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ENVIRONMENTAL CONSULTATION & REMEDIATION

KPRG and Associates, Inc.

CCR COMPLIANCE
ANNUAL GROUNDWATER MONITORING and CORRECTIVE ACTION REPORT - 2017

Midwest Generation, LLC
Waukegan Station
401 E. Greenwood Avenue
Waukegan, Illinois

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) Waukegan Generating Station. The wells sampled were selected by Midwest Generation to meet the monitoring requirements of the CCR Rule for both the West and East Ash Ponds. The CCR monitoring well network around these ponds consists of eight monitoring wells (MW-01 though MW-04, MW-09, MW-11, MW-14 and MW-16). Wells MW-09, MW-11 and MW-14 are upgradient wells.

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 ponds at this facility consists of eight wells (MW-01, MW-02, MW-03, MW-04, MW-09, MW-11, MW-14 and MW-16) as shown on Figure 1. 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 good condition.

All 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 was for Appendix III detection monitoring parameters.

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. The water levels were used to generate a groundwater flow maps for each sampling event. These maps are provided as Figures 2 through 11. A review of the maps indicates a consistent southeasterly groundwater flow direction beneath the ash ponds. 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:

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

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

The average hydraulic conductivity of 4.04×10^{-3} ft/sec used in Table 2 was obtained from the Hydrogeologic Assessment Report dated February 2011 and prepared by Patrick Engineering. The estimated effective porosity of the aquifer materials (0.35) was obtained from literature (Applied Hydrogeology, Fetter, 1980).

3.0 ANALYTICAL DATA AND STATUS OF EVALUATIONS

The analytical data from the detection monitoring groundwater sampling for Appendix III and IV parameters are provided in Tables 3 and 4, 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. Both 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 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 Waukegan 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™ statistical software package.

4.0 SUMMARY/CONCLUSIONS AND RECOMMENDATIONS

The Detection Monitoring requirements in accordance with the CCR Rule have been successfully met. 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.

Based on an evaluation of groundwater flow conditions over the reporting period shows that the flow system has been 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 Waukegan 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 – Waukegan Generating Station, Waukegan, IL. February 2011.

- KPRG and Associates, Inc., CCR Compliance Monitoring, Sampling and Analysis Plan, Midwest Generation, LLC Waukegan Generating Station. October 10, 2017.

- KPRG and Associates, Inc., CCR Compliance Statistical Approach for Groundwater Data Evaluation, Midwest Generation, LLC Waukegan Generating Station. October 10, 2017.

- C.W. Fetter, Jr., Applied Hydrogeology. Charles E. Merrill Publishing Co., 1980.

FIGURES

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K P R G

KPRG and Associates, inc.

14665 West Lisbon Road, Suite 28 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 MONITORING WELL SITE MAP

WAUKEGAN STATION
WAUKEGAN, ILLINOIS

Scale: 1" = 550' | Date: January 2, 2018

KPRG Project No. 12313.2 | FIGURE 1

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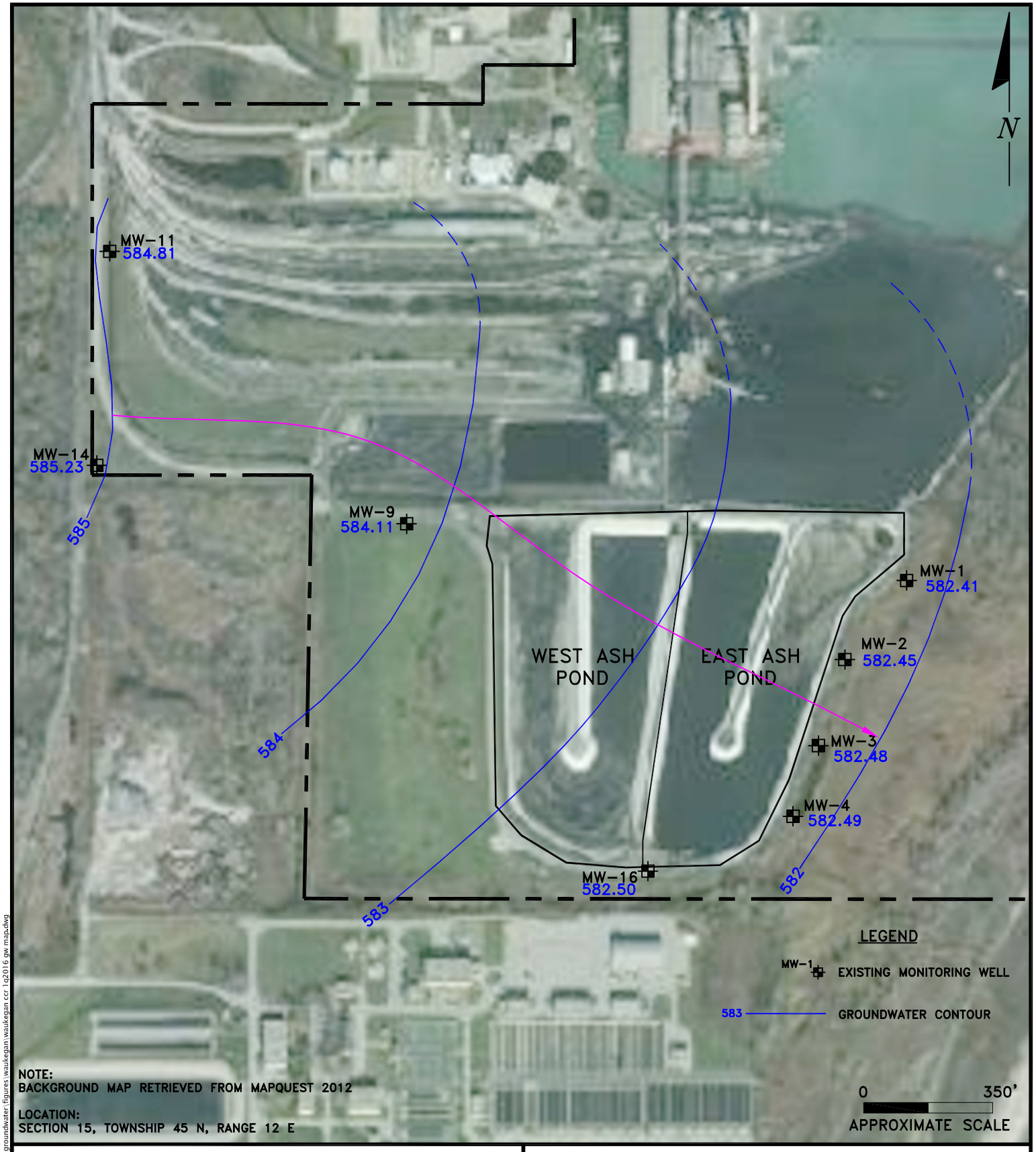
CCR GROUNDWATER CONTOUR-11/2015

WAUKEGAN STATION
WAUKEGAN, ILLINOIS

Scale: 1" = 350' | Date: February 11, 2016

KPRG Project No. 12313.2 | FIGURE 2



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

CCR GROUNDWATER CONTOUR-3/2016

WAUKEGAN STATION
WAUKEGAN, ILLINOIS

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

KPRG Project No. 12313.2 | FIGURE 3

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NOTE:
BACKGROUND MAP RETRIEVED FROM MAPQUEST 2012

LOCATION:
SECTION 15, TOWNSHIP 45 N, RANGE 12 E

CCR GROUNDWATER CONTOUR–5/2016

WAUKEGAN STATION
WAUKEGAN, ILLINOIS

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

KPRG Project No. 12313.2 | FIGURE 4

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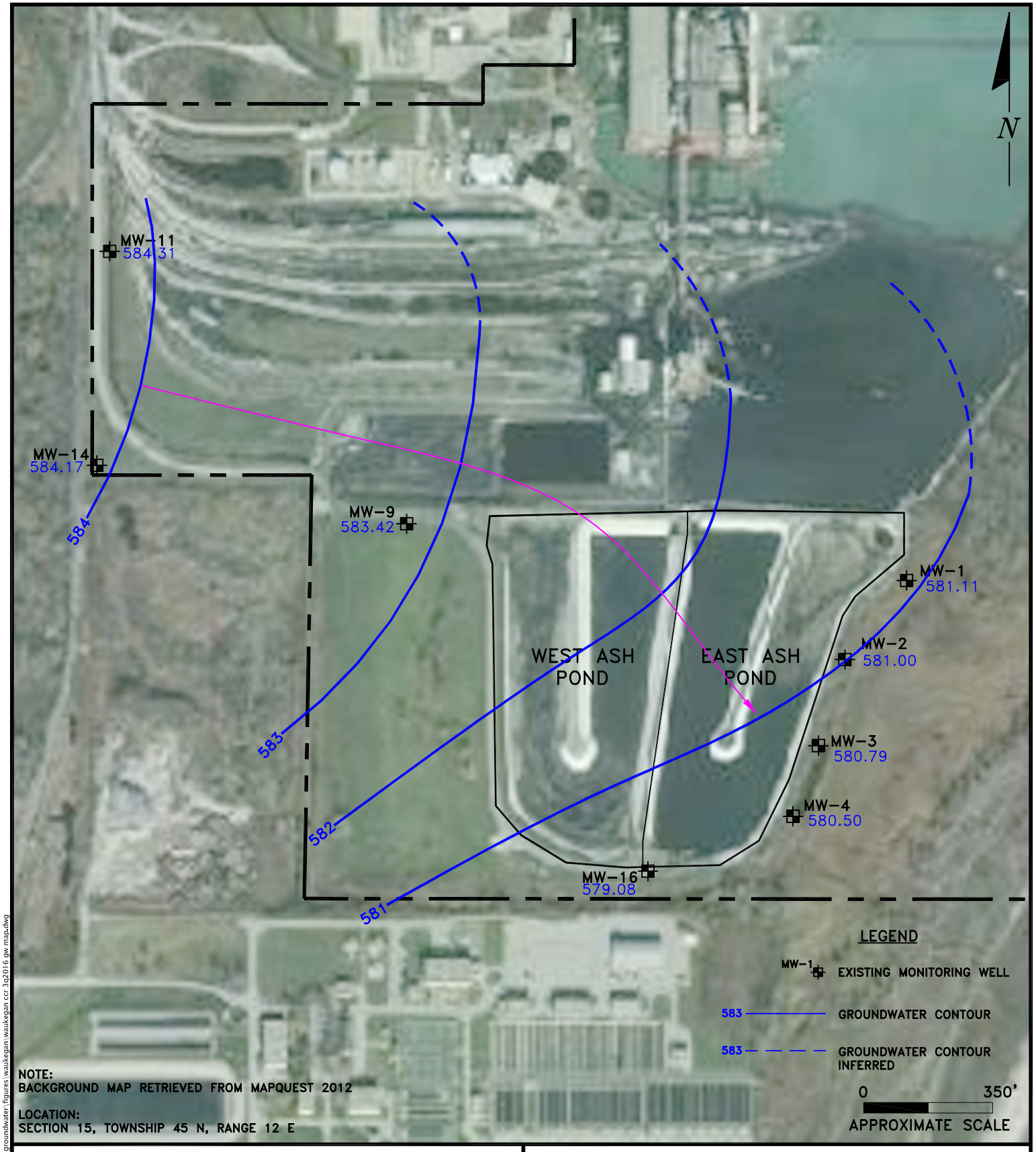

NOTE:
BACKGROUND MAP RETRIEVED FROM MAPQUEST 2012

LOCATION:
SECTION 15, TOWNSHIP 45 N, RANGE 12 E

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

CCR GROUNDWATER CONTOUR-08/2016

WAUKEGAN STATION
WAUKEGAN, ILLINOIS

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

KPRG Project No. 12313.2 | FIGURE 5

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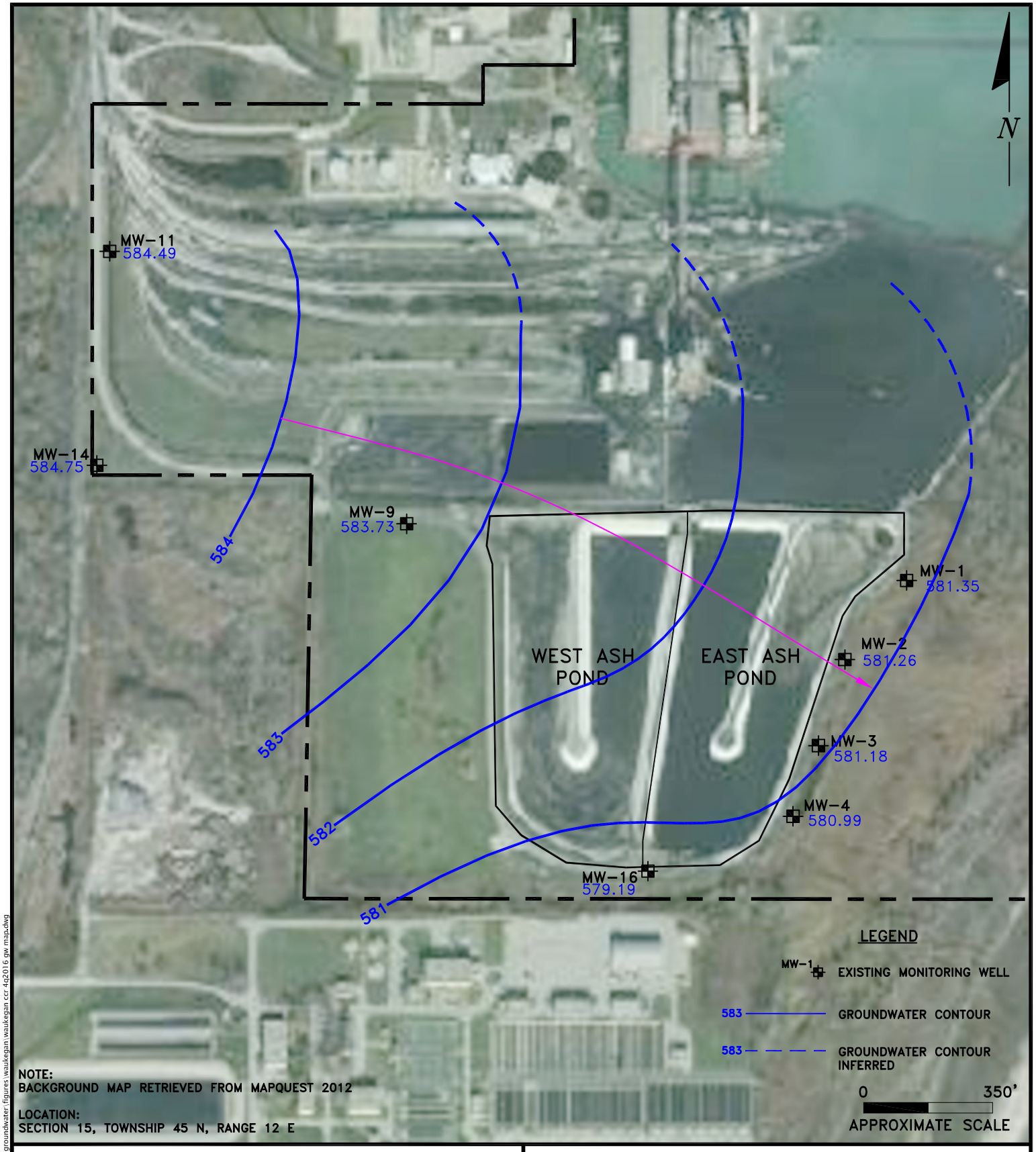

NOTE:
BACKGROUND MAP RETRIEVED FROM MAPQUEST 2012

LOCATION:
SECTION 15, TOWNSHIP 45 N, RANGE 12 E

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CCR GROUNDWATER CONTOUR-12/2016

WAUKEGAN STATION
WAUKEGAN, ILLINOIS

Scale: 1" = 350' | Date: January 3, 2017

KPRG Project No. 12313.2 | FIGURE 6

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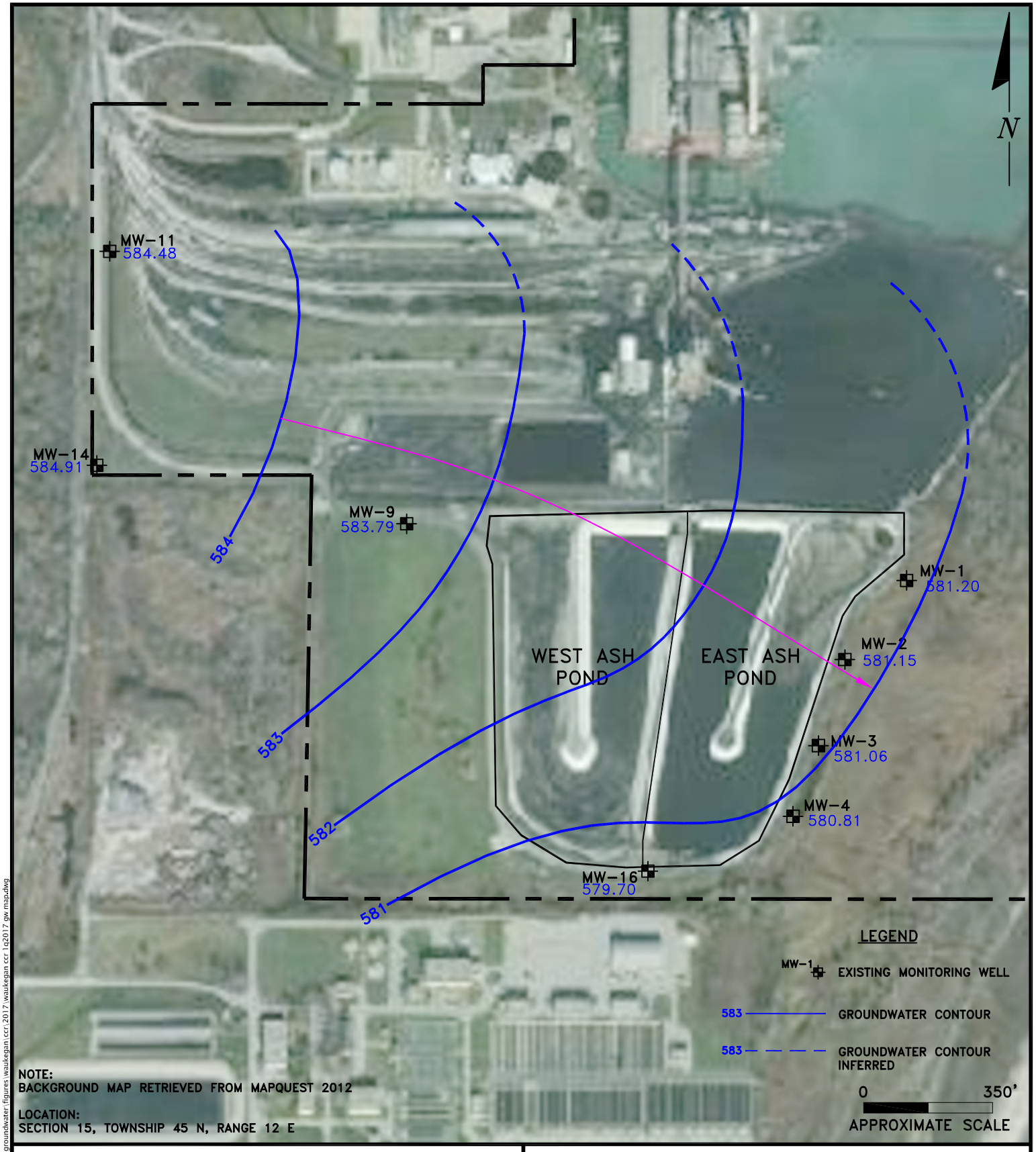

NOTE:
BACKGROUND MAP RETRIEVED FROM MAPQUEST 2012

LOCATION:
SECTION 15, TOWNSHIP 45 N, RANGE 12 E

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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-02/2017

WAUKEGAN STATION
WAUKEGAN, ILLINOIS

Scale: 1" = 350' | Date: April 5, 2017

KPRG Project No. 12313.2 | FIGURE 7

NOTE:
BACKGROUND MAP RETRIEVED FROM MAPQUEST 2012

LOCATION:
SECTION 15, TOWNSHIP 45 N, RANGE 12 E

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CCR GROUNDWATER CONTOUR-05/2017

WAUKEGAN STATION
WAUKEGAN, ILLINOIS

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

KPRG Project No. 12313.2 | FIGURE 8

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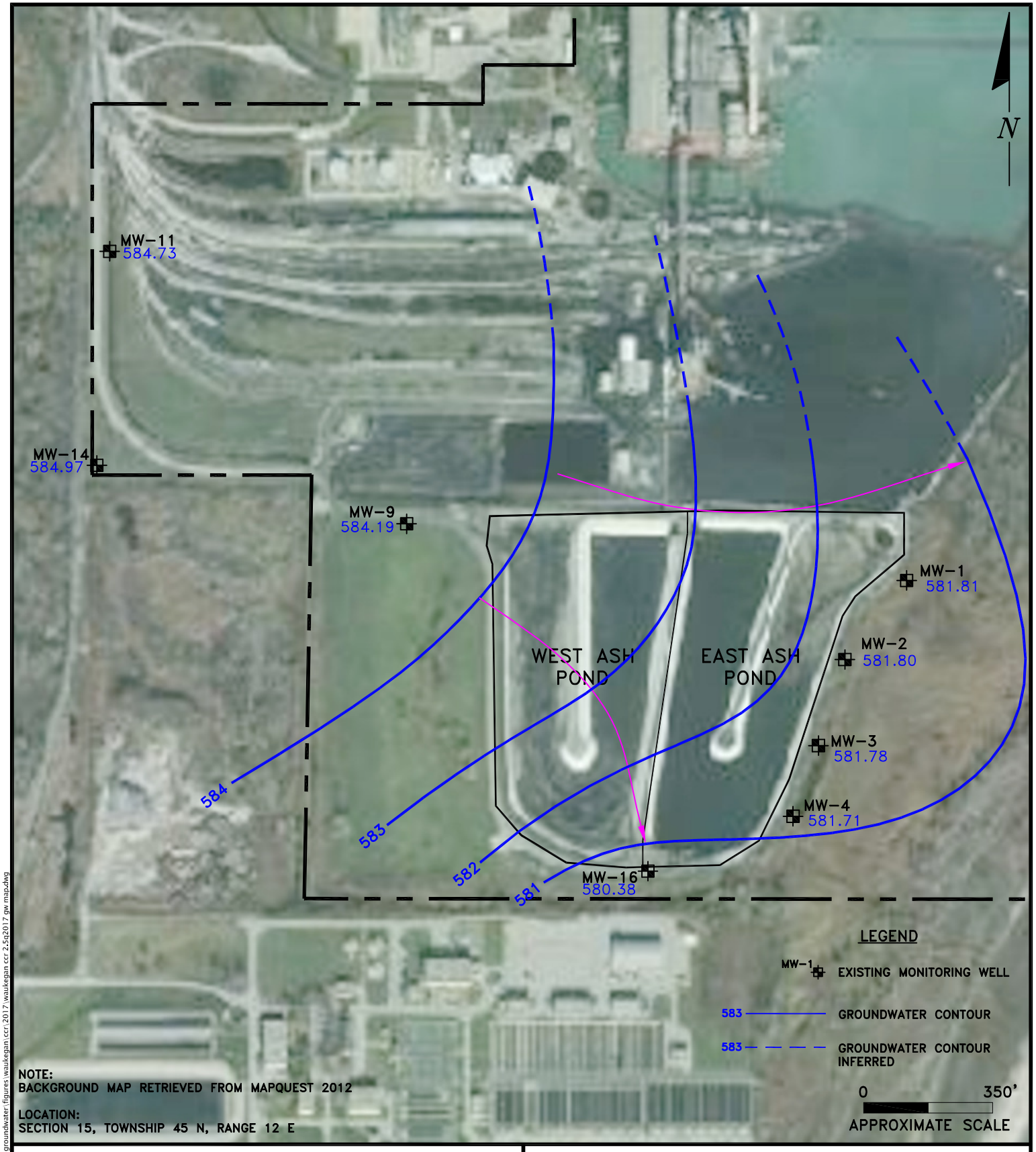

NOTE:
BACKGROUND MAP RETRIEVED FROM MAPQUEST 2012

LOCATION:
SECTION 15, TOWNSHIP 45 N, RANGE 12 E

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

CCR GROUNDWATER CONTOUR-07/2017

WAUKEGAN STATION
WAUKEGAN, ILLINOIS

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

KPRG Project No. 12313.2 | FIGURE 9

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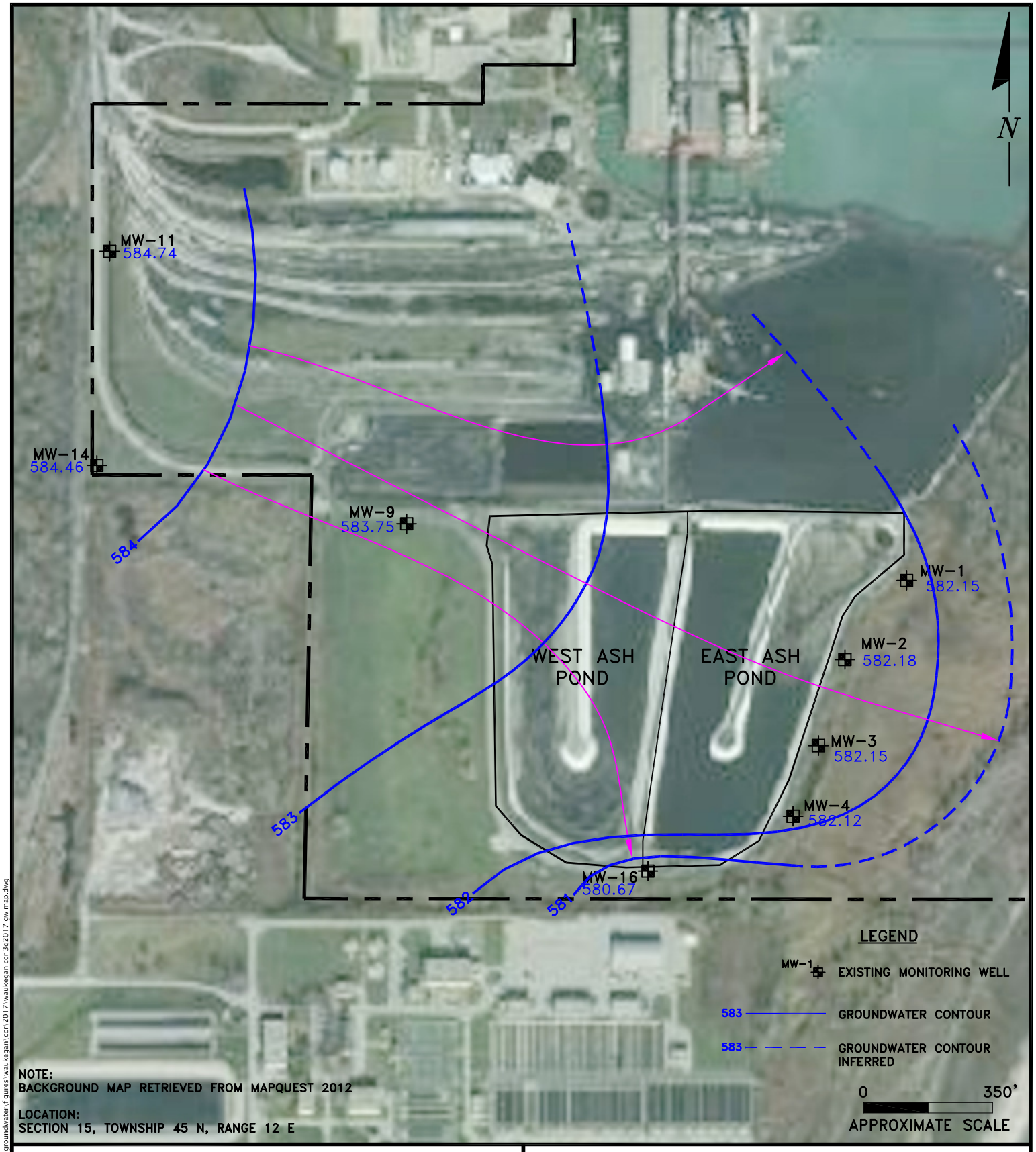

NOTE:
BACKGROUND MAP RETRIEVED FROM MAPQUEST 2012

LOCATION:
SECTION 15, TOWNSHIP 45 N, RANGE 12 E

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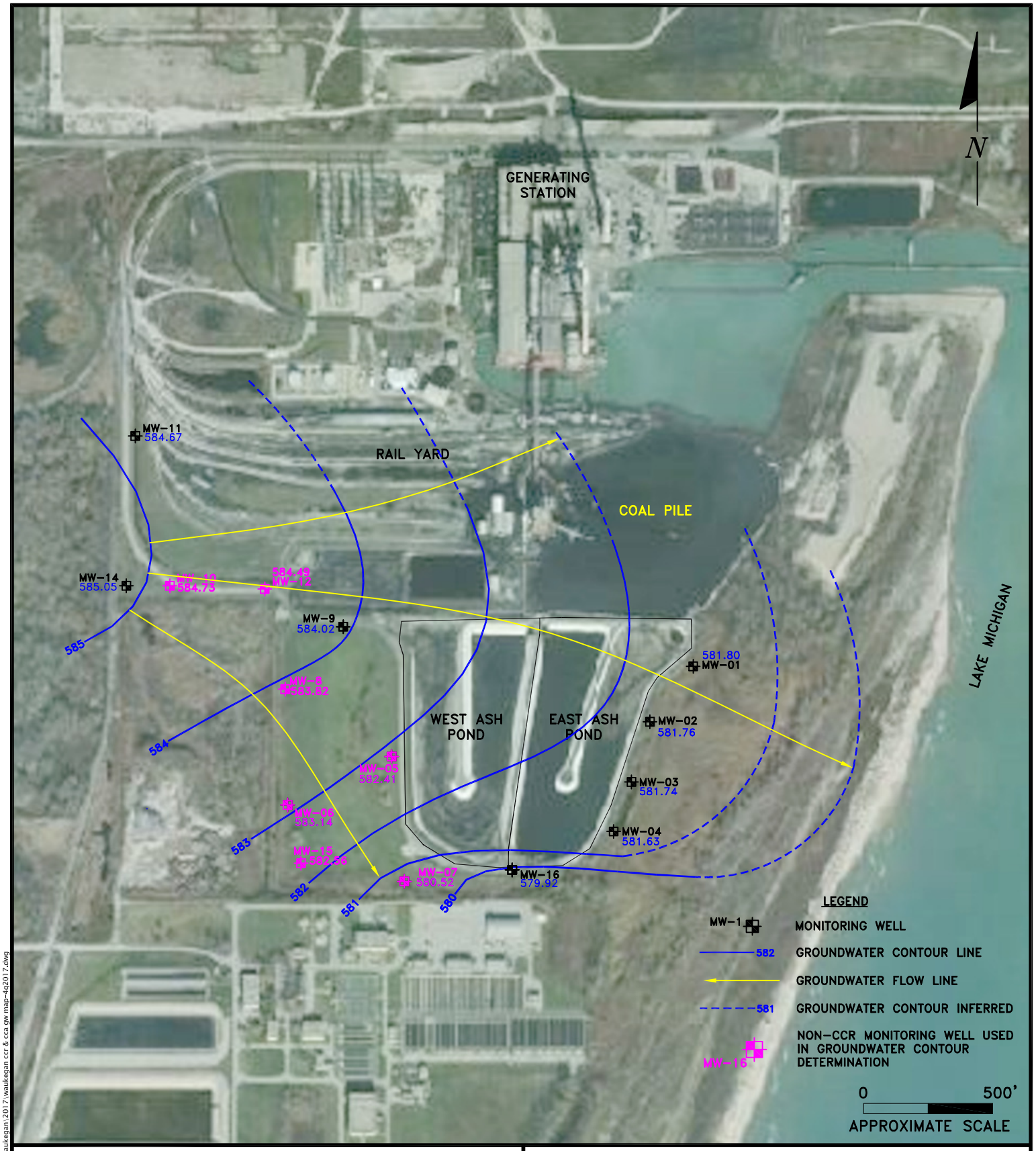
CCR GROUNDWATER CONTOUR-09/2017

WAUKEGAN STATION
WAUKEGAN, ILLINOIS

Scale: 1" = 350' | Date: October 18, 2017

KPRG Project No. 12313.2 | FIGURE 10



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GROUNDWATER CONTOUR MAP 11/2017

WAUKEGAN STATION
WAUKEGAN, ILLINOIS

Scale: 1" = 500' | Date: December 20, 2017

KPRG Project No. 12313.2 | FIGURE 11

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TABLES

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

Well ID	Date	Top of Casing Elevation (ft above MSL)	Depth to Groundwater (ft below TOC)	Groundwater Elevation (ft above MSL)
MW-01	11/2/2015	603.12	20.75	582.37
	2/29/2016	603.12	20.71	582.41
	5/2/2016	603.12	20.89	582.23
	8/23/2016	603.12	22.01	581.11
	12/2/2016	603.62	22.27	581.35
	2/21/2017	603.62	22.42	581.20
	5/15/2017	603.62	20.52	583.10
	7/5/2017	603.62	21.81	581.81
	9/11/2017	603.62	21.47	582.15
	11/27/2017	603.62	21.82	581.80
MW-02	11/2/2015	603.04	20.71	582.33
	2/29/2016	603.04	20.59	582.45
	5/2/2016	603.04	20.82	582.22
	8/23/2016	603.04	22.04	581.00
	12/2/2016	603.39	22.13	581.26
	2/21/2017	603.39	22.24	581.15
	5/15/2017	603.39	20.25	583.14
	7/5/2017	603.39	21.59	581.80
	9/11/2017	603.39	21.21	582.18
	11/27/2017	603.39	21.63	581.76
MW-03	11/2/2015	602.91	20.37	582.54
	2/29/2016	602.91	20.43	582.48
	5/2/2016	602.91	20.66	582.25
	8/23/2016	602.91	22.12	580.79
	12/2/2016	603.70	22.52	581.18
	2/21/2017	603.70	22.64	581.06
	5/15/2017	603.70	20.55	583.15
	7/5/2017	603.70	21.92	581.78
	9/11/2017	603.70	21.55	582.15
	11/28/2017	603.70	21.96	581.74
MW-04	11/2/2015	603.19	20.83	582.36
	2/29/2016	603.19	20.70	582.49
	5/2/2016	603.19	20.94	582.25
	8/23/2016	603.19	22.69	580.50
	12/2/2016	603.17	22.18	580.99
	2/21/2017	603.17	22.36	580.81
	5/15/2017	603.17	20.04	583.13
	7/5/2017	603.17	21.46	581.71
	9/11/2017	603.17	21.05	582.12
	11/28/2017	603.17	21.54	581.63
MW-09	11/2/2015	594.00	9.78	584.22
	2/29/2016	594.00	9.89	584.11
	5/2/2016	594.00	9.59	584.41
	8/23/2016	594.00	10.58	583.42
	12/2/2016	594.00	10.27	583.73
	2/21/2017	594.00	10.21	583.79
	5/15/2017	594.00	9.57	584.43
	7/6/2017	594.00	9.81	584.19
	9/11/2017	594.00	10.25	583.75
	11/29/2017	594.00	9.98	584.02
MW-11	11/2/2015	590.35	5.27	585.08
	2/29/2016	590.35	5.54	584.81
	5/2/2016	590.35	5.17	585.18
	8/23/2016	590.35	6.04	584.31
	12/2/2016	590.35	5.86	584.49
	2/21/2017	590.35	5.87	584.48
	5/15/2017	590.35	5.33	585.02
	7/6/2017	590.35	5.62	584.73
	9/11/2017	590.35	5.61	584.74
	11/30/2017	590.35	5.68	584.67
MW-14	11/2/2015	590.24	5.17	585.07
	2/29/2016	590.24	5.01	585.23
	5/2/2016	590.24	4.49	585.75
	8/23/2016	590.24	6.07	584.17
	12/2/2016	590.24	5.49	584.75
	2/21/2017	590.24	5.33	584.91
	5/15/2017	590.24	4.67	585.57
	7/6/2017	590.24	5.27	584.97
	9/11/2017	590.24	5.78	584.46
	11/30/2017	590.24	5.19	585.05
MW-16	11/2/2015	607.41	25.13	582.28
	2/29/2016	607.41	24.91	582.50
	5/2/2016	607.41	25.23	582.18
	8/23/2016	607.41	28.33	579.08
	12/2/2016	607.41	28.22	579.19
	2/21/2017	607.41	27.71	579.70
	5/15/2017	607.41	23.99	583.42
	7/6/2017	607.41	27.03	580.38
	9/11/2017	607.41	26.74	580.67
	11/27/2017	607.41	27.49	579.92

MSL - Mean Sea Level
TOC - Top of Casing

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

DATE	Groundwater Flow Direction	K_{avg} (ft/sec)*	Average Hydraulic Gradient (ft/ft)	Porosity (unitless)**	Estimated Seepage Velocity (ft/day)
11/2/2015	Southeast	4.040E-03	0.0018	0.35	1.75
2/29/2016	Southeast	4.040E-03	0.0013	0.35	1.30
5/2/2016	Southeast	4.040E-03	0.0015	0.35	1.45
8/23/2016	East-Southeast	4.040E-03	0.0017	0.35	1.65
12/2/2016	East-Southeast	4.040E-03	0.0021	0.35	2.09
2/21/2017	East-Southeast	4.040E-03	0.0022	0.35	2.14
5/15/2017	East-Southeast	4.040E-03	0.0008	0.35	0.80
7/5/2017	East-Southeast	4.040E-03	0.0049	0.35	4.84
9/11/2017	East-Southeast	4.040E-03	0.0018	0.35	1.75
11/27/2017	East-Southeast	4.040E-03	0.0024	0.35	2.39

* K_{avg} - Average hydraulic conductivity (feet/second) from Hydrogeologic Assessment Report, Patrick Engineering, February 2011.

** - Porosity estimate from Applied Hydrogeology, Fetter, 1980.

Table 3. Detection Monitoring - Appendix III Groundwater Analytical Results through 2017 - Midwest Generation, LLC, Waukegan Station, Waukegan, IL.

Well	Date	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
MW-09 up-gradient	11/4/2015	13	210	450	0.14	6.60	370	1700
	3/2/2016	35	380	720	0.11	7.02	970	2800
	5/3/2016	16	310	620	0.12	7.02	740	2500
	8/25/2016	4.5	130	270	0.21	7.13	190	1100
	12/8/2016	15	200	330	0.18	7.01	270	1300
	2/23/2017	14	190	290	0.12	7.68	320	1300
	5/16/2017	27	160	67	0.29	8.15	420	970
	7/6/2017	21	220	430	0.13	7.18	610	1800
	9/13/2017	21	250	420	0.14	7.17	520	1800
	11/29/2017	26	200	390	0.13	7.05	390	1600
MW-11 up-gradient	11/5/2015	5.2	140	240	0.13	6.51	190	1100
	3/2/2016	4.0	170	240	0.1	7.16	210	1200
	5/5/2016	5.0	140	280	0.11	7.17	160	1000
	8/26/2016	3.5	180	240	0.13	6.97	110	1100
	12/7/2016	3.0	170	270	0.12	7.06	110	1200
	2/24/2017	2.4	180	220	4.9	6.61	170	1200
	5/18/2017	1.8	160	170	0.12	7.42	120	1000
	7/6/2017	2.4	160	190	0.14	7.33	130	1100
	9/13/2017	1.9	140	150	0.26	7.16	96	870
	11/30/2017	2.2	170	200	0.14	6.99	93	1100
MW-14 up-gradient	11/5/2015	1.4	150	190	0.19	6.78	140	1000
	3/2/2016	0.93	150	110	0.17	7.24	150	870
	5/5/2016	1.2	170	120	0.18	7.17	190	980
	8/26/2016	1.5	200	210	0.12	7.00	190	1300
	12/7/2016	0.95	240	340	0.25	6.81	120	1100
	2/23/2017	0.73	150	99	0.19	6.88	110	730
	5/18/2017	0.81	120	130	0.3	7.62	70	590
	7/6/2017	1.2	190	180	0.13	7.29	190	1300
	9/13/2017	2.3	180	190	0.15	7.20	270	1200
	11/30/2017	0.85	170	130	0.19	7.33	99	940
MW-01 down-gradient	11/2/2015	1.8	64	71	0.46	10.93	310	560
	3/1/2016	V 1.9	58	63	0.26	11.13	270	570
	5/4/2016	2.0	45	60	0.3	11.09	210	490
	8/23/2016	2.0	42	60	0.26	10.49	240	550
	12/5/2016	2.2	55	65	0.34	10.46	180	560
	2/21/2017	2.2	50	61	0.29	11.30	250	540
	5/15/2017	2.1	52	59	0.37	10.69	330	570
	7/5/2017	2.3	44	51	0.34	10.83	320	570
	9/14/2017	2.4	71	47	0.24	10.45	430	770
	11/27/2017	2.7	84	43	0.11	7.85	330	840

Notes:
All units are in mg/l except pH is in standard units.
V - Serial Dilution exceeds the control limits
Italics Dates - Data that will be compared against establsihed statistical background.

Table 3. Detection Monitoring - Appendix III Groundwater Analytical Results through 2017 - Midwest Generation, LLC, Waukegan Station, Waukegan, IL.

Well	Date	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
MW-02 down-gradient	11/2/2015	3.0	32	47	0.78	8.27	230	460
	3/1/2016	4.1	39	47	1.3	8.57	220	510
	5/4/2016	3.3	34	51	1.5	8.19	180	440
	8/23/2016	3.1	42	59	1.3	7.52	250	500
	12/5/2016	3.1	28	56	1.0	8.62	160	430
	2/21/2017	3.3	31	52	0.8	8.75	190	420
	5/15/2017	3.6	85	48	0.6	8.33	320	640
	7/5/2017	4.2	100	52	0.4	7.92	300	710
	9/14/2017	2.5	87	54	0.4	8.19	340	780
	11/27/2017	3.4	69	57	0.6	7.34	200	570
MW-03 down-gradient	11/2/2015	2.3	72	87	0.51	9.26	270	570
	3/1/2016	2.9	61	70	0.33	7.33	220	530
	5/4/2016	2.4	42	74	0.56	7.25	170	470
	8/24/2016	2.0	70	59	0.3	9.13	200	430
	12/5/2016	2.4	57	60	0.41	7.62	120	440
	2/21/2017	2.2	56	65	0.33	7.56	180	460
	5/16/2017	3.9	110	61	0.27	7.9	320	820
	7/5/2017	3	60	60	0.28	7.46	200	470
	9/14/2017	2.1	86	57	0.26	7.53	260	680
	11/28/2017	2.6	69	63	0.56	6.96	120	500
MW-04 down-gradient	11/3/2015	1.8	66	62	0.51	6.68	240	480
	3/1/2016	2.0	58	51	0.5	7.17	170	450
	5/4/2016	1.6	44	49	0.61	6.92	140	340
	8/24/2016	2.0	46	58	0.56	7.01	120	370
	12/5/2016	3.4	200	60	0.21	7.40	300	1000
	2/22/2017	2.4	150	41	0.17	7.44	290	850
	5/16/2017	2.5	170	29	0.32	7.94	400	970
	7/5/2017	3.6	200	51	0.29	7.09	520	1100
	9/14/2017	2.5	180	45	0.28	7.04	480	1100
	11/28/2017	2.3	110	32	0.28	7.04	130	560
MW-16 down-gradient	11/3/2015	4.1	230	87	0.43	6.24	610	1400
	3/2/2016	3.1	360	130	0.35	6.76	990	1700
	5/2/2016	4.9	250	150	0.49	6.99	620	1600
	8/24/2016	3.6	130	53	0.71	7.00	330	830
	12/5/2016	3.8	160	52	0.51	7.03	280	920
	2/24/2017	6.5	200	67	0.2	5.76	570	1100
	5/16/2017	2.6	340	130	0.15	7.57	760	1700
	7/6/2017	9.5	190	70	0.57	7.35	480	1100
	9/13/2017	2.8	190	55	0.61	7.33	460	970
	11/27/2017	4.2	140	58	0.71	7.16	270	760

Notes:
All units are in mg/l except pH is in standard units.
V - Serial Dilution exceeds the control limits
Italics Dates - Data that will be compared against establsihed statistical background.

Table 4. Detection Monitoring - Appendix IV Groundwater Analytical Results through 2017 - Midwest Generation, LLC, Waukegan Station, Waukegan, IL

Well	Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Fluoride	Lead	Lithium	Mercury	Molybdenum	Radium 226 + 228 Combined	Selenium	Thallium
MW-09 up-gradient	11/4/2015	< 0.003	< 0.001	0.015	^ < 0.001	< 0.0005	< 0.005	< 0.001	0.14	< 0.0005	0.081	< 0.0002	0.260	0.1818	< 0.0025	< 0.002
	3/2/2016	< 0.003	0.06	0.05	< 0.001	< 0.0005	0.043	< 0.001	0.11	0.00061	0.094	< 0.0002	0.51	< 0.36	0.025	< 0.002
	5/3/2016	< 0.003	0.0014	0.025	< 0.001	< 0.0005	< 0.005	< 0.001	0.12	< 0.0005	0.083	< 0.0002	0.63	< 0.512	0.024	< 0.002
	8/25/2016	0.0041	0.042	0.024	< 0.001	0.0011	0.056	0.0027	0.21	0.0012	0.049	< 0.0002	0.063	0.482	0.039	< 0.002
	12/8/2016	< 0.003	0.004	0.016	< 0.001	0.00052	< 0.005	< 0.001	0.18	< 0.0005	0.077	< 0.0002	0.24	< 0.72	0.038	< 0.002
	2/23/2017	< 0.003	0.0027	0.014	< 0.001	< 0.0005	0.059	0.0018	0.12	< 0.0005	0.068	< 0.0002	0.26	< 0.461	0.016	< 0.002
	5/16/2017	< 0.003	< 0.001	0.0094	^< 0.001	< 0.0005	< 0.005	< 0.001	0.29	< 0.0005	0.045	< 0.0002	0.51	< 0.342	0.0085	< 0.002
	7/6/2017	< 0.003	0.002	0.018	< 0.001	< 0.0005	< 0.005	< 0.001	0.13	< 0.0005	0.089	< 0.0002	0.31	< 0.316	0.021	< 0.002
	9/13/2017	< 0.003	0.0067	0.019	< 0.001	< 0.0005	0.0052	0.0017	0.14	< 0.0005	0.069	< 0.0002	0.33	0.944	0.0041	< 0.002
	11/29/2017	< 0.003	0.0017	0.015	< ^ 0.001	< 0.0005	< 0.005	< 0.001	0.13	< 0.0005	0.086	< 0.0002	0.47	0.475	0.042	< 0.002
MW-11 up-gradient	11/5/2015	< 0.003	0.77	0.039	^ < 0.001	< 0.0005	< 0.005	< 0.001	0.13	0.001	0.055	< 0.0002	< 0.0050	0.656	< 0.0025	< 0.002
	3/2/2016	< 0.003	0.55	0.048	< 0.001	< 0.0005	0.0058	< 0.001	0.1	0.0011	0.049	< 0.0002	< 0.0050	1.09	< 0.0025	< 0.002
	5/5/2016	< 0.003	0.51	0.038	< 0.001	< 0.0005	< 0.005	< 0.001	0.11	< 0.0005	0.057	< 0.0002	< 0.005	1.24	< 0.0025	< 0.002
	8/26/2016	< 0.003	1.1	0.05	< 0.001	< 0.0005	0.0055	< 0.001	0.13	0.0005	0.055	< 0.0002	< 0.005	1.04	< 0.0025	< 0.002
	12/7/2016	< 0.003	0.87	0.049	< 0.001	< 0.0005	< 0.005	< 0.001	0.12	< 0.0005	0.038	< 0.0002	< 0.005	1.87	< 0.0025	< 0.002
	2/24/2017	< 0.003	0.58	0.047	< 0.001	< 0.0005	< 0.005	< 0.001	H 0.13	< 0.0005	0.039	< 0.0002	< 0.005	0.982	< 0.0025	< 0.002
	5/18/2017	< 0.003	0.5	0.047	^< 0.001	< 0.0005	0.0056	< 0.001	0.12	< 0.0005	0.036	< 0.0002	< 0.005	1.31	< 0.0025	< 0.002
	7/6/2017	< 0.003	0.69	0.056	< 0.001	< 0.0005	0.0057	< 0.001	0.14	< 0.0005	0.041	< 0.0002	< 0.005	0.889	< 0.0025	< 0.002
	9/13/2017	< 0.003	0.86	0.036	< 0.001	< 0.0005	0.008	< 0.001	0.26	0.00071	0.037	< 0.0002	0.0054	0.718	< 0.0025	< 0.002
	11/30/2017	< 0.003	0.59	0.05	< ^ 0.001	< 0.0005	< 0.005	< 0.001	0.14	< 0.0005	0.041	< 0.0002	< 0.005	1.21	< 0.0025	< 0.002
MW-14 up-gradient	11/5/2015	< 0.003	0.19	0.052	^ < 0.001	< 0.0005	0.01	0.0012	0.19	< 0.0005	0.025	< 0.0002	< 0.005	0.7087	< 0.0025	< 0.002
	3/2/2016	0.015	4.3	0.12	< 0.001	< 0.0005	1.1	0.0036	0.17	0.00068	0.019	< 0.0002	< 0.005	1.36	< 0.0025	< 0.002
	5/5/2016	< 0.003	0.35	0.054	< 0.001	< 0.0005	0.017	0.0014	0.18	< 0.0005	0.021	< 0.0002	< 0.005	< 0.488	< 0.0025	< 0.002
	8/26/2016	< 0.003	1.0	0.058	< 0.001	< 0.0005	0.021	< 0.001	0.12	< 0.0005	0.026	< 0.0002	< 0.005	0.75	< 0.0025	< 0.002
	12/7/2016	0.0096	19	0.42	< 0.001	0.00089	4.6	0.0025	0.25	0.00084	0.022	< 0.0002	0.0094	< 0.866	0.014	< 0.002
	2/23/2017	0.0061	9.3	0.36	< 0.001	0.001	4.6	0.0070	0.19	0.00095	0.017	< 0.0002	< 0.005	< 0.514	0.0031	< 0.002
	5/18/2017	0.0035	3.3	0.44	^< 0.001	0.002	4.8	0.0041	0.3	0.00054	0.013	0.00043	< 0.005	0.779	< 0.0025	< 0.002
	7/6/2017	< 0.003	0.4	0.071	< 0.001	< 0.0005	0.026	0.0013	0.13	< 0.0005	0.034	< 0.0002	< 0.005	0.549	< 0.0025	< 0.002
	9/13/2017	< 0.003	0.52	0.065	< 0.001	< 0.0005	0.0078	< 0.0010	0.15	< 0.0005	0.025	< 0.0002	< 0.005	< 0.359	< 0.0025	< 0.002
	11/30/2017	0.0093	21	0.27	< ^ 0.001	0.00068	3.2	0.0021	0.19	< 0.0005	0.023	< 0.0002	0.0055	1.01	0.0072	< 0.002
MW-01 down-gradient	11/2/2015	< 0.003	0.074	0.025	^ < 0.001	< 0.0005	< 0.005	< 0.001	0.46	< 0.0005	< 0.01	< 0.0002	0.04	0.0683	0.0047	< 0.002
	3/1/2016	< 0.003	0.1	0.026	< 0.001	< 0.0005	< 0.005	< 0.001	0.26	< 0.0005	< 0.01	< 0.0002	0.059	< 0.317	< 0.0025	< 0.002
	5/4/2016	< 0.003	0.11	0.017	< 0.001	< 0.0005	< 0.005	< 0.001	0.3	< 0.0005	< 0.01	< 0.0002	0.069	< 0.40	< 0.0025	< 0.002
	8/23/2016	< 0.003	0.074	0.012	< 0.001	< 0.0005	< 0.005	< 0.001	0.26	< 0.0005	< 0.01	< 0.0002	0.065	< 0.478	0.0042	< 0.002
	12/5/2016	< 0.003	0.13	0.017	< 0.001	< 0.0005	< 0.005	< 0.001	0.34	< 0.0005	< 0.01	< 0.0002	0.07	< 0.465	0.0025	< 0.002
	2/21/2017	< 0.003	0.15	0.016	< 0.001	< 0.0005	< 0.005	< 0.001	0.29	< 0.0005	< 0.01	< 0.0002	0.069	0.516	< 0.0025	< 0.002
	5/15/2017	< 0.003	0.14	0.017	^< 0.001	< 0.0005	< 0.005	< 0.001	0.37	< 0.0005	< 0.01	< 0.0002	0.062	< 0.424	0.0036	< 0.002
	7/5/2017	< 0.003	0.066	0.014	< 0.001	< 0.0005	< 0.005	< 0.001	0.34	< 0.0005	< 0.01	< 0.0002	0.059	< 0.289	0.0095	< 0.002
	9/14/2017	< 0.003	0.04	0.033	< 0.001	< 0.0005	< 0.005	< 0.001	0.24	< 0.0005	< 0.01	< 0.0002	0.047	< 0.383	0.0096	< 0.002
	11/27/2017	< 0.003	0.021	0.055	< ^ 0.001	< 0.0005	< 0.005	< 0.001	0.11	< 0.0005	< 0.01	< 0.0002	0.034	0.568	0.023	< 0.002

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

^ - Denotes instrument related QC exceeds the control limits
NS - No Standard

H - Sample preped or analyzed beyond specific holding time.

Table 4. Detection Monitoring - Appendix IV Groundwater Analytical Results through 2017 - Midwest Generation, LLC, Waukegan Station, Waukegan, IL

Well	Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Fluoride	Lead	Lithium	Mercury	Molybdenum	Radium 226 + 228 Combined	Selenium	Thallium
MW-02 down-gradient	11/2/2015	< 0.003	0.014	0.016	^ < 0.001	< 0.0005	< 0.005	< 0.001	0.78	< 0.0005	< 0.01	< 0.0002	0.0630	0.4628	< 0.0025	< 0.002
	3/1/2016	< 0.003	0.011	0.02	< 0.001	< 0.0005	< 0.005	< 0.001	1.3	< 0.0005	< 0.01	< 0.0002	0.078	0.529	< 0.0025	< 0.002
	5/4/2016	< 0.003	0.0081	0.018	< 0.001	< 0.0005	< 0.005	< 0.001	1.5	< 0.0005	< 0.01	< 0.0002	0.069	< 0.425	< 0.0025	< 0.002
	8/23/2016	< 0.003	0.0082	0.016	< 0.001	< 0.0005	< 0.005	< 0.001	1.3	< 0.0005	< 0.010	< 0.0002	0.056	< 0.439	< 0.0025	< 0.002
	12/5/2016	< 0.003	0.018	0.015	< 0.001	< 0.0005	< 0.005	< 0.001	1.0	< 0.0005	< 0.01	< 0.0002	0.071	0.509	< 0.0025	< 0.002
	2/21/2017	< 0.003	0.028	0.012	< 0.001	< 0.0005	< 0.005	< 0.001	0.8	< 0.0005	< 0.01	< 0.0002	0.051	< 0.416	0.0038	< 0.002
	5/15/2017	< 0.003	0.02	0.029	^< 0.001	< 0.0005	< 0.005	< 0.001	0.6	< 0.0005	< 0.01	< 0.0002	0.047	0.425	0.023	< 0.002
	7/5/2017	< 0.003	0.0094	0.031	< 0.001	< 0.0005	< 0.005	< 0.001	0.4	< 0.0005	< 0.01	< 0.0002	0.047	< 0.295	0.017	< 0.002
	9/14/2017	< 0.003	0.012	0.035	< 0.001	< 0.0005	< 0.005	< 0.001	0.4	< 0.0005	< 0.01	< 0.0002	0.049	0.769	0.0052	< 0.002
	11/27/2017	< 0.003	0.011	0.022	< ^ 0.001	< 0.0005	< 0.005	< 0.001	0.6	< 0.0005	< 0.01	< 0.0002	0.048	< 0.442	< 0.0025	< 0.002
MW-03 down-gradient	11/2/2015	< 0.003	0.0068	0.011	^ < 0.001	< 0.0005	< 0.005	< 0.001	0.51	< 0.0005	< 0.01	< 0.0002	0.0370	0.071	< 0.0025	< 0.002
	3/1/2016	< 0.003	0.0069	0.015	< 0.001	< 0.0005	< 0.005	< 0.001	0.33	< 0.0005	< 0.01	< 0.0002	0.0560	< 0.332	0.0043	< 0.002
	5/4/2016	< 0.003	0.007	0.011	< 0.001	< 0.0005	< 0.005	< 0.001	0.56	< 0.0005	< 0.01	< 0.0002	0.058	< 0.48	< 0.0025	< 0.002
	8/24/2016	< 0.003	0.010	0.0069	< 0.001	< 0.0005	< 0.005	< 0.001	0.3	< 0.0005	< 0.01	< 0.0002	0.042	< 0.428	< 0.0025	< 0.002
	12/5/2016	< 0.003	0.0065	0.0094	< 0.001	< 0.0005	< 0.005	< 0.001	0.41	< 0.0005	< 0.010	< 0.0002	0.044	< 0.526	< 0.0025	< 0.002
	2/21/2017	< 0.003	0.011	0.0067	< 0.001	< 0.0005	< 0.005	< 0.001	0.33	< 0.0005	< 0.010	< 0.0002	0.043	0.437	< 0.0025	< 0.002
	5/16/2017	< 0.003	0.0087	0.039	^< 0.001	< 0.0005	< 0.005	< 0.001	0.27	< 0.0005	< 0.010	< 0.0002	0.041	< 0.461	0.014	< 0.002
	7/5/2017	< 0.003	0.0029	0.017	< 0.001	< 0.0005	< 0.005	< 0.001	0.28	< 0.0005	< 0.010	< 0.0002	0.058	< 0.304	0.0045	< 0.002
	9/14/2017	< 0.003	0.0024	0.026	< 0.001	< 0.0005	< 0.005	< 0.001	0.26	< 0.0005	< 0.010	< 0.0002	0.056	0.462	0.0081	< 0.002
	11/28/2017	< 0.003	0.0025	0.016	< ^ 0.001	< 0.0005	< 0.005	< 0.001	0.56	< 0.0005	< 0.010	< 0.0002	0.057	1.17	< 0.0025	< 0.002
MW-04 down-gradient	11/3/2015	< 0.003	0.0066	0.032	^ < 0.001	< 0.0005	< 0.005	< 0.001	0.51	< 0.0005	< 0.01	< 0.0002	0.031	0.2732	< 0.0025	< 0.002
	3/1/2016	< 0.003	0.0083	0.033	< 0.001	< 0.0005	< 0.005	< 0.001	0.5	< 0.0005	< 0.01	< 0.0002	0.048	0.478	< 0.0025	< 0.002
	5/4/2016	< 0.003	0.0083	0.017	< 0.001	< 0.0005	< 0.005	< 0.001	0.61	< 0.0005	< 0.01	< 0.0002	0.046	< 0.542	< 0.0025	< 0.002
	8/24/2016	< 0.003	0.0099	0.019	< 0.001	< 0.0005	< 0.005	< 0.001	0.56	< 0.0005	< 0.01	< 0.0002	0.049	< 0.461	< 0.0025	< 0.002
	12/5/2016	< 0.003	0.019	0.13	< 0.001	< 0.0005	< 0.005	< 0.0010	0.21	< 0.0005	< 0.01	< 0.0002	0.0097	1.04	0.02	< 0.002
	2/22/2017	< 0.003	0.036	0.093	< 0.001	< 0.0005	< 0.005	< 0.0010	0.17	< 0.0005	< 0.01	< 0.0002	0.015	0.886	0.0042	< 0.002
	5/16/2017	< 0.003	0.024	0.072	^< 0.001	< 0.0005	< 0.005	< 0.0010	0.32	< 0.0005	< 0.01	< 0.0002	0.017	0.55	0.032	< 0.002
	7/5/2017	< 0.003	0.0034	0.076	< 0.001	< 0.0005	< 0.005	< 0.0010	0.29	< 0.0005	< 0.01	< 0.0002	0.017	0.515	0.062	< 0.002
	9/14/2017	< 0.003	0.0028	0.076	< 0.001	< 0.0005	< 0.005	< 0.0010	0.28	< 0.0005	< 0.01	< 0.0002	0.021	0.794	0.026	< 0.002
	11/28/2017	< 0.003	0.0027	0.053	< ^ 0.001	< 0.0005	< 0.005	< 0.0010	0.28	< 0.0005	< 0.01	< 0.0002	0.032	0.872	0.0069	< 0.002
MW-16 down-gradient	11/3/2015	< 0.003	0.001	0.047	^ < 0.001	< 0.0005	< 0.005	< 0.001	0.43	< 0.0005	0.071	< 0.0002	0.021	0.865	0.0074	< 0.002
	3/2/2016	< 0.003	0.0015	0.035	< 0.001	0.001	< 0.005	< 0.001	0.35	< 0.0005	0.13	< 0.0002	0.013	< 0.396	0.0052	0.002
	5/2/2016	< 0.003	0.0011	0.052	< 0.001	0.00053	< 0.005	< 0.001	0.49	< 0.0005	0.024	< 0.0002	0.014	0.70	< 0.0025	< 0.002
	8/24/2016	< 0.003	< 0.001	0.028	< 0.001	< 0.0005	< 0.005	< 0.001	0.71	< 0.0005	0.014	< 0.0002	0.022	< 0.462	< 0.0025	< 0.002
	12/5/2016	< 0.003	0.036	0.062	< 0.001	< 0.0005	< 0.005	0.0012	0.51	0.00054	0.011	< 0.0002	0.021	0.791	< 0.0025	< 0.002
	2/24/2017	< 0.003	0.027	0.067	< 0.001	< 0.0005	0.005	0.0011	0.2	< 0.0005	0.012	< 0.0002	0.023	0.54	0.0037	< 0.002
	5/16/2017	< 0.003	0.043	0.045	^< 0.001	0.0043	0.0076	< 0.001	0.15	0.00057	0.13	< 0.0002	0.016	0.441	0.016	0.0021
	7/6/2017	< 0.003	0.0029	0.029	< 0.001	0.00069	< 0.005	< 0.001	0.57	< 0.0005	0.017	< 0.0002	0.017	< 0.382	< 0.0025	< 0.002
	9/13/2017	< 0.003	< 0.001	0.024	< 0.001	0.0005	< 0.005	< 0.001	0.61	< 0.0005	< 0.01	< 0.0002	0.024	< 0.335	< 0.0025	< 0.002
	11/27/2017	< 0.003	0.0031	0.026	< ^ 0.001	0.00097	< 0.005	< 0.001	0.71	< 0.0005	0.01	< 0.0002	0.026	0.557	< 0.0025	< 0.002

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

^ - Denotes instrument related QC exceeds the control limits
NS - No Standard

H - Sample preped or analyzed beyond specific holding time.