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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

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## 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

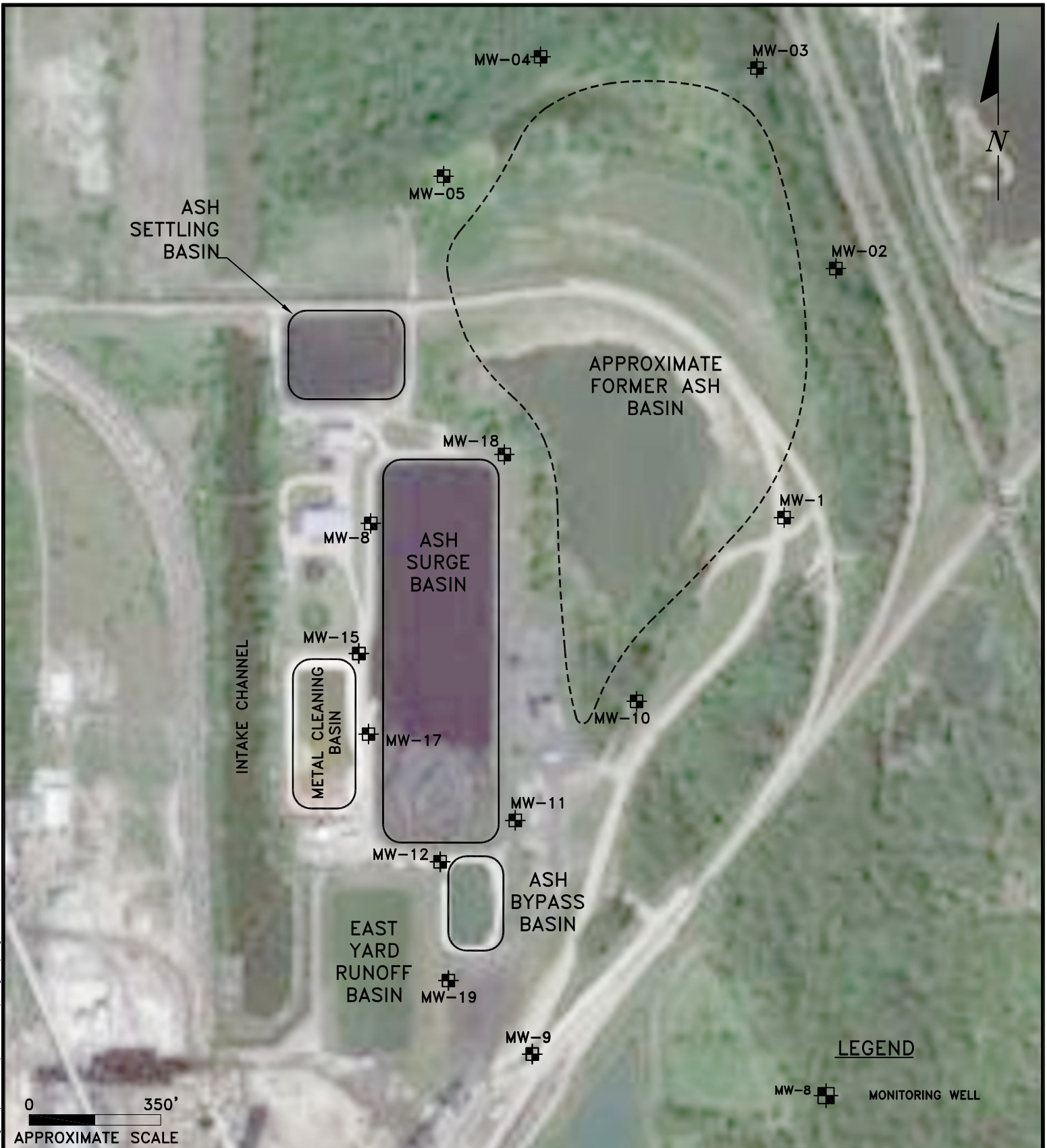
Based on an evaluation of groundwater flow conditions over the reporting period shows that the flow system has been fairly consistent over time between sampling events. The existing monitoring well network appears to be sufficient for the intended purposes of CCR Rule groundwater monitoring of the regulated 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**

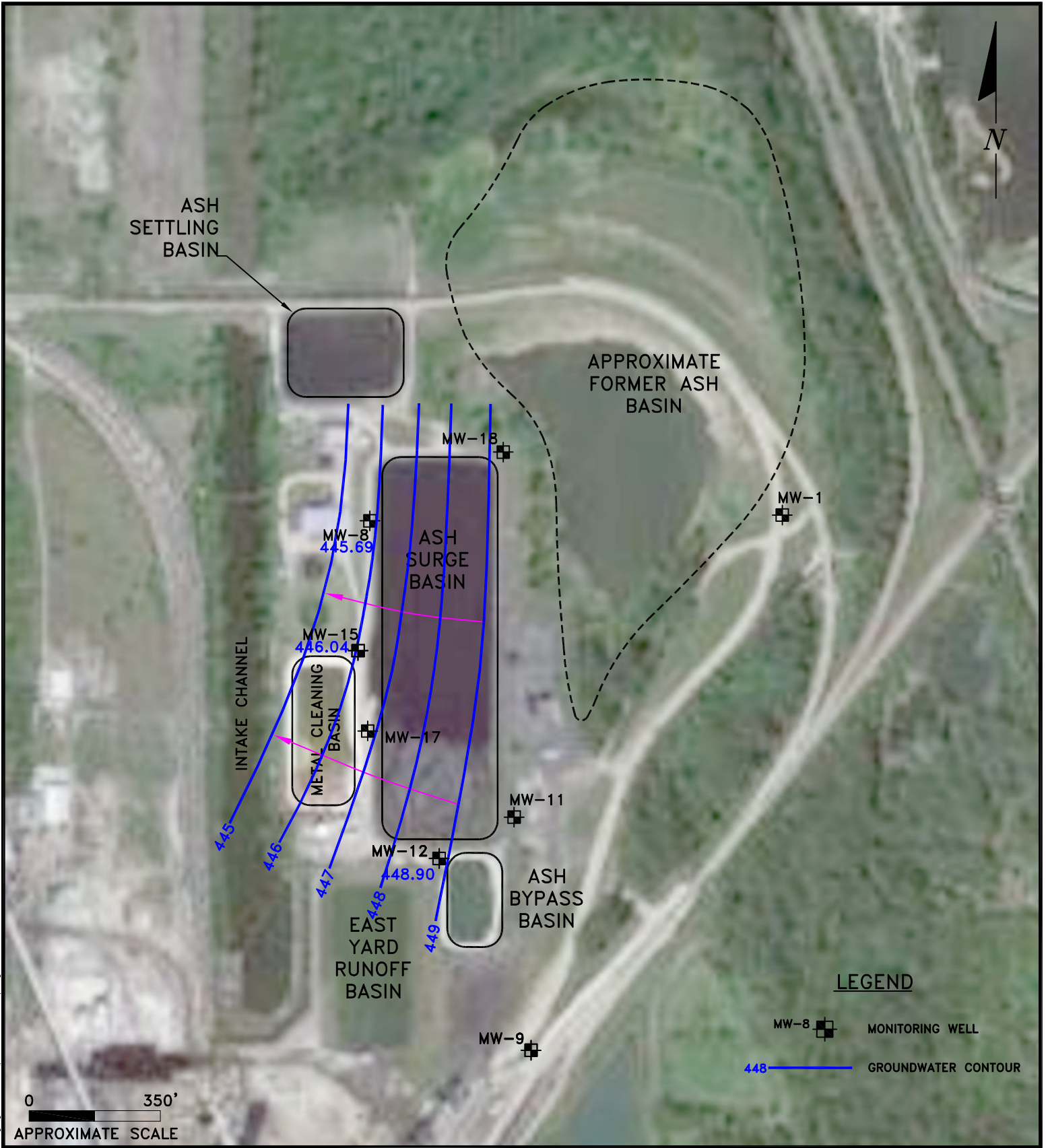
**Scale: 1" = 350'      Date: August 9, 2017**

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

**KPRG Project No. 12313.1      FIGURE 1**

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**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**

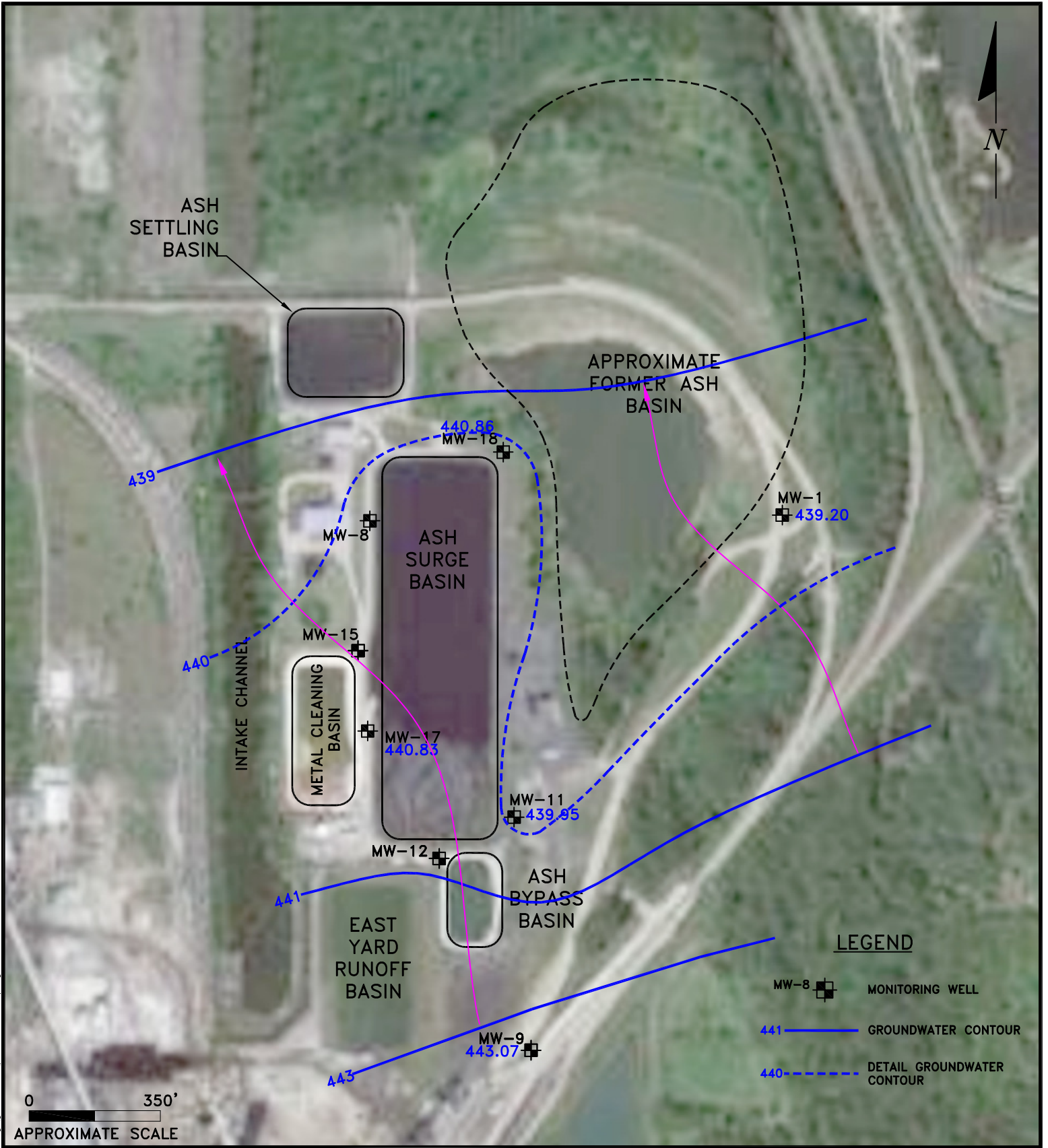
**Scale: 1" = 350'**

**Date: February 11, 2016**

**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**

**KPRG Project No. 12313.1**

**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**

**KPRG Project No. 12313.1**

**FIGURE 4**

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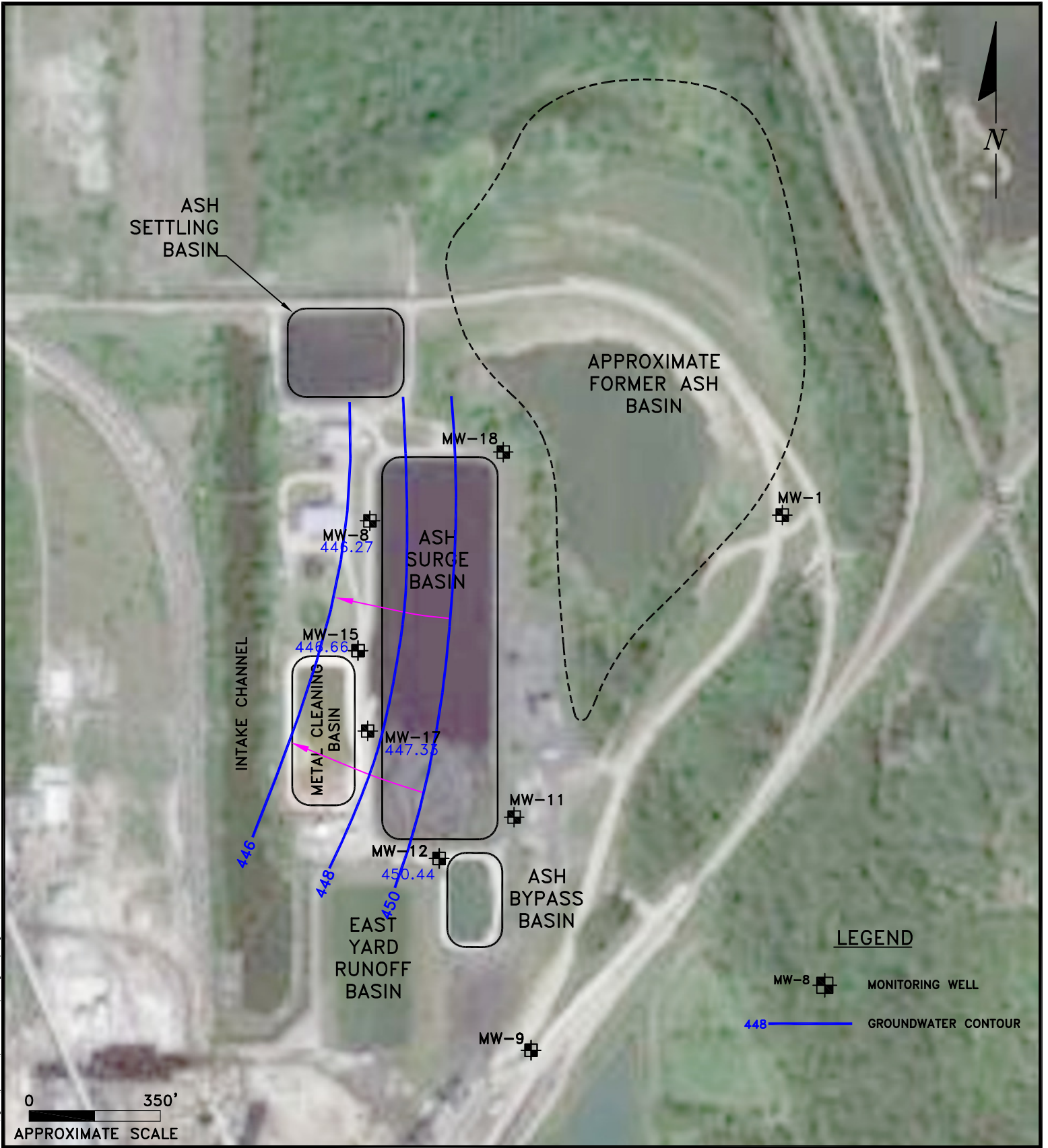
**CCR GROUNDWATER CONTOUR MAP  
FOR GRAVELLY SAND UNIT 2/2016**

**POWERTON STATION  
PEKIN, ILLINOIS**

**Scale: 1" = 350'      Date: April 19, 2016**

**KPRG Project No. 12313.1**

**FIGURE 5**



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

**POWERTON STATION  
PEKIN, ILLINOIS**

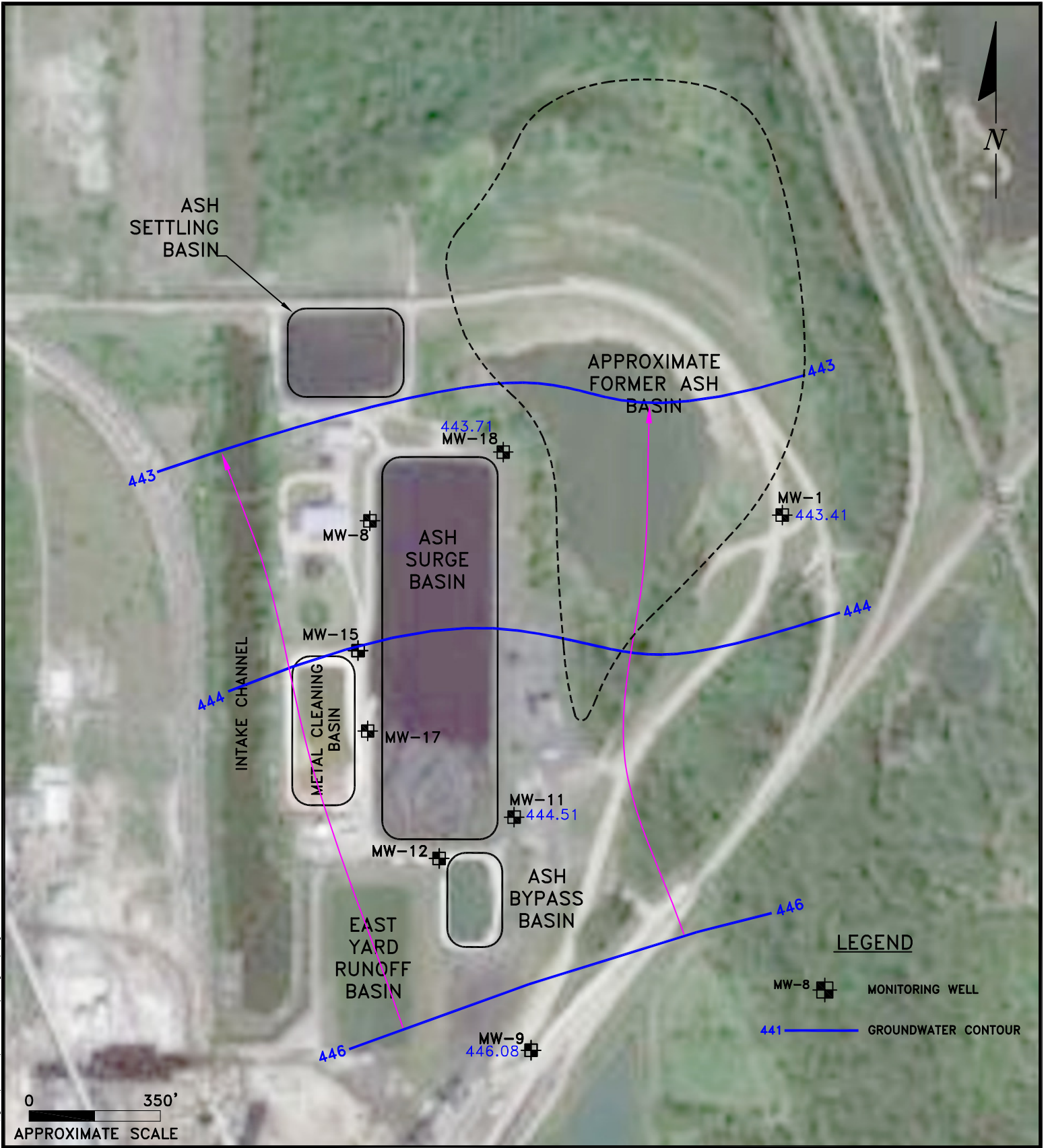
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**Date: July 12, 2016**

**KPRG Project No. 12313.1**

**FIGURE 6**

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**LEGEND**

- MW-8  MONITORING WELL
- 441  GROUNDWATER CONTOUR

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

**POWERTON STATION  
PEKIN, ILLINOIS**

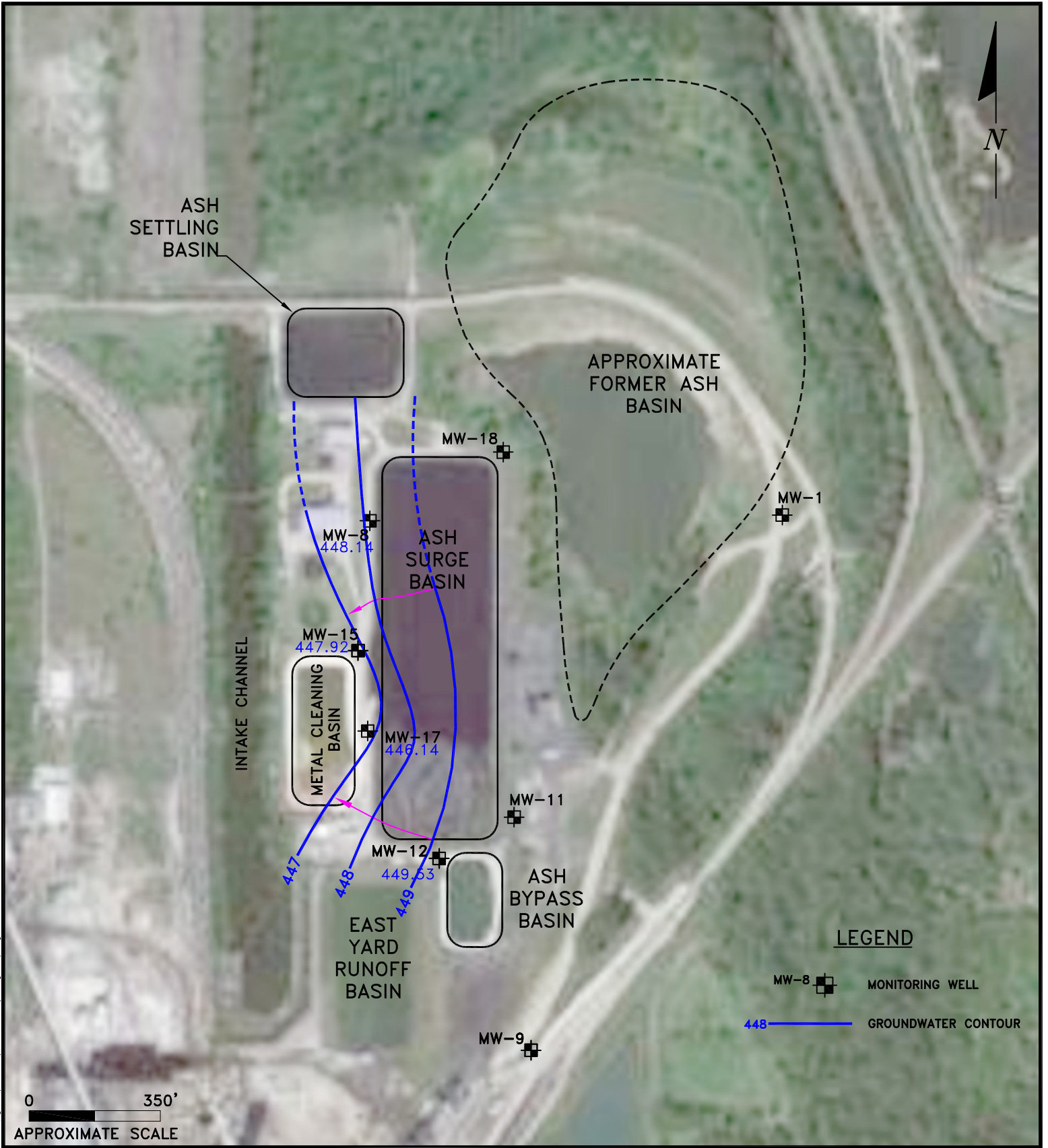
Scale: 1" = 350'      Date: July 12, 2016

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KPRG Project No. 12313.1      **FIGURE 7**

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**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**

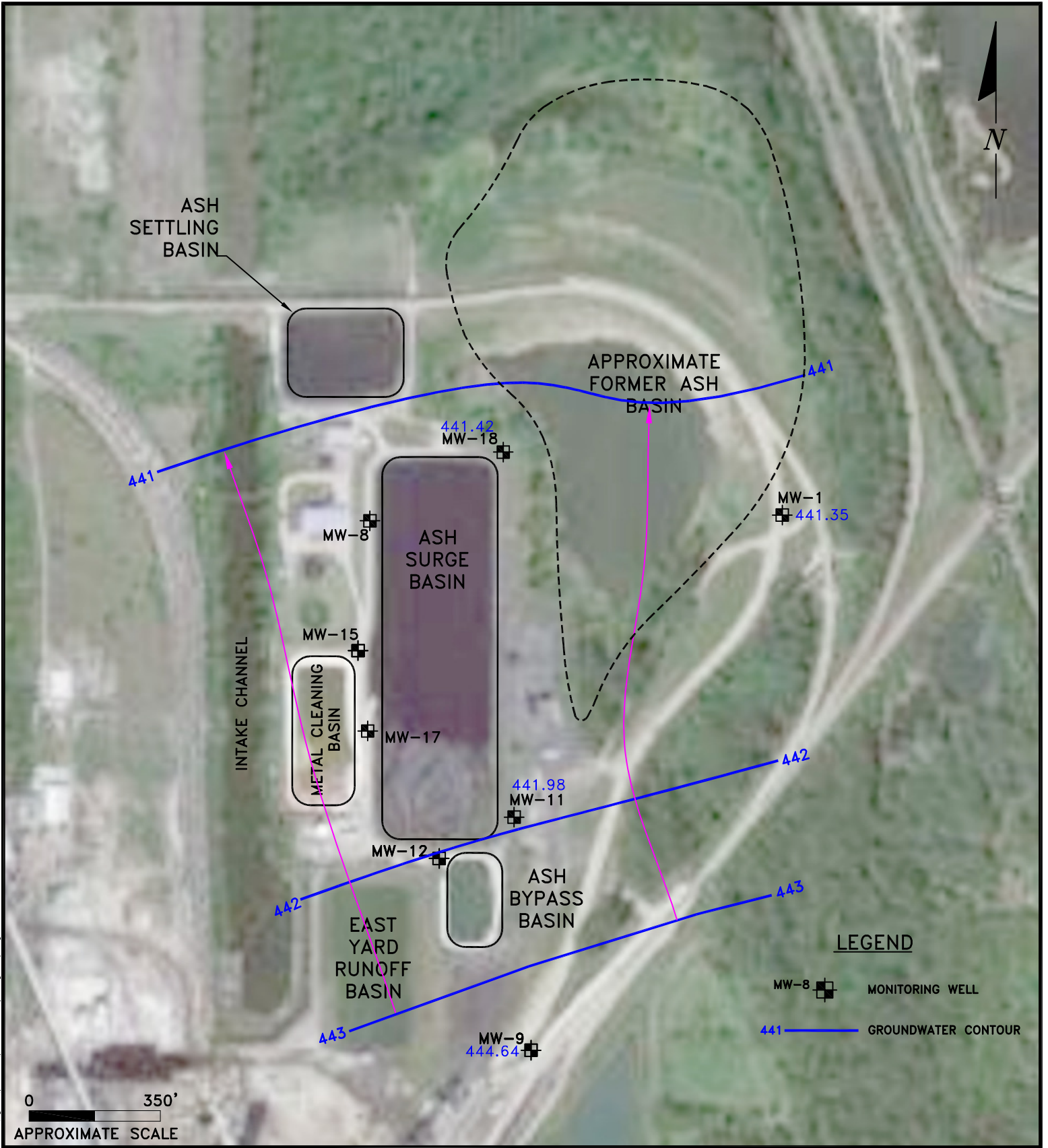
Scale: 1" = 350'      Date: October 10, 2016

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KPRG Project No. 12313.1      **FIGURE 8**

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**LEGEND**

- MW-8  MONITORING WELL
- 441  GROUNDWATER CONTOUR

0 350'  
APPROXIMATE SCALE

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

**POWERTON STATION  
PEKIN, ILLINOIS**

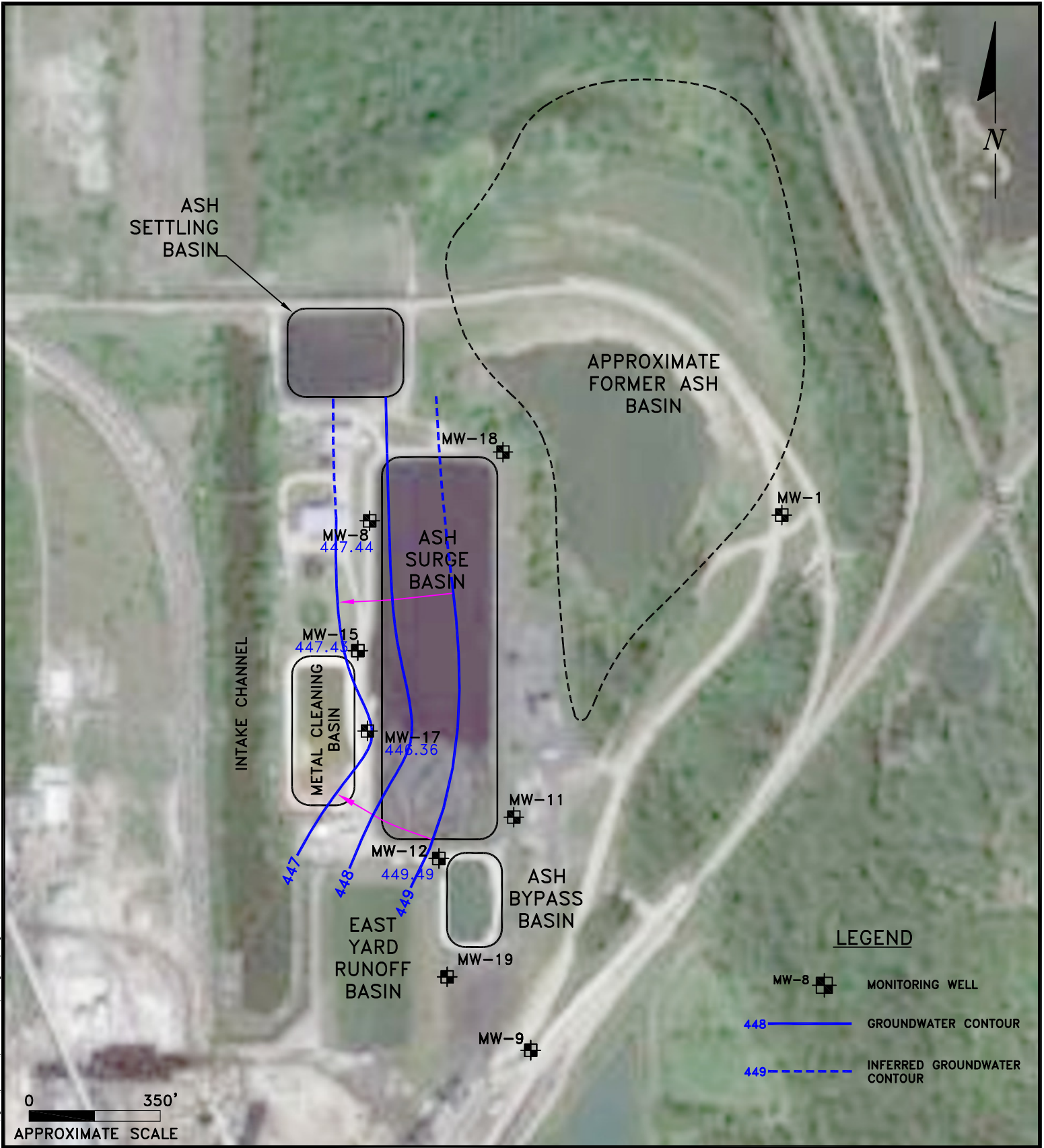
Scale: 1" = 350'      Date: October 10, 2016

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KPRG Project No. 12313.1      **FIGURE 9**

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**LEGEND**

- MW-8  MONITORING WELL
- 448  GROUNDWATER CONTOUR
- 449  INFERRED GROUNDWATER CONTOUR

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

**POWERTON STATION  
PEKIN, ILLINOIS**

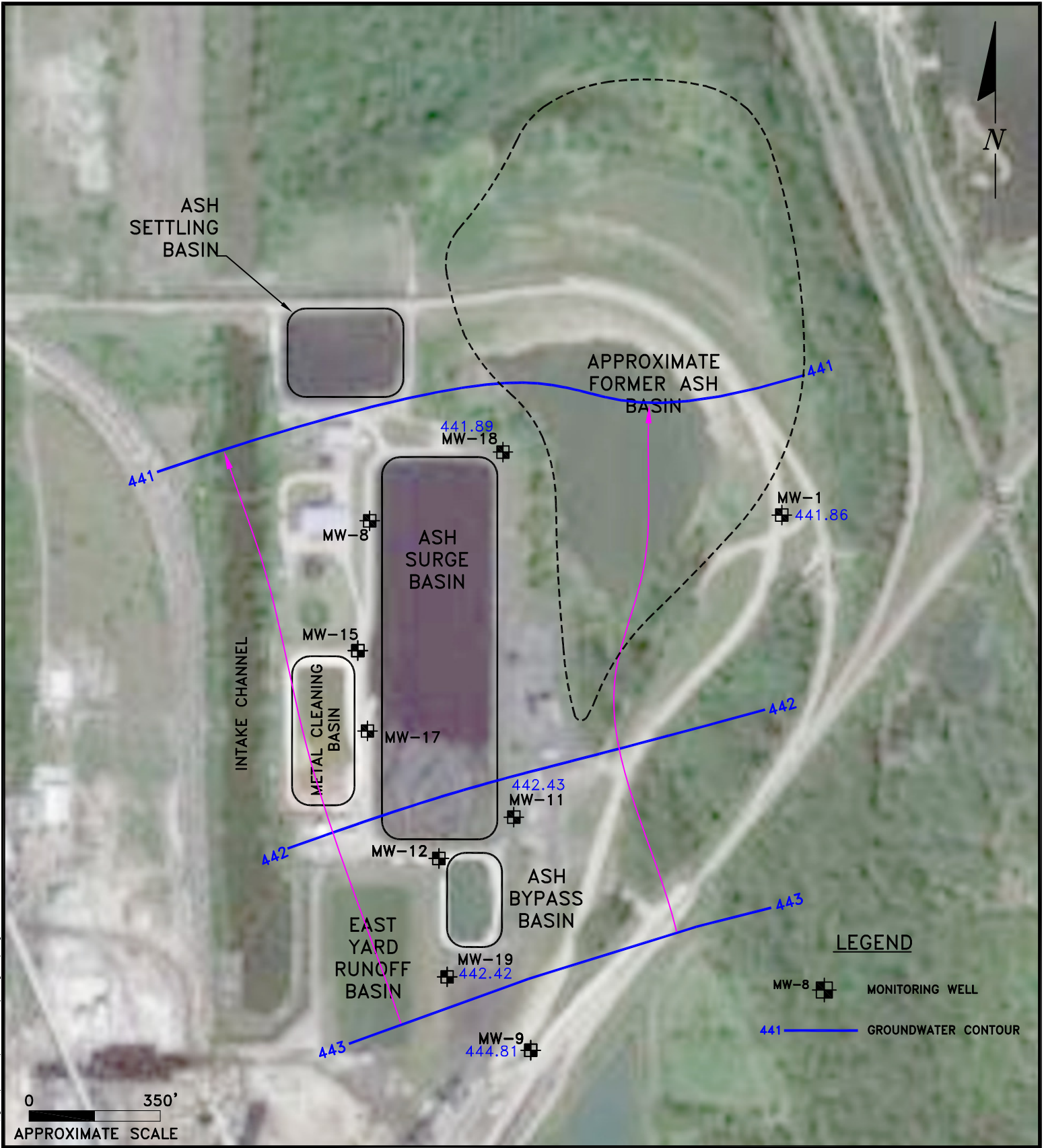
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**KPRG Project No. 12313.1      FIGURE 10**

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

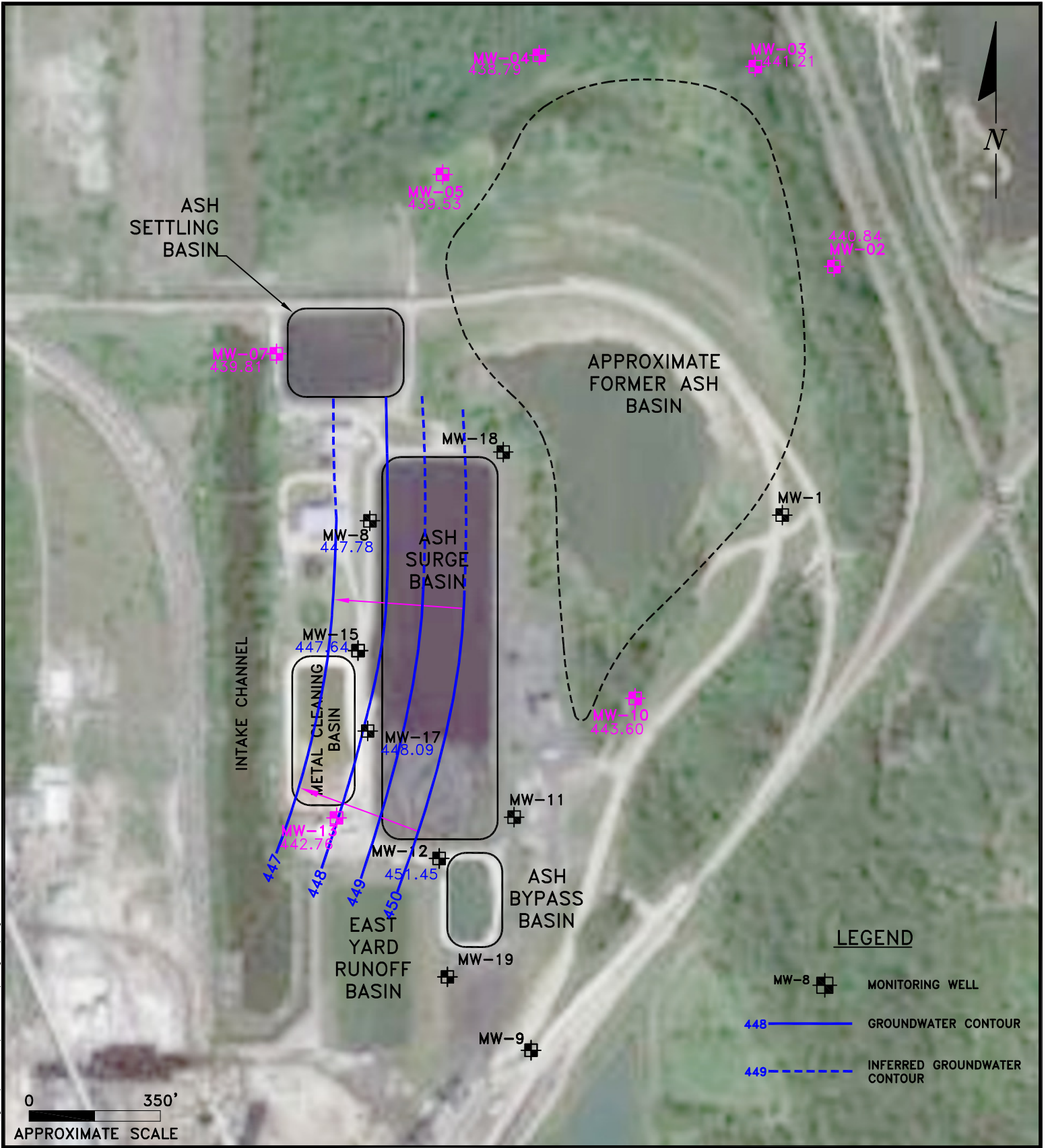
**POWERTON STATION  
PEKIN, ILLINOIS**

**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**

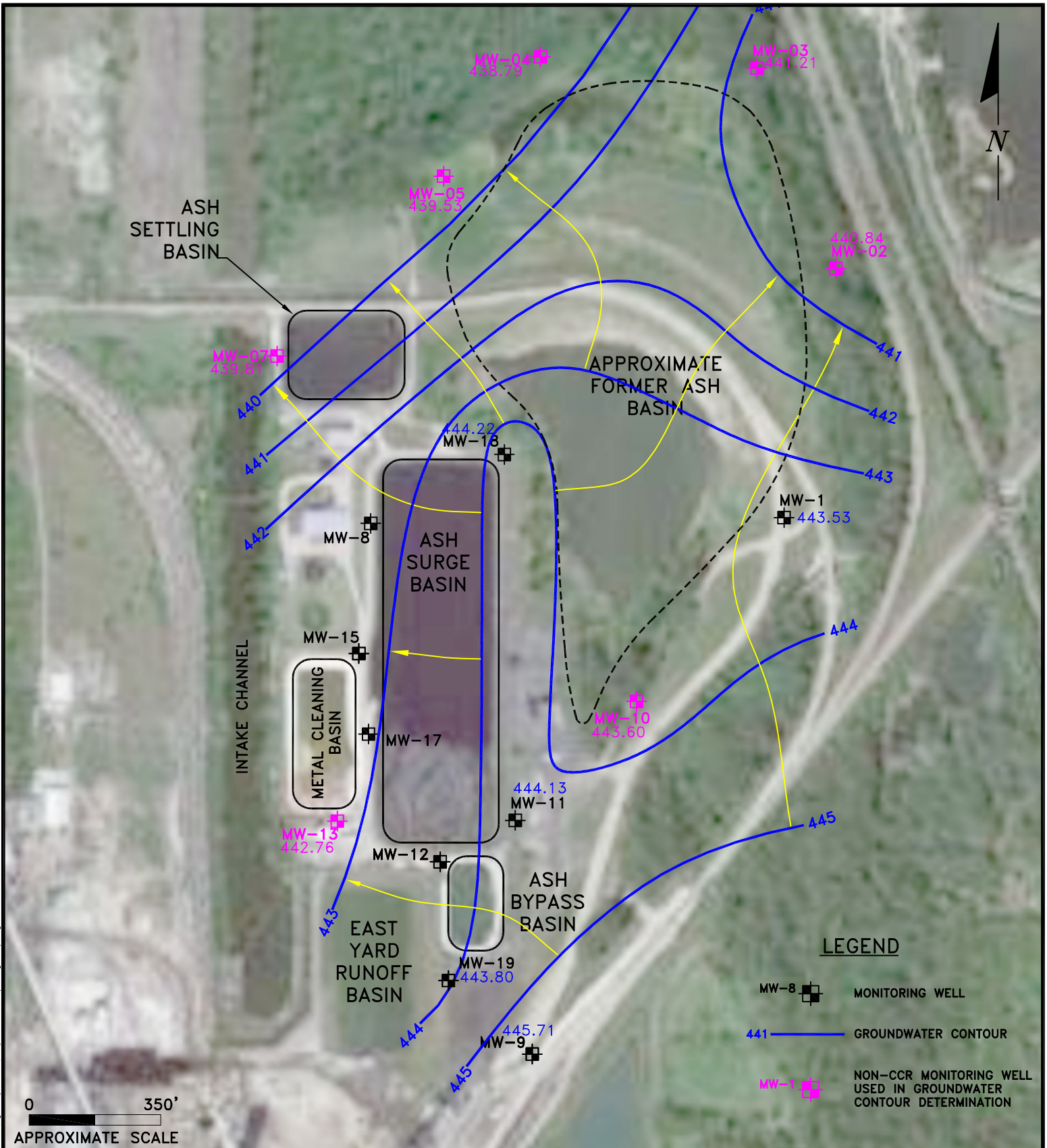
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**Date: April 5, 2017**

**KPRG Project No. 12313.1**

**FIGURE 12**

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

POWERTON STATION  
PEKIN, ILLINOIS

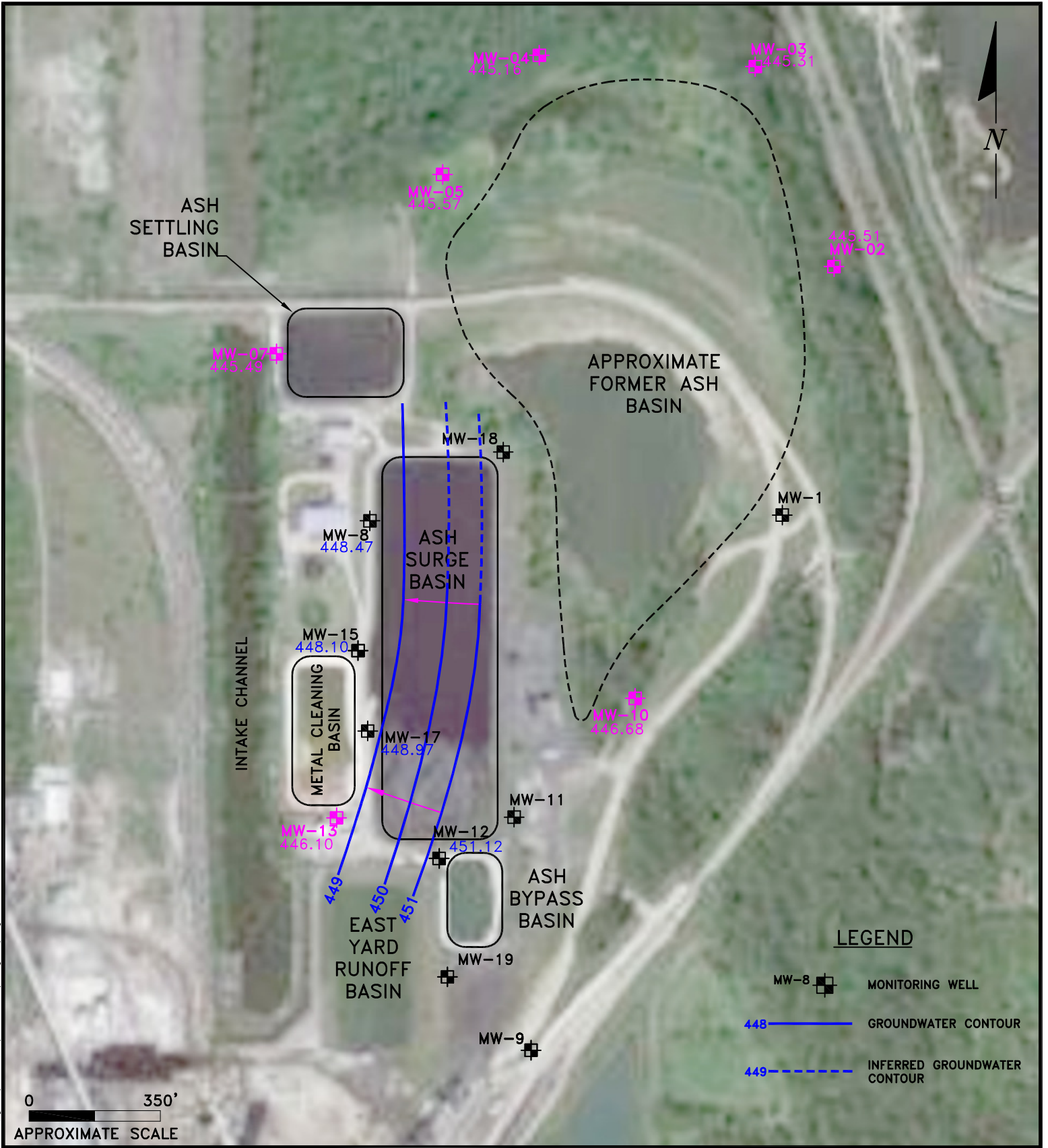
Scale: 1" = 350'

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**

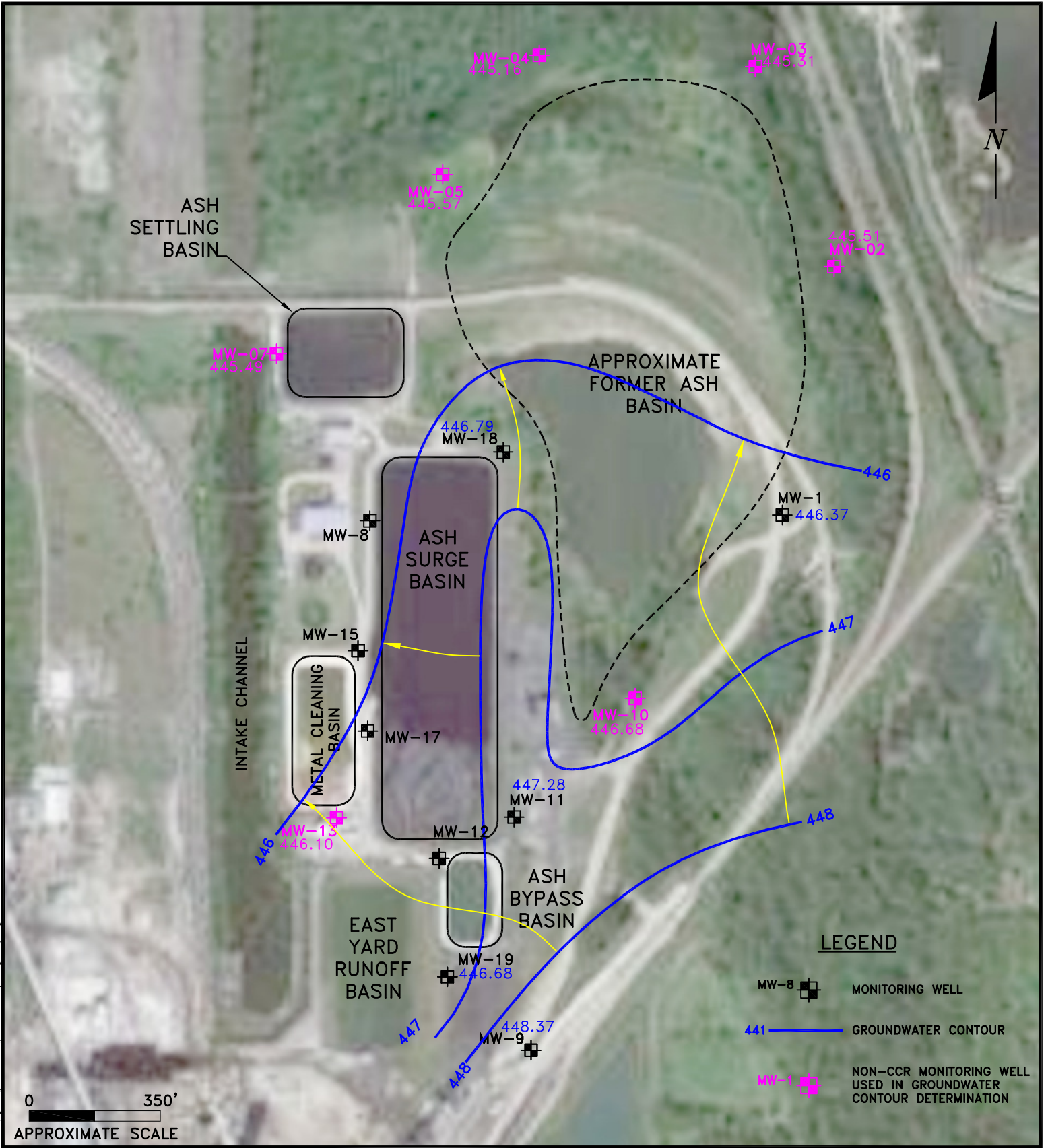
**POWERTON STATION  
PEKIN, ILLINOIS**

**Scale: 1" = 350'**

**Date: June 22, 2017**

**KPRG Project No. 12313.1**

**FIGURE 14**



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

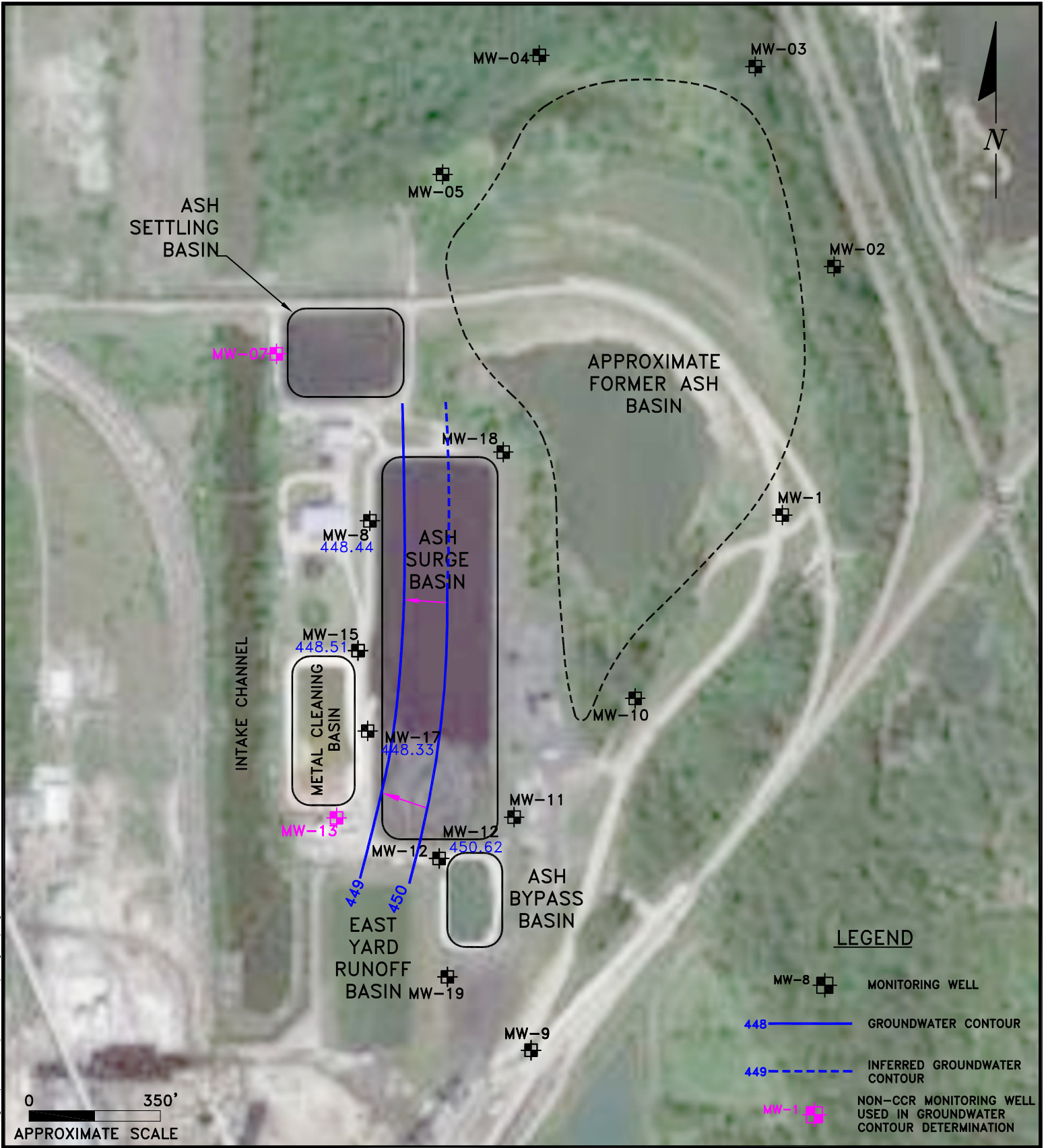
**POWERTON STATION  
PEKIN, ILLINOIS**

**Scale: 1" = 350'**

**Date: June 22, 2017**

**KPRG Project No. 12313.1**

**FIGURE 15**



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

**POWERTRON 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

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

**POWERTON STATION PEKIN, ILLINOIS**

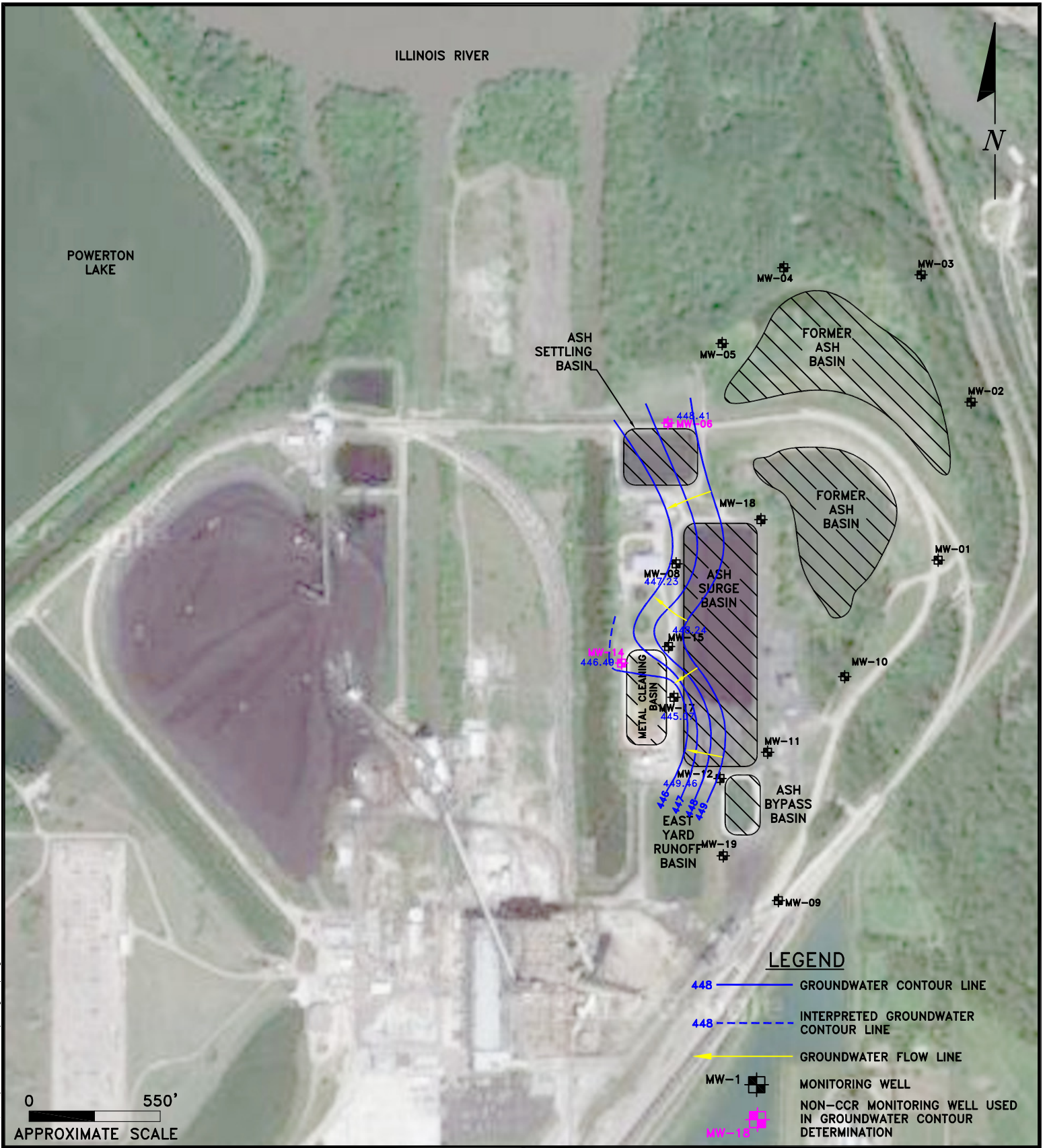
Scale: 1" = 350'      Date: August 9, 2017

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KPRG Project No. 12313.1      FIGURE 17

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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

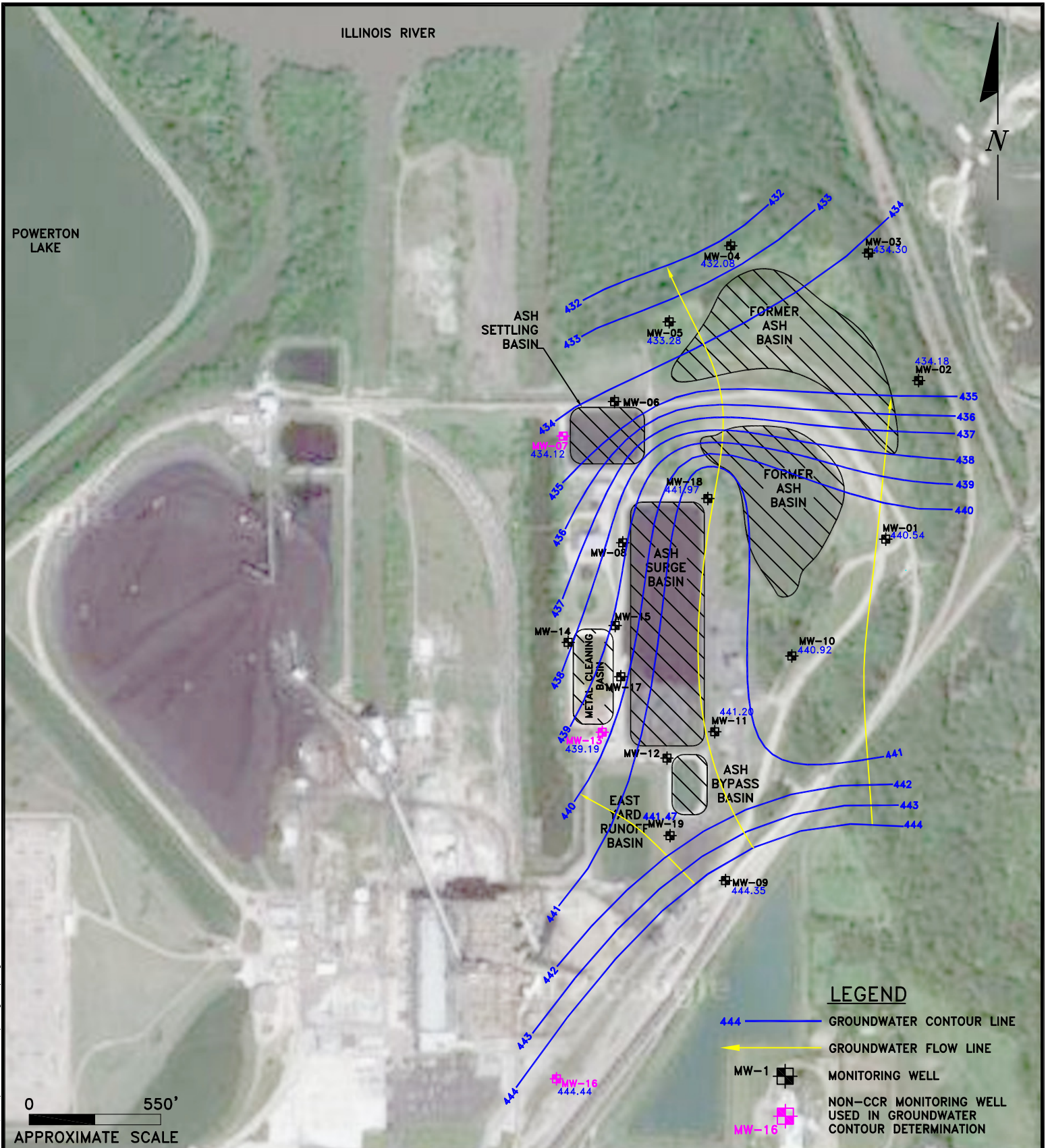
POWERTON STATION  
PEKIN, ILLINOIS

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**

KPRG and Associates, inc.

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

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

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

**POWERTON STATION  
PEKIN, ILLINOIS**

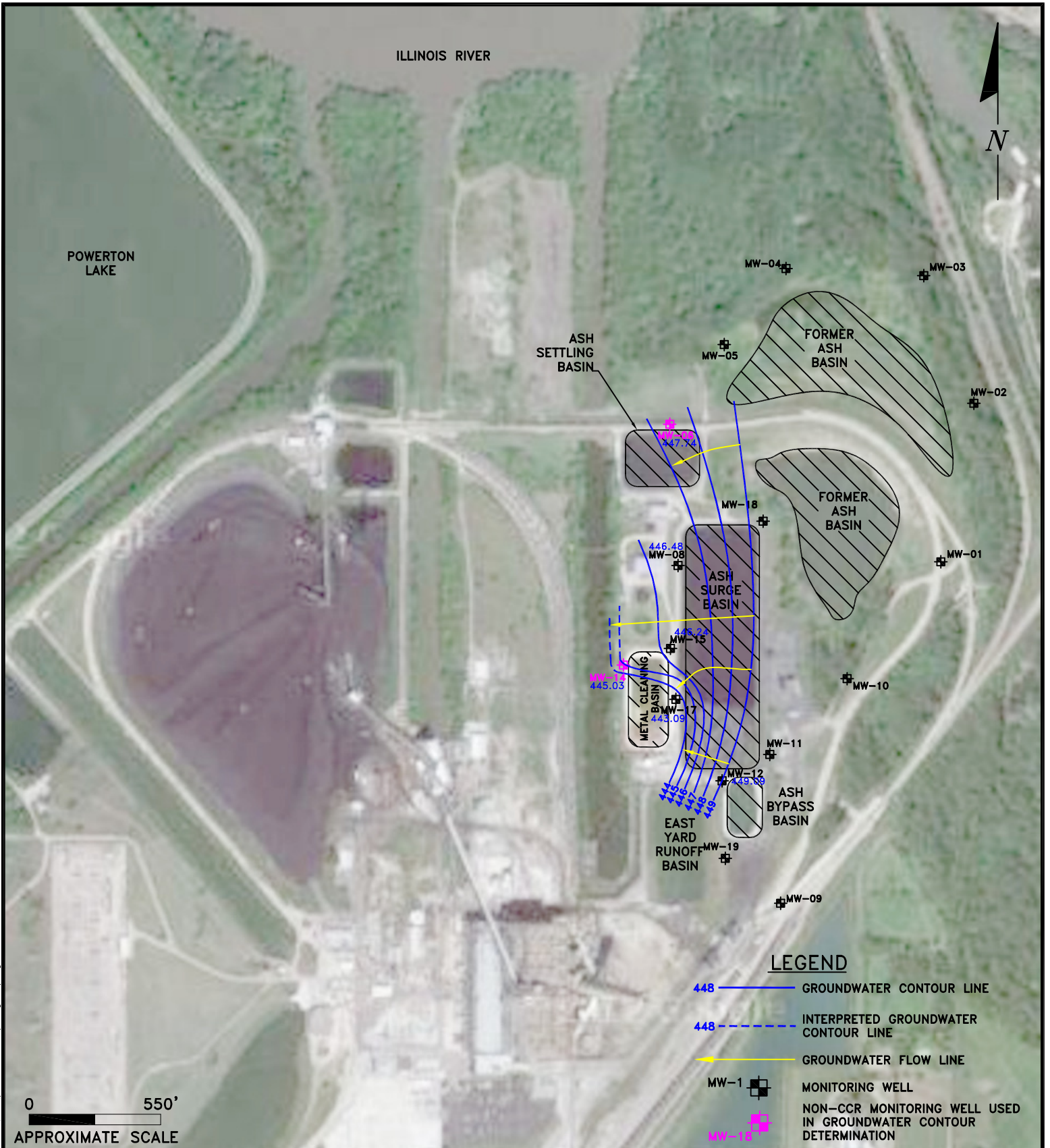
**Scale: 1" = 550'**

**Date: October 18, 2017**

**KPRG Project No. 12313.1**

**FIGURE 19**

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ENVIRONMENTAL CONSULTATION & REMEDIATION



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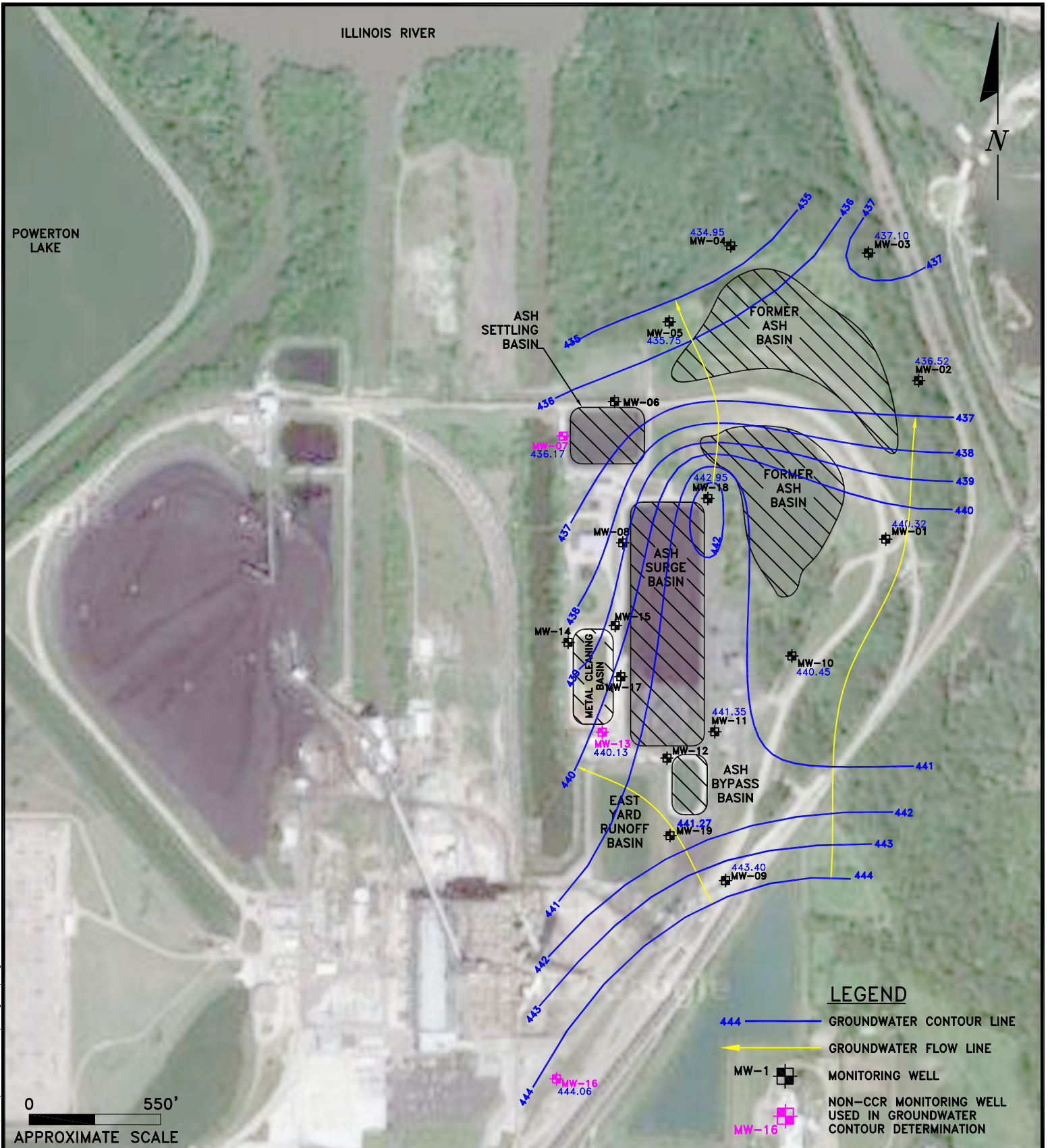
## CCR GROUNDWATER CONTOUR MAP FOR SILT/CLAY UNIT 11/2017

POWERTON STATION  
PEKIN, ILLINOIS

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

KPRG Project No. 12313.1      FIGURE 20

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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 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 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-11 (S) down-gradient	11/18/2015	< 0.003	0.017	0.18	^ < 0.001	< 0.0005	< 0.005	0.002	H 0.55	< 0.0005	< 0.01	H < 0.0002	0.0120	0.788	< 0.0025	< 0.002
	2/26/2016	< 0.003	0.023	0.23	< 0.001	< 0.0005	< 0.005	0.0023	0.55	< 0.0005	< 0.01	< 0.0002	0.013	0.562	< 0.0025	< 0.002
	5/20/2016	< 0.003	0.027	0.26	< 0.001	< 0.0005	< 0.005	0.0024	0.56	0.00076	< 0.01	< 0.0002	0.014	0.524	< 0.0025	< 0.002
	8/17/2016	< 0.003	F1 0.29	1.4	< 0.001	< 0.0005	< 0.005	0.0034	0.67	0.001	< 0.010	< 0.0002	0.011	1.130	< 0.0025	< 0.002
	11/17/2016	< 0.003	0.071	0.44	< 0.001	< 0.0005	< 0.005	0.0037	0.44	0.0013	< 0.01	< 0.0002	0.0088	0.734	< 0.0025	< 0.002
	2/16/2017	< 0.003	0.04	0.3	< 0.001	< 0.0005	< 0.005	0.003	0.4	0.00094	< 0.01	< 0.0002	0.013	0.341	< 0.0025	< 0.002
	5/3/2017	< 0.003	0.039	0.26	< 0.001	< 0.0005	< 0.005	0.0035	0.42	0.00093	< 0.01	< 0.0002	0.015	0.662	< 0.0025	< 0.002
	6/22/2017	< 0.003	0.07	0.36	< 0.001	< 0.0005	< 0.005	0.0025	0.6	< 0.0005	< 0.01	< 0.0002	0.014	< 0.418	< 0.0025	< 0.002
	8/29/2017	< 0.003	0.017	0.21	< 0.001	< 0.0005	< 0.005	0.0026	0.52	< 0.0005	< 0.01	< 0.0002	0.016	< 0.313	< 0.0025	< 0.002
11/9/2017	< 0.003	0.092	0.54	< 0.001	< 0.0005	< 0.005	0.0034	0.59	< 0.0005	< 0.01	< 0.0002	0.014	1.24	< 0.0025	< 0.002	
MW-12 (CL) down-gradient	11/19/2015	< 0.003	0.1	0.180	^ < 0.001	0.00068	< 0.005	< 0.001	H 0.57	0.00063	0.023	H < 0.0002	0.0280	< 0.685	< 0.0025	< 0.002
	2/26/2016	< 0.003	0.077	0.130	< 0.001	0.0016	< 0.005	< 0.001	0.4	0.0014	0.014	< 0.0002	0.0150	1.11	< 0.0025	< 0.002
	5/20/2016	< 0.003	0.065	0.16	F1 < 0.001	0.00077	< 0.005	< 0.001	0.49	0.0016	0.013	< 0.0002	0.028	0.576	< 0.0025	< 0.002
	8/18/2016	< 0.003	0.33	0.88	0.0013	0.007	< 0.005	0.001	0.49	0.0011	0.015	< 0.0002	0.011	3.68	< 0.0025	< 0.002
	11/18/2016	< 0.003	0.23	0.67	< 0.001	0.0028	< 0.005	< 0.001	0.46	< 0.0005	0.017	< 0.0002	< 0.01	1.86	< 0.0025	< 0.002
	2/16/2017	< 0.003	0.29	0.26	< 0.001	0.0057	< 0.005	0.0013	0.37	0.0042	0.010	< 0.0002	0.015	1.15	< 0.0025	< 0.002
	5/3/2017	< 0.003	0.1	0.17	< 0.001	0.0022	< 0.005	< 0.001	0.37	0.0038	0.011	< 0.0002	0.017	0.518	< 0.0025	< 0.002
	6/22/2017	< 0.003	0.025	0.11	< 0.001	< 0.0005	< 0.005	< 0.001	0.48	0.00096	< 0.010	< 0.0002	0.028	0.376	< 0.0025	< 0.002
	8/29/2017	< 0.003	0.02	0.095	< 0.001	< 0.0005	< 0.005	< 0.001	0.52	< 0.0005	0.014	< 0.0002	0.024	0.529	< 0.0025	< 0.002
11/10/2017	< 0.003	0.5	0.45	< 0.001	0.0015	< 0.005	< 0.001	0.48	0.00097	0.018	< 0.0002	0.023	1.67	< 0.0025	< 0.002	
MW-15 (CL) down-gradient	11/18/2015	< 0.003	0.03	0.096	^ < 0.001	0.00061	< 0.005	< 0.001	H 0.53	< 0.0005	0.042	H < 0.0002	0.023	< 0.599	0.0065	< 0.002
	2/25/2016	< 0.003	0.025	0.083	< 0.001	< 0.0005	< 0.005	< 0.001	0.61	< 0.0005	0.041	< 0.0002	0.035	0.870	0.045	< 0.002
	5/19/2016	< 0.003	0.04	0.097	< 0.001	0.00098	< 0.005	< 0.001	0.53	< 0.0005	0.044	< 0.0002	0.041	< 0.420	0.0067	< 0.002
	8/18/2016	< 0.003	0.13	0.11	< 0.001	0.0041	< 0.005	< 0.001	0.54	< 0.0005	0.028	< 0.0002	0.027	< 0.672	0.0061	< 0.002
	11/17/2016	< 0.003	0.0033	0.031	< 0.001	< 0.0005	< 0.005	< 0.0010	0.47	< 0.0005	0.016	< 0.0002	0.018	< 0.570	0.0078	< 0.002
	2/17/2017	< 0.003	0.02	0.056	< 0.001	< 0.0005	< 0.005	< 0.0010	0.43	< 0.0005	0.025	< 0.0002	0.027	< 0.392	0.0032	< 0.002
	5/4/2017	< 0.003	0.011	0.049	< 0.001	< 0.0005	< 0.005	< 0.0010	0.57	< 0.0005	0.023	< 0.0002	0.023	< 0.456	0.0034	< 0.002
	6/21/2017	< 0.003	0.0093	0.054	< 0.001	< 0.0005	< 0.005	< 0.0010	0.56	< 0.0005	0.027	< 0.0002	0.03	< 0.347	0.019	< 0.002
	8/29/2017	< 0.003	0.0018	0.044	< 0.001	< 0.0005	< 0.005	< 0.0010	0.53	< 0.0005	0.023	< 0.0002	0.032	< 0.377	0.0092	< 0.002
11/10/2017	< 0.003	0.0063	0.046	< 0.001	< 0.0005	< 0.005	< 0.0010	0.63	< 0.0005	0.025	< 0.0002	0.02	< 0.258	0.016	< 0.002	
MW-17 (CL) down-gradient	11/19/2015	< 0.003	0.0028	0.14	^ < 0.001	< 0.0005	< 0.005	0.0012	H 0.43	0.0012	0.019	H < 0.0002	0.035	< 0.790	< 0.0025	< 0.002
	2/22/2016	< 0.003	0.021	0.051	< 0.001	< 0.0005	< 0.005	0.0012	0.55	< 0.0005	0.038	< 0.0002	0.093	1.07	< 0.0025	< 0.002
	5/18/2016	< 0.003	0.32	0.12	< 0.001	0.0011	< 0.005	0.0015	0.64	< 0.0005	0.026	< 0.0002	0.12	8.27	< 0.0025	0.0028
	8/15/2016	< 0.003	0.34	0.12	< 0.001	0.001	< 0.005	0.0016	0.6	< 0.0005	0.022	< 0.0002	0.1	0.606	< 0.0025	0.0031
	11/14/2016	< 0.003	0.19	0.073	< 0.001	0.00051	< 0.005	0.0012	0.56	< 0.0005	0.022	< 0.0002	0.042	3.76	< 0.0025	0.0021
	2/13/2017	< 0.003	0.35	0.16	< 0.001	0.00093	< 0.005	0.0014	0.56	0.00079	0.019	< 0.0002	0.088	2.08	< 0.0025	0.0025
	5/4/2017	< 0.003	0.24	0.39	0.0013	0.0023	< 0.005	0.0023	0.61	0.00066	0.016	< 0.0002	0.036	1.91	< 0.0025	0.0065
	6/22/2017	< 0.003	0.41	0.13	< 0.001	0.0007	< 0.005	0.0012	0.72	0.0011	0.022	< 0.0002	0.11	1.21	< 0.0025	0.0022
	8/29/2017	< 0.003	0.24	0.092	< 0.001	< 0.0005	< 0.005	< 0.001	0.64	0.00058	0.021	< 0.0002	0.13	3.32	< 0.0025	0.0025
11/6/2017	< 0.003	0.17	0.38	< 0.001	0.0022	< 0.005	0.0015	0.62	< 0.0005	< 0.01	< 0.0002	0.019	2.54	< 0.0025	0.0075	
MW-18 (S) down-gradient	11/19/2015	< 0.003	0.0014	0.14	^ < 0.001	< 0.0005	< 0.005	< 0.001	H 0.66	< 0.0005	0.017	H < 0.0002	0.0051	< 0.845	< 0.0025	< 0.002
	2/22/2016	< 0.003	0.0012	0.15	< 0.001	< 0.0005	< 0.005	< 0.001	0.68	< 0.0005	0.022	< 0.0002	0.0055	1.88	< 0.0025	< 0.002
	5/18/2016	< 0.003	< 0.001	0.13	< 0.001	< 0.0005	< 0.005	< 0.001	0.71	< 0.0005	0.014	< 0.0002	0.0052	< 0.493	< 0.0025	< 0.002
	8/15/2016	< 0.003	< 0.001	0.14	< 0.001	< 0.0005	< 0.005	< 0.001	0.64	< 0.0005	0.012	< 0.0002	0.0059	0.836	< 0.0025	< 0.002
	11/18/2016	< 0.003	< 0.001	0.14	< 0.001	< 0.0005	< 0.005	< 0.001	0.58	< 0.0005	0.013	< 0.0002	0.0053	0.488	< 0.0025	< 0.002
	2/15/2017	< 0.003	< 0.001	0.14	< 0.001	< 0.0005	< 0.005	< 0.001	0.5	< 0.0005	0.014	< 0.0002	0.0058	< 0.347	< 0.0025	< 0.002
	5/5/2017	< 0.003	0.0032	0.12	< 0.001	< 0.0005	< 0.005	< 0.001	0.52	0.00057	0.01	< 0.0002	< 0.005	0.612	< 0.0025	< 0.002
	6/21/2017	< 0.003	< 0.001	0.12	< 0.001	< 0.0005	< 0.005	< 0.001	0.51	< 0.0005	0.014	< 0.0002	0.0051	0.629	< 0.0025	< 0.002
	8/28/2017	< 0.003	< 0.001	0.12	< 0.001	< 0.0005	< 0.005	< 0.001	0.53	< 0.0005	0.012	< 0.0002	0.005	0.498	< 0.0025	< 0.002
11/6/2017	< 0.003	< 0.001	0.12	< 0.001	< 0.0005	< 0.005	< 0.001	0.57	< 0.0005	0.011	< 0.0002	0.0057	0.755	< 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