

March 18, 2021

Richard Huggins  
Branch Chief, Energy Recovery and Waste Disposal, US EPA  
One Potomac Yard  
2777 S. Crystal Drive  
Arlington, Virginia 22202-3553

RE: Powerton Generating Station, Midwest Generation LLC  
Alternate Closure Demonstration, 40 CFR Part 257.103

Chief Huggins,

The purpose of this correspondence is to provide supplemental information in regard to our Demonstration for a Site-Specific Alternative Deadline to Initiate Closure documentation submitted to the United States Environmental Protection Agency (USEPS) on November 30, 2020 on behalf of the Powerton Generating Station, Midwest Generation LLC (MWG), located on 13082 E. Manito Road, Pekin Illinois 61554.

The station is subject to 40 CFR Part 257 Subpart D "The Federal CCR Rule" and pursuant to 40 CFR 257.103(f)(1)(iv)(A), MWG prepared and submitted it's demonstration and workplan detailing its proposed development of alternative disposal capacity and a timeline to replace Ash Surge Basin.

EPA has reviewed our demonstration and requested supplemental information (or clarification) regarding Well Log Boring and Construction information and Appendix IV monitoring data. Our submittal includes the following documentation which will be posted as supplemental information to our Website.

- **Original Demonstration** – For reference, an active link to the original November 30, 2020 submittal as the previous link was deactivated. The original Demonstrations can be found on our NRG Website as well.
- Supplemental Information.
  - 2017 Annual Report (for Appendix IV Data)
  - Well Logs MW1-MW19

Please note, the unit is in Detection monitoring and post background Appendix IV monitoring data is not available. To satisfy your request, the 2017 Annual Report (which is located on the NRG Website) to provide Appendix IV data collected during the initial eight rounds of background sampling.

We look forward to working with the USEPA and proceeding with our project to establish alternative capacity. Please contact me at (302)-540-0327 or [david.bacher@nrgenergy.com](mailto:david.bacher@nrgenergy.com) to address any questions or concerns regarding this submittal.

Sincerely,



David Bacher  
Senior Regional Manager  
Environmental Business, NRG Energy, Inc.

CC: Jessica Schumacher (USEPS Region 5)  
Anthony Carroll (USEPA Region 5)  
Kirsten Hillyer (US EPA)  
Frank Behan (USEPA)  
W. Stone (NRG), S. Shealey (MWG), W. Shander (MWG)



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**KPRG and Associates, Inc.**

**CCR COMPLIANCE  
ANNUAL GROUNDWATER MONITORING and  
CORRECTIVE ACTION REPORT - 2017**

**Midwest Generation, LLC  
Powerton Station  
13082 E. Manito Rd.  
Pekin, IL 61554**

Prepared By: **KPRG and Associates, Inc.  
14665 West Lisbon Road, Suite 2B  
Brookfield, WI 53005**

January 24, 2018

## TABLE OF CONTENTS

1.0	INTRODUCTION .....	1
2.0	FIELD PROCEDURES AND GROUNDWATER FLOW EVALUATION .....	2
2.1	Field Procedures.....	2
2.2	Groundwater Flow Evaluation .....	2
3.0	ANALYTICAL DATA AND STATUS OF EVALUATIONS .....	4
4.0	SUMMARY/CONCLUSIONS AND RECOMMENDATIONS.....	5
5.0	REFERENCES .....	6

## FIGURES

- 1 – CCR Monitoring Wells Site Map
- 2 – CCR Groundwater Contour Silt/Clay Unit 11/2015
- 3 – CCR Groundwater Contour Gravelly Sand Unit 11/2015
- 4 – CCR Groundwater Contour Silt/Clay Unit 2/2016
- 5 – CCR Groundwater Contour Gravelly Sand Unit 2/2016
- 6 – CCR Groundwater Contour Silt/Clay Unit 5/2016
- 7 – CCR Groundwater Contour Gravelly Sand Unit 5/2016
- 8 – CCR Groundwater Contour Silt/Clay Unit 8/2016
- 9 – CCR Groundwater Contour Gravelly Sand Unit 8/2016
- 10 – CCR Groundwater Contour Silt/Clay Unit 11/2016
- 11 – CCR Groundwater Contour Gravelly Sand Unit 11/2016
- 12 – CCR Groundwater Contour Silt/Clay Unit 2/2017
- 13 – CCR Groundwater Contour Gravelly Sand Unit 2/2017
- 14 – CCR Groundwater Contour Silt/Clay Unit 5/2017
- 15 – CCR Groundwater Contour Gravelly Sand Unit 5/2017
- 16 – CCR Groundwater Contour Silt/Clay Unit 6/2017
- 17 – CCR Groundwater Contour Gravelly Sand Unit 6/2017
- 18 – CCR Groundwater Contour Silt/Clay Unit 8/2017
- 19 – CCR Groundwater Contour Gravelly Sand Unit 8/2017
- 20 – CCR Groundwater Contour Silt/Clay Unit 11/2017
- 21 – CCR Groundwater Contour Gravelly Sand Unit 11/2017

## TABLES

- 1 – Groundwater Elevations
- 2 – Groundwater Flow Direction and Estimated Seepage Velocity/Flow Rate
- 3 – Detection Monitoring Appendix III Groundwater Analytical Results – Ash Bypass Basin and Ash Surge Basin
- 4 – Detection Monitoring Appendix IV Groundwater Analytical Results – Ash By-pass Basin and Ash Surge Basin
- 5 – Detection Monitoring Appendix III Groundwater Analytical Results – Former Ash Basin
- 6 – Detection Monitoring Appendix IV Groundwater Analytical Results – Former Ash Basin

## 1.0 INTRODUCTION

The Detection Monitoring requirements in accordance with the Federal Register, Environmental Protection Agency, 40 CFR Parts 257.94, Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule dated April 17, 2015 (CCR Rule) have been completed for the ash pond monitoring wells located at the Midwest Generation, LLC (Midwest Generation) Powerton Generating Station. The wells sampled were selected by Midwest Generation to meet the monitoring requirements of the CCR Rule for the Ash Surge Basin and the Ash By-pass Basin. The monitoring well network around these ponds consists of monitoring wells (MW-01 [upgradient], MW-08, MW-09 [upgradient], MW-11, MW-12, MW-15, MW-17, MW-18 and MW-19 [upgradient]) as shown on Figure 1. Upgradient monitoring well, MW-19 was more recently installed (October 2016) and is in the process of having the first full eight rounds of detection monitoring data being collected.

With the vacating of Section 257.100(b) through (d) in October 2016, the inactive Former Ash Basin (FAB), which is being planned for closure, was added to the CCR units that would require monitoring under the CCR Rule. Wells MW-02 through MW-05 and MW-10 were added to the CCR sampling program specifically for the FAB and are not part of the monitoring program for the Ash Surge Basin and Ash By-pass Basin.

This annual report covers the work performed relative to CCR groundwater monitoring through the end of 2017. It is prepared in accordance with Section 257.90(e)(1-5) and summarizes the sampling procedures used, provides an evaluation of groundwater flow conditions, summarizes the analytical data generated and provides a discussion of the statistical evaluations in the process of being completed as a basis for determining the appropriate next phase of compliance activities.

## 2.0 FIELD PROCEDURES AND GROUNDWATER FLOW EVALUATION

### 2.1 Field Procedures

As previously noted, the CCR groundwater monitoring network around the Ash By-pass Basin and Ash Surge Basin consists of monitoring wells (MW-01 [upgradient], MW-08, MW-09 [upgradient], MW-11, MW-12, MW-15, MW-17, MW-18 and MW-19 [upgradient]) as shown on Figure 1. The monitoring well network for the Former Ash basin consists of additional monitoring wells MW-02 through MW-05 and MW-10 (upgradient). As part of sampling procedures, the integrity of all monitoring wells was inspected and water levels obtained using an electronic water level meter (see summary of water level discussion below). All wells were found in generally good condition.

Groundwater samples were collected using the low-flow sampling technique from dedicated pumps. The samples were not filtered prior to analysis to provide for total metals concentrations as opposed to dissolved metals concentrations. One duplicate sample was collected from a randomly selected monitoring well per sampling event for quality assurance purposes. To fulfill initial detection monitoring requirements under Section 257.94(b), the first eight rounds of groundwater sampling included the analysis of all compounds listed in the CCR Rule, Part 257, Appendices III and IV to facilitate development of statistical background water quality. The ninth round of sampling along with a resample event was for Appendix III detection monitoring parameters for the Ash By-pass Basin and Ash Surge Basin.

### 2.2 Groundwater Flow Evaluation

Water level data measurements were obtained from each well during each round of groundwater monitoring. A complete round of water levels was collected prior to initiating sampling, and the water level data are summarized in Table 1. It is noted that monitoring wells MW-8, MW-12, MW-15 and MW-17 are screened within a shallow, localized, saturated clay/silt unit which is underlain by a more extensive sand unit. The remaining monitoring wells, have deeper screens, within the more extensive sand unit. The water levels from wells screened in the clay/silt unit and the water levels from monitoring wells screened within the sand unit were evaluated separately and used to generate groundwater flow maps for each unit. These maps are provided on Figures 2 through 21.

In accordance with general groundwater sampling requirements under Section 257.93(c), Table 2 provides a summary of the flow direction and an estimated rate of groundwater flow for each sampling event. The flow rate was calculated using the following equation:

$$V_s = \frac{Kdh}{n_e dl}, \text{ where}$$

$V_s$  is seepage velocity (distance/time)

$K$  is hydraulic conductivity (distance/time)

$dh/dl$  is hydraulic gradient (unitless)

$n_e$  is effective porosity (unitless)

The average hydraulic conductivities of  $3.28 \times 10^{-7}$  ft/sec (silt/clay unit) in Table 2 was estimated from literature (Freeze and Cherry, 1979). The hydraulic conductivity of  $3.81 \times 10^{-3}$  (sandy unit) used in Table 2 was obtained from the Hydrogeologic Assessment Report dated February 2011 and prepared by Patrick Engineering. The estimated effective porosities of the silt/clay materials (0.40) and of the sandy materials (0.35) were obtained from literature (Applied Hydrogeology, Fetter, 1980).

### 3.0 ANALYTICAL DATA AND STATUS OF EVALUATIONS

The analytical data from the Ash By-pass Basin and Ash Surge Basin detection monitoring groundwater sampling for Appendix III and IV parameters are provided in Tables 3 and 4, respectively. The analytical data collected to date for the Former Ash Basin detection monitoring groundwater sampling for Appendix III and IV are provided in Tables 5 and 6, respectively. As previously noted, all of this initial data was collected as part of detection monitoring requirements under 257.94(b). Table 3 (Appendix III) also includes a ninth round and a resample event (dates in italics in table) which is the first formal round of detection monitoring after obtaining the required number of samples for development of statistical background. All tables include the sample dates and whether the specific well is considered upgradient or downgradient relative to groundwater flow and the regulated unit(s).

The first eight rounds of Appendix III Ash By-pass Basin and Ash Surge Basin detection monitoring data from established upgradient wells are in the process of being statistically evaluated to establish background water quality in accordance with procedures defined in CCR Compliance Statistical Approach for Groundwater Data Evaluation, Midwest Generation Powerton Generating Station dated October 10, 2017. This includes outlier testing, spatial/temporal variability testing, distributional testing, and the establishment of Prediction Limits for all Appendix III compounds to which the ninth round of groundwater detection monitoring data will be compared to determine whether there may be a statistically significant increase (SSI) for a specific compound at each well location. The evaluations are being performed with the assistance of the Sanitas<sup>TM</sup> statistical software package.



#### 4.0 SUMMARY/CONCLUSIONS AND RECOMMENDATIONS

The Detection Monitoring requirements in accordance with the CCR Rule have been successfully met for the Ash By-pass Basin and Ash Surge Basin. Eight rounds of groundwater data have been generated for all upgradient and downgradient monitoring wells for Appendix III and Appendix IV parameters. In addition, a ninth round and resample event has also been collected for subsequent use in statistical comparisons. The background data collection for the Former Ash Basin detection monitoring program is still ongoing as previously discussed due to the vacating of Section 257.100(b) through (d) in October 2016

Based on an evaluation of groundwater flow conditions over the reporting period shows that the flow system has been fairly consistent over time between sampling events. The existing monitoring well network appears to be sufficient for the intended purposes of CCR Rule groundwater monitoring of the regulated units. No additional monitoring well installations are proposed at this time based on the groundwater flow evaluation.

Development of statistical background for upgradient wells is in the process of being completed. Once this evaluation is completed a determination will be made whether there may be SSIs in downgradient monitoring wells in accordance with procedures defined in CCR Compliance Statistical Approach for Groundwater Data Evaluation, Midwest Generation Powerton Generating Station dated October 10, 2017. Appropriate recommendations will be made once the statistical evaluation is completed regarding whether the site should continue with routine detection monitoring, proceed with an alternate source demonstration or to transition to an assessment monitoring program.

## 5.0 REFERENCES

- Federal Register, Environmental Protection Agency, 40 CFR Parts 257 and 261, Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities; Final Rule. Vol. 80, No. 74, Friday April 17, 2015.
- Patrick Engineering, Inc., Hydrogeologic Assessment Report – Powerton Generating Station, Pekin, IL. February 2011.
- KPRG and Associates, Inc., CCR Compliance Monitoring, Sampling and Analysis Plan, Midwest Generation, LLC Powerton Generating Station. October 10, 2017.
- KPRG and Associates, Inc., CCR Compliance Statistical Approach for Groundwater Data Evaluation, Midwest Generation, LLC Powerton Generating Station. October 10, 2017.
- C.W. Fetter, Jr., Applied Hydrogeology. Charles E. Merrill Publishing Co., 1980.
- R.A. Freeze and J.A. Cherry, Groundwater. Prentice-Hall, Inc. Publishing Co., 1979.

## **FIGURES**



**LEGEND**

MW-8 MONITORING WELL

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**CCR MONITORING WELL SITE MAP**

**POWERTON STATION  
PEKIN, ILLINOIS**

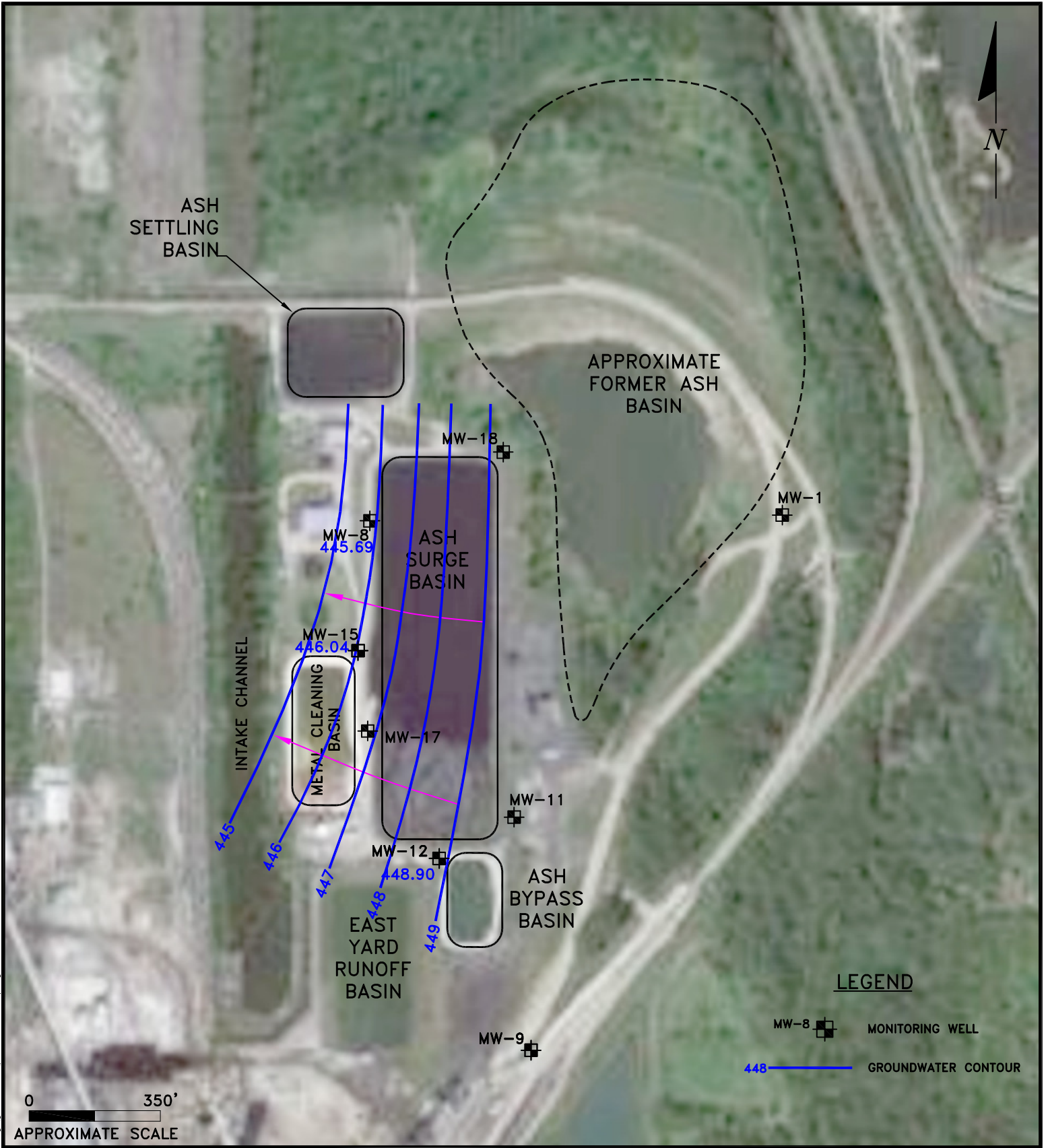
**Scale: 1" = 350'     Date: August 9, 2017**

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

**KPRG Project No. 12313.1     FIGURE 1**

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

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0 350'  
 APPROXIMATE SCALE

**LEGEND**

- MW-8 MONITORING WELL
- 448 GROUNDWATER CONTOUR

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**CCR GROUNDWATER CONTOUR MAP  
 FOR SILT/CLAY UNIT 11/2015**

**POWERTON STATION  
 PEKIN, ILLINOIS**

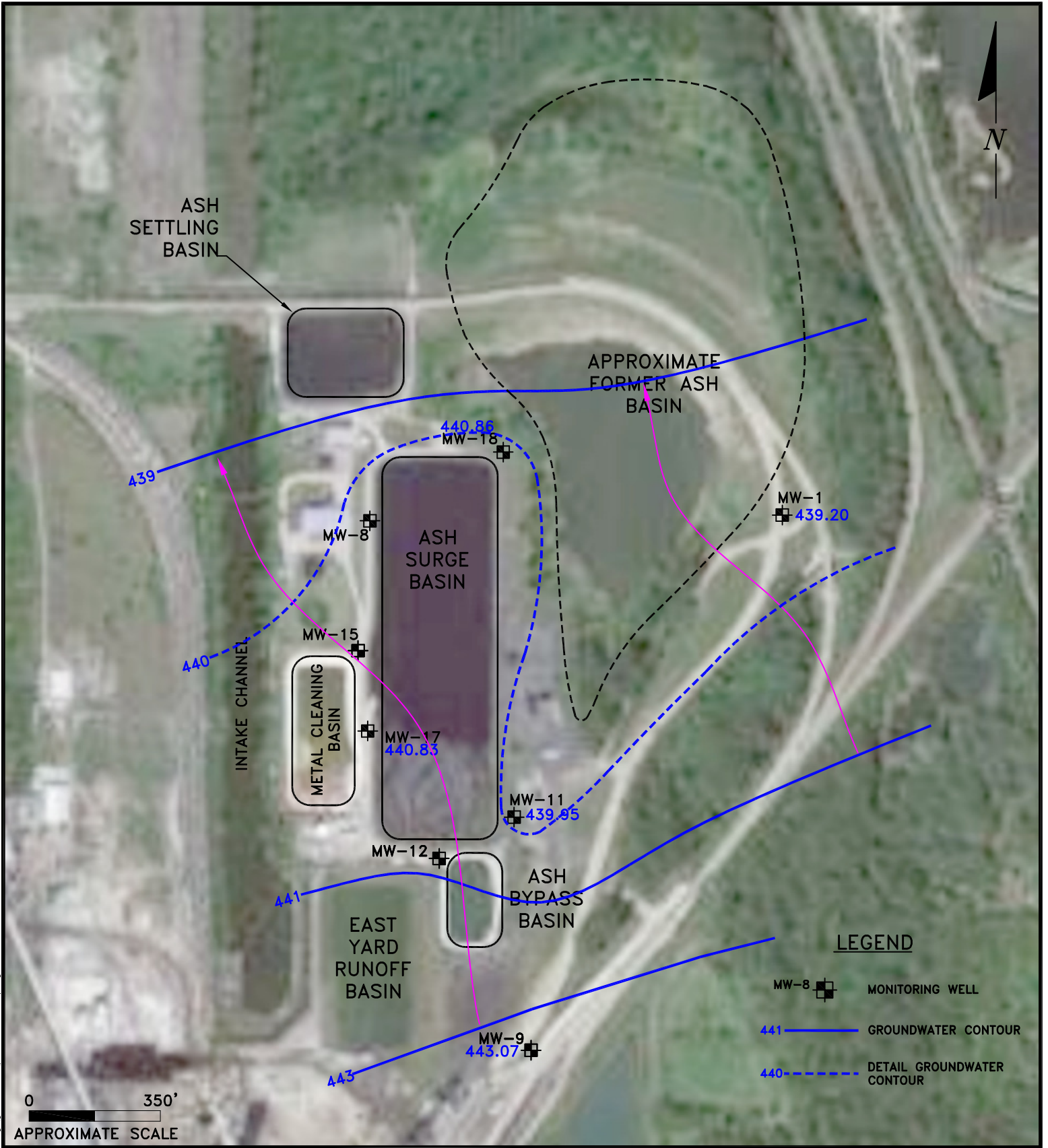
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414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

**KPRG Project No. 12313.1      FIGURE 2**

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**CCR GROUNDWATER CONTOUR MAP  
FOR GRAVELLY SAND UNIT 11/2015**

**POWERTON STATION  
PEKIN, ILLINOIS**

**Scale: 1" = 350'**

**Date: February 11, 2016**

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**FIGURE 3**



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**CCR GROUNDWATER CONTOUR MAP  
FOR SILT/CLAY UNIT 2/2016**

**POWERTON STATION  
PEKIN, ILLINOIS**

**Scale: 1" = 350'**

**Date: April 19, 2016**

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**FIGURE 4**

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CCR GROUNDWATER CONTOUR MAP  
FOR GRAVELLY SAND UNIT 2/2016

POWERTON STATION  
PEKIN, ILLINOIS

Scale: 1" = 350'

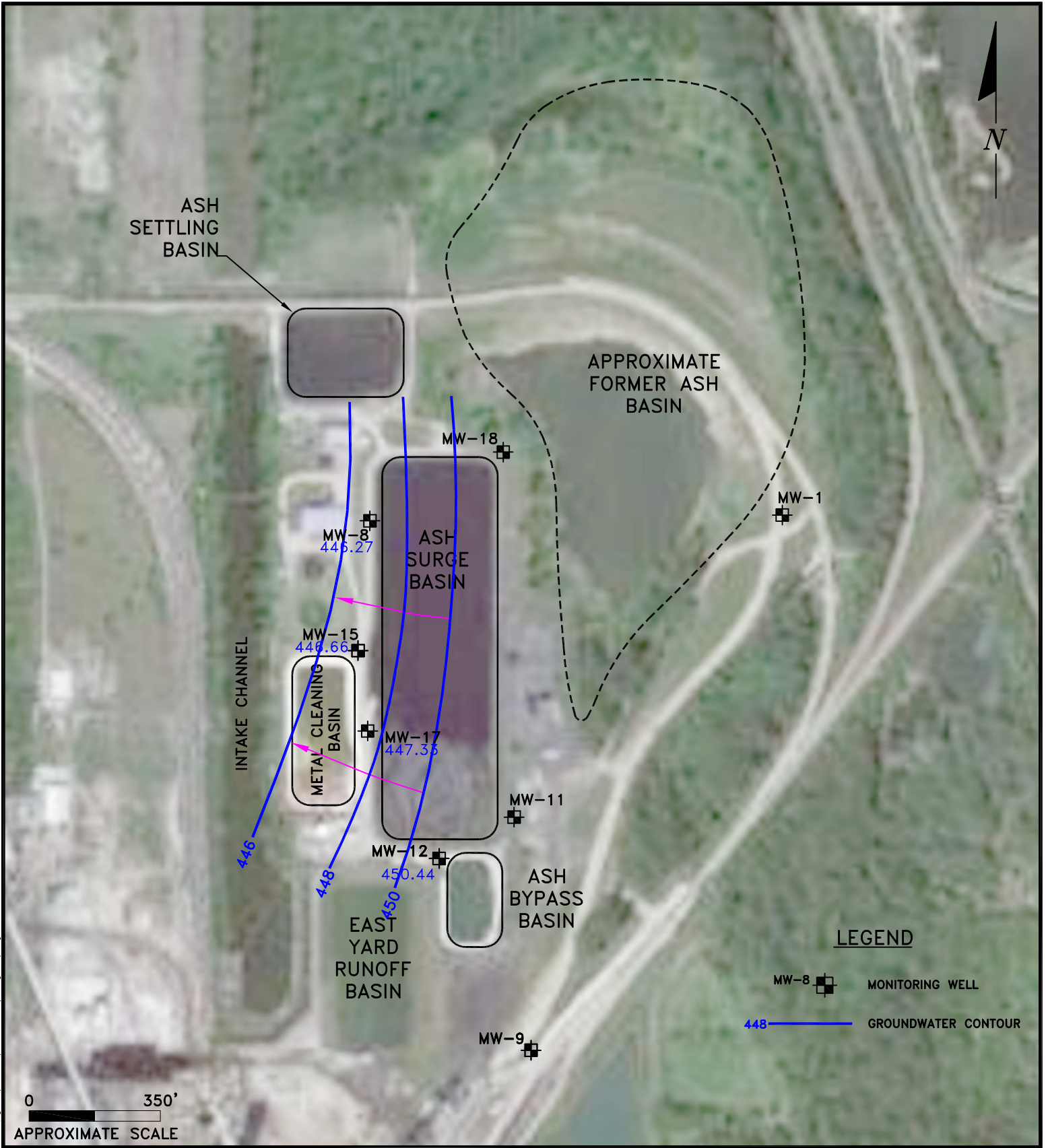
Date: April 19, 2016

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FIGURE 5

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**CCR GROUNDWATER CONTOUR MAP  
FOR SILT/CLAY UNIT 5/2016**

**POWERTON STATION  
PEKIN, ILLINOIS**

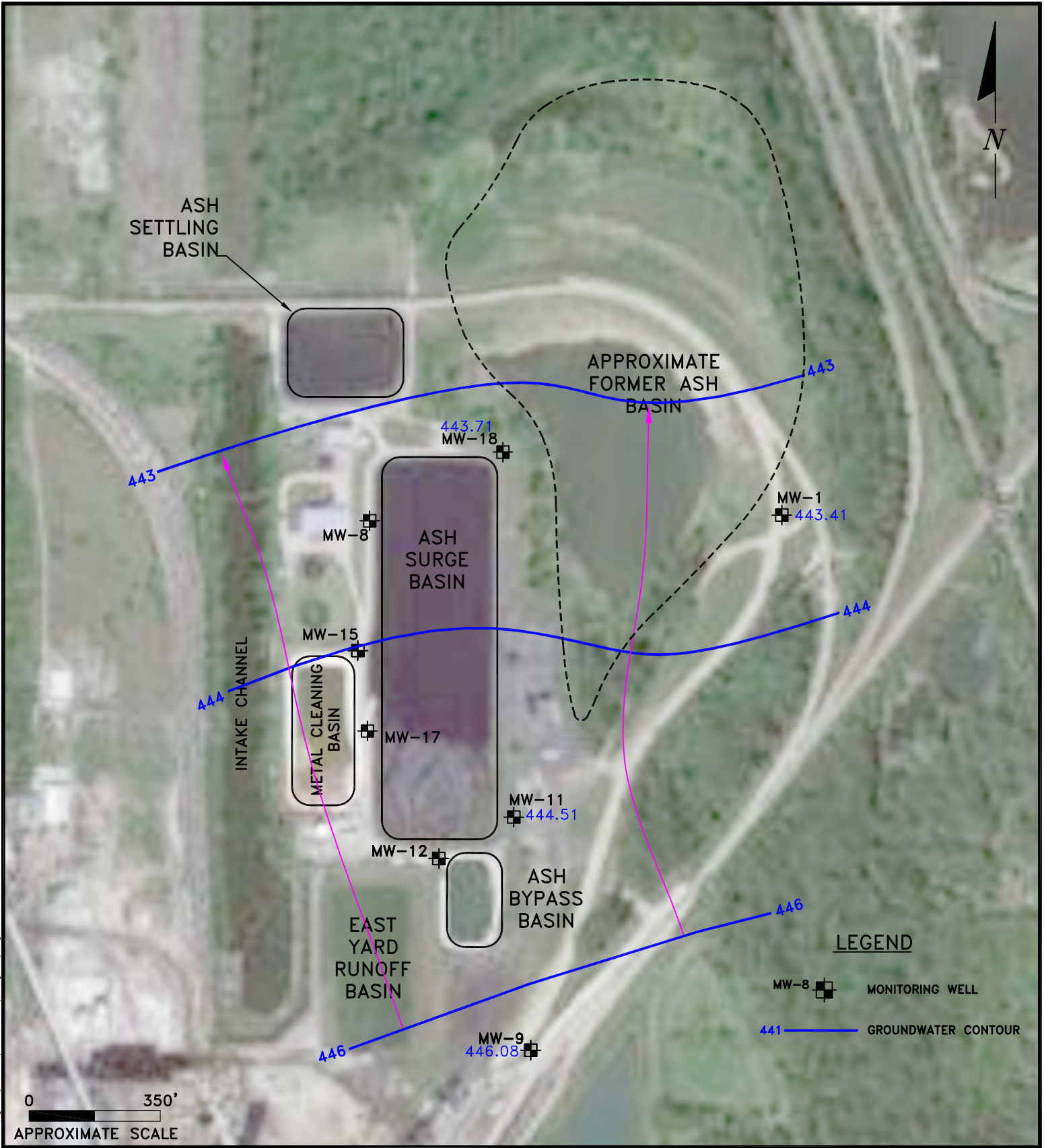
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**Date: July 12, 2016**

**KPRG Project No. 12313.1**

**FIGURE 6**

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**CCR GROUNDWATER CONTOUR MAP  
FOR GRAVELLY SAND UNIT 5/2016**

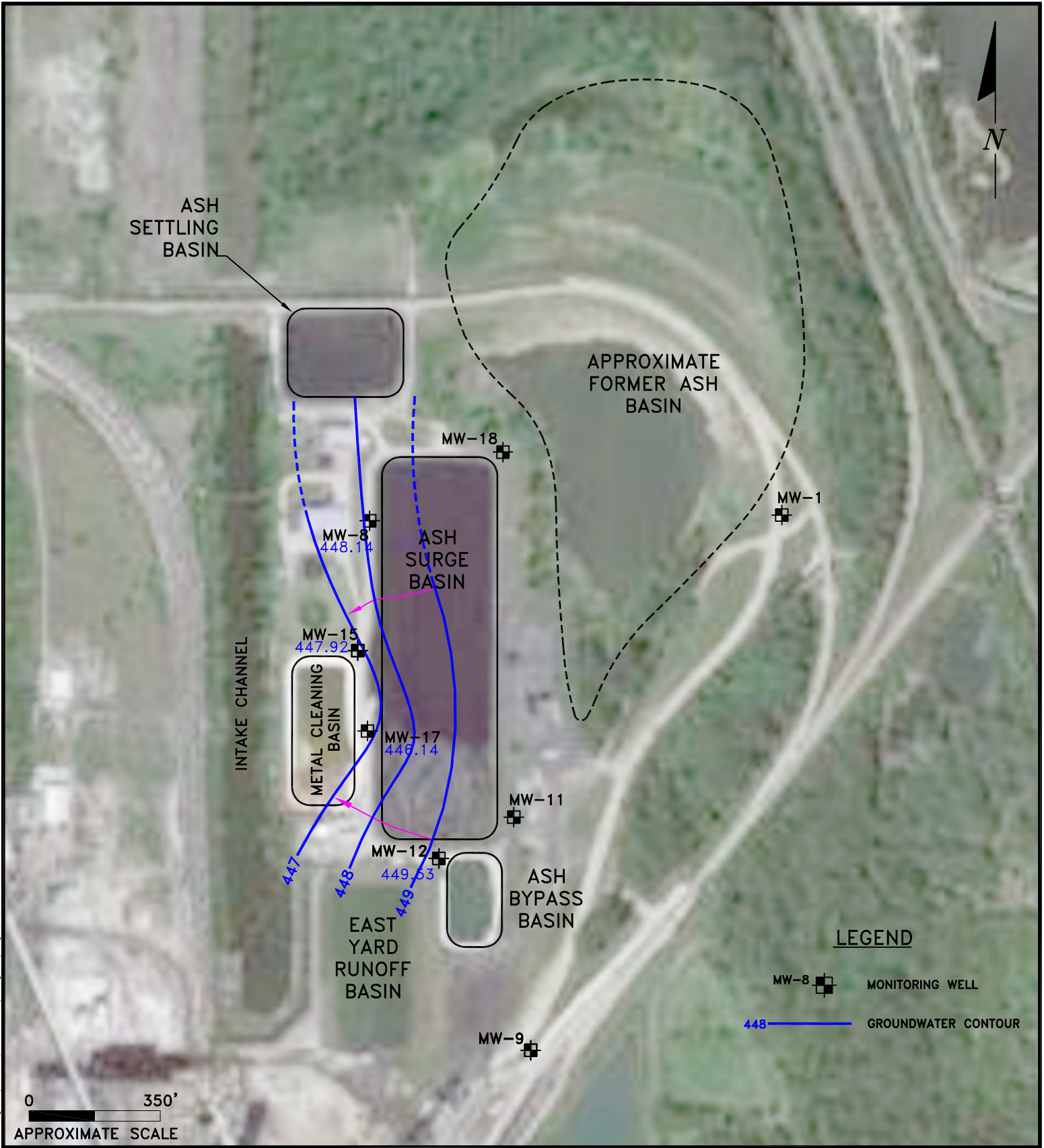
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PEKIN, ILLINOIS**

**Scale: 1" = 350'**

**Date: July 12, 2016**

**KPRG Project No. 12313.1**

**FIGURE 7**



**LEGEND**

- MW-8  MONITORING WELL
- 448  GROUNDWATER CONTOUR

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**CCR GROUNDWATER CONTOUR MAP  
FOR SILT/CLAY UNIT 08/2016**

**POWERTON STATION  
PEKIN, ILLINOIS**

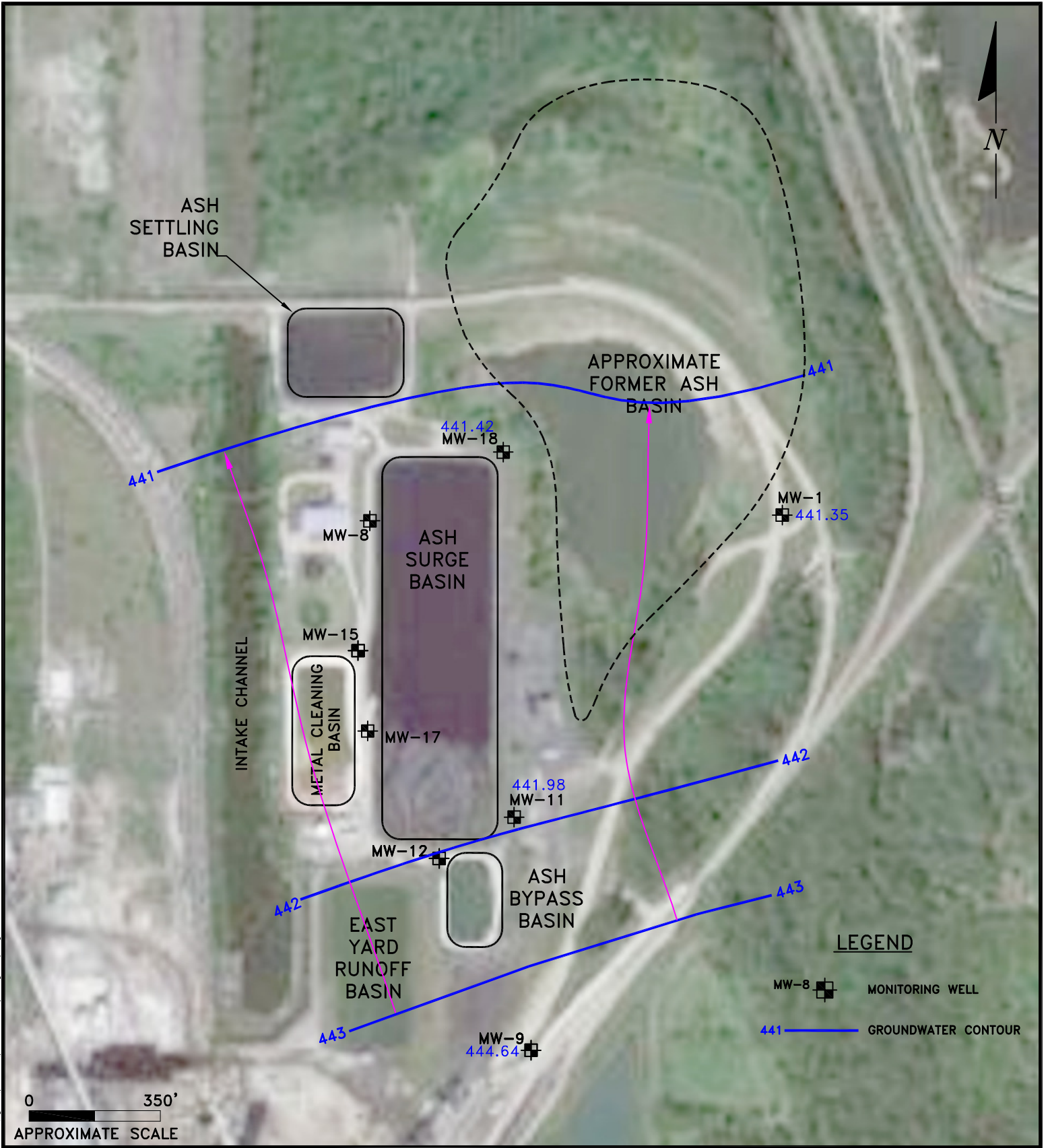
**Scale: 1" = 350'      Date: October 10, 2016**

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**KPRG Project No. 12313.1      FIGURE 8**

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**CCR GROUNDWATER CONTOUR MAP  
FOR GRAVELLY SAND UNIT 08/2016**

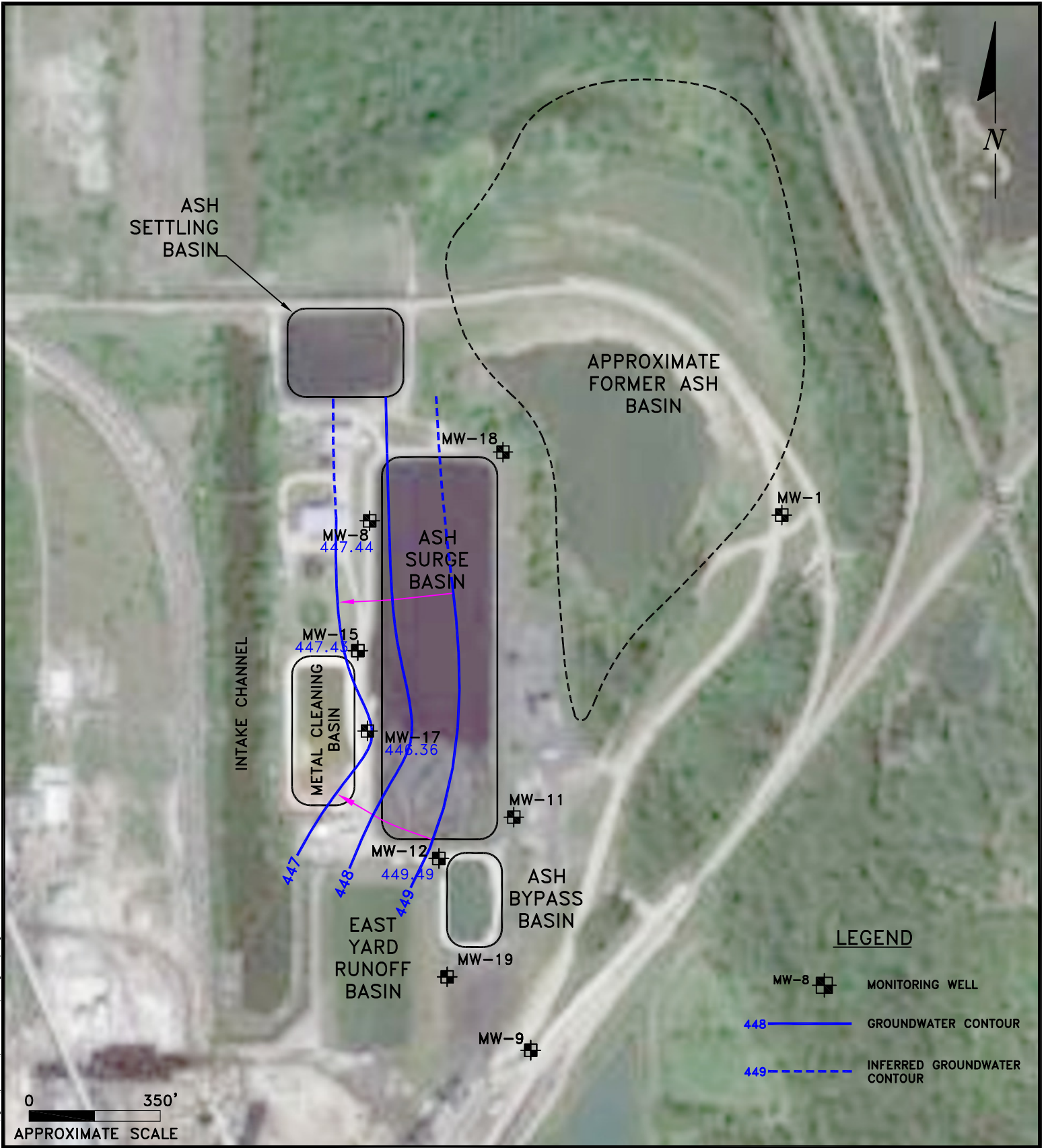
**POWERTON STATION  
PEKIN, ILLINOIS**

**Scale: 1" = 350'**

**Date: October 10, 2016**

**KPRG Project No. 12313.1**

**FIGURE 9**



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**CCR GROUNDWATER CONTOUR MAP  
FOR SILT/CLAY UNIT 11/2016**

**POWERTON STATION  
PEKIN, ILLINOIS**

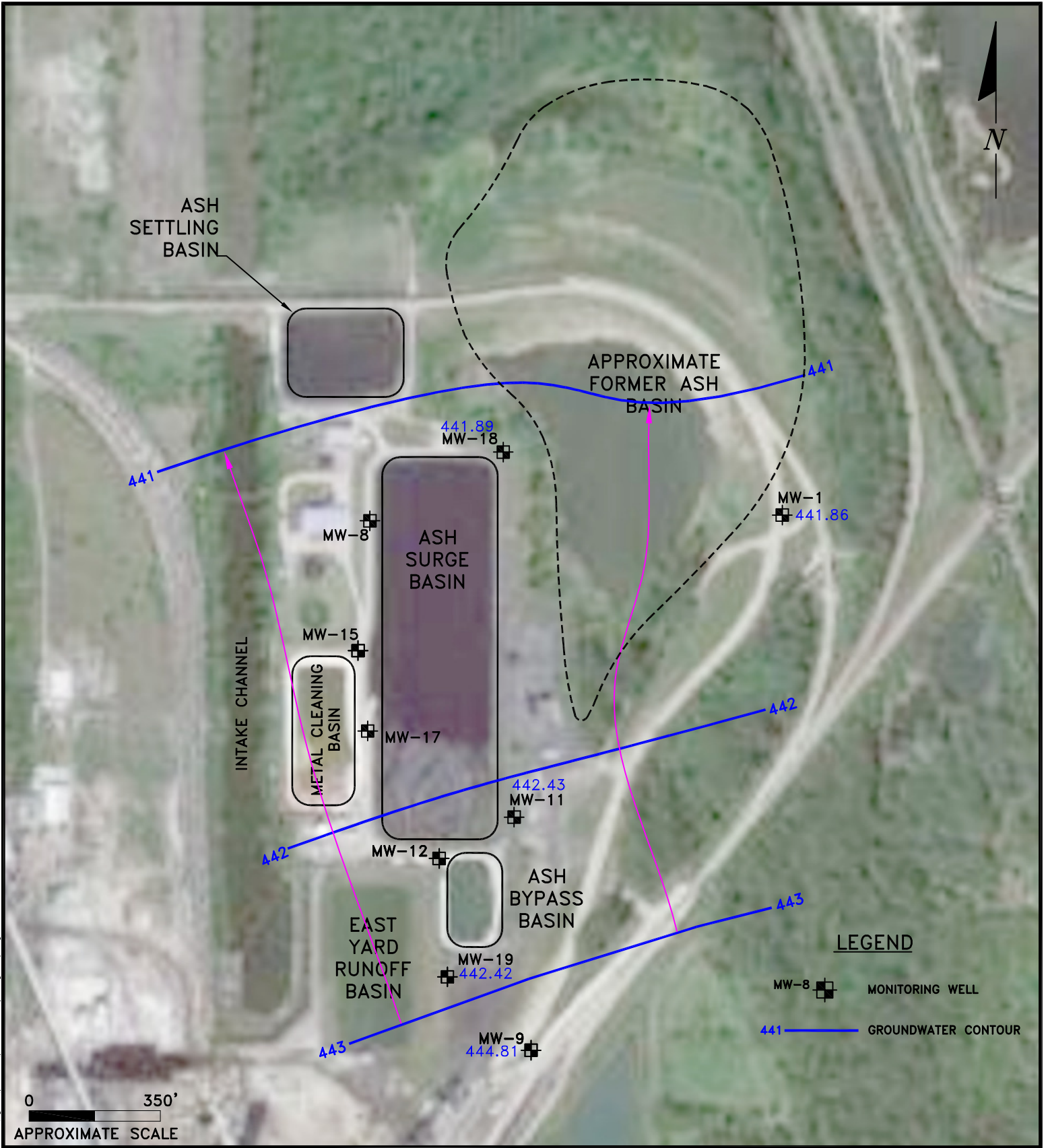
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**Date: January 3, 2017**

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**FIGURE 10**

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**CCR GROUNDWATER CONTOUR MAP  
FOR GRAVELLY SAND UNIT 11/2016**

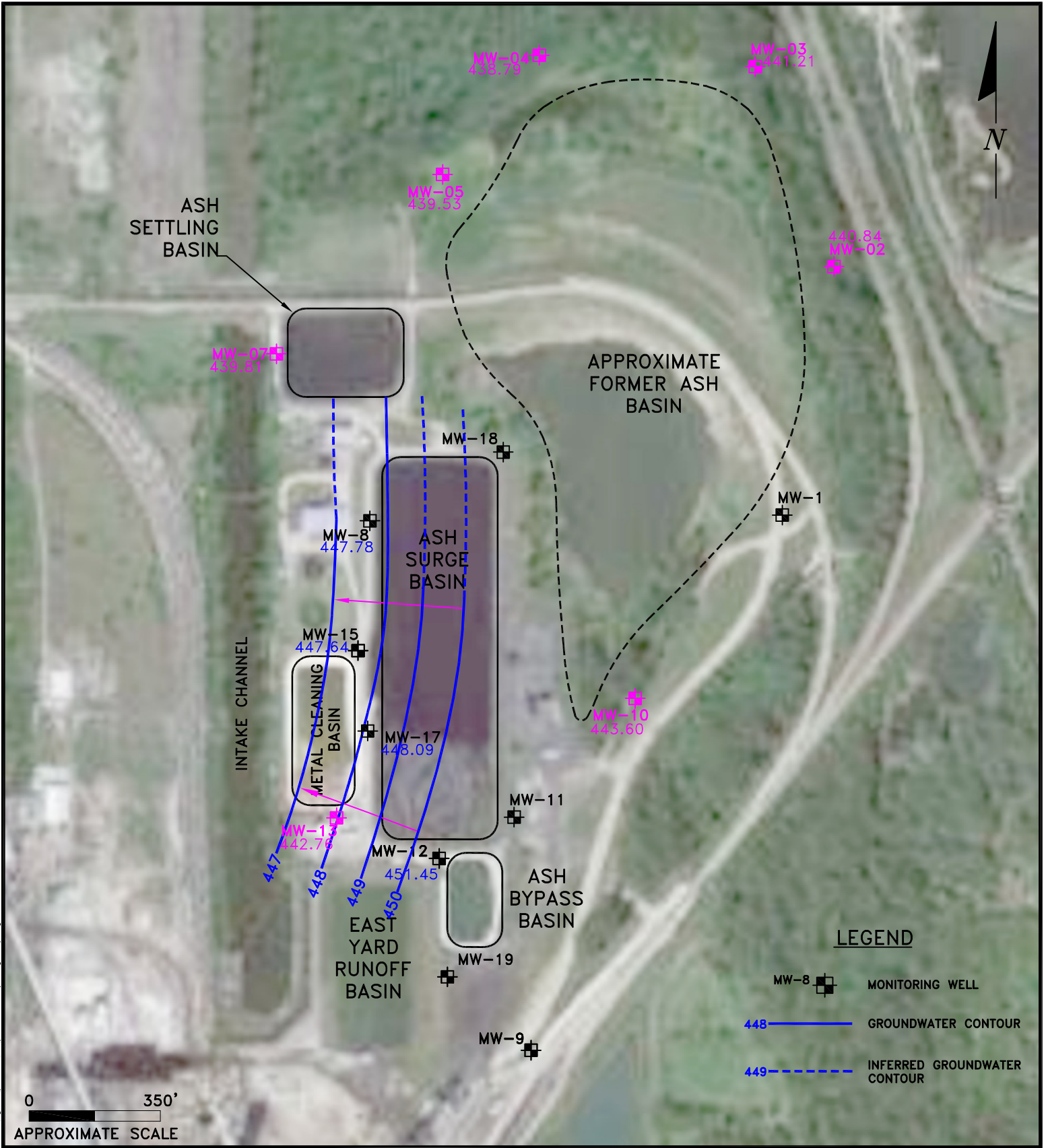
**POWERTON STATION  
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**Scale: 1" = 350'**

**Date: January 3, 2017**

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**FIGURE 11**



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**CCR GROUNDWATER CONTOUR MAP  
FOR SILT/CLAY UNIT 02/2017**

**POWERTON STATION  
PEKIN, ILLINOIS**

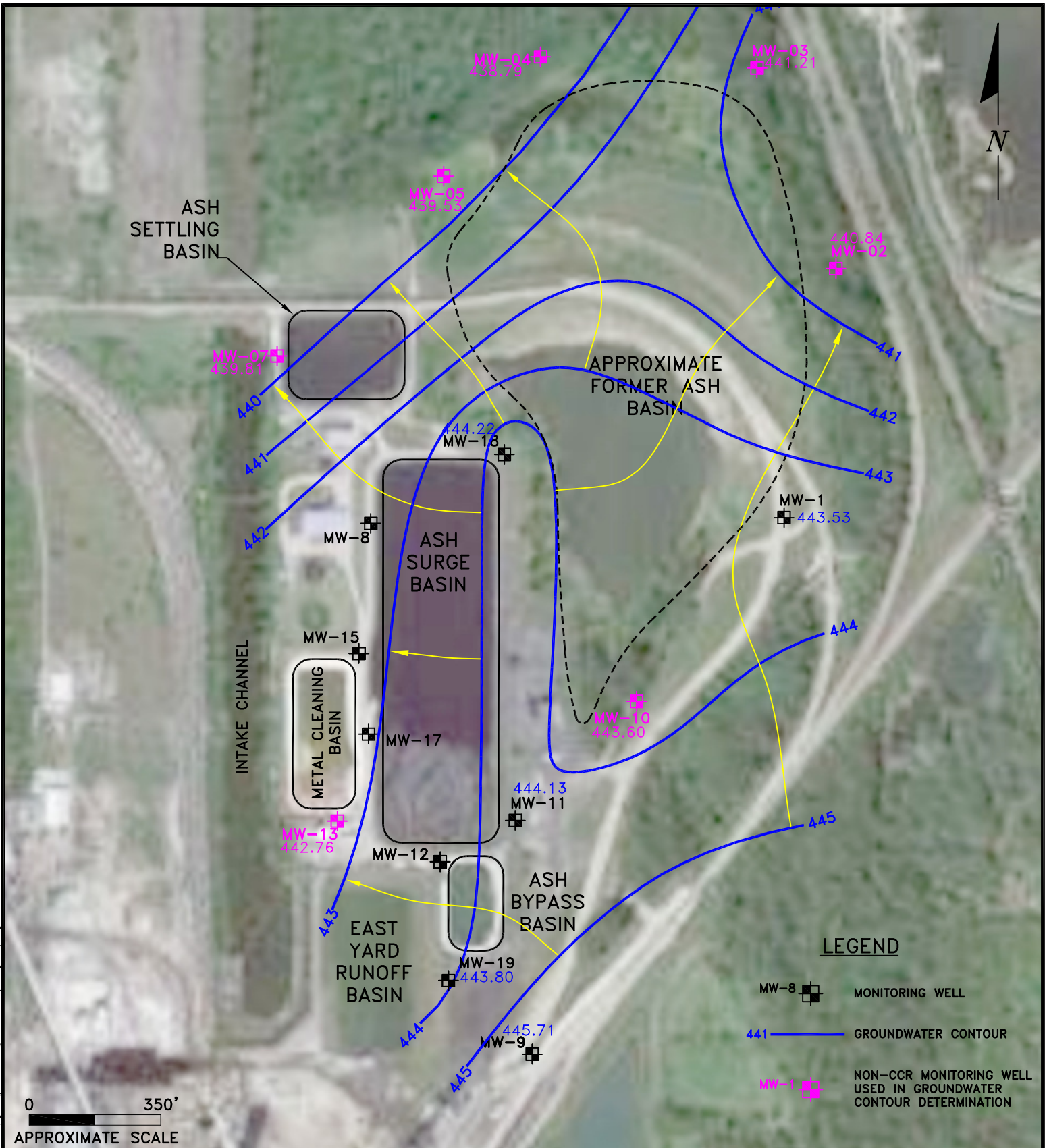
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**Date: April 5, 2017**

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**FIGURE 12**

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**CCR GROUNDWATER CONTOUR MAP  
FOR GRAVELLY SAND UNIT 02/2017**

**POWERTON STATION  
PEKIN, ILLINOIS**

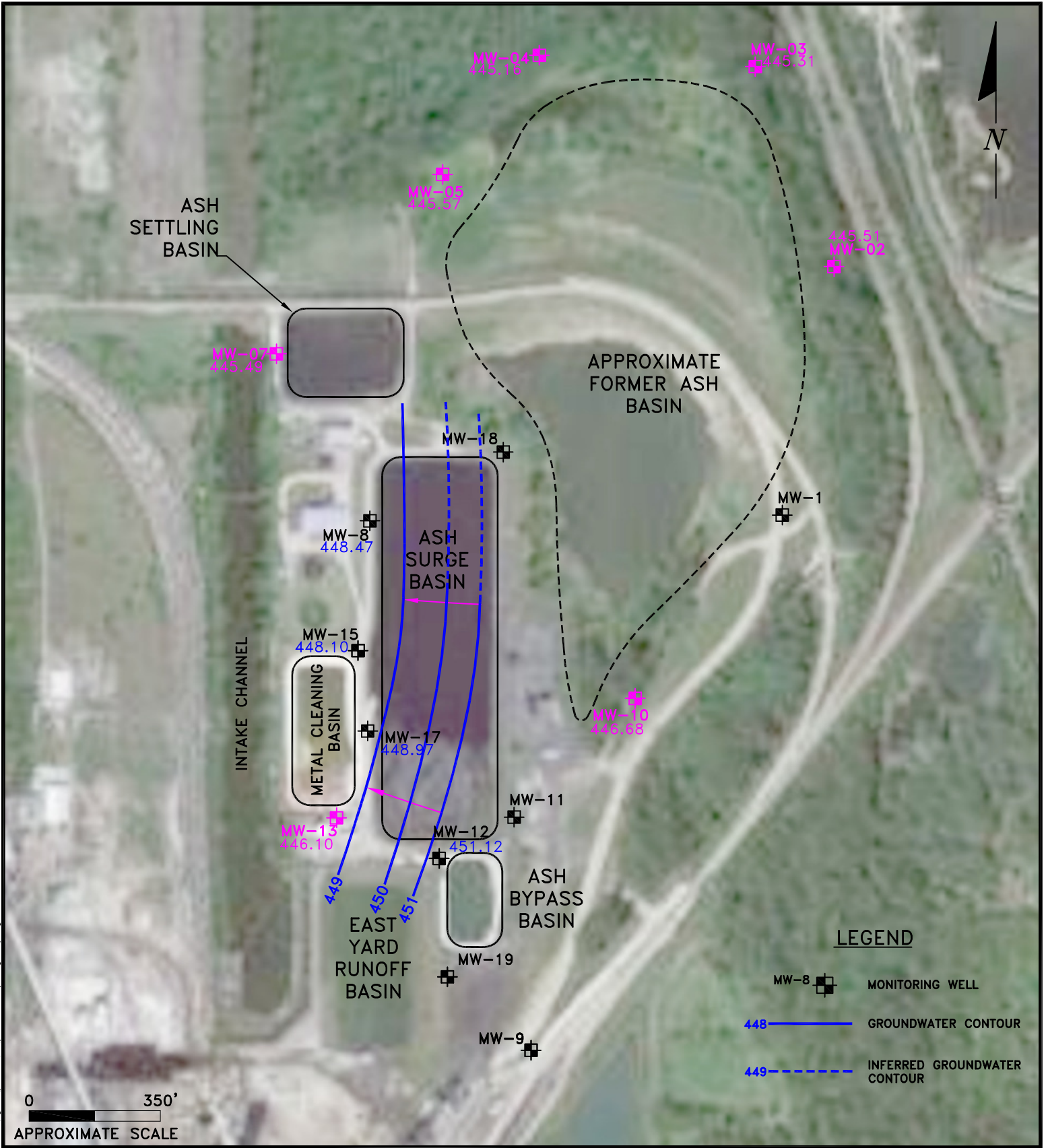
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**Date: April 5, 2017**

**KPRG Project No. 12313.1**

**FIGURE 13**





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**CCR GROUNDWATER CONTOUR MAP  
FOR SILT/CLAY UNIT 05/2017**

**POWERTON STATION  
PEKIN, ILLINOIS**

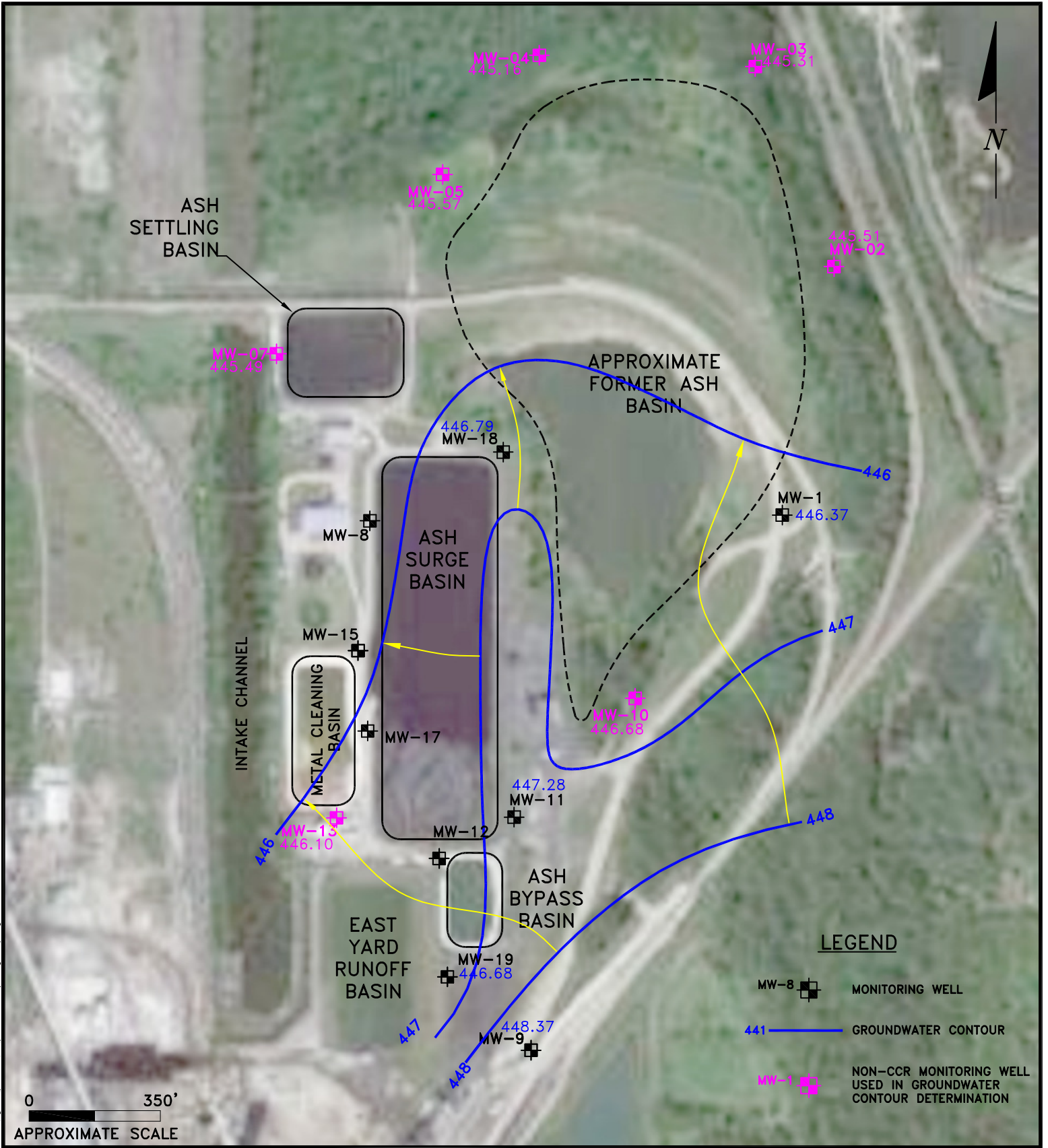
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**Date: June 22, 2017**

**KPRG Project No. 12313.1**

**FIGURE 14**

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**LEGEND**

- MW-8 MONITORING WELL
- 441 GROUNDWATER CONTOUR
- MW-1 NON-CCR MONITORING WELL USED IN GROUNDWATER CONTOUR DETERMINATION

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**CCR GROUNDWATER CONTOUR MAP FOR GRAVELLY SAND UNIT 05/2017**

**POWERTON STATION  
PEKIN, ILLINOIS**

Scale: 1" = 350'      Date: June 22, 2017

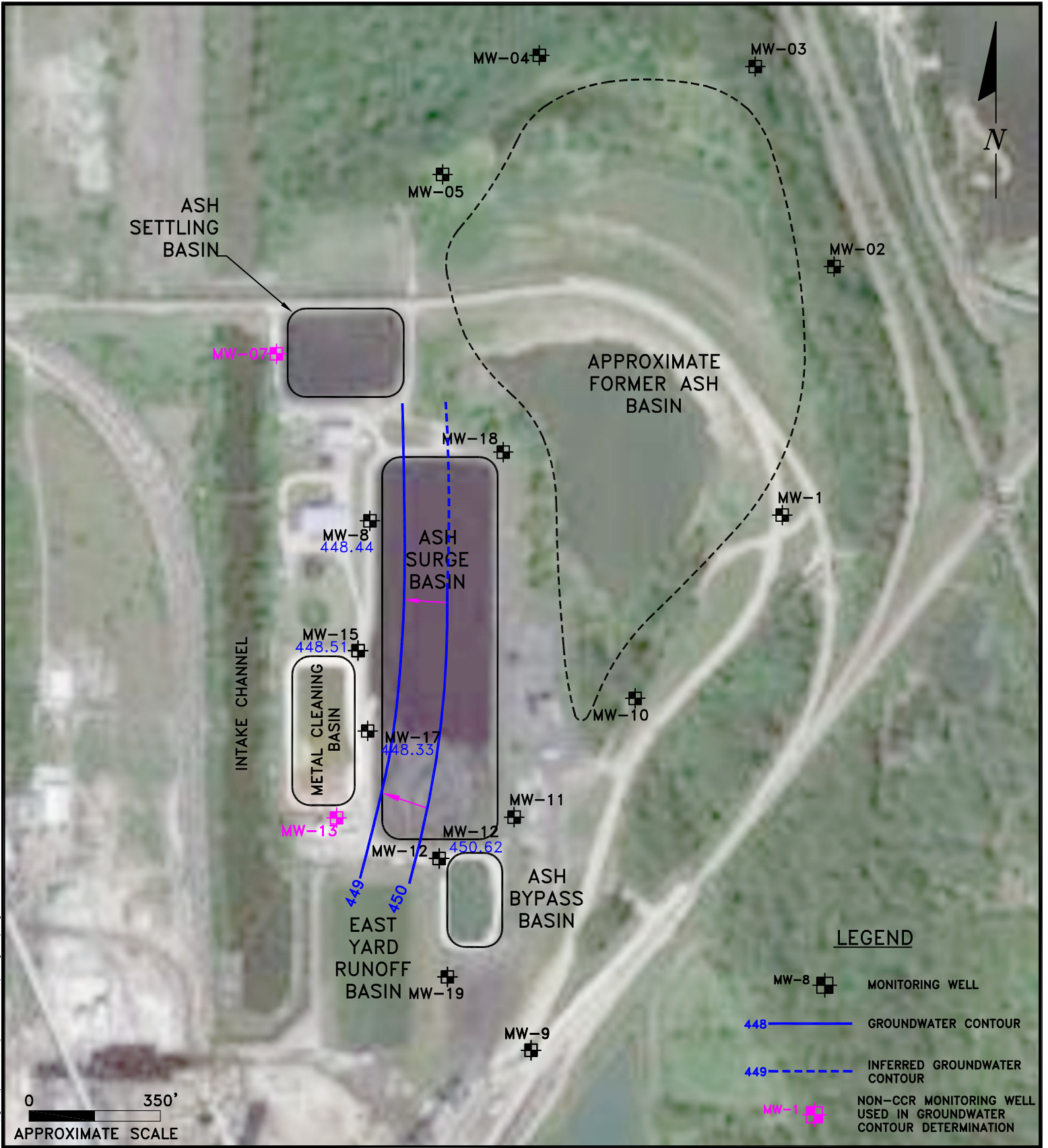
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KPRG Project No. 12313.1

FIGURE 15

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

**CCR GROUNDWATER CONTOUR MAP  
FOR SILT/CLAY UNIT 06/2017**

**POWERTON STATION  
PEKIN, ILLINOIS**

**Scale: 1" = 350'      Date: August 9, 2017**

**KPRG Project No. 12313.1**

**FIGURE 16**



**LEGEND**

- MW-8 MONITORING WELL
- 441 GROUNDWATER CONTOUR
- 440- DETAIL GROUNDWATER CONTOUR
- MW-1 NON-CCR MONITORING WELL USED IN GROUNDWATER CONTOUR DETERMINATION

0 350'  
APPROXIMATE SCALE

ENVIRONMENTAL CONSULTATION & REMEDIATION

**K P R G**

KPRG and Associates, Inc.

**CCR GROUNDWATER CONTOUR MAP FOR GRAVELLY SAND UNIT 06/2017**

**POWERTON STATION  
PEKIN, ILLINOIS**

Scale: 1" = 350' Date: August 9, 2017

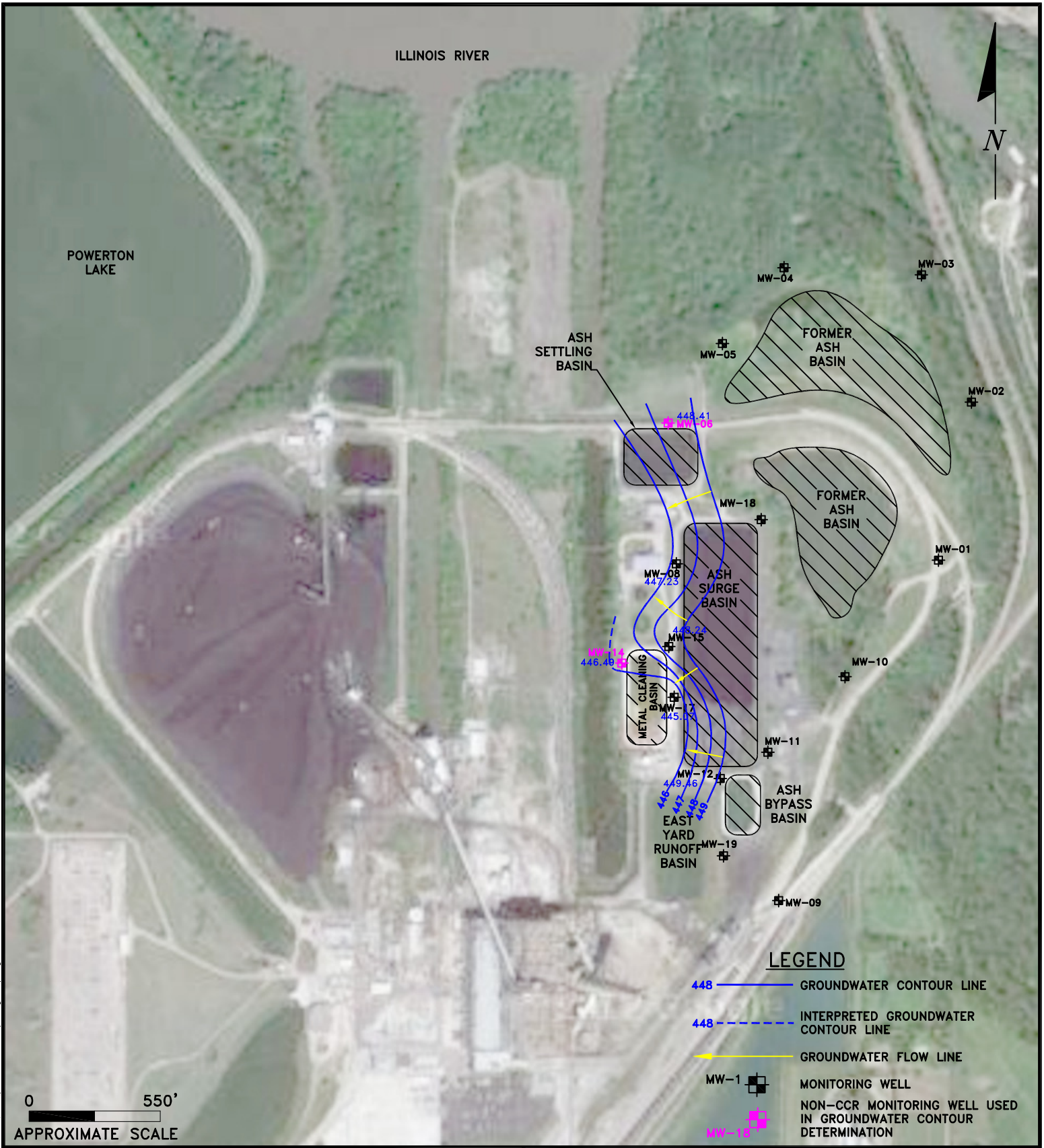
KPRG Project No. 12313.1

FIGURE 17

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

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

## CCR GROUNDWATER CONTOUR MAP FOR SILT/CLAY UNIT 08/2017

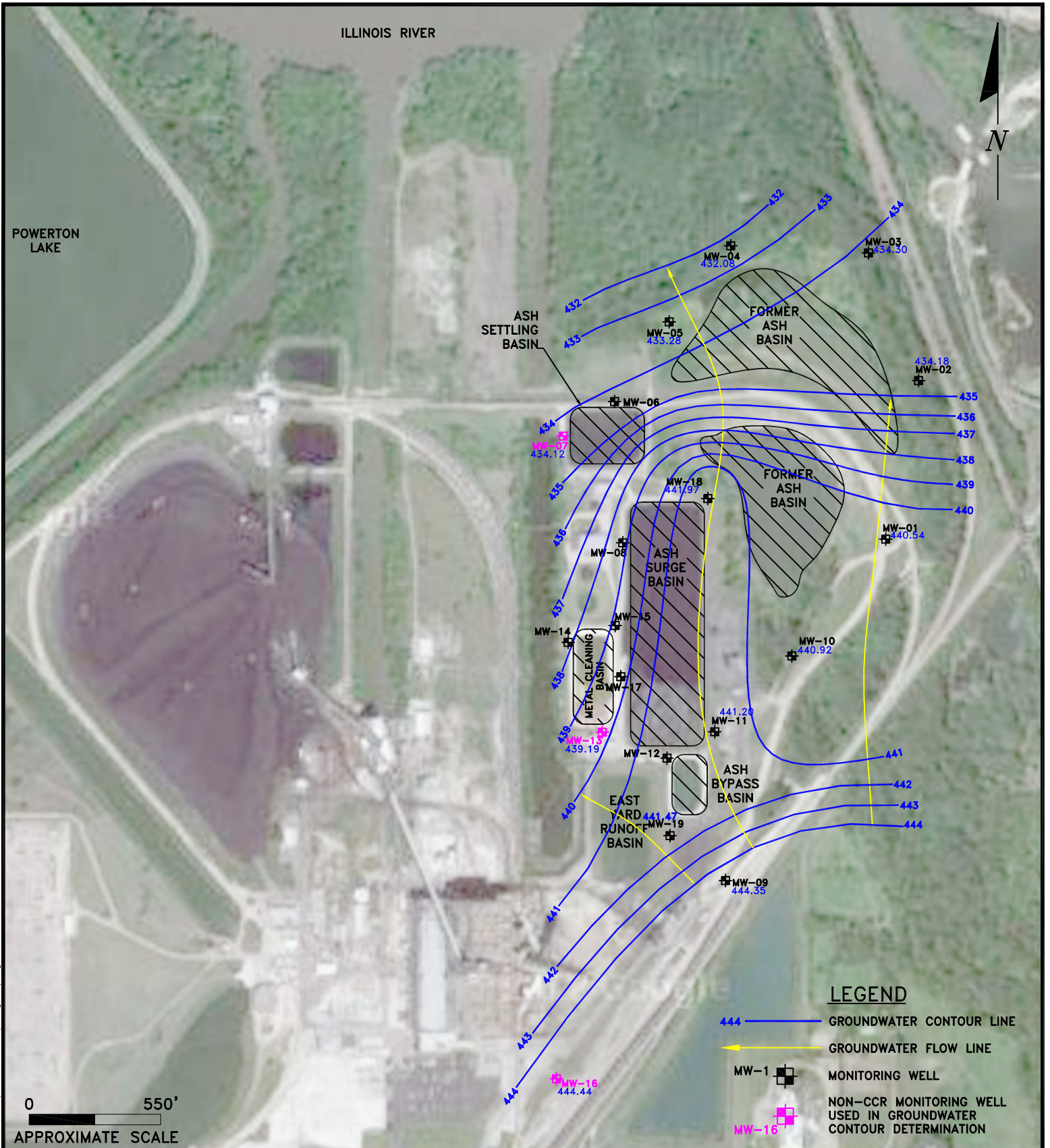
POWERTON STATION  
PEKIN, ILLINOIS

Scale: 1" = 550'      Date: October 18, 2017

KPRG Project No. 12313.1

FIGURE 18

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**LEGEND**

- 444 — GROUNDWATER CONTOUR LINE
- ← GROUNDWATER FLOW LINE
- MW-1 — MONITORING WELL
- MW-16 — NON-CCR MONITORING WELL USED IN GROUNDWATER CONTOUR DETERMINATION

ENVIRONMENTAL CONSULTATION & REMEDIATION

**K P R G**

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

**CCR GROUNDWATER CONTOUR MAP FOR GRAVELLY SAND UNIT 08/2017**

**POWERTON STATION  
PEKIN, ILLINOIS**

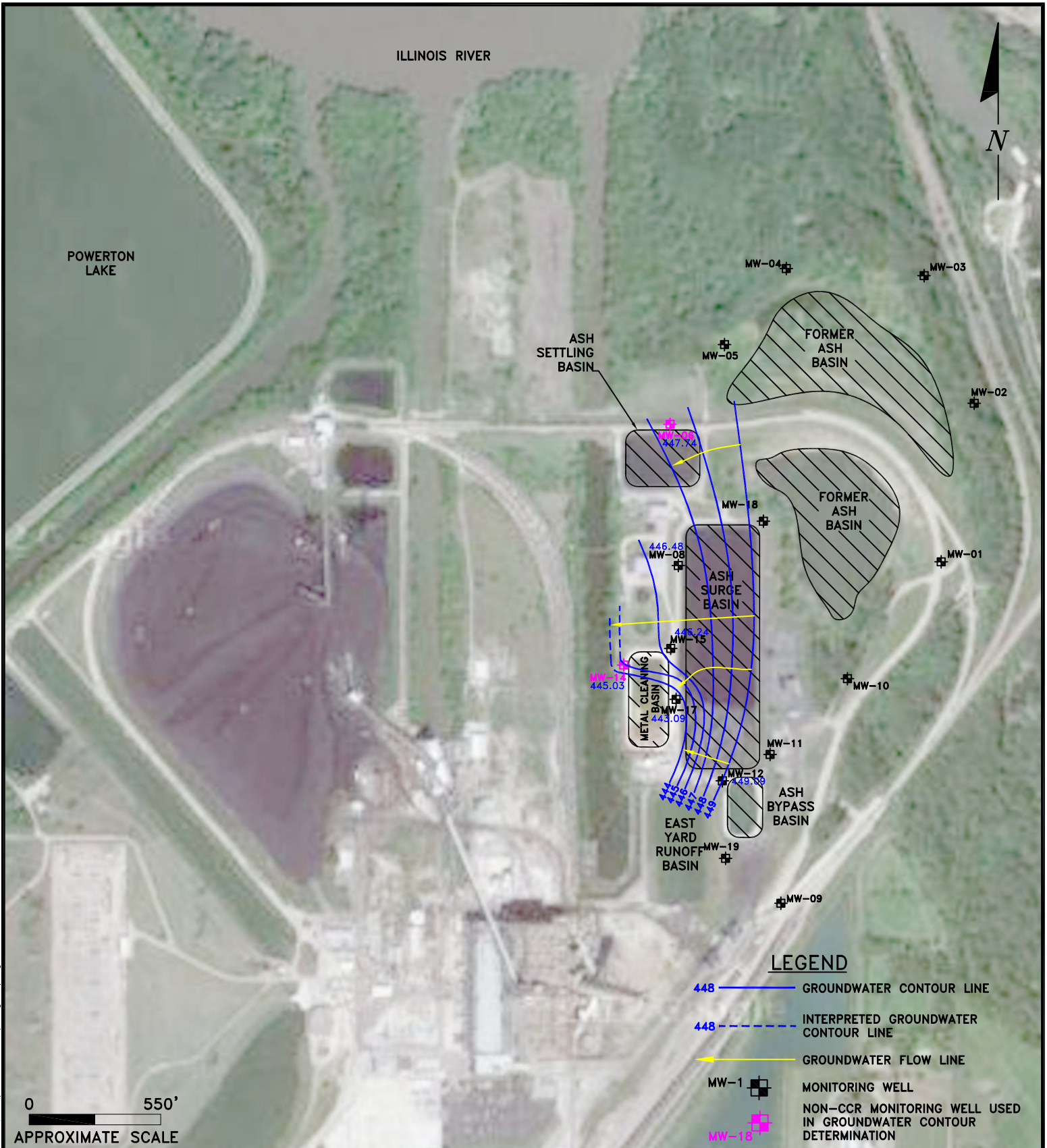
**Scale: 1" = 550'**

**Date: October 18, 2017**

**KPRG Project No. 12313.1**

**FIGURE 19**

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## CCR GROUNDWATER CONTOUR MAP FOR SILT/CLAY UNIT 11/2017

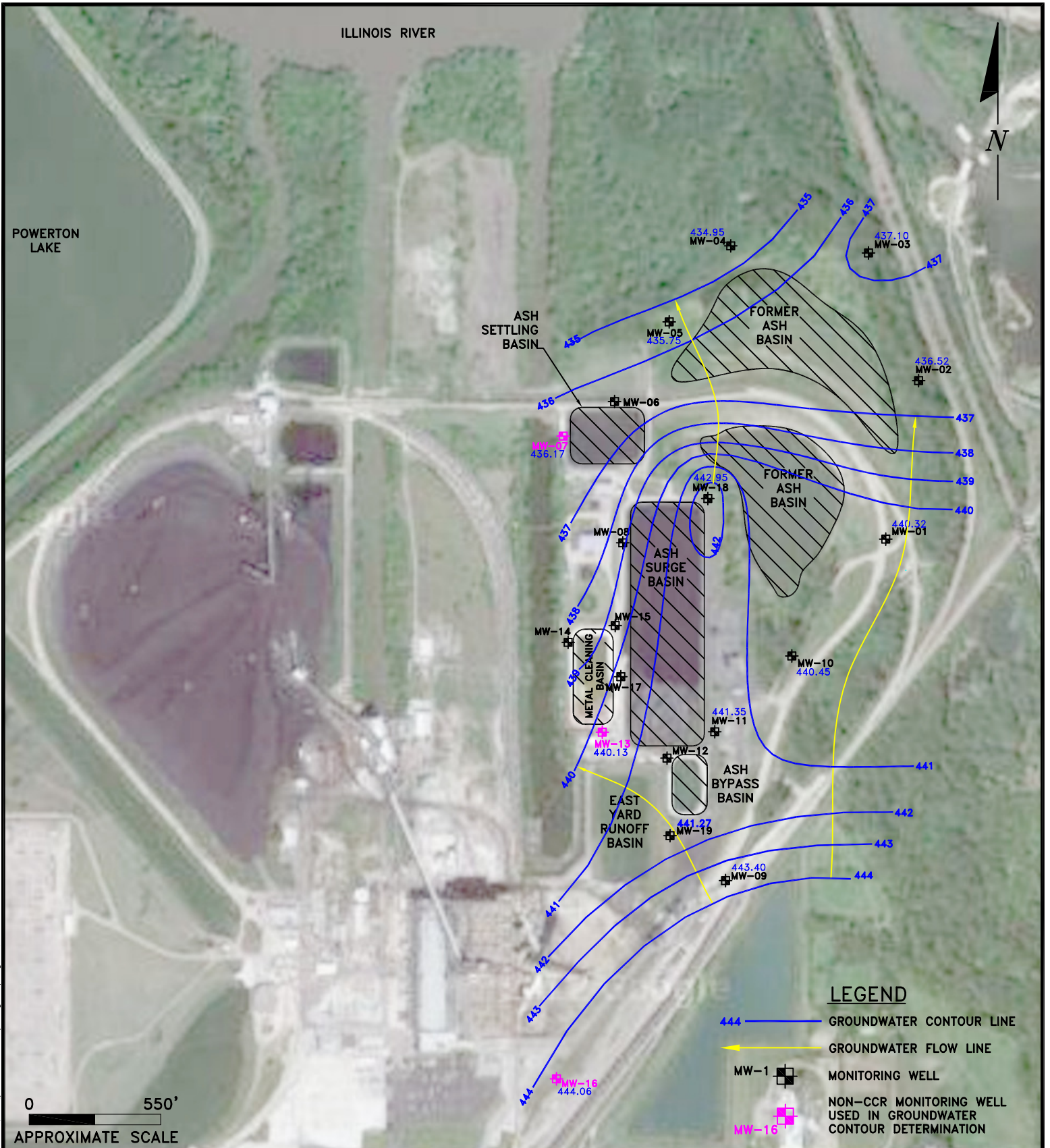
POWERTON STATION  
PEKIN, ILLINOIS

Scale: 1" = 550'      Date: December 18, 2017

KPRG Project No. 12313.1

FIGURE 20

T:\projects\midwest\generation\12313\_figures\powerton\2017\powerton\_station\_kq2017\_gw\_map.dwg\stb



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**CCR GROUNDWATER CONTOUR MAP FOR GRAVELLY SAND UNIT 11/2017**

**POWERTON STATION  
PEKIN, ILLINOIS**

Scale: 1" = 550'

Date: December 18, 2017

KPRG Project No. 12313.1

FIGURE 21

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## **TABLES**

Table 1. Groundwater Elevations - Midwest Generation, LLC, Powerton Station, Pekin, IL

Well ID	Date	Top of Casing Elevation (ft above MSL)	Depth to Groundwater (ft below TOC)	Groundwater Elevation (ft above MSL)
MW-01	11/16/2015	465.24	26.04	439.20
	2/22/2016	465.24	21.90	443.34
	5/16/2016	465.24	21.83	443.41
	8/15/2016	465.24	23.89	441.35
	11/14/2016	465.24	23.38	441.86
	2/13/2017	465.24	21.71	443.53
	5/1/2017	465.24	18.87	446.37
	6/20/2017	465.24	21.54	443.70
	8/25/2017	465.24	24.70	440.54
11/8/2017	465.24	24.92	440.32	
MW-02	6/20/2017	462.60	22.04	440.56
	8/23/2017	462.60	28.42	434.18
	11/7/2017	462.60	26.08	436.52
MW-03	6/20/2017	462.48	22.31	440.17
	8/23/2017	462.48	28.18	434.30
	11/7/2017	462.48	25.38	437.10
MW-04	6/20/2017	460.57	22.15	438.42
	8/28/2017	460.57	28.49	432.08
	11/7/2017	460.57	25.62	434.95
MW-05	11/16/2015	458.58	26.39	432.19
	2/22/2016	458.58	21.12	437.46
	5/16/2016	458.58	16.58	442.00
	8/15/2016	458.58	23.59	434.99
	11/14/2016	458.58	22.72	435.86
	2/13/2017	458.58	19.13	439.45
	5/1/2017	458.58	13.09	445.49
	6/20/2017	458.58	19.43	439.15
	8/28/2017	458.58	25.38	433.20
11/7/2017	458.58	22.91	435.67	
MW-08	11/16/2015	471.75	26.06	445.69
	2/22/2016	471.75	23.99	447.76
	5/16/2016	471.75	25.48	446.27
	8/15/2016	471.75	23.61	448.14
	11/14/2016	471.75	24.31	447.44
	2/13/2017	471.75	23.97	447.78
	5/1/2017	471.75	23.28	448.47
	6/20/2017	471.75	23.31	448.44
	8/29/2017	471.75	24.52	447.23
11/8/2017	471.75	25.27	446.48	
MW-09	11/16/2015	469.14	26.07	443.07
	2/22/2016	469.14	22.83	446.31
	5/16/2016	469.14	23.06	446.08
	8/15/2016	469.14	24.50	444.64
	11/14/2016	469.14	24.33	444.81
	2/13/2017	469.14	23.43	445.71
	5/1/2017	469.14	20.77	448.37
	6/20/2017	469.14	22.15	446.99
	8/25/2017	469.14	24.79	444.35
11/8/2017	469.14	25.74	443.40	
MW-10	6/22/2017	457.31	13.46	443.85
	8/24/2017	457.31	16.39	440.92
	11/9/2017	457.31	16.86	440.45
MW-11	11/16/2015	471.62	31.67	439.95
	2/22/2016	471.62	28.34	443.28
	5/16/2016	471.62	27.11	444.51
	8/15/2016	471.62	29.64	441.98
	11/14/2016	471.62	29.19	442.43
	2/13/2017	471.62	27.49	444.13
	5/1/2017	471.62	24.34	447.28
	6/20/2017	471.62	26.94	444.68
	8/29/2017	471.62	30.42	441.20
11/9/2017	471.62	30.27	441.35	

Table 1. Groundwater Elevations - Midwest Generation, LLC, Powerton Station, Pekin, IL

Well ID	Date	Top of Casing Elevation (ft above MSL)	Depth to Groundwater (ft below TOC)	Groundwater Elevation (ft above MSL)
MW-12	11/16/2015	473.38	24.48	448.90
	2/22/2016	473.38	21.41	451.97
	5/16/2016	473.38	22.94	450.44
	8/15/2016	473.38	23.85	449.53
	11/14/2016	473.38	23.89	449.49
	2/13/2017	473.38	21.93	451.45
	5/1/2017	473.38	22.26	451.12
	6/20/2017	473.38	22.76	450.62
	8/26/2017	473.38	23.92	449.46
11/10/2017	473.38	24.29	449.09	
MW-15	11/16/2015	471.37	25.33	446.04
	2/22/2016	471.37	22.91	448.46
	5/16/2016	471.37	24.71	446.66
	8/15/2016	471.37	23.45	447.92
	11/14/2016	471.37	23.94	447.43
	2/13/2017	471.37	23.73	447.64
	5/1/2017	471.37	23.27	448.10
	6/20/2017	471.37	22.86	448.51
	8/29/2017	471.37	23.13	448.24
11/10/2017	471.37	25.13	446.24	
MW-17	11/16/2015	467.75	26.92	440.83
	2/22/2016	467.75	19.86	447.89
	5/16/2016	467.75	20.42	447.33
	8/15/2016	467.75	21.61	446.14
	11/14/2016	467.75	21.39	446.36
	2/13/2017	467.75	19.66	448.09
	5/1/2017	467.75	18.78	448.97
	6/20/2017	467.75	19.42	448.33
	8/29/2017	467.75	22.68	445.07
11/6/2017	467.75	24.66	443.09	
MW-18	11/16/2015	469.28	28.42	440.86
	2/22/2016	469.28	27.96	441.32
	5/16/2016	469.28	25.57	443.71
	8/15/2016	469.28	27.86	441.42
	11/14/2016	469.28	27.39	441.89
	2/13/2017	469.28	25.06	444.22
	5/1/2017	469.28	22.49	446.79
	6/20/2017	469.28	24.97	444.31
	8/28/2017	469.28	27.30	441.98
11/6/2017	469.28	26.33	442.95	
MW-19	11/14/2016	465.07	22.65	442.42
	2/13/2017	465.07	21.27	443.80
	5/1/2017	465.07	18.39	446.68
	6/20/2017	465.07	20.44	444.63
	8/28/2017	465.07	23.60	441.47
	11/9/2017	465.07	23.80	441.27

MSL - Mean Sea Level  
TOC - Top of Casing

Table 2. Groundwater Flow Direction and Estimated Seepage Velocity/Flow Rate - Powerton Generation Station.

DATE	Screened Unit	Groundwater Flow Direction	Kavg (ft/sec)*	Average Hydraulic Gradient (ft/ft)	Porosity (unitless)**	Estimated Seepage Velocity (ft/day)
11/16/2015	Silt/clay	Westerly	3.280E-07	0.0093	0.4	0.001
11/16/2015	Sandy	North-Northwest	3.810E-03	0.0026	0.35	2.40
2/22/2016	Silt/clay	Westerly	3.280E-07	0.0098	0.4	0.001
2/22/2016	Sandy	North-Northwest	3.810E-03	0.0030	0.35	2.82
5/16/2016	Silt/clay	Westerly	3.280E-07	0.0124	0.4	0.001
5/16/2016	Sandy	North-Northwest	3.810E-03	0.0021	0.35	1.98
8/15/2016	Silt/clay	Westerly	3.280E-07	0.0093	0.4	0.001
8/15/2016	Sandy	North-Northwest	3.810E-03	0.0014	0.35	1.32
11/14/2016	Silt/clay	Westerly	3.280E-07	0.0083	0.4	0.001
11/14/2016	Sandy	North-Northwest	3.810E-03	0.0014	0.35	1.32
2/13/2017	Silt/clay	Westerly	3.280E-07	0.0091	0.4	0.001
2/13/2017	Sandy	Northeasterly - Northwesterly	3.810E-03	0.0049	0.35	4.609
5/1/2017	Silt/clay	Westerly	3.280E-07	0.0100	0.4	0.001
5/1/2017	Sandy	Northeasterly - Northwesterly	3.810E-03	0.0021	0.35	1.98
6/20/2017	Silt/clay	Westerly	3.280E-07	0.0088	0.4	0.001
6/20/2017	Sandy	Northeasterly - Northwesterly	3.810E-03	0.0057	0.35	5.36
8/25/2017	Silt/clay	Westerly	3.280E-07	0.0214	0.4	0.002
8/25/2017	Sandy	North-Northwest	3.810E-03	0.0174	0.35	16.37
11/8/2017	Silt/clay	Westerly	3.280E-07	0.0267	0.4	0.002
11/8/2017	Sandy	North-Northwest	3.810E-03	0.0157	0.35	14.77

\* Kavg - Average hydraulic conductivity for sandy unit (feet/second) from Hydrogeologic Assessment Report, Patrick Engineering, February 2011.  
Average hydraulic conductivity for silt/clay unit (feet/second) from Groundwater, Freeze and Cherry, 1979.

\*\* - Porosity estimates from Applied Hydrogeology, Fetter, 1980.

Table 3. Detection Monitoring Appendix III Groundwater Analytical Results through 2017 - Ash By-pass Basin and Ash Surge Basin - Midwest Generation, LLC, Powerton Station, Pekin, IL.

Well	Date	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
MW-01 (S) up-gradient	11/16/2015	1.0	98	44	0.17	7.07	93	530
	2/25/2016	0.2	110	42	0.16	7.23	54	460
	5/20/2016	0.34	100	44	0.17	6.95	65	430
	8/17/2016	0.27	78	39	0.25	7.16	50	530
	11/16/2016	0.18	97	39	0.21	7.22	32	500
	2/14/2017	0.18	120	55	0.17	7.30	60	550
	5/3/2017	0.19	86	66	0.16	7.41	45	460
	6/21/2017	0.18	85	58	0.18	7.60	47	540
	8/25/2017	0.56	86	41	0.18	7.41	63	490
	11/8/2017	0.57	130	38	0.12	6.69	61	640
MW-09 (S) up-gradient	11/18/2015	2.0	63	H 31	H 0.19	7.15	H 110	H 440
	2/25/2016	2.3	77	36	0.19	7.34	120	500
	5/19/2016	2.0	73	38	0.17	7.30	100	520
	8/17/2016	2.7	74	39	0.15	7.32	120	750
	11/17/2016	4.5	85	38	0.13	7.37	110	630
	2/15/2017	4.1	84	38	0.13	6.94	160	620
	5/3/2017	3.5	85	38	0.17	7.48	170	680
	6/21/2017	3.3	82	38	0.14	7.63	180	760
	8/25/2017	3.8	85	36	0.14	7.3	150	630
	11/8/2017	4	89	37	0.13	6.92	190	650
MW-19 (S) up-gradient	11/18/2016	3.8	89	38	0.13	7.34	120	670
	2/15/2017	4.7	88	37	0.13	7.50	180	630
	5/5/2017	3.3	88	38	0.14	7.51	160	640
	6/21/2017	2.3	110	35	0.12	7.30	170	690
	8/28/2017	3.5	97	36	0.16	7.20	160	700
	11/6/2017	4.5	86	35	0.17	7.26	190	640
MW-08 (CL) down-gradient	11/18/2015	1.5	160	H 170	H 0.44	7.61	H 470	H 1300
	2/25/2016	1.7	160	200	0.30	7.00	280	1100
	5/18/2016	1.7	160	140	0.34	7.67	300	1200
	8/17/2016	1.0	150	230	0.35	7.33	360	1400
	11/15/2016	1.2	140	290	0.33	6.90	230	1300
	2/16/2017	1.5	150	460	0.28	7.00	230	1500
	5/2/2017	0.55	140	300	0.33	7.30	320	1300
	6/21/2017	1.2	160	490	0.3	7.27	350	1700
	8/29/2017	1.2	150	360	0.47	7.29	300	1500
	11/8/2017	0.68	130	260	0.45	7.27	270	1200

Notes:

All units are in mg/l except pH is in standard units.

*Italics Dates* - Data that will be compared against established statistical background.

S - Sandy Unit  
CL - Silty Clay Unit

F1 - MS and/or MSD Recovery outside of limits.

H - Sample was prepped or analyzed beyond the specified holding time.

Table 3. Detection Monitoring Appendix III Groundwater Analytical Results through 2017 - Ash By-pass Basin and Ash Surge Basin - Midwest Generation, LLC, Powerton Station, Pekin, IL.

Well	Date	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
MW-11 (S) down-gradient	11/18/2015	1.7	110	H 54	H 0.55	7.06	H 160	H 670
	2/26/2016	1.5	140	120	0.55	7.25	220	850
	5/20/2016	1.6	140	120	0.56	7.10	210	920
	8/17/2016	1.0	130	93	0.67	7.08	180	910
	11/17/2016	1.2	140	130	0.44	7.21	240	1100
	2/16/2017	1.6	140	110	0.40	6.62	260	910
	5/3/2017	1.3	160	160	0.42	7.36	440	1300
	6/22/2017	1.2	140	120	0.60	7.21	260	1000
	8/29/2017	2.2	130	83	0.52	7.23	310	1100
	11/9/2017	1.5	140	100	0.59	6.96	230	970
MW-12 (CL) down-gradient	11/19/2015	0.94	160	H 220	H 0.57	7.12	H 650	H 1400
	2/26/2016	0.42	130	200	0.40	7.96	530	1200
	5/20/2016	0.65	150	200	0.49	7.28	550	1400
	8/18/2016	0.69	170	200	0.49	7.06	620	1600
	11/18/2016	0.83	140	180	0.46	7.34	340	1300
	2/16/2017	0.48	140	190	0.37	7.54	630	1300
	5/3/2017	0.49	120	190	0.37	7.47	500	1200
	6/22/2017	0.5	130	190	0.48	7.36	580	1400
	8/29/2017	0.78	140	180	0.52	7.34	520	1400
	11/10/2017	0.94	130	170	0.48	7.38	370	1200
MW-15 (CL) down-gradient	11/18/2015	1.5	270	H 210	H 0.53	6.55	H 1400	H 2400
	2/25/2016	2.0	240	110	0.61	6.84	640	1700
	5/19/2016	2.7	320	240	0.53	6.83	1200	2800
	8/18/2016	1.5	200	F1 170	0.54	6.96	660	1900
	11/17/2016	1.3	120	180	0.47	6.91	560	1900
	2/17/2017	1.9	200	190	0.43	7.24	670	1700
	5/4/2017	1.5	180	190	0.57	7.35	670	1700
	6/21/2017	1.6	180	200	0.56	7.3	530	1600
	8/29/2017	2.2	190	200	0.53	6.87	540	1800
	11/10/2017	1.6	170	180	0.63	7.09	530	1500
MW-17 (CL) down-gradient	11/19/2015	1.6	210	H 230	H 0.43	7.11	H 850	H 1800
	2/22/2016	1.8	290	280	0.55	7.19	960	2100
	5/18/2016	1.4	200	230	0.64	7.02	700	1800
	8/15/2016	1.1	220	220	0.60	7.08	860	2100
	11/14/2016	1.5	200	210	0.56	7.26	560	2000
	2/13/2017	1.6	190	230	0.56	6.84	770	1600
	5/4/2017	1.2	170	210	0.61	7.29	720	1500
	6/22/2017	0.95	150	230	0.72	7.38	580	1600
	8/29/2017	1.4	190	230	0.64	7.19	640	1900
	11/6/2017	1.7	190	240	0.62	7.27	840	1800
MW-18 (S) down-gradient	11/19/2015	0.80	140	H 220	H 0.66	7.62	H 310	H 1200
	2/22/2016	0.76	150	220	0.68	7.06	310	1200
	5/18/2016	0.72	120	230	0.71	7.68	230	1200
	8/15/2016	0.67	130	210	0.64	7.52	330	1300
	11/18/2016	0.94	130	200	0.58	7.69	250	1300
	2/15/2017	0.56	140	190	0.50	7.81	340	1200
	5/5/2017	0.46	130	180	0.52	8.12	360	1100
	6/21/2017	0.53	120	190	0.51	8.1	320	1200
	8/28/2017	0.65	120	200	0.53	7.81	310	1200
	11/6/2017	0.67	120	190	0.57	7.74	400	1200

Notes:

All units are in mg/l except pH is in standard units.

*Italics Dates* - Data that will be compared against established statistical background.

S - Sandy Unit

CL - Silty Clay Unit

F1 - MS and/or MSD Recovery outside of limits.

H - Sample was prepped or analyzed beyond the specified holding time.

Table 4. Detection Monitoring - Appendix IV Groundwater Analytical Results through 2017 - Ash By-pass Basin and Ash Surge Basin - Midwest Generation, LLC, Powerton Station, Pekin, IL

Well	Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Fluoride	Lead	Lithium	Mercury	Molybdenum	Radium 226 + 228 Combined	Selenium	Thallium
MW-01 (S) up-gradient	11/16/2015	< 0.003	< 0.001	0.057	^ < 0.001	< 0.0005	< 0.005	< 0.001	0.17	* < 0.0005	< 0.01	< 0.0002	< 0.0050	0.744	< 0.0025	* < 0.002
	2/25/2016	< 0.003	0.0025	0.053	< 0.001	< 0.0005	< 0.005	0.0014	0.16	0.0019	< 0.01	< 0.0002	< 0.005	< 0.722	0.0029	< 0.002
	5/20/2016	< 0.003	0.0081	0.062	< 0.001	< 0.0005	0.007	0.0053	0.17	0.011	< 0.01	< 0.0002	< 0.005	< 0.953	< 0.0025	< 0.002
	8/17/2016	< 0.003	0.0014	0.048	< 0.001	< 0.0005	< 0.005	< 0.001	0.25	0.0014	< 0.010	< 0.0002	0.0057	< 0.491	< 0.0025	< 0.002
	11/16/2016	< 0.003	0.0051	0.056	< 0.001	< 0.0005	< 0.005	0.0044	0.21	0.0082	< 0.01	< 0.0002	0.0059	< 0.618	< 0.0025	< 0.002
	2/14/2017	< 0.003	0.0041	0.056	< 0.001	< 0.0005	< 0.005	0.0045	0.17	0.0076	< 0.01	< 0.0002	0.0056	< 0.837	< 0.0025	< 0.002
	5/3/2017	< 0.003	0.0015	0.045	< 0.001	< 0.0005	< 0.005	0.0033	0.16	0.0067	< 0.01	< 0.0002	< 0.005	< 0.574	< 0.0025	< 0.002
	6/21/2017	< 0.003	< 0.001	0.04	< 0.001	< 0.0005	< 0.005	< 0.001	0.18	< 0.0005	< 0.01	< 0.0002	0.0061	< 0.418	< 0.0025	< 0.002
	8/25/2017	< 0.003	< 0.001	0.049	< 0.001	< 0.0005	< 0.005	< 0.001	0.18	< 0.0005	< 0.01	< 0.0002	0.0059	0.775	< 0.0025	< 0.002
11/8/2017	< 0.003	< 0.001	0.083	< 0.001	< 0.0005	< 0.005	< 0.001	0.12	< 0.0005	< 0.01	< 0.0002	< 0.005	0.343	< 0.0025	< 0.002	
MW-09 (S) up-gradient	11/18/2015	< 0.003	< 0.001	0.027	^ < 0.001	< 0.0005	< 0.005	< 0.001	H 0.19	< 0.0005	< 0.01	H < 0.0002	0.043	< 0.655	< 0.0025	< 0.002
	2/25/2016	< 0.003	0.0042	0.036	< 0.001	< 0.0005	< 0.005	0.0011	0.19	< 0.0005	< 0.01	< 0.0002	0.053	< 0.361	< 0.0025	< 0.002
	5/19/2016	< 0.003	< 0.001	0.029	< 0.001	< 0.0005	< 0.005	< 0.001	0.17	< 0.0005	< 0.01	< 0.0002	0.042	< 0.394	0.0032	< 0.002
	8/17/2016	< 0.003	< 0.001	0.031	< 0.001	< 0.0005	< 0.005	< 0.001	0.15	< 0.0005	< 0.01	< 0.0002	0.036	< 0.498	< 0.0025	< 0.002
	11/17/2016	< 0.003	0.0038	0.039	< 0.001	< 0.0005	< 0.005	< 0.001	0.13	< 0.0005	< 0.010	< 0.0002	0.036	0.646	0.0025	< 0.002
	2/15/2017	< 0.003	0.0032	0.043	< 0.001	< 0.0005	< 0.005	< 0.001	0.13	< 0.0005	< 0.010	< 0.0002	0.035	< 0.377	0.0062	< 0.002
	5/3/2017	< 0.003	0.0012	0.034	< 0.001	< 0.0005	< 0.005	< 0.001	0.17	< 0.0005	< 0.010	< 0.0002	0.034	< 0.445	0.011	< 0.002
	6/21/2017	< 0.003	< 0.001	0.037	< 0.001	< 0.0005	< 0.005	< 0.001	0.14	< 0.0005	< 0.010	< 0.0002	0.033	< 0.38	0.0072	< 0.002
	8/25/2017	< 0.003	< 0.001	0.044	< 0.001	< 0.0005	< 0.005	< 0.001	0.14	< 0.0005	< 0.010	< 0.0002	0.028	< 0.16	0.0043	< 0.002
11/8/2017	< 0.003	0.0012	0.048	< 0.001	< 0.0005	< 0.005	< 0.001	0.13	< 0.0005	< 0.010	< 0.0002	0.026	0.344	< 0.0025	< 0.002	
MW-19 (S) up-gradient	11/18/2016	< 0.003	< 0.001	0.084	< 0.001	< 0.0005	< 0.005	0.001	0.13	0.00068	< 0.01	< 0.0002	0.035	< 0.476	0.0043	< 0.002
	2/15/2017	< 0.003	< 0.001	0.088	< 0.001	< 0.0005	< 0.005	< 0.001	0.13	0.00061	< 0.01	< 0.0002	0.046	< 0.482	0.0063	< 0.002
	5/5/2017	< 0.003	< 0.001	0.076	< 0.001	< 0.0005	< 0.005	0.0013	0.14	0.0012	< 0.01	< 0.0002	0.035	0.923	0.0068	< 0.002
	6/21/2017	< 0.003	< 0.001	0.089	< 0.001	< 0.0005	< 0.005	< 0.001	0.12	< 0.0005	< 0.01	< 0.0002	0.024	< 0.334	0.0028	< 0.002
	8/28/2017	< 0.003	< 0.001	0.073	< 0.001	< 0.0005	< 0.005	< 0.001	0.16	< 0.0005	< 0.01	< 0.0002	0.041	0.37	0.0035	< 0.002
	11/6/2017	< 0.003	< 0.001	0.071	< 0.001	< 0.0005	< 0.005	< 0.001	0.17	< 0.0005	< 0.01	< 0.0002	0.042	0.36	< 0.0025	< 0.002
MW-08 (CL) down-gradient	11/18/2015	< 0.003	0.0029	0.15	^ < 0.001	< 0.0005	< 0.005	< 0.001	H 0.44	< 0.0005	0.028	H < 0.0002	0.01	< 0.559	< 0.0025	< 0.002
	2/25/2016	< 0.003	0.0018	0.11	< 0.001	0.00052	< 0.005	< 0.001	0.3	0.00072	0.015	< 0.0002	0.02	0.535	< 0.0025	< 0.002
	5/18/2016	< 0.003	0.0029	0.16	< 0.001	< 0.0005	< 0.005	< 0.001	0.34	< 0.0005	0.036	< 0.0002	0.0069	0.417	< 0.0025	< 0.002
	8/17/2016	< 0.003	0.0032	0.15	< 0.001	< 0.0005	< 0.005	< 0.001	0.35	< 0.0005	0.023	< 0.0002	0.013	< 0.519	< 0.0025	< 0.002
	11/15/2016	< 0.003	0.0012	0.076	< 0.001	< 0.0005	< 0.005	< 0.001	0.33	< 0.0005	0.017	< 0.0002	0.016	0.583	< 0.0025	< 0.002
	2/16/2017	< 0.003	0.003	0.086	< 0.001	< 0.0005	< 0.005	< 0.001	0.28	0.00087	< 0.01	< 0.0002	0.026	< 0.375	< 0.0025	< 0.002
	5/2/2017	< 0.003	0.0029	0.13	< 0.001	< 0.0005	< 0.005	< 0.001	0.33	< 0.0005	0.022	< 0.0002	0.0083	< 0.480	< 0.0025	< 0.002
	6/21/2017	< 0.003	0.0045	0.14	< 0.001	< 0.0005	< 0.005	< 0.001	0.3	< 0.0005	0.017	< 0.0002	0.031	< 0.439	< 0.0025	< 0.002
	8/29/2017	< 0.003	0.0011	0.062	< 0.001	< 0.0005	< 0.005	< 0.001	0.47	< 0.0005	< 0.01	< 0.0002	0.034	0.699	< 0.0025	< 0.002
11/8/2017	< 0.003	0.0027	0.1	< 0.001	< 0.0005	< 0.005	< 0.001	0.45	< 0.0005	0.019	< 0.0002	0.014	0.806	< 0.0025	< 0.002	

Notes:  
 All units are in mg/l except Radium is in pCi/L as noted.  
 S - Sand Unit  
 CL - Silty Clay Unit

F1 - MS and/or MSD Recovery outside of limits.  
 H - Sample was prepped or analyzed beyond the specified holding time.  
 \* - LCS or LCSD is outside acceptance limits.  
 ^ - Denotes instrument related QC exceeds the control limits





Table 5. Detection Monitoring - Appendix III Groundwater Analytical Results through 2017 - Former Ash Basin - Midwest Generation, LLC, Powerton Station, Pekin, IL.

Well	Date	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
MW-10 (S) up-gradient	6/22/2017	0.5	100	48	0.190	6.81	54	1
	8/24/2017	0.3	93	51	0.180	7.14	57	480
	11/9/2017	0.4	98	48	0.180	6.78	64.00	500
MW-02 (S) down-gradient	6/20/2017	0.33	90	55	0.19	7.01	47	500
	8/23/2017	V 1.30	86	49	0.19	7.40	61	440
	11/7/2017	3.70	98	46	0.17	7.1	88.00	550
MW-03 (S) down-gradient	6/20/2017	0.4	76	54	0.29	7.26	49	480
	8/23/2017	0.4	79	52	0.28	7.44	52	430
	11/7/2017	0.3	79	62	0.26	7.04	61.00	460
MW-04 (S) down-gradient	6/20/2017	0.5	77	55	0.29	7.45	53	480
	8/28/2017	V 0.7	90	89	0.33	7.13	110	680
	11/7/2017	0.6	110	94	0.24	6.8	130.00	650
MW-05 (S) down-gradient	5/17/2016	0.70	100	85	0.35	7.08	120	660
	8/16/2016	0.69	110	97	0.30	6.85	150	830
	11/15/2016	0.93	94	66	0.23	6.96	77	620
	2/14/2017	0.79	100	100	0.25	7.25	170	760
	5/1/2017	0.7	100	92	0.28	7.6	170	710
	6/20/2017	0.64	89	63	0.28	7.32	78	550
	8/28/2017	0.62	110	120	0.33	7.05	210	870
	11/7/2017	0.51	99	110	0.31	6.87	160	990

Notes:

All units are in mg/l except pH is in standard units.  
S - Sand Unit

V- Serial dilution exceeds control limits.

Table 6. Detection Monitoring - Appendix IV Groundwater Analytical Results through 2017 - Former Ash Basin - Midwest Generation, LLC, Powerton Station, Pekin, IL

Well	Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Fluoride	Lead	Lithium	Mercury	Molybdenum	Radium 226 + 228 Combined	Selenium	Thallium
MW-10 (S) up-gradient	6/22/2017	< 0.003	0.002	0.250	< 0.001	< 0.001	< 0.005	0.008	0.190	0.003	< 0.010	< 0.0002	< 0.005	0.408	0.0042	< 0.002
	8/24/2017	< 0.003	0.002	0.220	< 0.001	< 0.001	< 0.005	0.007	0.180	0.003	< 0.010	< 0.0002	< 0.005	0.564	0.0044	< 0.002
	11/9/2017	< 0.003	< 0.001	0.220	< 0.001	< 0.001	< 0.005	0.004	0.180	< 0.001	< 0.010	< 0.0002	< 0.005	1.020	0.0034	< 0.002
MW-02 (S) down-gradient	6/20/2017	< 0.003	0.001	0.075	< 0.001	< 0.0005	< 0.005	< 0.001	0.190	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.341	< 0.0025	< 0.002
	8/23/2017	< 0.003	< 0.001	0.062	< 0.001	< 0.0005	< 0.005	< 0.001	0.190	< 0.0005	< 0.01	< 0.0002	< 0.005	0.833	< 0.0025	< 0.002
	11/7/2017	< 0.003	0.001	0.091	< 0.001	< 0.0005	< 0.005	< 0.001	0.170	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.049	0.0027	< 0.002
MW-03 (S) down-gradient	6/20/2017	< 0.003	0.001	0.066	< 0.001	< 0.0005	< 0.005	< 0.001	0.290	< 0.0005	< 0.010	< 0.0002	< 0.005	< 0.325	< 0.0025	< 0.002
	8/23/2017	< 0.003	0.001	0.066	< 0.001	< 0.0005	< 0.005	< 0.001	0.280	< 0.0005	< 0.010	< 0.0002	< 0.005	1.200	< 0.0025	< 0.002
	11/7/2017	< 0.003	0.001	0.068	< 0.001	< 0.0005	< 0.005	< 0.001	0.260	< 0.0005	< 0.010	< 0.0002	< 0.005	0.588	< 0.0025	< 0.002
MW-04 (S) down-gradient	6/20/2017	< 0.003	< 0.001	0.0025	< 0.001	< 0.0005	< 0.005	< 0.001	0.290	< 0.0005	< 0.010	< 0.0002	< 0.005	< 0.343	< 0.0025	< 0.002
	8/28/2017	< 0.003	< 0.001	0.0280	< 0.001	< 0.0005	< 0.005	< 0.001	0.330	< 0.0005	< 0.010	< 0.0002	0.013	< 0.246	< 0.0025	< 0.002
	11/7/2017	< 0.003	< 0.001	0.0510	< 0.001	< 0.0005	< 0.005	< 0.001	0.240	< 0.0005	< 0.010	< 0.0002	< 0.005	< 0.024	0.0092	< 0.002
MW-05 (S) down-gradient	5/17/2016	< 0.003	< 0.001	0.051	< 0.001	< 0.0005	< 0.005	< 0.001	0.35	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.373	< 0.0025	< 0.002
	8/16/2016	< 0.003	< 0.001	0.06	< 0.001	< 0.0005	< 0.005	< 0.001	0.3	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.452	< 0.0025	< 0.002
	11/15/2016	< 0.003	< 0.001	0.051	< 0.001	< 0.0005	< 0.005	< 0.001	0.23	< 0.0005	< 0.01	< 0.0002	< 0.005	0.449	< 0.0025	< 0.002
	2/14/2017	< 0.003	< 0.001	0.062	< 0.001	< 0.0005	< 0.005	< 0.001	0.25	0.00091	< 0.01	< 0.0002	< 0.005	< 0.359	< 0.0025	< 0.002
	5/1/2017	< 0.003	< 0.001	0.059	< 0.001	< 0.0005	< 0.005	< 0.001	0.28	< 0.0005	< 0.01	< 0.0002	0.0066	< 0.439	< 0.0025	< 0.002
	6/20/2017	< 0.003	< 0.001	0.048	< 0.001	< 0.0005	< 0.005	< 0.001	0.28	< 0.0005	< 0.01	< 0.0002	0.0061	< 0.365	< 0.0025	< 0.002
	8/28/2017	< 0.003	< 0.001	0.064	< 0.001	< 0.0005	< 0.005	< 0.001	0.33	< 0.0005	< 0.01	< 0.0002	0.0085	0.381	< 0.0025	< 0.002
11/7/2017	< 0.003	< 0.001	0.058	< 0.001	< 0.0005	< 0.005	< 0.001	0.31	< 0.0005	< 0.01	< 0.0002	< 0.005	< 0.123	< 0.0025	< 0.002	

Notes:

All units are in mg/l except Radium is in pCi/L as noted.

S - Sand Unit

**PATRICK ENGINEERING INC.**

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

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

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

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

REMARKS  
**Installed 2" diameter PVC monitoring well.**

WATER LEVEL (ft.)  
 ▽ **22.0**  
 ▽  
 ▽

**PATRICK ENGINEERING INC.**

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

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

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

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

REMARKS  
**Installed 2" diameter PVC monitoring well.**

WATER LEVEL (ft.)  
 ∇ **22.0**  
 ∇  
 ∇

**PATRICK ENGINEERING INC.**

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

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

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

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


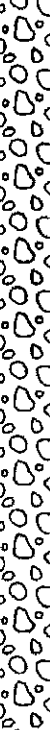
REMARKS  
**Installed 2" diameter PVC monitoring well.**

WATER LEVEL (ft.)  
 ∇ **24.0**  
 ∇  
 ∇

**PATRICK ENGINEERING INC.**

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

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

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

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

REMARKS  
**Installed 2" diameter PVC monitoring well.**

WATER LEVEL (ft.)  
 ∇ **24.0**  
 ∇  
 ∇

**PATRICK ENGINEERING INC.**

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

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

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

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


REMARKS  
**Installed 2" diameter PVC monitoring well.**

WATER LEVEL (ft.)  
 ∇ 23.0  
 ∇  
 ∇

# PATRICK ENGINEERING INC.

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

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

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

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

REMARKS  
**Installed 2" diameter PVC monitoring well.**

WATER LEVEL (ft.)  
 ∇ 23.0  
 ∇  
 ∇



**PATRICK ENGINEERING INC.**

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

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

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

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

REMARKS  
**Installed 2" diameter PVC monitoring well.**

WATER LEVEL (ft.)  
 ▽ **24.0**  
 ▽  
 ▽

**PATRICK ENGINEERING INC.**

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

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

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

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

REMARKS  
**Installed 2" diameter PVC monitoring well.**

WATER LEVEL (ft.)  
 ∇ **24.0**  
 ∇  
 ∇

# PATRICK ENGINEERING INC.

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

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

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

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

REMARKS  
**Installed 2" diameter PVC monitoring well.**

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

**PATRICK ENGINEERING INC.**

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

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

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

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

REMARKS  
**Installed 2" diameter PVC monitoring well.**

WATER LEVEL (ft.)  
 ∇ 20.5  
 ∇  
 ∇

# PATRICK ENGINEERING INC.

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

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

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

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

REMARKS  
**Installed 2" diameter PVC monitoring well.**

WATER LEVEL (ft.)

▽ 17.0

▽

▽

**PATRICK ENGINEERING INC.**

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

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

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

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

REMARKS  
**Installed 2" diameter PVC monitoring well.**

WATER LEVEL (ft.)  
 ▽ **17.0**  
 ▽  
 ▽

# PATRICK ENGINEERING INC.

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

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

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

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

REMARKS  
**Installed 2" diameter PVC monitoring well.**

WATER LEVEL (ft.)

▽ 36.0

▽

▽

**PATRICK ENGINEERING INC.**

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

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

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

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

REMARKS  
**Installed 2" diameter PVC monitoring well.**




WATER LEVEL (ft.)  
 ▽ **36.0**  
 ▽  
 ▽



# PATRICK ENGINEERING INC.

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

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

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

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




REMARKS  
**Installed 2" diameter PVC monitoring well.**

WATER LEVEL (ft.)  
 ▽ 21.0  
 ▽ 19.5  
 ▽

**PATRICK ENGINEERING INC.**

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

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

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

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





REMARKS  
**Installed 2" diameter PVC monitoring well.**

WATER LEVEL (ft.)  
 ∇ 21.0  
 ∇ 19.5  
 ▼

**PATRICK ENGINEERING INC.**

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

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

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

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


REMARKS  
**Installed 2" diameter PVC monitoring well.**

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

**PATRICK ENGINEERING INC.**

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

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

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

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

REMARKS  
**Installed 2" diameter PVC monitoring well.**

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

**PATRICK ENGINEERING INC.**

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

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

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

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

REMARKS  
**Installed 2" diameter PVC  
 monitoring well.**

WATER LEVEL (ft.)  
 ▽ **21.0'**  
 ▽  
 ▽

**PATRICK ENGINEERING INC.**

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

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

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

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

REMARKS  
**Installed 2" diameter PVC monitoring well.**

WATER LEVEL (ft.)  
 ▽ **21.0'**  
 ▽  
 ▽

**PATRICK ENGINEERING INC.**

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

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

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

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

**REMARKS**  
 Installed 2" diameter PVC  
 monitoring well.

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

**PATRICK ENGINEERING INC.**

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

LOGGED BY **MPG**  
 GROUND ELEVATION **488.1**

ELEV.	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content					NOTES & TEST RESULTS
						PL	Unconfined Compressive Strength (TSF) *			LL	
						1	2	3	4	5	
448.1	20.0			SS-9 21.0-22.5 0"R	1 2 3						qu=NT
				SS-10 23.5-25.0 18"R	WOH WOH 1						qu=0.5**tsf
442.1	26.0		Dark gray silty clay, some organics, medium stiff, dry CL	SS-11 26.0-27.5 18"R	1 3 4						qu=1.5**tsf
441.6	26.5				SS-12 28.5-30.0 18"R	3 4 6					Sand pack 28.0'-40.0' qu=2.5**tsf
					SS-13 31.0-32.5 18"R	3 4 6					Set screen (slot 0.010") 30.0'-40.0' qu=2.5**tsf
435.6	32.5		Brown and gray coarse to fine gravel, coarse to fine sand, loose, saturated GP	SS-14 33.5-35.0 18"R	1 2 1						qu=NT
					SS-15 36.0-37.5 18"R	1 0 0					qu=NT
431.6	36.5			Light brown fine sand, well graded, very loose, saturated SW	SS-16 38.5-40.0 18"R	2 3 4					qu=NT
428.1	40.0		End of Boring at 40.0'								

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

REMARKS  
 Installed 2" diameter PVC monitoring well.





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



**PATRICK ENGINEERING INC.**

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

LOGGED BY **MPG**  
 GROUND ELEVATION **470.0**

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

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

REMARKS  
 Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)  
 ∇ 20.5  
 ∇ 19.5  
 ∇

**PATRICK ENGINEERING INC.**

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

LOGGED BY **MPG**  
 GROUND ELEVATION **470.0**

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

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

REMARKS  
 Installed 2" diameter PVC monitoring well.




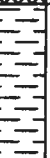
**WATER LEVEL (ft.)**

▽ 20.5  
 ▽ 19.5  
 ▾

**PATRICK ENGINEERING INC.**

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

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

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

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

REMARKS  
**Installed 2" diameter PVC monitoring well.**

WATER LEVEL (ft.)  
 ▽ 31.5  
 ▽ 29.5  
 ▼

**PATRICK ENGINEERING INC.**

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

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

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

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




REMARKS  
**Installed 2" diameter PVC monitoring well.**

WATER LEVEL (ft.)  
 ∇ **31.5**  
 ∇ **29.5**  
 ∇

**PATRICK ENGINEERING INC.**

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

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

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

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

REMARKS  
**Installed 2" diameter PVC monitoring well.**

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

**PATRICK ENGINEERING INC.**

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

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

ELEV.	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content					NOTES & TEST RESULTS
						PL	Unconfined Compressive Strength (TSF) *			LL	
						1	2	3	4	5	
447.7 447.2	20.0 20.9		very loose, low plasticity, saturated OL								Set screen (slot 0.010") 20.0'-30.0' qu=NT
				SS-9 21.0-22.5 18"R	1 0 0						
				SS-10 23.5-25.0 18"R	1 1 2						qu=0.25**tsf
442.7	25.0		Gray and mottled black organic silt, trace fine sand, soft, low plasticity, moist OL								qu=0.25**tsf
				SS-11 26.0-27.5 18"R	0 0 1						
438.7	29.0		Gray and black organic clay, medium stiff, moist OH								qu=1.25**tsf
				SS-12 28.5-30.0 18"R	2 3 4						
437.7	30.0		End of Boring at 30.0'								

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

REMARKS  
**Installed 2" diameter PVC monitoring well.**

WATER LEVEL (ft.)  
 ∇ 19.5  
 ∇ 20.5  
 ∇

**PATRICK ENGINEERING INC.**

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

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

ELEV.	DEPTH (FT)	STRATA	SOIL/ROCK DESCRIPTION	SAMPLE TYPE & NO. DEPTH (FT) RECOVERY(IN)	BLOW COUNTS	Water Content					NOTES & TEST RESULTS
						PL	Unconfined Compressive Strength (TSF) *			LL	
						10	20	30	40	60	
448.3	20.0		Gray fine sand, trace medium sand, loose, saturated SM	SS-9 21.0-22.5 18"R	1						Set screen (slot 0.010") 20.0'-30.0' qu=NT
444.8	23.5		Gray silt, mottled black, some organics, soft, moist to wet OL	SS-10 23.5-25.0 18"R	1 2 2						qu=0.75**tsf
				SS-11 26.0-27.5 18"R	1 2 2						qu=1.0**tsf
440.3	28.0		Gray silty clay, some organics, soft, medium stiff, dry CL	SS-12 28.5-30.0 18"R	1 3 2						qu=1.0**tsf
438.3	30.0		End of Boring at 30.0'								

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

REMARKS  
 Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)  
 ▽ 20.0'  
 ▽ 19.5'  
 ▼

**PATRICK ENGINEERING INC.**

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

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

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

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

REMARKS  
 Installed 2" diameter PVC monitoring well.

WATER LEVEL (ft.)  
 20.0'  
 19.5'



## GEOLOGIC LOG OF MW-16

(Page 1 of 1)

Midwest Generation, LLC  
Powerton Station  
Pekin, Illinois

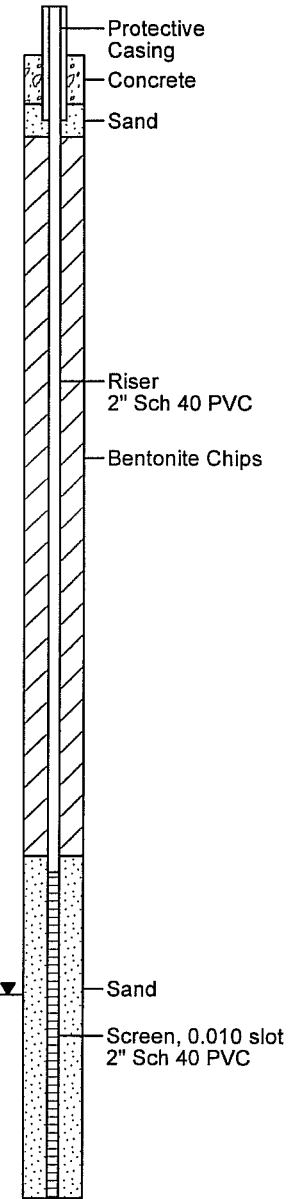
KPRG Project No. 18311.21

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

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

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

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



**GEOLOGIC LOG OF MW-17**  
 (Page 1 of 2)

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

Midwest Generation, LLC  
 Powerton Station  
 Pekin, Illinois  
 Project No. 15315.7

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

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



ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRC and Associates, Inc.

# GEOLOGIC LOG OF MW-17

(Page 2 of 2)

Midwest Generation, LLC  
Powerton Station  
Pekin, Illinois

Project No. 15315.7

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

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

Depth in Feet	Surf. Elev. 575	DESCRIPTION	% RQD	% Recovery	Well Diagram:
22	553				<p>Filter Sand</p> <p>Screen, 0.010 slot 2" Sch 40 PVC</p>
23	552				
24	551				
25	550				
26	549	SILTY SAND, black and dark gray, fine to meduim, wet.			
27	548	SILT and SAND, gray and black, wet.			
28	547				
29	546				
30	545				
31	544	End of Boring at 30 feet.			
32	543				
33	542				
34	541				
35	540				
36	539				
37	538				
38	537				
39	536				
40	535				
41	534				
42	533				
43	532				
44					



## GEOLOGIC LOG OF MW-18

(Page 1 of 2)

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

Midwest Generation, LLC  
 Powerton Station  
 Pekin, Illinois  
 Project No. 15315.7

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

Depth in Feet	Surf. Elev. 575	DESCRIPTION	% RQD	% Recovery	Well Diagram:
0	575	SILTY CLAY, brown, trace gravel, slightly moist.			<p style="text-align: right;">Concrete with Flushmount</p> <p style="text-align: right;">Bentonite Grout</p> <p style="text-align: right;">Riser 2" Sch 40 PVC</p>
1	574				
2	573				
3	572	SILTY SAND, fine to coarse, black, brown and dark gray, dry to slightly moist.			
4	571				
5	570				
6	569				
7	568	- clayey from 7-8, followed by occasional clayey layers			
8	567				
9	566				
10	565				
11	564				
12	563				
13	562				
14	561				
15	560				
16	559	- begin all black			
17	558				
18	557				
19	556	- very moist			
20	555				
21	554				
22					



# GEOLOGIC LOG OF MW-18

(Page 2 of 2)

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

Midwest Generation, LLC  
 Powerton Station  
 Pekin, Illinois  
 Project No. 15315.7

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

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

**GEOLOGIC LOG OF MW-19**  
 (Page 1 of 2)

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

Midwest Generation, LLC  
 Powerton Station  
 Pekin, Illinois

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

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

**GEOLOGIC LOG OF MW-19**  
 (Page 2 of 2)

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

Midwest Generation, LLC  
 Powerton Station  
 Pekin, Illinois

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

Depth in Feet	Surf. Elev. 575	DESCRIPTION	% RQD	% Recovery	Well Diagram:
22	553				<p>Bentonite Grout            Riser            2" Sch 40 PVC            Filter Sand            Screen, 0.010 slot            2" Sch 40 PVC</p>
23	552				
24	551				
25	550				
26	549				
27	548				
28	547				
29	546	SAND, fine to medium, gray, trace gravel, moist.			
30	545	SAND, fine to medium, brown, very moist.			
31	544				
32	543				
33	542				
34	541				
35	540				
36	539				
37	538				
38	537				
39	536				
40	535				
41	534				
42	533	End of Boring at 41 feet.			
43	532				
44					