samples from the screened intervals for gradation (ASTM D6913) and percent passing #200 sieve (ASTM D1140).
- 3) Gradation curves are provided as **Attachment 2**.

2.5 Monitoring Well Construction

- 1) Final well construction dimensions are provided in **Table 1**.
- 2) Monitoring wells were constructed of 2-inch schedule 40 PVC casing and 2-inch schedule 40 PVC 0.010-inch factory slotted screen.
- 3) A filter pack was placed in the annular space extending from a minimum of 6 inches below the bottom of the well to a minimum of 1 foot above the top of the screen.
- 4) A bentonite pellet seal was placed in the annular space above the filter pack and extended to a minimum of 2 feet above the filter pack. The bentonite pellets were hydrated as they were installed.
- 5) High solids bentonite grout was placed in the annular space from the bentonite seal to within 2 feet of ground surface using a tremie pipe.
- 6) A lockable steel protective casing, extending 2.5 to 3 ft above ground surface) was set in a concrete pad measuring 2 feet by 2 feet in area and 6 inches in thickness. The pad was constructed to slope away from the protective casing.

2.6 Well Development

- 1) Well development began on 8 March 2016 and was completed on 29 March 2016.
- 2) Well development was conducted by pumping using two Geotech Reclaimer pumps powered by a compressor. During pumping, each well was gently surged by moving the pump up and down the screened interval to mobilize fine-grained sediment and facilitate its removal.
- 3) Water quality parameters (discussed in **Section 2.8**) were monitored using a multi-parameter sonde, water quality meter, and flow-through cell (Geotech YSI ProDSS) in the final period of development.
- 4) During development, depth to water and flow rate measurements were also collected.



- 5) Pumping rates during well development ranged from 0.3 to 0.7 gallons per minute (gpm).

2.7 Water Level Gauging

- 1) Water level readings were collected periodically during drilling activities and during well development, using an electronic water level indicator, by measuring depth to water from the top of the inside casing.
- 2) Following well installation, while development of selected wells was still being conducted, a full round of water levels was collected on 17 March 2016.
- 3) All water level readings were converted to elevations relative to MSL using the surveyed top of casing elevations.
- 4) A summary of measured depths to water and water level elevations is provided in **Table 2**. The data in **Table 2** include historical water level elevations in the existing wells provided by AEP, two rounds of readings collected in existing wells by Amec Foster Wheeler on 14 January and 17 March 2016, and one round of water levels collected from the new wells on 17 March 2016. Updated hydrographs for the existing wells are provided in **Attachment 3**.

2.8 Water Quality Parameters

- 1) Water quality field parameters were collected during well development in a flow-through cell using a Geotech multiparameter digital sampling system (YSI ProDSS).
- 2) Water quality parameters monitored included temperature, pH, specific conductance (SC), dissolved oxygen (DO), oxidation-reduction potential (ORP), and turbidity.
- 3) Water quality parameters were monitored in the final period of well development at a reduced flow rate.
- 4) A summary of stabilized water quality parameters is provided in **Table 3**.

3.0 SUMMARY AND FINDINGS

Figure 1 is a map showing the locations of the monitoring wells as installed. Full boring and well construction logs are provided in **Attachment 1**. **Table 1** is a summary of well construction details. **Table 2** summarizes water level measurements collected over multiple events in the four monitoring wells installed in 2010, as well as measurements collected on 17 March 2016. **Table 2** also includes water level measurements collected on 17 March 2016, from the 20 new monitoring wells installed in 2016.

Geologic and hydraulic interpretations are provided in **Figures 2 through 7**. **Figure 2** is a contour map of the bedrock surface in the vicinity of the BA Ponds, and **Figure 3** is a contour map of the potentiometric surface on 17 March 2016, based on the water level measurements collected on that date from the wells installed in the shallow zone. **Figure 4** shows the lines of three geologic cross-sections through the area of the BA Ponds, provided in **Figures 5, 6 and 7**.



The information obtained during drilling and installation of the new monitoring wells has been compared to background information (published data for the area, as well as site documents provided for review by AEP) summarized in the report titled *Groundwater Monitoring Network Evaluation, Bottom Ash Ponds, Rockport Plant, Indiana-Michigan Power Company, Rockport, Indiana* (GWMN Report) prepared for AEP by Amec Foster Wheeler. Full citations are provided in that report for sources referenced in this discussion.

The bedrock elevations encountered in the deep soil borings near the BA Ponds, which ranged in elevation from 274.1 to 298.8 ft MSL, along with the east-southeasterly slope of the bedrock surface (in the direction of the Ohio River), are generally consistent with the site information and published documents reviewed in the GWMN Report.

Core samples from bedrock were not obtained, but fragments recovered in split spoons and cuttings indicate that bedrock beneath the area of the BA Ponds consists of gray shale. This is consistent with the information from other site borings, and with published geologic mapping (Grove 2006), which indicates that the bedrock underlying the site and most of Spencer County is the Pennsylvanian Age Raccoon Group, consisting of sandstone and shale with minor amounts of mudstone, coal and limestone.

The unconsolidated overburden materials above bedrock generally agreed with historical information available for the site and discussed in Section 2.4.2.2 of the Groundwater Monitoring Network Evaluation Report, which grouped unconsolidated material into four units. This terminology has been maintained for the discussion of unconsolidated materials encountered during monitoring well installation and has been carried over to the cross sections presented in **Figures 5 through 7**.

- Fill – silt and clay (presumed to be reworked native soils) associated with the pond dikes. Because all but two locations (MW-1600 S,I,D and MW-1601 S,I,D) were positioned on top of the dikes, a substantial amount of fill material was encountered from ground surface to depths up to 15 BGS. Fill material generally consisted of silty clay, clay, and small amounts of sand.
- Unit No. 1 – surficial silt and clay. This unit was encountered beneath the fill material extending to a depth of between 15 and 29 feet BGS. The unit is a stiff silty to sandy clay with small amounts of interbedded sand layers.
- Unit No. 2 – well sorted sand. Below the surficial silts and clays was a poorly graded (well sorted) fine to medium grained sand to a maximum depth of approximately 32 to 43 feet BGS.
- Unit No. 3 – poorly sorted sand. This unit was encountered below Unit No. 2 and extended (along with Unit No. 4) to bedrock. Unit No. 3 consists of fine to coarse grained sand grading to sand and gravel of Unit No. 4.



- Unit No. 4 – sand and gravel. This unit was encountered interbedded within Unit No. 3 and consisted of fine to coarse, poorly to well sorted sand with variable amounts of gravel and coal particles.

At each well location a shallow, intermediate, and deep monitoring well was installed. Because one shallow monitoring well already existed at the location for MW-1602, only two new wells (an intermediate and a deep well) were installed. Screening intervals for each well were selected based on lithology described from the deep boring and are provided in **Table 1**. Elevations of screened intervals for shallow and intermediate were generally consistent across all locations. Top of screen elevations ranged from 362.9 to 363.2 ft MSL for shallow wells and 330.7 to 332.3 ft MSL for intermediate wells. Screened intervals for deep wells varied more than the other wells due to differences in the depth to bedrock. Top of screen elevations ranged from 284.3 to 308.8 ft MSL.

Following installation and during development, water levels were collected from all wells. Previous data from the four monitoring wells installed in 2010 indicate that the horizontal hydraulic gradient and groundwater flow direction beneath the ponds is typically to the east-southeast, toward the Ohio River. However, the historical data also indicate that temporary gradient reversals can occur in response to rapidly rising river stage conditions. The elevation of the water table can be expected to range between 366 and 372 ft MSL, with occasional (less than annual frequency) rises up to 376 ft MSL. The horizontal hydraulic gradient measured on 17 March 2016, as depicted in **Figure 3** based on the water levels in the shallow wells, was low (on the order of 0.0003 ft/ft) with a slope to the east.

Water level measurements collected in the three-well clusters installed in 2016 indicate there is very little difference in water levels between the three levels (shallow, intermediate and deep) at any location, and the direction of the vertical gradient is variable. Water level elevation differences on 17 March 2016, between wells in any cluster ranged from 0.01 to 0.33 ft, averaging 0.08 feet.

Field water quality data collected during well development is summarized in **Table 3**. Groundwater temperature ranged from 13.7° C in MW-1606I to 20.3° C in MW-1602D. The pH was neutral, ranging from 6.74 standard units (S.U.) in MW-1600S to 7.37 S.U. in MW-1604I. Specific Conductance (SC) ranged from 553 $\mu\text{S}/\text{cm}$ in MW-1604D to 1,365 $\mu\text{S}/\text{cm}$ in MW-1605D. Dissolved oxygen (DO) and oxidation-reduction potential (ORP) indicate a reducing to slightly oxidizing environment. DO ranged from 0.18 mg/L at MW-1606I to 6.61 at MW-1601I, while ORP ranged from -126 mV at MW-1606D to 219 mV at MW-1606S. Turbidity, stabilized at or below 5 NTU at all but one well and ranged from 0.7 NTU at MW-1604D to 5.8 NTU MW-1606S.

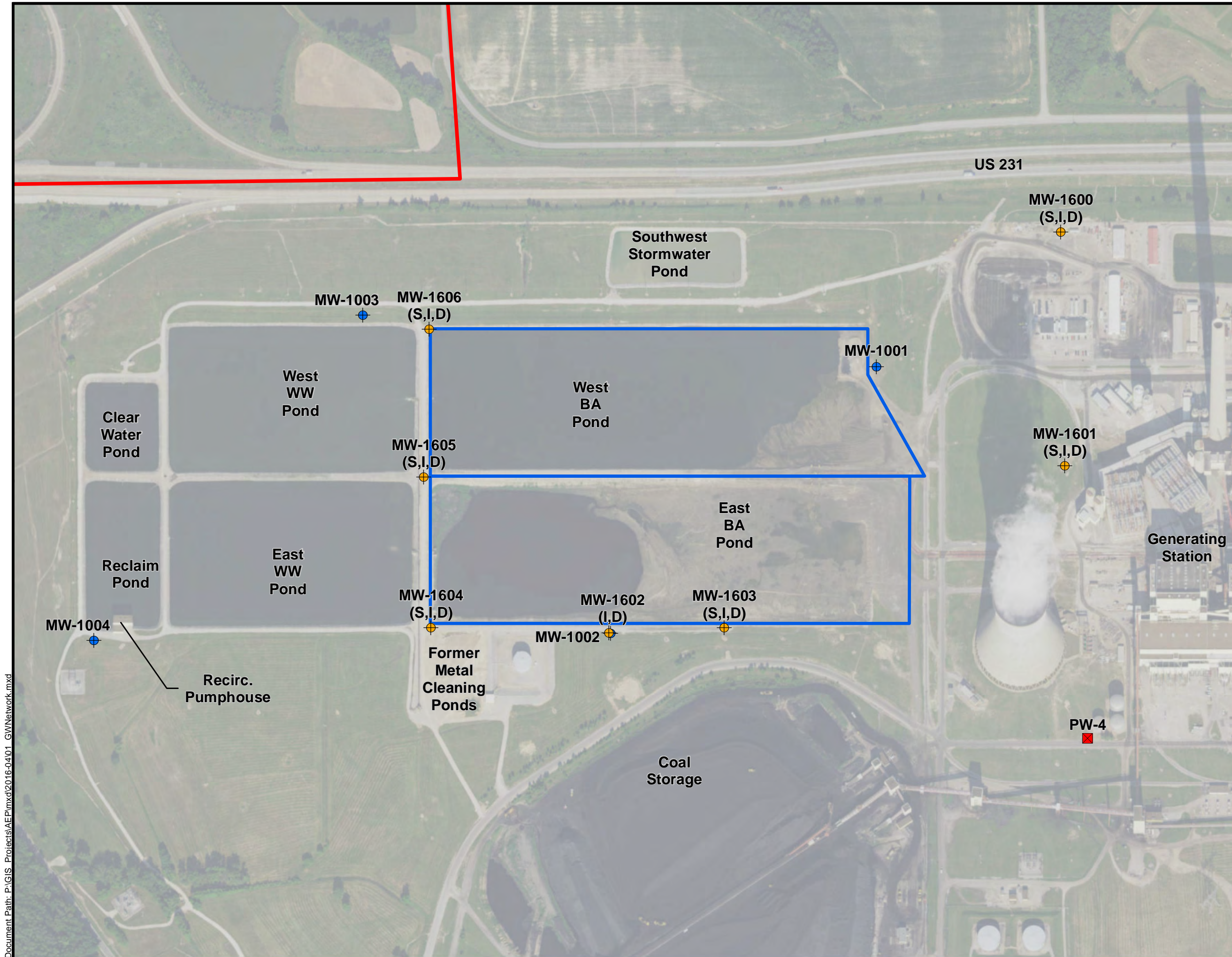
During well development, pumping rate and drawdown were recorded in the field notes. These data were used to calculate the specific capacity of each well to determine if additional hydraulic testing would be necessary. The specific capacity is the discharge in gallons per minute (gpm) per foot of drawdown. Specific capacity ranged from 0.2 gpm/ft at MW-1601D and MW-1603D



to a maximum of 11 gpm/ft at MW-1600D. In 11 out of 20 wells there was no drawdown so specific capacity, which was essentially too high to measure from available pumping rates, could not be calculated.

FIGURES





- Legend**
- Monitoring Well Cluster (2016)
 - USWAG Monitoring Well (2010)
 - Water Supply Well
 - Property Boundary
 - Bottom Ash

Data Sources
 Date of Photography: May-June 2016
 Source of Photography: U.S. Department of Agriculture, National Agriculture Imagery Program (NAIP)



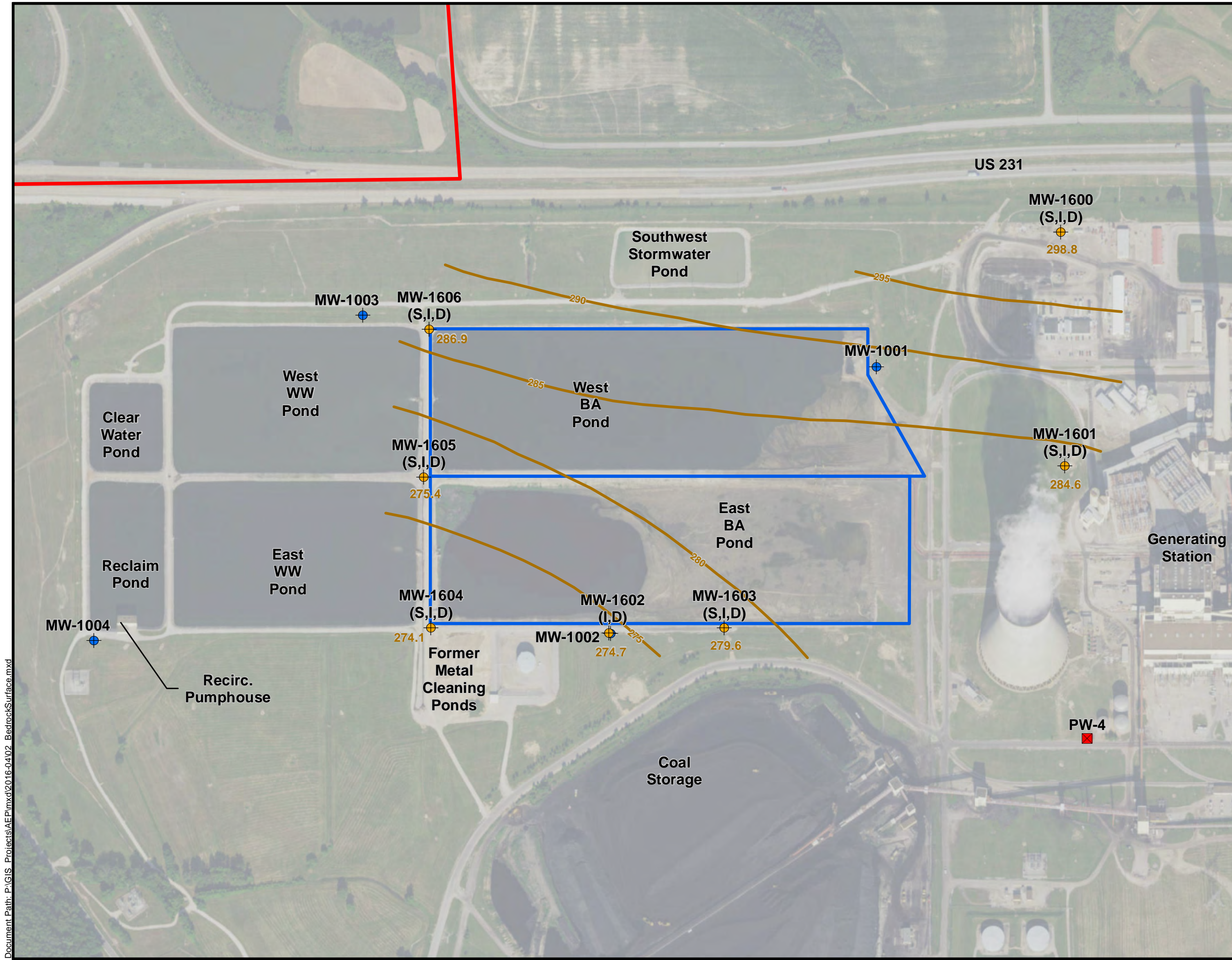
**GROUNDWATER MONITORING NETWORK
 BOTTOM ASH PONDS
 AEP - ROCKPORT, IN**
 PROJECT NUMBER: 7382153161

SCALE	1" = 400'	FIG. 1
DATE	9/14/2017	
DRAWN BY	TMR	
APPROVED BY	ALD	



2456 Fortune Drive, Suite 100
 Lexington, Kentucky 40509
 Phone: (859) 255-3308

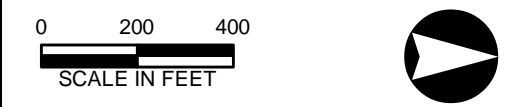
Document Path: P:\GIS Projects\AEP\mxd\2016-04\01_GWNetwork.mxd



- Legend**
- Monitoring Well Cluster
 - USWAG Monitoring Well
 - Water Supply Well
 - Bedrock Elevation Contour (FT)
 - Property Boundary
 - Bottom Ash

Bedrock Elevation (FT MSL)
 298.8 Bedrock elevation in the deep monitoring well boring

Data Sources
 Date of Photography: May-June 2016
 Source of Photography: U.S. Department of Agriculture, National Agriculture Imagery Program (NAIP)



**BEDROCK SURFACE
 CONTOUR MAP
 BOTTOM ASH PONDS
 AEP - ROCKPORT, IN**
 PROJECT NUMBER: 7382153161

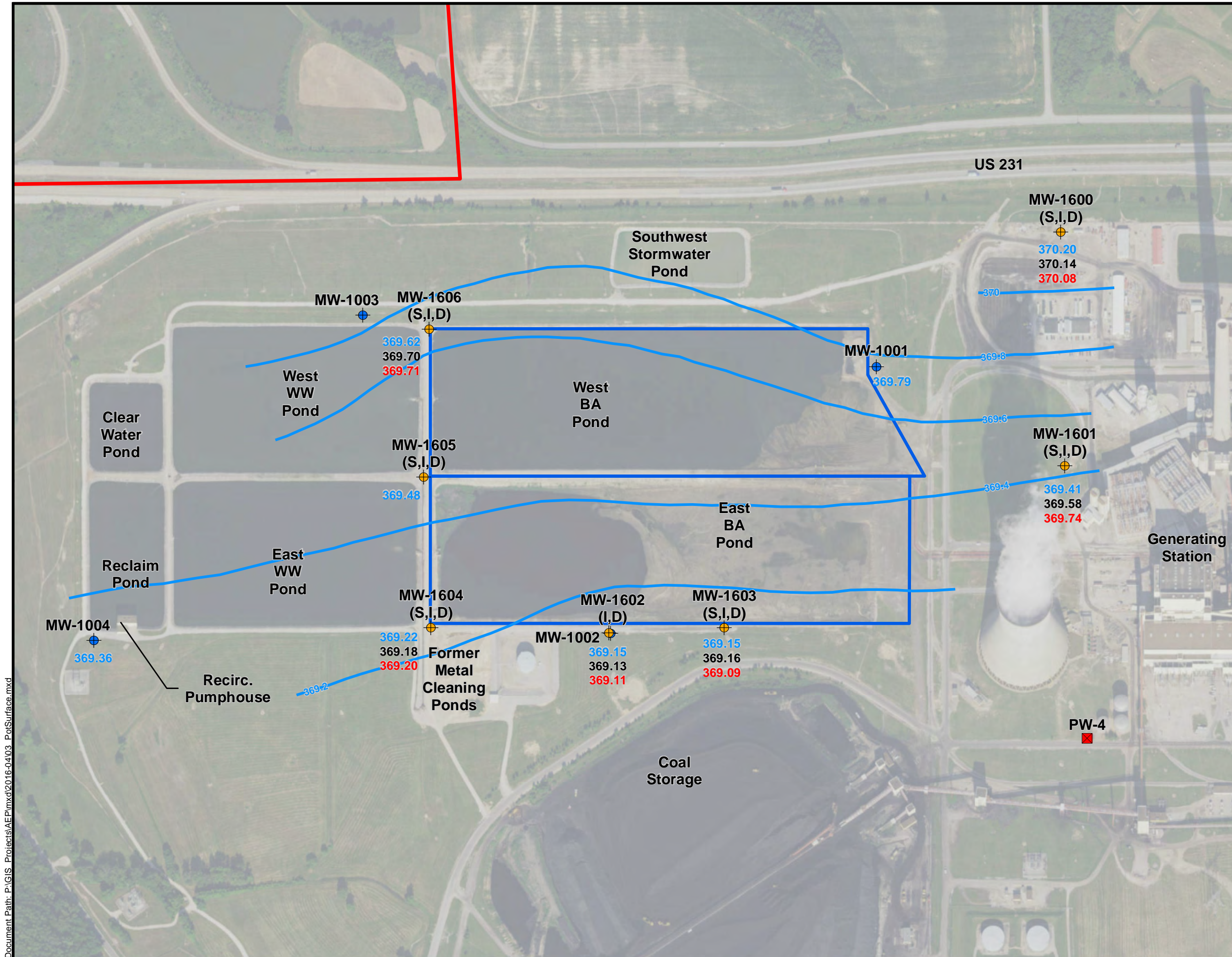
SCALE	1" = 400'
DATE	9/14/2017
DRAWN BY	TMR
APPROVED BY	ALD

**FIG.
2**



2456 Fortune Drive, Suite 100
 Lexington, Kentucky 40509
 Phone: (859) 255-3308

Document Path: P:\GIS - Projects\AEP\mxd\2016-04\02_BedrockSurface.mxd



- Legend**
- Monitoring Well Cluster
 - USWAG Monitoring Well
 - Water Supply Well
 - Potentiometric Elevation Contour (FT MSL)
Contour Interval: 0.2 FT
 - Property Boundary
 - Bottom Ash

Groundwater Potentiometric Elevation (FT MSL)

- 369.22 Shallow Well
- 369.18 Intermediate Well
- 369.20 Deep Well

Data Sources


Date of Photography: May-June 2016
 Source of Photography: U.S. Department of Agriculture, National Agriculture Imagery Program (NAIP)



**POTENTIOMETRIC SURFACE
 CONTOUR MAP
 17 MARCH 2016
 AEP - ROCKPORT, IN
 PROJECT NUMBER: 7382153161**

SCALE	1" = 400'
DATE	9/14/2017
DRAWN BY	TMR
APPROVED BY	ALD

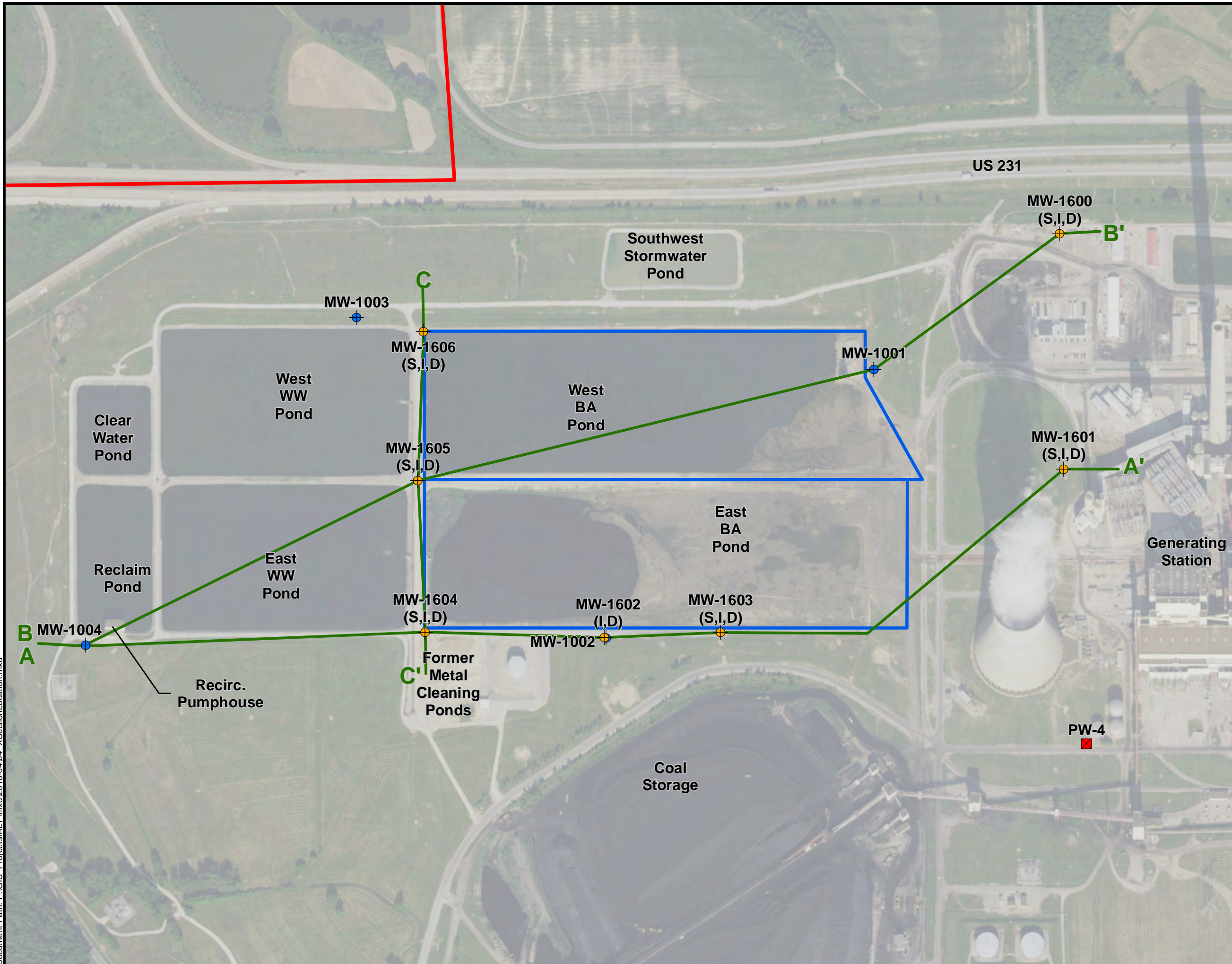
**FIG.
 3**



2456 Fortune Drive, Suite 100
 Lexington, Kentucky 40509
 Phone: (859) 255-3308

Document Path: P:\GIS Projects\AEP\mxd\2016-04\03 PotSurface.mxd

Document Path: P:\GIS - Projects\AEP\mxd\2016-04\04_XSectionLocation.mxd



- Legend**
- Monitoring Well Cluster
 - USWAG Monitoring Well
 - Water Supply Well
 - Cross Section Lines
 - Property Boundary
 - Bottom Ash

Data Sources
 Date of Photography: May-June 2016
 Source of Photography: U.S. Department of Agriculture, National Agriculture Imagery Program (NAIP)



**CROSS SECTION
 LOCATION MAP
 BOTTOM ASH PONDS
 AEP - ROCKPORT, IN**

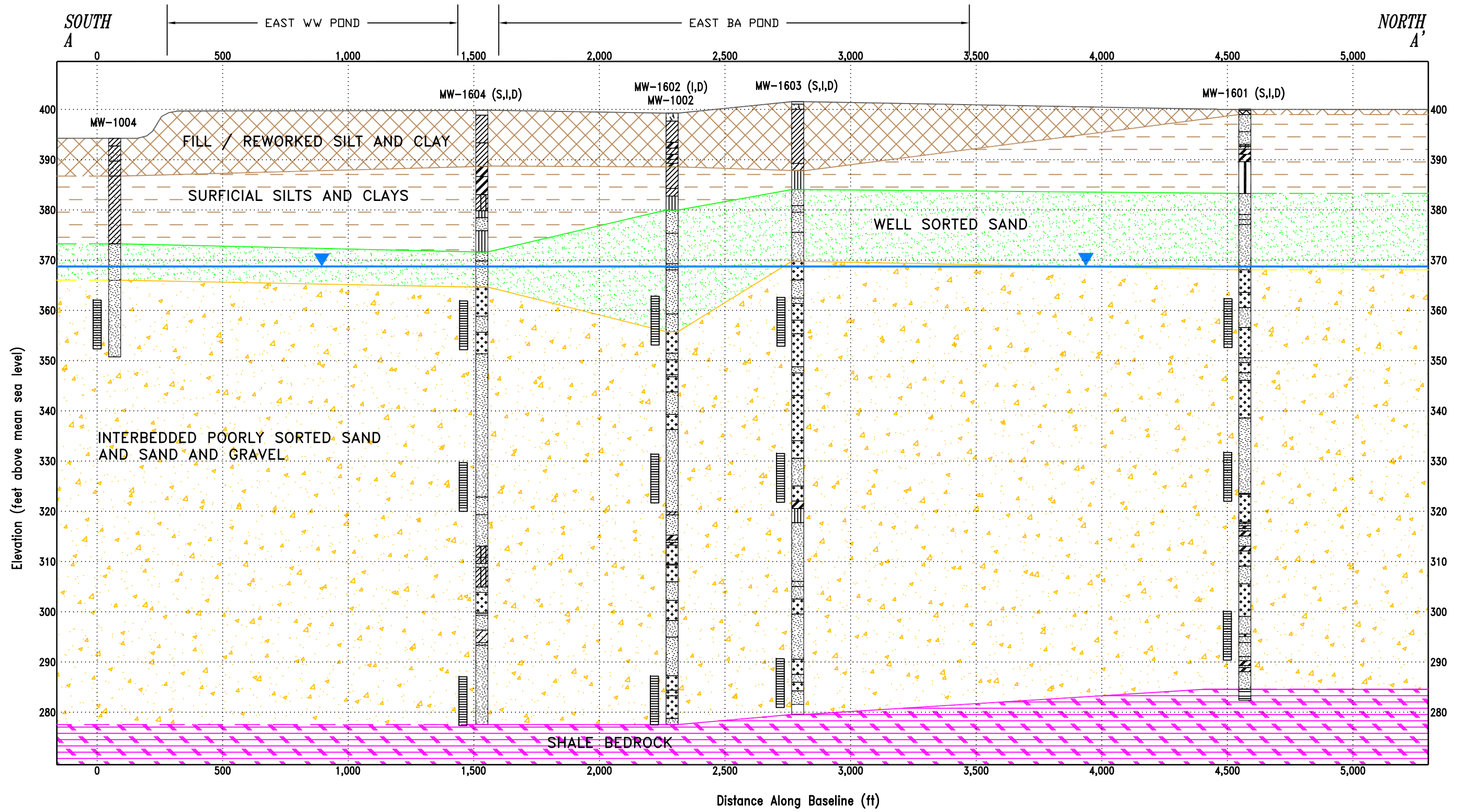
PROJECT NUMBER: 7382153161

SCALE	1" = 400'
DATE	9/14/2017
DRAWN BY	TMR
APPROVED BY	ALD

**FIG.
4**



2456 Fortune Drive, Suite 100
 Lexington, Kentucky 40509
 Phone: (859) 255-3308



0' 400'
 SCALE: 1"=400'
 VERTICAL EXAGGERATION: 20X



**amec
 foster
 wheeler**
 Environment & Infrastructure, Inc.
 2456 Fortune Drive, Suite 100
 Lexington, Kentucky 40509
 Phone: (859) 255-3308

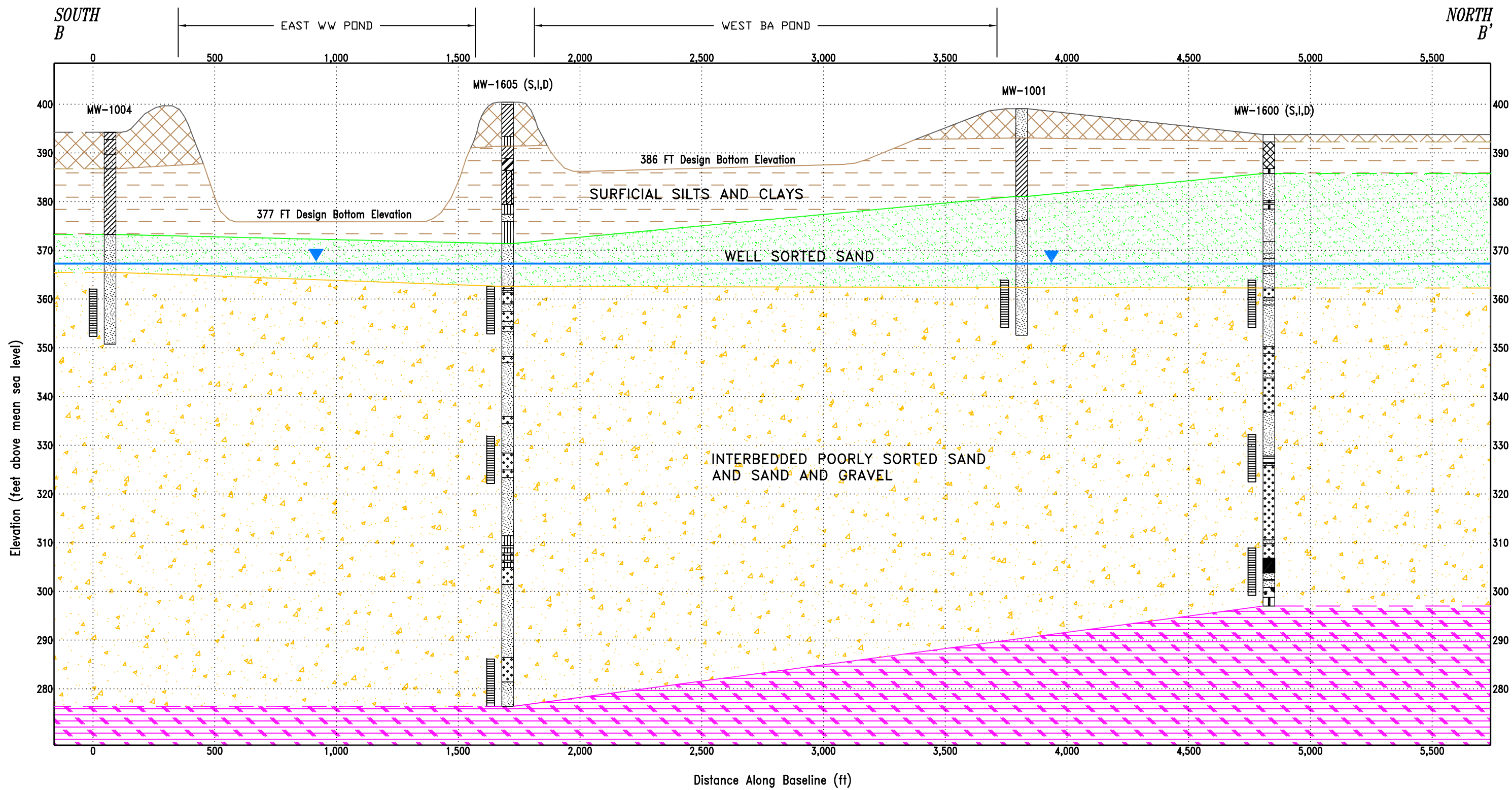
**BOTTOM ASH PONDS
 AEP - ROCKPORT, INDIANA**

CROSS SECTION A - A'

PROJECT NUMBER: 7382-15-3161

SCALE	1" = 400'
DATE	05/20/2016
DRAWN BY	VM / TMR
APPROVED BY	ALD

**FIG.
 5**



0' 400'

SCALE: 1"=400'

VERTICAL EXAGGERATION: 20X



Environment & Infrastructure, Inc.
2456 Fortune Drive, Suite 100
Lexington, Kentucky 40509
Phone: (859) 255-3308

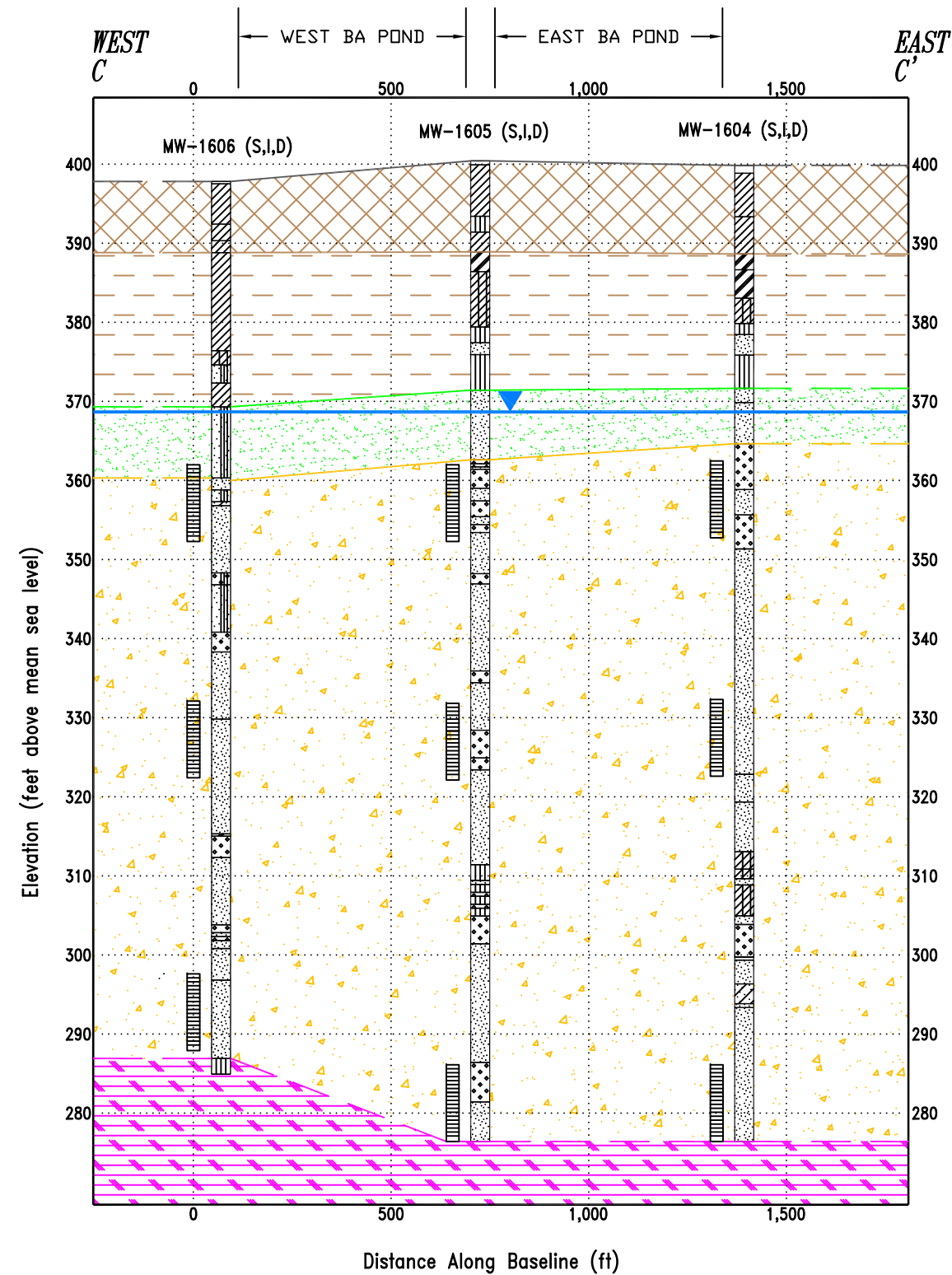
**BOTTOM ASH PONDS
AEP - ROCKPORT, INDIANA**

CROSS SECTION B - B'

PROJECT NUMBER: 7362-15-3161

SCALE	1" = 400'
DATE	05/20/2016
DRAWN BY	VM / TMR
APPROVED BY	ALD

**FIG.
6**



LEGEND:

- | | | | | | |
|--|--|--|--|--|-----------------------------------|
| | USCS Low Plasticity Clay | | USCS Silt | | USCS Clayey Sand |
| | USCS High Plasticity Clay | | USCS Poorly-graded Sand | | USCS Poorly-graded Sand with Silt |
| | USCS Low Plasticity Silty Clay | | USCS Well-graded Sand | | USCS Well-graded Sand with Silt |
| | Fill or Reworked Soil | | Shale | | USCS Well-graded Gravel |
| | Interbedded Poorly Sorted Sand and Sand and Gravel | | Surficial Silt and Clay | | Well Sorted Sand |
| | Shale Bedrock | | | | |
| | Screened Interval | | Water level elevation measured in shallow wells on 17 March 2016 | | |

0' 400'
SCALE: 1"=400'
VERTICAL EXAGGERATION: 20X



Environment & Infrastructure, Inc.
2456 Fortune Drive, Suite 100
Lexington, Kentucky 40509
Phone: (859) 255-3308

BOTTOM ASH PONDS
AEP - ROCKPORT, INDIANA

CROSS SECTION C - C'

PROJECT NUMBER: 7382-15-3161

SCALE	1" = 400'
DATE	05/20/2016
DRAWN BY	VM / TMR
APPROVED BY	ALD

FIG.
7

TABLES



**Table 1
Monitoring Well Construction Details
Bottom Ash Pond Complex
AEP Rockport Plant, Rockport, Indiana**

Well ID	Date Installed	Northing SPCS NAD27 (ft)	Easting SPCS NAD27 (ft)	Top of Casing (TOC) Elevation* (ft MSL)	Ground Surface Elevation (ft MSL)	Casing Stick-Up (ft AGS)	Length of Screen (ft)	Type of Screen (PVC)	Total Depth of Boring (ft BGS)	Depth to Top of Bedrock (ft BGS)	Sounded Depth of Well (ft BMP)	Depth to Top of Screen (ft BGS)	Bottom of Boring Elevation (ft MSL)	Top of Bedrock Elevation (ft MSL)	Bottom of Well Elevation (ft MSL)	Bottom of Screen Elevation (ft MSL)	Top of Screen Elevation (ft MSL)
MW-1001	6/2/2010	153488.0	513047.6	402.35	400.03	2.3	9.7	2" x 0.010"	41.0	---	---	29.7	359.0	---	360.0	360.6	370.3
MW-1002	6/2/2010	152307.4	514231.0	401.42	399.09	2.3	9.7	2" x 0.010"	46.5	---	---	35.2	352.6	---	353.6	354.2	363.9
MW-1003	6/2/2010	151208.1	512820.7	393.23	390.84	2.4	9.7	2" x 0.010"	39.0	---	---	27.7	351.8	---	352.8	353.4	363.1
MW-1004	6/3/2010	150013.4	514264.7	396.55	394.25	2.3	9.7	2" x 0.010"	43.5	---	---	32.2	350.8	---	351.8	352.4	362.1
MW-1600-S	2/29/2016	154305.946	512458.043	396.73	393.69	3.0	9.6	2" x 0.010"	41.6	---	43.59	30.6	352.1	---	353.1	353.5	363.1
MW-1600-I	2/29/2016	154306.008	512454.030	396.65	393.72	2.9	9.6	2" x 0.010"	73.0	---	74.59	61.7	320.7	---	322.1	322.5	332.1
MW-1600-D	2/17/2016	154306.313	512448.952	396.31	393.79	2.5	9.6	2" x 0.010"	96.8	95.0	97.52	85.0	297.0	298.8	298.8	299.2	308.8
MW-1601-S	2/27/2016	154327.617	513479.660	402.65	399.77	2.9	9.6	2" x 0.010"	48.0	---	49.74	36.9	351.8	---	352.9	353.3	362.9
MW-1601-I	2/26/2016	154325.290	513483.510	402.83	399.96	2.9	9.6	2" x 0.010"	79.8	---	80.95	68.1	320.2	---	321.9	322.3	331.9
MW-1601-D	2/26/2016	154323.168	513487.454	402.84	400.09	2.8	9.6	2" x 0.010"	117.7	115.5	112.77	100.0	282.4	284.6	290.1	290.5	300.1
MW-1602-I	2/9/2016	152295.035	514229.173	402.03	399.38	2.6	9.6	2" x 0.010"	78.7	---	80.45	67.8	320.7	---	321.6	322.0	331.6
MW-1602-D	1/26/2016	152300.217	514229.384	401.91	399.28	2.6	9.6	2" x 0.010"	125.0	124.6	126.96	114.3	274.3	274.7	275.0	275.4	285.0
MW-1603-S	2/3/2016	152802.696	514206.885	403.85	401.46	2.4	9.6	2" x 0.010"	49.3	---	50.63	38.2	352.2	---	353.2	353.6	363.2
MW-1603-I	2/1/2016	152807.294	519207.223	404.15	401.41	2.7	9.6	2" x 0.010"	79.6	---	81.67	68.9	321.8	---	322.5	322.9	332.5
MW-1603-D	1/29/2016	152811.949	514207.457	403.85	401.56	2.3	9.6	2" x 0.010"	122.0	122.0	123.14	110.9	279.6	279.6	280.7	281.1	290.7
MW-1604-S	1/29/2016	151503.132	514197.320	402.46	399.76	2.7	9.6	2" x 0.010"	48.0	---	49.35	36.7	351.8	---	353.1	353.5	363.1
MW-1604-I	1/28/2016	151506.473	514201.037	402.19	399.74	2.4	9.6	2" x 0.010"	79.0	---	81.46	69.0	320.7	---	320.7	321.1	330.7
MW-1604-D	1/15/2016	151510.165	514204.869	402.44	399.85	2.6	9.6	2" x 0.010"	126.6	125.8	128.15	115.6	273.3	274.1	274.3	274.7	284.3
MW-1605-S	3/1/2016	151478.765	513528.386	403.38	400.33	3.1	9.6	2" x 0.010"	49.0	---	50.60	37.6	351.3	---	352.8	353.2	362.8
MW-1605-I	3/2/2016	151478.914	513532.565	403.22	400.60	2.6	9.6	2" x 0.010"	80.0	---	81.50	68.9	320.6	---	321.7	322.1	331.7
MW-1605-D	2/3/2016	151478.903	513537.066	403.78	400.42	3.4	9.6	2" x 0.010"	127.5	125.0	128.00	114.6	272.9	275.4	275.8	276.2	285.8
MW-1606-S	3/2/2016	151498.907	512889.413	400.65	397.62	3.0	9.6	2" x 0.010"	46.0	---	47.62	34.6	351.6	---	353.0	353.4	363.0
MW-1606-I	3/1/2016	151500.402	512885.504	400.75	397.75	3.0	9.6	2" x 0.010"	77.0	---	78.41	65.4	320.8	---	322.3	322.7	332.3
MW-1606-D	2/12/2016	151502.092	512881.487	400.73	397.82	2.9	9.6	2" x 0.010"	112.9	110.9	113.15	100.2	284.9	286.9	287.6	288.0	297.6

Prepared By: TMR 4/19/16
Checked By: SGW 4/21/2016

Notes:

* Top of casing on new wells surveyed 3-4 March 2016.

--- = Data not available or not applicable

ft = feet

in = inches

BMP = below measuring point (top of casing)

BGS = below ground surface

MSL = above Mean Sea Level, equivalent to the National Geodetic Vertical Datum of 1929 (NGVD29)

AGS = above ground surface

TOC = top of casing (PVC pipe)

SPCS = State Plane Coordinate System

NAD27 = North American Datum of 1927

**Table 2
Groundwater Elevation Summary
Bottom Ash Pond Complex
AEP Rockport Plant, Rockport, Indiana**

Well No.	MW 1001	MW 1002	MW 1003	MW 1004	MW-1600-S	MW-1600-I	MW-1600-D	MW-1601-S
Date Installed	6/2/2010	6/2/2010	6/2/2010	6/2/2010	2/29/2016	2/29/2016	2/17/2016	2/27/2016
MP Elevation (ft MSL)*	402.35	401.42	393.23	396.55	396.73	396.65	396.31	402.65
Depth to Well Bottom (ft BMP)	42.32	47.83	40.39	44.80	43.59	74.59	97.52	49.74
Well Bottom Elevation (ft MSL)	360.0	353.6	352.8	351.8	353.1	322.1	298.8	352.9
Depth to Water (ft BMP)								
5/17/2011	---	---	---	---	---	---	---	---
11/17/2011	---	---	---	---	---	---	---	---
11/15/2012	---	---	---	---	---	---	---	---
5/20/2013	---	---	---	---	---	---	---	---
11/13/2013	---	---	---	---	---	---	---	---
5/12/2014	---	---	---	---	---	---	---	---
11/12/2014	---	---	---	---	---	---	---	---
5/7/2015	---	---	---	---	---	---	---	---
1/14/2016	33.01	32.87	24.20	28.58	---	---	---	---
3/17/2016	32.56	32.27	23.40	27.19	26.53	26.51	26.23	33.24
Water Level Elevation (ft MSL)								
5/17/2011	371.61	373.20	373.72	376.13	---	---	---	---
11/17/2011	370.77	369.17	369.64	367.35	---	---	---	---
11/15/2012	368.91	367.48	367.83	365.93	---	---	---	---
5/20/2013	369.11	367.95	368.61	367.38	---	---	---	---
11/13/2013	368.38	366.99	367.49	366.43	---	---	---	---
5/12/2014	370.06	369.55	369.93	368.84	---	---	---	---
11/12/2014	368.57	367.03	367.64	365.57	---	---	---	---
5/7/2015	370.75	371.16	371.35	370.93	---	---	---	---
1/14/2016	369.34	368.55	369.03	367.97	---	---	---	---
3/17/2016	369.79	369.15	369.83	369.36	370.20	370.14	370.08	369.41

**Table 2
Groundwater Elevation Summary
Bottom Ash Pond Complex
AEP Rockport Plant, Rockport, Indiana**

Well No.	MW-1601-I	MW-1601-D	MW-1602-I	MW-1602-D	MW-1603-S	MW-1603-I	MW-1603-D	MW-1604-S
Date Installed	2/26/2016	2/26/2016	2/9/2016	1/26/2016	2/3/2016	2/1/2016	1/29/2016	1/29/2016
MP Elevation (ft MSL)*	402.83	402.84	402.03	401.91	403.85	404.15	403.85	402.46
Depth to Well Bottom (ft BMP)	80.95	112.77	80.45	126.96	50.63	81.67	123.14	49.35
Well Bottom Elevation (ft MSL)	321.9	290.1	321.6	275.0	353.2	322.5	280.7	353.1
Depth to Water (ft BMP)								
5/17/2011	---	---	---	---	---	---	---	---
11/17/2011	---	---	---	---	---	---	---	---
11/15/2012	---	---	---	---	---	---	---	---
5/20/2013	---	---	---	---	---	---	---	---
11/13/2013	---	---	---	---	---	---	---	---
5/12/2014	---	---	---	---	---	---	---	---
11/12/2014	---	---	---	---	---	---	---	---
5/7/2015	---	---	---	---	---	---	---	---
1/14/2016	---	---	---	---	---	---	---	---
3/17/2016	33.25	33.10	32.90	32.80	34.70	34.99	34.76	33.24
Water Level Elevation (ft MSL)								
5/17/2011	---	---	---	---	---	---	---	---
11/17/2011	---	---	---	---	---	---	---	---
11/15/2012	---	---	---	---	---	---	---	---
5/20/2013	---	---	---	---	---	---	---	---
11/13/2013	---	---	---	---	---	---	---	---
5/12/2014	---	---	---	---	---	---	---	---
11/12/2014	---	---	---	---	---	---	---	---
5/7/2015	---	---	---	---	---	---	---	---
1/14/2016	---	---	---	---	---	---	---	---
3/17/2016	369.58	369.74	369.13	369.11	369.15	369.16	369.09	369.22

Table 2
Groundwater Elevation Summary
Bottom Ash Pond Complex
AEP Rockport Plant, Rockport, Indiana

Well No.	MW-1604-I	MW-1604-D	MW-1605-S	MW-1605-I	MW-1605-D	MW-1606-S	MW-1606-I	MW-1606-D
Date Installed	1/28/2016	1/15/2016	3/1/2016	3/2/2016	2/3/2016	3/2/2016	3/1/2016	2/12/2016
MP Elevation (ft MSL)*	402.19	402.44	403.38	403.22	403.78	400.65	400.75	400.73
Depth to Well Bottom (ft BMP)	81.46	128.15	50.60	81.50	128.00	47.62	78.41	113.15
Well Bottom Elevation (ft MSL)	320.7	274.3	352.8	321.7	275.8	353.0	322.3	287.6
Depth to Water (ft BMP)								
5/17/2011	---	---	---	---	---	---	---	---
11/17/2011	---	---	---	---	---	---	---	---
11/15/2012	---	---	---	---	---	---	---	---
5/20/2013	---	---	---	---	---	---	---	---
11/13/2013	---	---	---	---	---	---	---	---
5/12/2014	---	---	---	---	---	---	---	---
11/12/2014	---	---	---	---	---	---	---	---
5/7/2015	---	---	---	---	---	---	---	---
1/14/2016	---	---	---	---	---	---	---	---
3/17/2016	33.01	33.24	33.90	34.0	35.0	31.03	31.05	31.02
Water Level Elevation (ft MSL)								
5/17/2011	---	---	---	---	---	---	---	---
11/17/2011	---	---	---	---	---	---	---	---
11/15/2012	---	---	---	---	---	---	---	---
5/20/2013	---	---	---	---	---	---	---	---
11/13/2013	---	---	---	---	---	---	---	---
5/12/2014	---	---	---	---	---	---	---	---
11/12/2014	---	---	---	---	---	---	---	---
5/7/2015	---	---	---	---	---	---	---	---
1/14/2016	---	---	---	---	---	---	---	---
3/17/2016	369.18	369.20	369.48	369.22	368.78	369.62	369.70	369.71

Prepared by: TMR 4/19/16
Checked by: SGW 4/21/16

Notes:

- * Top of casing on new wells surveyed 3-4 March 2016.
- = Data not available or not applicable
- ft = feet
- BMP = below measuring point (top of casing)
- MSL = above Mean Sea Level, equivalent to the National Geodetic Vertical Datum of 1929 (NGVD29)

Table 3
Field Water Quality Data
Bottom Ash Pond Complex
AEP Rockport Plant, Rockport, Indiana

Well ID	Date	Time	Static DTW (ft BMP)	pH (S.U.)	Temp (°C)	SC (µS/cm)	DO (mg/L)	ORP (mV)	Turb (NTU)
MW-1600-S	3/22/2016	10:15	26.53	6.74	15.5	735	0.8	103	1.6
MW-1600-I	3/22/2016	12:00	26.51	6.97	15.5	703	4.22	-64.3	5.0*
MW-1600-D	3/22/2016	9:40	26.23	6.88	14.3	715	0.52	-104	1.8
MW-1601-S	3/10/2016	15:05	33.36	7.17	16.0	725	0.89	---	1.6
MW-1601-I	3/10/2016	13:45	33.35	6.78	15.9	788	6.61	-59.0	3.9
MW-1601-D	3/30/2016	9:05	33.1	6.97	15.6	759	1.91	-102.6	4.0
MW-1602-I	3/15/2016	16:40	33.21	7.18	18.8	738	0.6	---	4.8
MW-1602-D	3/15/2016	15:45	32.51	7.18	20.3	919	0.58	---	5.0
MW-1603-S	3/20/2016	15:40	34.70	7.15	17.0	792	0.42	-90.2	1.8
MW-1603-I	3/20/2016	16:25	34.99	7.04	14.4	835	2.48	-71.6	5.0
MW-1603-D	3/20/2016	15:00	34.76	6.95	14.4	739	0.75	-98.3	2.1
MW-1604-S	3/14/2016	14:25	33.21	7.33	18.9	876	0.39	---	2.3
MW-1604-I	3/12/2016	12:50	33.40	7.37	16.9	782	1.58	---	1.9
MW-1604-D	3/12/2016	11:30	33.59	7.23	16.2	553	0.57	---	0.69
MW-1605-S	3/17/2016	14:05	33.62	7.11	18.3	978	0.25	157	2.1
MW-1605-I	3/17/2016	13:15	33.51	7.16	16.3	790	0.39	-90.7	4.9
MW-1605-D	3/17/2016	10:45	33.73	7.12	17.1	1,365	0.45	-95.2	3.3
MW-1606-S	3/19/2016	13:10	31.03	7.00	14.0	788	2.75	219	5.8
MW-1606-I	3/19/2016	9:55	31.50	7.21	13.7	631	0.18	-93.2	1.5
MW-1606-D	3/19/2016	10:35	31.20	7.11	13.8	568	0.71	-126	3.1

Prepared By: TMR 4/25/16

Checked By: ALD 4/26/2016

Notes:

- * = Final turbidity measurement collected at 14:00 after an additional 2 hours of pumping.
- = Data not available or not applicable
- ft = feet
- S.U. = Standard Units
- °C = degrees Celcius
- µS/cm = microSiemens per centimeter
- mg/L = milligrams per liter
- mV = milliVolts
- NTU = Nephelometric Turbidity Units
- DTW = Depth to Water
- BMP = Below Measuring Point (top of casing)
- Temp = Temperature
- SC = Specific Conductance
- DO = Dissolved Oxygen
- ORP = Oxidation-Reduction Potential
- Turb = Turbidity

ATTACHMENTS



ATTACHMENT 1

**WELL CONSTRUCTION AND LITHOLOGIC LOGS
2016 BA POND MONITORING WELLS**



AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**
 COMPANY **INDIANA MICHIGAN POWER COMPANY**
 PROJECT **ROCKPORT PLANT**
 COORDINATES **N 154,306.3 E 512,449.0**
 GROUND ELEVATION **393.8** SYSTEM **State Plane using NAD27/29**

BORING NO. **MW-1600D** DATE **4/27/16** SHEET **1** OF **4**
 BORING START **2/17/16** BORING FINISH **2/17/16**
 PIEZOMETER TYPE _____ WELL TYPE **OW**
 HGT. RISER ABOVE GROUND **2.52** DIA **2.0**
 DEPTH TO TOP OF WELL SCREEN **84.99** BOTTOM **94.59**
 WELL DEVELOPMENT **YES** BACKFILL _____
 FIELD PARTY **ZLR / REB** RIG **D-120**

Water Level, ft	<input type="text"/>	<input type="text"/>	<input type="text"/>
TIME	<input type="text"/>	<input type="text"/>	<input type="text"/>
DATE	<input type="text"/>	<input type="text"/>	<input type="text"/>

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO									
1	SS	0.0	1.5	33-14-10	1.5					Gravel = 18 inches		
2	SS	1.5	3.0	3-5-6	1.5					Silty clay, l. brown 5YR 6/4 and l. grey N7 mottled, dry, stiff, FILL @ 3' sl. stiff		
3	SS	3.0	4.5	2-3-4	1.5					@ 4.2' w/dusky brown 5YR 2/2 silt @ 4.5' stiff, some iron oxide particles, moist		
4	SS	4.5	6.0	4-4-6	1.5		5					
5	SS	6.0	7.5	3-6-9	1.5							
6	SS	7.5	9.0	2-5-6	1.5			MH		Clayey silt, moderate brown 5YR 4/4 and l. grey N7 fat clay mottled, moist, med. dense, trace oxide particles, likely fill		
7	SS	9.0	10.5	3-4-4	1.4		10	SP		Poorly graded sand, fine grained, l. brown 5YR 5/6, dry to moist, med. dense @ 9' v. fine grained, loose		
8	SS	10.5	12.0	3-4-4	1.4							
9	SS	12.0	13.5	2-3-5	1.5							
10	SS	13.5	15.0	2-4-5	1.5			MH		Clayey silt, moderate brown 5YR 4/4, moist, loose		
11	SS	15.0	16.5	3-8-10	1.5		15	SP		Poorly graded sand, fine grained pale yellowish brown 10YR 6/2, moist, loose		
12	SS	16.5	18.0	4-6-8	1.5			MH		Clayey silt, moderate brown 5YR 4/4, moist, loose		
13	SS	18.0	19.5	5-6-5	1.5			SP		Poorly graded sand, fine grained, pale yellowish brown 10YR 6/2, moist, med. dense @ 16' 3" layer - clayey silt (prev. material) @ 19' 4" layer - poorly graded sand (l. brown, v. fine grained) prev. material @ 21' loose @ 21.3' w/black silt		
14	SS	19.5	21.0	3-5-4	1.5							

TYPE OF CASING USED

_____	NQ-2 ROCK CORE
_____	6" x 3.25 HSA
_____	9" x 6.25 HSA
_____	HW CASING ADVANCER 4"
_____	NW CASING 3"
_____	SW CASING 6"
_____	AIR HAMMER 8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC
 WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER **AMEC FOSTER WHEELER**

AEP_RK_BAP_CCR_COMPLIANCE.GPJ_AEP.GDT_4/27/16

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1600D** DATE **4/27/16** SHEET **2** OF **4**

PROJECT **ROCKPORT PLANT**

BORING START **2/17/16** BORING FINISH **2/17/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
15	SS	21.0	22.5	3-3-5	1.5							
16	SS	22.5	24.0	2-3-3	1.5				SP	Poorly graded sand, v. fine grained, l. brown 5YR 5/6, moist, loose @ 22.8' 3" layer - PG sand, fine, pale yellowish br. prev. material		
17	SS	24.0	25.5	4-6-6	1.5					@ 23.2' w/black silt @ 23.5' no black silt @ 24' moderate red 5R 4/6		
18	SS	25.5	27.0	2-2-4	1.0		25		SP	Poorly graded sand, med. grained, d. yellowish brown 10YR 4/2, moist, med. dense, some black silt		
19	SS	27.0	28.5	2-2-2	1.2				SP	Poorly graded sand, v. fine grained, pale yellowish brown 10YR 6/2, wet, loose, trace clay (l. brown 5YR 6/4), trace coarse gravel, water in spoon		
20	SS	28.5	30.0	4-8-11	1.5				SP	Poorly graded sand, fine grained, pale yellowish brown 10YR 6/2, wet, v. loose, w/lean clay (mod. brown 5YR 4/4)		
21	SS	30.0	31.5	6-6-8	1.0		30			Poorly graded sand, fine grained, mod. yellowish brown 10YR 5/4, wet, med. dense, w/fine gravel @ 30.5' w/black silt @ 30.7' no black silt		
22	SS	31.5	33.0	4-6-9	1.5				SW	Well graded sand, coarse grained, dark reddish brown 10R 3/4, wet, med. dense, w/fine gravel @ 32' 5" layer pg sand, fine, mod. yellowish brown, prev. material		
23	SS	33.0	34.5	8-9-12	1.5				SP	Poorly graded sand, fine grained, mod. yellowish brown 10YR 5/4, wet, med. dense, w/fine gravel, trace black silt		
24	SS	34.5	36.0	13-16-12	1.5		35		SP	Poorly graded sand, fine to med. grained, dusky red 5R 3/4, wet, med. dense, w/fine gravel, trace coarse gravel		
25	SS	36.0	37.5	6-7-7	1.5					Poorly graded sand, fine grained, mod. yellowish brown 10YR 5/4, wet, med. dense, w/fine gravel @ 36' trace coarse gavel @ 37.5' well graded SW @ 40' poorly graded SP @ 41' trace fine gravel, no coarse gravel @ 42' dense @ 43.1' 1" seam black silt and fine gravel - possible coal		
26	SS	37.5	39.0	5-8-12	1.5							
27	SS	39.0	40.5	6-12-17	1.5		40					
28	SS	40.5	42.0	6-11-19	1.5							
29	SS	42.0	43.5	7-15-24	1.5							
30	SS	43.5	45.0	3-10-16	1.4				SW	Well graded sand, fine to med. grained, pale yellowish brown 10YR 6/2 wet, med. dense, w/fine gravel		
31	SS	45.0	46.5	10-13-16	1.5		45		SW	@ 44' trace lean clay mod. brown 5YR 4/4 @ 44.4' no clay		

Continued Next Page

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1600D** DATE **4/27/16** SHEET **3** OF **4**

PROJECT **ROCKPORT PLANT**

BORING START **2/17/16** BORING FINISH **2/17/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
32	SS	46.5	48.0	6-9-14	1.4					Well graded sand, coarse grained, mod. yellowish brown 10YR 5/4, wet, med. dense, w/fine gravel, trace coarse gravel @ 46.5' med. to coarse grained		
33	SS	48.0	49.5	9-16-20	1.5							
34	SS	49.5	51.0	12-11-15	1.4		50		SP	Poorly graded sand, fine grained, pale brown 5YR 5/4, wet, dense, trace coarse gravel		
35	SS	51.0	52.5	7-12-12	1.5				SW	Well graded sand, fine to med. grained, d. yellowish brown 10YR 4/2, wet, med. dense, some fine gravel, some black silt @ 51' trace coarse gravel @ 52.5' fine grained, no coarse gravel @ 54' no fine gravel @ 55.5' brownish grey 5YR 4/1 w/fine gravel		
36	SS	52.5	54.0	4-9-12	1.5							
37	SS	54.0	55.5	9-10-14	1.4		55					
38	SS	55.5	57.0	6-12-16	1.5							
39	SS	57.0	58.5	7-9-11	1.4				SP	Poorly graded sand, fine grained, brownish grey 5YR 4/1, wet, med. dense, w/black silt @ 60' dense @ 60.6' 1.5" shale fragment @ 62.1' w/fine gravel @ 63' v. dense @ 64.2' 3" layer shale, l. grey N7 @ 64.5' some coarse gravel @ 65' 2" layer shale, l. grey N7		
40	SS	58.5	60.0	7-10-16	1.2		60					
41	SS	60.0	61.5	13-16-16	1.5							
42	SS	61.5	63.0	6-14-25	1.4							
43	SS	63.0	64.5	11-20-38	1.5							
44	SS	64.5	66.0	22-24-29	1.4		65					
45	SS	66.0	67.5	50/3						Shale, l. grey, dry, hard		
46	SS	67.5	69.0	13-13-14	1.5				SP	Indeterminate layer transition due to 3" recovery (spoon refusal) in prev. sample		
47	SS	69.0	70.5	12-16-16	1.4				SW	Poorly graded sand, v. fine grained, brownish grey 5YR 4/1, wet, med. dense, w/fine gravel Well graded sand, med. grained, d. yellowish brown 10YR 4/2, wet, med. dense, w/fine gravel, some coarse gravel @ 69' dense, fine to med. grained @ 70.5' med. grained @ 71' 3" layer fat clay, l. grey N7 (w/shale).		
48	SS	70.5	72.0	6-13-21	1.3		70					

AEP RK BAP CCR COMPLIANCE.GPJ_AEP.GDT 4/27/16

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1600D** DATE **4/27/16** SHEET **4** OF **4**

PROJECT **ROCKPORT PLANT**

BORING START **2/17/16** BORING FINISH **2/17/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES					
		FROM	TO			%											
49	SS	72.0	73.5	8-13-24	1.1		75			w/coarse gravel @ 72' no coarse gravel @ 73.5' mod. dense, sample washed out @76' 2.5" layer coal fragments @ 79' 1" seam fat clay, l. grey N7 @ 79.5' trace black silt							
50	SS	73.5	75.0	10-9-17	0												
51	SS	75.0	76.5	5-13-14	1.4												
52	SS	76.5	78.0	9-12-18	1.1												
53	SS	78.0	79.5	6-6-15	1.4												
54	SS	79.5	81.0	6-7-13	1.2												
55	SS	81.0	82.5	6-6-8	1.1												
56	SS	82.5	84.0	7-8-9	1.3												
57	SS	84.0	85.5	10-12-21	1.5								85	SP	Poorly graded sand, v. fine grained, pale yellowish brown 10YR 6/2, wet, med. dense, trace black silt		
														SW	Well graded sand, med. grained, d. yellowish brown 10YR 4/2, wet, dense, w/fine gravel, trace coarse gravel, trace black silt @ 84.6' 2.5" layer coal w/~30% above material		
58	SS	85.5	87.0	14-11-10	1.5				SW	@ 85.5' med. dense, no coarse gravel, no black silt							
59	SS	87.0	88.5	6-7-8	1.4				GW	Well graded gravel, brownish grey 5YR 4/1, wet, med. dense, fine rounded, w/med. grained sand (l. yellowish brown 10YR 4.2, prev. material)							
60	SS	88.5	90.0	15-19-24	.08					@ 88.5' dense, sample washed out/blocket, cobble fragment in spoon tip							
61	SS	90.0	91.5	11-25-21	1.5		90		SP	Poorly graded sand, fine grained, mod. yellowish brown 10YR 5/4, wet, dense, some fine gravel, trace coarse gravel							
62	SS	91.5	93.0	16-13-12	1.5				GW SP	Well graded gravel, brownish grey 5YR 4/1, wet, dense, fine to coarse, rounded, w/fine grained sand (mod. yellowish brown 10YR 5/4)							
63	SS	93.0	94.5	10-11-12	1.0				GW	Poorly graded sand, fine grained, mod. yellowish brown 10YR 5/4, wet, med. dense, w/fine gravel, some coarse gravel							
64	SS	94.5	96.0	9-26-50/5	1.4					Well graded gravel, brownish grey 5YR 4/1, wet, med. dense, fine to coarse, rounded, w/fine grained sand							
							95		MH	@ 94.5' hard							
65	SS	96.0	97.5	35-50/4						Clayey silt, l. grey moist, hard non-durable shale Spoon refusal @ 96.8' Auger refusal @ 96.8' BT @ 96.8'							

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**
 COMPANY **INDIANA MICHIGAN POWER COMPANY**
 PROJECT **ROCKPORT PLANT**
 COORDINATES **N 154,306.0 E 512,454.0**
 GROUND ELEVATION **393.7** SYSTEM **State Plane using NAD27/29**

BORING NO. **MW-16001** DATE **4/27/16** SHEET **1** OF **4**
 BORING START **2/29/16** BORING FINISH **2/29/16**
 PIEZOMETER TYPE _____ WELL TYPE **OW**
 HGT. RISER ABOVE GROUND **2.93** DIA **2.0**
 DEPTH TO TOP OF WELL SCREEN **61.7** BOTTOM **71.22**
 WELL DEVELOPMENT **YES** BACKFILL _____
 FIELD PARTY **ZLR / REB** RIG **D-120**

Water Level, ft	▽	▼	▼
TIME			
DATE			

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO									
1	SS	0.0	1.5	33-14-10	1.5					Gravel = 18 inches		
2	SS	1.5	3.0	3-5-6	1.5					Silty clay, l. brown 5YR 6/4 and l. grey N7 mottled, dry, stiff, FILL @ 3' sl. stiff @ 4.2' w/dusky brown 5YR 2/2 silt @ 4.5' stiff, some iron oxide particles, moist		
3	SS	3.0	4.5	2-3-4	1.5							
4	SS	4.5	6.0	4-4-6	1.5							
5	SS	6.0	7.5	3-6-9	1.5		5					
6	SS	7.5	9.0	2-5-6	1.5				MH	Clayey silt, moderate brown 5YR 4/4 and l. grey N7 fat clay mottled, moist, med. dense, trace oxide particles, likely fill		
7	SS	9.0	10.5	3-4-4	1.4				SP	Poorly graded sand, fine grained, l. brown 5YR 5/6, dry to moist, med. dense @ 9' v. fine grained, loose		
8	SS	10.5	12.0	3-4-4	1.4							
9	SS	12.0	13.5	2-3-5	1.5							
10	SS	13.5	15.0	2-4-5	1.5							
11	SS	15.0	16.5	3-8-10	1.5							
12	SS	16.5	18.0	4-6-8	1.5							
13	SS	18.0	19.5	5-6-5	1.5							
14	SS	19.5	21.0	3-5-4	1.5							

TYPE OF CASING USED

	NQ-2 ROCK CORE
	6" x 3.25 HSA
	9" x 6.25 HSA
	HW CASING ADVANCER 4"
	NW CASING 3"
	SW CASING 6"
	AIR HAMMER 8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC
 WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER **AMEC FOSTER WHEELER**

AEP_RK_BAP_CCR_COMPLIANCE.GPJ AEP.GDT 4/27/16

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-16001** DATE **4/27/16** SHEET **2** OF **4**

PROJECT **ROCKPORT PLANT**

BORING START **2/29/16** BORING FINISH **2/29/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
15	SS	21.0	22.5	3-3-5	1.5							
16	SS	22.5	24.0	2-3-3	1.5				SP	Poorly graded sand, v. fine grained, l. brown 5YR 5/6, moist, loose @ 22.8' 3" layer - PG sand, fine, pale yellowish br. prev. material		
17	SS	24.0	25.5	4-6-6	1.5					@ 23.2' w/black silt @ 23.5' no black silt @ 24' moderate red 5R 4/6		
18	SS	25.5	27.0	2-2-4	1.0		25		SP	Poorly graded sand, med. grained, d. yellowish brown 10YR 4/2, moist, med. dense, some black silt		Water @ 25.5'
19	SS	27.0	28.5	2-2-2	1.2				SP	Poorly graded sand, v. fine grained, pale yellowish brown 10YR 6/2, wet, loose, trace clay (l. brown 5YR 6/4), trace coarse gravel, water in spoon		
20	SS	28.5	30.0	4-8-11	1.5				SP	Poorly graded sand, fine grained, pale yellowish brown 10YR 6/2, wet, v. loose, w/lean clay (mod. brown 5YR 4/4)		Began Mud Rotary @ 28.5'
21	SS	30.0	31.5	6-6-8	1.0		30			Poorly graded sand, fine grained, mod. yellowish brown 10YR 5/4, wet, med. dense, w/fine gravel @ 30.5' w/black silt @ 30.7' no black silt		
22	SS	31.5	33.0	4-6-9	1.5				SW	Well graded sand, coarse grained, dark reddish brown 10R 3/4, wet, med. dense, w/fine gravel @ 32' 5" layer pg sand, fine, mod. yellowish brown, prev. material		
23	SS	33.0	34.5	8-9-12	1.5				SP	Poorly graded sand, fine grained, mod. yellowish brown 10YR 5/4, wet, med. dense, w/fine gravel, trace black silt		
24	SS	34.5	36.0	13-16-12	1.5		35		SP	Poorly graded sand, fine to med. grained, dusky red 5R 3/4, wet, med. dense, w/fine gravel, trace coarse gravel		
25	SS	36.0	37.5	6-7-7	1.5					Poorly graded sand, fine grained, mod. yellowish brown 10YR 5/4, wet, med. dense, w/fine gravel @ 36' trace coarse gavel @ 37.5' well graded SW @ 40' poorly graded SP @ 41' trace fine gravel, no coarse gravel @ 42' dense @ 43.1' 1" seam black silt and fine gravel - possible coal		
26	SS	37.5	39.0	5-8-12	1.5							
27	SS	39.0	40.5	6-12-17	1.5		40					
28	SS	40.5	42.0	6-11-19	1.5							
29	SS	42.0	43.5	7-15-24	1.5							
30	SS	43.5	45.0	3-10-16	1.4				SW	Well graded sand, fine to med. grained, pale yellowish brown 10YR 6/2 wet, med. dense, w/fine gravel		
31	SS	45.0	46.5	10-13-16	1.5		45		SW	@ 44' trace lean clay mod. brown 5YR 4/4 @ 44.4' no clay		

Continued Next Page

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-16001** DATE **4/27/16** SHEET **3** OF **4**

PROJECT **ROCKPORT PLANT**

BORING START **2/29/16** BORING FINISH **2/29/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
32	SS	46.5	48.0	6-9-14	1.4					Well graded sand, coarse grained, mod. yellowish brown 10YR 5/4, wet, med. dense, w/fine gravel, trace coarse gravel @ 46.5' med. to coarse grained		
33	SS	48.0	49.5	9-16-20	1.5							
34	SS	49.5	51.0	12-11-15	1.4		50		SP	Poorly graded sand, fine grained, pale brown 5YR 5/4, wet, dense, trace coarse gravel		
35	SS	51.0	52.5	7-12-12	1.5				SW	Well graded sand, fine to med. grained, d. yellowish brown 10YR 4/2, wet, med. dense, some fine gravel, some black silt @ 51' trace coarse gravel @ 52.5' fine grained, no coarse gravel @ 54' no fine gravel @ 55.5' brownish grey 5YR 4/1 w/fine gravel		
36	SS	52.5	54.0	4-9-12	1.5							
37	SS	54.0	55.5	9-10-14	1.4		55					
38	SS	55.5	57.0	6-12-16	1.5							
39	SS	57.0	58.5	7-9-11	1.4				SP	Poorly graded sand, fine grained, brownish grey 5YR 4/1, wet, med. dense, w/black silt @ 60' dense @ 60.6' 1.5" shale fragment @ 62.1' w/fine gravel @ 63' v. dense @ 64.2' 3" layer shale, l. grey N7 @ 64.5' some coarse gravel @ 65' 2" layer shale, l. grey N7		
40	SS	58.5	60.0	7-10-16	1.2		60					
41	SS	60.0	61.5	13-16-16	1.5							
42	SS	61.5	63.0	6-14-25	1.4							
43	SS	63.0	64.5	11-20-38	1.5							
44	SS	64.5	66.0	22-24-29	1.4		65					
45	SS	66.0	67.5	50/3						Shale, l. grey, dry, hard		
46	SS	67.5	69.0	13-13-14	1.5				SP	Indeterminate layer transition due to 3" recovery (spoon refusal) in prev. sample		
47	SS	69.0	70.5	12-16-16	1.4				SW	Poorly graded sand, v. fine grained, brownish grey 5YR 4/1, wet, med. dense, w/fine gravel Well graded sand, med. grained, d. yellowish brown 10YR 4/2, wet, med. dense, w/fine gravel, some coarse gravel @ 69' dense, fine to med. grained @ 70.5' med. grained @ 71' 3" layer fat clay, l. grey N7 (w/shale).		
48	SS	70.5	72.0	6-13-21	1.3		70					

Continued Next Page

AEP RK BAP CCR COMPLIANCE.GPJ_AEP.GDT_4/27/16

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING




JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-16001** DATE **4/27/16** SHEET **4** OF **4**

PROJECT **ROCKPORT PLANT**

BORING START **2/29/16** BORING FINISH **2/29/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
49	SS	72.0	73.5	8-13-24	1.1					w/coarse gravel @ 72' no coarse gravel @ 73.5' mod. dense, sample washed out @76' 2.5" layer coal fragments @ 79' 1" seam fat clay, l. grey N7 @ 79.5' trace black silt		

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**
 COMPANY **INDIANA MICHIGAN POWER COMPANY**
 PROJECT **ROCKPORT PLANT**
 COORDINATES **N 154,305.9 E 512,458.0**
 GROUND ELEVATION **393.7** SYSTEM **State Plane using NAD27/29**

BORING NO. **MW-1600S** DATE **4/27/16** SHEET **1** OF **2**
 BORING START **2/29/16** BORING FINISH **2/29/16**
 PIEZOMETER TYPE _____ WELL TYPE **OW**
 HGT. RISER ABOVE GROUND **3.04** DIA **2.0**
 DEPTH TO TOP OF WELL SCREEN **30.6** BOTTOM **40.19**
 WELL DEVELOPMENT **YES** BACKFILL _____
 FIELD PARTY **ZLR / REB** RIG **D-120**

Water Level, ft	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TIME			
DATE			

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO									
1	SS	0.0	1.5	33-14-10	1.5					Gravel = 18 inches		
2	SS	1.5	3.0	3-5-6	1.5					Silty clay, l. brown 5YR 6/4 and l. grey N7 mottled, dry, stiff, FILL @ 3' sl. stiff		
3	SS	3.0	4.5	2-3-4	1.5					@ 4.2' w/dusky brown 5YR 2/2 silt @ 4.5' stiff, some iron oxide particles, moist		
4	SS	4.5	6.0	4-4-6	1.5		5					
5	SS	6.0	7.5	3-6-9	1.5							
6	SS	7.5	9.0	2-5-6	1.5			MH		Clayey silt, moderate brown 5YR 4/4 and l. grey N7 fat clay mottled, moist, med. dense, trace oxide particles, likely fill		
7	SS	9.0	10.5	3-4-4	1.4		10	SP		Poorly graded sand, fine grained, l. brown 5YR 5/6, dry to moist, med. dense @ 9' v. fine grained, loose		
8	SS	10.5	12.0	3-4-4	1.4							
9	SS	12.0	13.5	2-3-5	1.5							
10	SS	13.5	15.0	2-4-5	1.5			MH		Clayey silt, moderate brown 5YR 4/4, moist, loose		
11	SS	15.0	16.5	3-8-10	1.5		15	SP		Poorly graded sand, fine grained pale yellowish brown 10YR 6/2, moist, loose		
12	SS	16.5	18.0	4-6-8	1.5			MH		Clayey silt, moderate brown 5YR 4/4, moist, loose		
13	SS	18.0	19.5	5-6-5	1.5			SP		Poorly graded sand, fine grained, pale yellowish brown 10YR 6/2, moist, med. dense @ 16' 3" layer - clayey silt (prev. material) @ 19' 4" layer - poorly graded sand (l. brown, v. fine grained) prev. material @ 21' loose @ 21.3' w/black silt		
14	SS	19.5	21.0	3-5-4	1.5							

TYPE OF CASING USED

	NQ-2 ROCK CORE
	6" x 3.25 HSA
	9" x 6.25 HSA
	HW CASING ADVANCER 4"
	NW CASING 3"
	SW CASING 6"
	AIR HAMMER 8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC
 WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER **AMEC FOSTER WHEELER**

AEP_RK_BAP_CCR_COMPLIANCE.GPJ_AEP_GDT_4/27/16

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1600S** DATE **4/27/16** SHEET **2** OF **2**

PROJECT **ROCKPORT PLANT**

BORING START **2/29/16** BORING FINISH **2/29/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
15	SS	21.0	22.5	3-3-5	1.5							
16	SS	22.5	24.0	2-3-3	1.5				SP	Poorly graded sand, v. fine grained, l. brown 5YR 5/6, moist, loose @ 22.8' 3" layer - PG sand, fine, pale yellowish br. prev. material		
17	SS	24.0	25.5	4-6-6	1.5				SP	@ 23.2' w/black silt @ 23.5' no black silt @ 24' moderate red 5R 4/6		
18	SS	25.5	27.0	2-2-4	1.0		25		SP	Poorly graded sand, med. grained, d. yellowish brown 10YR 4/2, moist, med. dense, some black silt		Water @ 25.5'
19	SS	27.0	28.5	2-2-2	1.2				SP	Poorly graded sand, v. fine grained, pale yellowish brown 10YR 6/2, wet, loose, trace clay (l. brown 5YR 6/4), trace coarse gravel, water in spoon		
20	SS	28.5	30.0	4-8-11	1.5				SP	Poorly graded sand, fine grained, pale yellowish brown 10YR 6/2, wet, v. loose, w/lean clay (mod. brown 5YR 4/4)		Began Mud Rotary @ 28.5'
21	SS	30.0	31.5	6-6-8	1.0		30			Poorly graded sand, fine grained, mod. yellowish brown 10YR 5/4, wet, med. dense, w/fine gravel @ 30.5' w/black silt @ 30.7' no black silt		
22	SS	31.5	33.0	4-6-9	1.5				SW	Well graded sand, coarse grained, dark reddish brown 10R 3/4, wet, med. dense, w/fine gravel @ 32' 5" layer pg sand, fine, mod. yellowish brown, prev. material		
23	SS	33.0	34.5	8-9-12	1.5				SP	Poorly graded sand, fine grained, mod. yellowish brown 10YR 5/4, wet, med. dense, w/fine gravel, trace black silt		
24	SS	34.5	36.0	13-16-12	1.5		35		SP	Poorly graded sand, fine to med. grained, dusky red 5R 3/4, wet, med. dense, w/fine gravel, trace coarse gravel		
25	SS	36.0	37.5	6-7-7	1.5					Poorly graded sand, fine grained, mod. yellowish brown 10YR 5/4, wet, med. dense, w/fine gravel @ 36' trace coarse gavel @ 37.5' well graded SW @ 40' poorly graded SP @ 41' trace fine gravel, no coarse gravel @ 42' dense @ 43.1' 1" seam black silt and fine gravel - possible coal		
26	SS	37.5	39.0	5-8-12	1.5							
27	SS	39.0	40.5	6-12-17	1.5		40					
28	SS	40.5	42.0	6-11-19	1.5							







AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

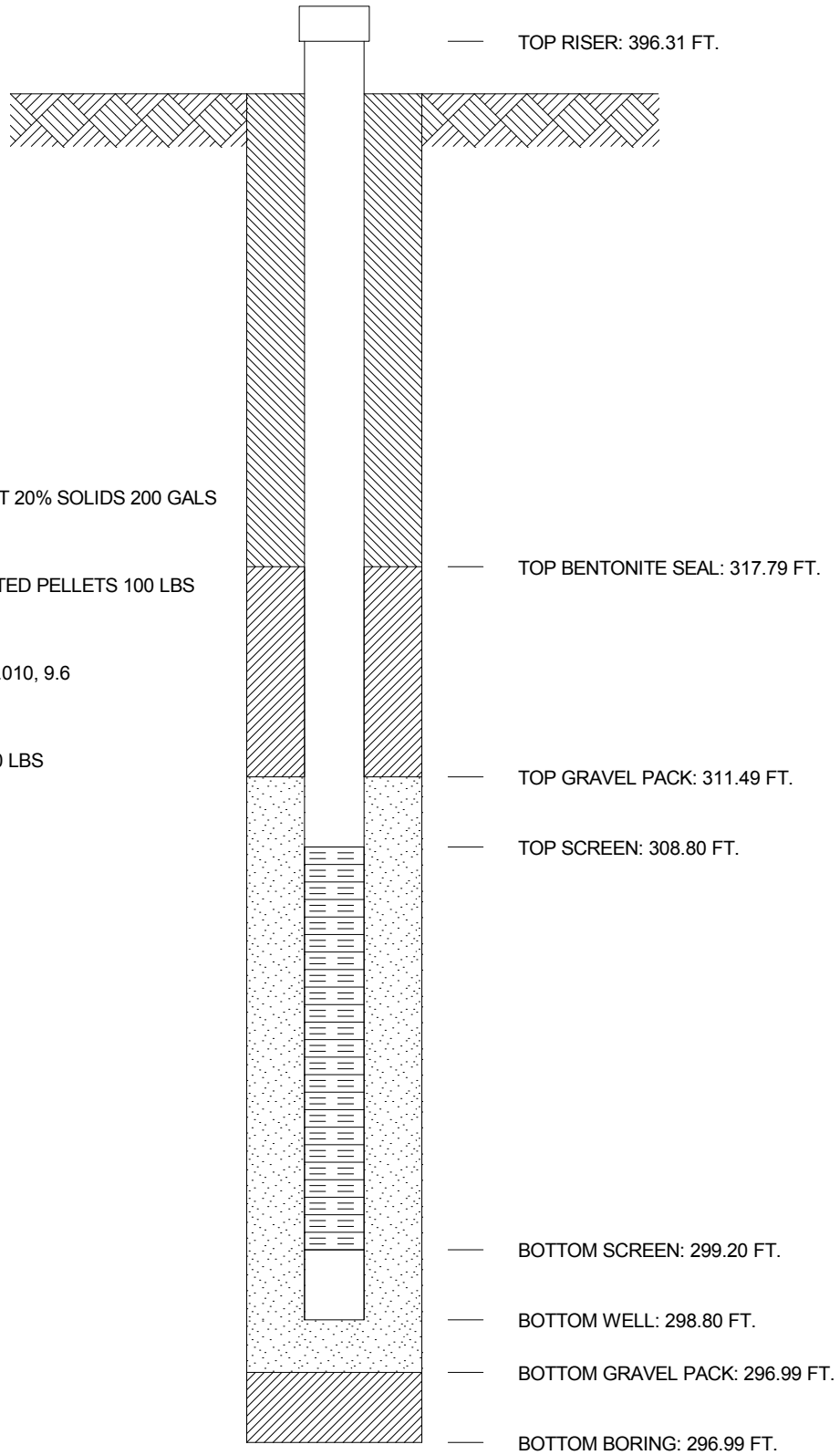
AMERICAN ELECTRIC POWER SERVICE CORPORATION
 AEP CIVIL ENGINEERING LABORATORY
 MONITORING WELL CONSTRUCTION



JOB NUMBER 42393125-01
 COMPANY INDIANA MICHIGAN POWER COMPANY WELL No. MW-1600D BORING No. MW-1600D INSTALLED 2/17/16
 PROJECT ROCKPORT PLANT
 COORDINATES N 154,306.3 E 512,449.0
 SYSTEM State Plane using NAD27/29

GROUND ELEVATION 393.79 FT.

-  GROUT SEAL: QUICK GROUT 20% SOLIDS 200 GALS
-  BENTONITE SEAL: 3/8" COATED PELLETS 100 LBS
-  SCREEN: 2.0 dia., SLOTTED .010, 9.6
-  GRAVEL PACK: #5 SAND 300 LBS
-  RISER PIPE: 2.0, dia., PVC
-  SPACERS, DEPTH:









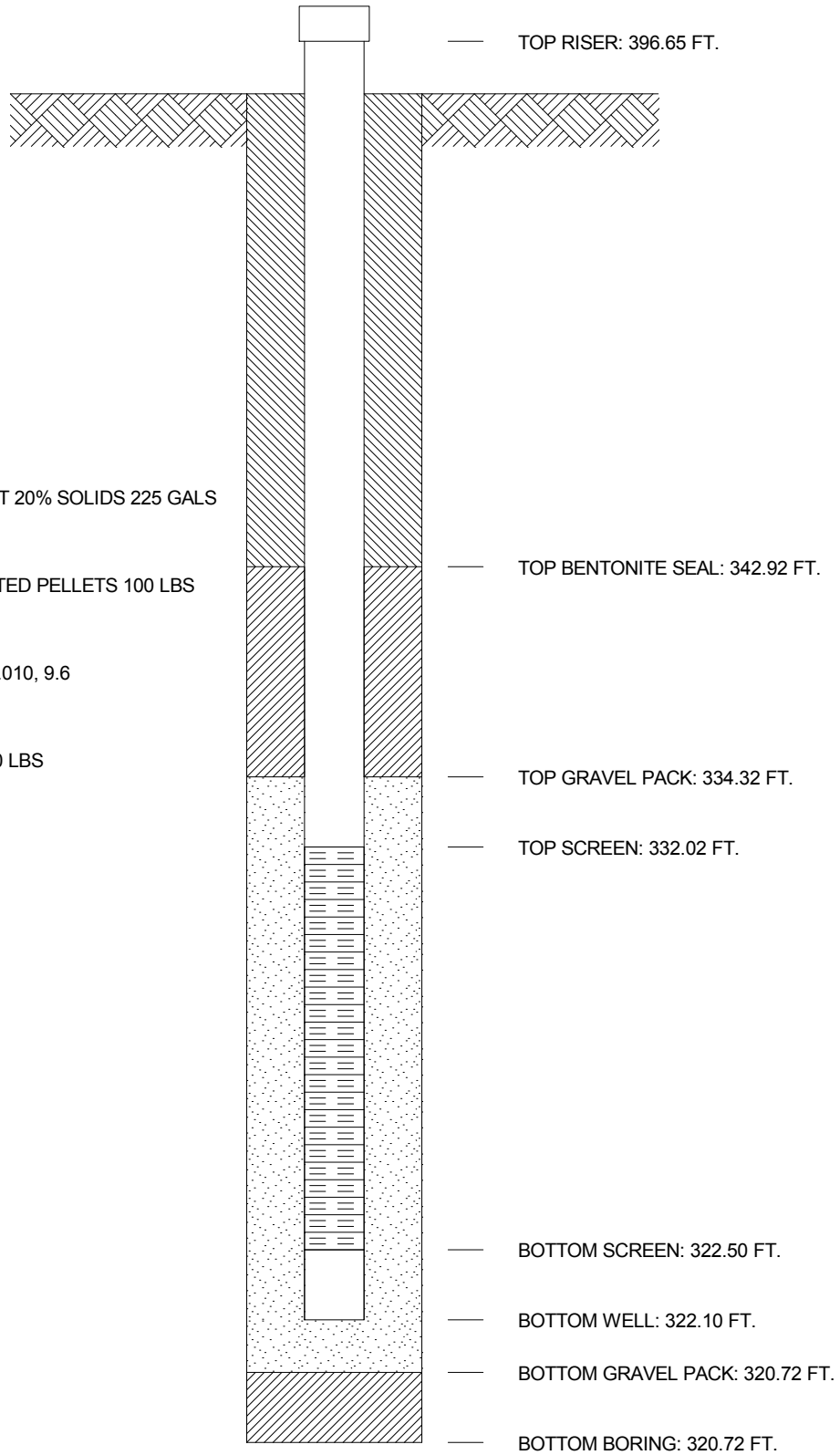
AMERICAN ELECTRIC POWER SERVICE CORPORATION
 AEP CIVIL ENGINEERING LABORATORY
 MONITORING WELL CONSTRUCTION



JOB NUMBER 42393125-01
 COMPANY INDIANA MICHIGAN POWER COMPANY WELL No. MW-1600I BORING No. MW-1600I INSTALLED 2/29/16
 PROJECT ROCKPORT PLANT
 COORDINATES N 154,306.0 E 512,454.0
 SYSTEM State Plane using NAD27/29

GROUND ELEVATION 393.72 FT.

-  GROUT SEAL: QUICK GROUT 20% SOLIDS 225 GALS
-  BENTONITE SEAL: 3/8" COATED PELLETS 100 LBS
-  SCREEN: 2.0 dia., SLOTTED .010, 9.6
-  GRAVEL PACK: #5 SAND 200 LBS
-  RISER PIPE: 2.0, dia., PVC
-  SPACERS, DEPTH:









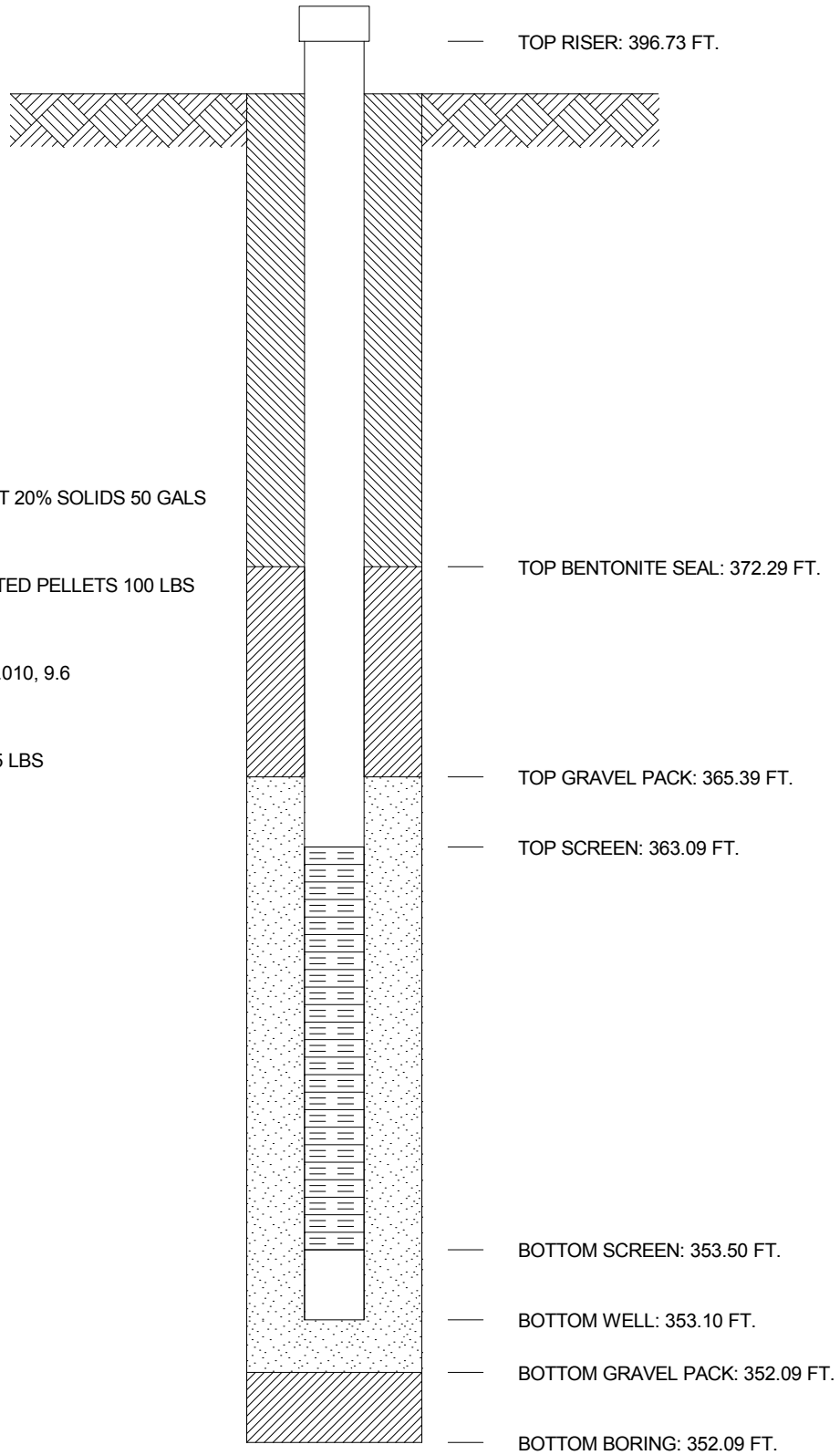
AMERICAN ELECTRIC POWER SERVICE CORPORATION
 AEP CIVIL ENGINEERING LABORATORY
 MONITORING WELL CONSTRUCTION



JOB NUMBER 42393125-01
 COMPANY INDIANA MICHIGAN POWER COMPANY WELL No. MW-1600S BORING No. MW-1600S INSTALLED 2/29/16
 PROJECT ROCKPORT PLANT
 COORDINATES N 154,305.9 E 512,458.0
 SYSTEM State Plane using NAD27/29

GROUND ELEVATION 393.69 FT.

-  GROUT SEAL: QUICK GROUT 20% SOLIDS 50 GALS
-  BENTONITE SEAL: 3/8" COATED PELLETS 100 LBS
-  SCREEN: 2.0 dia., SLOTTED .010, 9.6
-  GRAVEL PACK: #5 SAND 225 LBS
-  RISER PIPE: 2.0, dia., PVC
-  SPACERS, DEPTH:



AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**
 COMPANY **INDIANA MICHIGAN POWER COMPANY**
 PROJECT **ROCKPORT PLANT**
 COORDINATES **N 154,323.2 E 513,487.5**
 GROUND ELEVATION **400.1** SYSTEM **State Plane using NAD27/29**

BORING NO. **MW-1601D** DATE **4/27/16** SHEET **1** OF **5**
 BORING START **2/26/16** BORING FINISH **2/26/16**
 PIEZOMETER TYPE _____ WELL TYPE **OW**
 HGT. RISER ABOVE GROUND **2.75** DIA **2.0**
 DEPTH TO TOP OF WELL SCREEN **100.0** BOTTOM **109.59**
 WELL DEVELOPMENT **YES** BACKFILL _____
 FIELD PARTY **ZLR / REB** RIG **D-120**

Water Level, ft	<input type="text"/>	<input type="text"/>	<input type="text"/>
TIME			
DATE			

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO									
1	SS	0.0	1.5	4-5-8	1.5					Topsoil = 3 inches Silty clay, l. brown 5YR 6/4 and l. grey N7 mottled, dry, stiff *FILL		
2	SS	1.5	3.0	3-8-15	1.5				SP	Poorly graded sand, fine grained, mod. yellowish brown 10YR 5/4, dry, med. dense @ 2' 2" layer - silty clay (prev. material) @ 4' some black silt		
3	SS	3.0	4.5	3-13-16	1.4							
4	SS	4.5	6.0	4-8-8	1.5		5		SP	Poorly graded sand, fine grained, d. yellowish brown 10YR 4/2, moist, med. dense, trace fine gravel @ 6' water in spoon, loose		
5	SS	6.0	7.5	2-3-4	1.5							
6	SS	7.5	9.0	2-3-5	1.5				SC SP	Clayey sand, fine grained, med. bluish gray 5B 5/1, moist, loose		
7	SS	9.0	10.5	4-7-10	1.5		10		SC CH CH	Poorly graded sand, fine grained, d. yellowish brown 10YR 4/2, moist, loose Clayey sand, fine grained, med. bluish grey SB 5/1, moist, loose Fat clay, l. grey N7, moist, firm		
8	SS	10.5	12.0	4-6-5	1.5				MH	Fat clay, l. grey N7 and poorly graded sand, fine grained d. yellowish brown 10YR 4/2, moist, med. dense, 50/50 mix		
9	SS	12.0	13.5	3-5-5	1.5					Clayey silt, pale yellowish brown 10YR 6/2 and l. grey N7, moist, med. dense, mottled @ 12' loose @ 18.5' pale yellowish brown 10YR 6/2		
10	SS	13.5	15.0	3-4-6	1.5							
11	SS	15.0	16.5	3-4-4	1.5		15					
12	SS	16.5	18.0	3-5-5	1.5							
13	SS	18.0	19.5	4-4-5	1.5				SP	Poorly graded sand, v. fine grained greyish orange 10YR 7/4, moist, loose @ 20.7' trace black silt		
14	SS	19.5	21.0	3-4-4	1.5							

TYPE OF CASING USED

_____	NQ-2 ROCK CORE
_____	6" x 3.25 HSA
_____	9" x 6.25 HSA
_____	HW CASING ADVANCER 4"
_____	NW CASING 3"
_____	SW CASING 6"
_____	AIR HAMMER 8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC
 WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER **AMEC FOSTER WHEELER**

AEP_RK_BAP_CCR_COMPLIANCE.GPJ AEP.GDT 4/27/16

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1601D** DATE **4/27/16** SHEET **2** OF **5**

PROJECT **ROCKPORT PLANT**

BORING START **2/26/16** BORING FINISH **2/26/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES	
		FROM	TO			%							
15	SS	21.0	22.5	3-6-6	1.5					SP			Poorly graded sand, fine grained, pale yellowish brown 10YR 6/2 moist, med. dense
16	SS	22.5	24.0	4-5-8	1.5					SP			Poorly graded sand, v. fine grained, greyish orange 10YR 7/4, moist, med. dense
17	SS	24.0	25.5	3-7-10	1.5		25			SP			Poorly graded sand, fine grained, pale yellowish brown 10YR 6/2 moist to wet, med. dense @ 23.8' fine to med. grained, trace black silt @ 24' fine grained, no black, silt, trace fine gravel @ 26' coal fragment (2") (bl. silt) @ 29.1' 1" layer - lean clay, d. yellowish brown 10YR 4/2 @ 31' trace black silt
18	SS	25.5	27.0	4-6-7	1.5								
19	SS	27.0	28.5	3-5-10	1.5								
20	SS	28.5	30.0	3-6-8	1.5								
21	SS	30.0	31.5	4-4-9	1.5		30						
22	SS	31.5	33.0	4-5-6	1.5								
23	SS	33.0	34.5	3-3-4	1.3					SW			Well graded sand, fine to med. grained, d. yellowish brown 10YR 4/2, wet, med. dense, trace fine gravel @ 33' loose @ 34.5' med. dense, w/fine gravel
24	SS	34.5	36.0	6-6-7	1.3		35						
25	SS	36.0	37.5	4-4-5	1.2								
26	SS	37.5	39.0	5-6-12	1.4					SW			Well graded sand, coarse grained, dusky brown 5YR 2/2, wet, loose, w/fine gravel @ 37.5' med. dense @ 39' trace coarse gravel
27	SS	39.0	40.5	11-10-12	1.5								
28	SS	40.5	42.0	6-11-15	1.5		40			SP			Poorly graded sand, fine gained, l. brown 5YR 5/6, wet, med. dense, trace fine gravel @ 40.5' w/fine gravel, trace coarse gravel @ 42' some fine gravel, no coarse gravel
29	SS	42.0	43.5	6-10-10	1.3								
30	SS	43.5	45.0	6-11-12	1.5								
31	SS	45.0	46.5	9-8-8	1.4		45			SW			Well graded sand, coarse grained, dusky brown 5YR 2/2, wet, med. dense, w/fine gravel, trace coarse gravel (rounded) @ 46.5' coarse gravel, plug in spoon @ 48' some coarse gravel, dense

Continued Next Page

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1601D** DATE **4/27/16** SHEET **3** OF **5**

PROJECT **ROCKPORT PLANT**

BORING START **2/26/16** BORING FINISH **2/26/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
32	SS	46.5	48.0	10-9-16	.2							
33	SS	48.0	49.5	11-15-21	1.4							
34	SS	49.5	51.0	11-15-15	1.4		50		SP	Poorly graded sand, fine grained, mod. yellowish brown 10YR 5/4, wet, med. dense, w/fine gravel		
									SW	@ 50' 1" layer - coal (angular fragments)		
35	SS	51.0	52.5	9-15-19	1.5					Well graded sand, med. to coarse grained, d. yellowish brown 10YR 4/2, wet, med. dense, w/fine gravel, trace coarse gravel		
36	SS	52.5	54.0	8-13-16	1.4				SP	@ 51' dense		
									SW	@ 51.5' 1" layer - coal (angular fragments)		
37	SS	54.0	55.5	8-9-11	1.3		55			Poorly graded sand, fine grained, olive grey 5Y 4/1, wet, med. dense, w/fine gravel		
									SW	@ 53.3' 1.5" layer - coal (angular fragments)		
38	SS	55.5	57.0	9-14-16	1.4					Well graded sand, med. to coarse grained, d. yellowish brown 10YR 4/2, wet, med. dense, w/fine gravel		
39	SS	57.0	58.5	7-10-10	1.3					@ 55.5' trace coarse gravel		
40	SS	58.5	60.0	6-7-13	1.5					@ 57' no coarse gravel		
										@ 59.7' w/coal fragments, angular		
										@ 60.3' no coal fragments, some fine gravel		
41	SS	60.0	61.5	9-13-14	1.5		60					
42	SS	61.5	63.0	6-8-11	1.5				SP	Poorly graded sand, med. grained, pale yellowish brown 10YR 6/2, wet, med. dense, trace fine gravel		
43	SS	63.0	64.5	5-9-12	1.4					@ 64.5' fine to med. grained		
44	SS	64.5	66.0	8-9-12	1.4		65			@ 67.5' dense		
										@ 69' med. dense		
										@ 70.5' dense		
										@ 71' some coarse gravel		
										@ 72' w/coarse gravel		
45	SS	66.0	67.5	5-9-17	1.5							
46	SS	67.5	69.0	7-15-23	1.4							
47	SS	69.0	70.5	6-9-14	1.3		70					
48	SS	70.5	72.0	8-19-21	1.4							

AEP RK BAP CCR COMPLIANCE.GPJ_AEP.GDT 4/27/16

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1601D** DATE **4/27/16** SHEET **4** OF **5**

PROJECT **ROCKPORT PLANT**

BORING START **2/26/16** BORING FINISH **2/26/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
49	SS	72.0	73.5	14-22-19	1.4							
50	SS	73.5	75.0	10-13-19	1.5							
51	SS	75.0	76.5	9-15-36	1.5		75					
52	SS	76.5	78.0	17-13-14	1.4				SP SW	Poorly graded sand, fine grained, yellowish brown 10YR 5/4, wet, med. dense, some fine gravel, trace coarse gravel @ 75' v. dense, trace fine gravel, no coarse gravel		
53	SS	78.0	79.5	9-18-18	1.2					Well graded sand, coarse grained, d. yellowish brown 10YR 4/2, wet, med. dense, w/fine gravel, some coarse gravel @ 78' dense @ 80' 4" layer - coarse gravel @ 81' 3" layer - poorly graded sand, fine grained, mod. yellowish brown (prev. material) @ 81.9' w/coal fragments		
54	SS	79.5	81.0	13-11-12	1.4		80					
55	SS	81.0	82.5	6-8-14	1.5							
56	SS	82.5	84.0	7-6-16	1.5				CH	Fat clay, l. grey N7, wet, v. stiff (shale)		
									SP	Poorly graded sand, fine grained, mod. yellowish brown 10YR 5/4, wet, med. dense		
									CH	Fat clay, l. grey N7, wet, v. stiff		
57	SS	84.0	85.5	9-12-14	1.5				SP	Fat clay, l. grey N7, wet, v. stiff		
									CH	Poorly graded sand, fine grained, l. grey N7, wet, med. dense		
58	SS	85.5	87.0	4-9-9	1.5		85		SP	Fat clay, l. grey N7, wet, v. stiff (shale)		
										Poorly graded sand, fine grained, olive grey 5Y 4/1, wet, med. dense, some fat clay (l. grey, prev. material) @ 85.5' l. grey N7		
59	SS	87.0	88.5	7-14-18	1.5				CH	Fat clay, l. grey N7, wet, v. stiff		
60	SS	88.5	90.0	10-11-17	1.5				SW	Well graded sand, med. grained, med. l. grey N6, wet, dense, trace fine gravel @ 88.5' 3.5" layer - fat clay N7, prev. material @ 89' some fat clay N7, prev. material @ 90' 3.5" layer - fat clay N7, prev. material		
61	SS	90.0	91.5	7-10-13	1.5		90					
62	SS	91.5	93.0	9-13-16	1.4				SP	Poorly graded sand, fine to med. grained, med. d. grey N4, wet, med. dense @ 91.5' 1.5" layer - fat clay N7, prev. material @ 92' some fine gravel, trace black silt, trace fat clay (N7, prev. material) @ 93' w/fine gravel, trace coarse gravel, med. grained		
63	SS	93.0	94.5	8-8-9	1.4							
64	SS	94.5	96.0	10-15-17	1.4		95		SW	Well graded sand, med. grained, med. d. grey N4, wet, dense, w/fine gravel @ 96' med. to coarse grained, mod. dense @ 99' dense, trace coarse gravel @ 100.5' med. dense		
65	SS	96.0	97.5	10-11-12	1.2							
66	SS	97.5	99.0	9-13-14	1.5							

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1601D** DATE **4/27/16** SHEET **5** OF **5**

PROJECT **ROCKPORT PLANT**

BORING START **2/26/16** BORING FINISH **2/26/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
67	SS	99.0	100.5	10-15-19	1.5		100					
68	SS	100.5	102.0	10-12-10	1.4				SP	Poorly graded sand, v. fine grained, brownish grey 5YR 4/1, wet, med. dense, some fine gravel		
69	SS	102.0	103.5	7-2-6	1.5					@ 102' loose, no fine gravel, water in spoon		
70	SS	103.5	105.0	5-5-9	1.5					@ 103.5 med. dense		
71	SS	105.0	106.5	5-6-13	1.5		105		MH	Clayey silt MH, l. grey N7, moist to wet, med. dense		
72	SS	106.5	108.0	10-11-14	1.4				SP	Poorly graded sand v. fine grained, med. l. grey N6, wet, med. dense		
73	SS	108.0	109.5	7-8-9	1.5					Poorly graded sand, fine grained, mod. yellowish brown 10YR 5/4, wet, med. dense, trace fine gravel		
74	SS	109.5	111.0	4-4-10	1.5		110		CH	Poorly graded sand, v. fine grained, med. l. grey N6, wet, med. dense, trace fat clay (CH - l. grey, prev. material)		
75	SS	111.0	112.5	7-9-20	1.5				SP	Fat clay, l. grey N7, wet, stiff		
76	SS	112.5	114.0	50/3	0				CH	Poorly graded sand, v. fine grained, med. l. grey N6, wet, mod. dense		
77	SS	114.0	115.5	12-13-20	1.1				SP	Fat clay, l. grey N7, wet, v. stiff		
78	SS	115.5	117.0	50/5	.3		115			Poorly graded sand, v. fine grained, med. l. grey N6, wet, med. dense, w/fat clay (l. grey, prev. material)		
79	SS	117.0	118.5	46-50/3	.5					@ 112.5' no recovery - possible cobble or rock fragment		
										@ 114' dense		
										@ 114.5' 2" layer - fat clay (N7), prev. material		
										@ 115' w/coarse gravel, shale fragments		
										@ 115.2' 1" layer - coal fragments		
										Shale, l. grey N7, dry, hard, some siltstone (olive grey - 5Y 4/1)		
										@ 117' no siltstone		
										Spoon refusal @ 117.7'		
										Auger refusal @ 117.7'		
										BT @ 117.7'		

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**
 COMPANY **INDIANA MICHIGAN POWER COMPANY**
 PROJECT **ROCKPORT PLANT**
 COORDINATES **N 154,325.3 E 513,483.5**
 GROUND ELEVATION **400.0** SYSTEM **State Plane using NAD27/29**

BORING NO. **MW-1601I** DATE **4/27/16** SHEET **1** OF **4**
 BORING START **2/26/16** BORING FINISH **2/26/16**
 PIEZOMETER TYPE _____ WELL TYPE **OW**
 HGT. RISER ABOVE GROUND **2.87** DIA **2.0**
 DEPTH TO TOP OF WELL SCREEN **68.1** BOTTOM **77.6**
 WELL DEVELOPMENT **YES** BACKFILL _____
 FIELD PARTY **ZLR / REB** RIG **D-120**

Water Level, ft	<input type="text"/>	<input type="text"/>	<input type="text"/>
TIME			
DATE			

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO									
1	SS	0.0	1.5	4-5-8	1.5					Topsoil = 3 inches Silty clay, l. brown 5YR 6/4 and l. grey N7 mottled, dry, stiff *FILL		
2	SS	1.5	3.0	3-8-15	1.5				SP	Poorly graded sand, fine grained, mod. yellowish brown 10YR 5/4, dry, med. dense @ 2' 2" layer - silty clay (prev. material) @ 4' some black silt		
3	SS	3.0	4.5	3-13-16	1.4							
4	SS	4.5	6.0	4-8-8	1.5		5		SP	Poorly graded sand, fine grained, d. yellowish brown 10YR 4/2, moist, med. dense, trace fine gravel @ 6' water in spoon, loose		
5	SS	6.0	7.5	2-3-4	1.5							
6	SS	7.5	9.0	2-3-5	1.5				SC SP	Clayey sand, fine grained, med. bluish gray 5B 5/1, moist, loose		
7	SS	9.0	10.5	4-7-10	1.5		10		SC CH	Poorly graded sand, fine grained, d. yellowish brown 10YR 4/2, moist, loose Clayey sand, fine grained, med. bluish grey SB 5/1, moist, loose		
8	SS	10.5	12.0	4-6-5	1.5				MH	Fat clay, l. grey N7, moist, firm Fat clay, l. grey N7 and poorly graded sand, fine grained d. yellowish brown 10YR 4/2, moist, med. dense, 50/50 mix		
9	SS	12.0	13.5	3-5-5	1.5					Clayey silt, pale yellowish brown 10YR 6/2 and l. grey N7, moist, med. dense, mottled @ 12' loose @ 18.5' pale yellowish brown 10YR 6/2		
10	SS	13.5	15.0	3-4-6	1.5							
11	SS	15.0	16.5	3-4-4	1.5		15					
12	SS	16.5	18.0	3-5-5	1.5							
13	SS	18.0	19.5	4-4-5	1.5				SP	Poorly graded sand, v. fine grained greyish orange 10YR 7/4, moist, loose @ 20.7' trace black silt		
14	SS	19.5	21.0	3-4-4	1.5							

TYPE OF CASING USED

	NQ-2 ROCK CORE
	6" x 3.25 HSA
	9" x 6.25 HSA
	HW CASING ADVANCER 4"
	NW CASING 3"
	SW CASING 6"
	AIR HAMMER 8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC
 WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER **AMEC FOSTER WHEELER**

AEP_RK_BAP_CCR_COMPLIANCE.GPJ AEP.GDT 4/27/16

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1601I** DATE **4/27/16** SHEET **2** OF **4**

PROJECT **ROCKPORT PLANT**

BORING START **2/26/16** BORING FINISH **2/26/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES	
		FROM	TO			%							
15	SS	21.0	22.5	3-6-6	1.5					SP			Poorly graded sand, fine grained, pale yellowish brown 10YR 6/2 moist, med. dense
16	SS	22.5	24.0	4-5-8	1.5					SP			Poorly graded sand, v. fine grained, greyish orange 10YR 7/4, moist, med. dense
17	SS	24.0	25.5	3-7-10	1.5					SP			Poorly graded sand, fine grained, pale yellowish brown 10YR 6/2 moist to wet, med. dense @ 23.8' fine to med. grained, trace black silt @ 24' fine grained, no black, silt, trace fine gravel @ 26' coal fragment (2") (bl. silt) @ 29.1' 1" layer - lean clay, d. yellowish brown 10YR 4/2 @ 31' trace black silt
18	SS	25.5	27.0	4-6-7	1.5		25						
19	SS	27.0	28.5	3-5-10	1.5								
20	SS	28.5	30.0	3-6-8	1.5								
21	SS	30.0	31.5	4-4-9	1.5		30						
22	SS	31.5	33.0	4-5-6	1.5								
23	SS	33.0	34.5	3-3-4	1.3				SW				Well graded sand, fine to med. grained, d. yellowish brown 10YR 4/2, wet, med. dense, trace fine gravel @ 33' loose @ 34.5' med. dense, w/fine gravel
24	SS	34.5	36.0	6-6-7	1.3		35						
25	SS	36.0	37.5	4-4-5	1.2								
26	SS	37.5	39.0	5-6-12	1.4				SW				Well graded sand, coarse grained, dusky brown 5YR 2/2, wet, loose, w/fine gravel @ 37.5' med. dense @ 39' trace coarse gravel
27	SS	39.0	40.5	11-10-12	1.5								
28	SS	40.5	42.0	6-11-15	1.5		40			SP			Poorly graded sand, fine gained, l. brown 5YR 5/6, wet, med. dense, trace fine gravel @ 40.5' w/fine gravel, trace coarse gravel @ 42' some fine gravel, no coarse gravel
29	SS	42.0	43.5	6-10-10	1.3								
30	SS	43.5	45.0	6-11-12	1.5								
31	SS	45.0	46.5	9-8-8	1.4		45			SW			Well graded sand, coarse grained, dusky brown 5YR 2/2, wet, med. dense, w/fine gravel, trace coarse gravel (rounded) @ 46.5' coarse gravel, plug in spoon @ 48' some coarse gravel, dense

Continued Next Page

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1601I** DATE **4/27/16** SHEET **3** OF **4**

PROJECT **ROCKPORT PLANT**

BORING START **2/26/16** BORING FINISH **2/26/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
32	SS	46.5	48.0	10-9-16	.2							
33	SS	48.0	49.5	11-15-21	1.4							
34	SS	49.5	51.0	11-15-15	1.4		50		SP	Poorly graded sand, fine grained, mod. yellowish brown 10YR 5/4, wet, med. dense, w/fine gravel		
									SW	@ 50' 1" layer - coal (angular fragments)		
35	SS	51.0	52.5	9-15-19	1.5					Well graded sand, med. to coarse grained, d. yellowish brown 10YR 4/2, wet, med. dense, w/fine gravel, trace coarse gravel		
36	SS	52.5	54.0	8-13-16	1.4				SP	@ 51' dense		
									SW	@ 51.5' 1" layer - coal (angular fragments)		
37	SS	54.0	55.5	8-9-11	1.3		55			Poorly graded sand, fine grained, olive grey 5Y 4/1, wet, med. dense, w/fine gravel		
									SW	@ 53.3' 1.5" layer - coal (angular fragments)		
38	SS	55.5	57.0	9-14-16	1.4					Well graded sand, med. to coarse grained, d. yellowish brown 10YR 4/2, wet, med. dense, w/fine gravel		
										@ 55.5' trace coarse gravel		
39	SS	57.0	58.5	7-10-10	1.3					@ 57' no coarse gravel		
										@ 59.7' w/coal fragments, angular		
40	SS	58.5	60.0	6-7-13	1.5					@ 60.3' no coal fragments, some fine gravel		
41	SS	60.0	61.5	9-13-14	1.5		60					
42	SS	61.5	63.0	6-8-11	1.5				SP	Poorly graded sand, med. grained, pale yellowish brown 10YR 6/2, wet, med. dense, trace fine gravel		
43	SS	63.0	64.5	5-9-12	1.4					@ 64.5' fine to med. grained		
										@ 67.5' dense		
44	SS	64.5	66.0	8-9-12	1.4		65			@ 69' med. dense		
										@ 70.5' dense		
										@ 71' some coarse gravel		
										@ 72' w/coarse gravel		
45	SS	66.0	67.5	5-9-17	1.5							
46	SS	67.5	69.0	7-15-23	1.4							
47	SS	69.0	70.5	6-9-14	1.3		70					
48	SS	70.5	72.0	8-19-21	1.4							

AEP RK BAP CCR COMPLIANCE.GPJ_AEP.GDT 4/27/16

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1601I**

DATE **4/27/16**

SHEET **4** OF **4**

PROJECT **ROCKPORT PLANT**

BORING START **2/26/16**

BORING FINISH **2/26/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
49	SS	72.0	73.5	14-22-19	1.4		75			Poorly graded sand, fine grained, yellowish brown 10YR 5/4, wet, med. dense, some fine gravel, trace coarse gravel @ 75' v. dense, trace fine gravel, no coarse gravel Well graded sand, coarse grained, d. yellowish brown 10YR 4/2, wet, med. dense, w/fine gravel, some coarse gravel @ 78' dense @ 80' 4" layer - coarse gravel @ 81' 3" layer - poorly graded sand, fine grained, mod. yellowish brown (prev. material) @ 81.9' w/coal fragments		
50	SS	73.5	75.0	10-13-19	1.5							
51	SS	75.0	76.5	9-15-36	1.5							
52	SS	76.5	78.0	17-13-14	1.4							
53	SS	78.0	79.5	9-18-18	1.2							
54	SS	79.5	81.0	13-11-12	1.4							

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**
 COMPANY **INDIANA MICHIGAN POWER COMPANY**
 PROJECT **ROCKPORT PLANT**
 COORDINATES **N 154,327.6 E 513,479.7**
 GROUND ELEVATION **399.8** SYSTEM **State Plane using NAD27/29**

BORING NO. **MW-1601S** DATE **4/27/16** SHEET **1** OF **3**
 BORING START **2/27/16** BORING FINISH **2/27/16**
 PIEZOMETER TYPE _____ WELL TYPE **OW**
 HGT. RISER ABOVE GROUND **2.88** DIA **2.0**
 DEPTH TO TOP OF WELL SCREEN **36.9** BOTTOM **46.47**
 WELL DEVELOPMENT **YES** BACKFILL _____
 FIELD PARTY **ZLR / REB** RIG **D-120**

Water Level, ft	▽	▼	▼
TIME			
DATE			

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO									
1	SS	0.0	1.5	4-5-8	1.5					Topsoil = 3 inches Silty clay, l. brown 5YR 6/4 and l. grey N7 mottled, dry, stiff *FILL		
2	SS	1.5	3.0	3-8-15	1.5				SP	Poorly graded sand, fine grained, mod. yellowish brown 10YR 5/4, dry, med. dense @ 2' 2" layer - silty clay (prev. material) @ 4' some black silt		
3	SS	3.0	4.5	3-13-16	1.4							
4	SS	4.5	6.0	4-8-8	1.5		5		SP	Poorly graded sand, fine grained, d. yellowish brown 10YR 4/2, moist, med. dense, trace fine gravel @ 6' water in spoon, loose		
5	SS	6.0	7.5	2-3-4	1.5							
6	SS	7.5	9.0	2-3-5	1.5				SC SP	Clayey sand, fine grained, med. bluish gray 5B 5/1, moist, loose		
7	SS	9.0	10.5	4-7-10	1.5		10		SC CH	Poorly graded sand, fine grained, d. yellowish brown 10YR 4/2, moist, loose Clayey sand, fine grained, med. bluish grey SB 5/1, moist, loose		
8	SS	10.5	12.0	4-6-5	1.5				MH	Fat clay, l. grey N7, moist, firm Fat clay, l. grey N7 and poorly graded sand, fine grained d. yellowish brown 10YR 4/2, moist, med. dense, 50/50 mix		
9	SS	12.0	13.5	3-5-5	1.5					Clayey silt, pale yellowish brown 10YR 6/2 and l. grey N7, moist, med. dense, mottled @ 12' loose @ 18.5' pale yellowish brown 10YR 6/2		
10	SS	13.5	15.0	3-4-6	1.5							
11	SS	15.0	16.5	3-4-4	1.5		15					
12	SS	16.5	18.0	3-5-5	1.5							
13	SS	18.0	19.5	4-4-5	1.5				SP	Poorly graded sand, v. fine grained greyish orange 10YR 7/4, moist, loose @ 20.7' trace black silt		
14	SS	19.5	21.0	3-4-4	1.5							

TYPE OF CASING USED

_____	NQ-2 ROCK CORE
_____	6" x 3.25 HSA
_____	9" x 6.25 HSA
_____	HW CASING ADVANCER 4"
_____	NW CASING 3"
_____	SW CASING 6"
_____	AIR HAMMER 8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC
 WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER **AMEC FOSTER WHEELER**

AEP_RK_BAP_CCR_COMPLIANCE.GPJ AEP.GDT 4/27/16

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1601S** DATE **4/27/16** SHEET **2** OF **3**

PROJECT **ROCKPORT PLANT**

BORING START **2/27/16** BORING FINISH **2/27/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES	
		FROM	TO			%							
15	SS	21.0	22.5	3-6-6	1.5					SP			Poorly graded sand, fine grained, pale yellowish brown 10YR 6/2 moist, med. dense
16	SS	22.5	24.0	4-5-8	1.5					SP			Poorly graded sand, v. fine grained, greyish orange 10YR 7/4, moist, med. dense
17	SS	24.0	25.5	3-7-10	1.5					SP			Poorly graded sand, fine grained, pale yellowish brown 10YR 6/2 moist to wet, med. dense @ 23.8' fine to med. grained, trace black silt @ 24' fine grained, no black, silt, trace fine gravel @ 26' coal fragment (2") (bl. silt) @ 29.1' 1" layer - lean clay, d. yellowish brown 10YR 4/2 @ 31' trace black silt
18	SS	25.5	27.0	4-6-7	1.5		25						
19	SS	27.0	28.5	3-5-10	1.5								
20	SS	28.5	30.0	3-6-8	1.5								
21	SS	30.0	31.5	4-4-9	1.5		30						
22	SS	31.5	33.0	4-5-6	1.5								
23	SS	33.0	34.5	3-3-4	1.3				SW				Well graded sand, fine to med. grained, d. yellowish brown 10YR 4/2, wet, med. dense, trace fine gravel @ 33' loose @ 34.5' med. dense, w/fine gravel
24	SS	34.5	36.0	6-6-7	1.3		35						
25	SS	36.0	37.5	4-4-5	1.2								
26	SS	37.5	39.0	5-6-12	1.4				SW				Well graded sand, coarse grained, dusky brown 5YR 2/2, wet, loose, w/fine gravel @ 37.5' med. dense @ 39' trace coarse gravel
27	SS	39.0	40.5	11-10-12	1.5								
28	SS	40.5	42.0	6-11-15	1.5		40			SP			Poorly graded sand, fine gained, l. brown 5YR 5/6, wet, med. dense, trace fine gravel @ 40.5' w/fine gravel, trace coarse gravel @ 42' some fine gravel, no coarse gravel
29	SS	42.0	43.5	6-10-10	1.3								
30	SS	43.5	45.0	6-11-12	1.5								
31	SS	45.0	46.5	9-8-8	1.4		45			SW			Well graded sand, coarse grained, dusky brown 5YR 2/2, wet, med. dense, w/fine gravel, trace coarse gravel (rounded) @ 46.5' coarse gravel, plug in spoon @ 48' some coarse gravel, dense

Continued Next Page

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER 42393125-01

COMPANY INDIANA MICHIGAN POWER COMPANY

BORING NO. MW-1601S DATE 4/27/16 SHEET 3 OF 3

PROJECT ROCKPORT PLANT

BORING START 2/27/16 BORING FINISH 2/27/16

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
32	SS	46.5	48.0	10-9-16	.2							

AMERICAN ELECTRIC POWER SERVICE CORPORATION
 AEP CIVIL ENGINEERING LABORATORY
 MONITORING WELL CONSTRUCTION



JOB NUMBER 42393125-01

COMPANY INDIANA MICHIGAN POWER COMPANY

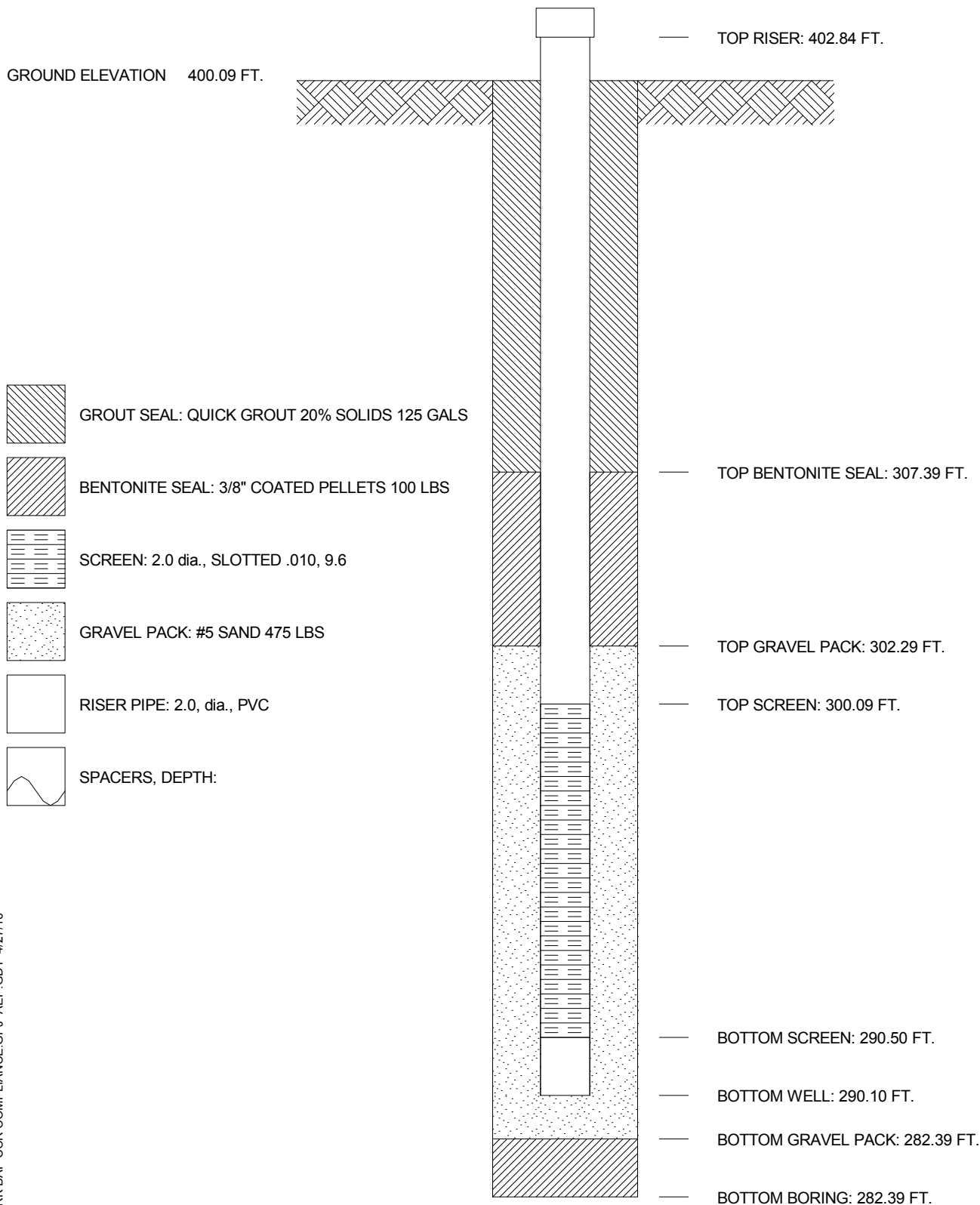
WELL No. MW-1601D BORING No. MW-1601D INSTALLED 2/26/16

PROJECT ROCKPORT PLANT

COORDINATES N 154,323.2 E 513,487.5

SYSTEM State Plane using NAD27/29

GROUND ELEVATION 400.09 FT.









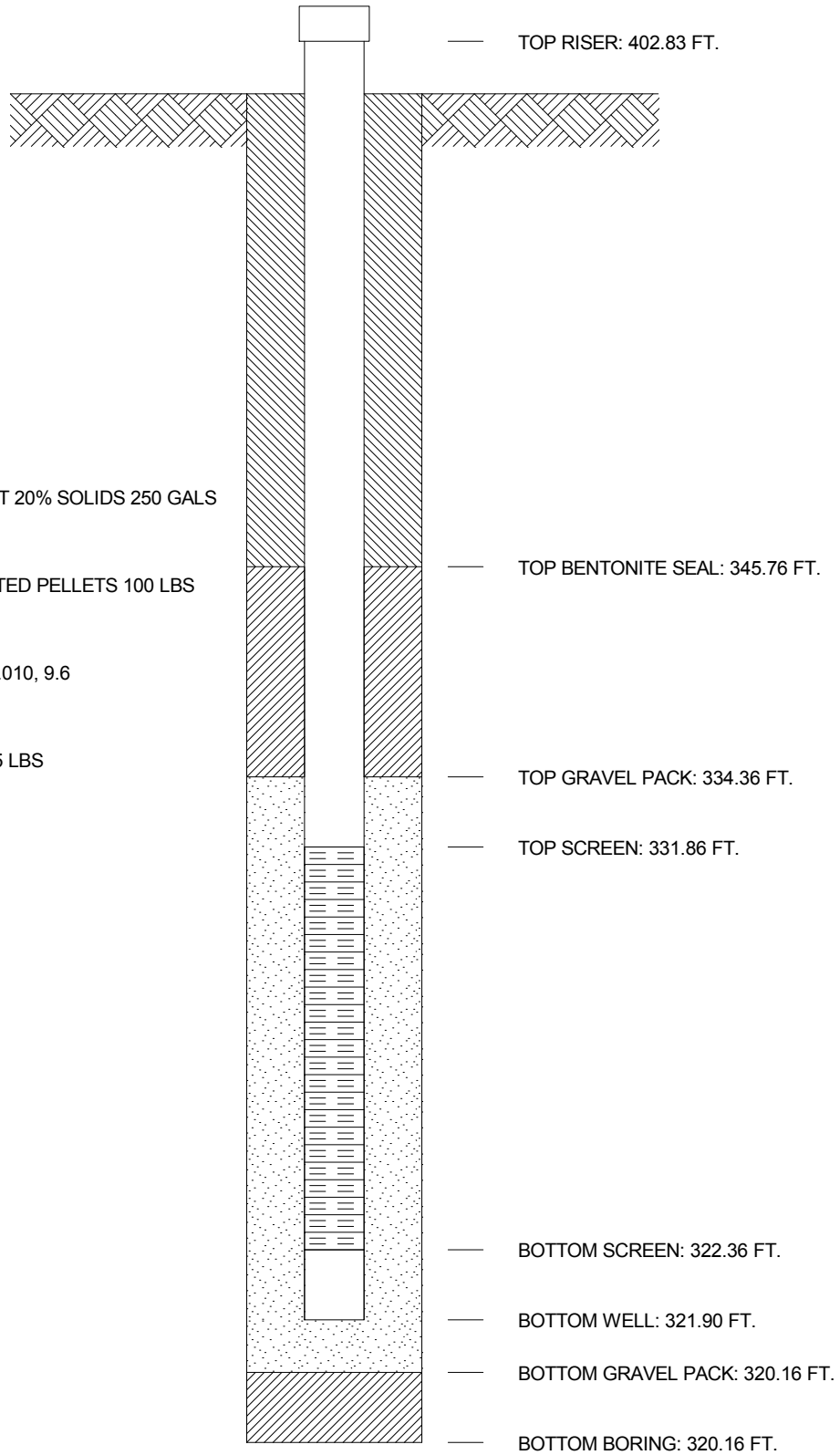
AMERICAN ELECTRIC POWER SERVICE CORPORATION
 AEP CIVIL ENGINEERING LABORATORY
 MONITORING WELL CONSTRUCTION



JOB NUMBER 42393125-01
 COMPANY INDIANA MICHIGAN POWER COMPANY WELL No. MW-1601I BORING No. MW-1601I INSTALLED 2/26/16
 PROJECT ROCKPORT PLANT
 COORDINATES N 154,325.3 E 513,483.5
 SYSTEM State Plane using NAD27/29

GROUND ELEVATION 399.96 FT.

-  GROUT SEAL: QUICK GROUT 20% SOLIDS 250 GALS
-  BENTONITE SEAL: 3/8" COATED PELLETS 100 LBS
-  SCREEN: 2.0 dia., SLOTTED .010, 9.6
-  GRAVEL PACK: #5 SAND 175 LBS
-  RISER PIPE: 2.0, dia., PVC
-  SPACERS, DEPTH:









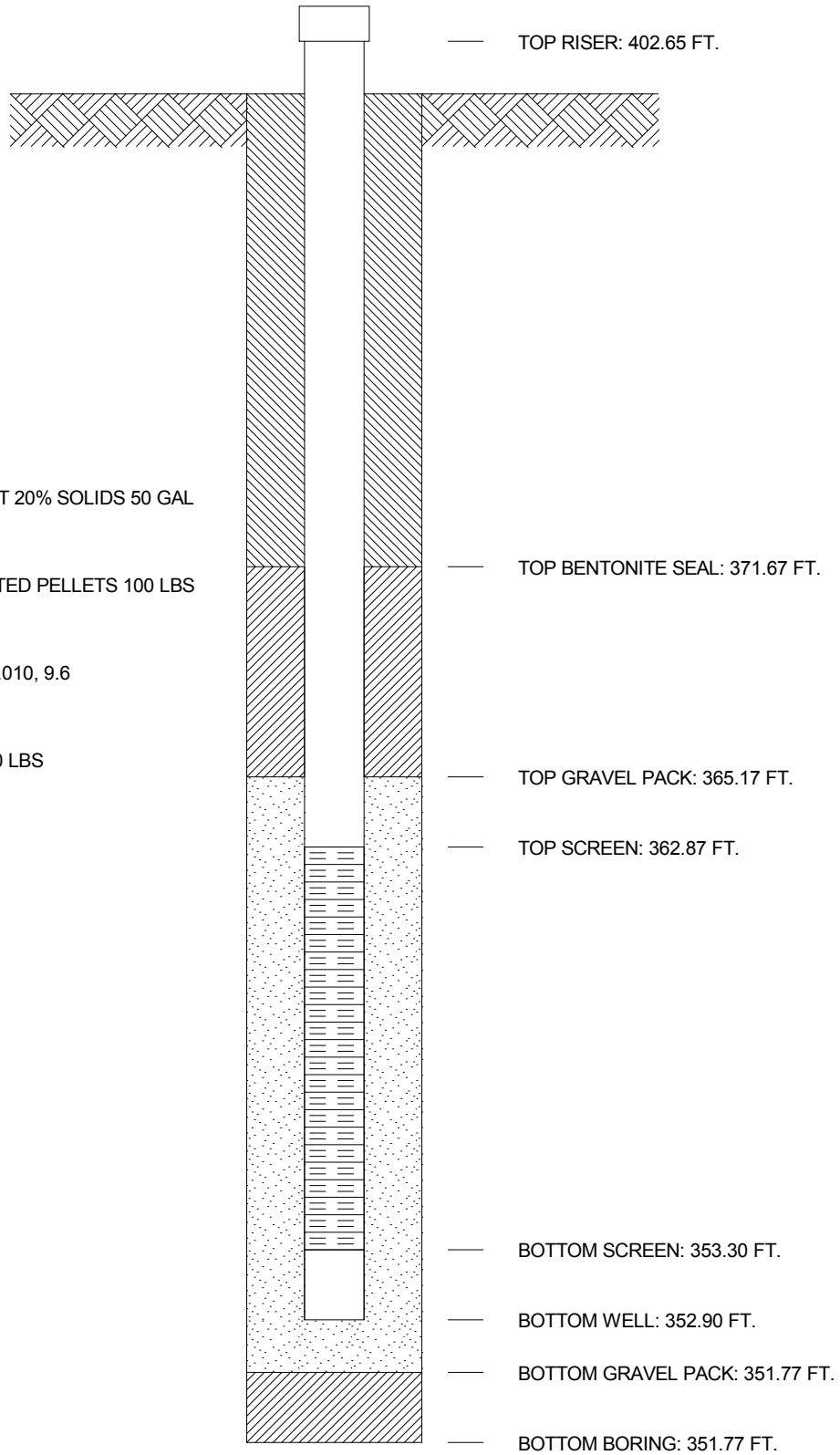
AMERICAN ELECTRIC POWER SERVICE CORPORATION
 AEP CIVIL ENGINEERING LABORATORY
 MONITORING WELL CONSTRUCTION



JOB NUMBER 42393125-01
 COMPANY INDIANA MICHIGAN POWER COMPANY WELL No. MW-1601S BORING No. MW-1601S INSTALLED 2/27/16
 PROJECT ROCKPORT PLANT
 COORDINATES N 154,327.6 E 513,479.7
 SYSTEM State Plane using NAD27/29

GROUND ELEVATION 399.77 FT.

-  GROUT SEAL: QUICK GROUT 20% SOLIDS 50 GAL
-  BENTONITE SEAL: 3/8" COATED PELLETS 100 LBS
-  SCREEN: 2.0 dia., SLOTTED .010, 9.6
-  GRAVEL PACK: #5 SAND 200 LBS
-  RISER PIPE: 2.0, dia., PVC
-  SPACERS, DEPTH:



AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**
 COMPANY **INDIANA MICHIGAN POWER COMPANY**
 PROJECT **ROCKPORT PLANT**
 COORDINATES **N 152,300.2 E 514,229.4**
 GROUND ELEVATION **399.3** SYSTEM **State Plane using NAD27/29**

BORING NO. **MW-1602D** DATE **4/27/16** SHEET **1** OF **6**
 BORING START **1/26/16** BORING FINISH **1/26/16**
 PIEZOMETER TYPE _____ WELL TYPE **OW**
 HGT. RISER ABOVE GROUND **2.63** DIA **2.0**
 DEPTH TO TOP OF WELL SCREEN **114.3** BOTTOM **123.88**
 WELL DEVELOPMENT **YES** BACKFILL _____
 FIELD PARTY **ZLR / REB** RIG **D-120**

Water Level, ft	<input type="text"/>	<input type="text"/>	<input type="text"/>
TIME			
DATE			

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO									
1	SS	0.0	1.5	3-2-5	1.5					Topsoil = 20 inches		
2	SS	1.5	3.0	6-9-9	1.25				CL	Silty lean clay, light brown 5YR 5/6 moderate brown 5YR 4/4 & medium light gray N5 fat clay seam, mottled, moist, v. stiff, trace organic *possible mud/grout/fill from nearby (~10') MW =>*FILL* @ 3' stiff no organic, some moderate yellowish brown 10YR 5/4 silt		
3	SS	3.0	4.5	4-6-7	1.25							
4	SS	4.5	6.0	3-3-4	1.16		5					
5	SS	6.0	7.5	3-3-4	1.5			CH	Fat clay, medium light gray N6, moist to moist, firm *FILL*			
6	SS	7.5	9.0	2-2-3	1.5				CL	@ 6' w/lean clay, dark yellowish brown 10YR 4/2 mottled		
7	SS	9.0	10.5	4-5-6	1.5				CH	Silty lean clay, dark yellowish brown 10YR 4/2, moist, firm, some water in spoon *FILL*		
8	SS	10.5	12.0	5-6-9	1.5				CL	Fat clay, olive gray 5Y 4/1, dry to moist, firm *FILL*		
9	SS	12.0	13.5	2-5-8	1.41				CH	Silty lean clay, dark yellowish brown 10YR 4/2 with olive gray 5Y 4/1 fat clay mottled, moist, stiff, some moderate yellowish brown 10YR 5/4 silt, trace organic (wood, roots) *FILL*		
10	SS	13.5	15.0	2-5-8	1.33				CL	Fat clay, olive gray 5Y 4/1, dry to moist, stiff, trace organic *FILL*		
11	SS	15.0	16.5	4-5-7	1.5				CH	Silty lean clay, dark yellowish brown 10YR 4/2 with olive gray 5Y 4/1 fat clay heavily mottled, moist, stiff, some moderate yellowish brown 10YR 5/4 and dark reddish brown 10R 3/4 silty *FILL* @ 12' trace sandstone to 1/4" @ 13.5' no sandstone, trace black oxide		
12	SS	16.5	18.0	3-3-5	1.5				CL	Lean silty clay, dark yellowish brown 10YR 4/2, moist, stiff, trace moderate yellowish brown 10YR 5/4 silt, trace medium light gray N6 fat clay		
13	SS	18.0	19.5	4-3-5	1.5				ML	Clayey silt, dark yellowish brown 10YR 4/2, moist, loose @ 18.5' .5" sand seam		
14	SS	19.5	21.0	3-3-4	1.5				SP	Very fine grained sand, moderate yellowish brown		

TYPE OF CASING USED

	NQ-2 ROCK CORE
	6" x 3.25 HSA
	9" x 6.25 HSA
	HW CASING ADVANCER 4"
	NW CASING 3"
	SW CASING 6"
	AIR HAMMER 8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC
 WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER **AMEC FOSTER WHEELER**

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1602D** DATE **4/27/16** SHEET **2** OF **6**

PROJECT **ROCKPORT PLANT**

BORING START **1/26/16** BORING FINISH **1/26/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	U S C S	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
15	SS	21.0	22.5	2-2-3	1.5					10YR 5/4 to dark yellowish brown 10YR 4/2, moist, loose, poorly graded @ 19.8' clay, silt seam (prev. material) 4.5" @ 21.2' clayey silt seam (prev. material) 3" @ 22' fat clay seam, medium light gray N6 and dark yellowish orange 10YR 6/6 mottled, 2" @ 22.8' clay silt seam (prev. material) 8"		
16	SS	22.5	24.0	2-3-3	1.41							
17	SS	24.0	25.5	4-6-11	.91				SP	Med. grained sand, dark yellowish brown 10YR 4/2 to moderate yellowish brown 10YR 5/4, moist, med. dense @ 25.1' 25.3' fine grained sand seam (prev. material) .5" @ 27' loose @ 28.9' clayey silt seam (prev. material) 2.5" @ 29.7' coarse sand seam dark reddish brown 10R 3/4 w/black oxide, 2"		
18	SS	25.5	27.0	5-5-8	.83		25					
19	SS	27.0	28.5	3-5-5	1.0							
20	SS	28.5	30.0	2-4-5	1.25							
21	SS	30.0	31.5	4-5-7	1.08		30		SP	Coarse sand, dark reddish brown 10R 3/4, moist, med. dense		
22	SS	31.5	33.0	2-2-3	1.33				SP	Med. grain to coarse sand, dark yellowish brown 10YR 4/2, moist, med. dense, w/gravel to 1/4"		
23	SS	33.0	34.5	1-2-3	1.33					Fine to med. grained sand, grayish brown 5YR 3/2, moist, med. dense, poorly graded @ 31.5' loose @ 33' moist to wet, water in spoon @ 34.5' v. loose @ 35.5' 6" silty clay seam ~50% medium light gray N6 @ 36' loose @ 37.5' trace gravel to 1/4"		
24	SS	34.5	36.0	3-1-3	.83		35					
25	SS	36.0	37.5	2-4-5	.91							
26	SS	37.5	39.0	7-4-4	.41							
27	SS	39.0	40.5	3-5-11	.83							
28	SS	40.5	42.0	6-7-9	.91		40		SP	Very fine grain to fine grained sand, dark yellowish brown 10YR 4/2, moist to wet, med. dense, poorly graded, trace gravel to 1/4", some black, @ 42' fine to med. grained		
29	SS	42.0	43.5	3-6-9	.75							
30	SS	43.5	45.0	3-6-8	.66							
31	SS	45.0	46.5	11-9-13	1.08		45		SW	Coarse sand, dark yellowish brown 10YR 4/2, moist to wet, med. dense, well graded, with gravel to 1/4", trace black silt @ 4' moderate brown 5YR 3/4 to grayish brown 5YR 3/2		

Continued Next Page

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1602D** DATE **4/27/16** SHEET **3** OF **6**

PROJECT **ROCKPORT PLANT**

BORING START **1/26/16** BORING FINISH **1/26/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
32	SS	46.5	48.0	5-11-13	1.0					@ 47.6' coal fragments (2")		
33	SS	48.0	49.5	11-12-13	1.0				SP	Fine to med. grain sand, grayish brown 5YR 3/2, moist to wet, med. dense, some gravel to 1/4"		
34	SS	49.5	51.0	5-5-8	1.16		50		SW	Coarse sand, grayish brown 5YR 3/2, moist to wet, med. dense, well graded with gravel to 1/4" @ 51.3' 2" coal seam @ 51.8' 3" med. grain sand seam, moderate brown 5YR 4/4, w/gravel to 1/4"		
35	SS	51.0	52.5	5-5-7	1.16							
36	SS	52.5	54.0	5-7-11	.75				SP SW	Fine to med. grain sand, grayish brown 5YR 3/2, moist to wet, med. dense, poorly graded, trace gravel to 1/4"		
37	SS	54.0	55.5	9-8-11	.50		55			Coarse sand, grayish brown 5YR 3/2, moist to wet, well graded, with gravel med. dense to 1/4" @ 54.5' 2" sandstone plug		
38	SS	55.5	57.0	5-12-16	1.41				SP	Fine grained sand, grayish brown 5YR 3/2, moist to wet, med. dense, poorly graded @ 56' 1.5" coal seam @ 57" med. grained, with gravel (riverstone) to 1/4", well graded		
39	SS	57.0	58.5	10-14-14	1.08							
40	SS	58.5	60.0	6-10-17	1.25		60					
41	SS	60.0	61.5	10-13-16	1.16				SW	Coarse sand, grayish brown 5YR 3/2, wet, med. dense, well graded w/well rounded, fine to coarse gravel to 1"		
42	SS	61.5	63.0	7-11-20	1.25							
43	SS	63.0	64.5	7-13-15	1.25				SP	Med. grained sand, grayish brown 5YR 3/2, moist to wet, med. dense, poorly graded, trace gravel to 1/4"		
44	SS	64.5	66.0	6-10-14	1.33		65			@ 64.5' fine grained @ 67.1' 1/5" coal fragments @ 67.5' dense, w/well rounded fine gravel @ 69' med. dense, well rounded fine gravel @ 70.5' dense @ 72' med. dense @ 73.5' dense @ 74.5' w/well rounded fine gravel @ 75' w/well rounded fine gravel @ 76.5' w/well rounded fine to coarse gravel @ 79.3' 2" shale fragment		
45	SS	66.0	67.5	8-10-13	1.16							
46	SS	67.5	69.0	10-19-22	1.25							
47	SS	69.0	70.5	9-10-12	1.08		70					
48	SS	70.5	72.0	10-15-18	1.16							

AEP RK BAP CCR COMPLIANCE.GPJ_AEP.GDT_4/27/16

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1602D** DATE **4/27/16** SHEET **4** OF **6**

PROJECT **ROCKPORT PLANT**

BORING START **1/26/16** BORING FINISH **1/26/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
49	SS	72.0	73.5	8-10-12	1.16							
50	SS	73.5	75.0	7-15-19	1.1							
51	SS	75.0	76.5	12-18-21	1.33		75					
52	SS	76.5	78.0	8-16-29	1.41							
53	SS	78.0	79.5	27-18-15	1.5							
54	SS	79.5	81.0	11-16-26	1.5							
55	SS	81.0	82.5	9-18-23	1.41				CL	Silty clay, olive gray 5Y 3/2, wet, stiff (N values from shale)		
56	SS	82.5	84.0	8-14-14	1.16				SP	Fine grained sand, olive gray 5Y 3/2, wet, dense, poorly graded @ 81' silty clay seam (prev. material)		
57	SS	84.0	85.5	10-13-18	1.5				CH	Silty fat clay, brownish gray 5YR 4/1, wet, stiff		
58	SS	85.5	87.0	15-14-20	1.5				SP	Med. grained sand, moderate yellowish brown 10YR 5/4, wet, dense, trace well rounded fine gravel		
59	SS	87.0	88.5	10-12-12	1.08				CH	Coarse sand, moderate yellowish brown 10YR 5/4, moist, dense, well graded, w/well rounded fine to coarse gravel to 1"		
60	SS	88.5	90.0	15-13-24	1.33				SW	@ 85.2' 1" coal fragments Silty fat clay, moderate yellowish brown 10YR 5/4, wet, v. stiff		
61	SS	90.0	91.5	15-17-21	1.75				SP	Coarse sand, moderate yellowish brown 10YR 5/4, moist, dense, well graded, w/well rounded fine to coarse gravel to 1"		
62	SS	91.5	93.0	11-17-20	1.08				SW	@ 87" med. dense @ 88.5' clay plug (prev. material), 3"		
63	SS	93.0	94.5	8-11-16	1.33				SP	Med. grained sand, moderate yellowish brown 10YR 5/4, moist, dense, well rounded fine gravel		
64	SS	94.5	96.0	1-11-17	1.41				SW	Coarse sand, moderate yellowish brown 10YR 5/4, moist to wet, dense, well graded, w/gravel to 1.25'		
65	SS	96.0	97.5	7-10-18	1.41				SP	Med. grained sand, moderate yellowish brown 10YR 5/4, moist to wet, med. dense, trace fine gravel @ 95.5' mostly brown @ 96.3' .5" coal seam		
66	SS	97.5	99.0	6-11-13	1.16				SW	Coarse sand, moderate yellowish brown 10YR 5/4 to moderate brown 5YR 4/4, moist, med. dense,		

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1602D** DATE **4/27/16** SHEET **5** OF **6**

PROJECT **ROCKPORT PLANT**

BORING START **1/26/16** BORING FINISH **1/26/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
67	SS	99.0	100.5	8-13-21	1.25		100			well graded, w/fine to coarse gravel @ 100.3' shale fragment 2"		
68	SS	100.5	102.0	6-6-13	1.5				SP	V. fine to fine sand, grayish brown 5YR 3/2, moist to wet, med. dense, poorly graded @ 102.2' 3" coarse sand seam (prev. material)		
69	SS	102.0	103.5	6-8-17	1.5							
70	SS	103.5	105.0	10-12-15	1.25							
71	SS	105.0	106.5	8-11-19	1.41		105		SP	Fine to med. grained sand, grayish brown 5YR 3/2, moist to wet, med. dense, trace fine gravel @ 105' no gravel @ 106.5' dense @ 107.7' 1" shale fragment @ 109' 3" shale fragment @ 110.8' trace shale @ 111' no shale		
72	SS	106.5	108.0	8-12-20	1.33							
73	SS	108.0	109.5	13-21-17	1.33							
74	SS	109.5	111.0	8-16-31	1.5		110		SW	Coarse sand, grayish brown 5YR 3/2, moist to wet, v. dense, w/fine to coarse gravel (~50%), well graded @ 114.1' 1.5" clay seam (prev. material, gray fat)		
75	SS	111.0	112.5	12-20-31	1.41							
76	SS	112.5	114.0	17-27-28	1.41							
77	SS	114.0	115.5	12-26-22	1.5		115		SW	Fine grained sand, grayish brown 5YR 3/2, wet, dense, well graded, w/gravel to 1.75"		
78	SS	115.5	117.0	8-7-7	1.41							
79	SS	117.0	118.5	13-12-15	1.25							
80	SS	118.5	120.0	8-9-14	1.25							
81	SS	120.0	121.5	11-11-21	1.33		120		SW	Coarse sand, grayish brown 5YR 3/2, moist, med. dense, well graded w/fine gravel (~50%), some black silt		
82	SS	121.5	123.0	12-21-43	1.25							
83	SS	123.0	124.5	32-50/5	.91							

Continued Next Page

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1602D** DATE **4/27/16** SHEET **6** OF **6**

PROJECT **ROCKPORT PLANT**

BORING START **1/26/16** BORING FINISH **1/26/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
84	SS	124.5	126.0	50/5	.41		125			Shale, olive gray 5Y 4/1, moist, hard Spoon refusal @ 125' Auger refusal @ 125' TOR 124.6' Boring terminated @ 125'		

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**
 COMPANY **INDIANA MICHIGAN POWER COMPANY**
 PROJECT **ROCKPORT PLANT**
 COORDINATES **N 152,295.0 E 514,229.2**
 GROUND ELEVATION **399.4** SYSTEM **State Plane using NAD27/29**

BORING NO. **MW-1602I** DATE **4/27/16** SHEET **1** OF **4**
 BORING START **2/9/16** BORING FINISH **2/9/16**
 PIEZOMETER TYPE _____ WELL TYPE **OW**
 HGT. RISER ABOVE GROUND **2.65** DIA **2.0**
 DEPTH TO TOP OF WELL SCREEN **67.8** BOTTOM **77.38**
 WELL DEVELOPMENT **YES** BACKFILL _____
 FIELD PARTY **ZLR / REB** RIG **D-120**

Water Level, ft	<input type="text"/>	<input type="text"/>	<input type="text"/>
TIME	<input type="text"/>	<input type="text"/>	<input type="text"/>
DATE	<input type="text"/>	<input type="text"/>	<input type="text"/>

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO									
1	SS	0.0	1.5	3-2-5	1.5					Topsoil = 20 inches		
2	SS	1.5	3.0	6-9-9	1.25				CL	Silty lean clay, light brown 5YR 5/6 moderate brown 5YR 4/4 & medium light gray N5 fat clay seam, mottled, moist, v. stiff, trace organic *possible mud/grout/fill from nearby (~10') MW =>*FILL* @ 3' stiff no organic, some moderate yellowish brown 10YR 5/4 silt		
3	SS	3.0	4.5	4-6-7	1.25							
4	SS	4.5	6.0	3-3-4	1.16		5					
5	SS	6.0	7.5	3-3-4	1.5			CH	Fat clay, medium light gray N6, moist to moist, firm *FILL*			
6	SS	7.5	9.0	2-2-3	1.5				CL	@ 6' w/lean clay, dark yellowish brown 10YR 4/2 mottled		
7	SS	9.0	10.5	4-5-6	1.5				CH	Silty lean clay, dark yellowish brown 10YR 4/2, moist, firm, some water in spoon *FILL*		
									CL	Fat clay, olive gray 5Y 4/1, dry to moist, firm *FILL*		
8	SS	10.5	12.0	5-6-9	1.5			10	CH	Silty lean clay, dark yellowish brown 10YR 4/2 with olive gray 5Y 4/1 fat clay mottled, moist, stiff, some moderate yellowish brown 10YR 5/4 silt, trace organic (wood, roots) *FILL*		
9	SS	12.0	13.5	2-5-8	1.41				CL	Fat clay, olive gray 5Y 4/1, dry to moist, stiff, trace organic *FILL*		
10	SS	13.5	15.0	2-5-8	1.33					Silty lean clay, dark yellowish brown 10YR 4/2 with olive gray 5Y 4/1 fat clay heavily mottled, moist, stiff, some moderate yellowish brown 10YR 5/4 and dark reddish brown 10R 3/4 silty *FILL* @ 12' trace sandstone to 1/4"		
										@ 13.5' no sandstone, trace black oxide		
11	SS	15.0	16.5	4-5-7	1.5			15	CL	Lean silty clay, dark yellowish brown 10YR 4/2, moist, stiff, trace moderate yellowish brown 10YR 5/4 silt, trace medium light gray N6 fat clay		
12	SS	16.5	18.0	3-3-5	1.5				ML	Clayey silt, dark yellowish brown 10YR 4/2, moist, loose @ 18.5' .5" sand seam		
13	SS	18.0	19.5	4-3-5	1.5							
14	SS	19.5	21.0	3-3-4	1.5				SP	Very fine grained sand, moderate yellowish brown		

TYPE OF CASING USED

	NQ-2 ROCK CORE
	6" x 3.25 HSA
	9" x 6.25 HSA
	HW CASING ADVANCER 4"
	NW CASING 3"
	SW CASING 6"
	AIR HAMMER 8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC
 WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER **AMEC FOSTER WHEELER**

AEP_RK_BAP_CCR_COMPLIANCE.GPJ AEP.GDT 4/27/16

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1602I** DATE **4/27/16** SHEET **2** OF **4**

PROJECT **ROCKPORT PLANT**

BORING START **2/9/16** BORING FINISH **2/9/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	U S C S	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
15	SS	21.0	22.5	2-2-3	1.5					10YR 5/4 to dark yellowish brown 10YR 4/2, moist, loose, poorly graded @ 19.8' clay, silt seam (prev. material) 4.5" @ 21.2' clayey silt seam (prev. material) 3" @ 22' fat clay seam, medium light gray N6 and dark yellowish orange 10YR 6/6 mottled, 2" @ 22.8' clay silt seam (prev. material) 8"		
16	SS	22.5	24.0	2-3-3	1.41							
17	SS	24.0	25.5	4-6-11	.91				SP	Med. grained sand, dark yellowish brown 10YR 4/2 to moderate yellowish brown 10YR 5/4, moist, med. dense @ 25.1' 25.3' fine grained sand seam (prev. material) .5" @ 27' loose @ 28.9' clayey silt seam (prev. material) 2.5" @ 29.7' coarse sand seam dark reddish brown 10R 3/4 w/black oxide, 2"		
18	SS	25.5	27.0	5-5-8	.83		25					
19	SS	27.0	28.5	3-5-5	1.0							
20	SS	28.5	30.0	2-4-5	1.25							
21	SS	30.0	31.5	4-5-7	1.08		30		SP	Coarse sand, dark reddish brown 10R 3/4, moist, med. dense		
22	SS	31.5	33.0	2-2-3	1.33				SP	Med. grain to coarse sand, dark yellowish brown 10YR 4/2, moist, med. dense, w/gravel to 1/4"		
23	SS	33.0	34.5	1-2-3	1.33					Fine to med. grained sand, grayish brown 5YR 3/2, moist, med. dense, poorly graded @ 31.5' loose @ 33' moist to wet, water in spoon @ 34.5' v. loose @ 35.5' 6" silty clay seam ~50% medium light gray N6 @ 36' loose @ 37.5' trace gravel to 1/4"		
24	SS	34.5	36.0	3-1-3	.83		35					
25	SS	36.0	37.5	2-4-5	.91							
26	SS	37.5	39.0	7-4-4	.41							
27	SS	39.0	40.5	3-5-11	.83							
28	SS	40.5	42.0	6-7-9	.91		40		SP	Very fine grain to fine grained sand, dark yellowish brown 10YR 4/2, moist to wet, med. dense, poorly graded, trace gravel to 1/4", some black, @ 42' fine to med. grained		
29	SS	42.0	43.5	3-6-9	.75							
30	SS	43.5	45.0	3-6-8	.66							
31	SS	45.0	46.5	11-9-13	1.08		45		SW	Coarse sand, dark yellowish brown 10YR 4/2, moist to wet, med. dense, well graded, with gravel to 1/4", trace black silt @ 4' moderate brown 5YR 3/4 to grayish brown 5YR 3/2		Began Mud Rotary @ 37.5'

Continued Next Page

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1602I** DATE **4/27/16** SHEET **3** OF **4**

PROJECT **ROCKPORT PLANT**

BORING START **2/9/16** BORING FINISH **2/9/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
32	SS	46.5	48.0	5-11-13	1.0					@ 47.6' coal fragments (2")		
33	SS	48.0	49.5	11-12-13	1.0				SP	Fine to med. grain sand, grayish brown 5YR 3/2, moist to wet, med. dense, some gravel to 1/4"		
34	SS	49.5	51.0	5-5-8	1.16		50		SW	Coarse sand, grayish brown 5YR 3/2, moist to wet, med. dense, well graded with gravel to 1/4" @ 51.3' 2" coal seam @ 51.8' 3" med. grain sand seam, moderate brown 5YR 4/4, w/gravel to 1/4"		
35	SS	51.0	52.5	5-5-7	1.16							
36	SS	52.5	54.0	5-7-11	.75				SP SW	Fine to med. grain sand, grayish brown 5YR 3/2, moist to wet, med. dense, poorly graded, trace gravel to 1/4"		
37	SS	54.0	55.5	9-8-11	.50		55			Coarse sand, grayish brown 5YR 3/2, moist to wet, well graded, with gravel med. dense to 1/4" @ 54.5' 2" sandstone plug		
38	SS	55.5	57.0	5-12-16	1.41				SP	Fine grained sand, grayish brown 5YR 3/2, moist to wet, med. dense, poorly graded @ 56' 1.5" coal seam @ 57" med. grained, with gravel (riverstone) to 1/4", well graded		
39	SS	57.0	58.5	10-14-14	1.08							
40	SS	58.5	60.0	6-10-17	1.25		60					
41	SS	60.0	61.5	10-13-16	1.16				SW	Coarse sand, grayish brown 5YR 3/2, wet, med. dense, well graded w/well rounded, fine to coarse gravel to 1"		
42	SS	61.5	63.0	7-11-20	1.25							
43	SS	63.0	64.5	7-13-15	1.25				SP	Med. grained sand, grayish brown 5YR 3/2, moist to wet, med. dense, poorly graded, trace gravel to 1/4"		
44	SS	64.5	66.0	6-10-14	1.33		65			@ 64.5' fine grained @ 67.1' 1/5" coal fragments @ 67.5' dense, w/well rounded fine gravel @ 69' med. dense, well rounded fine gravel @ 70.5' dense @ 72' med. dense @ 73.5' dense @ 74.5' w/well rounded fine gravel @ 75' w/well rounded fine gravel @ 76.5' w/well rounded fine to coarse gravel @ 79.3' 2" shale fragment		
45	SS	66.0	67.5	8-10-13	1.16							
46	SS	67.5	69.0	10-19-22	1.25							
47	SS	69.0	70.5	9-10-12	1.08		70					
48	SS	70.5	72.0	10-15-18	1.16							

Continued Next Page

AEP_RK_BAP_CCR_COMPLIANCE.GPJ_AEP_GDT_4/27/16

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-16021** DATE **4/27/16** SHEET **4** OF **4**

PROJECT **ROCKPORT PLANT**

BORING START **2/9/16** BORING FINISH **2/9/16**







SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
49	SS	72.0	73.5	8-10-12	1.16		75					
50	SS	73.5	75.0	7-15-19	1.1							
51	SS	75.0	76.5	12-18-21	1.33							
52	SS	76.5	78.0	8-16-29	1.41							
53	SS	78.0	79.5	27-18-15	1.5							

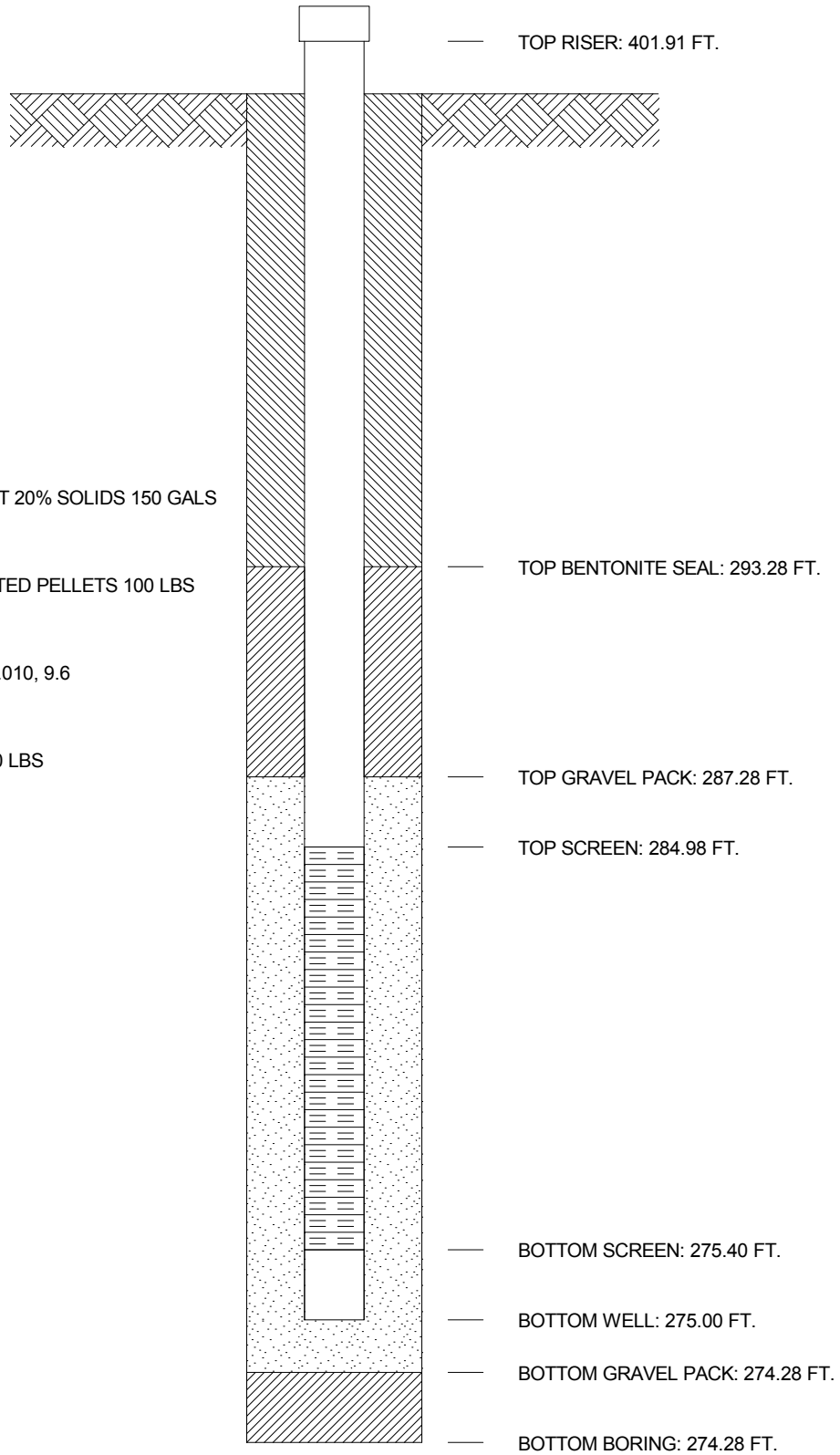
AMERICAN ELECTRIC POWER SERVICE CORPORATION
 AEP CIVIL ENGINEERING LABORATORY
 MONITORING WELL CONSTRUCTION



JOB NUMBER 42393125-01
 COMPANY INDIANA MICHIGAN POWER COMPANY WELL No. MW-1602D BORING No. MW-1602D INSTALLED 1/26/16
 PROJECT ROCKPORT PLANT
 COORDINATES N 152,300.2 E 514,229.4
 SYSTEM State Plane using NAD27/29

GROUND ELEVATION 399.28 FT.

-  GROUT SEAL: QUICK GROUT 20% SOLIDS 150 GALS
-  BENTONITE SEAL: 3/8" COATED PELLETS 100 LBS
-  SCREEN: 2.0 dia., SLOTTED .010, 9.6
-  GRAVEL PACK: #5 SAND 200 LBS
-  RISER PIPE: 2.0, dia., PVC
-  SPACERS, DEPTH:









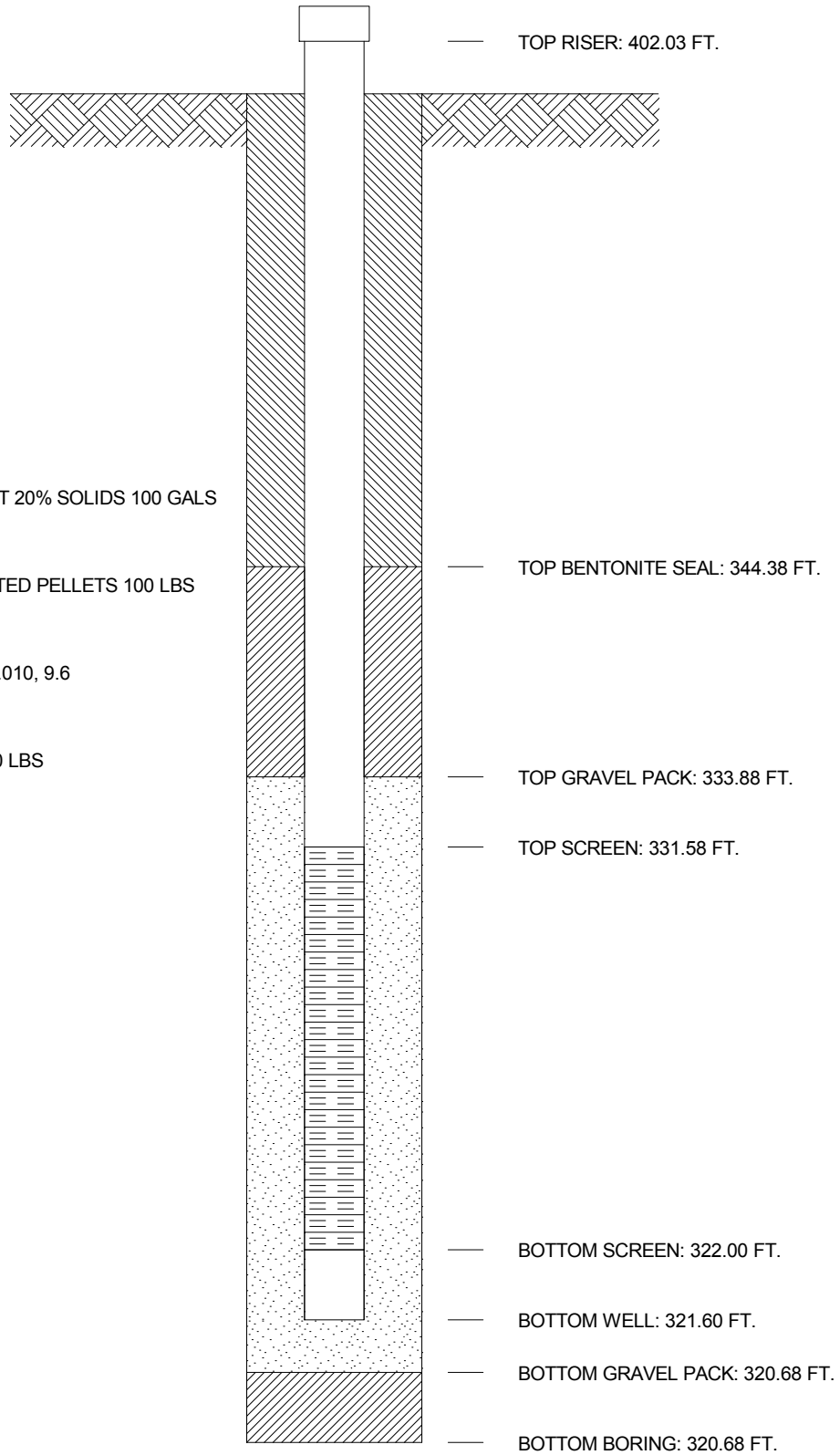
AMERICAN ELECTRIC POWER SERVICE CORPORATION
 AEP CIVIL ENGINEERING LABORATORY
 MONITORING WELL CONSTRUCTION



JOB NUMBER 42393125-01
 COMPANY INDIANA MICHIGAN POWER COMPANY WELL No. MW-1602I BORING No. MW-1602I INSTALLED 2/9/16
 PROJECT ROCKPORT PLANT
 COORDINATES N 152,295.0 E 514,229.2
 SYSTEM State Plane using NAD27/29

GROUND ELEVATION 399.38 FT.

-  GROUT SEAL: QUICK GROUT 20% SOLIDS 100 GALS
-  BENTONITE SEAL: 3/8" COATED PELLETS 100 LBS
-  SCREEN: 2.0 dia., SLOTTED .010, 9.6
-  GRAVEL PACK: #5 SAND 150 LBS
-  RISER PIPE: 2.0, dia., PVC
-  SPACERS, DEPTH:



AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
LOG OF BORING



JOB NUMBER **42393125-01**
 COMPANY **INDIANA MICHIGAN POWER COMPANY**
 PROJECT **ROCKPORT PLANT**
 COORDINATES **N 152,811.9 E 514,207.5**
 GROUND ELEVATION **401.6** SYSTEM **State Plane using NAD27/29**

BORING NO. **MW-1603D** DATE **4/27/16** SHEET **1** OF **5**
 BORING START **1/29/16** BORING FINISH **1/29/16**
 PIEZOMETER TYPE _____ WELL TYPE **OW**
 HGT. RISER ABOVE GROUND **2.29** DIA **2.0**
 DEPTH TO TOP OF WELL SCREEN **110.9** BOTTOM **120.46**
 WELL DEVELOPMENT **YES** BACKFILL _____
 FIELD PARTY **ZLR / REB** RIG **D-120**

Water Level, ft	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TIME			
DATE			

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO									
1	SS	0.0	1.5	3-3-6	.5					Gravel = 6 inches Topsoil = 12 inches		
2	SS	1.5	3.0	4-11-14	.75				CL	Silty clay, l. brown 5YR 6/4 and l. grey N7 mottled, dry to moist, v. stiff @ 3' trace moderate red 5R 4/6 silt @ 6' stiff, geofabric in spoon @ 7.5' v. stiff, wood debris @ 9' w/pale yellowish brown 10YR 6/2 fat clay, stiff		
3	SS	3.0	4.5	5-9-12	1.0							
4	SS	4.5	6.0	7-10-13	.92		5					
5	SS	6.0	7.5	4-6-9	1.08							
6	SS	7.5	9.0	4-8-12	1.5							
7	SS	9.0	10.5	2-3-7	1.33							
8	SS	10.5	12.0	2-4-9	1.5		10					
9	SS	12.0	13.5	4-5-7	1.33							
10	SS	13.5	15.0	3-5-9	1.5				SC	Clayey sand, moderate brown 5YR 4/4, moist, med. dense, w/l. grey N7 clay, fine grained, trace black N1 silt		
11	SS	15.0	16.5	3-4-7	1.5				ML	Clayey silt, moderate yellowish brown 10YR 5/4, moist, med. dense, some l. grey N7 fat clay @ 15' trace l. grey N7 fat clay		
12	SS	16.5	18.0	3-4-6	1.16		15					
13	SS	18.0	19.5	3-4-4	1.5							
14	SS	19.5	21.0	4-6-8	1.5				SP	Poorly graded sand, moderate yellowish brown 10YR 5/4, fine grained, moist, loose @ 18' v. fine to fine grained		

TYPE OF CASING USED

	NQ-2 ROCK CORE
	6" x 3.25 HSA
	9" x 6.25 HSA
	HW CASING ADVANCER 4"
	NW CASING 3"
	SW CASING 6"
	AIR HAMMER 8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC
 WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER **AMEC FOSTER WHEELER**

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1603D** DATE **4/27/16** SHEET **2** OF **5**

PROJECT **ROCKPORT PLANT**

BORING START **1/29/16** BORING FINISH **1/29/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES	
		FROM	TO			%							
15	SS	21.0	22.5	2-2-3	1.42		25		SP	Poorly graded sand, grayish orange 10YR 7/4, moist, med. dense, fine grained, trace black N1 silt			
16	SS	22.5	24.0	1-3-4	1.5				SP	@ 21.5' 2" clay seam, moderate brown 5YR 4/4			
17	SS	24.0	25.5	4-7-8	.33		30			Poorly graded sand, moderate yellowish brown 10YR 5/4, moist, v. fine grained, loose			
18	SS	25.5	27.0	3-6-9	1.5						@ 22.8' 2.5" clayey silt seam (prev. material)		
19	SS	27.0	28.5	5-6-9	1.5						@ 23.6' 2" grayish orange 10YR 7/4 sand seam (prev. material)		
20	SS	28.5	30.0	4-7-12	1.5		35			@ 24' 3" shale fragment, med. l. grey N6			
21	SS	30.0	31.5	5-6-8	1.5						@ 25.5' 2" shale fragments		
22	SS	31.5	33.0	5-6-10	1.5		40		SW	Poorly graded sand, grayish orange 10YR 7/4, moist, med. dense, fine grained, trace black N1 silt			
23	SS	33.0	34.5	3-5-8	1.25						@ 26.6' 1" coarse sand seam, dark yellowish brown 10YR 4/2, w/rounded fine gravel, well graded		
24	SS	34.5	36.0	5-7-9	1.41						@ 27.9' 2" coarse sand seam (prev. material)		
25	SS	36.0	37.5	6-5-7	1.25		45			@ 28.7' clay seam, 1.5" (prev. material)			
26	SS	37.5	39.0	2-3-7	1.33						@ 29.5' .5" coarse sand seam, moderate red 5R4/6, w/black N1 silt, poorly graded		
27	SS	39.0	40.5	6-8-8	1.41				@ 31.1' 1/4" coal fragments and black N1 silt				
28	SS	40.5	42.0	3-6-9	1.16		45		SW	Well graded sand, coarse grained, pale yellowish brown 10YR 6/2, moist, med. dense, trace black N1 silt			
29	SS	42.0	43.5	5-8-8	1.25						@ 32.5' .5" coarse sand seam, moderate red (prev. material)		
30	SS	43.5	45.0	5-4-7	.83						@ 33' med. grained		
31	SS	45.0	46.5	6-8-14	1.16				@ 35 1/4" coal fragments				
									SP	Poorly graded sand, moderate yellowish brown 10YR 5/4, moist to wet, med. dense, fine grained, some fine gravel, water in spoon			
										@ 36' fine to med. grained			
									SP	Poorly graded sand, pale reddish brown 10R 5/4, fine grained, moist to wet, med. dense			
										@ 38.6' 2" coarse sand seam dark yellowish brown 10YR 4/2 w/black N1 silt (50%)			
									SW	Well graded sand, coarse grained, moist to wet, med. dense, with fine gravel			
										@ 40' 1/4" coal fragments			
										Well graded sand, moderate, yellowish brown 10YR 5/4, fine grained, moist to wet, med. dense, some fine gravel			
										@ 41' coarse sand seam, 3", d. yellowish brown 10YR 4/2, prev. material			
										@ 42.5' coarse sand seam, 3.5", d. yellowish brown 10YR 4/2, w/black N1 silt and fine gravel			
									SW	Well graded sand, d. yellowish brown 10YR 4/2, coarse grained, moist to wet, med. dense, with fine gravel			
										@ 43.8' trace coal fragments, angular			
										@ 44' no coal fragments			

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1603D** DATE **4/27/16** SHEET **3** OF **5**

PROJECT **ROCKPORT PLANT**

BORING START **1/29/16** BORING FINISH **1/29/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES		
		FROM	TO			%								
32	SS	46.5	48.0	13-10-18	1.33		50		SW	@ 45.5' some coarse gravel, rounded @ 45.7' .5" coal fragments @ 46' 1.5" coal fragments				
33	SS	48.0	49.5	9-14-19	1.41						Well graded sand, moderate yellowish brown 10YR 5/4, fine grained, moist to wet, med. dense, some fine gravel @ 46.9' 1.5" shale seam @ 47.6' 1" coal fragment and black N1 silt, angular @ 47.8' 1.5" rounded fine gravel, clean, poorly graded @ 48' 1" shale fragment @ 48.1' dense, poorly graded, trace fine gravel @ 49.5' w/fine gravel @ 51' well graded, med. dense			
34	SS	49.5	51.0	11-15-18	1.33						@ 52.5' trace shale fragments to 1.5"			
35	SS	51.0	52.5	6-9-16	1.41									
36	SS	52.5	54.0	7-14-21	1.41									
37	SS	54.0	55.5	10-12-12	1.5				55		SW	Poorly graded sand, med. grained, pale yellowish brown 10YR 6/2, moist to wet, dense, trace fine gravel		
38	SS	55.5	57.0	9-12-31	1.41							Well graded sand, pale yellowish brown 10YR 6/2, fine grained, moist to wet, med. dense, some fine gravel, trace coarse gravel @ 55.5' dense, no coarse gravel @ 57' med. dense @ 58' 2.5" shale seam, med. l. grey N6		
39	SS	57.0	58.5	10-10-15	1.16									
40	SS	58.5	60.0	8-10-15	1.5				60		SW	Well graded sand, l. olive grey 5Y 6/1, fine to med. grained, moist to wet, med. dense, with fine gravel (rounded) @ 61.5' fine grained @ 63' trace fine gravel @ 64.5' d. yellowish brown 10YR 4/2 @ 66' fine to med. grained, some fine gravel (rounded)		
41	SS	60.0	61.5	7-10-11	1.25									
42	SS	61.5	63.0	8-13-13	1.25									
43	SS	63.0	64.5	7-9-17	1.16									
44	SS	64.5	66.0	6-9-10	1.33		65							
45	SS	66.0	67.5	10-11-15	1.16									
46	SS	67.5	69.0	10-11-15	1.33				SW	Well graded sand, d. yellowish brown 10YR 4/2, coarse grained, moist to wet, med. dense, with fine gravel				
47	SS	69.0	70.5	9-13-15	1.5		70							
48	SS	70.5	72.0	9-12-18	1.33				SP	Poorly graded sand, pale yellowish brown 10YR 6/2, fine grained, moist to wet, dense				

AEP_RK_BAP_CCR_COMPLIANCE.GPJ_AEP_GDT_4/27/16

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1603D** DATE **4/27/16** SHEET **4** OF **5**

PROJECT **ROCKPORT PLANT**

BORING START **1/29/16** BORING FINISH **1/29/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
49	SS	72.0	73.5	5-8-16	1.41		75			@ 72' med. dense @ 73' v. fine grained, moist @ 75.5' silty clay seam (~50%), moderate brown 5YR 3/4, moist, stiff to v. stiff @ 76.2' shale fragment, 3"		
50	SS	73.5	75.0	8-8-12	1.33							
51	SS	75.0	76.5	9-11-13	1.5							
52	SS	76.5	78.0	8-12-18	1.0		80		SW	Well graded sand, d. yellowish brown 10YR 4/2, coarse grained, moist to wet, dense, w/fine gavel, trace coarse gravel (rounded) @ 78' 3.5" shale fragment @ 78.4' coarse gravel seam 3" @ 78.6' 3" shale fragment		
53	SS	78.0	79.5	21-21-15	.75							
54	SS	79.5	81.0	3-6-6	1.41							
55	SS	81.0	82.5	5-4-6	1.5		85		ML	Clayey silt, l. grey N7, moist to wet, loose @ 83' 2.5" fine grained sand seam, med. d. grey N4		
56	SS	82.5	84.0	5-6-11	1.5							
57	SS	84.0	85.5	5-6-15	1.5							
58	SS	85.5	87.0	11-15-19	1.5		90		SP	Poorly graded sand, med. d. grey N4, fine grained, moist to wet, med. dense @ 85' 4" clayey silt seam, prev. material @ 85.5' dense @ 86' 3.5" clayey silt seam, prev. material @ 88.5' v. dense @ 91.5' med. dense @ 92' some fine gravel @ 92.2' 1" coal fragments seam @ 93' d. yellowish brown 10YR 4/2, 4" clayey silt seam (prev. material) (50%) @ 94.4' 2" coal fragments seam @ 95' 6" coal fragments (75%) and above material (25%)		
59	SS	87.0	88.5	9-13-29	.41							
60	SS	88.5	90.0	15-21-34	1.5							
61	SS	90.0	91.5	12-22-30	1.5							
62	SS	91.5	93.0	7-12-17	1.33		95		SP	Poorly graded sand, coarse grained, moderate reddish brown 10R 4/6, moist to wet, dense, trace coal fragments @ 96' with coal fragments (~50%)		
63	SS	93.0	94.5	8-11-12	1.5							
65	SS	94.0	95.5	12-22-17	1.5							
64	SS	94.5	96.0	7-14-19	1.5							
66	SS	97.5	99.0	9-9-12	1.5				SP	Poorly graded sand, fine to med. grained, dusky		

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1603D** DATE **4/27/16** SHEET **5** OF **5**

PROJECT **ROCKPORT PLANT**

BORING START **1/29/16** BORING FINISH **1/29/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
67	SS	99.0	100.5	8-9-15	1.5		100		SW	yellow 5Y 6/4, moist to wet, dense, some coarse gravel @ 97.5' med. dense @ 97.7' 1" clayey silt plug (prev. material)		
68	SS	100.5	102.0	16-20-12	.50					Well graded sand, coarse grained, dusky yellowish brown 10YR 2/2, moist to wet, med. dense, with fine gravel, trace coarse gravel @ 100.5' dense @ 101.8' 2.5" shale fragment		
69	SS	102.0	103.5	6-5-8	1.16				SP	Poorly graded sand, very fine grained, dark yellowish orange 10YR 6/6, wet, med. dense, trace fine gravel @ 105' grey 5Y 4/1 @ 108.5' moderate reddish brown 10R 4/6 @ 109' grey 5Y 4/1 @ 109.5' moist to wet		
70	SS	103.5	105.0	9-8-10	1.41							
71	SS	105.0	106.5	7-10-12	1.41		105					
72	SS	106.5	108.0	6-9-12	1.33							
73	SS	108.0	109.5	6-8-13	1.25							
74	SS	109.5	111.0	7-9-15	1.5		110					
75	SS	111.0	112.5	17-16-20	1.41				SW	Well graded sand, coarse grained, olive grey 5Y 3/2, moist to wet, dense, w/fine gravel, trace coarse gravel @ 112.5' med. dense		
76	SS	112.5	114.0	8-10-17	1.33							
77	SS	114.0	115.5	14-22-26	1.41		115		SP	Poorly graded sand, fine grained, medium grey N5, moist to wet, dense, some fine gravel		
78	SS	115.5	117.0	12-20-31	1.33					SW	Well graded sand, coarse grained, light olive grey 5Y 6/1, moist to wet, v. dense, with fine gravel, some coarse gravel	
79	SS	117.0	118.5	15-13-16	1.25				SP	Poorly graded sand, fine grained, light olive grey 5Y 6/1, moist to wet, med. dense, some fine gravel @ 118.5' dense, with fine gravel, some coarse gravel		
80	SS	118.5	120.0	13-15-16	1.25							
81	SS	120.0	121.5	10-16-20	1.25		120					
82	SS	121.5	123.0	25-50/4	1.33					Shale, med. l. grey N6, dry to moist, hard Spoon refusal @ 122' Auger refusal @ 122' Boring terminated @ 122'		

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
LOG OF BORING



JOB NUMBER **42393125-01**
 COMPANY **INDIANA MICHIGAN POWER COMPANY**
 PROJECT **ROCKPORT PLANT**
 COORDINATES **N 152,807.3 E 519,207.2**
 GROUND ELEVATION **401.4** SYSTEM **State Plane using NAD27/29**

BORING NO. **MW-1603I** DATE **4/27/16** SHEET **1** OF **4**
 BORING START **2/1/16** BORING FINISH **2/1/16**
 PIEZOMETER TYPE _____ WELL TYPE **OW**
 HGT. RISER ABOVE GROUND **2.74** DIA **2.0**
 DEPTH TO TOP OF WELL SCREEN **68.9** BOTTOM **78.51**
 WELL DEVELOPMENT **YES** BACKFILL _____
 FIELD PARTY **MWJ / TAS** RIG **D-50**

Water Level, ft	<input type="text"/>	<input type="text"/>	<input type="text"/>
TIME	<input type="text"/>	<input type="text"/>	<input type="text"/>
DATE	<input type="text"/>	<input type="text"/>	<input type="text"/>

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO									
1	SS	0.0	1.5	3-3-6	.5					Gravel = 6 inches Topsoil = 12 inches		
2	SS	1.5	3.0	4-11-14	.75				CL	Silty clay, l. brown 5YR 6/4 and l. grey N7 mottled, dry to moist, v. stiff @ 3' trace moderate red 5R 4/6 silt @ 6' stiff, geofabric in spoon @ 7.5' v. stiff, wood debris @ 9' w/pale yellowish brown 10YR 6/2 fat clay, stiff		
3	SS	3.0	4.5	5-9-12	1.0							
4	SS	4.5	6.0	7-10-13	.92							
5	SS	6.0	7.5	4-6-9	1.08							
6	SS	7.5	9.0	4-8-12	1.5							
7	SS	9.0	10.5	2-3-7	1.33							
8	SS	10.5	12.0	2-4-9	1.5							
9	SS	12.0	13.5	4-5-7	1.33							
10	SS	13.5	15.0	3-5-9	1.5				SC	Clayey sand, moderate brown 5YR 4/4, moist, med. dense, w/l. grey N7 clay, fine grained, trace black N1 silt		
11	SS	15.0	16.5	3-4-7	1.5				ML	Clayey silt, moderate yellowish brown 10YR 5/4, moist, med. dense, some l. grey N7 fat clay @ 15' trace l. grey N7 fat clay		
12	SS	16.5	18.0	3-4-6	1.16							
13	SS	18.0	19.5	3-4-4	1.5							
14	SS	19.5	21.0	4-6-8	1.5				SP	Poorly graded sand, moderate yellowish brown 10YR 5/4, fine grained, moist, loose @ 18' v. fine to fine grained		

TYPE OF CASING USED

	NQ-2 ROCK CORE
	6" x 3.25 HSA
	9" x 6.25 HSA
	HW CASING ADVANCER 4"
	NW CASING 3"
	SW CASING 6"
	AIR HAMMER 8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC
 WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER **AMEC FOSTER WHEELER**

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1603I** DATE **4/27/16** SHEET **2** OF **4**

PROJECT **ROCKPORT PLANT**

BORING START **2/1/16** BORING FINISH **2/1/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
15	SS	21.0	22.5	2-2-3	1.42				SP	Poorly graded sand, grayish orange 10YR 7/4, moist, med. dense, fine grained, trace black N1 silt		
16	SS	22.5	24.0	1-3-4	1.5				SP	@ 21.5' 2" clay seam, moderate brown 5YR 4/4		
17	SS	24.0	25.5	4-7-8	.33					Poorly graded sand, moderate yellowish brown 10YR 5/4, moist, v. fine grained, loose		
18	SS	25.5	27.0	3-6-9	1.5		25			@ 22.8' 2.5" clayey silt seam (prev. material)		
19	SS	27.0	28.5	5-6-9	1.5					@ 23.6' 2" grayish orange 10YR 7/4 sand seam (prev. material)		
20	SS	28.5	30.0	4-7-12	1.5					@ 24' 3" shale fragment, med. l. grey N6		
21	SS	30.0	31.5	5-6-8	1.5				SP	@ 25.5' 2" shale fragments		
22	SS	31.5	33.0	5-6-10	1.5					Poorly graded sand, grayish orange 10YR 7/4, moist, med. dense, fine grained, trace black N1 silt		
23	SS	33.0	34.5	3-5-8	1.25					@ 26.6' 1" coarse sand seam, dark yellowish brown 10YR 4/2, w/rounded fine gravel, well graded		
24	SS	34.5	36.0	5-7-9	1.41				SW	@ 27.9' 2" coarse sand seam (prev. material)		
25	SS	36.0	37.5	6-5-7	1.25					@ 28.7' clay seam, 1.5" (prev. material)		
26	SS	37.5	39.0	2-3-7	1.33					@ 29.5' .5" coarse sand seam, moderate red 5R4/6, w/black N1 silt, poorly graded		
27	SS	39.0	40.5	6-8-8	1.41					@ 31.1' 1/4" coal fragments and black N1 silt		
28	SS	40.5	42.0	3-6-9	1.16				SW	@ 31.3' 1/4" coal fragment and black, N1 silt		
29	SS	42.0	43.5	5-8-8	1.25					Well graded sand, coarse grained, pale yellowish brown 10YR 6/2, moist, med. dense, trace black N1 silt		
30	SS	43.5	45.0	5-4-7	.83					@ 32.5' .5" coarse sand seam, moderate red (prev. material)		
31	SS	45.0	46.5	6-8-14	1.16				SW	@ 33' med. grained		
							35			@ 35 1/4" coal fragments		
							40			Poorly graded sand, moderate yellowish brown 10YR 5/4, moist to wet, med. dense, fine grained, some fine gravel, water in spoon		
										@ 36' fine to med. grained		
										@ 38.6' 2" coarse sand seam dark yellowish brown 10YR 4/2 w/black N1 silt (50%)		
									SP	Poorly graded sand, pale reddish brown 10R 5/4, fine grained, moist to wet, med. dense		
										@ 40' 1/4" coal fragments		
									SW	Well graded sand, moderate, yellowish brown 10YR 5/4, fine grained, moist to wet, med. dense, some fine gravel		
										@ 41' coarse sand seam, 3", d. yellowish brown 10YR 4/2, prev. material		
										@ 42.5' coarse sand seam, 3.5", d. yellowish brown 10YR 4/2, w/black N1 silt and fine gravel		
							45		SW	Well graded sand, d. yellowish brown 10YR 4/2, coarse grained, moist to wet, med. dense, with fine gravel		
										@ 43.8' trace coal fragments, angular		
										@ 44' no coal fragments		

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1603I** DATE **4/27/16** SHEET **3** OF **4**

PROJECT **ROCKPORT PLANT**

BORING START **2/1/16** BORING FINISH **2/1/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES	
		FROM	TO			%							
32	SS	46.5	48.0	13-10-18	1.33		50		SW	@ 45.5' some coarse gravel, rounded @ 45.7' .5" coal fragments @ 46' 1.5" coal fragments			
33	SS	48.0	49.5	9-14-19	1.41						Well graded sand, moderate yellowish brown 10YR 5/4, fine grained, moist to wet, med. dense, some fine gravel @ 46.9' 1.5" shale seam @ 47.6' 1" coal fragment and black N1 silt, angular @ 47.8' 1.5" rounded fine gravel, clean, poorly graded @ 48' 1" shale fragment @ 48.1' dense, poorly graded, trace fine gravel @ 49.5' w/fine gravel @ 51' well graded, med. dense		
34	SS	49.5	51.0	11-15-18	1.33						@ 52.5' trace shale fragments to 1.5"		
35	SS	51.0	52.5	6-9-16	1.41								
36	SS	52.5	54.0	7-14-21	1.41		55		SP	Poorly graded sand, med. grained, pale yellowish brown 10YR 6/2, moist to wet, dense, trace fine gravel			
37	SS	54.0	55.5	10-12-12	1.5								
38	SS	55.5	57.0	9-12-31	1.41						Well graded sand, pale yellowish brown 10YR 6/2, fine grained, moist to wet, med. dense, some fine gravel, trace coarse gravel @ 55.5' dense, no coarse gravel @ 57' med. dense @ 58' 2.5" shale seam, med. l. grey N6		
39	SS	57.0	58.5	10-10-15	1.16								
40	SS	58.5	60.0	8-10-15	1.5		60		SW	Well graded sand, l. olive grey 5Y 6/1, fine to med. grained, moist to wet, med. dense, with fine gravel (rounded) @ 61.5' fine grained @ 63' trace fine gravel @ 64.5' d. yellowish brown 10YR 4/2 @ 66' fine to med. grained, some fine gravel (rounded)			
41	SS	60.0	61.5	7-10-11	1.25								
42	SS	61.5	63.0	8-13-13	1.25								
43	SS	63.0	64.5	7-9-17	1.16								
44	SS	64.5	66.0	6-9-10	1.33		65						
45	SS	66.0	67.5	10-11-15	1.16								
46	SS	67.5	69.0	10-11-15	1.33						Well graded sand, d. yellowish brown 10YR 4/2, coarse grained, moist to wet, med. dense, with fine gravel		
47	SS	69.0	70.5	9-13-15	1.5								
48	SS	70.5	72.0	9-12-18	1.33		70		SP	Poorly graded sand, pale yellowish brown 10YR 6/2, fine grained, moist to wet, dense			

AEP_RK_BAP_CCR_COMPLIANCE.GPJ_AEP_GDT_4/27/16

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1603I**

DATE **4/27/16**

SHEET **4** OF **4**

PROJECT **ROCKPORT PLANT**

BORING START **2/1/16**

BORING FINISH **2/1/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES		
		FROM	TO			%								
49	SS	72.0	73.5	5-8-16	1.41		75			@ 72' med. dense @ 73' v. fine grained, moist @ 75.5' silty clay seam (~50%), moderate brown 5YR 3/4, moist, stiff to v. stiff @ 76.2' shale fragment, 3"				
50	SS	73.5	75.0	8-8-12	1.33									
51	SS	75.0	76.5	9-11-13	1.5									
52	SS	76.5	78.0	8-12-18	1.0								SW	Well graded sand, d. yellowish brown 10YR 4/2, coarse grained, moist to wet, dense, w/fine gavel, trace coarse gravel (rounded)
53	SS	78.0	79.5	21-21-15	.75									@ 78' 3.5" shale fragment @ 78.4' coarse gravel seam 3" @ 78.6' 3" shale fragment
54	SS	79.5	81.0	3-6-6	1.41								CH	Fat clay, l. grey N7, wet, stiff

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**
 COMPANY **INDIANA MICHIGAN POWER COMPANY**
 PROJECT **ROCKPORT PLANT**
 COORDINATES **N 152,802.7 E 514,206.9**
 GROUND ELEVATION **401.5** SYSTEM **State Plane using NAD27/29**

BORING NO. **MW-1603S** DATE **4/27/16** SHEET **1** OF **3**
 BORING START **2/3/16** BORING FINISH **2/3/16**
 PIEZOMETER TYPE _____ WELL TYPE **OW**
 HGT. RISER ABOVE GROUND **2.39** DIA **2.0**
 DEPTH TO TOP OF WELL SCREEN **38.2** BOTTOM **47.86**
 WELL DEVELOPMENT **YES** BACKFILL _____
 FIELD PARTY **MJW / TAS** RIG **D-50**

Water Level, ft	<input type="text"/>	<input type="text"/>	<input type="text"/>
TIME			
DATE			

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO									
1	SS	0.0	1.5	3-3-6	.5					Gravel = 6 inches Topsoil = 12 inches		
2	SS	1.5	3.0	4-11-14	.75				CL	Silty clay, l. brown 5YR 6/4 and l. grey N7 mottled, dry to moist, v. stiff @ 3' trace moderate red 5R 4/6 silt @ 6' stiff, geofabric in spoon @ 7.5' v. stiff, wood debris @ 9' w/pale yellowish brown 10YR 6/2 fat clay, stiff		
3	SS	3.0	4.5	5-9-12	1.0							
4	SS	4.5	6.0	7-10-13	.92							
5	SS	6.0	7.5	4-6-9	1.08							
6	SS	7.5	9.0	4-8-12	1.5							
7	SS	9.0	10.5	2-3-7	1.33							
8	SS	10.5	12.0	2-4-9	1.5							
9	SS	12.0	13.5	4-5-7	1.33							
10	SS	13.5	15.0	3-5-9	1.5				SC	Clayey sand, moderate brown 5YR 4/4, moist, med. dense, w/l. grey N7 clay, fine grained, trace black N1 silt		
11	SS	15.0	16.5	3-4-7	1.5				ML	Clayey silt, moderate yellowish brown 10YR 5/4, moist, med. dense, some l. grey N7 fat clay @ 15' trace l. grey N7 fat clay		
12	SS	16.5	18.0	3-4-6	1.16							
13	SS	18.0	19.5	3-4-4	1.5				SP	Poorly graded sand, moderate yellowish brown 10YR 5/4, fine grained, moist, loose @ 18' v. fine to fine grained		
14	SS	19.5	21.0	4-6-8	1.5							

TYPE OF CASING USED

	NQ-2 ROCK CORE
	6" x 3.25 HSA
	9" x 6.25 HSA
	HW CASING ADVANCER 4"
	NW CASING 3"
	SW CASING 6"
	AIR HAMMER 8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC
 WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER **AMEC FOSTER WHEELER**

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1603S** DATE **4/27/16** SHEET **2** OF **3**

PROJECT **ROCKPORT PLANT**

BORING START **2/3/16** BORING FINISH **2/3/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES	
		FROM	TO			%							
15	SS	21.0	22.5	2-2-3	1.42		25		SP	Poorly graded sand, grayish orange 10YR 7/4, moist, med. dense, fine grained, trace black N1 silt			
16	SS	22.5	24.0	1-3-4	1.5				SP	@ 21.5' 2" clay seam, moderate brown 5YR 4/4			
17	SS	24.0	25.5	4-7-8	.33		30			Poorly graded sand, moderate yellowish brown 10YR 5/4, moist, v. fine grained, loose			
18	SS	25.5	27.0	3-6-9	1.5						@ 22.8' 2.5" clayey silt seam (prev. material)		
19	SS	27.0	28.5	5-6-9	1.5						@ 23.6' 2" grayish orange 10YR 7/4 sand seam (prev. material)		
20	SS	28.5	30.0	4-7-12	1.5		35			@ 24' 3" shale fragment, med. l. grey N6			
21	SS	30.0	31.5	5-6-8	1.5						@ 25.5' 2" shale fragments		
22	SS	31.5	33.0	5-6-10	1.5		40		SW	Poorly graded sand, grayish orange 10YR 7/4, moist, med. dense, fine grained, trace black N1 silt			
23	SS	33.0	34.5	3-5-8	1.25						@ 26.6' 1" coarse sand seam, dark yellowish brown 10YR 4/2, w/rounded fine gravel, well graded		
24	SS	34.5	36.0	5-7-9	1.41						@ 27.9' 2" coarse sand seam (prev. material)		
25	SS	36.0	37.5	6-5-7	1.25		45			@ 28.7' clay seam, 1.5" (prev. material)			
26	SS	37.5	39.0	2-3-7	1.33						@ 29.5' .5" coarse sand seam, moderate red 5R4/6, w/black N1 silt, poorly graded		
27	SS	39.0	40.5	6-8-8	1.41				@ 31.1' 1/4" coal fragments and black N1 silt				
28	SS	40.5	42.0	3-6-9	1.16		45		SW	Well graded sand, coarse grained, pale yellowish brown 10YR 6/2, moist, med. dense, trace black N1 silt			
29	SS	42.0	43.5	5-8-8	1.25						@ 32.5' .5" coarse sand seam, moderate red (prev. material)		
30	SS	43.5	45.0	5-4-7	.83						@ 33' med. grained		
31	SS	45.0	46.5	6-8-14	1.16				@ 35 1/4" coal fragments				
									SP	Poorly graded sand, moderate yellowish brown 10YR 5/4, moist to wet, med. dense, fine grained, some fine gravel, water in spoon			
										@ 36' fine to med. grained			
									SP	Poorly graded sand, pale reddish brown 10R 5/4, fine grained, moist to wet, med. dense			
										@ 38.6' 2" coarse sand seam dark yellowish brown 10YR 4/2 w/black N1 silt (50%)			
									SW	Well graded sand, moderate, yellowish brown 10YR 5/4, fine grained, moist to wet, med. dense, some fine gravel			
										@ 40' 1/4" coal fragments			
										Well graded sand, moderate, yellowish brown 10YR 5/4, fine grained, moist to wet, med. dense, some fine gravel			
										@ 41' coarse sand seam, 3", d. yellowish brown 10YR 4/2, prev. material			
										@ 42.5' coarse sand seam, 3.5", d. yellowish brown 10YR 4/2, w/black N1 silt and fine gravel			
									SW	Well graded sand, d. yellowish brown 10YR 4/2, coarse grained, moist to wet, med. dense, with fine gravel			
										@ 43.8' trace coal fragments, angular			
										@ 44' no coal fragments			

Continued Next Page

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1603S** DATE **4/27/16** SHEET **3** OF **3**

PROJECT **ROCKPORT PLANT**

BORING START **2/3/16** BORING FINISH **2/3/16**







SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
32	SS	46.5	48.0	13-10-18	1.33				SW	@ 45.5' some coarse gravel, rounded @ 45.7' .5" coal fragments @ 46' 1.5" coal fragments		
33	SS	48.0	49.5	9-14-19	1.41					Well graded sand, moderate yellowish brown 10YR 5/4, fine grained, moist to wet, med. dense, some fine gravel @ 46.9' 1.5" shale seam @ 47.6' 1" coal fragment and black N1 silt, angular @ 47.8' 1.5" rounded fine gravel, clean, poorly graded @ 48' 1" shale fragment @ 48.1' dense, poorly graded, trace fine gravel @ 49.5' w/fine gravel @ 51' well graded, med. dense @ 52.5' trace shale fragments to 1.5"		

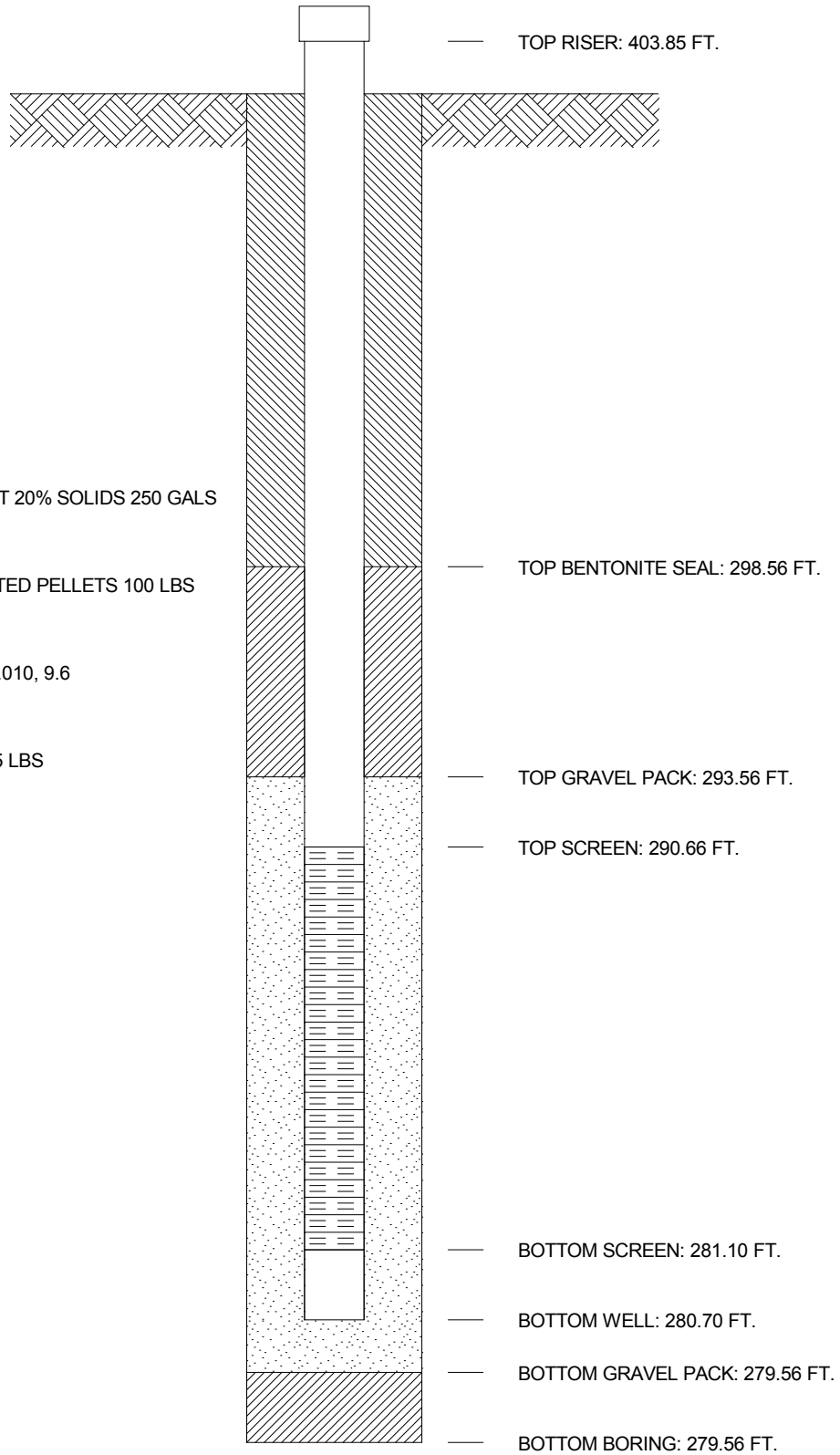
AMERICAN ELECTRIC POWER SERVICE CORPORATION
 AEP CIVIL ENGINEERING LABORATORY
 MONITORING WELL CONSTRUCTION



JOB NUMBER 42393125-01
 COMPANY INDIANA MICHIGAN POWER COMPANY WELL No. MW-1603D BORING No. MW-1603D INSTALLED 1/29/16
 PROJECT ROCKPORT PLANT
 COORDINATES N 152,811.9 E 514,207.5
 SYSTEM State Plane using NAD27/29

GROUND ELEVATION 401.56 FT.

-  GROUT SEAL: QUICK GROUT 20% SOLIDS 250 GALS
-  BENTONITE SEAL: 3/8" COATED PELLETS 100 LBS
-  SCREEN: 2.0 dia., SLOTTED .010, 9.6
-  GRAVEL PACK: #5 SAND 325 LBS
-  RISER PIPE: 2.0, dia., PVC
-  SPACERS, DEPTH:









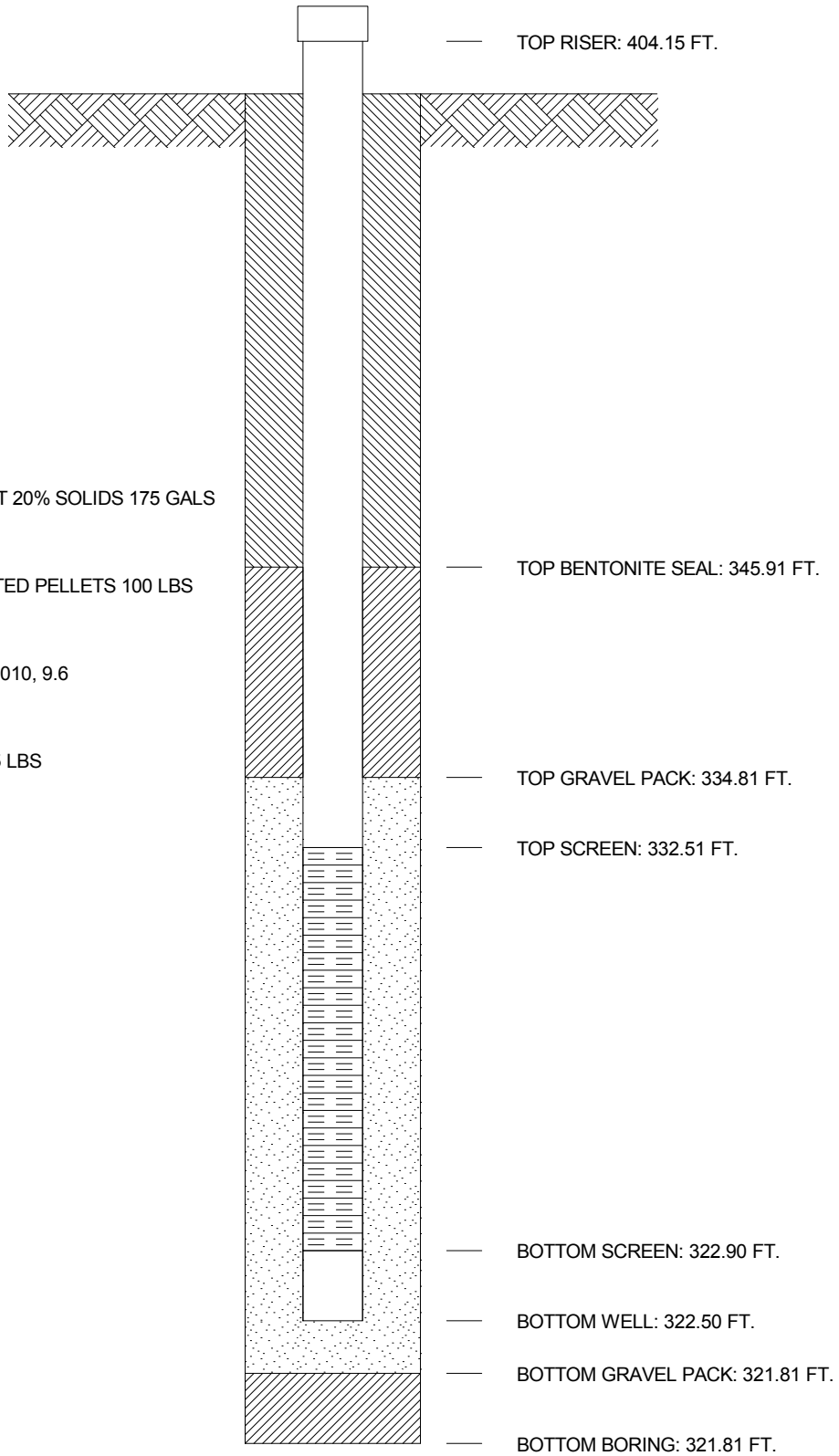
AMERICAN ELECTRIC POWER SERVICE CORPORATION
 AEP CIVIL ENGINEERING LABORATORY
 MONITORING WELL CONSTRUCTION



JOB NUMBER 42393125-01
 COMPANY INDIANA MICHIGAN POWER COMPANY WELL No. MW-1603I BORING No. MW-1603I INSTALLED 2/1/16
 PROJECT ROCKPORT PLANT
 COORDINATES N 152,807.3 E 519,207.2
 SYSTEM State Plane using NAD27/29

GROUND ELEVATION 401.41 FT.

-  GROUT SEAL: QUICK GROUT 20% SOLIDS 175 GALS
-  BENTONITE SEAL: 3/8" COATED PELLETS 100 LBS
-  SCREEN: 2.0 dia., SLOTTED .010, 9.6
-  GRAVEL PACK: #5 SAND 175 LBS
-  RISER PIPE: 2.0, dia., PVC
-  SPACERS, DEPTH:









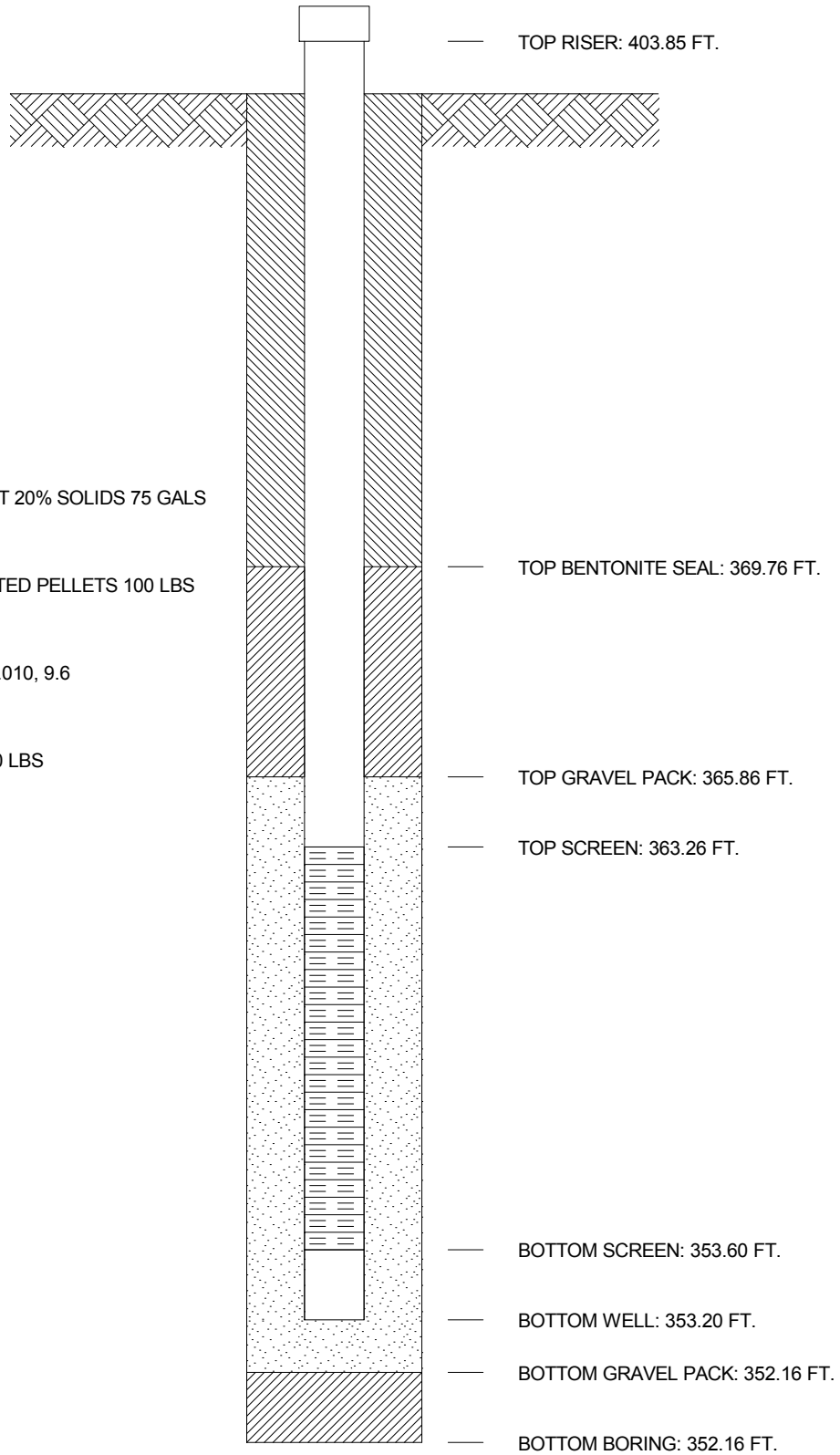
AMERICAN ELECTRIC POWER SERVICE CORPORATION
 AEP CIVIL ENGINEERING LABORATORY
 MONITORING WELL CONSTRUCTION



JOB NUMBER 42393125-01
 COMPANY INDIANA MICHIGAN POWER COMPANY WELL No. MW-1603S BORING No. MW-1603S INSTALLED 2/3/16
 PROJECT ROCKPORT PLANT
 COORDINATES N 152,802.7 E 514,206.9
 SYSTEM State Plane using NAD27/29

GROUND ELEVATION 401.46 FT.

-  GROUT SEAL: QUICK GROUT 20% SOLIDS 75 GALS
-  BENTONITE SEAL: 3/8" COATED PELLETS 100 LBS
-  SCREEN: 2.0 dia., SLOTTED .010, 9.6
-  GRAVEL PACK: #5 SAND 250 LBS
-  RISER PIPE: 2.0, dia., PVC
-  SPACERS, DEPTH:



AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**
 COMPANY **INDIANA MICHIGAN POWER COMPANY**
 PROJECT **ROCKPORT PLANT**
 COORDINATES **N 151,510.2 E 514,204.9**
 GROUND ELEVATION **399.9** SYSTEM **State Plane using NAD27/29**

BORING NO. **MW-1604D** DATE **4/27/16** SHEET **1** OF **6**
 BORING START **1/15/16** BORING FINISH **1/15/16**
 PIEZOMETER TYPE _____ WELL TYPE **OW**
 HGT. RISER ABOVE GROUND **2.59** DIA **2.0**
 DEPTH TO TOP OF WELL SCREEN **115.6** BOTTOM **125.15**
 WELL DEVELOPMENT **YES** BACKFILL _____
 FIELD PARTY **ZLR / REB** RIG **D-120**

Water Level, ft	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TIME			
DATE			

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO									
1	SS	0.0	1.5	17-29-28	.6					Surface gravel		
2	SS	1.5	3.0	8-10-10	1.0				CL	Lean silty clay, dark yellowish brown 10YR 4/2, dry to moist, v. stiff @ 3' trace black oxide nodules, some l. brown silt seams, hard		
3	SS	3.0	4.5	10-19-30	1.0							
4	SS	4.5	6.0	5-15-15	1.2		5					
5	SS	5.0	6.5	5-5-9	1.1							
6	SS	7.5	9.0	7-6-9	1.2				CL	Lean silty clay, dark yellowish brown 10YR 4/2, moist, stiff, some medium dark gray N4 silt seams @ 9' wood (~1")		
7	SS	9.0	10.5	6-5-9	1.2		10					
8	SS	10.0	11.5	4-2-3	1.3							
9	SS	12.0	13.5	5-5-7	1.5				CH	Fat clay, olive gray 5Y 4/1, moist, firm, trace black oxide nodules @ 12' stiff @ 13' some moderate yellowish brown 10YR 5/4 silty clay mottled		
10	SS	13.5	15.0	4-5-9	1.5				CH	Fat clay, medium dark gray N4, and silty lean clay, dark yellowish brown 10YR 4/2, mottled, moist, stiff @ 15' tools sunk / 1" spoon driven / material same, pp same, N value inferred @ 15.5' trace black oxide		
11	SS	15.0	16.5	5-6-5	1.0		15					
12	SS	16.5	18.0	2-3-5	1.5							
13	SS	18.0	19.5	3-4-7	1.5				CL ML	Lean silty clay, moderate yellowish brown 10YR 5/4, moist, firm to stiff, w/medium dark gray N4 fat clay seams (~15%)		
14	SS	19.5	21.0	2-3-4	1.4							

TYPE OF CASING USED

	NQ-2 ROCK CORE
	6" x 3.25 HSA
	9" x 6.25 HSA
	HW CASING ADVANCER 4"
	NW CASING 3"
	SW CASING 6"
	AIR HAMMER 8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC
 WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER **AMEC FOSTER WHEELER**

AEP_RK_BAP_CCR_COMPLIANCE.GPJ AEP.GDT 4/27/16

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1604D** DATE **4/27/16** SHEET **2** OF **6**

PROJECT **ROCKPORT PLANT**

BORING START **1/15/16** BORING FINISH **1/15/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
15	SS	21.0	22.5	4-4-4	1.5				ML	Clayey silt, moderate yellowish brown 10YR 5/4, moist, loose		
16	SS	22.5	24.0	2-3-3	1.5				SP	Fine grained sand, moderate yellowish brown 10YR 5/4, moist, loose, poorly graded @ 22.2' ~3" seam clayey silt, moderate yellowish brown 10YR 5/4, moist, loose @ 23.8' ~ 2" silt seam		
17	SS	24.0	25.5	1-1-2	1.0		25		ML	Sandy silt to silty sand, light brown 5YR 5/6, moist, v. loose		
18	SS	25.5	27.0	1-1-2	1.0							
19	SS	27.0	28.5	1-1-5	.83							
20	SS	28.5	30.0	1-5-7	.6				SP	Fine sand, dark yellowish orange 10YR 6/6, moist, loose, poorly graded @ 29' transitioning to moderate yellowish brown 10YR 5/4, moist, sample SS20 spilled		
21	SS	30.0	31.5	5-11-12	.8		30		SP	Fine sand, moderate yellowish brown 10YR 5/4, moist, med. dense, poorly graded @ 31.5' moist, dark yellowish brown 10YR 4/2, loose @ 33' v. loose, water in spoon, wet		
22	SS	31.5	33.0	2-4-3	1.1							
23	SS	33.0	34.5	4-1-3	.8							
24	SS	34.5	36.0	4-3-5	.7		35					
25	SS	36.0	37.5	10-6-9	1.5				SW	Coarse grained sand, dark yellowish brown 10YR 4/2, wet loose, well rounded fine gravel, well graded @ 36.5' v. stiff lean clay moderate yellowish brown 10YR 5/4 seam, higher N value likely due to clay, ~30% clay over last 12" longitudinally @ 38' clay seam @ 40' sand sample mostly washed out clay seam (lean clay, moderate yellowish brown 10YR 5/4, wet, v. stiff) ~50%		
26	SS	37.5	39.0	12-10-12	1.5							
27	SS	39.0	40.5	14-14-16	.6		40					
28	SS	40.5	42.0	5-12-19	1.5				SP	Medium grained sand, moderate yellowish brown 10YR 5/4, wet, dense, poorly graded, well rounded fine gravel @ 42' med dense, well rounded fine gravel		
29	SS	42.0	43.5	8-10-10	1.5							
30	SS	43.5	45.0	14-16-11	1.5							
31	SS	45.0	46.5	3-9-12	1.5		45		SW	Coarse grained sand, moderate yellowish brown 10YR 5/4, wet med. dense, w/well rounded fine gravel (to 1/2"), well graded		

Continued Next Page

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1604D** DATE **4/27/16** SHEET **3** OF **6**

PROJECT **ROCKPORT PLANT**

BORING START **1/15/16** BORING FINISH **1/15/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
32	SS	46.5	48.0	17-8-9	1.1							
33	SS	48.0	49.5	5-10-11	1.5							
34	SS	49.5	51.0	10-11-12	1.5		50		SP	Fine to med. grained sand, moderate yellowish brown 10YR 5/4, wet, med. dense, poorly graded, w/well rounded fine gravel @ 49.5' trace well rounded fine gravel @ 51' dense, moist @ 55.5' med. dense, transitioning to med. grain @ 57' w/well rounded fine to coarse gravel and rounded sandstone to ~1" @ 60' fully med. grained @ 61.5' w/well rounded fine to coarse gravel and rounded sandstone to 2" @ 63' fine to med. grain, well rounded fine gravel @ 67.5' trace black silt @ 70.5' mostly fine grained, no stone, wet @ 74.8' 1" seam, potential coal or slate, black N1, wet, coarse black N1 silt @ 75' back to fine to med. grain, trace small gravel (~1/4")		
35	SS	51.0	52.5	8-17-18	1.2							
36	SS	52.5	54.0	15-16-16	1.3							
37	SS	54.0	55.5	5-11-19	1.5							
38	SS	55.5	57.0	8-10-12	1.0		55					
39	SS	57.0	58.5	8-12-13	1.1							
40	SS	58.5	60.0	13-9-9	1.1							
41	SS	60.0	61.5	12-9-14	.8		60					
42	SS	61.5	63.0	10-10-11	.8							
43	SS	63.0	64.5	6-10-11	.8							
44	SS	64.5	66.0	7-9-13	1.0		65					
45	SS	66.0	67.5	7-10-16	.7							
46	SS	67.5	69.0	9-10-13	.8							
47	SS	69.0	70.5	8-12-14	.8							
48	SS	70.5	72.0	9-9-12	1.0		70					

AEP RK BAP CCR COMPLIANCE.GPJ_AEP.GDT 4/27/16

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1604D** DATE **4/27/16** SHEET **4** OF **6**

PROJECT **ROCKPORT PLANT**

BORING START **1/15/16** BORING FINISH **1/15/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
49	SS	72.0	73.5	7-10-13	1.0							
50	SS	73.5	75.0	6-10-20	1.3							
51	SS	75.0	76.5	11-13-17	1.2		75					
52	SS	76.5	78.0	8-29-47	.8							
53	SS	78.0	79.5	16-23-19	1.0				SP	Coarse sand with gravel (~50%) to 15", moderate yellowish brown 10YR 5/4, moist, v. dense, well graded @ 78' fine gravel, dense		
54	SS	79.5	81.0	10-13-19	1.5		80					
55	SS	81.0	82.5	7-13-18	1.0				SP	Fine grained sand, moderate yellowish brown 10YR 5/4 to dark yellowish brown 10YR 4/2, moist, dense, trace fine gravel, poorly graded @ 81' moist to wet, no gravel @ 82.5' med. dense, trace gravel @ 84' dense, no gravel @ 85.5' med. dense		
56	SS	82.5	84.0	6-12-17	.9							
57	SS	84.0	85.5	10-16-20	.8		85					
58	SS	85.5	87.0	11-11-17	1.2							
59	SS	87.0	88.5	12-15-13	1.3				CL ML	Lean silty clay, dark yellowish brown 10YR 4/2 to medium dark gray N4, moist to wet, v. stiff, w/sand @ 87.2' fine grained sand, moist med. dense, poorly graded		
60	SS	88.5	90.0	11-8-10	1.3				CL ML	Lean silty clay, dark yellowish brown 10YR 4/2 to medium dark gray N4, moist to wet, v. stiff, w/sand		
61	SS	90.0	91.5	7-6-14	1.2		90		SP	Fine grained sand, dark yellowish brown 10YR 4/2, wet, med. dense, poorly graded		
62	SS	91.5	93.0	6-12-9	1.5				CL ML	Lean silty clay, dark yellowish brown 10YR 4/2, moist to wet, v. stiff, w/sand @ 92.3' 5" sand seam (prev material) @ 93.5' 4" sand seam (prev material)		
63	SS	93.0	94.5	7-6-16	1.3							
64	SS	94.5	96.0	9-11-12	1.5		95					
65	SS	96.0	97.5	9-8-9	.8				SP	Fine grained sand, dark yellowish brown 10YR 4/2, wet, med. dense, poorly graded, trace pea gravel		
66	SS	97.5	99.0	13-13-14	.8				SW	Coarse sand and gravel, dark yellowish brown 10YR 4/2, moist to wet, med. dense, well graded, gravel to 1.5"		

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1604D** DATE **4/27/16** SHEET **5** OF **6**

PROJECT **ROCKPORT PLANT**

BORING START **1/15/16** BORING FINISH **1/15/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
67	SS	99.0	100.5	13-21-15	1.0		100					
68	SS	100.5	102.0	5-8-12	1.3			SP	Shale, medium dark gray N4, moist, v. stiff to hard, dark yellowish brown 10YR 4/2 w/sand			
69	SS	102.0	103.5	9-13-13	1.1				Fine grained sand, dark yellowish brown 10YR 4/2, v. moist med. dense			
70	SS	103.5	105.0	5-3-8	1.4			SC	Clayey sand, fine grained, dark yellowish brown 10YR 4/2, wet, loose			
71	SS	105.0	106.5	7-11-17	1.4		105					
72	SS	106.5	108.0	10-15-15	1.3			SP	Very fine grain sand, moderate yellowish brown 10YR 5/4, moist to wet, med. dense, poorly graded			
73	SS	108.0	109.5	6-11-18	1.3				Fine to med. grained sand, moderate yellowish brown 10YR 5/4 to medium dark gray N4, moist to wet, med. dense, poorly graded			
74	SS	109.5	111.0	9-17-18	1.2		110		@ 100' dense @ 111' trace rock to 1.5" @ 112.5' no stone @ 114' med. dense @ 115.5' loose, moist to wet @ 117' med. dense @ 118.5' d. grey, w/black silt @ 120' trace gravel to 1/4", dense @ 121.5' med. dense @ 123' wet, dense			
75	SS	111.0	112.5	8-17-24	1.2							
76	SS	112.5	114.0	14-23-23	1.3							
77	SS	114.0	115.5	6-7-10	1.3							
78	SS	115.5	117.0	5-5-5	1.3		115					
79	SS	117.0	118.5	5-5-6	1.4							
80	SS	118.5	120.0	6-9-15	1.3							
81	SS	120.0	121.5	8-15-20	1.5		120					
82	SS	121.5	123.0	8-10-17	1.5							
83	SS	123.0	124.5	7-12-38	1.5							

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1604D** DATE **4/27/16** SHEET **6** OF **6**

PROJECT **ROCKPORT PLANT**

BORING START **1/15/16** BORING FINISH **1/15/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
84	SS	124.5	126.0	10-13-35	1.4		125			Coarse sand, medium dark gray N4, moist to wet, dense, with gravel moist to wet graded @ 125.3' 2" coal seam (black, dry, coarse) Shale, medium dark gray N4, dry, hard TOR @ 125.8' Spoon refusal @ 126.6' BT @ 126.6'		
85	SS	126.0	127.5	37-50/2	.5							

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**
 COMPANY **INDIANA MICHIGAN POWER COMPANY**
 PROJECT **ROCKPORT PLANT**
 COORDINATES **N 151,506.5 E 514,201.0**
 GROUND ELEVATION **399.7** SYSTEM **State Plane using NAD27/29**

BORING NO. **MW-1604I** DATE **4/27/16** SHEET **1** OF **4**
 BORING START **1/28/16** BORING FINISH **1/28/16**
 PIEZOMETER TYPE _____ WELL TYPE **OW**
 HGT. RISER ABOVE GROUND **2.45** DIA **2.0**
 DEPTH TO TOP OF WELL SCREEN **69** BOTTOM **78.64**
 WELL DEVELOPMENT **YES** BACKFILL _____
 FIELD PARTY **MWJ / TAS** RIG **D-50**

Water Level, ft	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TIME			
DATE			

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO									
1	SS	0.0	1.5	17-29-28	.6					Surface gravel		
2	SS	1.5	3.0	8-10-10	1.0				CL	Lean silty clay, dark yellowish brown 10YR 4/2, dry to moist, v. stiff @ 3' trace black oxide nodules, some l. brown silt seams, hard		
3	SS	3.0	4.5	10-19-30	1.0							
4	SS	4.5	6.0	5-15-15	1.2		5					
5	SS	5.0	6.5	5-5-9	1.1							
6	SS	7.5	9.0	7-6-9	1.2				CL	Lean silty clay, dark yellowish brown 10YR 4/2, moist, stiff, some medium dark gray N4 silt seams @ 9' wood (~1")		
7	SS	9.0	10.5	6-5-9	1.2		10					
8	SS	10.0	11.5	4-2-3	1.3							
9	SS	12.0	13.5	5-5-7	1.5				CH	Fat clay, olive gray 5Y 4/1, moist, firm, trace black oxide nodules @ 12' stiff @ 13' some moderate yellowish brown 10YR 5/4 silty clay mottled		
10	SS	13.5	15.0	4-5-9	1.5				CH	Fat clay, medium dark gray N4, and silty lean clay, dark yellowish brown 10YR 4/2, mottled, moist, stiff @ 15' tools sunk / 1" spoon driven / material same, pp same, N value inferred @ 15.5' trace black oxide		
11	SS	15.0	16.5	5-6-5	1.0		15					
12	SS	16.5	18.0	2-3-5	1.5							
13	SS	18.0	19.5	3-4-7	1.5				CL ML	Lean silty clay, moderate yellowish brown 10YR 5/4, moist, firm to stiff, w/medium dark gray N4 fat clay seams (~15%)		
14	SS	19.5	21.0	2-3-4	1.4							

TYPE OF CASING USED

	NQ-2 ROCK CORE
	6" x 3.25 HSA
	9" x 6.25 HSA
	HW CASING ADVANCER 4"
	NW CASING 3"
	SW CASING 6"
	AIR HAMMER 8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC
 WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER **AMEC FOSTER WHEELER**

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1604I** DATE **4/27/16** SHEET **2** OF **4**

PROJECT **ROCKPORT PLANT**

BORING START **1/28/16** BORING FINISH **1/28/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
15	SS	21.0	22.5	4-4-4	1.5				ML	Clayey silt, moderate yellowish brown 10YR 5/4, moist, loose		
16	SS	22.5	24.0	2-3-3	1.5				SP	Fine grained sand, moderate yellowish brown 10YR 5/4, moist, loose, poorly graded @ 22.2' ~3" seam clayey silt, moderate yellowish brown 10YR 5/4, moist, loose @ 23.8' ~ 2" silt seam		
17	SS	24.0	25.5	1-1-2	1.0		25		ML	Sandy silt to silty sand, light brown 5YR 5/6, moist, v. loose		
18	SS	25.5	27.0	1-1-2	1.0							
19	SS	27.0	28.5	1-1-5	.83							
20	SS	28.5	30.0	1-5-7	.6				SP	Fine sand, dark yellowish orange 10YR 6/6, moist, loose, poorly graded @ 29' transitioning to moderate yellowish brown 10YR 5/4, moist, sample SS20 spilled		
21	SS	30.0	31.5	5-11-12	.8		30		SP	Fine sand, moderate yellowish brown 10YR 5/4, moist, med. dense, poorly graded @ 31.5' moist, dark yellowish brown 10YR 4/2, loose @ 33' v. loose, water in spoon, wet		
22	SS	31.5	33.0	2-4-3	1.1							
23	SS	33.0	34.5	4-1-3	.8							
24	SS	34.5	36.0	4-3-5	.7		35					
25	SS	36.0	37.5	10-6-9	1.5				SW	Coarse grained sand, dark yellowish brown 10YR 4/2, wet loose, well rounded fine gravel, well graded @ 36.5' v. stiff lean clay moderate yellowish brown 10YR 5/4 seam, higher N value likely due to clay, ~30% clay over last 12" longitudinally @ 38' clay seam @ 40' sand sample mostly washed out clay seam (lean clay, moderate yellowish brown 10YR 5/4, wet, v. stiff) ~50%		
26	SS	37.5	39.0	12-10-12	1.5							
27	SS	39.0	40.5	14-14-16	.6		40					
28	SS	40.5	42.0	5-12-19	1.5				SP	Medium grained sand, moderate yellowish brown 10YR 5/4, wet, dense, poorly graded, well rounded fine gravel @ 42' med dense, well rounded fine gravel		
29	SS	42.0	43.5	8-10-10	1.5							
30	SS	43.5	45.0	14-16-11	1.5							
31	SS	45.0	46.5	3-9-12	1.5		45		SW	Coarse grained sand, moderate yellowish brown 10YR 5/4, wet med. dense, w/well rounded fine gravel (to 1/2"), well graded		

Continued Next Page

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1604I** DATE **4/27/16** SHEET **3** OF **4**

PROJECT **ROCKPORT PLANT**

BORING START **1/28/16** BORING FINISH **1/28/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
32	SS	46.5	48.0	17-8-9	1.1							
33	SS	48.0	49.5	5-10-11	1.5							
34	SS	49.5	51.0	10-11-12	1.5		50		SP	Fine to med. grained sand, moderate yellowish brown 10YR 5/4, wet, med. dense, poorly graded, w/well rounded fine gravel @ 49.5' trace well rounded fine gravel @ 51' dense, moist @ 55.5' med. dense, transitioning to med. grain @ 57' w/well rounded fine to coarse gravel and rounded sandstone to ~1" @ 60' fully med. grained @ 61.5' w/well rounded fine to coarse gravel and rounded sandstone to 2" @ 63' fine to med. grain, well rounded fine gravel @ 67.5' trace black silt @ 70.5' mostly fine grained, no stone, wet @ 74.8' 1" seam, potential coal or slate, black N1, wet, coarse black N1 silt @ 75' back to fine to med. grain, trace small gravel (~1/4")		
35	SS	51.0	52.5	8-17-18	1.2							
36	SS	52.5	54.0	15-16-16	1.3							
37	SS	54.0	55.5	5-11-19	1.5							
38	SS	55.5	57.0	8-10-12	1.0		55					
39	SS	57.0	58.5	8-12-13	1.1							
40	SS	58.5	60.0	13-9-9	1.1							
41	SS	60.0	61.5	12-9-14	.8		60					
42	SS	61.5	63.0	10-10-11	.8							
43	SS	63.0	64.5	6-10-11	.8							
44	SS	64.5	66.0	7-9-13	1.0		65					
45	SS	66.0	67.5	7-10-16	.7							
46	SS	67.5	69.0	9-10-13	.8							
47	SS	69.0	70.5	8-12-14	.8							
48	SS	70.5	72.0	9-9-12	1.0		70					

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1604I**

DATE **4/27/16**

SHEET **4** OF **4**

PROJECT **ROCKPORT PLANT**

BORING START **1/28/16**

BORING FINISH **1/28/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
49	SS	72.0	73.5	7-10-13	1.0		75					
50	SS	73.5	75.0	6-10-20	1.3							
51	SS	75.0	76.5	11-13-17	1.2							
52	SS	76.5	78.0	8-29-47	.8							
53	SS	78.0	79.5	16-23-19	1.0							
									SP	Coarse sand with gravel (~50%) to 15", moderate yellowish brown 10YR 5/4, moist, v. dense, well graded @ 78' fine gravel, dense		

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**
 COMPANY **INDIANA MICHIGAN POWER COMPANY**
 PROJECT **ROCKPORT PLANT**
 COORDINATES **N 151,503.1 E 514,197.3**
 GROUND ELEVATION **399.8** SYSTEM **State Plane using NAD27/29**

BORING NO. **MW-1604S** DATE **4/27/16** SHEET **1** OF **3**
 BORING START **1/29/16** BORING FINISH **1/29/16**
 PIEZOMETER TYPE _____ WELL TYPE **OW**
 HGT. RISER ABOVE GROUND **2.70** DIA **2.0**
 DEPTH TO TOP OF WELL SCREEN **36.7** BOTTOM **46.26**
 WELL DEVELOPMENT **YES** BACKFILL _____
 FIELD PARTY **MWJ / TAS** RIG **D-50**

Water Level, ft	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TIME			
DATE			

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO									
1	SS	0.0	1.5	17-29-28	.6					Surface gravel		
2	SS	1.5	3.0	8-10-10	1.0				CL	Lean silty clay, dark yellowish brown 10YR 4/2, dry to moist, v. stiff @ 3' trace black oxide nodules, some l. brown silt seams, hard		
3	SS	3.0	4.5	10-19-30	1.0							
4	SS	4.5	6.0	5-15-15	1.2		5					
5	SS	5.0	6.5	5-5-9	1.1							
6	SS	7.5	9.0	7-6-9	1.2				CL	Lean silty clay, dark yellowish brown 10YR 4/2, moist, stiff, some medium dark gray N4 silt seams @ 9' wood (~1")		
7	SS	9.0	10.5	6-5-9	1.2		10					
8	SS	10.0	11.5	4-2-3	1.3							
9	SS	12.0	13.5	5-5-7	1.5				CH	Fat clay, olive gray 5Y 4/1, moist, firm, trace black oxide nodules @ 12' stiff @ 13' some moderate yellowish brown 10YR 5/4 silty clay mottled		
10	SS	13.5	15.0	4-5-9	1.5				CH	Fat clay, medium dark gray N4, and silty lean clay, dark yellowish brown 10YR 4/2, mottled, moist, stiff @ 15' tools sunk / 1" spoon driven / material same, pp same, N value inferred @ 15.5' trace black oxide		
11	SS	15.0	16.5	5-6-5	1.0		15					
12	SS	16.5	18.0	2-3-5	1.5							
13	SS	18.0	19.5	3-4-7	1.5				CL ML	Lean silty clay, moderate yellowish brown 10YR 5/4, moist, firm to stiff, w/medium dark gray N4 fat clay seams (~15%)		
14	SS	19.5	21.0	2-3-4	1.4							

TYPE OF CASING USED

	NQ-2 ROCK CORE
	6" x 3.25 HSA
	9" x 6.25 HSA
	HW CASING ADVANCER 4"
	NW CASING 3"
	SW CASING 6"
	AIR HAMMER 8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC
 WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER **AMEC FOSTER WHEELER**

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1604S** DATE **4/27/16** SHEET **2** OF **3**

PROJECT **ROCKPORT PLANT**

BORING START **1/29/16** BORING FINISH **1/29/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
15	SS	21.0	22.5	4-4-4	1.5				ML	Clayey silt, moderate yellowish brown 10YR 5/4, moist, loose		
16	SS	22.5	24.0	2-3-3	1.5				SP	Fine grained sand, moderate yellowish brown 10YR 5/4, moist, loose, poorly graded @ 22.2' ~3" seam clayey silt, moderate yellowish brown 10YR 5/4, moist, loose @ 23.8' ~ 2" silt seam		
17	SS	24.0	25.5	1-1-2	1.0		25		ML	Sandy silt to silty sand, light brown 5YR 5/6, moist, v. loose		
18	SS	25.5	27.0	1-1-2	1.0							
19	SS	27.0	28.5	1-1-5	.83							
20	SS	28.5	30.0	1-5-7	.6				SP	Fine sand, dark yellowish orange 10YR 6/6, moist, loose, poorly graded @ 29' transitioning to moderate yellowish brown 10YR 5/4, moist, sample SS20 spilled		
21	SS	30.0	31.5	5-11-12	.8		30		SP	Fine sand, moderate yellowish brown 10YR 5/4, moist, med. dense, poorly graded @ 31.5' moist, dark yellowish brown 10YR 4/2, loose @ 33' v. loose, water in spoon, wet		
22	SS	31.5	33.0	2-4-3	1.1							
23	SS	33.0	34.5	4-1-3	.8							
24	SS	34.5	36.0	4-3-5	.7		35					
25	SS	36.0	37.5	10-6-9	1.5				SW	Coarse grained sand, dark yellowish brown 10YR 4/2, wet loose, well rounded fine gravel, well graded @ 36.5' v. stiff lean clay moderate yellowish brown 10YR 5/4 seam, higher N value likely due to clay, ~30% clay over last 12" longitudinally @ 38' clay seam @ 40' sand sample mostly washed out clay seam (lean clay, moderate yellowish brown 10YR 5/4, wet, v. stiff) ~50%		
26	SS	37.5	39.0	12-10-12	1.5							
27	SS	39.0	40.5	14-14-16	.6		40					
28	SS	40.5	42.0	5-12-19	1.5				SP	Medium grained sand, moderate yellowish brown 10YR 5/4, wet, dense, poorly graded, well rounded fine gravel @ 42' med dense, well rounded fine gravel		
29	SS	42.0	43.5	8-10-10	1.5							
30	SS	43.5	45.0	14-16-11	1.5							
31	SS	45.0	46.5	3-9-12	1.5		45		SW	Coarse grained sand, moderate yellowish brown 10YR 5/4, wet med. dense, w/well rounded fine gravel (to 1/2"), well graded		

Continued Next Page

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1604S** DATE **4/27/16** SHEET **3** OF **3**

PROJECT **ROCKPORT PLANT**

BORING START **1/29/16** BORING FINISH **1/29/16**







SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
32	SS	46.5	48.0	17-8-9	1.1							

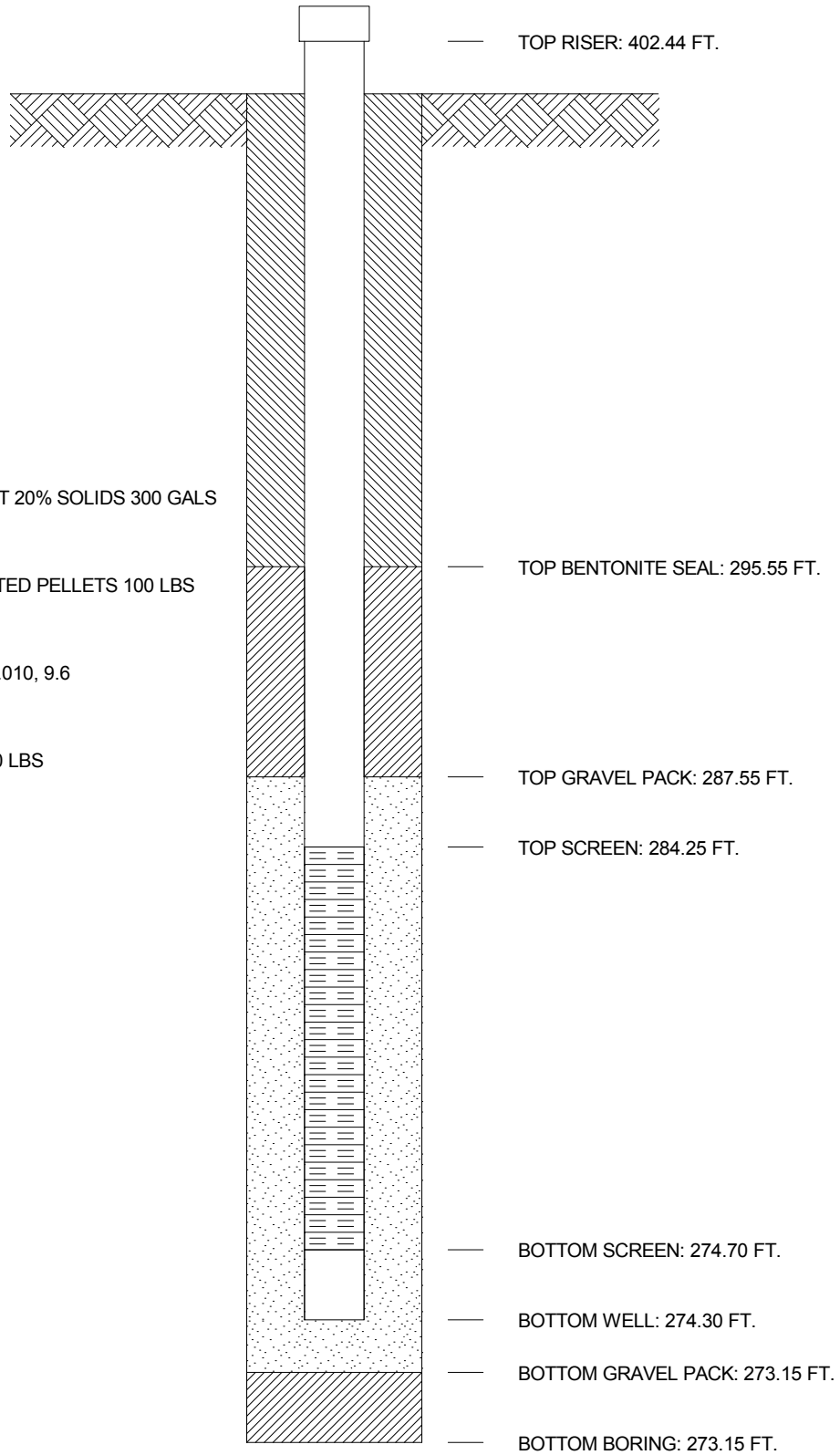
AMERICAN ELECTRIC POWER SERVICE CORPORATION
 AEP CIVIL ENGINEERING LABORATORY
 MONITORING WELL CONSTRUCTION



JOB NUMBER 42393125-01
 COMPANY INDIANA MICHIGAN POWER COMPANY WELL No. MW-1604D BORING No. MW-1604D INSTALLED 1/15/16
 PROJECT ROCKPORT PLANT
 COORDINATES N 151,510.2 E 514,204.9
 SYSTEM State Plane using NAD27/29

GROUND ELEVATION 399.85 FT.

-  GROUT SEAL: QUICK GROUT 20% SOLIDS 300 GALS
-  BENTONITE SEAL: 3/8" COATED PELLETS 100 LBS
-  SCREEN: 2.0 dia., SLOTTED .010, 9.6
-  GRAVEL PACK: #5 SAND 200 LBS
-  RISER PIPE: 2.0, dia., PVC
-  SPACERS, DEPTH:



AMERICAN ELECTRIC POWER SERVICE CORPORATION
 AEP CIVIL ENGINEERING LABORATORY
 MONITORING WELL CONSTRUCTION



JOB NUMBER 42393125-01

COMPANY INDIANA MICHIGAN POWER COMPANY

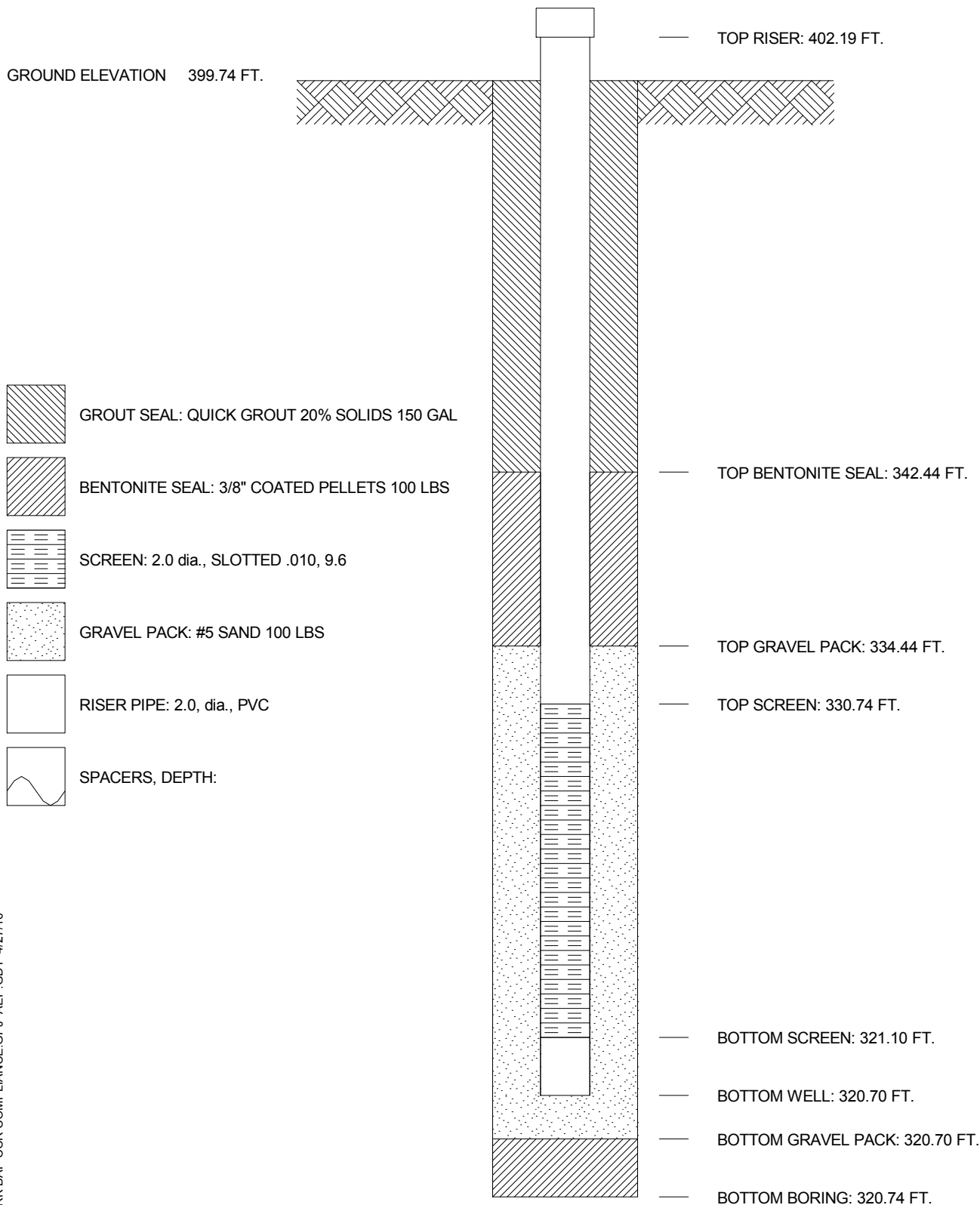
WELL No. MW-1604I BORING No. MW-1604I INSTALLED 1/28/16







PROJECT ROCKPORT PLANT

COORDINATES N 151,506.5 E 514,201.0

SYSTEM State Plane using NAD27/29

GROUND ELEVATION 399.74 FT.









-  GROUT SEAL: QUICK GROUT 20% SOLIDS 150 GAL
-  BENTONITE SEAL: 3/8" COATED PELLETS 100 LBS
-  SCREEN: 2.0 dia., SLOTTED .010, 9.6
-  GRAVEL PACK: #5 SAND 100 LBS
-  RISER PIPE: 2.0, dia., PVC
-  SPACERS, DEPTH:

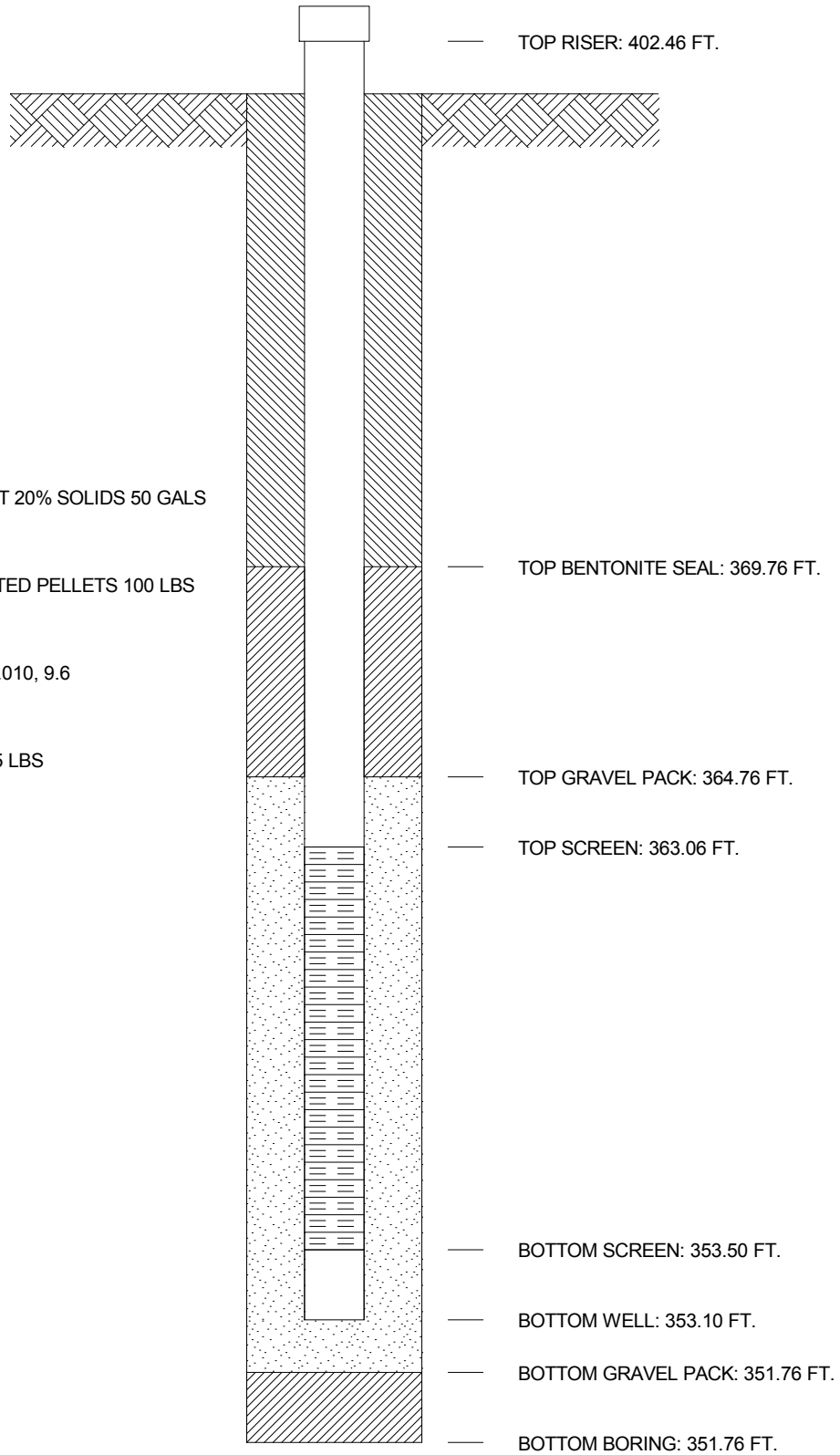
AMERICAN ELECTRIC POWER SERVICE CORPORATION
 AEP CIVIL ENGINEERING LABORATORY
 MONITORING WELL CONSTRUCTION



JOB NUMBER 42393125-01
 COMPANY INDIANA MICHIGAN POWER COMPANY WELL No. MW-1604S BORING No. MW-1604S INSTALLED 1/29/16
 PROJECT ROCKPORT PLANT
 COORDINATES N 151,503.1 E 514,197.3
 SYSTEM State Plane using NAD27/29

GROUND ELEVATION 399.76 FT.

-  GROUT SEAL: QUICK GROUT 20% SOLIDS 50 GALS
-  BENTONITE SEAL: 3/8" COATED PELLETS 100 LBS
-  SCREEN: 2.0 dia., SLOTTED .010, 9.6
-  GRAVEL PACK: #5 SAND 275 LBS
-  RISER PIPE: 2.0, dia., PVC
-  SPACERS, DEPTH:



AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
LOG OF BORING



JOB NUMBER **42393125-01**
 COMPANY **INDIANA MICHIGAN POWER COMPANY**
 PROJECT **ROCKPORT PLANT**
 COORDINATES **N 151,478.9 E 513,537.1**
 GROUND ELEVATION **400.4** SYSTEM **State Plane using NAD27/29**

BORING NO. **MW-1605D** DATE **4/27/16** SHEET **1** OF **6**
 BORING START **2/3/16** BORING FINISH **2/3/16**
 PIEZOMETER TYPE _____ WELL TYPE **OW**
 HGT. RISER ABOVE GROUND **3.36** DIA **2.0**
 DEPTH TO TOP OF WELL SCREEN **114.6** BOTTOM **124.22**
 WELL DEVELOPMENT **YES** BACKFILL _____
 FIELD PARTY **ZLR / REB** RIG **D-50**

Water Level, ft	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TIME			
DATE			

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO									
1	SS	0.0	1.5	20-13-10	1.25				CL	Gravel = 6 inches		
2	SS	1.5	3.0	5-15-18	1.25				CL	Silty clay, moderate yellowish brown 10R 5/4 and med l. grey N6 mottled, moist, v. stiff @ 1.5' hard @ 3' v. stiff		
3	SS	3.0	4.5	7-9-15	1.41							
4	SS	4.5	6.0	11-12-14	1.5		5					
5	SS	6.0	7.5	4-8-11	1.41							
6	SS	7.5	9.0	3-6-11	1.33				ML	Clayey silt, medium grey N5, moist, med. dense, w/mod. yellowish brown 10R 5/4 silty clay mottled		
7	SS	9.0	10.5	3-4-7	1.41		10		CL	Silty clay, mod. yellowish brown 10R 5/4, moist, stiff, w/mod. grey N5 clayey silt mottled		
8	SS	10.5	12.0	3-4-6	1.5							
9	SS	12.0	13.5	2-2-4	1.5				CH	Fat to lean clay, med. l. grey N6, moist, firm		
10	SS	13.5	15.0	2-2-5	1.41							
11	SS	15.0	16.5	2-4-5	1.5		15		CL ML	Silty clay, mod. reddish brown 10R 4/6 w/mod. l. grey N6 fat clay heavily mottled, moist, firm @ 15' stiff @ 15.5' l" shale fragment, angular @ 18' very silty @ 20' trace to some pale yellowish brown 10YR 6/2 silt		
12	SS	16.5	18.0	3-5-9	1.5							
13	SS	18.0	19.5	3-6-8	1.41							
14	SS	19.5	21.0	3-5-7	1.41							

TYPE OF CASING USED

	NQ-2 ROCK CORE
	6" x 3.25 HSA
	9" x 6.25 HSA
	HW CASING ADVANCER 4"
	NW CASING 3"
	SW CASING 6"
	AIR HAMMER 8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC
 WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER **AMEC FOSTER WHEELER**

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1605D** DATE **4/27/16** SHEET **2** OF **6**

PROJECT **ROCKPORT PLANT**

BORING START **2/3/16** BORING FINISH **2/3/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
15	SS	21.0	22.5	3-4-7	1.5				ML	Clayey silt, pale yellowish brown 10YR 6/2, moist, med. dense, w/silty clay (prev. material), trace sand		
16	SS	22.5	24.0	4-4-5	1.5				SP	Poorly graded sand, v. fine to fine grained, l. brown 5YR 5/6, moist, loose @ 23.2' 2" clayey silt seam (prev. material)		
17	SS	24.0	25.5	1-1-3	1.5		25		ML	Clayey silt, pale yellowish brown 10YR 6/2, moist to wet, v. loose @ 25' 2" l. brown sand seam (prev. material) @ 26' 2" l. brown sand seam @ 26.4' 15" l. brown sand seam @ 26.8' 1" l. brown sand seam @ 27' loose @ 28' 2" l. brown sand seam		
18	SS	25.5	27.0	1-1-1	1.5				SP	Poorly graded sand, fine grained, l. brown 5YR 5/6, moist, med. dense @ 30' d. yellowish orange 10YR 6/6 @ 31' 3" clayey silt seam (prev. material) @ 32.3' trace fine gravel and black silt @ 32.5' no fine gravel or silt @ 33' moist, loose @ 34.1' 2" clayey silt seam (prev. material) @ 34.5' moist to wet, water in spoon @ 34.9' 2.5' clayey silt seam (prev. material)		
19	SS	27.0	28.5	2-1-4	1.5				SW	Well graded sand, fine grained, l. brown 5YR 5/6, moist to wet, med. dense, w/fine gravel		
20	SS	28.5	30.0	5-6-7	1.33				SW	Well graded sand, coarse grained, grayish black N2, moist to wet, med. dense, trace fine gravel		
21	SS	30.0	31.5	3-5-7	1.25		30		SP	Poorly graded sand, v. fine grained, l. brown 5YR 5/6, moist to wet, med. dense		
22	SS	31.5	33.0	5-7-8	1.5				SP	Well graded sand, fine to med. grained, moderate yellowish brown 10YR 5/4, moist to wet, loose @ 40.5' med. dense @ 41' 1.5" shale seam w/clay		
23	SS	33.0	34.5	3-3-6	1.41				SW	Poorly graded sand, v. fine to fine grained, mod. yellowish brown 10YR 5/4, moist to wet, med. dense		
24	SS	34.5	36.0	2-4-5	1.5		35		SW	Well graded sand, med. grained, mod. reddish brown 10R 4/6, moist to wet, med. dense @ 44' med. to coarse grained		
25	SS	36.0	37.5	2-4-6	1.33				SP	Poorly graded sand, fine grained, mod. yellowish brown 10YR 5/4, moist to wet, med. dense		
26	SS	37.5	39.0	4-3-8	1.5				SW	Well graded sand, med. grained, mod. reddish brown 10R 4/6, moist to wet, med. dense @ 44' med. to coarse grained		
27	SS	39.0	40.5	3-3-5	1.5		40		SP	Poorly graded sand, fine grained, mod. yellowish		
28	SS	40.5	42.0	11-8-10	1.25				SW	Well graded sand, med. grained, mod. reddish brown 10R 4/6, moist to wet, med. dense @ 44' med. to coarse grained		
29	SS	42.0	43.5	4-5-11	1.5				SP	Poorly graded sand, fine grained, mod. yellowish		
30	SS	43.5	45.0	8-9-9	1.16				SW	Well graded sand, med. grained, mod. reddish brown 10R 4/6, moist to wet, med. dense @ 44' med. to coarse grained		
31	SS	45.0	46.5	6-9-14	1.5		45		SP	Poorly graded sand, fine grained, mod. yellowish		

Continued Next Page

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1605D** DATE **4/27/16** SHEET **3** OF **6**

PROJECT **ROCKPORT PLANT**

BORING START **2/3/16** BORING FINISH **2/3/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES	
		FROM	TO			%							
32	SS	46.5	48.0	6-8-11	1.5		50		SW	brown 10YR 5/4, moist to wet, mod. dense, some fine gravel			
33	SS	48.0	49.5	6-10-14	1.5				SP	Well graded sand, med. to coarse grained, mod. reddish brown 10R 4/6, moist to wet, med. dense, trace fine gravel			
34	SS	49.5	51.0	8-12-18	1.33					Poorly graded sand, fine grained, mod. yellowish brown 10YR 5/4, moist to wet, med. dense, trace fine gravel @ 48' w/fine gravel, trace coarse gravel @ 49.5' no coarse gravel			
35	SS	51.0	52.5	8-11-18	1.41								
36	SS	52.5	54.0	8-9-13	.91		55		SW	Well graded sand, med. to coarse grained, mod. reddish brown 10R 4/6, moist to wet, mod. dense, trace fine gravel			
37	SS	54.0	55.5	11-20-26	1.25				SP	Poorly graded sand, fine grained, mod. yellowish brown 10YR 5/4, moist to wet, mod. dense, trace fine gravel @ 54' no fine gravel, dense @ 57' wet, mod. dense @ 60' dense @ 63' mod. dense			
38	SS	55.5	57.0	10-15-16	1.5								
39	SS	57.0	58.5	6-12-16	1.33		60						
40	SS	58.5	60.0	7-10-18	1.33								
41	SS	60.0	61.5	8-9-12	1.33								
42	SS	61.5	63.0	10-13-19	1.25								
43	SS	63.0	64.5	9-11-18	1.33		65						
44	SS	64.5	66.0	9-11-15	1.08				SW	Well graded sand, med. to coarse grained, mod. yellowish brown 10YR 5/4, moist to wet, mod. dense, trace black silt			
45	SS	66.0	67.5	7-8-13	1.41				SP	Poorly graded sand, fine grained, mod. yellowish brown 10YR 5/4, moist to wet, mod. dense @ 68.5' trace fine gravel, trace coal fragments @ 70' no fine gravel, no coal fragments @ 70.9' trace fine gravel @ 71.6' no fine gravel, wet			
46	SS	67.5	69.0	5-5-8	1.5								
47	SS	69.0	70.5	6-8-12	1.5		70						
48	SS	70.5	72.0	0-12-16	1.5								

AEP RK BAP CCR COMPLIANCE.GPJ_AEP.GDT 4/27/16

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1605D** DATE **4/27/16** SHEET **4** OF **6**

PROJECT **ROCKPORT PLANT**

BORING START **2/3/16** BORING FINISH **2/3/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES	
		FROM	TO			%							
49	SS	72.0	73.5	8-8-10	1.25		75		SW	Well graded sand, fine grained d. yellowish brown 10YR 4/2, moist to wet, mod. dense, trace fine gravel @ 73.5' w/fine gravel, trace coarse gravel			
50	SS	73.5	75.0	9-12-17	1.41				SW	Well graded sand, coarse grained, brownish grey 5YR 4/1, moist to wet, mod. dense, w/fine gravel, trace coarse gravel			
51	SS	75.0	76.5	8-7-9	1.5				SP	Poorly graded sand, fine grained, pale yellowish brown 10YR 6/2, wet, dense, trace fine gravel @ 78' mod. dense @ 81' v. fine to fine grained @ 82.5' no fine gravel @ 84' dense @ 85' 2" shale fragment @ 85.2' v. fine grained @ 85.5' 3.5" shale fragment @ 87' fine grained, d. yellowish brown 10YR 4/2 @ 88.5' v. fine grained, mod. dense			
52	SS	76.5	78.0	10-15-25	1.5		80						
53	SS	78.0	79.5	7-13-12	1.33								
54	SS	79.5	81.0	5-7-12	1.5								
55	SS	81.0	82.5	6-12-13	1.5								
56	SS	82.5	84.0	8-10-16	1.41		85						
57	SS	84.0	85.5	10-21-22	1.41								
58	SS	85.5	87.0	14-21-14	.5								
59	SS	87.0	88.5	6-13-25	1.41		90						
60	SS	88.5	90.0	8-9-9	1.16				ML	Clayey silt, med. I. grey N6, moist to wet, mod. dense			
61	SS	90.0	91.5	15-24-7	1.41				SP	Poorly graded sand, fine grained, d. yellowish brown 10YR 4/2, moist, dense			
62	SS	91.5	93.0	7-21-28	1.5		95		ML	Clayey silt, med. I. grey N6, moist to wet, dense			
63	SS	93.0	94.5	14-18-21	1.5				SW	Well graded sand, coarse grained, med. grey N5, w/fine gravel, some coarse gravel			
64	SS	94.5	96.0	12-17-25	1.5				ML	Clayey silt, med. I. grey N6, moist to wet, dense			
65	SS	96.0	97.5	20-21-19	1.33		95		SW	Well graded sand, fine grained, med. grey N5, moist to wet, dense, w/fine gravel			
66	SS	97.5	99.0	13-11-18	1.41				ML	Clayey silt, med. I. grey N6, moist to wet, dense			
									SW	Well graded sand, coarse grained, med. grey N5, moist to wet, dense, w/fine gravel @ 98.7' coal fragments			

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1605D** DATE **4/27/16** SHEET **5** OF **6**

PROJECT **ROCKPORT PLANT**

BORING START **2/3/16** BORING FINISH **2/3/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
67	SS	99.0	100.5	15-22-28	1.5		100		SP	Poorly graded sand, v. fine to fine grained, pale yellowish brown 10YR 6/2, moist to wet, dense, w/fine gravel @ 100.5' no fine gravel, mod. dense @ 102' v. fine, dense @ 105' mod. dense @ 106' trace coal fragments @ 106.3' no coal fragments @ 109.5' moist @ 111' v. moist to wet @ 112.5' moist to wet, dense @ 113' trace fine gravel, trace coarse gravel @ 113.5' no fine gravel, no coarse gravel		
68	SS	100.5	102.0	8-8-9	1.5							
69	SS	102.0	103.5	10-16-18	1.5							
70	SS	103.5	105.0	9-13-18	1.41							
71	SS	105.0	106.5	8-12-16	1.5		105					
72	SS	106.5	108.0	6-9-13	1.5							
73	SS	108.0	109.5	7-8-12	1.25							
74	SS	109.5	111.0	6-8-10	1.41		110					
75	SS	111.0	112.5	5-10-12	1.25							
76	SS	112.5	114.0	6-11-27	1.33							
77	SS	114.0	115.5	13-21-13	1.25		115	SW	Well graded sand, med. to coarse grained, med. grey N5, moist to wet, dense, w/fine gravel, some coarse gavel @ 115.5' coarse grained, mod. dense, trace coarse gravel @ 118.5' v. dense			
78	SS	115.5	117.0	7-7-9	1.33							
79	SS	117.0	118.5	9-9-8	1.16							
80	SS	118.5	120.0	12-36-22	1.5							
81	SS	120.0	121.5	10-11-19	1.41		120	SP	Poorly graded sand, v. fine grained, med. l. grey N6, moist to wet, v. dense @ 120' med. dense, sl. moist @ 122' fine grained, w/fine gravel, dense @ 124.5' trace coarse gravel			
82	SS	121.5	123.0	12-20-29	1.5							
83	SS	123.0	124.5	14-16-19	1.5							

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1605D** DATE **4/27/16** SHEET **6** OF **6**

PROJECT **ROCKPORT PLANT**

BORING START **2/3/16** BORING FINISH **2/3/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
84	SS	124.5	126.0	18-12-25	1.5		125					
85	SS	126.0	127.5	17-28-50/5	1.5				ML	Clayey silt, l. grey N7, moist, hard, non-durable shale @ 126' flaky, dry to moist Spoon refusal @ 127.4' Auger refusal @127.5' (shale)		
86	SS	127.5	129.0	27-50/2	.66							

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**
 COMPANY **INDIANA MICHIGAN POWER COMPANY**
 PROJECT **ROCKPORT PLANT**
 COORDINATES **N 151,478.9 E 513,532.6**
 GROUND ELEVATION **400.6** SYSTEM **State Plane using NAD27/29**

BORING NO. **MW-1605I** DATE **4/27/16** SHEET **1** OF **4**
 BORING START **3/2/16** BORING FINISH **3/2/16**
 PIEZOMETER TYPE _____ WELL TYPE **OW**
 HGT. RISER ABOVE GROUND **2.62** DIA **2.0**
 DEPTH TO TOP OF WELL SCREEN **68.9** BOTTOM **78.5**
 WELL DEVELOPMENT **YES** BACKFILL _____
 FIELD PARTY **ZLR / REB** RIG **D-120**

Water Level, ft	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TIME			
DATE			

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO									
1	SS	0.0	1.5	20-13-10	1.25				CL	Gravel = 6 inches		
2	SS	1.5	3.0	5-15-18	1.25				CL	Silty clay, moderate yellowish brown 10R 5/4 and med l. grey N6 mottled, moist, v. stiff @ 1.5' hard @ 3' v. stiff		
3	SS	3.0	4.5	7-9-15	1.41							
4	SS	4.5	6.0	11-12-14	1.5		5					
5	SS	6.0	7.5	4-8-11	1.41							
6	SS	7.5	9.0	3-6-11	1.33				ML	Clayey silt, medium grey N5, moist, med. dense, w/mod. yellowish brown 10R 5/4 silty clay mottled		
7	SS	9.0	10.5	3-4-7	1.41		10		CL	Silty clay, mod. yellowish brown 10R 5/4, moist, stiff, w/mod. grey N5 clayey silt mottled		
8	SS	10.5	12.0	3-4-6	1.5							
9	SS	12.0	13.5	2-2-4	1.5				CH	Fat to lean clay, med. l. grey N6, moist, firm		
10	SS	13.5	15.0	2-2-5	1.41							
11	SS	15.0	16.5	2-4-5	1.5		15		CL ML	Silty clay, mod. reddish brown 10R 4/6 w/mod. l. grey N6 fat clay heavily mottled, moist, firm @ 15' stiff @ 15.5' l" shale fragment, angular @ 18' very silty @ 20' trace to some pale yellowish brown 10YR 6/2 silt		
12	SS	16.5	18.0	3-5-9	1.5							
13	SS	18.0	19.5	3-6-8	1.41							
14	SS	19.5	21.0	3-5-7	1.41							

TYPE OF CASING USED

_____	NQ-2 ROCK CORE
_____	6" x 3.25 HSA
_____	9" x 6.25 HSA
_____	HW CASING ADVANCER 4"
_____	NW CASING 3"
_____	SW CASING 6"
_____	AIR HAMMER 8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC
 WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER **AMEC FOSTER WHEELER**

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1605I** DATE **4/27/16** SHEET **2** OF **4**

PROJECT **ROCKPORT PLANT**

BORING START **3/2/16** BORING FINISH **3/2/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	U S C S	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
15	SS	21.0	22.5	3-4-7	1.5				ML	Clayey silt, pale yellowish brown 10YR 6/2, moist, med. dense, w/silty clay (prev. material), trace sand		
16	SS	22.5	24.0	4-4-5	1.5				SP	Poorly graded sand, v. fine to fine grained, l. brown 5YR 5/6, moist, loose @ 23.2' 2" clayey silt seam (prev. material)		
17	SS	24.0	25.5	1-1-3	1.5		25		ML	Clayey silt, pale yellowish brown 10YR 6/2, moist to wet, v. loose @ 25' 2" l. brown sand seam (prev. material) @ 26' 2" l. brown sand seam @ 26.4' 15" l. brown sand seam @ 26.8' 1" l. brown sand seam @ 27' loose @ 28' 2" l. brown sand seam		
18	SS	25.5	27.0	1-1-1	1.5				SP	Poorly graded sand, fine grained, l. brown 5YR 5/6, moist, med. dense @ 30' d. yellowish orange 10YR 6/6 @ 31' 3" clayey silt seam (prev. material) @ 32.3' trace fine gravel and black silt @ 32.5' no fine gravel or silt @ 33' moist, loose @ 34.1' 2" clayey silt seam (prev. material) @ 34.5' moist to wet, water in spoon @ 34.9' 2.5' clayey silt seam (prev. material)		
19	SS	27.0	28.5	2-1-4	1.5				SP	Poorly graded sand, fine grained, l. brown 5YR 5/6, moist, med. dense @ 30' d. yellowish orange 10YR 6/6 @ 31' 3" clayey silt seam (prev. material) @ 32.3' trace fine gravel and black silt @ 32.5' no fine gravel or silt @ 33' moist, loose @ 34.1' 2" clayey silt seam (prev. material) @ 34.5' moist to wet, water in spoon @ 34.9' 2.5' clayey silt seam (prev. material)		
20	SS	28.5	30.0	5-6-7	1.33				SP	Poorly graded sand, fine grained, l. brown 5YR 5/6, moist, med. dense @ 30' d. yellowish orange 10YR 6/6 @ 31' 3" clayey silt seam (prev. material) @ 32.3' trace fine gravel and black silt @ 32.5' no fine gravel or silt @ 33' moist, loose @ 34.1' 2" clayey silt seam (prev. material) @ 34.5' moist to wet, water in spoon @ 34.9' 2.5' clayey silt seam (prev. material)		
21	SS	30.0	31.5	3-5-7	1.25		30		SP	Poorly graded sand, fine grained, l. brown 5YR 5/6, moist, med. dense @ 30' d. yellowish orange 10YR 6/6 @ 31' 3" clayey silt seam (prev. material) @ 32.3' trace fine gravel and black silt @ 32.5' no fine gravel or silt @ 33' moist, loose @ 34.1' 2" clayey silt seam (prev. material) @ 34.5' moist to wet, water in spoon @ 34.9' 2.5' clayey silt seam (prev. material)		
22	SS	31.5	33.0	5-7-8	1.5				SP	Poorly graded sand, fine grained, l. brown 5YR 5/6, moist, med. dense @ 30' d. yellowish orange 10YR 6/6 @ 31' 3" clayey silt seam (prev. material) @ 32.3' trace fine gravel and black silt @ 32.5' no fine gravel or silt @ 33' moist, loose @ 34.1' 2" clayey silt seam (prev. material) @ 34.5' moist to wet, water in spoon @ 34.9' 2.5' clayey silt seam (prev. material)		
23	SS	33.0	34.5	3-3-6	1.41				SP	Poorly graded sand, fine grained, l. brown 5YR 5/6, moist, med. dense @ 30' d. yellowish orange 10YR 6/6 @ 31' 3" clayey silt seam (prev. material) @ 32.3' trace fine gravel and black silt @ 32.5' no fine gravel or silt @ 33' moist, loose @ 34.1' 2" clayey silt seam (prev. material) @ 34.5' moist to wet, water in spoon @ 34.9' 2.5' clayey silt seam (prev. material)		
24	SS	34.5	36.0	2-4-5	1.5		35		SP	Poorly graded sand, fine grained, l. brown 5YR 5/6, moist, med. dense @ 30' d. yellowish orange 10YR 6/6 @ 31' 3" clayey silt seam (prev. material) @ 32.3' trace fine gravel and black silt @ 32.5' no fine gravel or silt @ 33' moist, loose @ 34.1' 2" clayey silt seam (prev. material) @ 34.5' moist to wet, water in spoon @ 34.9' 2.5' clayey silt seam (prev. material)		
25	SS	36.0	37.5	2-4-6	1.33				SP	Poorly graded sand, fine grained, l. brown 5YR 5/6, moist, med. dense @ 30' d. yellowish orange 10YR 6/6 @ 31' 3" clayey silt seam (prev. material) @ 32.3' trace fine gravel and black silt @ 32.5' no fine gravel or silt @ 33' moist, loose @ 34.1' 2" clayey silt seam (prev. material) @ 34.5' moist to wet, water in spoon @ 34.9' 2.5' clayey silt seam (prev. material)		
26	SS	37.5	39.0	4-3-8	1.5				SW	Well graded sand, fine grained, l. brown 5YR 5/6, moist to wet, med. dense, w/fine gravel		
27	SS	39.0	40.5	3-3-5	1.5		40		SW	Well graded sand, coarse grained, grayish black N2, moist to wet, med. dense, trace fine gravel		
28	SS	40.5	42.0	11-8-10	1.25				SP	Poorly graded sand, v. fine grained, l. brown 5YR 5/6, moist to wet, med. dense Well graded sand, fine to med. grained, moderate yellowish brown 10YR 5/4, moist to wet, loose @ 40.5' med. dense @ 41' 1.5" shale seam w/clay		Begin Mud Rotary @ 40.5'
29	SS	42.0	43.5	4-5-11	1.5				SW	Poorly graded sand, v. fine to fine grained, mod. yellowish brown 10YR 5/4, moist to wet, med. dense		
30	SS	43.5	45.0	8-9-9	1.16				SW	Well graded sand, med. grained, mod. reddish brown 10R 4/6, moist to wet, med. dense @ 44' med. to coarse grained		
31	SS	45.0	46.5	6-9-14	1.5		45		SP	Poorly graded sand, fine grained, mod. yellowish		

Continued Next Page

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1605I** DATE **4/27/16** SHEET **3** OF **4**

PROJECT **ROCKPORT PLANT**

BORING START **3/2/16** BORING FINISH **3/2/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
32	SS	46.5	48.0	6-8-11	1.5		50		SW	brown 10YR 5/4, moist to wet, mod. dense, some fine gravel		
33	SS	48.0	49.5	6-10-14	1.5				SP	Well graded sand, med. to coarse grained, mod. reddish brown 10R 4/6, moist to wet, mod. dense, trace fine gravel		
34	SS	49.5	51.0	8-12-18	1.33					Poorly graded sand, fine grained, mod. yellowish brown 10YR 5/4, moist to wet, mod. dense, trace fine gravel @ 48' w/fine gravel, trace coarse gravel @ 49.5' no coarse gravel		
35	SS	51.0	52.5	8-11-18	1.41							
36	SS	52.5	54.0	8-9-13	.91		55		SW	Well graded sand, med. to coarse grained, mod. reddish brown 10R 4/6, moist to wet, mod. dense, trace fine gravel		
37	SS	54.0	55.5	11-20-26	1.25				SP	Poorly graded sand, fine grained, mod. yellowish brown 10YR 5/4, moist to wet, mod. dense, trace fine gravel @ 54' no fine gravel, dense @ 57' wet, mod. dense @ 60' dense @ 63' mod. dense		
38	SS	55.5	57.0	10-15-16	1.5							
39	SS	57.0	58.5	6-12-16	1.33							
40	SS	58.5	60.0	7-10-18	1.33		60					
41	SS	60.0	61.5	8-9-12	1.33							
42	SS	61.5	63.0	10-13-19	1.25							
43	SS	63.0	64.5	9-11-18	1.33							
44	SS	64.5	66.0	9-11-15	1.08		65		SW	Well graded sand, med. to coarse grained, mod. yellowish brown 10YR 5/4, moist to wet, mod. dense, trace black silt		
45	SS	66.0	67.5	7-8-13	1.41				SP	Poorly graded sand, fine grained, mod. yellowish brown 10YR 5/4, moist to wet, mod. dense @ 68.5' trace fine gravel, trace coal fragments @ 70' no fine gravel, no coal fragments @ 70.9' trace fine gravel @ 71.6' no fine gravel, wet		
46	SS	67.5	69.0	5-5-8	1.5							
47	SS	69.0	70.5	6-8-12	1.5							
48	SS	70.5	72.0	0-12-16	1.5		70					

AEP RK BAP CCR COMPLIANCE.GPJ_AEP_GDT_4/27/16

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1605I** DATE **4/27/16** SHEET **4** OF **4**

PROJECT **ROCKPORT PLANT**

BORING START **3/2/16** BORING FINISH **3/2/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES	
		FROM	TO			%							
49	SS	72.0	73.5	8-8-10	1.25		75		SW	Well graded sand, fine grained d. yellowish brown 10YR 4/2, moist to wet, mod. dense, trace fine gravel @ 73.5' w/fine gravel, trace coarse gravel			
50	SS	73.5	75.0	9-12-17	1.41				SW	Well graded sand, coarse grained, brownish grey 5YR 4/1, moist to wet, mod. dense, w/fine gravel, trace coarse gravel			
51	SS	75.0	76.5	8-7-9	1.5				SP	Poorly graded sand, fine grained, pale yellowish brown 10YR 6/2, wet, dense, trace fine gravel @ 78' mod. dense @ 81' v. fine to fine grained @ 82.5' no fine gravel @ 84' dense @ 85' 2" shale fragment @ 85.2' v. fine grained @ 85.5' 3.5" shale fragment @ 87' fine grained, d. yellowish brown 10YR 4/2 @ 88.5' v. fine grained, mod. dense			
52	SS	76.5	78.0	10-15-25	1.5								
53	SS	78.0	79.5	7-13-12	1.33								
54	SS	79.5	81.0	5-7-12	1.5				80				

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**
 COMPANY **INDIANA MICHIGAN POWER COMPANY**
 PROJECT **ROCKPORT PLANT**
 COORDINATES **N 151,478.8 E 513,528.4**
 GROUND ELEVATION **400.3** SYSTEM **State Plane using NAD27/29**

BORING NO. **MW-1605S** DATE **4/27/16** SHEET **1** OF **3**
 BORING START **3/1/16** BORING FINISH **3/1/16**
 PIEZOMETER TYPE _____ WELL TYPE **OW**
 HGT. RISER ABOVE GROUND **3.05** DIA **2.0**
 DEPTH TO TOP OF WELL SCREEN **37.6** BOTTOM **47.13**
 WELL DEVELOPMENT **YES** BACKFILL _____
 FIELD PARTY **ZLR / REB** RIG **D-120**

Water Level, ft	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TIME			
DATE			

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO									
1	SS	0.0	1.5	20-13-10	1.25				CL	Gravel = 6 inches		
2	SS	1.5	3.0	5-15-18	1.25				CL	Silty clay, moderate yellowish brown 10R 5/4 and med l. grey N6 mottled, moist, v. stiff @ 1.5' hard @ 3' v. stiff		
3	SS	3.0	4.5	7-9-15	1.41							
4	SS	4.5	6.0	11-12-14	1.5		5					
5	SS	6.0	7.5	4-8-11	1.41							
6	SS	7.5	9.0	3-6-11	1.33				ML	Clayey silt, medium grey N5, moist, med. dense, w/mod. yellowish brown 10R 5/4 silty clay mottled		
7	SS	9.0	10.5	3-4-7	1.41		10		CL	Silty clay, mod. yellowish brown 10R 5/4, moist, stiff, w/mod. grey N5 clayey silt mottled		
8	SS	10.5	12.0	3-4-6	1.5							
9	SS	12.0	13.5	2-2-4	1.5				CH	Fat to lean clay, med. l. grey N6, moist, firm		
10	SS	13.5	15.0	2-2-5	1.41							
11	SS	15.0	16.5	2-4-5	1.5		15		CL ML	Silty clay, mod. reddish brown 10R 4/6 w/mod. l. grey N6 fat clay heavily mottled, moist, firm @ 15' stiff @ 15.5' l" shale fragment, angular @ 18' very silty @ 20' trace to some pale yellowish brown 10YR 6/2 silt		
12	SS	16.5	18.0	3-5-9	1.5							
13	SS	18.0	19.5	3-6-8	1.41							
14	SS	19.5	21.0	3-5-7	1.41							

TYPE OF CASING USED

_____	NQ-2 ROCK CORE
_____	6" x 3.25 HSA
_____	9" x 6.25 HSA
_____	HW CASING ADVANCER 4"
_____	NW CASING 3"
_____	SW CASING 6"
_____	AIR HAMMER 8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC
 WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER **AMEC FOSTER WHEELER**

AEP_RK_BAP_CCR_COMPLIANCE.GPJ_AEP_GDT_4/27/16

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1605S** DATE **4/27/16** SHEET **2** OF **3**

PROJECT **ROCKPORT PLANT**

BORING START **3/1/16** BORING FINISH **3/1/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
15	SS	21.0	22.5	3-4-7	1.5				ML	Clayey silt, pale yellowish brown 10YR 6/2, moist, med. dense, w/silty clay (prev. material), trace sand		
16	SS	22.5	24.0	4-4-5	1.5				SP	Poorly graded sand, v. fine to fine grained, l. brown 5YR 5/6, moist, loose @ 23.2' 2" clayey silt seam (prev. material)		
17	SS	24.0	25.5	1-1-3	1.5		25		ML	Clayey silt, pale yellowish brown 10YR 6/2, moist to wet, v. loose @ 25' 2" l. brown sand seam (prev. material) @ 26' 2" l. brown sand seam @ 26.4' 15" l. brown sand seam @ 26.8' 1" l. brown sand seam @ 27' loose @ 28' 2" l. brown sand seam		
18	SS	25.5	27.0	1-1-1	1.5				SP	Poorly graded sand, fine grained, l. brown 5YR 5/6, moist, med. dense @ 30' d. yellowish orange 10YR 6/6 @ 31' 3" clayey silt seam (prev. material) @ 32.3' trace fine gravel and black silt @ 32.5' no fine gravel or silt @ 33' moist, loose @ 34.1' 2" clayey silt seam (prev. material) @ 34.5' moist to wet, water in spoon @ 34.9' 2.5' clayey silt seam (prev. material)		
19	SS	27.0	28.5	2-1-4	1.5				SP	Poorly graded sand, fine grained, l. brown 5YR 5/6, moist, med. dense @ 30' d. yellowish orange 10YR 6/6 @ 31' 3" clayey silt seam (prev. material) @ 32.3' trace fine gravel and black silt @ 32.5' no fine gravel or silt @ 33' moist, loose @ 34.1' 2" clayey silt seam (prev. material) @ 34.5' moist to wet, water in spoon @ 34.9' 2.5' clayey silt seam (prev. material)		
20	SS	28.5	30.0	5-6-7	1.33				SP	Poorly graded sand, fine grained, l. brown 5YR 5/6, moist, med. dense @ 30' d. yellowish orange 10YR 6/6 @ 31' 3" clayey silt seam (prev. material) @ 32.3' trace fine gravel and black silt @ 32.5' no fine gravel or silt @ 33' moist, loose @ 34.1' 2" clayey silt seam (prev. material) @ 34.5' moist to wet, water in spoon @ 34.9' 2.5' clayey silt seam (prev. material)		
21	SS	30.0	31.5	3-5-7	1.25		30		SW	Well graded sand, fine grained, l. brown 5YR 5/6, moist to wet, med. dense, w/fine gravel		
22	SS	31.5	33.0	5-7-8	1.5				SW	Well graded sand, fine grained, l. brown 5YR 5/6, moist to wet, med. dense, w/fine gravel		
23	SS	33.0	34.5	3-3-6	1.41				SP	Well graded sand, coarse grained, grayish black N2, moist to wet, med. dense, trace fine gravel		
24	SS	34.5	36.0	2-4-5	1.5		35		SW	Poorly graded sand, v. fine grained, l. brown 5YR 5/6, moist to wet, med. dense		
25	SS	36.0	37.5	2-4-6	1.33				SW	Well graded sand, fine to med. grained, moderate yellowish brown 10YR 5/4, moist to wet, loose @ 40.5' med. dense @ 41' 1.5" shale seam w/clay		
26	SS	37.5	39.0	4-3-8	1.5				SP	Poorly graded sand, v. fine grained, l. brown 5YR 5/6, moist to wet, med. dense		
27	SS	39.0	40.5	3-3-5	1.5		40		SW	Well graded sand, med. grained, mod. reddish brown 10R 4/6, moist to wet, med. dense @ 44' med. to coarse grained		
28	SS	40.5	42.0	11-8-10	1.25				SW	Poorly graded sand, v. fine to fine grained, mod. yellowish brown 10YR 5/4, moist to wet, med. dense		
29	SS	42.0	43.5	4-5-11	1.5				SP	Well graded sand, med. grained, mod. reddish brown 10R 4/6, moist to wet, med. dense @ 44' med. to coarse grained		
30	SS	43.5	45.0	8-9-9	1.16				SW	Poorly graded sand, fine grained, mod. yellowish		
31	SS	45.0	46.5	6-9-14	1.5		45		SP	Poorly graded sand, fine grained, mod. yellowish		Begin Mud Rotary @ 40.5'

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1605S** DATE **4/27/16** SHEET **3** OF **3**

PROJECT **ROCKPORT PLANT**

BORING START **3/1/16** BORING FINISH **3/1/16**







SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
32	SS	46.5	48.0	6-8-11	1.5				SW	brown 10YR 5/4, moist to wet, mod. dense, some fine gravel		
33	SS	48.0	49.5	6-10-14	1.5				SP	Well graded sand, med. to coarse grained, mod. reddish brown 10R 4/6, moist to wet, med. dense, trace fine gravel Poorly graded sand, fine grained, mod. yellowish brown 10YR 5/4, moist to wet, med. dense, trace fine gravel @ 48' w/fine gravel, trace coarse gravel @ 49.5' no coarse gravel		

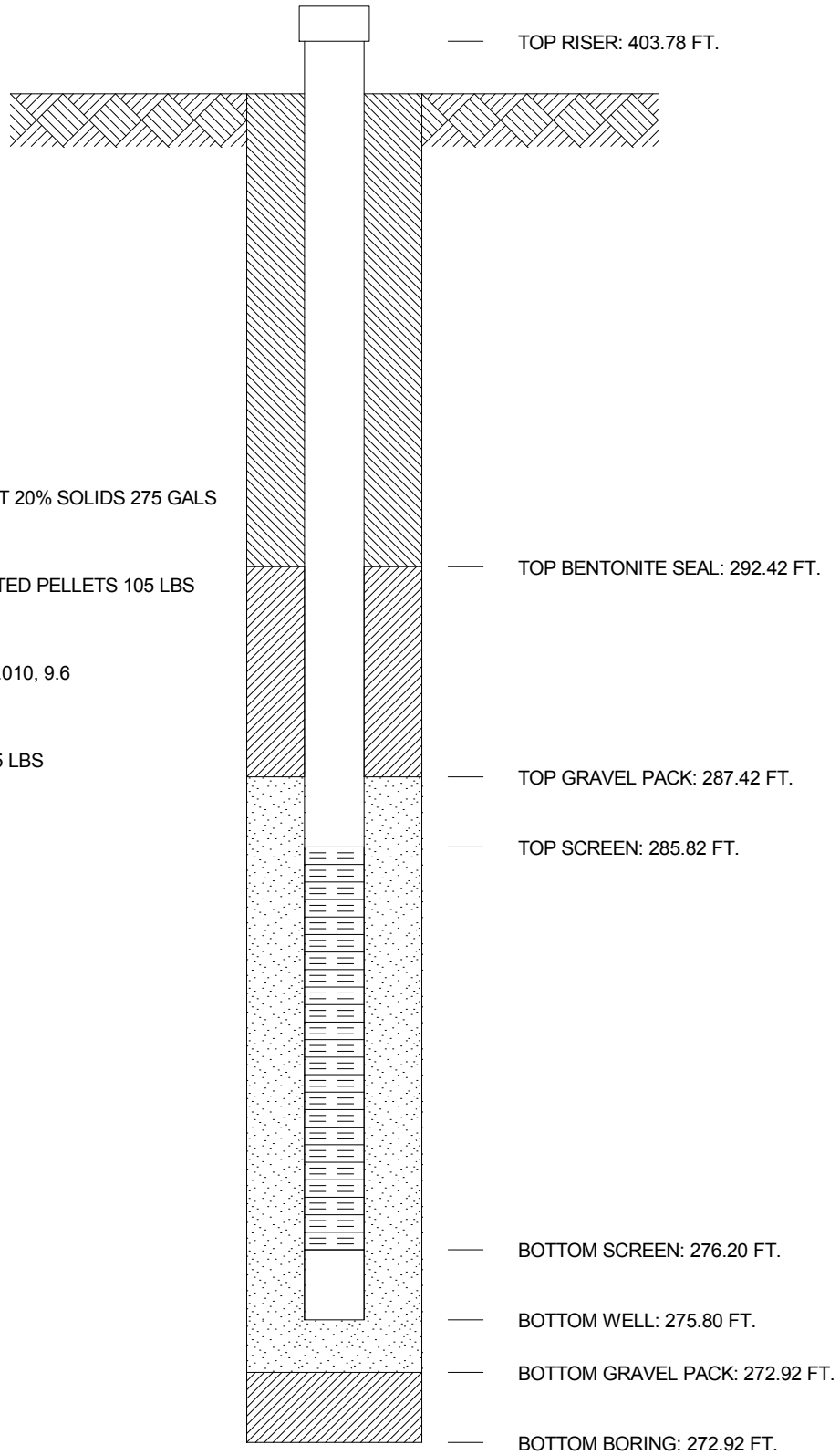
AMERICAN ELECTRIC POWER SERVICE CORPORATION
 AEP CIVIL ENGINEERING LABORATORY
 MONITORING WELL CONSTRUCTION



JOB NUMBER 42393125-01
 COMPANY INDIANA MICHIGAN POWER COMPANY WELL No. MW-1605D BORING No. MW-1605D INSTALLED 2/3/16
 PROJECT ROCKPORT PLANT
 COORDINATES N 151,478.9 E 513,537.1
 SYSTEM State Plane using NAD27/29

GROUND ELEVATION 400.42 FT.

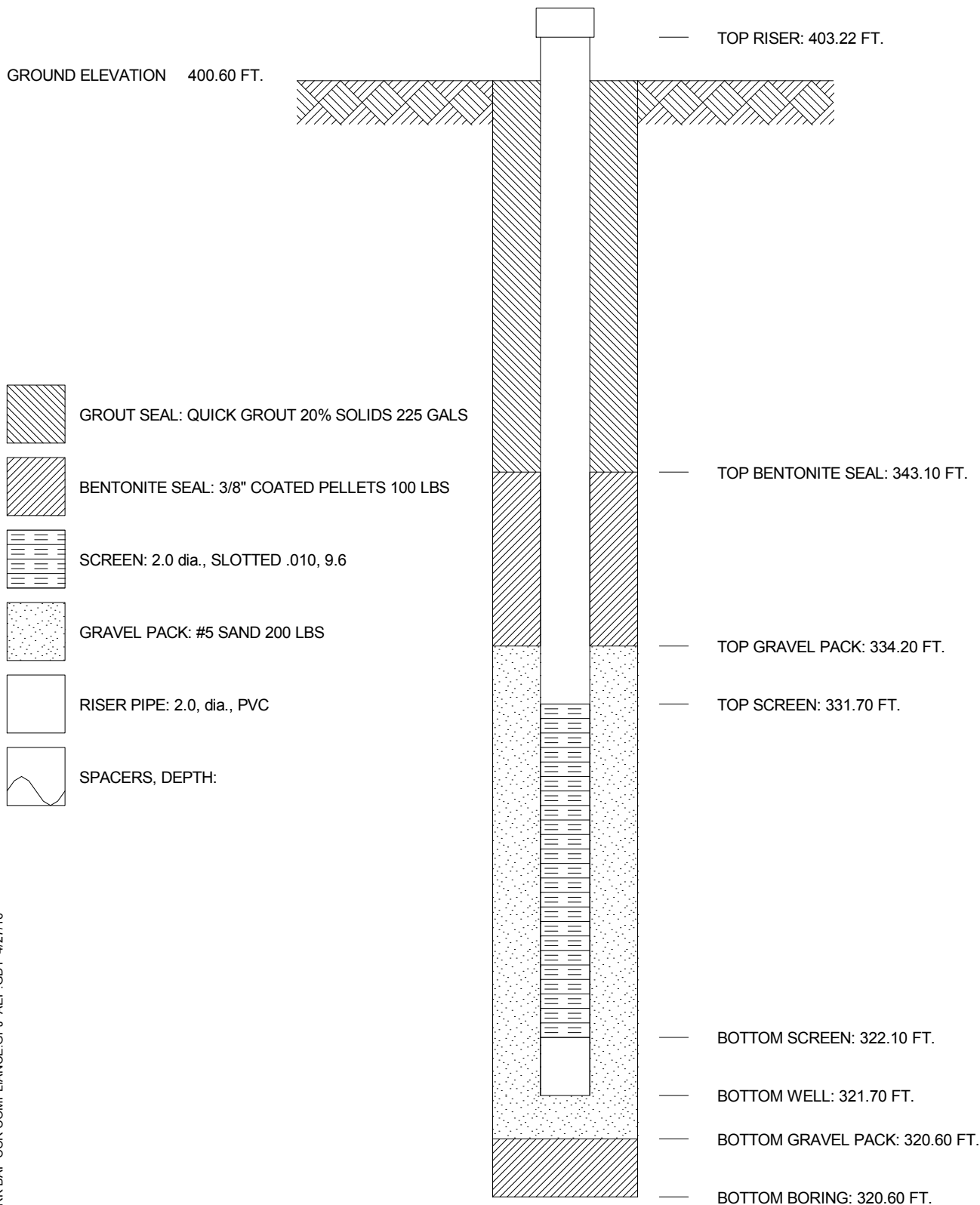
-  GROUT SEAL: QUICK GROUT 20% SOLIDS 275 GALS
-  BENTONITE SEAL: 3/8" COATED PELLETS 105 LBS
-  SCREEN: 2.0 dia., SLOTTED .010, 9.6
-  GRAVEL PACK: #5 SAND 375 LBS
-  RISER PIPE: 2.0, dia., PVC
-  SPACERS, DEPTH:



AMERICAN ELECTRIC POWER SERVICE CORPORATION
 AEP CIVIL ENGINEERING LABORATORY
 MONITORING WELL CONSTRUCTION



JOB NUMBER 42393125-01
 COMPANY INDIANA MICHIGAN POWER COMPANY WELL No. MW-1605I BORING No. MW-1605I INSTALLED 3/2/16
 PROJECT ROCKPORT PLANT
 COORDINATES N 151,478.9 E 513,532.6
 SYSTEM State Plane using NAD27/29









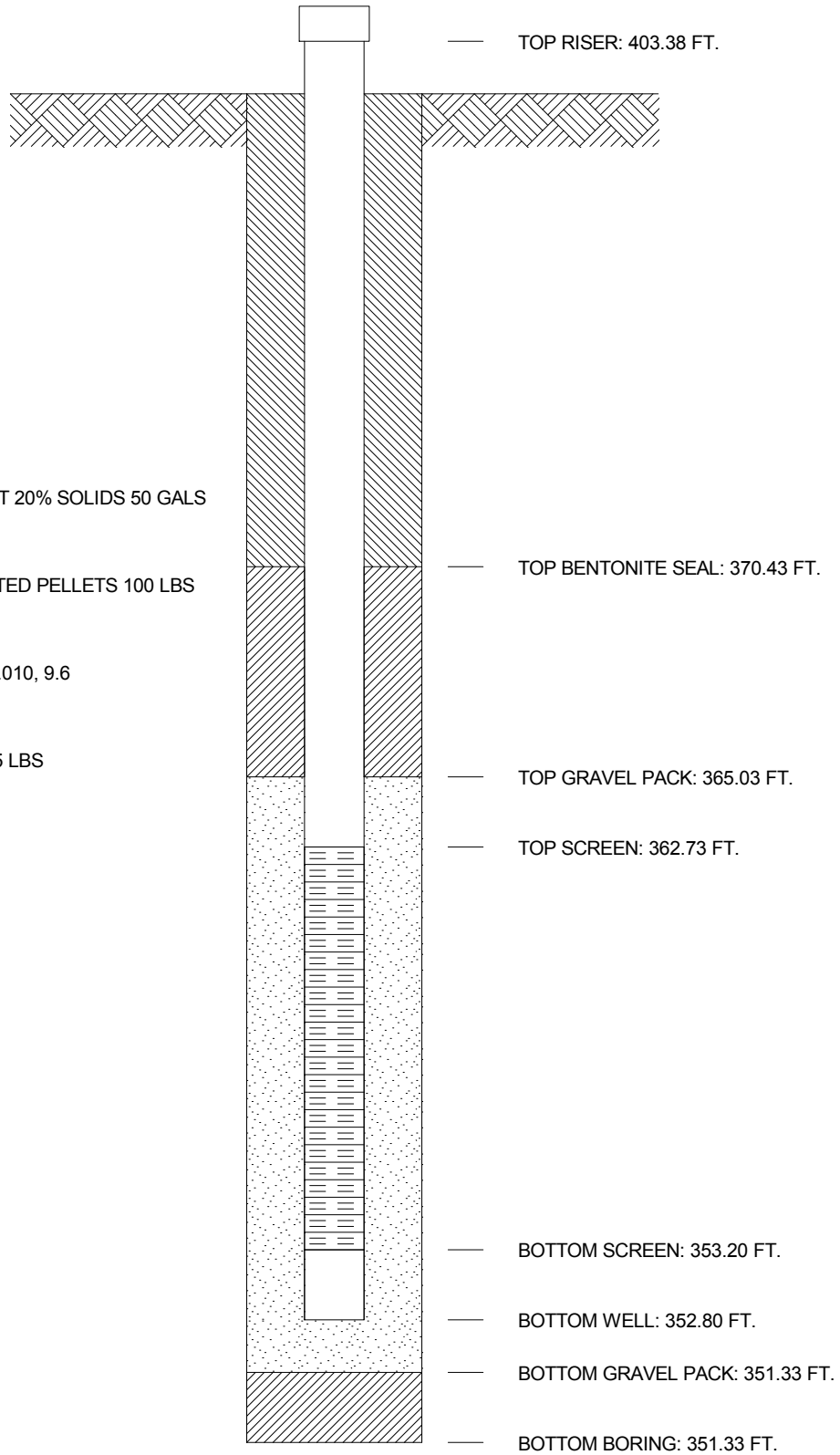
AMERICAN ELECTRIC POWER SERVICE CORPORATION
 AEP CIVIL ENGINEERING LABORATORY
 MONITORING WELL CONSTRUCTION



JOB NUMBER 42393125-01
 COMPANY INDIANA MICHIGAN POWER COMPANY WELL No. MW-1605S BORING No. MW-1605S INSTALLED 3/1/16
 PROJECT ROCKPORT PLANT
 COORDINATES N 151,478.8 E 513,528.4
 SYSTEM State Plane using NAD27/29

GROUND ELEVATION 400.33 FT.

-  GROUT SEAL: QUICK GROUT 20% SOLIDS 50 GALS
-  BENTONITE SEAL: 3/8" COATED PELLETS 100 LBS
-  SCREEN: 2.0 dia., SLOTTED .010, 9.6
-  GRAVEL PACK: #5 SAND 245 LBS
-  RISER PIPE: 2.0, dia., PVC
-  SPACERS, DEPTH:



AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**
 COMPANY **INDIANA MICHIGAN POWER COMPANY**
 PROJECT **ROCKPORT PLANT**
 COORDINATES **N 151,502.1 E 512,881.5**
 GROUND ELEVATION **397.8** SYSTEM **State Plane using NAD27/29**

BORING NO. **MW-1606D** DATE **4/27/16** SHEET **1** OF **5**
 BORING START **2/12/16** BORING FINISH **2/12/16**
 PIEZOMETER TYPE _____ WELL TYPE **OW**
 HGT. RISER ABOVE GROUND **2.91** DIA **2.0**
 DEPTH TO TOP OF WELL SCREEN **100.2** BOTTOM **109.82**
 WELL DEVELOPMENT **YES** BACKFILL _____
 FIELD PARTY **ZLR / REB** RIG **D-120**

Water Level, ft	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TIME			
DATE			

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO									
1	SS	0.0	1.5	3-5-9	1.5				CL	Crushed stone gravel (limestone)		
2	SS	1.5	3.0	4-7-9	1.5					Lean clay, moderate yellowish brown 10YR 5/4, moist, trace fine grained sand, stiff @ 1.5' as above, trace coarse grain sand and black decomposed organic staining @ 3' trace fine gravel		
3	SS	3.0	4.5	3-4-6	1.3							
4	SS	4.5	6.0	1-2-8	1.3		5					
5	SS	6.0	7.5	5-9-10	1.5				CL	Lean clay, pale yellow brown 10YR 6/2, moist, some light brown oxide staining @ 6.0' yellow brown and brown 10YR 5/4 @ 7.5' pale yellow brown 10YR 6/2, trace fine roots, trace fine grained sand		
6	SS	7.5	9.0	3-6-9	1.5				CL	Lean clay w/sand, dark yellow brown 10YR 4/2, moist, little fine grained sand		
7	SS	9.0	10.5	2-4-5	1.5		10		CL	Lean clay, light bluish gray 5B 7/1, moist, some brown oxide staining, trace coarse grained sand @ 12.5' as above, becomes moderate brown in color 5YR 4/4 @ 13.5' moderate yellow brown 10YR 5/4 and pale yellow brown 10YR 6/2) mottled @ 13.5' - 15' trace fine grained sand, trace fine gravel @ 19.5' mostly 10YR 6/2 in color		
8	SS	10.5	12.0	3-4-6	1.5							
9	SS	12.0	13.5	3-5-9	1.5							
10	SS	13.5	15.0	4-5-7	1.5							
11	SS	15.0	16.5	3-5-6	1.5		15					
12	SS	16.5	18.0	3-4-6	1.5							
13	SS	18.0	19.5	2-5-7	1.5							
14	SS	19.5	21.0	3-3-6	1.5							

TYPE OF CASING USED

_____	NQ-2 ROCK CORE
_____	6" x 3.25 HSA
_____	9" x 6.25 HSA
_____	HW CASING ADVANCER 4"
_____	NW CASING 3"
_____	SW CASING 6"
_____	AIR HAMMER 8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC
 WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER **AMEC FOSTER WHEELER**

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1606D** DATE **4/27/16** SHEET **2** OF **5**

PROJECT **ROCKPORT PLANT**

BORING START **2/12/16** BORING FINISH **2/12/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	U S C S	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
15	SS	21.0	22.5	3-4-5	1.5							
16	SS	22.5	24.0	2-4-6	1.5			CL ML		Silty clay, pale yellow brown 10YR 6/2, moist, trace to little fine grained sand		
17	SS	24.0	25.5	1-2-5	1.2			SP SM		Poorly graded sand w/silt, pale yellow brown 10YR 6/2, moist, fine to medium grained sand @ 24.9' 3" silt layer		
18	SS	25.5	27.0	2-4-6	1.5		25					
19	SS	27.0	28.5	1-5-9	1.3			CL		Lean clay, moderate yellowish brown 10YR 5/4, moist, few sandy layers <1" thick @ 28.3' SP-SM layer (~3" thick)		
20	SS	28.5	30.0	4-4-5	1.3			SP SM		Poorly graded sand w/silt, dark yellowish orange 10YR 6/6, wet, fine to medium grained sand, little coarse grained sand @ 31.5' trace fine gravel @ 34.5' trace fine gravel		
21	SS	30.0	31.5	5-7-8	1.5		30					
22	SS	31.5	33.0	3-3-4	1.1							
23	SS	33.0	34.5	1-2-5	0							
24	SS	34.5	36.0	3-4-8	.8		35					
25	SS	36.0	37.5	3-5-7	1.0							
26	SS	37.5	39.0	5-6-7	.9			SP		Poorly graded sand, dark yellowish orange 10YR 6/6, wet, fine to medium grained sand, trace to little coarse grained sand @ 37.5' trace gravel		
27	SS	39.0	40.5	4-7-20	1.2			SP SM		Poorly graded sand w/silt, dark yellowish orange 10YR 6/6, wet, fine to medium grained sand, trace coarse grained sand		
28	SS	40.5	42.0	7-7-8	1.1		40	SC		Clayey sand, moderate brown 5YR 3/4, wet, fine to medium grained sand		
29	SS	42.0	43.5	4-6-10	1.0			SP		Poorly graded sand, dark yellowish orange 10YR 6/6, wet, fine to medium grained sand, trace coarse grained sand & fine gravel @ 42.0' - 43.5' increase in coarse grained sand @ 45.2' - 45.5' color change to moderate brown 5YR 4/4 @ 46.5' increase in coarse grained sand, trace wood fragments (tree bark) @ 48' color change to pale yellowish brown 10YR		
30	SS	43.5	45.0	4-5-7	1.0							
31	SS	45.0	46.5	4-6-10	1.2		45					

Continued Next Page

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1606D** DATE **4/27/16** SHEET **3** OF **5**

PROJECT **ROCKPORT PLANT**

BORING START **2/12/16** BORING FINISH **2/12/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
32	SS	46.5	48.0	8-9-11	1.1					6/2, few black decomposed organic layers		
33	SS	48.0	49.5	6-10-13	1.1							
34	SS	49.5	51.0	18-13-13	.9		50		SW SM	Well graded sand w/silt & gravel, wet, pale yellowish brown 10YR 6/2, fine to coarse grained sand, little to some fine gravel, trace coarse gravel		
35	SS	51.0	52.5	7-14-16	1.1				SP SM	Poorly graded sand w/silt, moderate yellowish brown 10YR 5/4, wet, fine to medium grained sand, trace coarse grained sand, few layers of decomposed organics (from 51' - 52.5') @ 54' trace coarse gravel, fines between 5 - 10% @ 55.5' trace fine gravel		
36	SS	52.5	54.0	7-9-15	1.0							
37	SS	54.0	55.5	10-10-14	1.2		55					
38	SS	55.5	57.0	8-10-13	1.2							
39	SS	57.0	58.5	7-9-9	1.3				SW	Well graded sand, med. to coarse grained, dark yellowish brown 10YR 4/2, wet, med. dense, trace fine gravel @ 59' trace coarse gravel		
40	SS	58.5	60.0	4-5-9	1.2		60		SP	Poorly graded sand, fine grained, dusky yellowish brown 10YR 2/2, wet, med. dense, w/fine gravel @ 60.5' 2" shale fragment @ 61.5' dark yellowish brown 10YR 4/2, dense @ 61.8' 2" shale fragment @ 62' some lean clay, pale yellowish brown (prev. material) @ 62.5' no clay, trace fine gravel @ 63' no fine gravel @ 64.5' med. dense @ 65.8' 15" coarse sand seam (prev. material) @ 66' dense @ 67.2' 3" shale seam, med. l. grey N6 @ 67.7' med. grained		
41	SS	60.0	61.5	6-6-9	1.5							
42	SS	61.5	63.0	6-13-21	1.5							
43	SS	63.0	64.5	10-17-31	1.3		65					
44	SS	64.5	66.0	13-13-17	1.4							
45	SS	66.0	67.5	6-14-18	1.5							
46	SS	67.5	69.0	9-14-17	1.5							
47	SS	69.0	70.5	10-20-20	1.1		70		SP	Poorly graded sand, fine gravel, pale yellowish brown 10YR 6.2, wet, dense @ 69' moist to v. moist @ 72' med. dense, fine grained @ 75' dense, d. yellowish brown 10YR 4.2 @ 76.5' med. dense, trace black silt @ 80.6 3" shale plug (responsible for increase in N value (same material)) @ 81.3' 1.5" shale plug, dense		
48	SS	70.5	72.0	10-19-26	1.4							

AEP RK BAP CCR COMPLIANCE.GPJ_AEP.GDT 4/27/16

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1606D** DATE **4/27/16** SHEET **4** OF **5**

PROJECT **ROCKPORT PLANT**

BORING START **2/12/16** BORING FINISH **2/12/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
49	SS	72.0	73.5	7-10-17	1.3		75			@ 81.5' no recovery, potential cobble blocking during sampling		
50	SS	73.5	75.0	8-9-13	1.2							
51	SS	75.0	76.5	10-16-25	1.4							
52	SS	76.5	78.0	9-10-14	1.4							
53	SS	78.0	79.5	6-9-18	1.5							
54	SS	79.5	81.0	10-17-34	1.5							
55	SS	81.0	82.5	31-19-14	1.3							
56	SS	82.5	84.0	10-16-21	1.5							
57	SS	84.0	85.5	9-19-21	1.5							
58	SS	85.5	87.0	7-15-24	1.3							
59	SS	87.0	88.5	10-13-20	1.2							
60	SS	88.5	90.0	8-14-23	1.4							
61	SS	90.0	91.5	8-13-27	1.3							
62	SS	91.5	93.0	8-7-16	1.5							
63	SS	93.0	94.5	7-9-15	1.5							
64	SS	94.5	96.0	12-12-14	1.5							
65	SS	96.0	97.5	3-5-5	1.5							
66	SS	97.5	99.0	5-5-6	1.4							
							90		SP	Poorly graded sand, fine grained, pale yellowish brown 10YR 6/2, wet, dense @ 88.5' trace fine gravel @ 91.5' with fine gravel		
							95		SW SP SW SP	Well graded sand, med. to coarse grained, dark yellowish brown 10YR 4/2, wet, med. dense, w/fine gravel Poorly graded sand, coarse grained, greyish red 5R 4/2, wet, med. dense, trace fine gravel Well graded sand, med. to coarse grained, dark yellowish brown 10YR 4/2, wet, med. dense, w/fine gravel		

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1606D** DATE **4/27/16** SHEET **5** OF **5**

PROJECT **ROCKPORT PLANT**

BORING START **2/12/16** BORING FINISH **2/12/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
67	SS	99.0	100.5	4-5-7	1.5		100			Poorly graded sand, coarse grained, greyish red 5R 4/2, wet, med. dense to loose, trace fine gravel Poorly graded sand, fine grained, pale yellowish brown 10YR 6/2, wet, loose @ 97.5' med. dense, fine grained		
68	SS	100.5	102.0	7-7-10	1.4				SP	Poorly graded sand, fine to fine grained, dusky red 5R 3/4, wet, med. dense		
69	SS	102.0	103.5	4-4-6	1.5					@ 102' loose, fine grained, moist		
70	SS	103.5	105.0	5-6-10	1.3					@ 103.5' med. dense @ 105' fine grained @ 106.5' dense		
71	SS	105.0	106.5	4-6-9	1.5		105			@ 108' med. dense, trace fine gravel @ 109' no fine gravel @ 110.6' siltstone fragments to 2.5", moderate brown 5YR 4/4, shiny, angular		
72	SS	106.5	108.0	7-11-20	1.4							
73	SS	108.0	109.5	8-13-15	1.5							
74	SS	109.5	111.0	10-18-11	1.3		110					
75	SS	111.0	112.5	14-50/3				ML	Silt, l. grey N7, moist, med. dense, non-durable shale			
76	SS	112.5	114.0	50/4					@ 111' clayey silt, hard Spoon refusal @ 111.7' Auger refusal @ 112.9 BT @ 112.9'			

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**
 COMPANY **INDIANA MICHIGAN POWER COMPANY**
 PROJECT **ROCKPORT PLANT**
 COORDINATES **N 151,500.4 E 512,885.5**
 GROUND ELEVATION **397.8** SYSTEM **State Plane using NAD27/29**

BORING NO. **MW-1606I** DATE **4/27/16** SHEET **1** OF **4**
 BORING START **3/1/16** BORING FINISH **3/1/16**
 PIEZOMETER TYPE _____ WELL TYPE **OW**
 HGT. RISER ABOVE GROUND **3.00** DIA **2.0**
 DEPTH TO TOP OF WELL SCREEN **65.4** BOTTOM **75.05**
 WELL DEVELOPMENT **YES** BACKFILL _____
 FIELD PARTY **ZLR / REB** RIG **D-120**

Water Level, ft	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TIME			
DATE			

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO									
1	SS	0.0	1.5	3-5-9	1.5				CL	Crushed stone gravel (limestone)		
2	SS	1.5	3.0	4-7-9	1.5					Lean clay, moderate yellowish brown 10YR 5/4, moist, trace fine grained sand, stiff @ 1.5' as above, trace coarse grain sand and black decomposed organic staining @ 3' trace fine gravel		
3	SS	3.0	4.5	3-4-6	1.3							
4	SS	4.5	6.0	1-2-8	1.3		5					
5	SS	6.0	7.5	5-9-10	1.5				CL	Lean clay, pale yellow brown 10YR 6/2, moist, some light brown oxide staining @ 6.0' yellow brown and brown 10YR 5/4 @ 7.5' pale yellow brown 10YR 6/2, trace fine roots, trace fine grained sand		
6	SS	7.5	9.0	3-6-9	1.5				CL	Lean clay w/sand, dark yellow brown 10YR 4/2, moist, little fine grained sand		
7	SS	9.0	10.5	2-4-5	1.5		10		CL	Lean clay, light bluish gray 5B 7/1, moist, some brown oxide staining, trace coarse grained sand @ 12.5' as above, becomes moderate brown in color 5YR 4/4 @ 13.5' moderate yellow brown 10YR 5/4 and pale yellow brown 10YR 6/2) mottled @ 13.5' - 15' trace fine grained sand, trace fine gravel @ 19.5' mostly 10YR 6/2 in color		
8	SS	10.5	12.0	3-4-6	1.5							
9	SS	12.0	13.5	3-5-9	1.5							
10	SS	13.5	15.0	4-5-7	1.5							
11	SS	15.0	16.5	3-5-6	1.5		15					
12	SS	16.5	18.0	3-4-6	1.5							
13	SS	18.0	19.5	2-5-7	1.5							
14	SS	19.5	21.0	3-3-6	1.5							

TYPE OF CASING USED

_____	NQ-2 ROCK CORE
_____	6" x 3.25 HSA
_____	9" x 6.25 HSA
_____	HW CASING ADVANCER 4"
_____	NW CASING 3"
_____	SW CASING 6"
_____	AIR HAMMER 8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC
 WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER **AMEC FOSTER WHEELER**

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1606I** DATE **4/27/16** SHEET **2** OF **4**

PROJECT **ROCKPORT PLANT**

BORING START **3/1/16** BORING FINISH **3/1/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
15	SS	21.0	22.5	3-4-5	1.5							
16	SS	22.5	24.0	2-4-6	1.5			CL ML		Silty clay, pale yellow brown 10YR 6/2, moist, trace to little fine grained sand		
17	SS	24.0	25.5	1-2-5	1.2			SP SM		Poorly graded sand w/silt, pale yellow brown 10YR 6/2, moist, fine to medium grained sand @ 24.9' 3" silt layer		
18	SS	25.5	27.0	2-4-6	1.5		25					
19	SS	27.0	28.5	1-5-9	1.3			CL		Lean clay, moderate yellowish brown 10YR 5/4, moist, few sandy layers <1" thick @ 28.3' SP-SM layer (~3" thick)		
20	SS	28.5	30.0	4-4-5	1.3							
21	SS	30.0	31.5	5-7-8	1.5		30	SP SM		Poorly graded sand w/silt, dark yellowish orange 10YR 6/6, wet, fine to medium grained sand, little coarse grained sand @ 31.5' trace fine gravel @ 34.5' trace fine gravel		
22	SS	31.5	33.0	3-3-4	1.1							
23	SS	33.0	34.5	1-2-5	0							
24	SS	34.5	36.0	3-4-8	.8		35					
25	SS	36.0	37.5	3-5-7	1.0							
26	SS	37.5	39.0	5-6-7	.9			SP		Poorly graded sand, dark yellowish orange 10YR 6/6, wet, fine to medium grained sand, trace to little coarse grained sand @ 37.5' trace gravel		
27	SS	39.0	40.5	4-7-20	1.2			SP SM		Poorly graded sand w/silt, dark yellowish orange 10YR 6/6, wet, fine to medium grained sand, trace coarse grained sand		
28	SS	40.5	42.0	7-7-8	1.1		40	SC SP		Clayey sand, moderate brown 5YR 3/4, wet, fine to medium grained sand		
29	SS	42.0	43.5	4-6-10	1.0					Poorly graded sand, dark yellowish orange 10YR 6/6, wet, fine to medium grained sand, trace coarse grained sand & fine gravel @ 42.0' - 43.5' increase in coarse grained sand @ 45.2' - 45.5' color change to moderate brown 5YR 4/4 @ 46.5' increase in coarse grained sand, trace wood fragments (tree bark) @ 48' color change to pale yellowish brown 10YR		
30	SS	43.5	45.0	4-5-7	1.0							
31	SS	45.0	46.5	4-6-10	1.2		45					

Continued Next Page

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1606I** DATE **4/27/16** SHEET **3** OF **4**

PROJECT **ROCKPORT PLANT**

BORING START **3/1/16** BORING FINISH **3/1/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
32	SS	46.5	48.0	8-9-11	1.1					6/2, few black decomposed organic layers		
33	SS	48.0	49.5	6-10-13	1.1							
34	SS	49.5	51.0	18-13-13	.9		50		SW SM	Well graded sand w/silt & gravel, wet, pale yellowish brown 10YR 6/2, fine to coarse grained sand, little to some fine gravel, trace coarse gravel		
35	SS	51.0	52.5	7-14-16	1.1				SP SM	Poorly graded sand w/silt, moderate yellowish brown 10YR 5/4, wet, fine to medium grained sand, trace coarse grained sand, few layers of decomposed organics (from 51' - 52.5') @ 54' trace coarse gravel, fines between 5 - 10% @ 55.5' trace fine gravel		
36	SS	52.5	54.0	7-9-15	1.0							
37	SS	54.0	55.5	10-10-14	1.2		55					
38	SS	55.5	57.0	8-10-13	1.2							
39	SS	57.0	58.5	7-9-9	1.3				SW	Well graded sand, med. to coarse grained, dark yellowish brown 10YR 4/2, wet, med. dense, trace fine gravel @ 59' trace coarse gravel		
40	SS	58.5	60.0	4-5-9	1.2		60		SP	Poorly graded sand, fine grained, dusky yellowish brown 10YR 2/2, wet, med. dense, w/fine gravel @ 60.5' 2" shale fragment @ 61.5' dark yellowish brown 10YR 4/2, dense @ 61.8' 2" shale fragment @ 62' some lean clay, pale yellowish brown (prev. material) @ 62.5' no clay, trace fine gravel @ 63' no fine gravel @ 64.5' med. dense @ 65.8' 15" coarse sand seam (prev. material) @ 66' dense @ 67.2' 3" shale seam, med. l. grey N6 @ 67.7' med. grained		
41	SS	60.0	61.5	6-6-9	1.5							
42	SS	61.5	63.0	6-13-21	1.5							
43	SS	63.0	64.5	10-17-31	1.3		65					
44	SS	64.5	66.0	13-13-17	1.4							
45	SS	66.0	67.5	6-14-18	1.5							
46	SS	67.5	69.0	9-14-17	1.5							
47	SS	69.0	70.5	10-20-20	1.1		70		SP	Poorly graded sand, fine gravel, pale yellowish brown 10YR 6.2, wet, dense @ 69' moist to v. moist @ 72' med. dense, fine grained @ 75' dense, d. yellowish brown 10YR 4.2 @ 76.5' med. dense, trace black silt @ 80.6 3" shale plug (responsible for increase in N value (same material)) @ 81.3' 1.5" shale plug, dense		
48	SS	70.5	72.0	10-19-26	1.4							

AEP RK BAP CCR COMPLIANCE.GPJ_AEP.GDT 4/27/16

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1606I** DATE **4/27/16** SHEET **4** OF **4**

PROJECT **ROCKPORT PLANT**

BORING START **3/1/16** BORING FINISH **3/1/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD		DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%							
49	SS	72.0	73.5	7-10-17	1.3			75			@ 81.5' no recovery, potential cobble blocking during sampling		
50	SS	73.5	75.0	8-9-13	1.2								
51	SS	75.0	76.5	10-16-25	1.4								
52	SS	76.5	78.0	9-10-14	1.4								

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**
 COMPANY **INDIANA MICHIGAN POWER COMPANY**
 PROJECT **ROCKPORT PLANT**
 COORDINATES **N 151,498.9 E 512,889.4**
 GROUND ELEVATION **397.6** SYSTEM **State Plane using NAD27/29**

BORING NO. **MW-1606S** DATE **4/27/16** SHEET **1** OF **3**
 BORING START **3/2/16** BORING FINISH **3/2/16**
 PIEZOMETER TYPE _____ WELL TYPE **OW**
 HGT. RISER ABOVE GROUND **3.03** DIA **2.0**
 DEPTH TO TOP OF WELL SCREEN **34.6** BOTTOM **44.22**
 WELL DEVELOPMENT **YES** BACKFILL _____
 FIELD PARTY **ZLR / REB** RIG **D-120**

Water Level, ft	▽	▼	▼
TIME			
DATE			

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO									
1	SS	0.0	1.5	3-5-9	1.5			CL	Crushed stone gravel (limestone)			
2	SS	1.5	3.0	4-7-9	1.5			CL	Lean clay, moderate yellowish brown 10YR 5/4, moist, trace fine grained sand, stiff @ 1.5' as above, trace coarse grain sand and black decomposed organic staining @ 3' trace fine gravel			
3	SS	3.0	4.5	3-4-6	1.3							
4	SS	4.5	6.0	1-2-8	1.3							
5	SS	6.0	7.5	5-9-10	1.5			CL	Lean clay, pale yellow brown 10YR 6/2, moist, some light brown oxide staining @ 6.0' yellow brown and brown 10YR 5/4 @ 7.5' pale yellow brown 10YR 6/2, trace fine roots, trace fine grained sand			
6	SS	7.5	9.0	3-6-9	1.5			CL	Lean clay w/sand, dark yellow brown 10YR 4/2, moist, little fine grained sand			
7	SS	9.0	10.5	2-4-5	1.5			CL	Lean clay, light bluish gray 5B 7/1, moist, some brown oxide staining, trace coarse grained sand @ 12.5' as above, becomes moderate brown in color 5YR 4/4 @ 13.5' moderate yellow brown 10YR 5/4 and pale yellow brown 10YR 6/2) mottled @ 13.5' - 15' trace fine grained sand, trace fine gravel @ 19.5' mostly 10YR 6/2 in color			
8	SS	10.5	12.0	3-4-6	1.5							
9	SS	12.0	13.5	3-5-9	1.5							
10	SS	13.5	15.0	4-5-7	1.5							
11	SS	15.0	16.5	3-5-6	1.5							
12	SS	16.5	18.0	3-4-6	1.5							
13	SS	18.0	19.5	2-5-7	1.5							
14	SS	19.5	21.0	3-3-6	1.5							

TYPE OF CASING USED

_____	NQ-2 ROCK CORE
_____	6" x 3.25 HSA
_____	9" x 6.25 HSA
_____	HW CASING ADVANCER 4"
_____	NW CASING 3"
_____	SW CASING 6"
_____	AIR HAMMER 8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC
 WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER **AMEC FOSTER WHEELER**

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1606S** DATE **4/27/16** SHEET **2** OF **3**

PROJECT **ROCKPORT PLANT**

BORING START **3/2/16** BORING FINISH **3/2/16**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
15	SS	21.0	22.5	3-4-5	1.5							
16	SS	22.5	24.0	2-4-6	1.5			CL ML		Silty clay, pale yellow brown 10YR 6/2, moist, trace to little fine grained sand		
17	SS	24.0	25.5	1-2-5	1.2			SP SM		Poorly graded sand w/silt, pale yellow brown 10YR 6/2, moist, fine to medium grained sand @ 24.9' 3" silt layer		
18	SS	25.5	27.0	2-4-6	1.5		25					
19	SS	27.0	28.5	1-5-9	1.3			CL		Lean clay, moderate yellowish brown 10YR 5/4, moist, few sandy layers <1" thick @ 28.3' SP-SM layer (~3" thick)		
20	SS	28.5	30.0	4-4-5	1.3			SP SM		Poorly graded sand w/silt, dark yellowish orange 10YR 6/6, wet, fine to medium grained sand, little coarse grained sand @ 31.5' trace fine gravel @ 34.5' trace fine gravel		
21	SS	30.0	31.5	5-7-8	1.5		30					
22	SS	31.5	33.0	3-3-4	1.1							
23	SS	33.0	34.5	1-2-5	0							
24	SS	34.5	36.0	3-4-8	.8		35					
25	SS	36.0	37.5	3-5-7	1.0							
26	SS	37.5	39.0	5-6-7	.9			SP		Poorly graded sand, dark yellowish orange 10YR 6/6, wet, fine to medium grained sand, trace to little coarse grained sand @ 37.5' trace gravel		
27	SS	39.0	40.5	4-7-20	1.2			SP SM		Poorly graded sand w/silt, dark yellowish orange 10YR 6/6, wet, fine to medium grained sand, trace coarse grained sand		
28	SS	40.5	42.0	7-7-8	1.1		40	SC		Clayey sand, moderate brown 5YR 3/4, wet, fine to medium grained sand		
29	SS	42.0	43.5	4-6-10	1.0			SP		Poorly graded sand, dark yellowish orange 10YR 6/6, wet, fine to medium grained sand, trace coarse grained sand & fine gravel @ 42.0' - 43.5' increase in coarse grained sand @ 45.2' - 45.5' color change to moderate brown 5YR 4/4 @ 46.5' increase in coarse grained sand, trace wood fragments (tree bark) @ 48' color change to pale yellowish brown 10YR		
30	SS	43.5	45.0	4-5-7	1.0							
31	SS	45.0	46.5	4-6-10	1.2		45					

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 4/27/16

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER 42393125-01

COMPANY INDIANA MICHIGAN POWER COMPANY

BORING NO. MW-1606S DATE 4/27/16 SHEET 3 OF 3

PROJECT ROCKPORT PLANT

BORING START 3/2/16 BORING FINISH 3/2/16

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
										6/2, few black decomposed organic layers		

AMERICAN ELECTRIC POWER SERVICE CORPORATION
 AEP CIVIL ENGINEERING LABORATORY
 MONITORING WELL CONSTRUCTION



JOB NUMBER 42393125-01

COMPANY INDIANA MICHIGAN POWER COMPANY

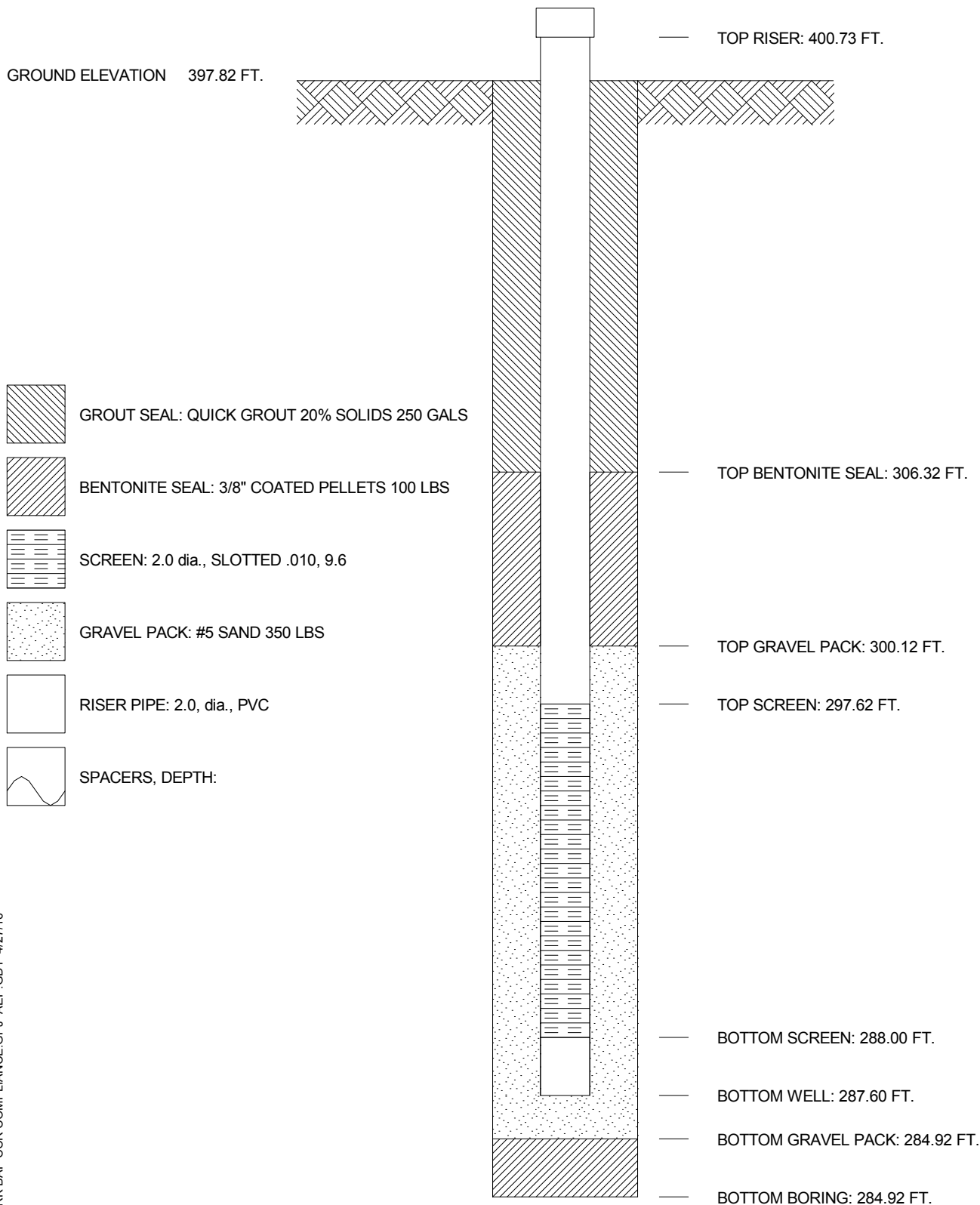
WELL No. MW-1606D BORING No. MW-1606D INSTALLED 2/12/16

PROJECT ROCKPORT PLANT

COORDINATES N 151,502.1 E 512,881.5

SYSTEM State Plane using NAD27/29

GROUND ELEVATION 397.82 FT.









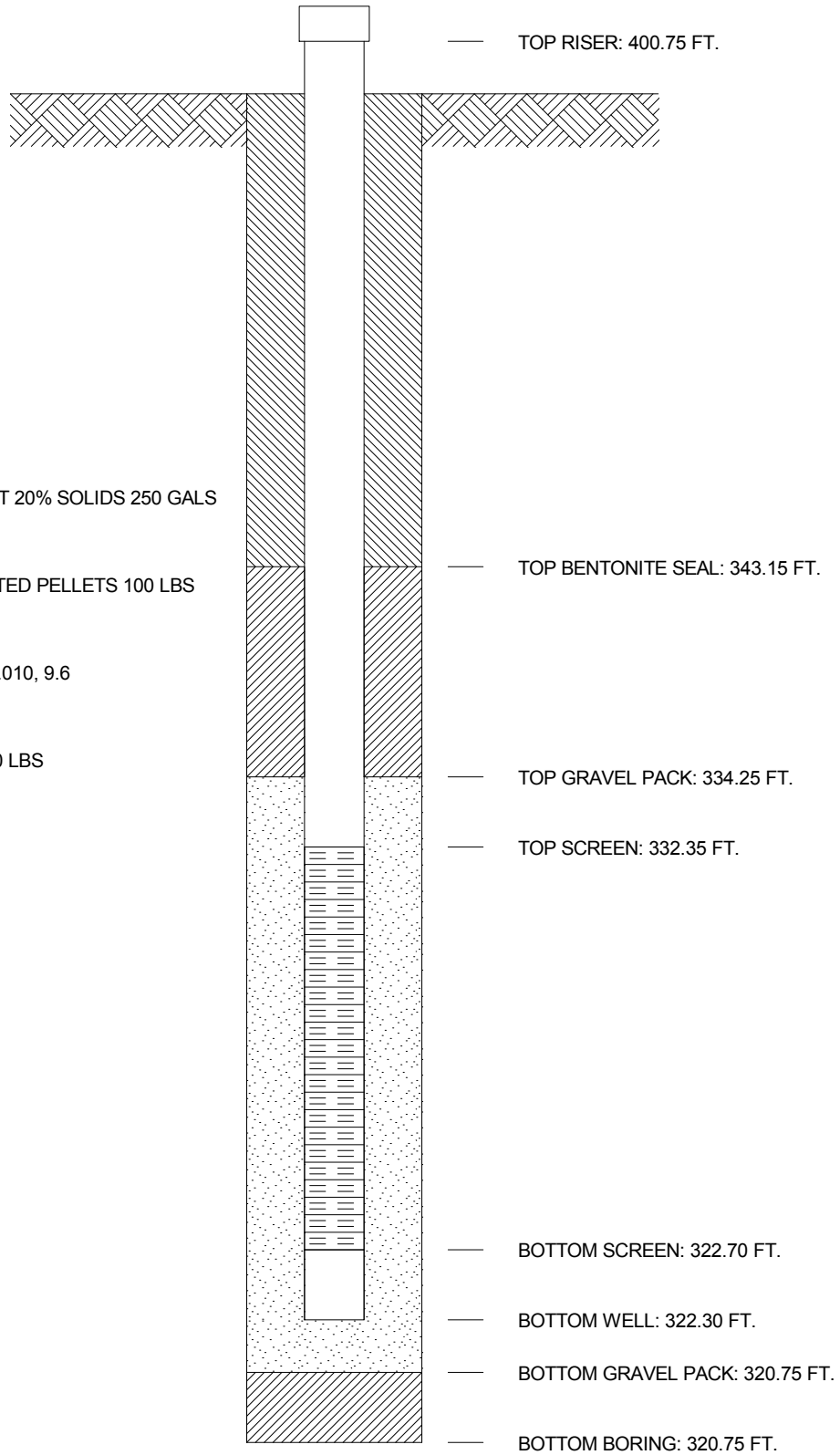
AMERICAN ELECTRIC POWER SERVICE CORPORATION
 AEP CIVIL ENGINEERING LABORATORY
 MONITORING WELL CONSTRUCTION



JOB NUMBER 42393125-01
 COMPANY INDIANA MICHIGAN POWER COMPANY WELL No. MW-1606I BORING No. MW-1606I INSTALLED 3/1/16
 PROJECT ROCKPORT PLANT
 COORDINATES N 151,500.4 E 512,885.5
 SYSTEM State Plane using NAD27/29

GROUND ELEVATION 397.75 FT.

-  GROUT SEAL: QUICK GROUT 20% SOLIDS 250 GALS
-  BENTONITE SEAL: 3/8" COATED PELLETS 100 LBS
-  SCREEN: 2.0 dia., SLOTTED .010, 9.6
-  GRAVEL PACK: #5 SAND 200 LBS
-  RISER PIPE: 2.0, dia., PVC
-  SPACERS, DEPTH:









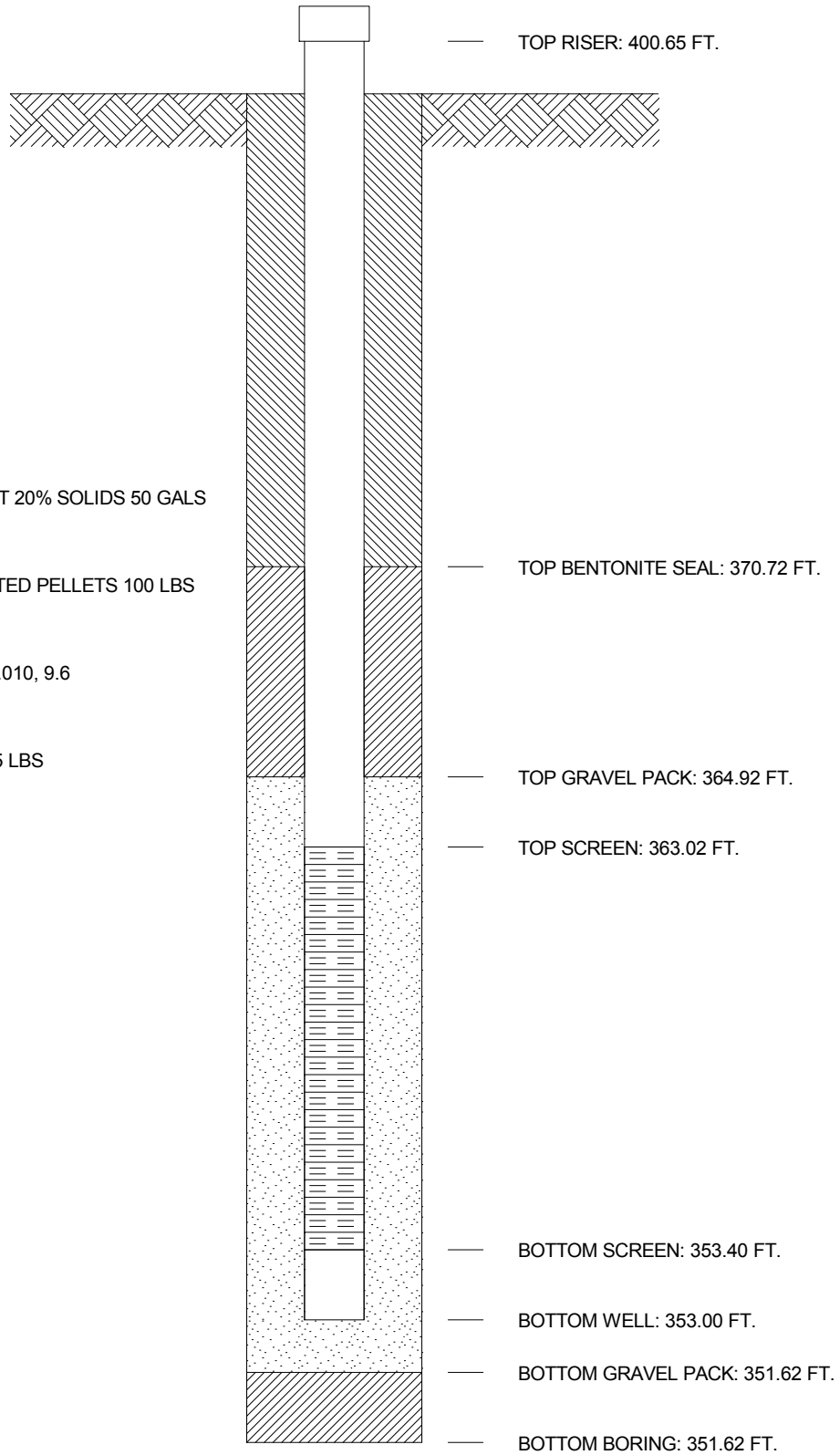
AMERICAN ELECTRIC POWER SERVICE CORPORATION
 AEP CIVIL ENGINEERING LABORATORY
 MONITORING WELL CONSTRUCTION



JOB NUMBER 42393125-01
 COMPANY INDIANA MICHIGAN POWER COMPANY WELL No. MW-1606S BORING No. MW-1606S INSTALLED 3/2/16
 PROJECT ROCKPORT PLANT
 COORDINATES N 151,498.9 E 512,889.4
 SYSTEM State Plane using NAD27/29

GROUND ELEVATION 397.62 FT.

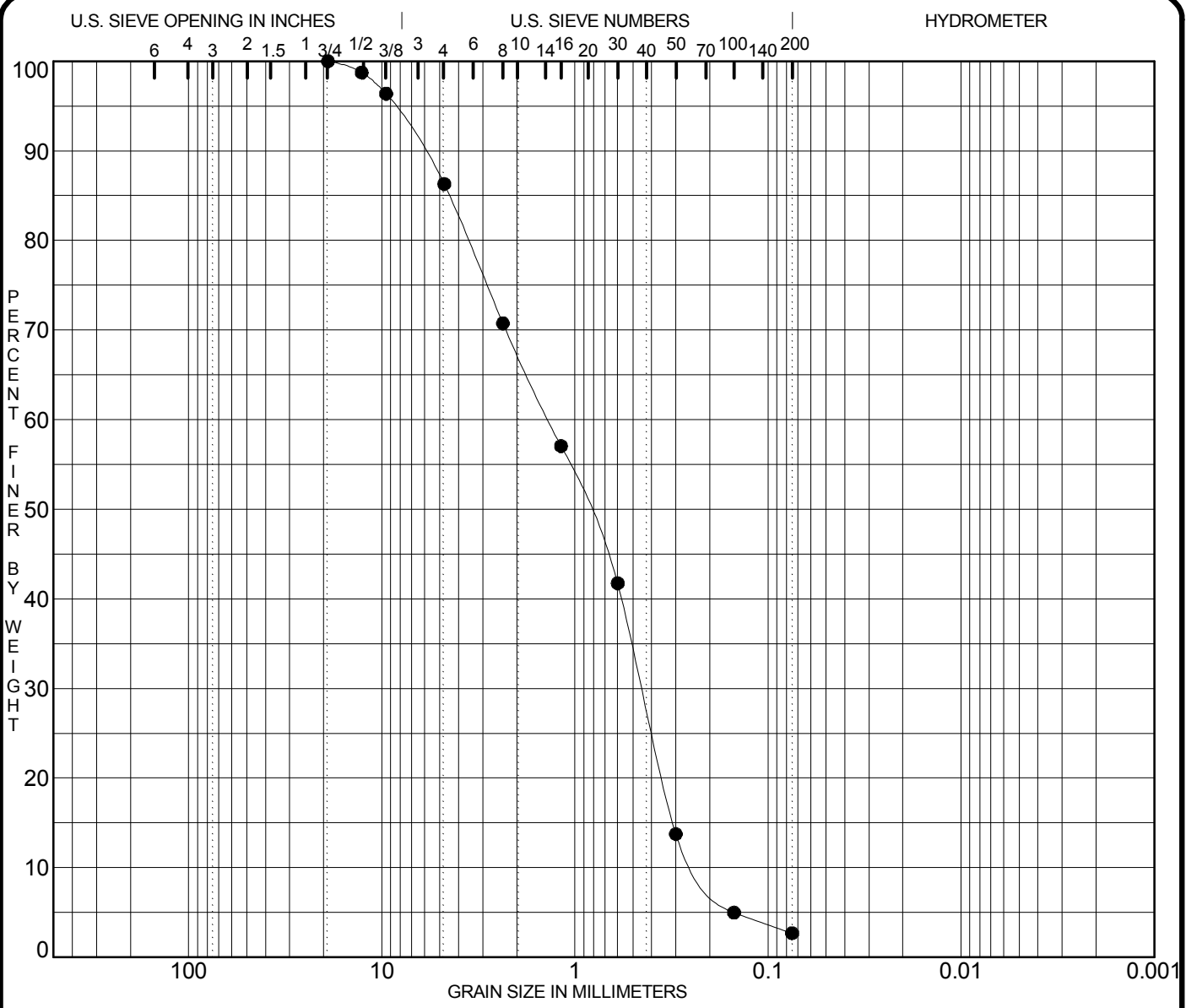
-  GROUT SEAL: QUICK GROUT 20% SOLIDS 50 GALS
-  BENTONITE SEAL: 3/8" COATED PELLETS 100 LBS
-  SCREEN: 2.0 dia., SLOTTED .010, 9.6
-  GRAVEL PACK: #5 SAND 225 LBS
-  RISER PIPE: 2.0, dia., PVC
-  SPACERS, DEPTH:



ATTACHMENT 2

**GRADATION CURVES FOR SCREENED INTERVALS
2016 BA POND MONITORING WELLS**





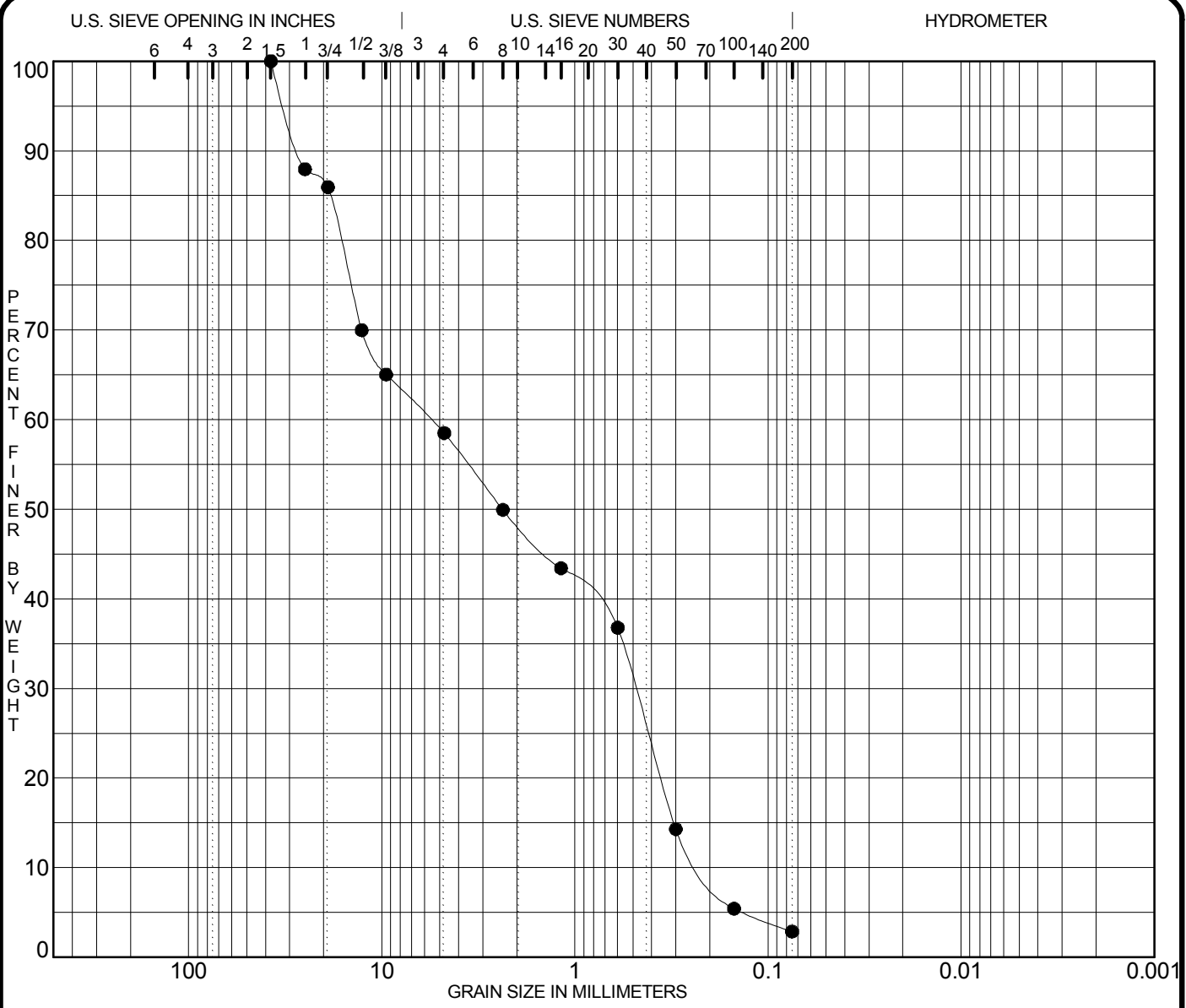
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification					MC%	LL	PL	PI	Sp.Gr.
● MW-1600D 84.5-94.1ft						13.5				
	POORLY GRADED SAND SP									
	SS-57,58,59,60,61 (Composite)									
	N 154,306.3 E 512,449.0									
	ELEVATION 393.8									
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Fines	%<.002		
● MW-1600D 84.5-94.1ft	19.000	1.370	0.449	0.223	13.7	83.6	2.7			

PROJECT ROCKPORT PLANT - JOB NO. 42393125-01
 DATE 3/22/16

GRADATION CURVES
 American Electric Power Service Corp.





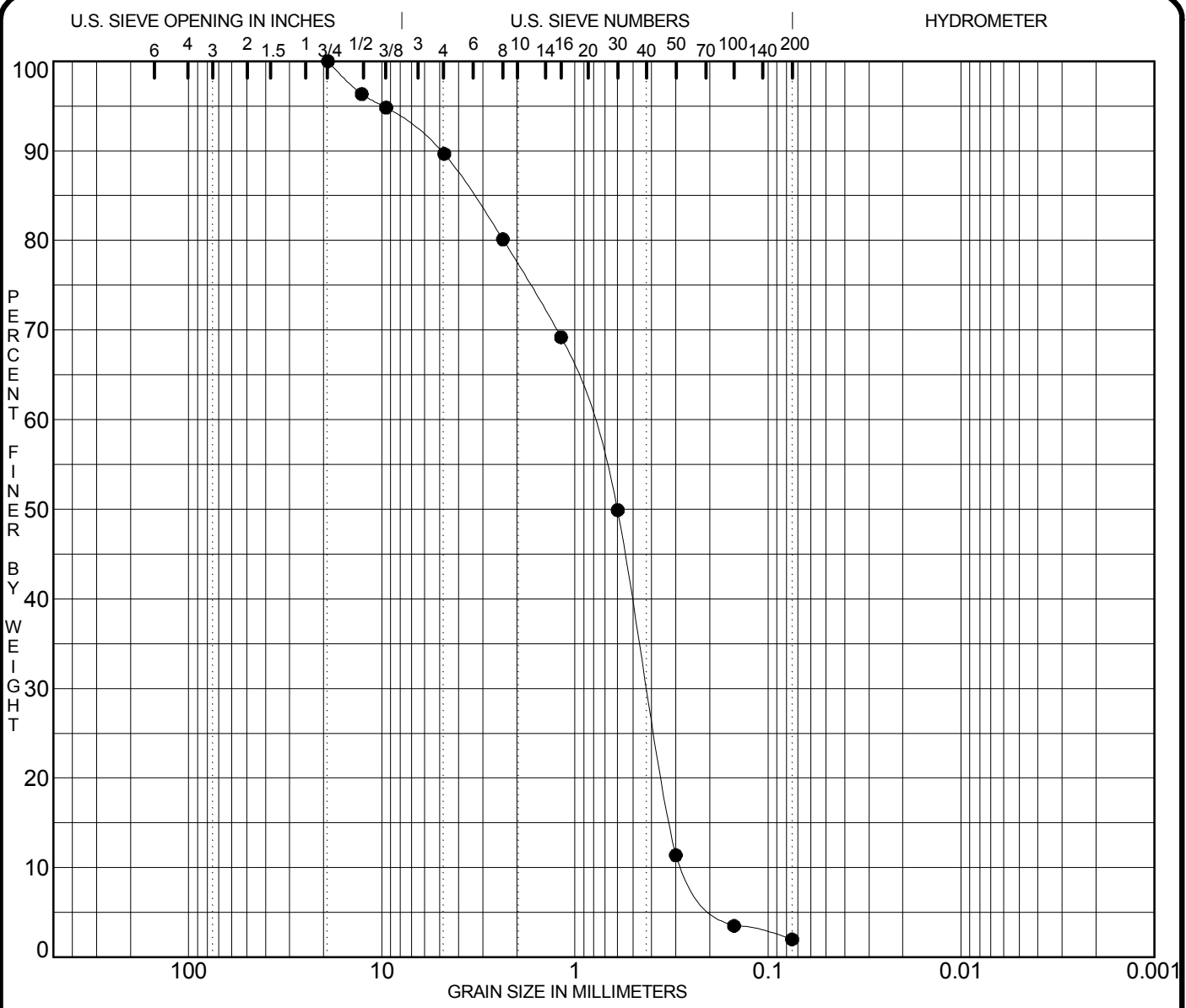
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification					MC%	LL	PL	PI	Sp.Gr.
● MW-1600I 61.6-71.2ft						12.6				
	POORLY GRADED SAND with GRAVEL SP									
	SS-42,43,44,45,46,47,48 (Composite)									
	N 154,306.0 E 512,454.0									
	ELEVATION 393.7									
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Fines	%<.002		
● MW-1600I 61.6-71.2ft	37.500	5.568	0.487	0.214	41.5	55.6	2.9			

PROJECT ROCKPORT PLANT - JOB NO. 42393125-01
 DATE 3/22/16

GRADATION CURVES
 American Electric Power Service Corp.





COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

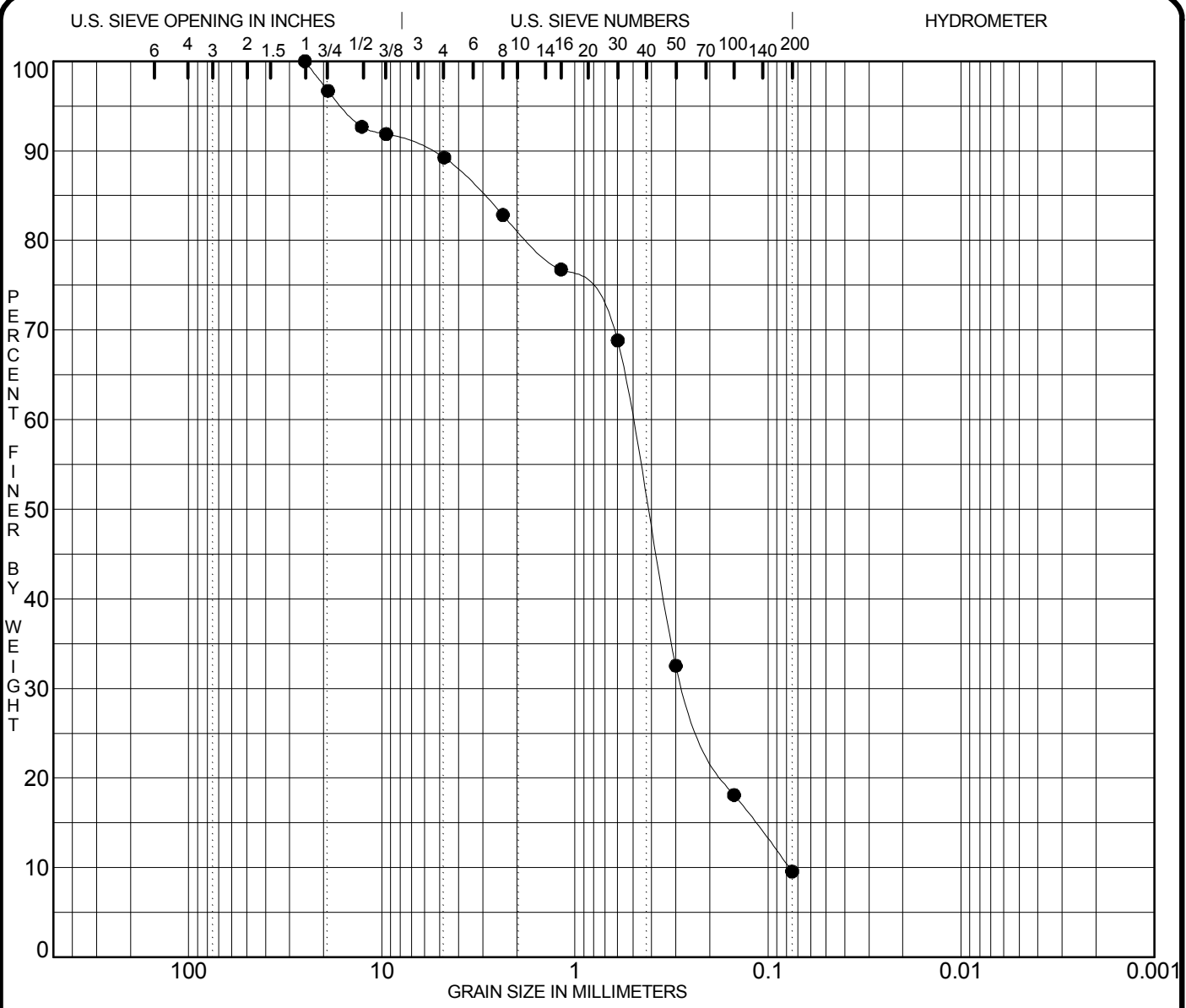
Specimen Identification	Classification	MC%	LL	PL	PI	Sp.Gr.
● MW-1600S 30.6-40.2ft		15.4				
	POORLY GRADED SAND SP					
	SS-21,22,23,24,25,26,27,28 (Composite)					
	N 154,305.9 E 512,458.0					
	ELEVATION 393.7					

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Fines	%<.002
● MW-1600S 30.6-40.2ft	19.000	0.855	0.419	0.266	10.3	87.7	2.0	

PROJECT ROCKPORT PLANT - JOB NO. 42393125-01
 DATE 3/22/16

GRADATION CURVES
 American Electric Power Service Corp.





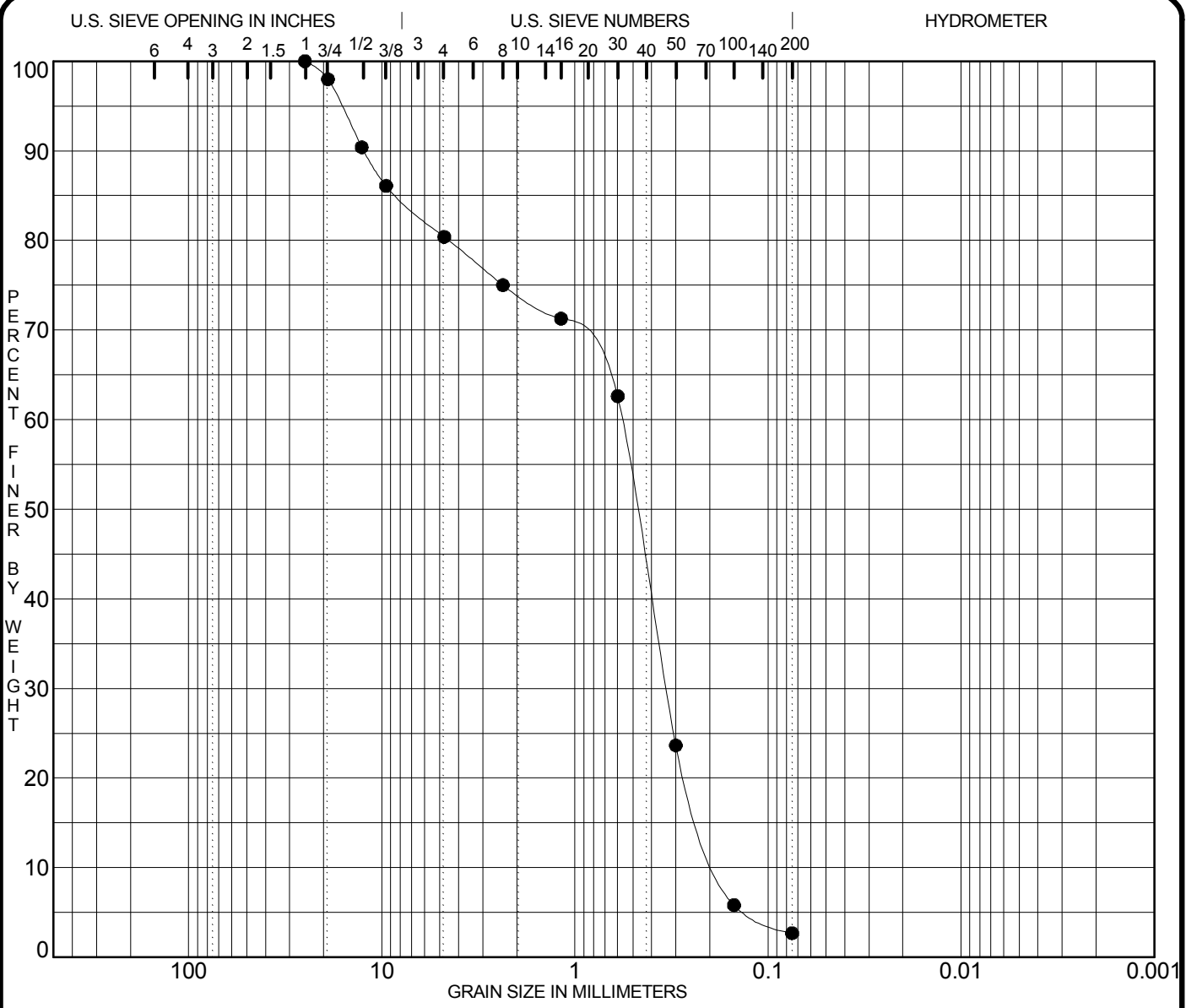
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification					MC%	LL	PL	PI	Sp.Gr.
● MW-1601D 99.8-109.4ft						23.9				
	SS-68,69,70,71,72,73 (Composite)									
	N 154,323.2 E 513,487.5									
	ELEVATION 400.1									
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Fines	%<.002		
● MW-1601D 99.8-109.4ft	25.000	0.507	0.266	0.078	10.8	79.7	9.6			

PROJECT ROCKPORT PLANT - JOB NO. 42393125-01
 DATE 3/22/16

GRADATION CURVES
 American Electric Power Service Corp.





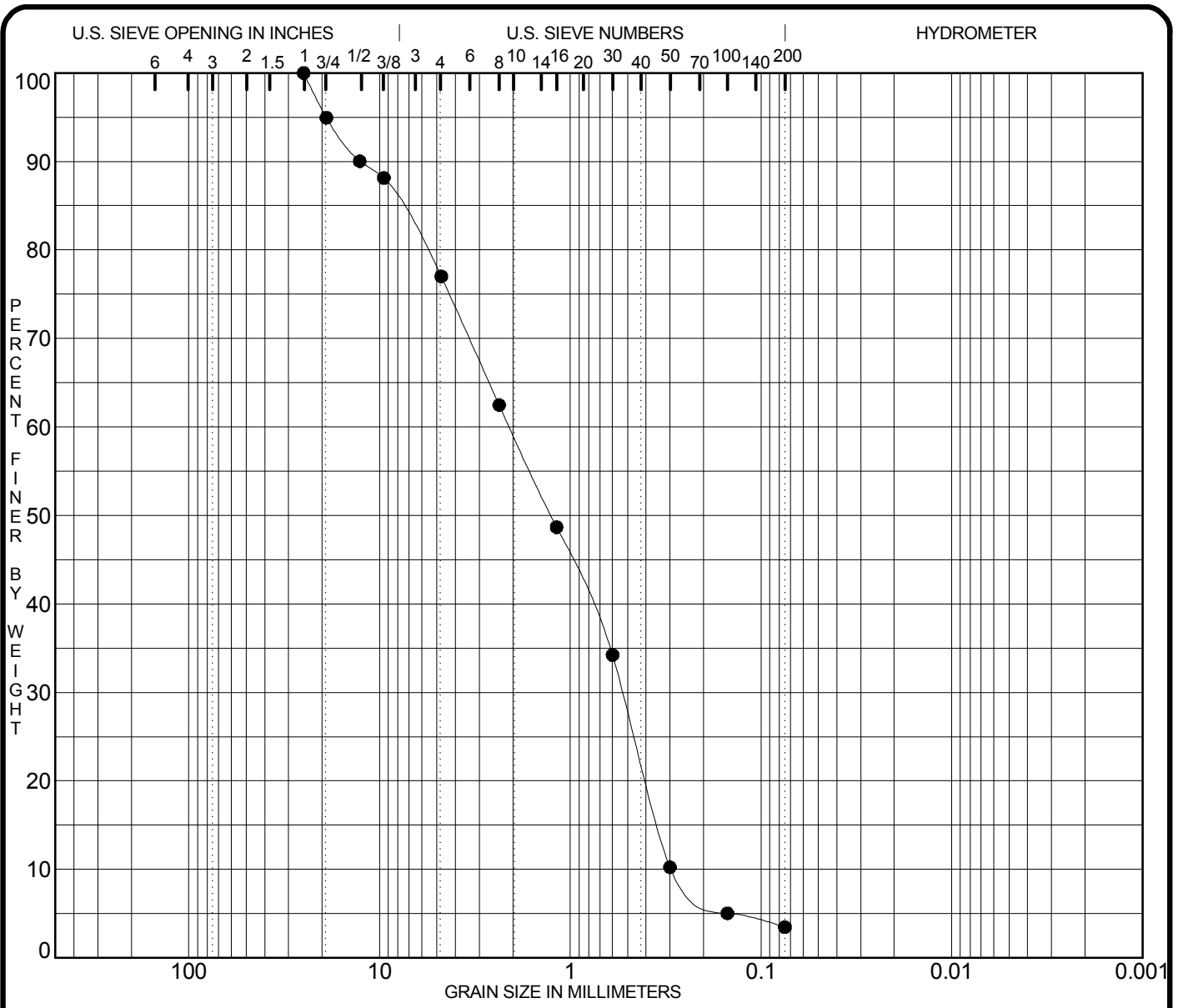
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification					MC%	LL	PL	PI	Sp.Gr.
● MW-1601I 67.8-77.4ft						15.7				
	POORLY GRADED SAND with GRAVEL SP									
	SS-48,48,49,50,51 (Composite)									
	N 154,325.3 E 513,483.5									
	ELEVATION 400.0									
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Fines	%<.002		
● MW-1601I 67.8-77.4ft	25.000	0.573	0.336	0.177	19.6	77.7	2.7			

PROJECT ROCKPORT PLANT - JOB NO. 42393125-01
 DATE 3/22/16

GRADATION CURVES
 American Electric Power Service Corp.





COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

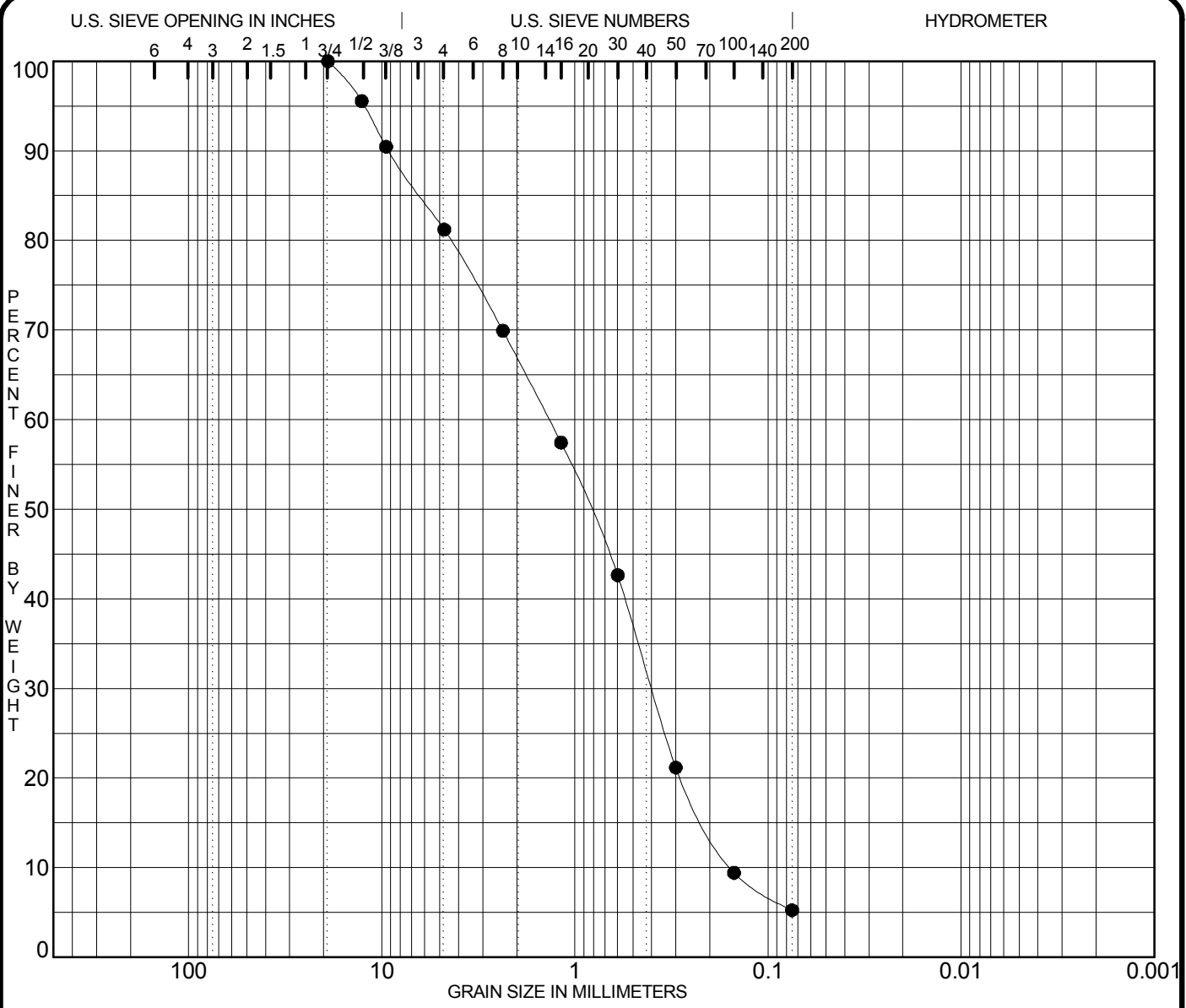
Specimen Identification	Classification					MC%	LL	PL	PI	Sp.Gr.
● MW-1601S 36.8-46.4ft						25.2				
	POORLY GRADED SAND with GRAVEL SP									
	SS-26,27,28,29,30,31 (Composite)									
	N 154,327.6 E 513,479.7									
	ELEVATION 399.8									
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Fines	%<.002		
● MW-1601S 36.8-46.4ft	25.000	2.084	0.531	0.290	23.0	73.5	3.5			

PROJECT ROCKPORT PLANT -

JOB NO. 42393125-01
DATE 3/22/16

GRADATION CURVES
American Electric Power Service Corp.





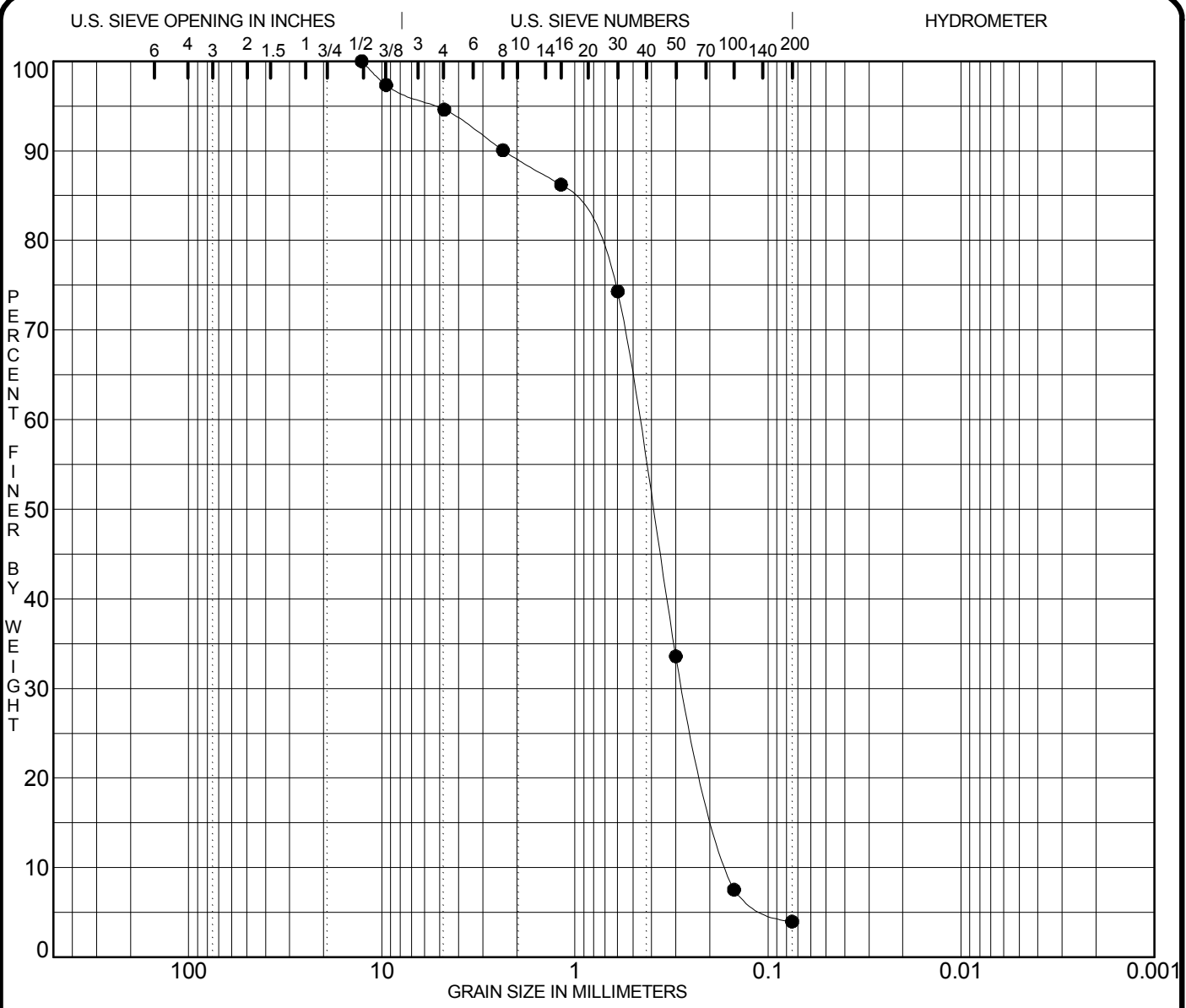
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification					MC%	LL	PL	PI	Sp.Gr.
● MW-1602D 14.0-123.6ft						14.1				
N 152,300.2 E 514,229.4 ELEVATION 399.3										
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Fines	%<.002		
● MW-1602D 14.0-123.6ft	19.000	1.361	0.399	0.155	18.8	76.0	5.3			

PROJECT ROCKPORT PLANT - JOB NO. 42393125-01
DATE 3/22/16

GRADATION CURVES
American Electric Power Service Corp.





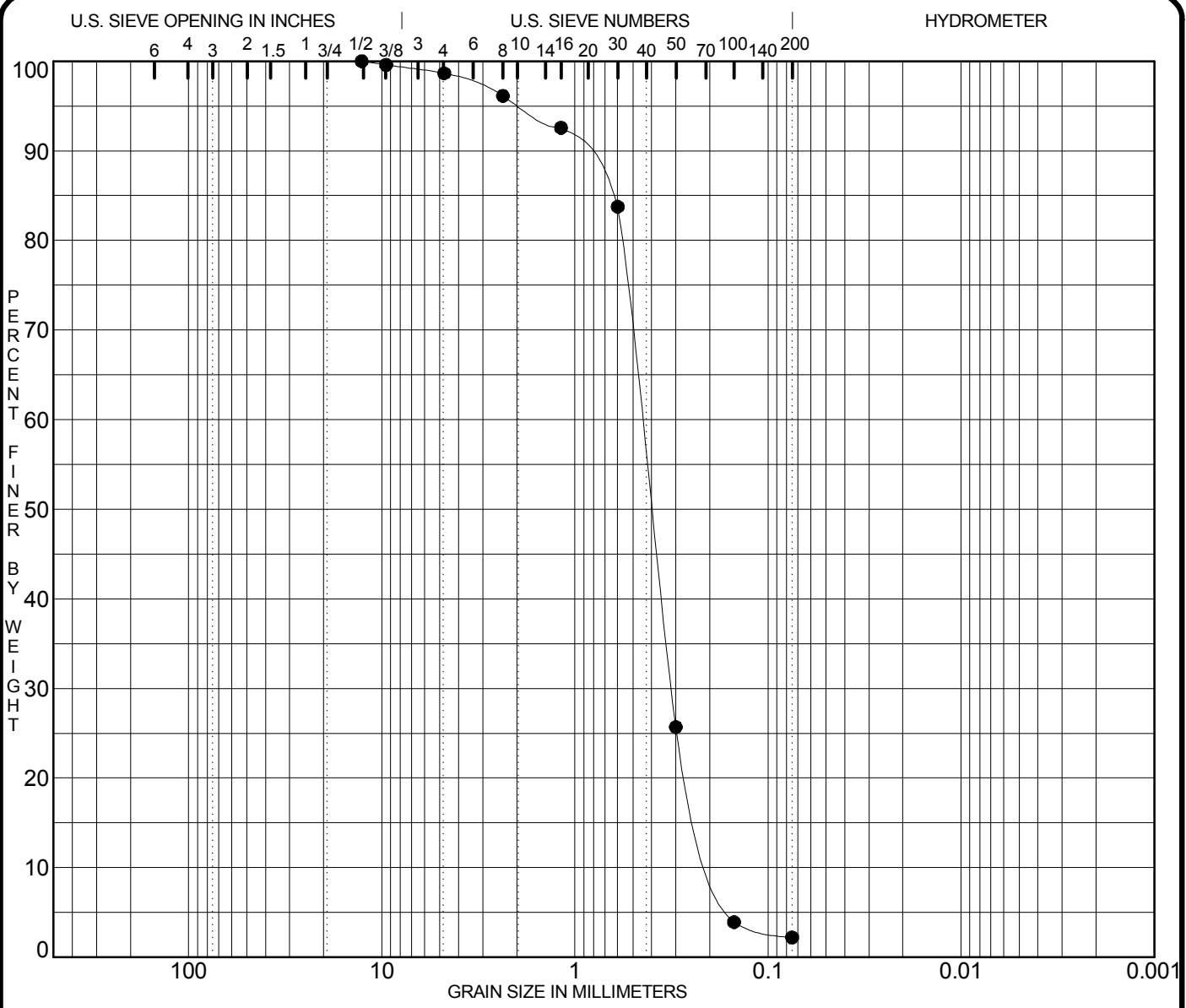
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification					MC%	LL	PL	PI	Sp.Gr.
● MW-1602I 67.5-77.1ft						17.9				
	POORLY GRADED SAND SP									
	N 152,295.0 E 514,229.2									
	ELEVATION 399.4									
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Fines	%<.002		
● MW-1602I 67.5-77.1ft	12.700	0.470	0.273	0.160	5.4	90.6	4.0			

PROJECT ROCKPORT PLANT - JOB NO. 42393125-01
 DATE 3/22/16

GRADATION CURVES
 American Electric Power Service Corp.



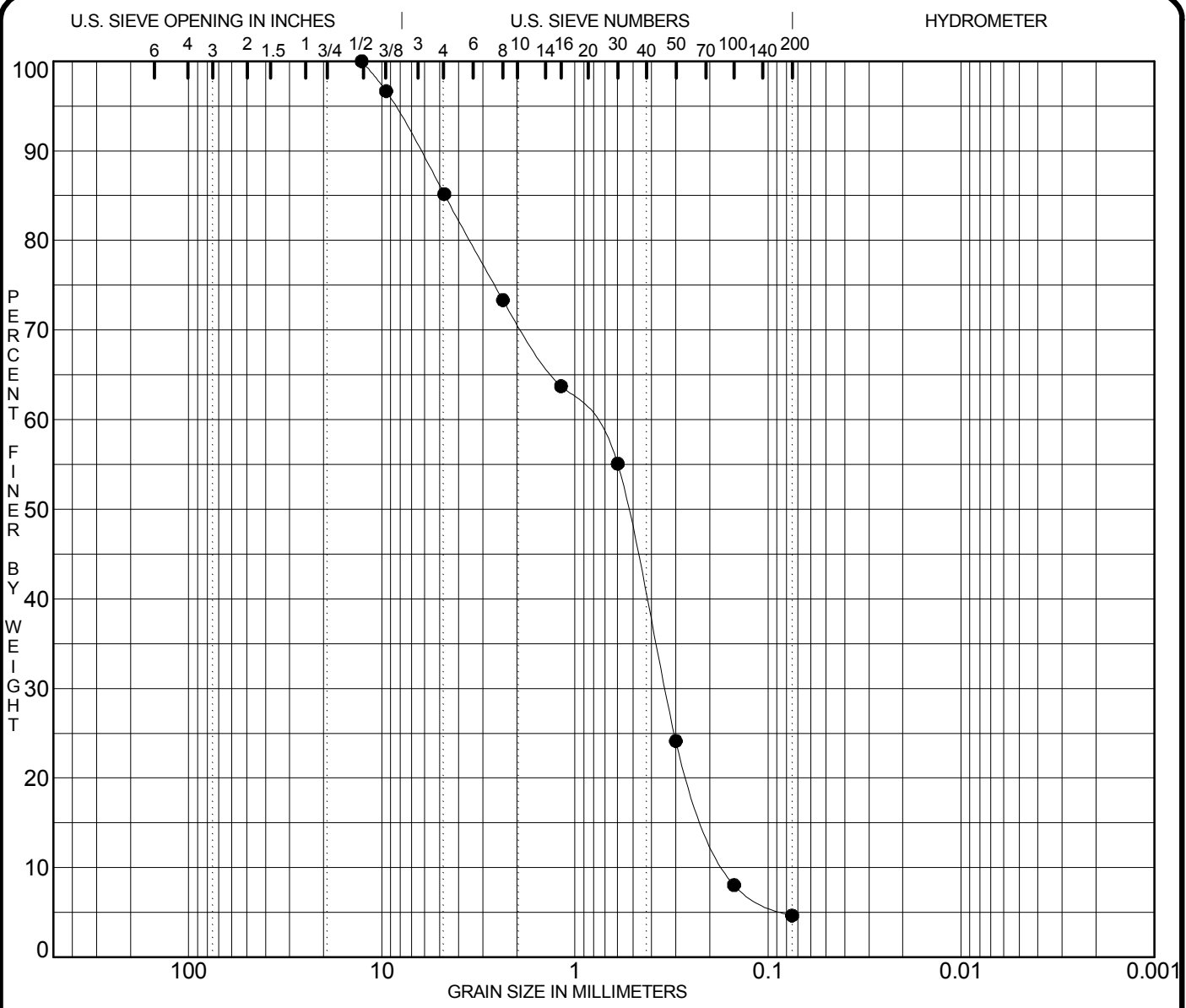


COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification					MC%	LL	PL	PI	Sp.Gr.
● MW-1602S 35.5-45.5ft						21.8				
	POORLY GRADED SAND SP									
	SS-24,25,26,27,28 (Composite Sample)									
	ELEVATION									
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Fines	%<.002		
● MW-1602S 35.5-45.5ft	12.700	0.452	0.316	0.182	1.3	96.4	2.2			

PROJECT ROCKPORT PLANT - JOB NO. 42393125-01
 DATE 3/22/16





COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

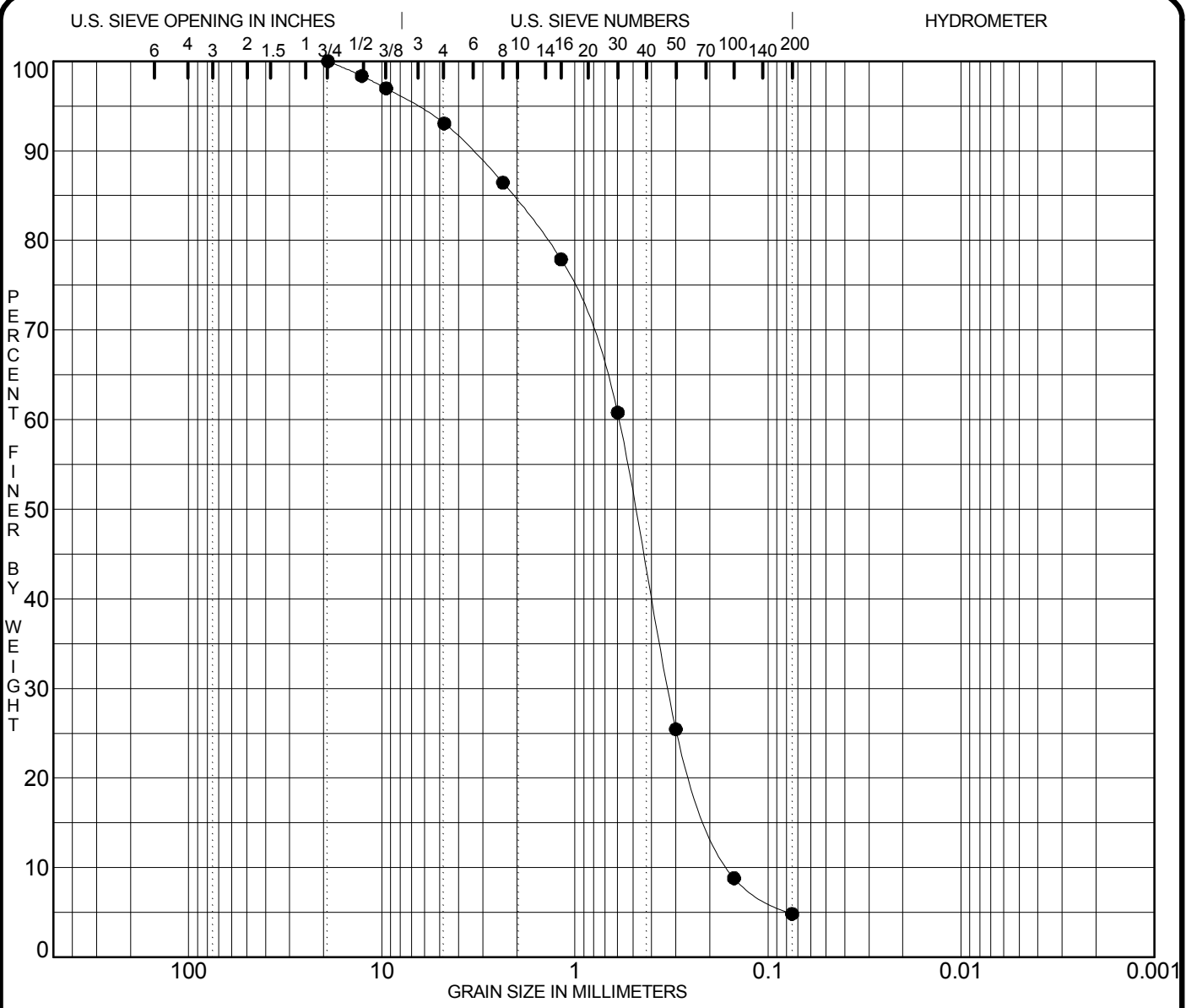
Specimen Identification	Classification	MC%	LL	PL	PI	Sp.Gr.
● MW-1603D 10.0-119.6ft		10.7				
	POORLY GRADED SAND SP					
	SS-75,76,77,78,79 (Composite Sample)					
	N 152,811.9 E 514,207.5					
	ELEVATION 401.6					

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Fines	%<.002
● MW-1603D 10.0-119.6ft	12.700	0.881	0.342	0.163	14.8	80.5	4.7	

PROJECT ROCKPORT PLANT - JOB NO. 42393125-01
 DATE 3/22/16

GRADATION CURVES
 American Electric Power Service Corp.



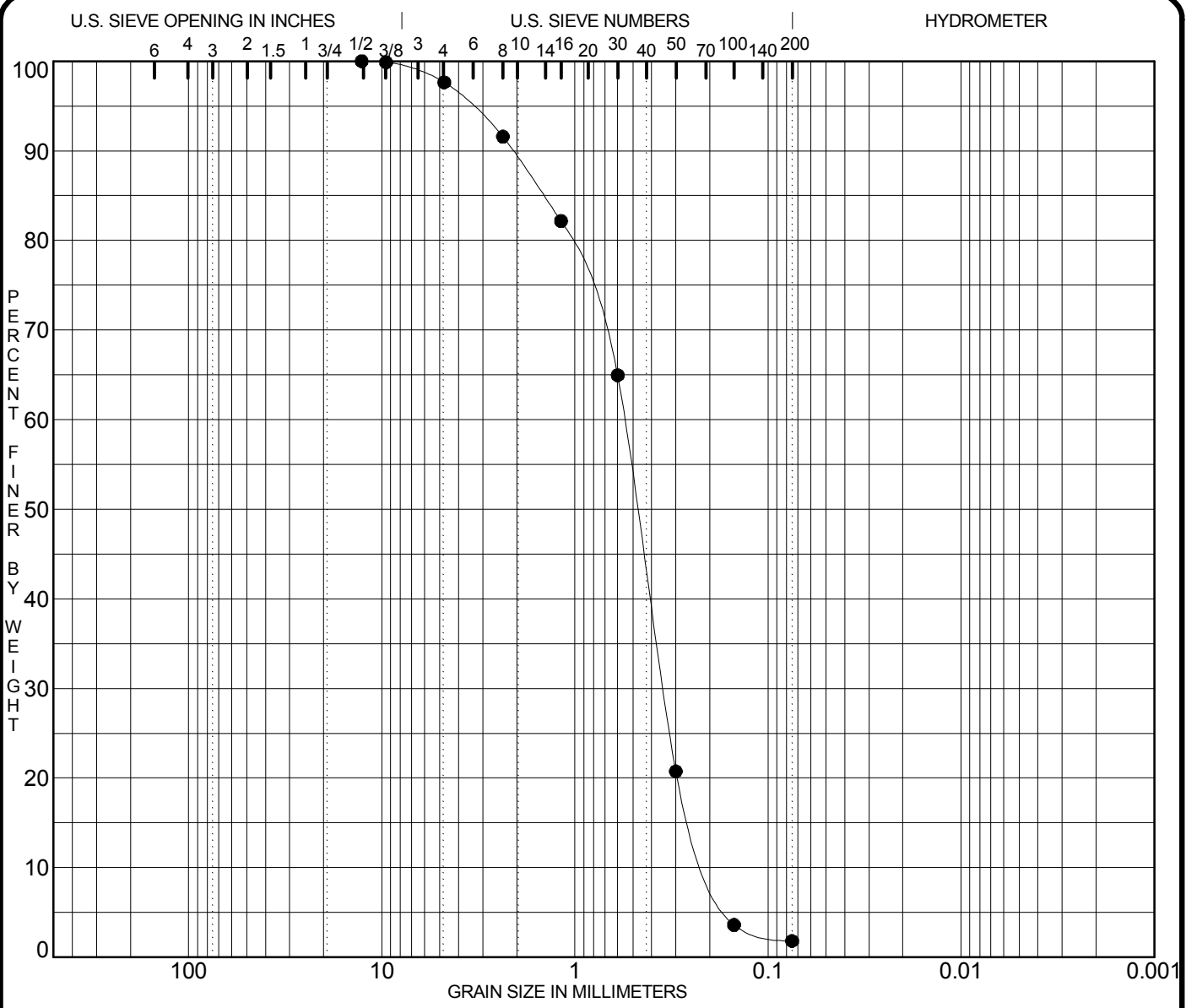


COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification					MC%	LL	PL	PI	Sp.Gr.
● MW-1603I 68.6-78.2ft						15.4				
	POORLY GRADED SAND SP									
	SS-47,48,49,50,51,52 (Composite)									
	N 152,805 and 19,207.2									
	ELEVATION 401.4									
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Fines	%<.002		
● MW-1603I 68.6-78.2ft	19.000	0.591	0.328	0.158	6.9	88.2	4.8			

PROJECT ROCKPORT PLANT - JOB NO. 42393125-01
DATE 3/22/16





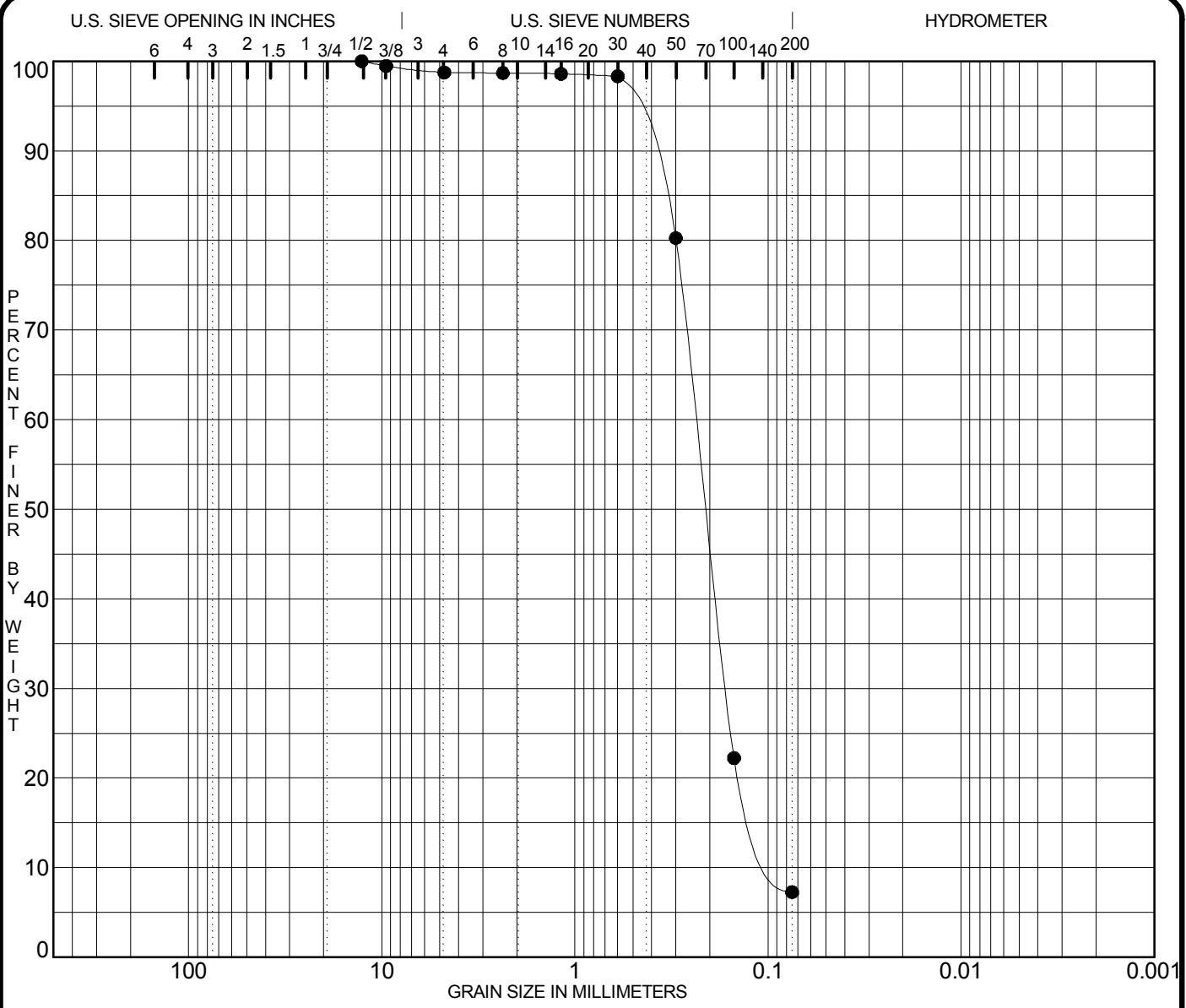
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification					MC%	LL	PL	PI	Sp.Gr.
● MW-1603S 37.6-47.2ft						16.3				
	POORLY GRADED SAND SP									
	SS-27,28,29,30 (Composite Sample)									
	N 152,802.7 E 514,206.9									
	ELEVATION 401.5									
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Fines	%<.002		
● MW-1603S 37.6-47.2ft	12.700	0.555	0.347	0.194	2.4	95.8	1.8			

PROJECT ROCKPORT PLANT - JOB NO. 42393125-01
 DATE 3/22/16

GRADATION CURVES
 American Electric Power Service Corp.





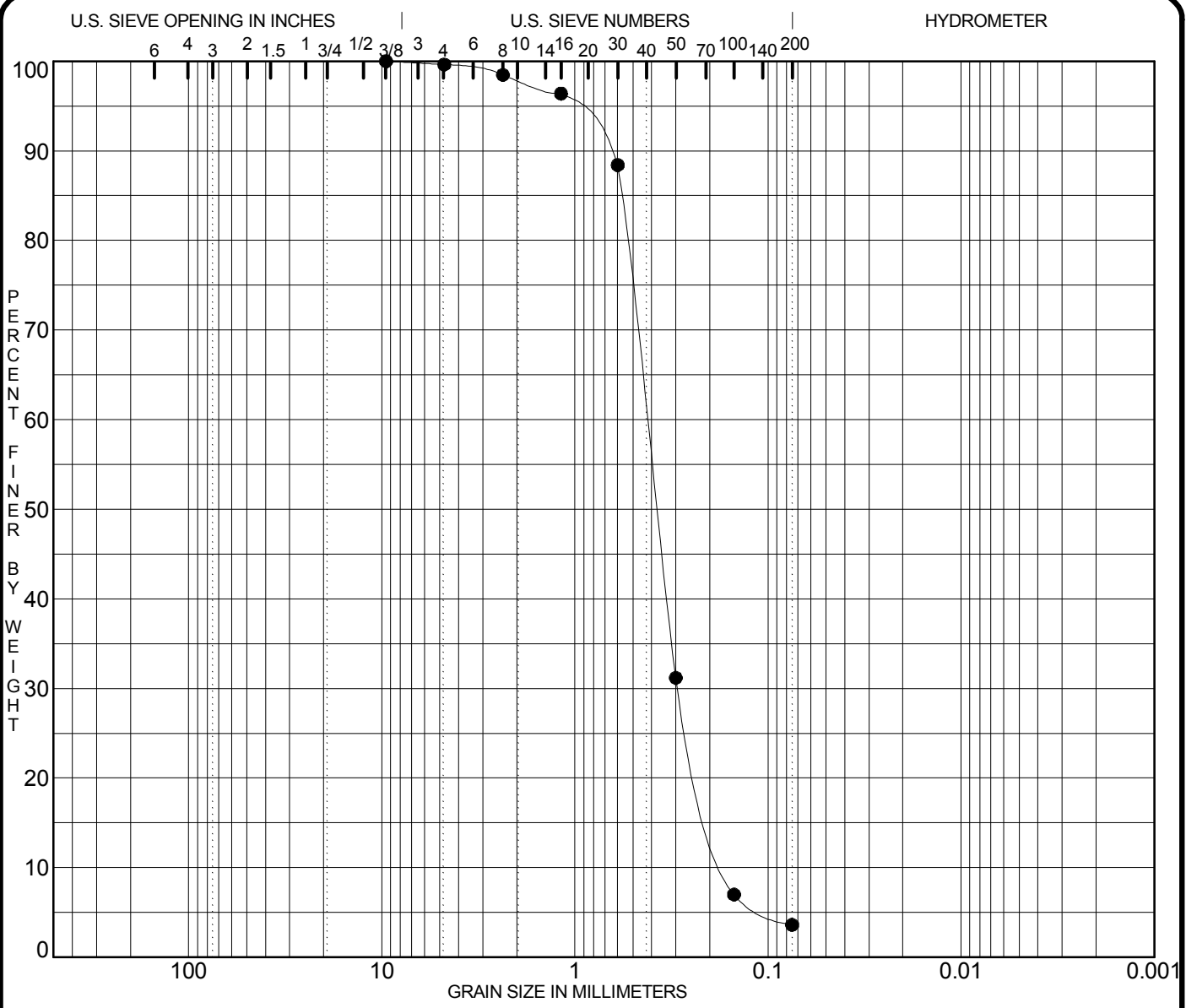
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification					MC%	LL	PL	PI	Sp.Gr.
● MW-1604D15.0-124.6ft						24.9				
	SS-78,79,80,81,82,83 (Composite)									
	N 151,516,517,518,519,520,521,522,523,524,204.9									
	ELEVATION 399.9									
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Fines	%<.002		
● MW-1604D15.0-124.6ft	12.700	0.236	0.165	0.085	1.3	91.5	7.3			

PROJECT ROCKPORT PLANT - JOB NO. 42393125-01
 DATE 3/22/16

GRADATION CURVES
 American Electric Power Service Corp.





COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

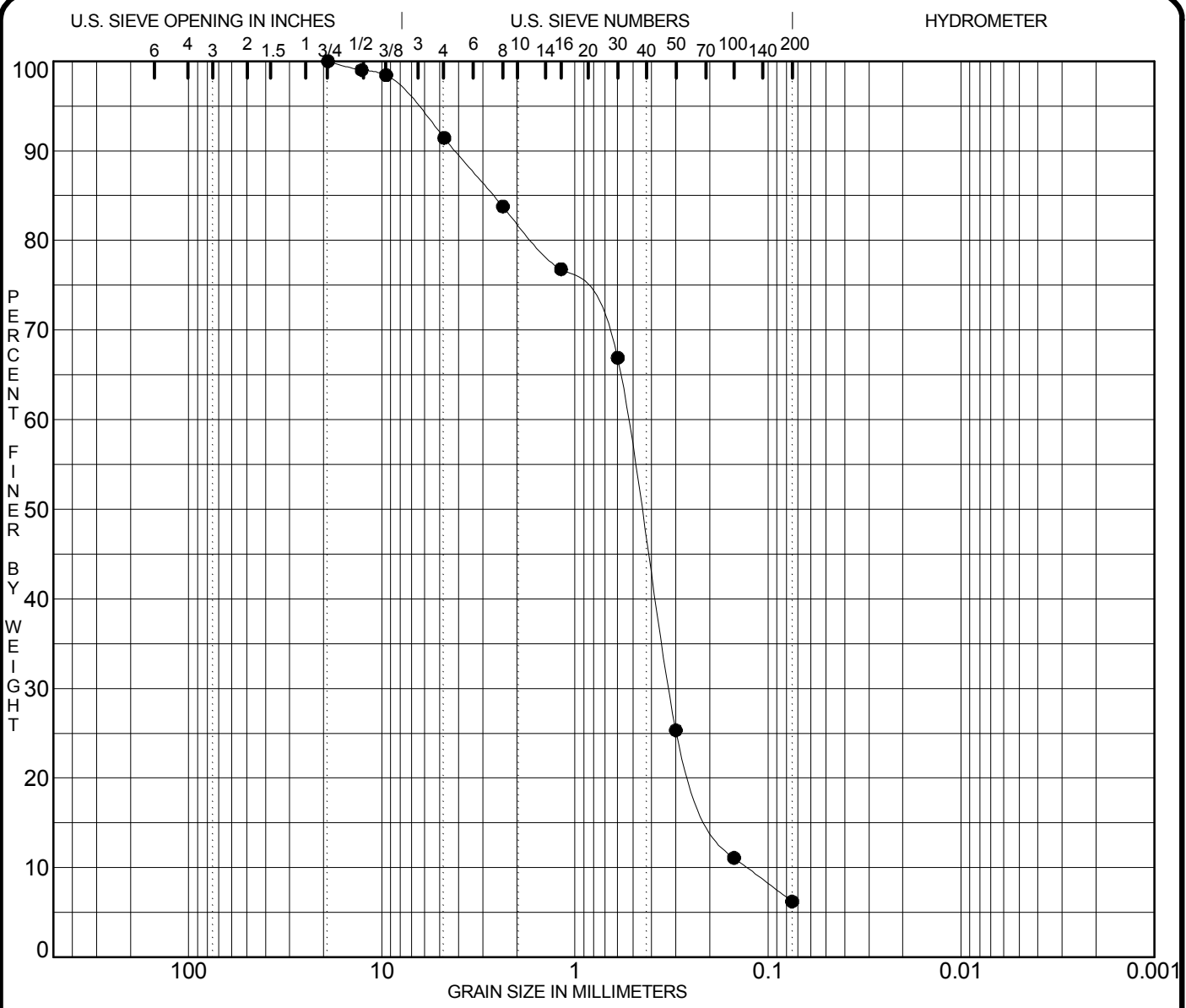
Specimen Identification	Classification	MC%	LL	PL	PI	Sp.Gr.
● MW-1604I 68.0-77.6ft		19.4				
	POORLY GRADED SAND SP					
	SS-47,48,49,50,51 (Composite Sample)					
	N 151,506.5 E 514,201.0					
	ELEVATION 399.7					

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Fines	%<.002
● MW-1604I 68.0-77.6ft	9.500	0.425	0.290	0.163	0.4	96.0	3.6	

PROJECT ROCKPORT PLANT - JOB NO. 42393125-01
 DATE 3/22/16

GRADATION CURVES
 American Electric Power Service Corp.





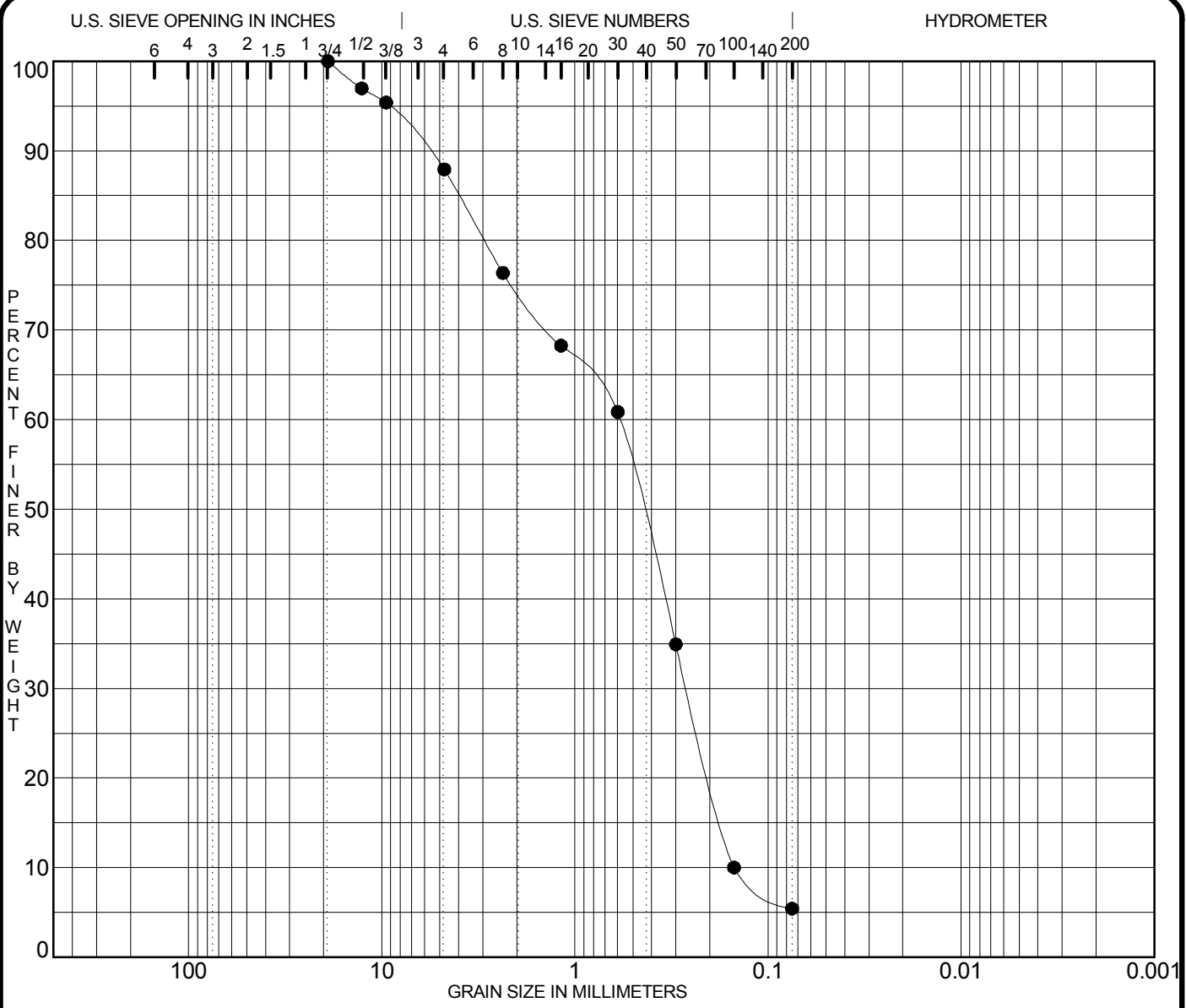
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification					MC%	LL	PL	PI	Sp.Gr.
● MW-1604S 37.0-46.6ft						15.5				
	SS-26,27,28,29,30,31 (Composite)									
	N 151,505 Samples 14,197.3									
	ELEVATION 399.8									
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Fines	%<.002		
● MW-1604S 37.0-46.6ft	19.000	0.535	0.324	0.128	8.6	85.2	6.2			

PROJECT ROCKPORT PLANT - JOB NO. 42393125-01
 DATE 3/22/16

GRADATION CURVES
 American Electric Power Service Corp.





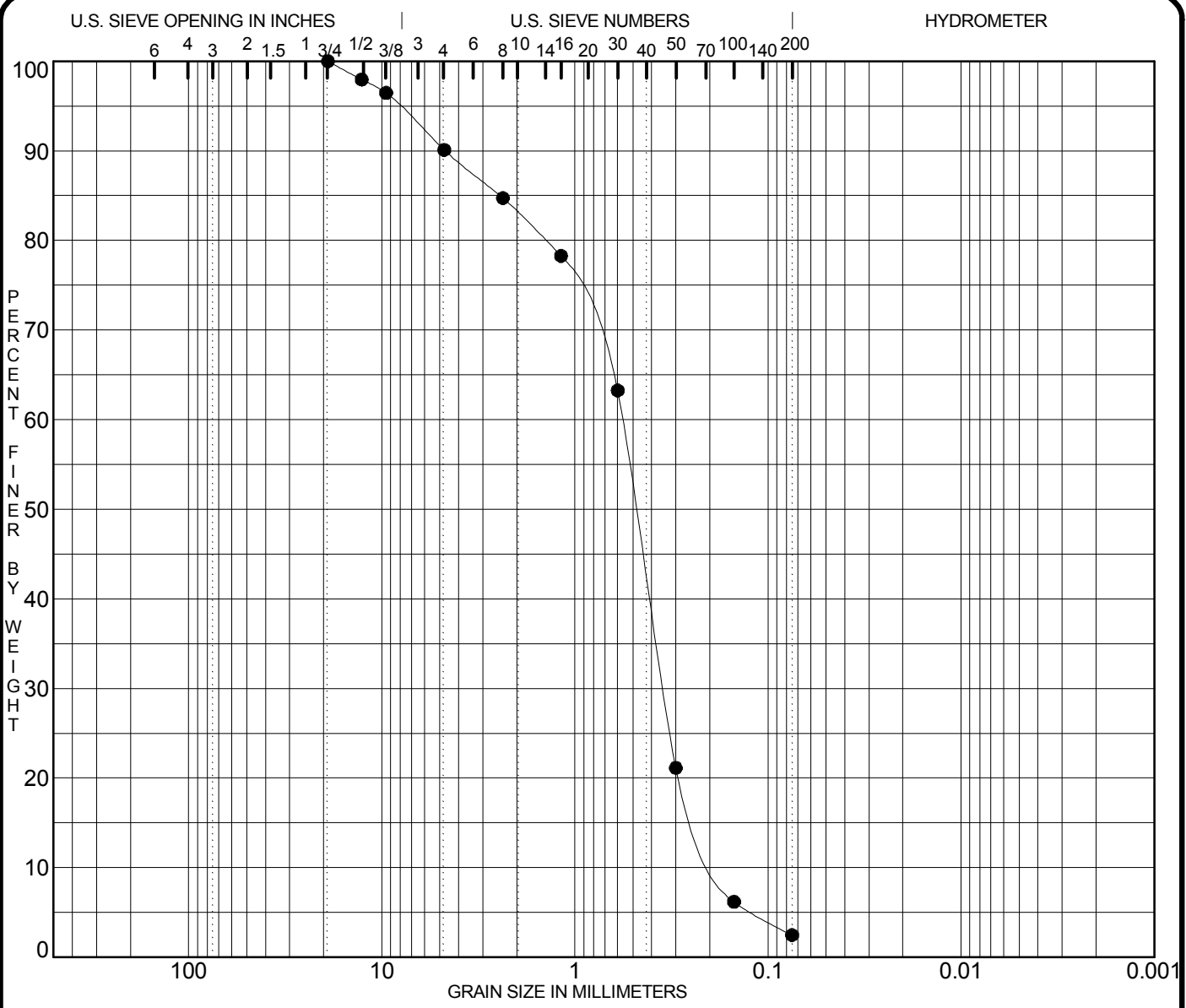
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification					MC%	LL	PL	PI	Sp.Gr.
● MW-1605D15.0-124.6ft						14.5				
	SS-78,79,80,81,82,83 (Composite)									
	N 151,478 and 1513,537.1									
	ELEVATION 400.4									
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Fines	%<.002		
● MW-1605D15.0-124.6ft	19.000	0.586	0.262	0.150	12.1	82.5	5.4			

PROJECT ROCKPORT PLANT - JOB NO. 42393125-01
 DATE 3/22/16

GRADATION CURVES
 American Electric Power Service Corp.





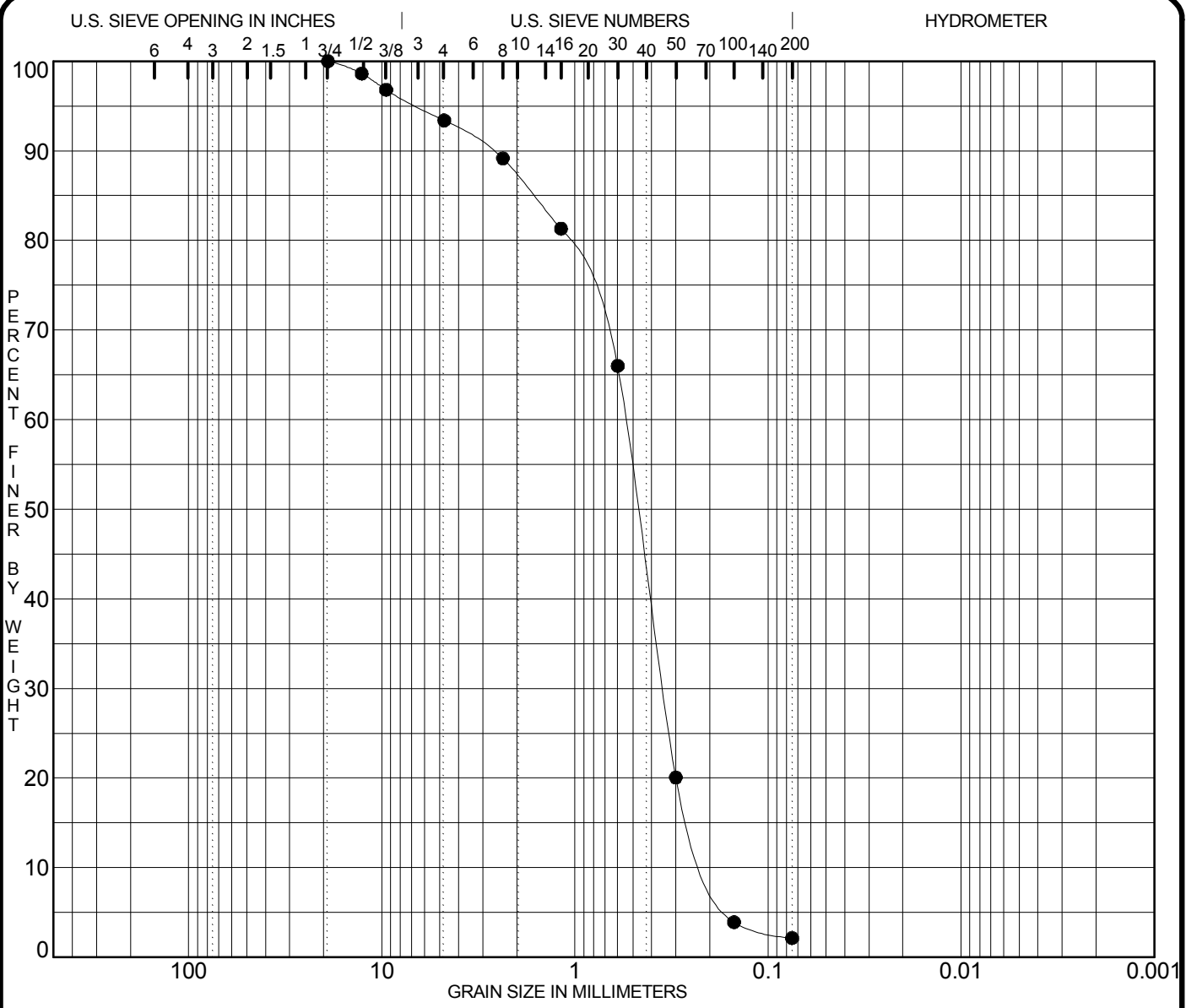
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification					MC%	LL	PL	PI	Sp.Gr.
● MW-1605I 68.6-78.2ft						19.7				
	POORLY GRADED SAND SP									
	SS-48,49,50,51,52 (Composite Sample)									
	N 151,478.9 E 513,532.6									
	ELEVATION 400.6									
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Fines	%<.002		
● MW-1605I 68.6-78.2ft	19.000	0.569	0.347	0.179	9.9	87.6	2.5			

PROJECT ROCKPORT PLANT - JOB NO. 42393125-01
 DATE 3/22/16

GRADATION CURVES
 American Electric Power Service Corp.





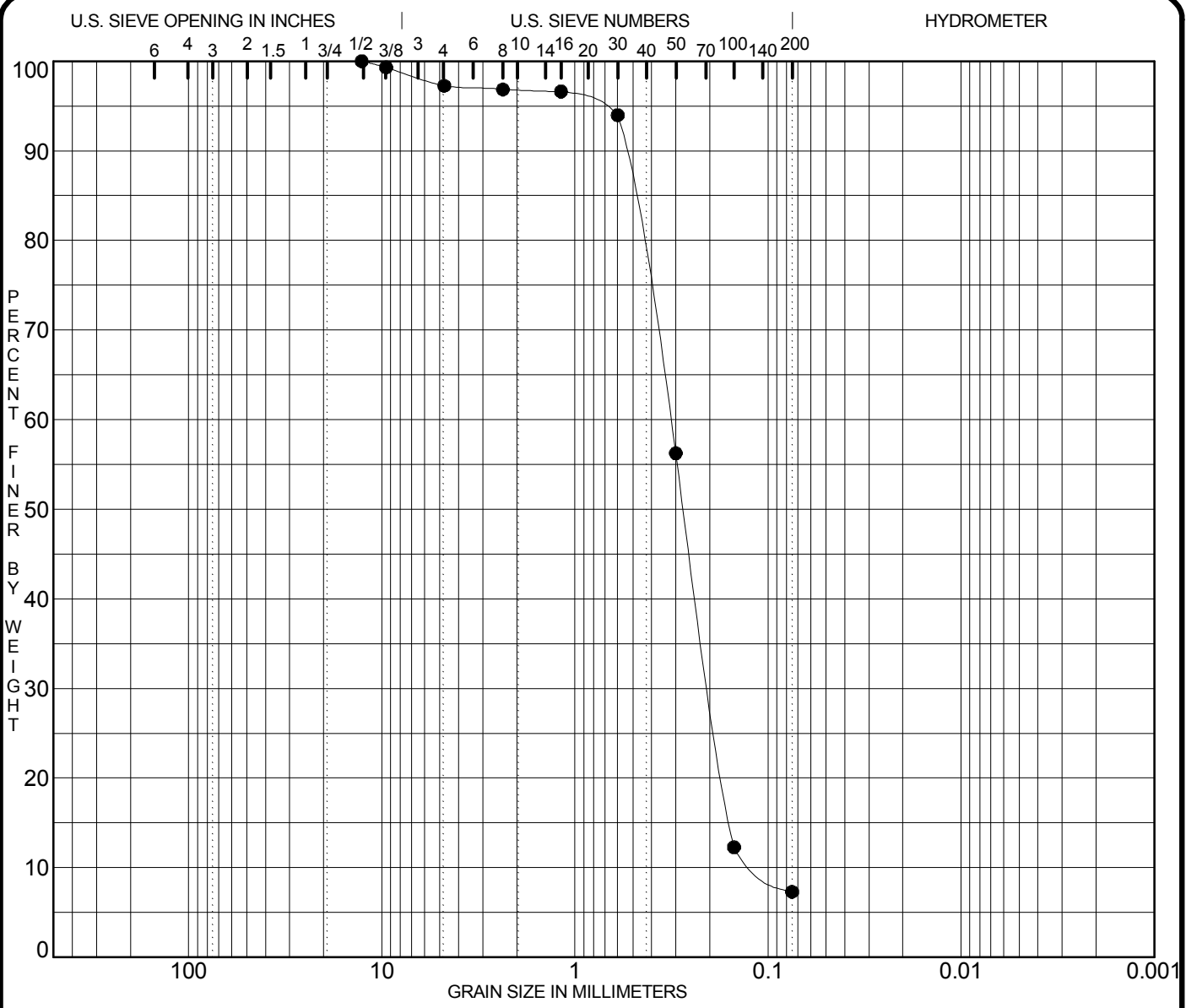
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification					MC%	LL	PL	PI	Sp.Gr.
● MW-1605S 37.6-47.2ft						16.0				
	POORLY GRADED SAND SP									
	SS-27,28,29,30,31 (Composite Sample)									
	N 151,478.8 E 513,528.4									
	ELEVATION 400.3									
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Fines	%<.002		
● MW-1605S 37.6-47.2ft	19.000	0.548	0.349	0.195	6.6	91.3	2.1			

PROJECT ROCKPORT PLANT - JOB NO. 42393125-01
 DATE 3/22/16

GRADATION CURVES
 American Electric Power Service Corp.





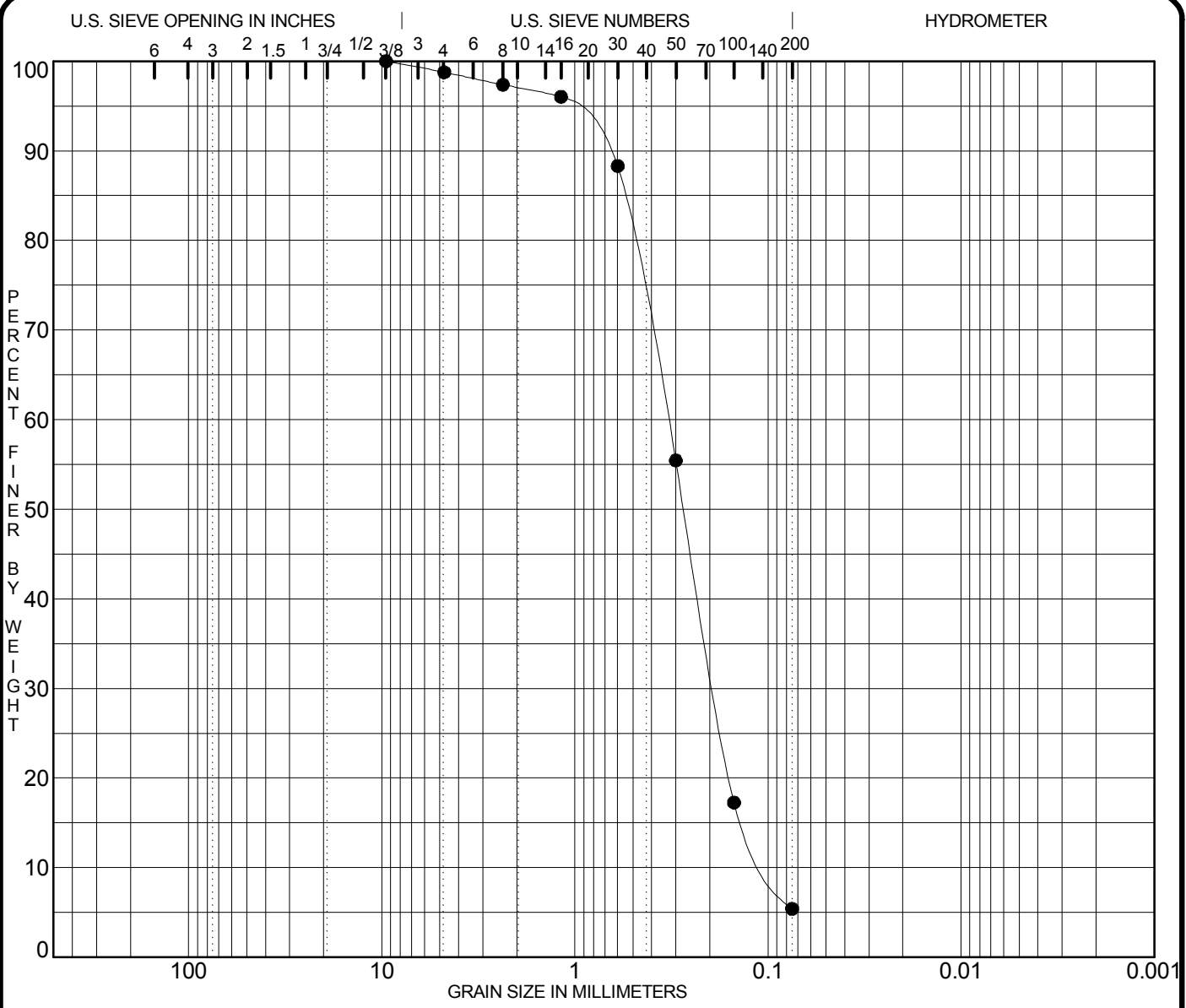
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification					MC%	LL	PL	PI	Sp.Gr.
● MW-1606D100.0-109.6ft						28.6				
	SS-68,69,70,71,72,73 (Composite)									
	N 151,509 samples									
	ELEVATION 397.8									
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Fines	%<.002		
● MW-1606D100.0-109.6ft	12.700	0.321	0.198	0.109	2.7	90.0	7.3			

PROJECT ROCKPORT PLANT - JOB NO. 42393125-01
 DATE 3/22/16

GRADATION CURVES
 American Electric Power Service Corp.





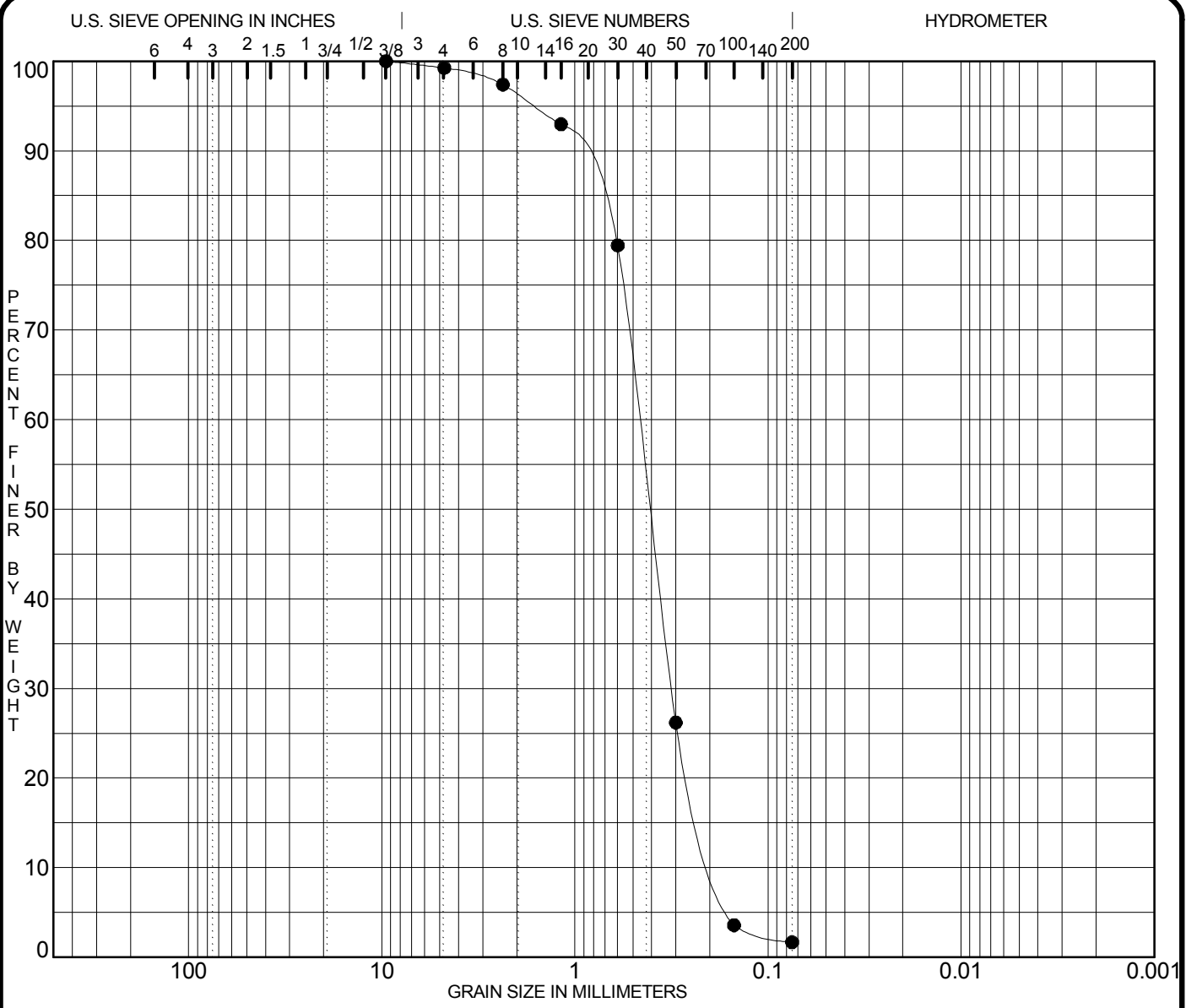
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification					MC%	LL	PL	PI	Sp.Gr.
● MW-1606I 65.7-75.3ft						18.9				
	SS-45,46,47,48,49,50 (Composite)									
	N 151,508 and 12,885.5									
	ELEVATION 397.8									
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Fines	%<.002		
● MW-1606I 65.7-75.3ft	9.500	0.330	0.189	0.098	1.2	93.4	5.4			

PROJECT ROCKPORT PLANT - JOB NO. 42393125-01
 DATE 3/22/16

GRADATION CURVES
 American Electric Power Service Corp.





COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification					MC%	LL	PL	PI	Sp.Gr.
● MW-1606S 34.7-44.3ft						20.9				
	POORLY GRADED SAND SP									
	SS-25,26,27,28,29 (Composite Sample)									
	N 151,498.9 E 512,889.4									
	ELEVATION 397.6									
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Fines	%<.002		
● MW-1606S 34.7-44.3ft	9.500	0.466	0.315	0.183	0.8	97.6	1.7			

PROJECT ROCKPORT PLANT - JOB NO. 42393125-01
 DATE 3/22/16



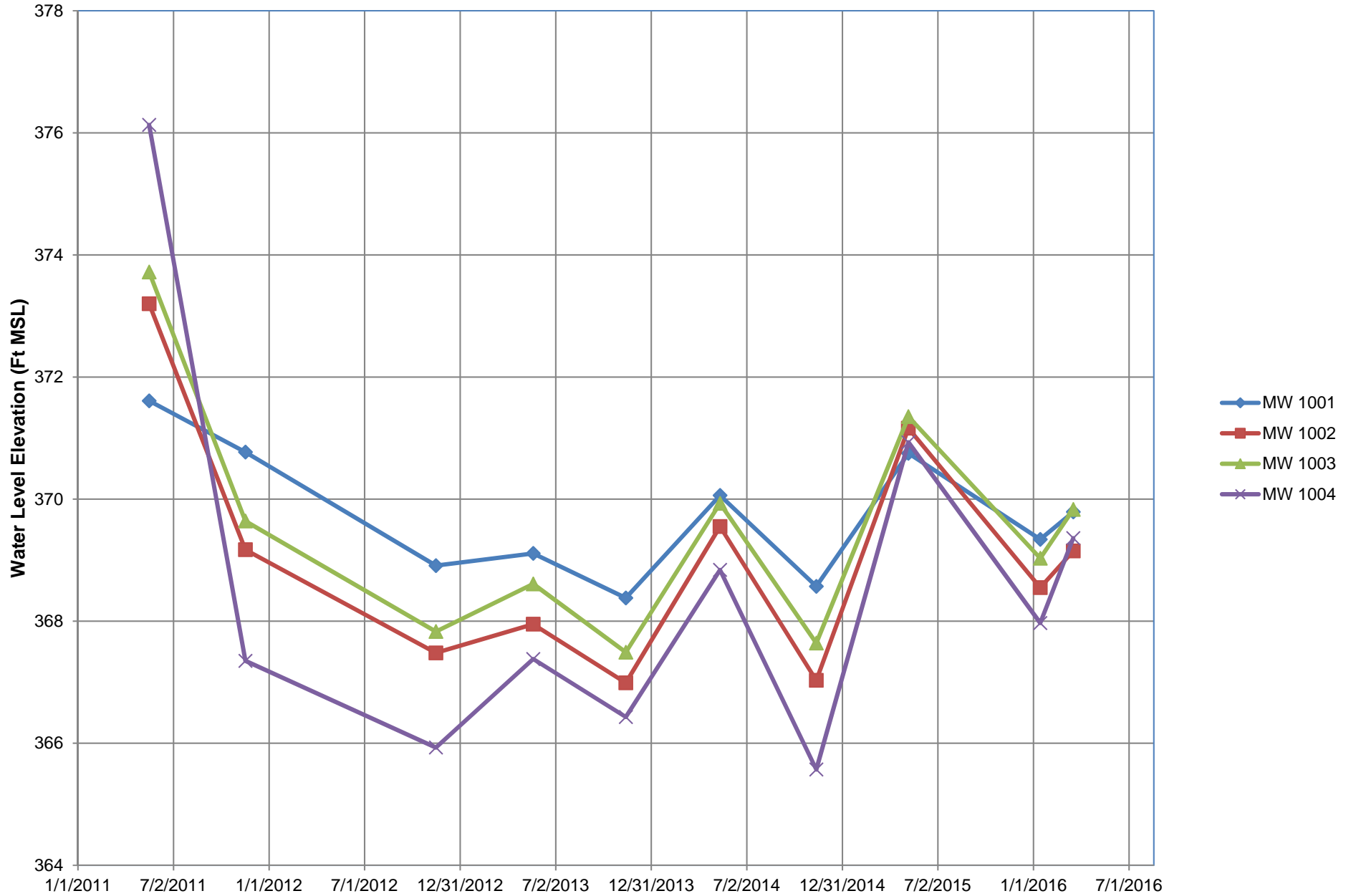
ATTACHMENT 3

**MONITORING WELL HYDROGRAPHS
2010 BA POND MONITORING WELLS**



AEP Rockport Plant

Wastewater Pond Complex - Monitoring Well Hydrographs



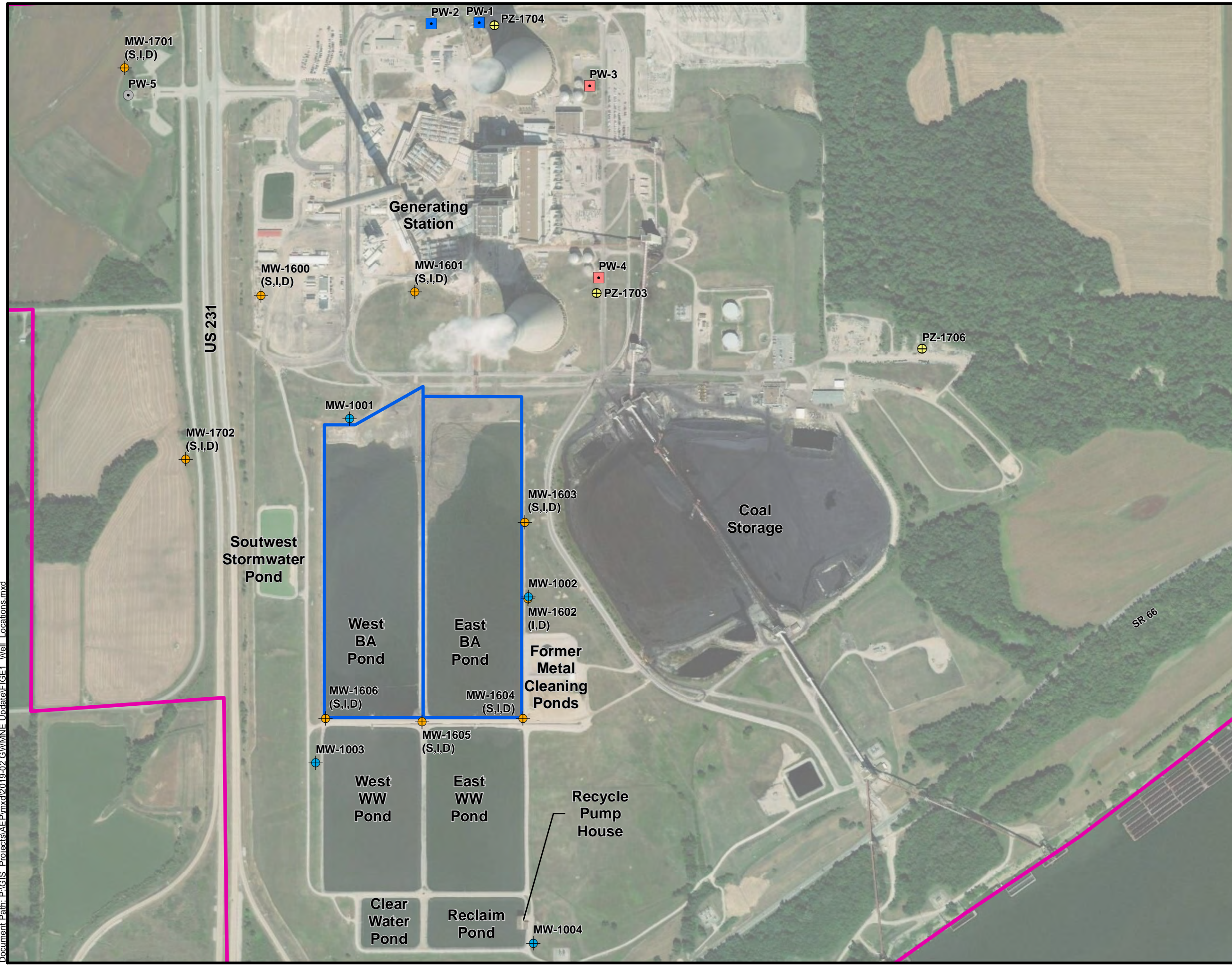
Appendix E

2017 Monitoring Well Installation Data

Appendix E-1

2017 Monitoring Well Location Map

Document Path: P:\GIS Projects\AEP\mxd\2019-02 GWMNE Update\FIG E1 Well Locations.mxd



- Legend**
- Piezometer
 - BAP - USWAG Monitoring Well
 - BAP - CCR Monitoring Well
 - Plant - Potable Water Supply Well
 - Plant - Fire Water Supply Well
 - Inactive Water Supply Well
 - Property Boundary
 - Bottom Ash Ponds (BAP)

Data Sources

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Date of Photography: May-June 2016
 Source of Photography: U.S. Department of Agriculture, National Agriculture Imagery Program (NAIP)



WASTEWATER POND COMPLEX		FIG. E-1
AEP - ROCKPORT, IN		
PROJECT NUMBER: 7362182624		
SCALE	1" = 600'	
DATE	2/13/2019	
DRAWN BY	TMR	
APPROVED BY	KDR	

wood.

2456 Fortune Drive, Suite 100
 Lexington, Kentucky 40509
 Phone: (859) 255-3308



Appendix E-2
2017 Well Construction Summary

**Table E-2
Monitoring Well Construction Details
Bottom Ash Pond Complex
AEP Rockport Plant, Rockport, Indiana**

Well ID	Date Installed	Northing SPCS NAD27	Easting SPCS NAD27	Top of Casing (TOC) Elevation (ft MSL)	Ground Surface Elevation Before Drilling (ft MSL)	Ground Surface Elevation (ft MSL)	Casing Stick-Up (ft AGS)	Length of Screen (ft)	Type of Screen (PVC)	Total Depth of Boring (ft BGS)	Depth to Top of Bedrock (ft BGS)	Sounded Depth of Well (ft BMP)	Estimated Depth to Bottom of Well from TOC (ft BMP)	Estimated Depth to Top of Screen (ft BGS)	Depth to Top of Screen (ft BGS)	Depth to Top of Sand Pack (ft BGS)	Depth to Top of Bentonite Seal (ft BGS)	Bottom of Boring Elevation (ft MSL)	Top of Bedrock Elevation (ft MSL)	Bottom of Well Elevation (ft MSL)	Bottom of Screen Elevation (ft MSL)	Top of Screen Elevation (ft MSL)
MW-1001	6/2/2010	153488.0	513047.6	402.35	---	400.0	2.3	9.7	2" x 0.010"	41.0	---	---	---	---	29.7	27.70	25.70	359.0	---	360.0	360.6	370.3
MW-1002	6/2/2010	152307.4	514231.0	401.42	---	399.1	2.3	9.7	2" x 0.010"	46.5	---	---	---	---	35.2	33.00	30.90	352.6	---	353.6	354.2	363.9
MW-1003	6/2/2010	151208.1	512820.7	393.23	---	390.8	2.4	9.7	2" x 0.010"	39.0	---	---	---	---	27.7	25.70	22.80	351.8	---	352.8	353.4	363.1
MW-1004	6/3/2010	150013.4	514264.7	396.55	---	394.3	2.3	9.7	2" x 0.010"	43.5	---	---	---	---	32.2	29.70	27.70	350.8	---	351.8	352.4	362.1
MW-1600-S	2/29/2016	154305.946	512458.043	396.73	393.6	393.7	3.0	9.6	2" x 0.010"	41.6	---	43.59	43.59	30.6	30.6	28.3	21.4	352.1	---	353.1	353.5	363.1
MW-1600-I	2/29/2016	154306.008	512454.030	396.65	393.6	393.7	2.9	9.6	2" x 0.010"	73.0	---	74.59	74.59	61.6	61.7	59.4	50.8	320.7	---	322.1	322.5	332.1
MW-1600-D	2/17/2016	154306.313	512448.952	396.31	393.6	393.8	2.5	9.6	2" x 0.010"	96.8	95.0	97.52	97.52	84.5	85.0	82.3	76.0	297.0	298.8	298.8	299.2	308.8
MW-1601-S	2/27/2016	154327.617	513479.660	402.65	399.8	399.8	2.9	9.6	2" x 0.010"	48.0	---	49.74	49.74	36.8	36.9	34.6	28.1	351.8	---	352.9	353.3	362.9
MW-1601-I	2/26/2016	154325.290	513483.510	402.83	399.8	400.0	2.9	9.6	2" x 0.010"	79.8	---	80.95	80.96	67.8	68.1	65.6	54.2	320.2	---	321.9	322.3	331.9
MW-1601-D	2/26/2016	154323.168	513487.454	402.84	399.8	400.1	2.8	9.6	2" x 0.010"	117.7	115.5	112.77	112.77	99.8	100.0	97.8	92.7	282.4	284.6	290.1	290.5	300.1
MW-1602-I	2/9/2016	152295.035	514229.173	402.03	399.1	399.4	2.6	9.6	2" x 0.010"	78.7	---	80.45	80.45	67.5	67.8	65.5	55.0	320.7	---	321.6	322.0	331.6
MW-1602-D	1/26/2016	152300.217	514229.384	401.91	399.1	399.3	2.6	9.6	2" x 0.010"	125.0	124.6	126.96	126.9	114.0	114.3	112.0	106.0	274.3	274.7	275.0	275.4	285.0
MW-1603-S	2/3/2016	152802.696	514206.885	403.85	400.6	401.5	2.4	9.6	2" x 0.010"	49.3	---	50.63	50.63	37.6	38.2	35.6	31.7	352.2	---	353.2	353.6	363.2
MW-1603-I	2/1/2016	152807.294	519207.223	404.15	400.6	401.4	2.7	9.6	2" x 0.010"	79.6	---	81.67	81.67	68.6	68.9	66.6	55.5	321.8	---	322.5	322.9	332.5
MW-1603-D	1/29/2016	152811.949	514207.457	403.85	400.6	401.6	2.3	9.6	2" x 0.010"	122.0	122.0	123.14	123.4	110.0	110.9	108.0	103.0	279.6	279.6	280.7	281.1	290.7
MW-1604-S	1/29/2016	151503.132	514197.320	402.46	399.8	399.8	2.7	9.6	2" x 0.010"	48.0	---	49.35	N/A	37.0	36.7	35.0	30.0	351.8	---	353.1	353.5	363.1
MW-1604-I	1/28/2016	151506.473	514201.037	402.19	399.8	399.7	2.4	9.6	2" x 0.010"	79.0	---	81.46	81.5	68.0	69.0	65.3	57.3	320.7	---	320.7	321.1	330.7
MW-1604-D	1/15/2016	151510.165	514204.869	402.44	399.8	399.9	2.6	9.6	2" x 0.010"	126.6	125.8	128.15	128.0	115.0	115.6	112.3	104.3	273.3	274.1	274.3	274.7	284.3
MW-1605-S	3/1/2016	151478.765	513528.386	403.38	400.6	400.3	3.1	9.6	2" x 0.010"	49.0	---	50.60	50.6	37.6	37.6	35.3	29.9	351.3	---	352.8	353.2	362.8
MW-1605-I	3/2/2016	151478.914	513532.565	403.22	400.6	400.6	2.6	9.6	2" x 0.010"	80.0	---	81.50	81.5	68.6	68.9	66.4	57.5	320.6	---	321.7	322.1	331.7
MW-1605-D	2/3/2016	151478.903	513537.066	403.78	400.6	400.4	3.4	9.6	2" x 0.010"	127.5	125.0	128.00	127.95	115.0	114.6	113.0	108.0	272.9	275.4	275.8	276.2	285.8
MW-1606-S	3/2/2016	151498.907	512889.413	400.65	397.7	397.6	3.0	9.6	2" x 0.010"	46.0	---	47.62	47.62	34.7	34.6	32.7	26.9	351.6	---	353.0	353.4	363.0
MW-1606-I	3/1/2016	151500.402	512885.504	400.75	397.7	397.8	3.0	9.6	2" x 0.010"	77.0	---	78.41	78.41	65.7	65.4	63.5	54.6	320.8	---	322.3	322.7	332.3
MW-1606-D	2/12/2016	151502.092	512881.487	400.73	397.7	397.8	2.9	9.6	2" x 0.010"	112.9	110.9	113.15	113.15	100.0	100.2	97.7	91.5	284.9	286.9	287.6	288.0	297.6
MW-1701-S	10/16/2017	155697.39	511567.94	398.30	---	395.6	2.7	9.7	2" x 0.010"	42.0	---	43.06	43.4	30.0	30.1	28.0	25.5	353.6	---	355.2	355.8	365.5
MW-1701-I	10/13/2017	155703.04	511568.64	398.29	---	395.6	2.7	9.7	2" x 0.010"	63.0	---	63.78	64.1	51.0	50.8	47.5	43.0	332.6	---	334.5	335.1	344.8
MW-1701-D	10/13/2017	155710.21	511569.45	398.65	---	395.9	2.7	9.7	2" x 0.010"	83.5	82.0	85.00	85.2	72.0	72.1	69.2	66.0	312.4	313.9	313.7	314.3	323.9
MW-1702-S	10/5/2017	153650.79	511921.68	396.16	---	393.2	3.0	9.7	2" x 0.010"	41.0	---	44.45	43.7	30.1	31.2	28.1	25.0	352.2	---	351.7	352.4	362.0
MW-1702-I	10/4/2017	153655.81	511921.85	396.26	---	393.3	3.0	9.7	2" x 0.010"	64.0	---	66.05	65.2	53.3	53.0	51.0	48.0	329.3	---	330.2	330.7	340.3
MW-1702-D	10/3/2017	153661.11	511922.14	396.30	---	393.3	3.0	9.7	2" x 0.010"	87.6	86.5	89.00	89.0	75.7	76.0	73.8	69.8	305.7	306.8	307.3	307.8	317.4
PZ-1703	10/16/2017	154454.33	514680.15	402.30	---	399.2	3.1	9.7	2" x 0.010"	52.0	---	53.04	53.1	39.9	39.7	37.0	33.0	347.2	---	349.3	349.9	359.5
PZ-1704	10/9/2017	156117.98	513931.11	402.48	---	398.9	3.5	9.7	2" x 0.010"	52.0	---	53.73	53.8	40.5	39.9	38.2	34.5	346.9	---	348.8	349.4	359.0
PZ-1705	10/5/2017	158401.58	514999.97	393.17	---	389.8	3.4	9.7	2" x 0.010"	51.0	---	53.11	53.5	40.1	39.4	38.0	35.0	338.8	---	340.1	340.8	350.4
PZ-1706	10/10/2017	153981.56	517033.49	398.37	---	395.1	3.2	9.7	2" x 0.010"	52.0	---	53.30	53.5	40.2	39.8	38.3	35.5	343.1	---	345.1	345.7	355.4

Notes:
 --- = Data not available or not applicable
 ft = feet
 BMP = below measuring point (top of casing)
 BGS = below ground surface
 MSL = above Mean Sea Level, equivalent to the National Geodetic Vertical Datum of 1929 (NGVD29)
 AGS = above ground surface
 TOC = top of casing (PVC pipe)
 SPCS = State Plane Coordinate System
 NAD27 = North American Datum of 1927

Prepared By: TMR 7/11/18
 Checked By: JCF 7/12/18

Appendix E-3
2017 Water Level Data Summary

Table 9'
Monitoring Well Piezometric Data
AEP Rockport Plant, Rockport, Indiana

Well ID	MW 1001	MW 1002	MW 1003	MW 1004	MW-1600-S	MW-1600-I	MW-1600-D	MW-1601-S	MW-1601-I	MW-1601-D	MW-1602-I	MW-1602-D
Date Installed	6/2/2010	6/2/2010	6/2/2010	6/2/2010	2/29/2016	2/29/2016	2/17/2016	2/27/2016	2/26/2016	2/26/2016	2/9/2016	1/26/2016
Date												
5/17/2011	371.61	373.20	373.72	376.13								
11/10/2011												
11/17/2011	370.77	369.17	369.64	367.35								
5/8/2012												
11/7/2012												
11/15/2012	368.91	367.48	367.83	365.93								
5/16/2013												
5/20/2013	369.11	367.95	368.61	367.38								
8/21/2013												
11/4/2013												
11/13/2013	368.38	366.99	367.49	366.43								
1/20/2014												
5/7/2014												
5/12/2014	370.06	369.55	369.93	368.84								
11/11/2014												
11/12/2014	368.57	367.03	367.64	365.57								
5/5/2015												
5/7/2015	370.75	371.16	371.35	370.93								
1/14/2016	369.34	368.55	369.03	367.97								
3/17/2016	369.79	369.15	369.83	369.36	370.20	370.14	370.08	369.41	369.58	369.74	369.13	369.11
6/7/2016		369.50									369.3	369.23
6/8/2016	370.60		370.09	368.21	370.92		370.71	370.06	370.27	370.38		
7/18/2016	370.29	368.87	369.44	367.37							368.71	368.60
7/19/2016					370.67	370.62	370.49	369.81	370.01	370.14		
7/20/2016												
9/19/2016	369.79		368.80	366.47	370.16	370.13	370.05		369.47	369.63		
9/20/2016		368.34						369.32			368.15	367.98
10/10/2016												
11/15/2016	369.31	367.99		366.04							367.82	367.60
11/16/2016					369.63	369.57	369.46	368.76	368.97	369.07		
1/9/2017	368.92	368.01	368.13	366.74							367.88	367.83
1/10/2017					369.18	369.12	369.03	368.46	368.66	368.76		
3/6/2017	369.30		369.11	368.31								
3/7/2017		368.73			369.39	369.35	369.24	368.69	368.91	368.90	368.39	368.40
3/8/2017												
3/9/2017												
5/8/2017					369.62	369.51	369.46	368.86				
5/9/2017									369.07	369.22		
5/10/2017												
5/18/2017		368.68									368.52	368.46
5/19/2017												

Notes:

ft = feet

BMP = below measuring point (top of casing)

MSL = above Mean Sea Level, equivalent to the National Geodetic Vertical Datum of 1929 (NGVD29)

Table 9'
Monitoring Well Piezometric Data
AEP Rockport Plant, Rockport, Indiana

Well ID	MW 1001	MW 1002	MW 1003	MW 1004	MW-1600-S	MW-1600-I	MW-1600-D	MW-1601-S	MW-1601-I	MW-1601-D	MW-1602-I	MW-1602-D
Date Installed	6/2/2010	6/2/2010	6/2/2010	6/2/2010	2/29/2016	2/29/2016	2/17/2016	2/27/2016	2/26/2016	2/26/2016	2/9/2016	1/26/2016
Date												
7/17/2017		368.29			369.58	369.52	369.42	368.76	368.96	368.99	368.14	368.03
7/18/2017												
7/19/2017												
10/3/2017		367.10			368.97	368.91	368.79				367.02	366.80
10/4/2017								368.10	368.24	368.40		
11/13/2017	368.16	365.61	367.43	366.05	368.71	368.63	368.57	367.83	368.01	368.11	366.74	366.65
12/12/2017		366.94			367.46	368.41	368.26	367.65	367.87	367.96	366.74	366.59
1/3/2018		366.83									366.63	366.54
2/8/2018												
6/4/2018					372.42	372.37	372.31					
6/5/2018		371.54						371.84	372.02	372.17	371.21	371.31
6/6/2018												
7/10/2018												
8/11/2018												
8/13/2018												
8/14/2018						371.79	371.69					
8/15/2018		370.02			371.84			371.04	371.26	371.37	369.84	369.71
8/18/2018												
9/24/2018												
9/25/2018												
9/26/2018												

Notes:

ft = feet

BMP = below measuring point (top of casing)

MSL = above Mean Sea Level, equivalent to the National Geodetic Vertical Datum of 1929 (NGVD29)

Table 9'
Monitoring Well Piezometric Data
AEP Rockport Plant, Rockport, Indiana

Well ID	MW-1603-S	MW-1603-I	MW-1603-D	MW-1604-S	MW-1604-I	MW-1604-D	MW-1605-S	MW-1605-I	MW-1605-D	MW-1606-S	MW-1606-I	MW-1606-D
Date Installed	2/3/2016	2/1/2016	1/29/2016	1/29/2016	1/28/2016	1/15/2016	3/1/2016	3/2/2016	2/3/2016	3/2/2016	3/1/2016	2/12/2016
Date												
5/17/2011												
11/10/2011												
11/17/2011												
5/8/2012												
11/7/2012												
11/15/2012												
5/16/2013												
5/20/2013												
8/21/2013												
11/4/2013												
11/13/2013												
1/20/2014												
5/7/2014												
5/12/2014												
11/11/2014												
11/12/2014												
5/5/2015												
5/7/2015												
1/14/2016												
3/17/2016	369.15	369.16	369.09	369.22	369.18	369.20	369.48	369.22	368.78	369.62	369.70	369.71
6/7/2016				369.03	369.04	368.99	369.45	369.41	369.68	369.86	369.9	369.89
6/8/2016	369.51	369.52	369.34									
7/18/2016	369.06	369.05	368.78		368.34	368.27			369.02			
7/19/2016							368.85	368.77		369.26	369.32	369.32
7/20/2016				368.34								
9/19/2016				367.78	367.66	367.69	368.27	368.16	368.40	368.63	368.70	368.69
9/20/2016	368.50	368.51										
10/10/2016			368.16									
11/15/2016	368.15	368.12	367.79	367.28	367.27	367.20						
11/16/2016							367.78	367.71	367.94	368.17	368.22	368.21
1/9/2017	368.05	368.16	367.74	367.39	367.40	367.35						
1/10/2017							367.79	367.72	367.98	367.98	368.05	368.04
3/6/2017											368.85	368.86
3/7/2017	368.47	368.55		368.36	368.58	368.29	368.56	368.60		368.74		
3/8/2017									368.90			
3/9/2017												
5/8/2017	368.60					368.47						
5/9/2017					368.49							
5/10/2017												
5/18/2017		368.62	368.51	368.52			368.76	368.68	369.00	368.97	369.03	369.01
5/19/2017												

Notes:

ft = feet

BMP = below measuring point (top of casing)

MSL = above Mean Sea Level, equivalent to the National Geodetic Vertical Datum of 1929 (NGVD29)

Table 9'
Monitoring Well Piezometric Data
AEP Rockport Plant, Rockport, Indiana

Well ID	MW-1603-S	MW-1603-I	MW-1603-D	MW-1604-S	MW-1604-I	MW-1604-D	MW-1605-S	MW-1605-I	MW-1605-D	MW-1606-S	MW-1606-I	MW-1606-D
Date Installed	2/3/2016	2/1/2016	1/29/2016	1/29/2016	1/28/2016	1/15/2016	3/1/2016	3/2/2016	2/3/2016	3/2/2016	3/1/2016	2/12/2016
Date												
7/17/2017	368.30	368.32	368.17	367.87			368.28					
7/18/2017					367.88	367.83		368.21	368.49	368.64	368.71	368.69
7/19/2017												
10/3/2017	367.33	367.34	367.09	366.56	366.56	366.52	367.16	367.00	367.26	367.53	367.59	367.59
10/4/2017												
11/13/2017	366.98	366.98	366.81	366.48	366.49	366.46	366.96	366.92	367.17	367.37	367.43	367.43
12/12/2017	366.96	366.94	366.73	366.41	366.41	366.35	366.89	366.77	367.03	367.25	367.33	
1/3/2018	366.93	366.89		366.32	366.32		366.58	366.71		367.09		
2/8/2018												
6/4/2018												
6/5/2018	371.54	371.54	371.37				371.44					
6/6/2018				371.16	371.18	371.12		371.37	371.66	371.73	371.81	371.75
7/10/2018												
8/11/2018				369.36								
8/13/2018	370.08	370.15	369.91									
8/14/2018					369.37	369.30						
8/15/2018							369.88	369.80	370.04		370.50	370.43
8/18/2018										370.38		
9/24/2018												
9/25/2018												
9/26/2018												

Notes:

ft = feet

BMP = below measuring point (top of casing)

MSL = above Mean Sea Level, equivalent to the National Geodetic Vertical Datum of 1929 (NGVD29)

**Table E-3
Monitoring Well Piezometric Data
AEP Rockport Plant, Rockport, Indiana**

Well ID	MW-1701-S	MW-1701-I	MW-1701-D	MW-1702-S	MW-1702-I	MW-1702-D	PZ-1703	PZ-1704	PZ-1705	PZ-1706
Date Installed	10/16/2017	10/13/2017	10/13/2017	10/5/2017	10/4/2017	10/3/2017	10/16/2017	10/9/2017	10/5/2017	10/10/2017
Date										
5/17/2011										
11/10/2011										
11/17/2011										
5/8/2012										
11/7/2012										
11/15/2012										
5/16/2013										
5/20/2013										
8/21/2013										
11/4/2013										
11/13/2013										
1/20/2014										
5/7/2014										
5/12/2014										
11/11/2014										
11/12/2014										
5/5/2015										
5/7/2015										
1/14/2016										
3/17/2016										
6/7/2016										
6/8/2016										
7/18/2016										
7/19/2016										
7/20/2016										
9/19/2016										
9/20/2016										
10/10/2016										
11/15/2016										
11/16/2016										
1/9/2017										
1/10/2017										
3/6/2017										
3/7/2017										
3/8/2017										
3/9/2017										
5/8/2017										
5/9/2017										
5/10/2017										
5/18/2017										
5/19/2017										

Notes:

ft = feet

BMP = below measuring point (top of casing)

MSL = above Mean Sea Level, equivalent to the National Geodetic Vertical Datum of 1929 (NGVD29)

**Table E-3
Monitoring Well Piezometric Data
AEP Rockport Plant, Rockport, Indiana**

Well ID	MW-1701-S	MW-1701-I	MW-1701-D	MW-1702-S	MW-1702-I	MW-1702-D	PZ-1703	PZ-1704	PZ-1705	PZ-1706
Date Installed	10/16/2017	10/13/2017	10/13/2017	10/5/2017	10/4/2017	10/3/2017	10/16/2017	10/9/2017	10/5/2017	10/10/2017
Date										
7/17/2017										
7/18/2017										
7/19/2017										
10/3/2017										
10/4/2017										
11/13/2017	369.52	369.54	369.56	368.88	368.90	368.83	366.34	368.30	368.41	365.74
12/12/2017										
1/3/2018										
2/8/2018	368.87	368.75	368.87	368.31	368.23	368.17				
6/4/2018	373.06			372.65	372.67	372.61				
6/5/2018		373.10	373.01							
6/6/2018										
7/10/2018										
8/11/2018										
8/13/2018				372.09	372.12					
8/14/2018	372.63	372.71	372.63			372.01				
8/15/2018										
8/18/2018										
9/24/2018		372.36	372.36							
9/25/2018	372.37			371.67	371.67					
9/26/2018						371.52				

Notes:

ft = feet

BMP = below measuring point (top of casing)

MSL = above Mean Sea Level, equivalent to the National Geodetic Vertical Datum of 1929 (NGVD29)

Appendix E-4

2017 Boring and Well Construction Logs

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**
 COMPANY **INDIANA MICHIGAN POWER COMPANY**
 PROJECT **ROCKPORT PLANT**
 COORDINATES **N 155,708.2 E 511,570.0**
 GROUND ELEVATION **395.3** SYSTEM **State Plane using NAD27/29**

BORING NO. **MW-1701D** DATE **7/11/18** SHEET **1** OF **4**
 BORING START **10/11/17** BORING FINISH **10/11/17**
 PIEZOMETER TYPE _____ WELL TYPE _____
 HGT. RISER ABOVE GROUND **3.1** DIA **4.25**
 DEPTH TO TOP OF WELL SCREEN **72** BOTTOM **79.62**
 WELL DEVELOPMENT **YES** BACKFILL _____
 FIELD PARTY **TERRACON/AMEC** RIG _____

Water Level, ft	<input type="text"/>	<input type="text"/>	<input type="text"/>
TIME	<input type="text"/>	<input type="text"/>	<input type="text"/>
DATE	<input type="text"/>	<input type="text"/>	<input type="text"/>

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO									
1	SS	0.0	2.0	2-2-3-4	1.75					TOPSOIL = 6 INCHES		
2	SS	2.0	4.0	2-4-4-6	.83				CL ML ML	MEDIUM STIFF LIGHT GRAYISH BROWN 2.5YR 6/2 SILTY CLAY (CL-ML)b w/some mottling, trace roots, moist		
3	SS	4.0	6.0	3-5-5-6	2.0				CL ML	MEDIUM STIFF LIGHT GRAYISH BROWN 2.5YR 6/2 CLAYEY SILT (ML) trace roots, moist		
4	SS	6.0	8.0	5-7-10-12	1.83				CL	MEDIUM STIFF LIGHT BROWN 5YR 7/4 LEAN CLAY (CL) trace black nodules, moist		
5	SS	8.0	10.0	5-8-12-12	1.92				CL	STIFF GRAYISH BROWN 5YR 5/2 SILTY CLAY (CL-ML) little black nodules, moist		
6	SS	10.0	12.0	4-6-8-11	2.0				CL	STIFF LIGHT BROWN 5YR 7/4 LEAN CLAY (CL) moist		
7	SS	12.0	14.0	4-4-7-8	2.0				CL	VERY STIFF LIGHT BROWN 5YR 7/4 LEAN CLAY (CL) some red mottling, trace black nodules, trace silt, moist		
8	SS	14.0	16.0	4-8-10-11	1.75				CL	STIFF LIGHT BROWN 5YR 7/4 AND GRAY (MOTTLED) LEAN CLAY (CL) w/black partings, moist		
9	SS	16.0	18.0	6-10-11-10	1.92				CL	STIFF LIGHT BROWN 5YR 7/4 LEAN CLAY (CL) moist		
10	SS	18.0	20.0	3-7-8-10	1.58				CL	STIFF LIGHT BROWN 5YR 7/4 LEAN CLAY (CL) trace soft zones, trace black silt, moist		
									ML SP	VERY STIFF BROWN 5YR 5/4 SANDY SILT (ML) moist		
									SP	MEDIUM DENSE LIGHT BROWN 5YR 8/4 FINE GRAINED PG SAND (SP) moist		
									SP	MEDIUM DENSE LIGHT BROWN 5YR 8/4 FINE GRAINED PG SAND (SP) trace sandy silt, moist		
									SP	MEDIUM DENSE LIGHT REDDISH BROWN 5YR 7/8 FINE GRAINED PG SAND (SP) moist		

TYPE OF CASING USED

	NQ-2 ROCK CORE
	6" x 3.25 HSA
	9" x 6.25 HSA
	HW CASING ADVANCER 4"
	NW CASING 3"
	SW CASING 6"
	AIR HAMMER 8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC
 WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER _____

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1701D** DATE **7/11/18** SHEET **2** OF **4**

PROJECT **ROCKPORT PLANT**

BORING START **10/11/17** BORING FINISH **10/11/17**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
11	SS	20.0	22.0	5-7-9-9	1.75				SP	MEDIUM DENSE LIGHT BROWN 5YR 7/4 FINE GRAINED PG SAND (SP) moist		
12	SS	22.0	24.0	3-5-5-8	1.83				SP	LOOSE LIGHT BROWN 5YR 8/4 W/RED FINE TO MEDIUM GRAINED PG SAND (SP) silty sand seams, trace coal, moist		
13	SS	24.0	26.0	6-8-10-11	1.67		25		SP	MEDIUM DENSE LIGHT BROWN 5YR 8/4 W/RED FINE TO MEDIUM GRAINED PG SAND (SP) silty sand seam @ 24.5' - 24.9', trace coal, moist, wet @ 25.5'		
14	SS	26.0	28.0	3-6-6-7	1.5				SP	LOOSE LIGHT GRAYISH BROWN 5YR 6/3 W/RED FINE TO MEDIUM GRAINED PG SAND (SP) silty sand seams, trace coal, trace coarse grained, wet		
15	SS	28.0	30.0	1-3-6-8	1.67				SP	LOOSE LIGHT BROWN 5YR 6/6 W/RED MEDIUM GRAINED PG SAND (SP) trace coarse grained, little silty sand, wet		
16	SS	30.0	32.0	3-5-7-8	1.83		30		SP	LOOSE LIGHT BROWN 5YR 6/6 W/RED MEDIUM GRAINED PG SAND (SP) trace coarse grained, coarse grained seam @ 30.5' - 30.9', coal seams, little silty sand, wet		
17	SS	32.0	34.0	13-18-20-24	2.0				SP	DENSE BROWN 7YR 5/6 MEDIUM TO COARSE GRAINED PG SAND (SP) trace black silt, trace coarse grained, wet		
18	SS	34.0	36.0	3-6-12-14	.83				SP	MEDIUM DENSE BROWN 7YR 5/6 MEDIUM TO COARSE GRAINED PG SAND (SP) trace black silt, trace coarse grained, little fine to coarse gravel, wet		
19	SS	36.0	38.0	2-5-12-14	1.92		35					
20	SS	38.0	40.0	4-9-8-7	1.67				SP	DENSE BROWN 7YR 5/6 MEDIUM TO COARSE GRAINED PG SAND (SP) trace black silt, some coarse grained, wet		
21	SS	40.0	42.0	6-7-11-13	1.67		40					
22	SS	42.0	44.0	5-6-8-9	1.5				SW	MEDIUM DENSE GRAYISH BROWN 7.5YR 5/2 WG SAND AND FINE GRAVEL (SW) wet		
23	SS	44.0	46.0	3-5-2-19	2.0				SM	MEDIUM DENSE BROWN 5YR 5/6 SILTY SAND (SM) wet		
							45		SP	MEDIUM DENSE BROWN 5YR 5/6 FINE GRAINED PG SAND (SP) trace fine gravel, wet		

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 7/11/18

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1701D** DATE **7/11/18** SHEET **3** OF **4**

PROJECT **ROCKPORT PLANT**

BORING START **10/11/17** BORING FINISH **10/11/17**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
24	SS	46.0	48.0	13-14-	2.0				SP	MEDIUM DENSE BROWN 5YR 5/6 FINE GRAINED PG SAND (SP) trace fine gravel, coal seam @ 47.1' - 47.5', wet		
25	SS	48.0	50.0	5-6-11-12	1.83				SW SW	MEDIUM DENSE GRAYISH BROWN 7.5YR 5/2 WG SAND (SW) AND FINE GRAVEL wet MEDIUM DENSE GRAYISH BROWN 7.5YR 5/2 WG SAND (SW) AND FINE GRAVEL silty sand seams, wet		
26	SS	50.0	52.0	5-6-11-11	1.42		50		SW	MEDIUM DENSE GRAYISH BROWN 7.5YR 5/2 WG SAND (SW) AND FINE GRAVEL fine to coarse gravel, wet		
27	SS	52.0	54.0	1-2-3-5	.67				SP	LOOSE BROWNISH GRAY 5YR 6/1 MEDIUM GRAINED PG SAND (SP) AND FINE GRAVEL wet		
28	SS	54.0	56.0	4-7-11-18	1.67							
29	SS	56.0	58.0	13-16-18-21	1.42		55		SM SM	MEDIUM DENSE BROWN 5YR 6/3 SILTY SAND (SM) some black staining, wet DENSE BROWN 5YR 6/3 SILTY SAND (SM) wet		
30	SS	58.0	60.0	4-8-13-16	1.75				SP	MEDIUM DENSE GRAYISH BROWN 7.5YR 5/2 MEDIUM GRAINED PG SAND (SP) some fine gravel, wet		
31	SS	60.0	62.0	6-10-11-11	1.75		60					
32	SS	62.0	64.0	3-6-14-15	1.67							
33	SS	64.0	66.0	9-9-12-15	1.67							
34	SS	66.0	68.0	6-7-13-20	1.58		65		SM SP	MEDIUM DENSE BROWNISH GRAY 2.5YR 7/1 SILTY SAND (SM) some fine gravel, wet MEDIUM DENSE BROWNISH GRAY 2.5YR 7/1 MEDIUM GRAINED PG SAND (SP) little coarse gravel, wet		
35	SS	68.0	70.0	5-8-8-9	.75				SM	MEDIUM DENSE BROWNISH GRAY 2.5YR 7/1 SILTY SAND (SM) AND FINE GRAVEL wet		
36	SS	70.0	72.0	3-5-7-7	.17		70		SM	MEDIUM DENSE BROWNISH GRAY 2.5YR 7/1 SILTY SAND (SM) AND FINE GRAVEL @ 70' low recovery (possible fall-in), wet		

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 7/11/18

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1701D** DATE **7/11/18** SHEET **4** OF **4**

PROJECT **ROCKPORT PLANT**

BORING START **10/11/17** BORING FINISH **10/11/17**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
37	SS	72.0	74.0	7-13-18-25	1.67		75		SW	DENSE GRAYISH BROWN 2.5 YR 6/2 WG SAND (SW) AND FINE TO COARSE GRAVEL wet		
38	SS	74.0	76.0	10-9-10-10	.92				SW	MEDIUM DENSE GRAYISH BROWN 2.5 YR 6/2 WG SAND (SW) AND FINE TO COARSE GRAVEL pockets of PG Sand (MG), wet		
39	SS	76.0	78.0	6-7-13-17	.42				SP	MEDIUM DENSE GRAYISH BROWN 2.5YR 6/2 MEDIUM GRAINED PG SAND (SP) AND FINE GRAVEL some coarse grained, wet		
40	SS	78.0	80.0	3-10-20-20	1.25		80		SP	MEDIUM DENSE GRAYISH BROWN 2.5YR 6/2 FINE TO MEDIUM GRAINED PG SAND (SP) trace fine gravel, wet		
41	SS	80.0	82.0	9-18-46-20	2.0				ML	HARD GRAYISH BROWN 5YR 7/2 SANDY SILT (ML) trace fine gravel, wet @ 81' cobble fragments, trace coarse gravel, little silty sand		
42	SS	82.0	84.0	19-48-50/5	1.42		85			VERY DENSE LIGHT GRAY GLEY 2/6 - 5BG SHALE wet		
43	SS	84.0	86.0								SR @ 83.5' / BT @ 83.5' Begin well installation @ 83.5'	

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
LOG OF BORING



JOB NUMBER **42393125-01**
 COMPANY **INDIANA MICHIGAN POWER COMPANY**
 PROJECT **ROCKPORT PLANT**
 COORDINATES **N 153,659.2 E 511,922.9**
 GROUND ELEVATION **392.4** SYSTEM **State Plane using NAD27/29**

BORING NO. **MW-1702D** DATE **7/11/18** SHEET **1** OF **4**
 BORING START **9/26/17** BORING FINISH **10/2/17**
 PIEZOMETER TYPE _____ WELL TYPE _____
 HGT. RISER ABOVE GROUND **3.95** DIA **4.25**
 DEPTH TO TOP OF WELL SCREEN **75.7** BOTTOM **85.28**
 WELL DEVELOPMENT **YES** BACKFILL _____
 FIELD PARTY **TERRACON/AMEC** RIG _____

Water Level, ft	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TIME			
DATE			

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO									
1	SPT	0.0	2.0	2-3-4-5						SM ML		
2	SPT	2.0	4.0	4-4-5-6						ML		
3	SPT	4.0	6.0	4-4-6-7			5			ML		
4	SPT	6.0	8.0	3-4-5-6						ML		
5	SPT	8.0	10.0	3-2-3-2						SP		
6	SPT	10.0	12.0	2-2-3-4			10			SW SM		
7	SPT	12.0	14.0	2-2-4-5						SP		
8	SPT	14.0	16.0	3-5-8-8						SP		
9	SPT	16.0	18.0	3-3-6-7			15			SM SW		
10	SPT	18.0	20.0	4-5-5-6						SP SP		

TYPE OF CASING USED

	NQ-2 ROCK CORE
	6" x 3.25 HSA
	9" x 6.25 HSA
	HW CASING ADVANCER 4"
	NW CASING 3"
	SW CASING 6"
	AIR HAMMER 8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC
 WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER _____

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1702D** DATE **7/11/18** SHEET **2** OF **4**

PROJECT **ROCKPORT PLANT**

BORING START **9/26/17** BORING FINISH **10/2/17**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
11	SPT	20.0	22.0	3-4-6-9			25		SM	rounded, poorly graded, noncohesive		
									SP	LOOSE DARK YELLOWISH BROWN 10YR 4/4 FINE SILTY SAND w/few gravel, noncohesive, wet		
12	SPT	22.0	24.0	3-5-6-5			25		SW	LOOSE BROWNISH YELLOW 10YR 6/6 FINE TO MEDIUM GRAINED SAND rounded, poorly graded, noncohesive		
									SP	LOOSE YELLOWISH BROWN 10YR 5/6 MEDIUM TO COARSE GRAINED SAND well graded, angular, moist		
13	SPT	24.0	26.0	3-5-5-4			25		SW	LOOSE BROWNISH YELLOW 10YR 6/6 FINE TO MEDIUM GRAINED SAND rounded, poorly graded, noncohesive, wet @ 23.6'		
									SW	LOOSE BROWNISH YELLOW 10YR 6/6 COARSE GRAINED SAND well graded, angular, wet		
14	SPT	26.0	28.0	3-4-6-5			30		SW	LOOSE BLACK 7.5YR 2.5/1 MEDIUM TO COARSE GRAINED SAND well graded, noncohesive, wet		
									SW	LOOSE BROWNISH YELLOW 10YR 6/6 FINE TO MEDIUM GRAINED SAND rounded, poorly graded, noncohesive, wet		
15	SPT	28.0	30.0	4-7-7-9			30		SW	LOOSE BROWNISH YELLOW 10YR 6/6 COARSE GRAINED SAND well graded, angular, wet		
									SW	LOOSE BLACK 7.5YR 2.5/1 COARSE GRAINED SAND well graded, noncohesive, angular, wet		
16	SPT	30.0	32.0	5-9-9-10			35		SW	LOOSE BROWNISH YELLOW 10YR 6/6 COARSE GRAINED SAND well graded, wet		
									SW	LOOSE BROWNISH YELLOW 10YR 6/6 COARSE GRAINED SAND well graded, angular, wet		
17	SPT	32.0	34.0	8-11-13-20			35		SW	LOOSE BLACK 7.5YR 2.5/1 COARSE GRAINED SAND well graded, noncohesive, angular, wet		
									SW	LOOSE BROWNISH YELLOW 10YR 6/6 COARSE GRAINED SAND well graded, wet		
18	SPT	34.0	36.0	6-6-5-6			35		SW	LOOSE YELLOWISH BROWN 10YR 5/4 MEDIUM GRAINED SAND subrounded, poorly graded, wet		
									SW	LOOSE DARK YELLOWISH BROWN 10YR 4/4 COARSE GRAINED SAND angular, well graded, some gravel, wet		
19	SPT	36.0	38.0	3-5-5-6			40		SW	LOOSE YELLOWISH BROWN 10YR 5/4 MEDIUM GRAINED SAND subrounded, poorly graded, trace gravel, wet		
									SW	LOOSE YELLOWISH BROWN 10YR 5/4 FINE TO MEDIUM GRAINED SAND rounded, poorly graded, wet		
20	SPT	38.0	40.0	5-6-11-15			40		SW	LOOSE YELLOWISH BROWN 10YR 5/4 MEDIUM GRAINED SAND rounded, poorly graded, wet		
									SW	LOOSE YELLOWISH RED 5YR 5/6 MEDIUM GRAINED SAND subrounded, few gravel, interbedded gravel seams, well graded, wet		
21	SPT	40.0	42.0	4-6-9-13			45		SW	LOOSE YELLOWISH BROWN 10YR 5/4 COARSE GRAINED SAND well graded, few gravel, wet		
									SW	LOOSE BROWNISH YELLOW 10YR 6/6 FINE SAND rounded, poorly graded, wet		
22	SPT	42.0	44.0	7-9-11-15			45		SW	LOOSE BROWNISH YELLOW 10YR 6/6 FINE SAND rounded, poorly graded, wet		
									SW	LOOSE YELLOWISH BROWN 10YR 5/4 COARSE GRAINED SAND well graded, few gravel, wet		
23	SPT	44.0	46.0	6-12-13-11			45		SW	LOOSE BROWNISH YELLOW 10YR 6/6 FINE SAND rounded, poorly graded, wet		
										LOOSE YELLOWISH BROWN 10YR 5/4		

Continued Next Page

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 7/11/18

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1702D** DATE **7/11/18** SHEET **3** OF **4**

PROJECT **ROCKPORT PLANT**

BORING START **9/26/17** BORING FINISH **10/2/17**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
24	SPT	46.0	48.0	6-11-12-13						COARSE GRAINED SAND well graded, few gravel, wet		
25	SPT	48.0	50.0	8-9-11-20					SP SW	MEDIUM DENSE YELLOWISH BROWN 10YR 5/4 FINE GRAINED SAND poorly graded, few silt, few gravel, wet		
26	SPT	50.0	52.0	6-8-12-14			50		SW	LOOSE YELLOWISH BROWN 10YR 5/4 MEDIUM TO COARSE GRAINED SAND noncohesive, well graded, subrounded, few gravel, wet		
27	SPT	52.0	54.0	3-5-7-9						LOOSE OLIVE BROWN 2.5Y 4/3 MEDIUM TO COARSE GRAINED SAND noncohesive, subrounded, well graded, few gravel, wet		
28	SPT	54.0	56.0	5-5-10-11			55		SP	LOOSE OLIVE BROWN 2.5Y 4/3 FINE GRAINED SAND rounded, noncohesive, poorly graded, trace silt, wet		
29	SPT	56.0	58.0	2-3-7-9								
30	SPT	58.0	60.0	4-4-6-11			60		SP	LOOSE OLIVE BROWN 2.5Y 4/3 FINE GRAINED SAND rounded, noncohesive, poorly graded, trace silt, wet		
31	SPT	60.0	62.0	8-17-18-11								
32	SPT	62.0	64.0	8-9-12-13					SW	MEDIUM DENSE VERY DARK GRAYISH BROWN 10YR 3/2 MEDIUM GRAINED SAND subrounded, noncohesive, well graded, few gravel, wet		
33	SPT	64.0	66.0	7-13-21-22			65					
34	SPT	66.0	68.0	14-18-24-19					SW	MEDIUM DENSE DARK YELLOWISH BROWN 10YR 4/4 FINE GRAINED SAND w/gravel, well graded, wet		
35	SPT	68.0	70.0	6-7-10-8					SW	LOOSE DARK YELLOWISH BROWN 10YR 4/4 MEDIUM TO COARSE GRAINED SAND noncohesive, well graded, few gravel, wet		
36	SPT	70.0	72.0	5-4-8-8			70		SW	OLIVE BROWN 2.5Y 4/3 SAND well graded, small gravel, wet		

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 7/11/18

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **MW-1702D** DATE **7/11/18** SHEET **4** OF **4**

PROJECT **ROCKPORT PLANT**

BORING START **9/26/17** BORING FINISH **10/2/17**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
37	SPT	72.0	74.0	8-9-10-10								
38	SPT	74.0	76.0	4-9-13-17			75					
39	SPT	76.0	78.0	8-10-14-22				CH		VERY STIFF VERY DARK GRAY 2.5Y 3/1 CLAY high plastic, cohesive, wet		
40	SPT	78.0	80.0	6-12-12-12				SW		MEDIUM DENSE OLIVE BROWN 2.5Y 4/4 MEDIUM GRAINED SAND w/interbedded coarse seams, subrounded, few gravel, wet		
41	SPT	80.0	82.0	6-6-5-5			80					
42	SPT	82.0	84.0	6-12-12-8				SW		LOOSE OLIVE BROWN 2.5Y 4/4 COARSE GRAINED SAND well graded, few gravel, wet		
								SP		LOOSE OLIVE BROWN 2.5Y 4/4 FINE TO MEDIUM GRAINED SAND poorly graded, subrounded		
43	SPT	84.0	86.0	5-5-8-26				CH SW		VERY STIFF VERY DARK GRAY 2.5Y 3/1 CLAY		
							85			high plastic, cohesive, wet		
44	SPT	86.0	88.0	26-50/2-49-50/3				SP CH SW		LOOSE OLIVE BROWN 2.5Y 4/4 MEDIUM TO COARSE GRAINED SAND well graded, some gravel, wet		
										MEDIUM VERY DARK GRAY 2.5Y 3/1 CLAY high plastic, cohesive, rapid dilatancy, wet		
										LOOSE OLIVE BROWN 2.5Y 4/4 FINE GRAINED SAND noncohesive, rounded, poorly graded, wet		
										MEDIUM VERY DARK GRAY 2.5Y 3/1 CLAY high plastic, cohesive, wet		
										MEDIUM DENSE OLIVE BROWN 2.5Y 4/4 MEDIUM TO COARSE GRAINED SAND well graded, subrounded, some gravel, wet		
										HARD SANDSTONE		
										REFUSAL @ 87.6'		

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**
 COMPANY **INDIANA MICHIGAN POWER COMPANY**
 PROJECT **ROCKPORT PLANT**
 COORDINATES **N 154,452.3 E 514,681.1**
 GROUND ELEVATION **399.2** SYSTEM **State Plane using NAD27/29**

BORING NO. **PZ-1703** DATE **7/11/18** SHEET **1** OF **3**
 BORING START **10/16/17** BORING FINISH **10/16/17**
 PIEZOMETER TYPE _____ WELL TYPE _____
 HGT. RISER ABOVE GROUND **3.24** DIA **4.25**
 DEPTH TO TOP OF WELL SCREEN **39.85** BOTTOM **49.52**
 WELL DEVELOPMENT **YES** BACKFILL _____
 FIELD PARTY **TERRACON/AMEC** RIG _____

Water Level, ft	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TIME			
DATE			

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO									
										SILT AND GRAVEL (FILL)		
1	SS	3.0	5.0	5-5-5-5	2.0				SM	LOOSE BROWN 7.5YR 5/3 SILTY SAND (SM) (FILL) trace fine gravel, moist		
							5		CL	STIFF BROWN 7.5YR 5/4 SANDY CLAY (CL) (~FILL) moist @8' silt seams		
2	SS	8.0	10.0	3-4-7-7	2.0				CL	STIFF LIGHT GRAY GLEY 1-8-N AND LIGHT BROWN MOTTLED LEAN CLAY (CL) (~FILL) w/black, moist		
							10		CL ML	STIFF BROWN 2.5YR 4/4 SILTY CLAY (cl-ml) w/some light gray mottling, moist		
3	SS	13.0	15.0	4-6-7-7	2.0				SP	LOOSE LIGHT BROWN 5YR 7/4 FINE GRAINED PG SAND (SP) silty sand pockets, moist		
							15					
4	SS	18.0	20.0	3-3-4-3	2.0							

TYPE OF CASING USED

	NQ-2 ROCK CORE
	6" x 3.25 HSA
	9" x 6.25 HSA
	HW CASING ADVANCER 4"
	NW CASING 3"
	SW CASING 6"
	AIR HAMMER 8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC
 WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER _____

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **PZ-1703**

DATE **7/11/18**

SHEET **2** OF **3**

PROJECT **ROCKPORT PLANT**

BORING START **10/16/17**

BORING FINISH **10/16/17**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	U S C S	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
5	SS	23.0	25.0	5-8-10-10	1.92				SM	MEDIUM DENSE BROWN 5YR 4/4 SILTY SAND (SM) moist		
6	SS	28.0	30.0	6-9-11-7	1.83		25		SP	MEDIUM DENSE LIGHT BROWN 5YR 7/4 FINE TO MEDIUM GRAINED PG SAND (SP) moist @ 28' trace coal fragments, little to some fine gravel @ 33' some black staining, little silt, no coal fragments, , wet, water in spoon		
7	SS	33.0	35.0	2-4-3-5	1.92		30		SP	LOOSE BROWN 5YR 4/4 MEDIUM TO COARSE GRAINED PG SAND (SP) trace fine gravel, wet		
8	SS	38.0	40.0	3-4-4-6	1.5		35		SW	LOOSE GRAYISH BROWN 2.5YR 4/1 WS SAND (SW) w/fine to coarse gravel, wet		
9	SS	43.0	45.0	8-7-10-7	1.0		40		SP	MEDIUM DENSE BROWN 7.5YR 4/4 FINE TO MEDIUM GRAINED PG SAND AND FINE GRAVEL (SP) set		
							45					

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 7/11/18

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **PZ-1703** DATE **7/11/18** SHEET **3** OF **3**

PROJECT **ROCKPORT PLANT**

BORING START **10/16/17** BORING FINISH **10/16/17**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
10	SS	48.0	50.0	6-11-17-14			50		SP	MEDIUM DENSE GRAYISH BROWN 2.5YR 5/2 MEDIUM TO COARSE GRAINED PG SAND AND FINE GRAVEL (SP) wet		
										BT @ 52'		

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**
 COMPANY **INDIANA MICHIGAN POWER COMPANY**
 PROJECT **ROCKPORT PLANT**
 COORDINATES **N 156,115.9 E 513,931.8**
 GROUND ELEVATION **398.9** SYSTEM **State Plane using NAD27/29**

BORING NO. **PZ-1704** DATE **7/11/18** SHEET **1** OF **2**
 BORING START **10/6/17** BORING FINISH **10/6/17**
 PIEZOMETER TYPE _____ WELL TYPE _____
 HGT. RISER ABOVE GROUND **3.70** DIA **4.25**
 DEPTH TO TOP OF WELL SCREEN **40.53** BOTTOM **50.20**
 WELL DEVELOPMENT **YES** BACKFILL _____
 FIELD PARTY **TERRACON/AMEC** RIG _____

Water Level, ft	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TIME			
DATE			

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	U S C S	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO									
1	SPT	3.0	5.0	4-5-4-3						CH SM CL		
2	SPT	8.0	10.0	1-3-4-5						CH		
3	SPT	13.0	15.0	4-7-7-6						CH CH		
4	SPT	18.0	20.0	2-5-4-3						CH		

TYPE OF CASING USED

	NQ-2 ROCK CORE	
	6" x 3.25 HSA	
	9" x 6.25 HSA	
	HW CASING ADVANCER	4"
	NW CASING	3"
	SW CASING	6"
	AIR HAMMER	8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC
 WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER _____

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **PZ-1704** DATE **7/11/18** SHEET **2** OF **2**

PROJECT **ROCKPORT PLANT**

BORING START **10/6/17** BORING FINISH **10/6/17**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
5	SPT	23.0	25.0	3-4-5-5			25		CH	MEDIUM STIFF REDDISH BROWN 5YR 5/3 FAT CLAY high plastic, cohesive, fine sand seams ~1" thick @ 24.5' & 25.2'		
6	SPT	28.0	30.0	4-8-12-11			30		CH SM SW	MEDIUM STIFF BROWN 7.5YR 4/2 FAT CLAY high plastic, cohesive, moist MEDIUM DENSE REDDISH BROWN 2.5YR 4/4 FINE GRAINED SILTY SAND rounded, poorly graded, wet MEDIUM DENSE YELLOWISH BROWN 10YR 5/4 COARSE SAND well graded, few gravel, wet		
7	SPT	33.0	35.0	1-3-4-5			35		ML SM SW	VERY SOFT YELLOWISH BROWN 10YR 5/4 SANDY SILT non plastic, rapid dilatancy, wet VERY LOOSE STRONG BROWN 7.5YR 5/6 MEDIUM GRAINED SILTY SAND subrounded, few gravel, wet COAL SEAM LOOSE YELLOWISH BROWN 10YR 5/6 COARSE GRAINED SAND w/gravel, well graded, angular, wet		
8	SPT	38.0	40.0	3-4-7-8			40		SP	LOOSE YELLOWISH BROWN 10YR 5/6 MEDIUM GRAINED SAND subrounded, few gravel, wet		
							45					

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**
 COMPANY **INDIANA MICHIGAN POWER COMPANY**
 PROJECT **ROCKPORT PLANT**
 COORDINATES **N 158,399.6 E 515,000.5**
 GROUND ELEVATION **389.6** SYSTEM **State Plane using NAD27/29**

BORING NO. **PZ-1705** DATE **7/11/18** SHEET **1** OF **3**
 BORING START **10/5/17** BORING FINISH **10/5/17**
 PIEZOMETER TYPE _____ WELL TYPE _____
 HGT. RISER ABOVE GROUND **3.60** DIA **4.25**
 DEPTH TO TOP OF WELL SCREEN **40.07** BOTTOM **49.13**
 WELL DEVELOPMENT **YES** BACKFILL _____
 FIELD PARTY **TERRACON/AMEC** RIG _____

Water Level, ft	<input type="text"/>	<input type="text"/>	<input type="text"/>
TIME	<input type="text"/>	<input type="text"/>	<input type="text"/>
DATE	<input type="text"/>	<input type="text"/>	<input type="text"/>

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES	
		FROM	TO										
1	SPT	3.0	5.0	9-14-21-24			5		CH	VERY STIFF REDDISH BROWN 5YR 5/3 CLAY high plastic, cohesive, mottled, dry			
										ML			VERY STIFF YELLOW 10YR 7/6 CLAY low plastic, some sand, dry
2	SPT	8.0	10.0	6-10-11-10			10		CH	STIFF YELLOWISH BROWN 10YR 5/6 CLAY high plastic, cohesive, mottled, dry			
										SM			LOOSE YELLOWISH BROWN 10YR 5/6 FINE GRAINED SILTY SAND
										CH			rounded, poorly graded, dry
3	SPT	13.0	15.0	5-7-8-10			15		CH	STIFF LIGHT GRAY 10YR 7/2 CLAY high plastic, cohesive, moist			
										SW			LOOSE YELLOWISH BROWN 10YR 5/4 MEDIUM TO COARSE GRAINED SAND subrounded, well graded, few gravel
4	SPT	18.0	20.0	3-6-7-7					SW	LOOSE YELLOWISH BROWN 10YR 5/6 COARSE GRAINED SAND subrounded, well graded, some gravel, moist			

TYPE OF CASING USED

	NQ-2 ROCK CORE
	6" x 3.25 HSA
	9" x 6.25 HSA
	HW CASING ADVANCER 4"
	NW CASING 3"
	SW CASING 6"
	AIR HAMMER 8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC
 WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER _____

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **PZ-1705** DATE **7/11/18** SHEET **2** OF **3**

PROJECT **ROCKPORT PLANT**

BORING START **10/5/17** BORING FINISH **10/5/17**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
5	SPT	23.0	25.0	2-2-4-6			25		SP	VERY LOOSE YELLOWISH BROWN 10YR 5/6 MEDIUM GRAINED SAND subrounded, poorly graded, few gravel, wet		
6	SPT	28.0	30.0	3-3-2-3			30		SW SP	VERY LOOSE YELLOWISH BROWN 10YR 5/6 MEDIUM GRAINED SAND subrounded, well graded, few gravel, wet VERY DARK GRAYISH BROWN 10YR 3/2 SAND w/gravel, subrounded, well graded, rapid dilatancy, wet		
7	SPT	33.0	35.0	2-4-4-6			35		SP SW SP	VERY LOOSE DARK YELLOWISH ORANGE 10YR 6/6 FINE GRAINED SAND rounded, poorly graded, trace silt, wet VERY LOOSE DARK YELLOWISH BROWN 10YR 3/4 COARSE GRAINED SAND well graded, some gravel, trace clay, wet COAL SEAM LOOSE YELLOWISH BROWN 10YR 5/6 FINE GRAINED SAND rounded, poorly graded, few gravel, wet		
8	SPT	38.0	40.0	2-2-3-5			40		SW SW	VERY LOOSE BROWN 10YR 5/3 COARSE GRAINED SAND w/gravel, well graded, subrounded, trace clay, wet LOOSE GRAYISH BROWN 10YR 5/2 MEDIUM GRAINED SAND subrounded, well graded		
9	SPT	43.0	45.0	9-14-16-16			45		SW SP	LOOSE YELLOW BROWN 10YR 5/6 COARSE GRAINED SAND w/gravel, well graded, subrounded to angular, wet MEDIUM DENSE DARK YELLOWISH BROWN 10YR 4/4 FINE GRAINED SAND subrounded, poorly graded, few gravel, trace silt,		

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 7/11/18

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **PZ-1705** DATE **7/11/18** SHEET **3** OF **3**

PROJECT **ROCKPORT PLANT**

BORING START **10/5/17** BORING FINISH **10/5/17**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
10	SPT	48.0	50.0	9-11-12-14			50		SW	wet MEDIUM DENSE DARK YELLOWISH BROWN 10YR 4/6 COARSE GRAINED SAND well graded, subrounded, some gravel, wet		
										TBHD = 51'		

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**
 COMPANY **INDIANA MICHIGAN POWER COMPANY**
 PROJECT **ROCKPORT PLANT**
 COORDINATES **N 153,979.3 E 517,034.2**
 GROUND ELEVATION **395.1** SYSTEM **State Plane using NAD27/29**

BORING NO. **PZ-1706** DATE **7/11/18** SHEET **1** OF **3**
 BORING START **10/9/17** BORING FINISH **10/9/17**
 PIEZOMETER TYPE _____ WELL TYPE _____
 HGT. RISER ABOVE GROUND **3.36** DIA **4.25**
 DEPTH TO TOP OF WELL SCREEN **40.16** BOTTOM **49.85**
 WELL DEVELOPMENT **YES** BACKFILL _____
 FIELD PARTY **TERRACON/AMEC** RIG _____

Water Level, ft	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TIME			
DATE			

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD %	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO									
										TOPSOIL = 2" SILT AND GRAVEL FILL TO ~ 2.0'		
1	SS	3.0	5.0	4-6-8-7	1.42		5	CL ML		STIFF DARK GRAY (5YR 5/1) SILTY CLAY (CL-ML) AND GRAVEL (FINE TO COARSE) moist		
2	SS	8.0	10.0	2-2-3-3	1.58		10	CL		MEDIUM STIFF DARK GRAY (5YR 5/1) SANDY CLAY (CL) AND GRAVEL (FINE TO COARSE) moist		
3	SS	13.0	15.0	1-2-3-4	1.83		15	SP		LOOSE LIGHT BROWN (7.5YR 7/8) POORLY GRADED SAND (SP) FINE GRAINED sandy silt seams, moist @ 18' no sandy silt, trace fine gravel, trace coarse grained		
4	SS	18.0	20.0	4-4-5-4	1.75							

TYPE OF CASING USED

	NQ-2 ROCK CORE
	6" x 3.25 HSA
	9" x 6.25 HSA
	HW CASING ADVANCER 4"
	NW CASING 3"
	SW CASING 6"
	AIR HAMMER 8"

Continued Next Page

PIEZOMETER TYPE: PT = OPEN TUBE POROUS TIP, SS = OPEN TUBE SLOTTED SCREEN, G = GEONOR, P = PNEUMATIC
 WELL TYPE: OW = OPEN TUBE SLOTTED SCREEN, GM = GEOMON

RECORDER _____

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING



JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **PZ-1706** DATE **7/11/18** SHEET **2** OF **3**

PROJECT **ROCKPORT PLANT**

BORING START **10/9/17** BORING FINISH **10/9/17**

SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
5	SS	23.0	25.0	2-4-4-4	1.92		25		SP	LOOSE LIGHT BROWN (7.5YR 6/3) POORLY GRADED SAND (SP) AND FINE GRAVEL MEDIUM TO COARSE GRAINED moist		
6	SS	28.0	30.0	4-4-2-3	1.92		30		SM	LOOSE LIGHT BROWN (7.5YR 6/6) SILTY SAND (SM) trace fine to coarse gravel, wet		
7	SS	33.0	35.0	WH-WH-WH-2	1.83		35		SM	VERY LOOSE LIGHT BROWN (7.5YR 6/8) SILTY SAND (SM) wet		
8	SS	38.0	40.0	3-4-5-5	2.0		40		SP	LOOSE LIGHT BROWN (5YR 7/6) POORLY GRADED SAND (SP) FINE GRAINED wet		
9	SS	43.0	45.0	4-4-4-5	1.58		45		SM	LOOSE GRAYISH BROWN (2.5YR 6/2) SILTY SAND (SM) AND FINE GRAVEL wet		
									SW	LOOSE GRAYISH BROWN (5YR 6/2) WELL GRADED SAND (SW) AND FINE GRAVEL wet		

AEP RK BAP CCR COMPLIANCE.GPJ AEP.GDT 7/11/18

Continued Next Page

AMERICAN ELECTRIC POWER SERVICE CORPORATION
AEP CIVIL ENGINEERING LABORATORY
 LOG OF BORING




JOB NUMBER **42393125-01**

COMPANY **INDIANA MICHIGAN POWER COMPANY**

BORING NO. **PZ-1706** DATE **7/11/18** SHEET **3** OF **3**

PROJECT **ROCKPORT PLANT**

BORING START **10/9/17** BORING FINISH **10/9/17**







SAMPLE NUMBER	SAMPLE	SAMPLE DEPTH IN FEET		STANDARD PENETRATION RESISTANCE BLOWS / 6"	TOTAL LENGTH RECOVERY	RQD	DEPTH IN FEET	GRAPHIC LOG	USCS	SOIL / ROCK IDENTIFICATION	WELL	DRILLER'S NOTES
		FROM	TO			%						
10	SS	48.0	50.0	1-7-9-7	1.67		50		SP	MEDIUM DENSE BROWNISH GRAY (5YR 5/1) POORLY GRADED SAND (SP) FINE GRAINED some fine gravel, wet		
										BT @ 52' / WELL INSTALLATION @ 52'		

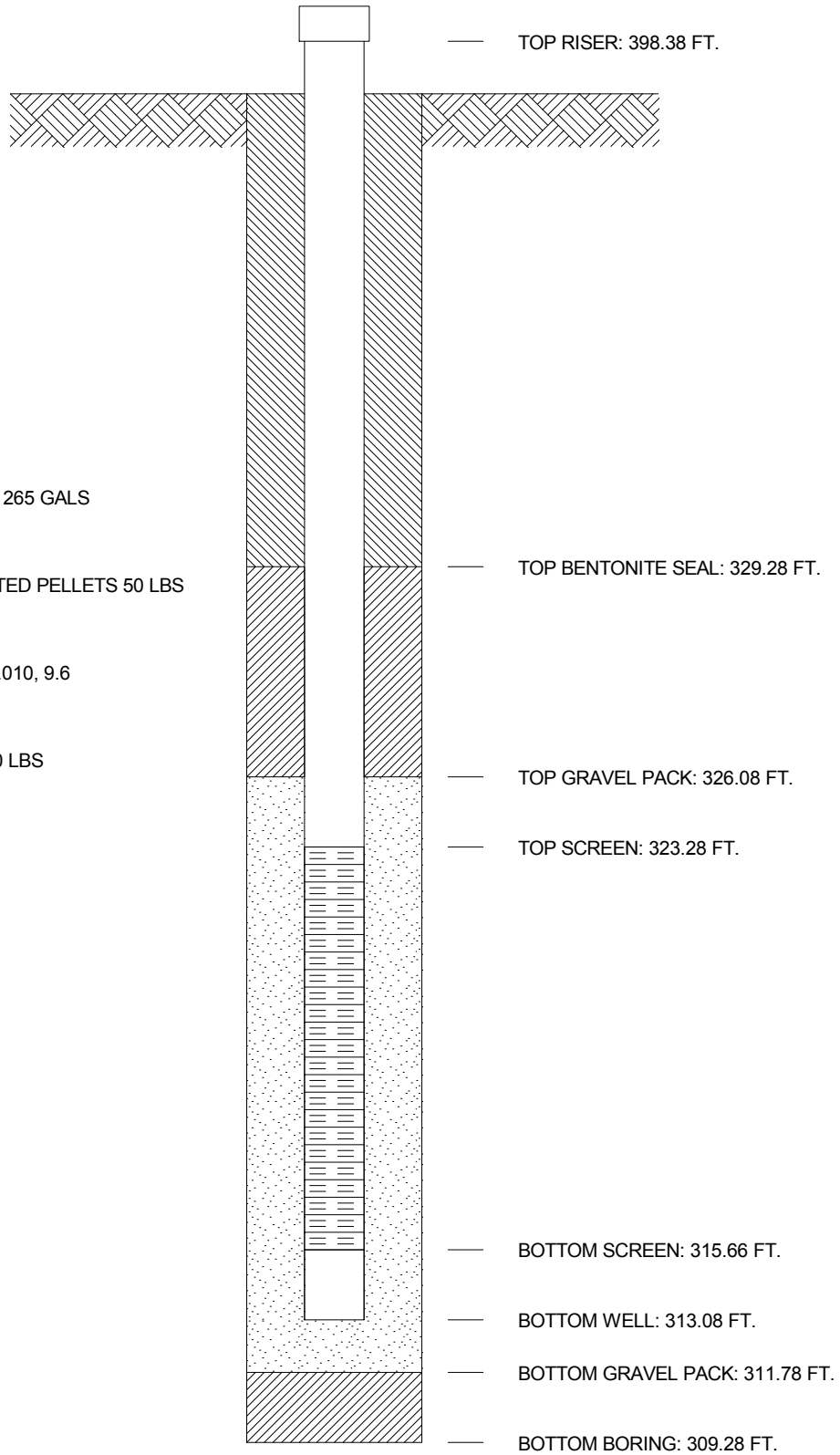
AMERICAN ELECTRIC POWER SERVICE CORPORATION
 AEP CIVIL ENGINEERING LABORATORY
 MONITORING WELL CONSTRUCTION



JOB NUMBER 42393125-01
 COMPANY INDIANA MICHIGAN POWER COMPANY WELL No. MW-1701D BORING No. _____ INSTALLED 10/11/17
 PROJECT ROCKPORT PLANT
 COORDINATES N 155,708.2 E 511,570.0
 SYSTEM State Plane using NAD27/29

GROUND ELEVATION 395.28 FT.

-  GROUT SEAL: HIGH SOLIDS 265 GALS
-  BENTONITE SEAL: 3/8" COATED PELLETS 50 LBS
-  SCREEN: 2.0 dia., SLOTTED .010, 9.6
-  GRAVEL PACK: #5 SAND 200 LBS
-  RISER PIPE: 2.0, dia., PVC
-  SPACERS, DEPTH:



MONITORING WELL CONSTRUCTION

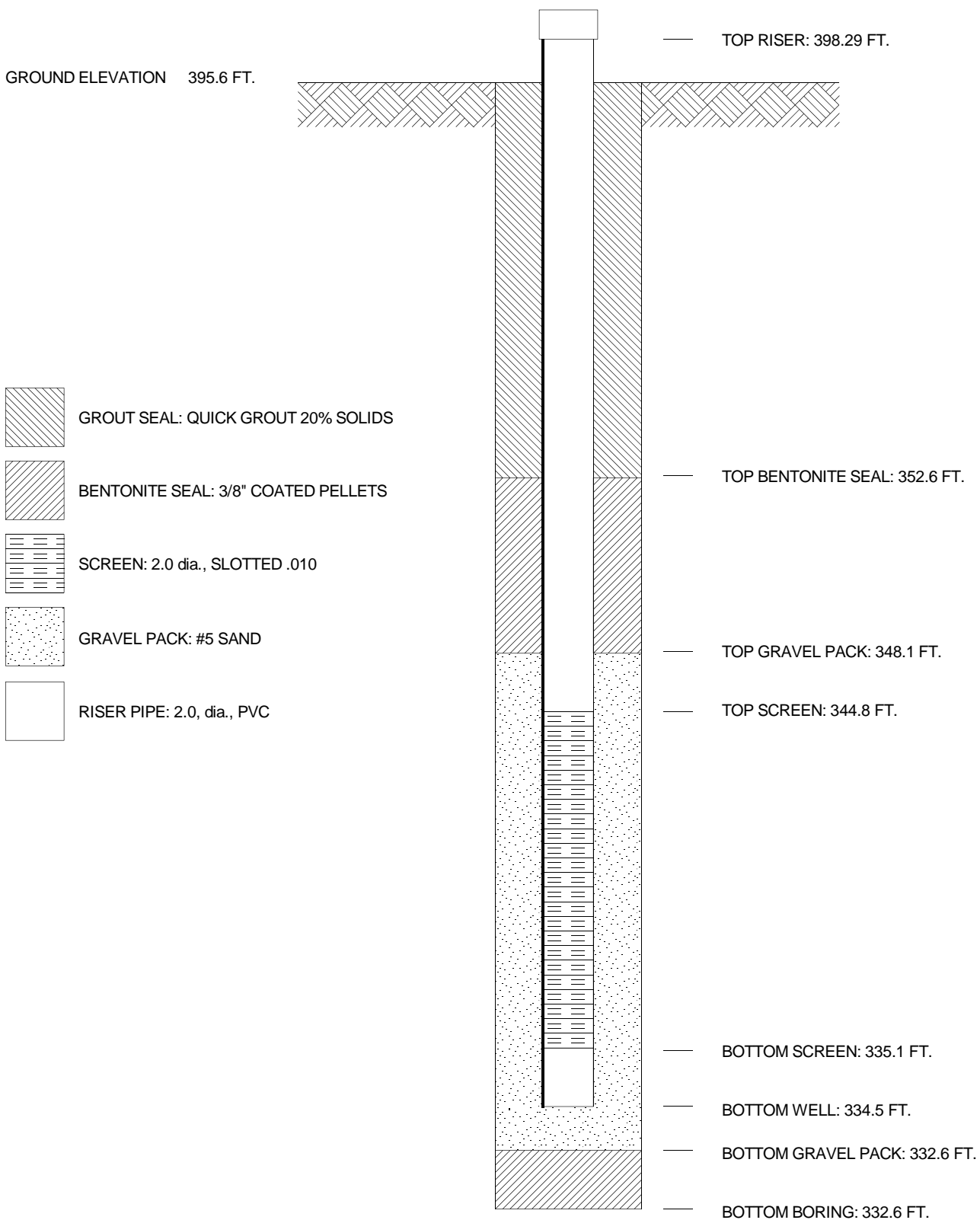
PROJECT NO. 7362172421

WELL ID MW-1701I

CLIENT AEP

DATE INSTALLED 10/13/2017

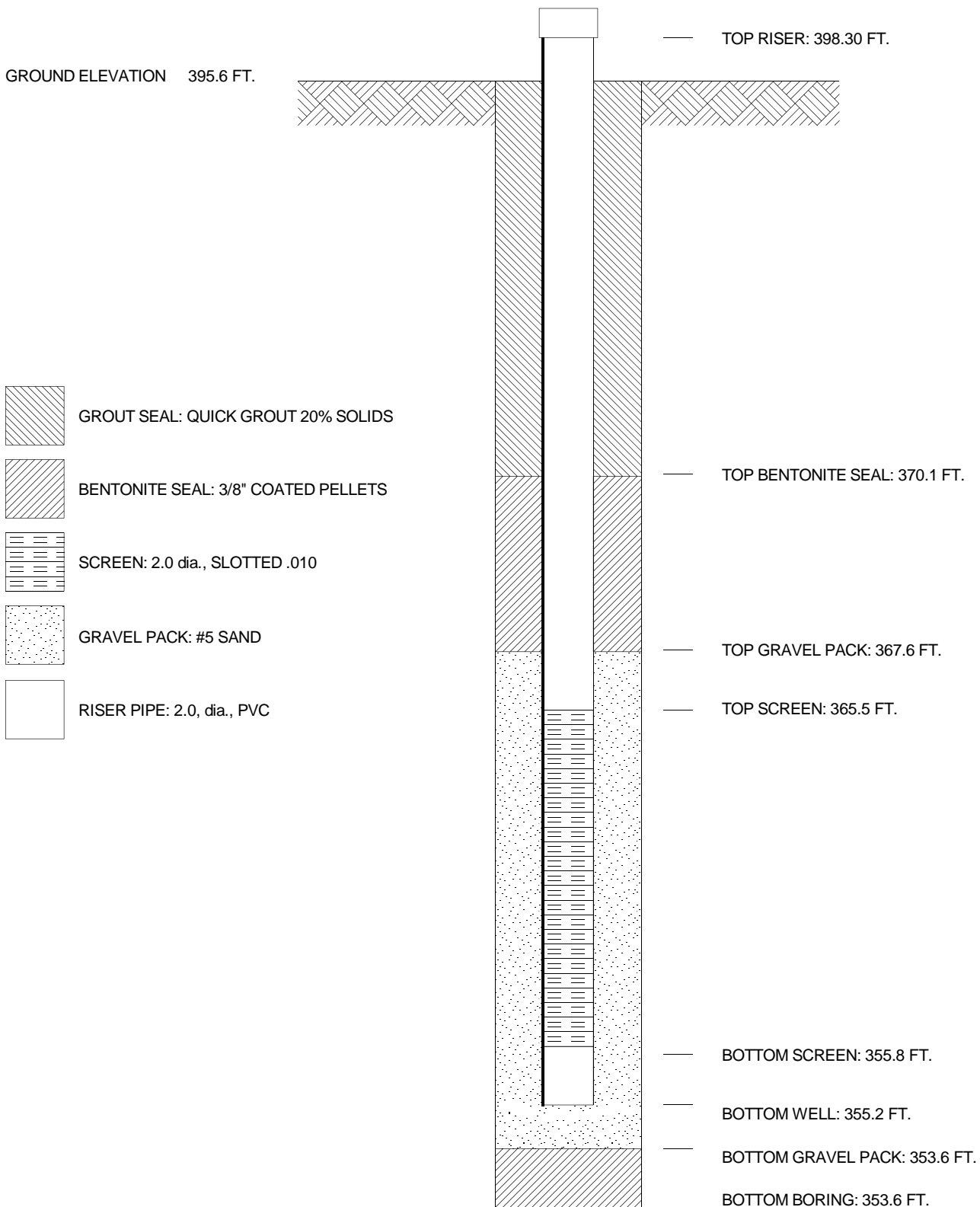
COORDINATES N 155703.04, E 511568.64 SPCS NAD27



MONITORING WELL CONSTRUCTION

PROJECT NO. 7362172421
CLIENT AEP
COORDINATES N 155697.39, E 511567.94 SPCS NAD27

WELL ID MW-1701S
DATE INSTALLED 10/16/2017









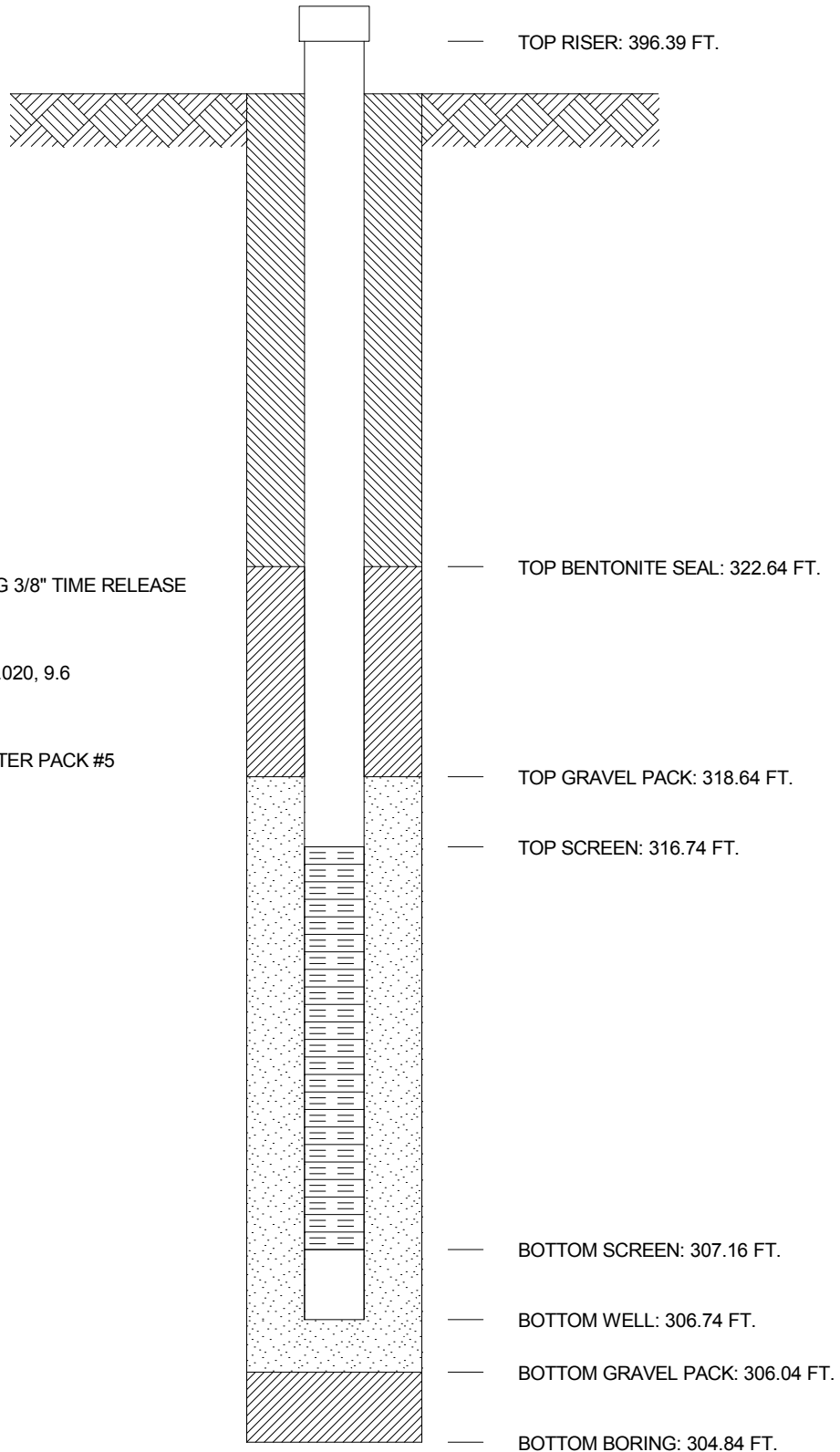
AMERICAN ELECTRIC POWER SERVICE CORPORATION
 AEP CIVIL ENGINEERING LABORATORY
 MONITORING WELL CONSTRUCTION



JOB NUMBER 42393125-01
 COMPANY INDIANA MICHIGAN POWER COMPANY WELL No. MW-1702D BORING No. _____ INSTALLED 10/2/17
 PROJECT ROCKPORT PLANT
 COORDINATES N 153,659.2 E 511,922.9
 SYSTEM State Plane using NAD27/29

GROUND ELEVATION 392.44 FT.

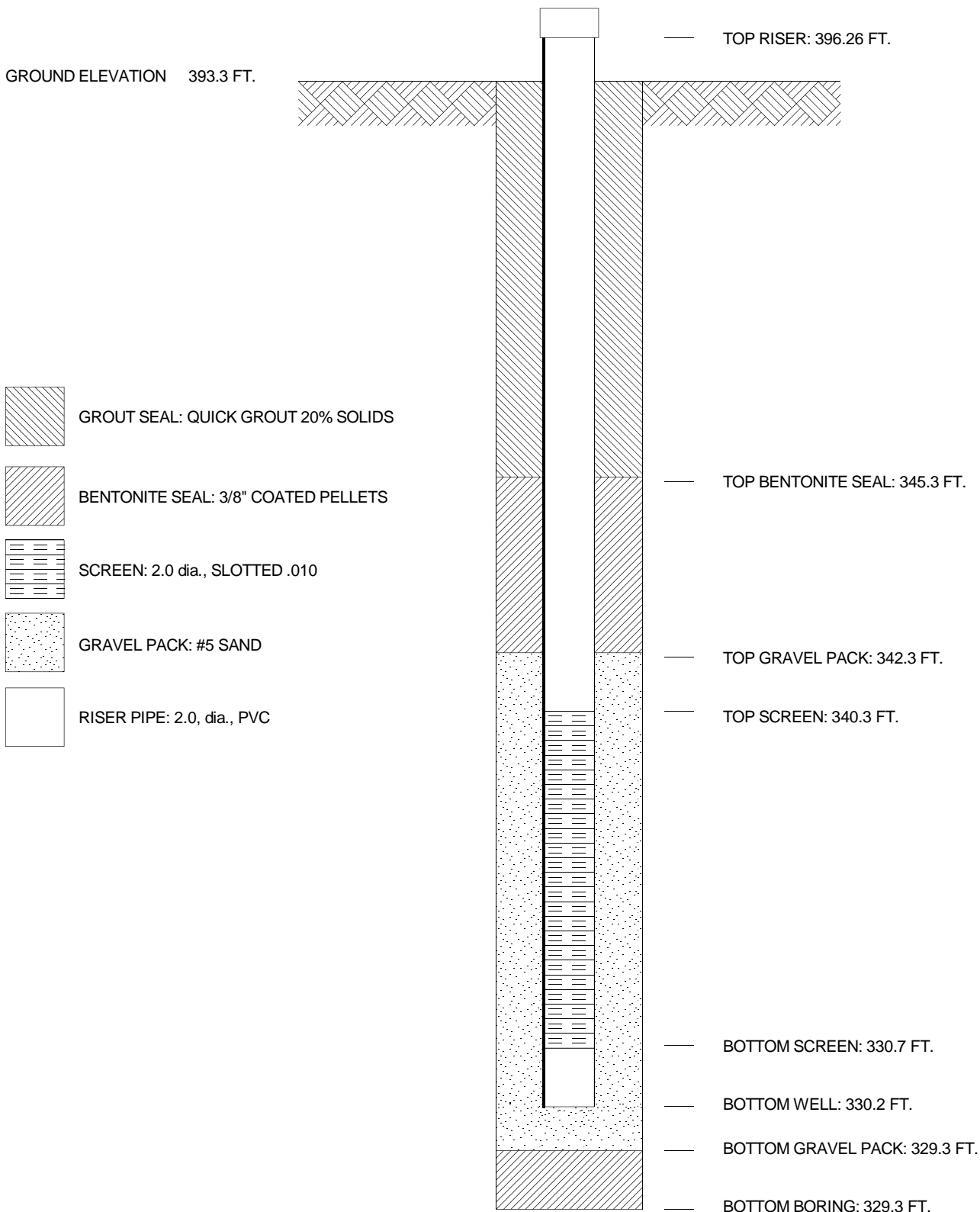
-  GROUT SEAL:
-  BENTONITE SEAL: PEL-PLUG 3/8" TIME RELEASE PELLETS
-  SCREEN: 2.0 dia., SLOTTED .020, 9.6
-  GRAVEL PACK: GLOBAL FILTER PACK #5
-  RISER PIPE: 2.0, dia., PVC
-  SPACERS, DEPTH:



MONITORING WELL CONSTRUCTION

PROJECT NO. 7362172421
CLIENT AEP
COORDINATES N 153655.81, E 511921.85 SPCS NAD27

WELL ID MW-1702I
DATE INSTALLED 10/4/2017



MONITORING WELL CONSTRUCTION

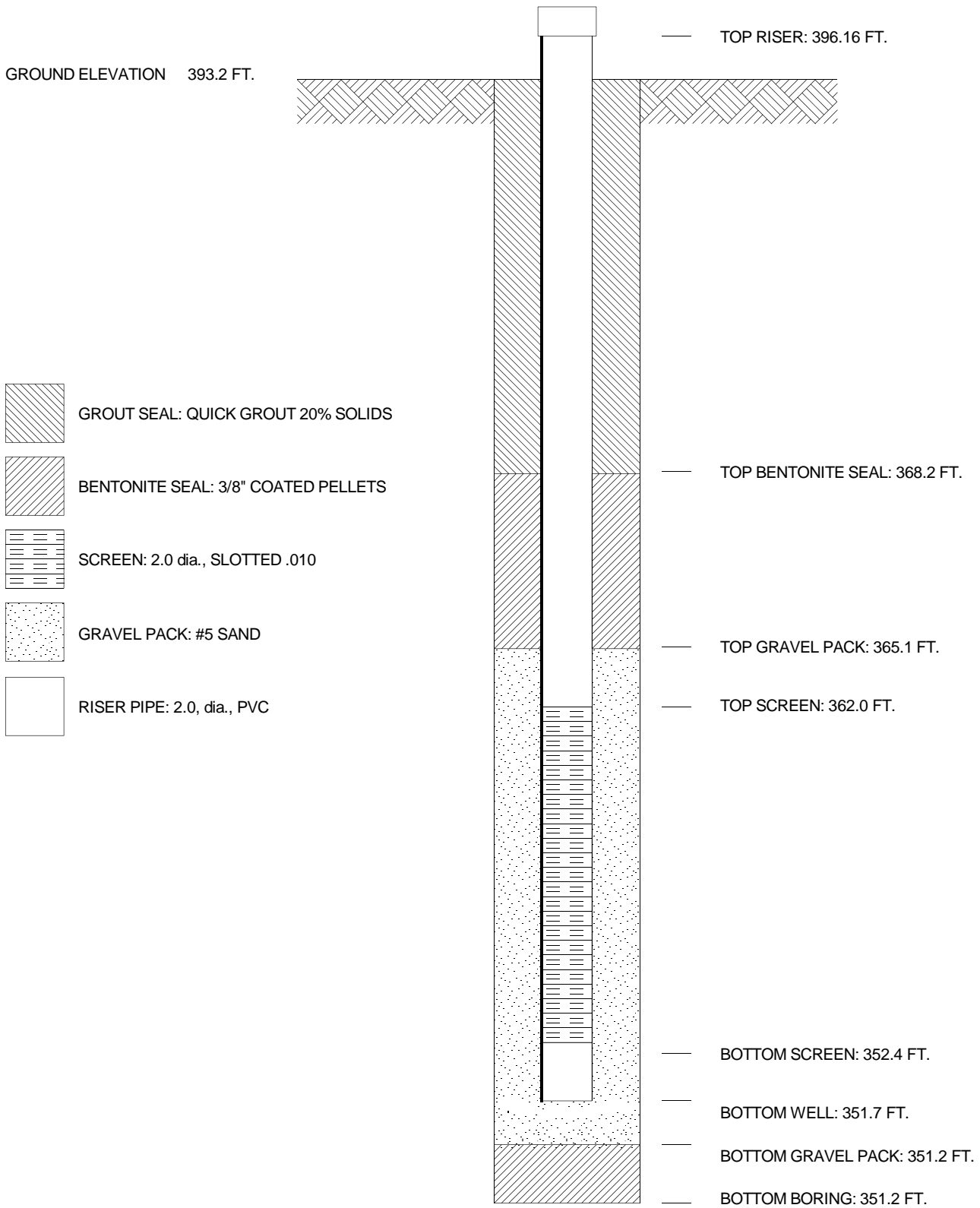
PROJECT NO. 7362172421

WELL ID MW-1702S

CLIENT AEP

DATE INSTALLED 10/5/2017

COORDINATES N 153650.79, E 511921.68 SPCS NAD27



AMERICAN ELECTRIC POWER SERVICE CORPORATION
 AEP CIVIL ENGINEERING LABORATORY
 MONITORING WELL CONSTRUCTION



JOB NUMBER 42393125-01

COMPANY INDIANA MICHIGAN POWER COMPANY

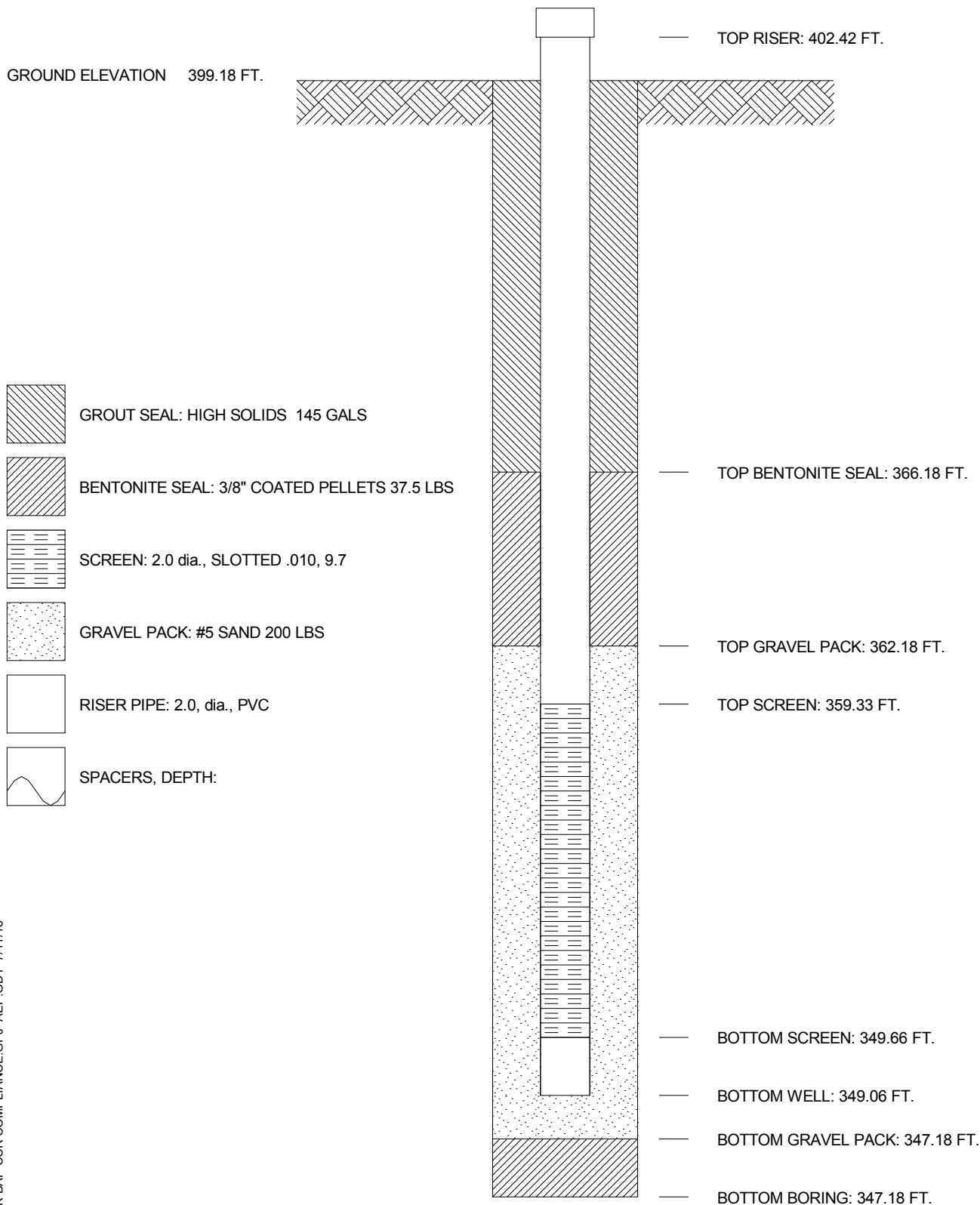
WELL No. PZ-1703 BORING No. _____ INSTALLED 10/16/17

PROJECT ROCKPORT PLANT

COORDINATES N 154,452.3 E 514,681.1

SYSTEM State Plane using NAD27/29

GROUND ELEVATION 399.18 FT.



AMERICAN ELECTRIC POWER SERVICE CORPORATION
 AEP CIVIL ENGINEERING LABORATORY
 MONITORING WELL CONSTRUCTION



JOB NUMBER 42393125-01

COMPANY INDIANA MICHIGAN POWER COMPANY

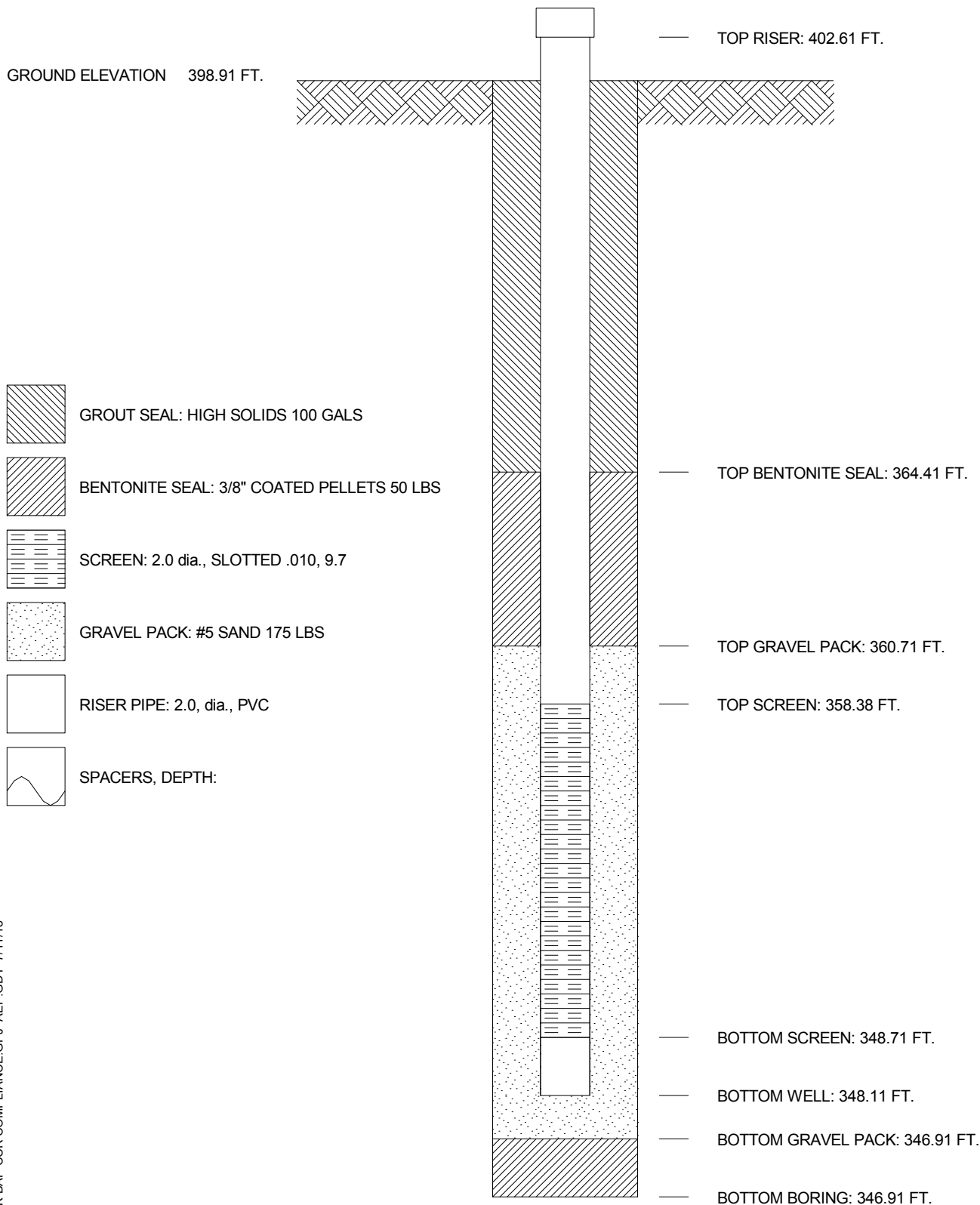
WELL No. PZ-1704 BORING No. _____ INSTALLED 10/6/17







PROJECT ROCKPORT PLANT

COORDINATES N 156,115.9 E 513,931.8

SYSTEM State Plane using NAD27/29

GROUND ELEVATION 398.91 FT.









-  GROUT SEAL: HIGH SOLIDS 100 GALS
-  BENTONITE SEAL: 3/8" COATED PELLETS 50 LBS
-  SCREEN: 2.0 dia., SLOTTED .010, 9.7
-  GRAVEL PACK: #5 SAND 175 LBS
-  RISER PIPE: 2.0, dia., PVC
-  SPACERS, DEPTH:

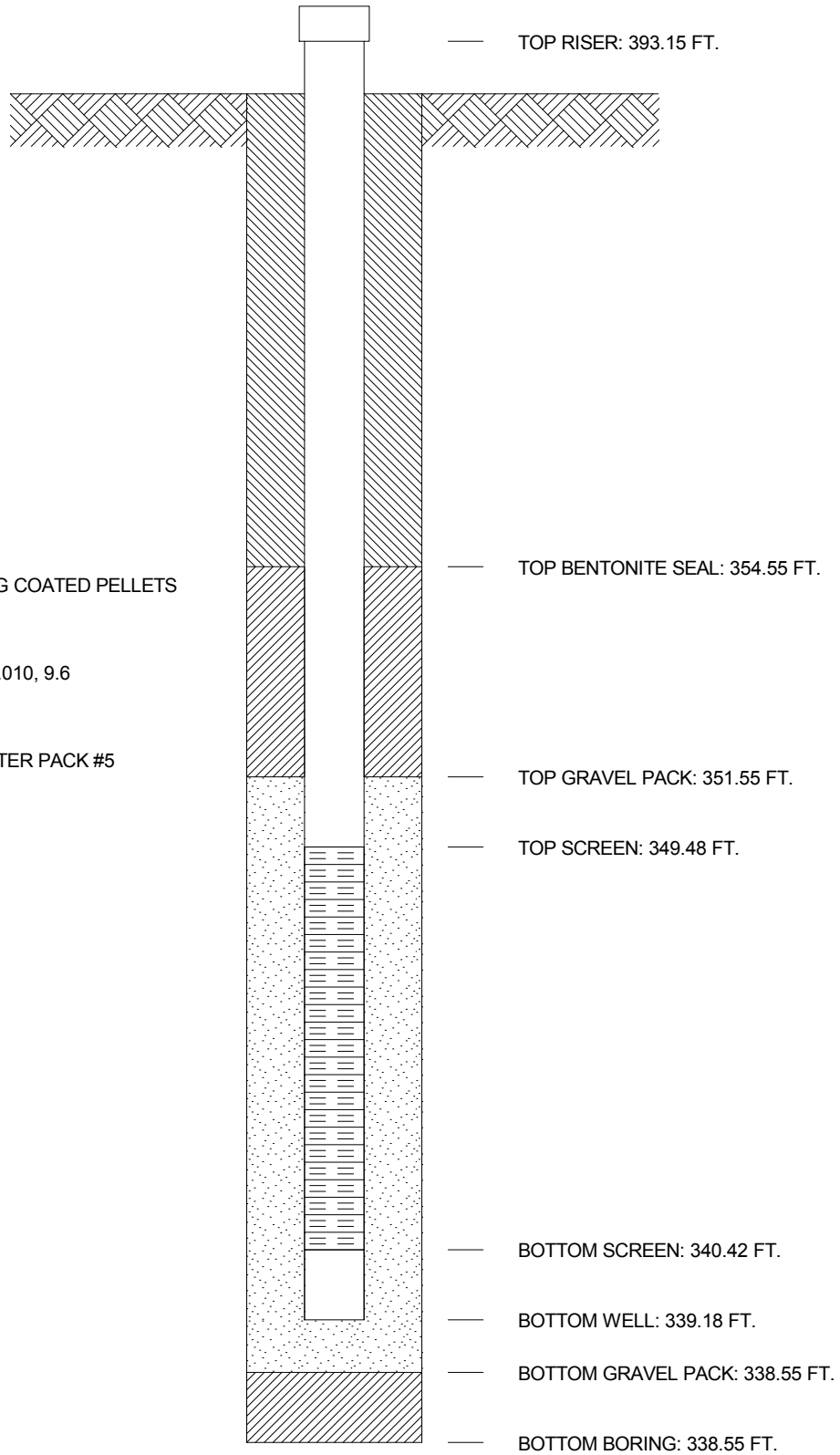
AMERICAN ELECTRIC POWER SERVICE CORPORATION
 AEP CIVIL ENGINEERING LABORATORY
 MONITORING WELL CONSTRUCTION



JOB NUMBER 42393125-01
 COMPANY INDIANA MICHIGAN POWER COMPANY WELL No. PZ-1705 BORING No. _____ INSTALLED 10/5/17
 PROJECT ROCKPORT PLANT
 COORDINATES N 158,399.6 E 515,000.5
 SYSTEM State Plane using NAD27/29

GROUND ELEVATION 389.55 FT.

-  GROUT SEAL: BENTONITE
-  BENTONITE SEAL: PEL-PLUG COATED PELLETS
-  SCREEN: 2.0 dia., SLOTTED .010, 9.6
-  GRAVEL PACK: GLOBAL FILTER PACK #5
-  RISER PIPE: 2.0, dia., PVC
-  SPACERS, DEPTH:









AMERICAN ELECTRIC POWER SERVICE CORPORATION
 AEP CIVIL ENGINEERING LABORATORY
 MONITORING WELL CONSTRUCTION



JOB NUMBER 42393125-01
 COMPANY INDIANA MICHIGAN POWER COMPANY WELL No. PZ-1706 BORING No. _____ INSTALLED 10/9/17
 PROJECT ROCKPORT PLANT
 COORDINATES N 153,979.3 E 517,034.2
 SYSTEM State Plane using NAD27/29

GROUND ELEVATION 395.10 FT.

-  GROUT SEAL: HIGH SOLIDS 100 GALS
-  BENTONITE SEAL: 3/8" COATED PELLETS 50 LBS
-  SCREEN: 2.0 dia., SLOTTED .010, 9.7
-  GRAVEL PACK: #5 SAND 200 LBS
-  RISER PIPE: 2.0, dia., PVC
-  SPACERS, DEPTH:

