2019 Annual Groundwater Monitoring and Corrective Action Report

WEST ASH POND COMPLEX
WOOD RIVER SITE
1 CHESSEN LANE
ALTON, ILLINOIS 62202

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2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

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1.0 INTRODUCTION

In accordance with Code of Federal Regulation (CFR) requirements under 40 CFR 257.90(e), ATON Environmental Consulting and Engineering PLLC (ATON) has prepared this report on behalf of CTI Development LLC (CTI) for the 2019 Wood River West Ash Pond Complex in Alton, Illinois. CTI took possession of the power station property on August 30, 2019 from Luminant/Dynegy Midwest Generation, LLC (DMG).

The owner or operator of an existing Coal Combustion Residuals (CCR) unit shall prepare an annual groundwater monitoring and corrective action report, for the preceding calendar year, that documents the status of the groundwater monitoring and corrective action program for the CCR unit. The report should summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and key activities for the upcoming year per 40 CFR § 257.90(e). The annual report will minimally cover the following site-specific information:

1. A drawing or diagram showing the CCR unit, the designated background (or upgradient) monitoring wells, and the designated downgradient monitoring wells.
2. Identification and discussion of any monitoring wells that were installed or decommissioned during the preceding year.
3. Provide a summary of groundwater samples taken for the West Ash Pond Complex, including the number of groundwater samples collected for analysis at each of the designated background and downgradient wells, the dates collected, whether the sample was required by the detection monitoring or assessment monitoring programs, and the groundwater monitoring data obtained under 40 CFR 257.90 - 257.98.
4. A discussion of the groundwater monitoring program including:
    a. Statistical analysis of groundwater data to identify constituents detected at a statistically significant increase over background levels.
    b. The transition from detection groundwater monitoring to assessment monitoring of constituents identified in the statistical assessment.
5. Other information required to be included in the annual report as specified in 40 CFR 257.90 - 257.98.

2.0 MONITORING & CORRECTIVE ACTION PROGRAM STATUS

As referenced in the 2018 Annual Groundwater Monitoring and Corrective Action Report (NRT/OGB 2019), the West Ash Pond Complex has been in an Assessment Monitoring Program in accordance with 40 CFR 257.94(e)(2). DMG placed the required notification on April 9, 2019.

Assessment monitoring sampling was continued in 2019 during the quarterly sampling events under the direction of DMG and the new owner, CTI. Samples were collected from each of the West Ash Pond Complex designated upgradient and downgradient wells and analyzed for the Appendix III and Appendix IV parameters. The analytical data was evaluated in accordance with the Statistical Analysis Plan (NRT/OBG 2017) provisions to determine if any statistically significant increases (SSIs) of the Appendix III parameters were above the background concentrations and if statistically significant levels (SSLs) of Appendix IV parameters were above the Groundwater Protections Standards (GWPSs).

In 2019, the West Ash Pond Complex entered into the quarterly sampling schedule as outlined with the Groundwater Monitoring Plan (NRT/OBG Oct. 2016) and Closure Plan (AECOM Nov. 2016). Quarterly sampling events were completed by Teklab Inc. on the following dates:

Q1 Sample Date	Q2 Sample Date	Q3 Sample Date	Q4 Sample Date
2/19/2019	5/29/2019	9/20/2019	11/19/2019

Assessment Monitoring Program Summary
November 2017 – November 2019

Well ID	Appendix III - SSIs		Appendix IV - SSLs	
	Trend	UCL Value	Trend	UCL Value
02	All Trends Decreasing or Statistically Insignificant	Boron & Sulfate Above Background	None	N/A
04	Increasing Trend for Fluoride Only	Fluoride Below Background	None	N/A
32R	Increasing Trend for Boron Only	Boron Above Background	None	N/A
34	All Trends Decreasing or Statistically Insignificant	Boron & Fluoride Above Background	None	N/A

The Statistical Background Values for the SSIs evaluation from Appendix III are summarized in Table A. The GWPSs for the SSLs evaluation from Appendix IV are summarized in Table B.

Table A - Statistical Background Values

Parameter	Statistical Background Value
Appendix III	
Boron (mg/L)	1.17
Calcium (mg/L	667.381
Chloride (mg/L)	3316
Fluoride (mg/L)	0.4
pH (S.U.)	6.4 / 7.4
Sulfate (mg/L)	279
TDS (mg/L)	7629

Notes:
mg/L = milligrams per liter
S.U. = Standard Units
TDS = Total Dissolved Solids

Table B - Groundwater Protection Standards

Parameter	Groundwater Protection Standard
Appendix IV	
Antimony (mg/L)	0.006
Arsenic (mg/L)	0.0574
Barium (mg/L)	2
Beryllium (mg/L)	0.004
Cadmium (mg/L)	0.005
Chromium (mg/L)	0.10
Cobalt (mg/L)	0.006
Fluoride (mg/L)	4
Lead (mg/L)	0.015
Lithium (mg/L)	0.171
Mercury (mg/L)	0.002
Molybdenum (mg/L)	0.10
Selenium (mg/L)	0.05
Thallium (mg/L)	0.002
Radium 226+228 (pCi/L)	5

Notes:
mg/L = milligrams per liter
pCi/L = picoCuries per liter

3.0 ACTIONS COMPLETED IN 2019

As previously noted, a quarterly groundwater sampling event was completed for the West Ash Pond Complex in 2019 under the Assessment Monitoring Program. A summary of the analytical data and statistical analyses are found in Appendix B - Tables 1 and 2.

Appendix A - Figure 1 displays the designated groundwater well system for the West Ash Pond Complex.

4.0 PROBLEMS ENCOUNTERED & CORRECTIVE ACTIONS

Performance and assessment of the designated groundwater well system for the West Ash Pond Complex encountered no issues during 2019. Guidelines in the Sampling and Analysis Plan (NRT/OGB, 2017) were followed during the collection and analysis of the representative samples.

5.0 2020 PLANNED ACTIONS

The following actions are planned for 2020:

- The continuation of Assessment Monitoring Program of the West Ash Pond Complex with quarterly sampling events.
- The continuation of statistical evaluation of the collected analytical data from the designated groundwater well system to determine if any SSLs for Appendix IV parameters has occurred.
- If an SSL has been identified, an assessment of "potential alternative sources" will be completed. A "potential alternative source" is one other than the referenced CCR unit that could have caused the SSL or the SSL resulted from an error in one of the following processes: sample collection, sample analysis, statistical evaluation, or a possible variation/change in the groundwater systems quality.
    - If an alternative source is causing the SSL, a documented demonstration will be completed within 90 days after the SSL discovery and included in the Groundwater Monitoring and Corrective Action report for that year.
    - If an alternative source is <u>not</u> the cause of the SSL, the procedure and requirements in 40 CFR 257.94 - 257.98 as applicable will be met. This also includes completion of the appropriate notifications required by 40 CFR 257.105 - 257.108.

6.0 REFERENCES

AECOM, November 28, 2016. Closure and Post-Closure Care Plan for the Wood River West Ash Complex at Dynegy Midwest Generation, LLC., Wood River Power Station.

Natural Resource Technology, Inc. (NRT), October 19, 2016. Groundwater Monitoring Plan, West Ash Pond Complex, Wood River Power Station, Alton, Illinois.

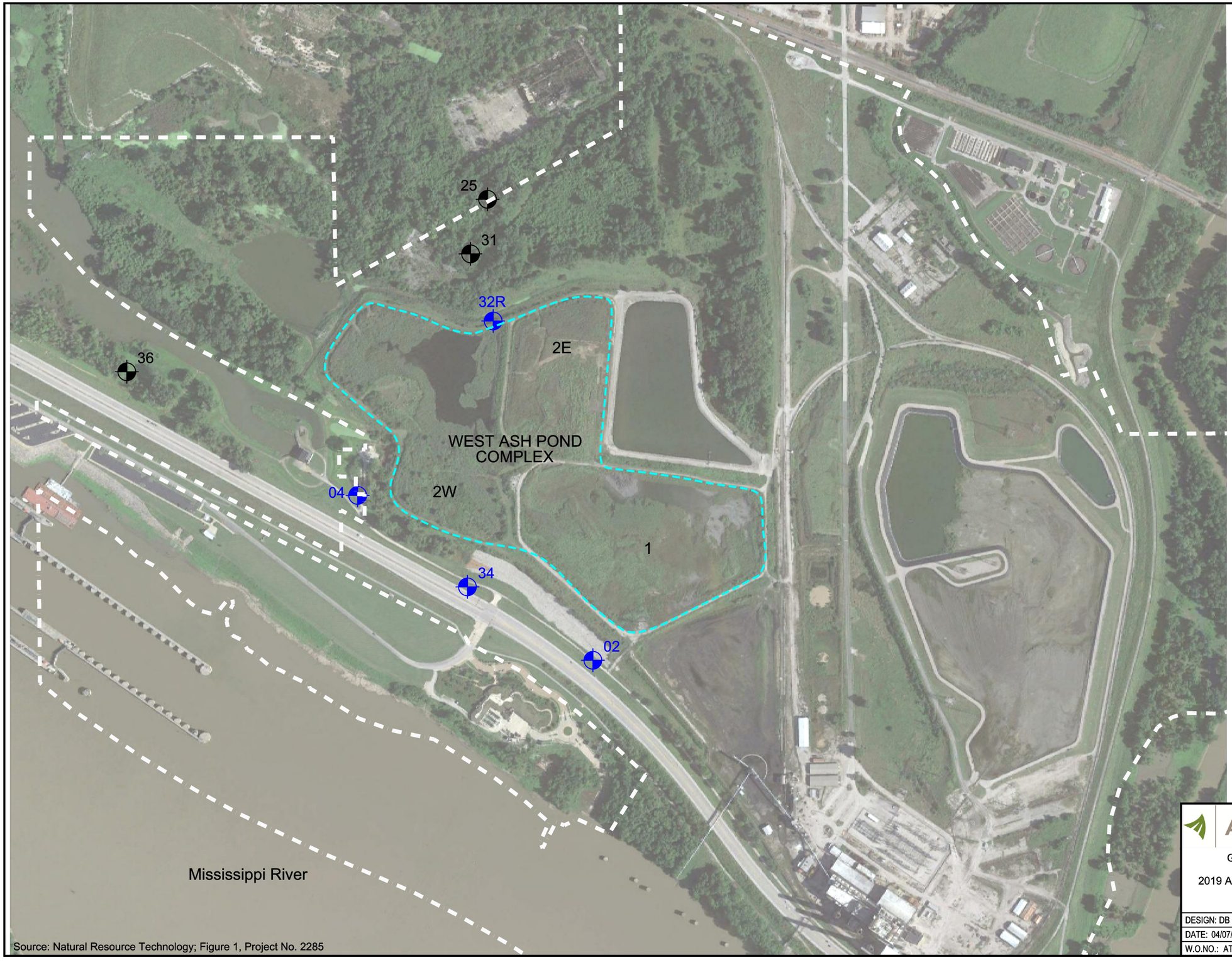
NRT/OBG, October 17, 2017. Sampling and Analysis Plan, West Ash Pond Complex, Wood River Power Station, Alton, Illinois.

NRT/OBG, October 17, 2017. Statistical Analysis Plan, Wood River Power Station, Alton, Illinois.

USEPA, April 17, 2015. 40 CFR Parts 257 and 261. Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule.

APPENDIX A

FIGURES



N

LEGEND

34 DOWNGRADIENT MONITORING MONITORING WELL LOCATION

31 BACKGROUND MONITORING WELL LOCATION

WEST IMPOUNDMENT

PROPERTY BOUNDARY (BASED ON 1997 SURVEY DATA)

Notes:

1. Figure base map modified after Natural Resource Technology, 2017.
2. Reference elevation data developed by others, 2015.
3. Field and analytical data provided by Teklabs, 2019.
4. Soil boring/well installations provided by various contractors, 1994-2004.
5. Well locations are approximate.

0 500 1000

SCALE APPROXIMATE FEET

Source: Natural Resource Technology; Figure 1, Project No. 2285

ATON

FIGURE 1
GROUNDWATER WELL SAMPLING LOCATION MAP
Designated Wells for West Ash Pond Complex
2019 Annual Groundwater Monitoring and Corrective Action Report
CTI Development LLC
Former Wood River Power Plant - Alton, IL

DESIGN: DB	DRAWN: LMC	CHKD.: DB
DATE: 04/07/2020	SCALE: AS SHOWN	REV.:
W.O.NO.: ATON\WOOD RIVER\FIG 1 GW WELL SAMP LOC MAP WEST POND		

APPENDIX B

TABLES

Table 1
Summary of Analytical Analyses - Appendix III
West Ash Pond Complex

Sample Location	Date Sampled	Boron (mg/L)	Calcium (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	pH (S.U.)	Sulfate (mg/L)	TDS (mg/L)
	Background values	**1.17**	**667.381**	**3316**	**0.4**	**6.4 / 7.4**	**279**	**7629**
Background / Upgradient Monitoring Wells								
25	11/2/2017	0.676	283	129	0.36	7.3	227	1300
	5/2/2018	0.41	177	148	0.41	6.70	130	906
	8/1/2018	0.48	188	148	0.43	6.90	137	998
	2/19/2019	0.37	133	97	0.43	6.98	72	716
	5/29/2019	0.32	131	99	0.45	6.97	63	688
	9/20/2019	0.43	165	100	0.46	6.78	79	858
	11/19/2019	0.49	176	142	0.43	6.83	122	912
31	11/2/2017	0.885	224	1090	0.28	7.5	190	3120
	5/2/2018	0.74	331	1320	0.33	6.70	287	3720
	8/1/2018	0.82	248	1150	0.32	7.00	244	3460
	2/19/2019	1.12	220	572	0.29	7.00	176	2460
	5/29/2019	0.99	256	910	0.30	6.87	178	2960
	9/20/2019	1.11	311	1020	0.28	6.54	174	3600
	11/19/2019	1.09	353	1300	0.25	6.72	192	3690
36	11/2/2017	0.107	75.2	45	0.24	7.4	<10	370
	5/2/2018	0.14	99	48	0.24	6.20	7	392
	7/31/2018	0.12	75	50	0.24	7.00	10	384
	2/19/2019	0.11	77	46	0.26	7.09	13	372
	9/20/2019	0.09	66	40	0.28	7.08	11	334
	11/19/2019	0.11	66.4	40	0.26	7.18	15	316
Downgradient Monitoring Wells								
2	11/2/2017	4.47	196	76	0.17	7.5	230	982
	5/2/2018	5.53	221	53	0.15	6.20	212	968
	8/1/2018	4.13	192	62	0.15	6.70	231	982
	2/19/2019	3.76	202	69	0.15	6.80	229	992
	5/29/2019	2.64	176	67	0.17	6.74	177	828
	9/20/2019	1.75	147	60	0.17	6.58	134	786
	11/19/2019	1.67	153	66	0.15	6.74	134	786
4	11/2/2017	0.40	199	61	0.16	7.4	<10	788
	5/2/2018	0.39	226	59	0.18	6.20	10	782
	7/31/2018	0.35	194	46	0.18	6.90	<10	818
	2/19/2019	0.33	197	35	0.21	6.92	10	778
	5/29/2019	0.36	199	35	0.18	6.85	7	772
	9/20/2019	0.36	182	37	0.19	6.72	<50	748
	11/19/2019	0.35	171	51	0.20	6.87	6	702
32R	11/2/2017	0.72	100	91	0.35	7.5	76	624
	5/2/2018	1.71	204	226	0.36	6.50	108	1,190
	8/1/2018	1.30	135	132	0.33	6.80	95	826
	2/19/2019	2.29	140	85	0.27	6.92	105	748
	5/29/2019	1.70	99.5	66	0.35	6.91	76	610
	9/19/2019	3.61	117	29	0.21	6.71	93	588
	11/19/2019	3.41	104	61	0.24	6.72	102	600
34	11/2/2017	1.51	254	152	0.52	7.4	<10	1,060
	5/2/2018	2.33	191	182	0.69	6.20	10	946
	7/31/2018	2.36	200	178	0.67	6.80	<10	972
	2/19/2019	2.21	221	179	0.67	6.86	<10	1,000
	5/29/2019	1.63	206	108	0.52	6.89	9	762
	9/20/2019	0.79	151	69	0.41	6.76	<50	662
	11/19/2019	0.86	168	87	0.42	6.90	6	722

Table 2
Summary of Analytical Analyses - Appendix IV
West Ash Pond Complex

Sample Location	Date Sampled	Sb, total (mg/L)	As, total (mg/L)	Ba, total (mg/L)	Be, total (mg/L)	Cd, total (mg/L)	Cr, total (mg/L)	Co, total (mg/L)	F, total (mg/L)	Pb, total (mg/L)	Li, total (mg/L)	Hg, total (mg/L)	Mo, total (mg/L)	Ra 226/228 Combined (pCi/L)	Se, total (mg/L)	Tl, total (mg/L)
	GWPS	0.006	0.0574	2	0.004	0.005	0.1	0.006	4	0.015	0.171	0.002	0.1	5	0.05	0.002
Background / Upgradient Monitoring Wells																
25	5/2/2018	0.001	0.0339	0.212	<0.001	0.0023	0.0015	0.0024	0.41	0.0024	0.036	<0.0002	0.0027	0.54	0.0012	<0.002
	8/1/2018	<0.001	0.0038	0.132	NA	<0.001	<0.0015	0.0012	0.43	<0.001	0.0385	NA	0.003	0.73	<0.001	NA
	2/19/2019	<0.001	0.004	0.102	<0.001	<0.001	<0.002	0.002	0.43	<0.001	0.029	<0.0002	0.005	0.19	<0.001	<0.002
	5/29/2019	0.0005	0.0048	0.106	<0.001	0.0017	<0.0015	0.0019	0.45	0.0011	0.0281	<0.0002	0.0047	0.38	<0.001	<0.002
	9/20/2019	<0.001	0.0029	0.124	<0.001	<0.001	<0.0015	<0.001	0.46	<0.001	0.034	<0.0002	0.0055	0.14	<0.001	<0.002
	11/19/2019	<0.001	0.005	0.133	<0.001	<0.001	<0.0015	0.0012	0.43	<0.001	0.039	<0.0002	0.0048	0.27	<0.001	<0.002
31	5/2/2018	0.001	0.0022	0.181	<0.001	0.001	<0.0015	0.001	0.33	<0.001	0.1	<0.0002	0.0063	2.96	0.0217	<0.002
	8/1/2018	<0.001	0.0023	0.182	NA	<0.001	0.0039	<0.001	0.32	<0.001	0.0903	NA	0.0066	1.43	0.0256	NA
	2/19/2019	<0.001	0.002	0.162	<0.001	<0.001	<0.002	<0.001	0.29	<0.001	0.059	<0.0002	0.006	1.28	0.036	<0.002
	5/29/2019	0.0005	0.0015	0.145	<0.001	0.0002	<0.0015	0.0002	0.3	<0.001	0.081	<0.0002	0.0048	0.00123	0.0252	<0.002
	9/20/2019	<0.001	0.0012	0.14	<0.001	<0.001	<0.0015	<0.001	0.28	<0.001	0.0921	<0.0002	0.0036	0.74	0.03	<0.002
	11/19/2019	<0.001	0.0009	0.158	<0.001	0.0006	<0.0015	0.0002	0.25	<0.001	0.102	<0.0002	0.0035	2.88	0.0262	<0.002
36	5/2/2018	<0.001	0.0028	0.343	<0.001	<0.001	<0.0015	0.001	0.24	<0.001	0.0042	<0.0002	<0.0015	2.41	<0.001	<0.002
	7/31/2018	<0.001	0.0023	0.3	NA	<0.001	<0.0015	<0.001	0.24	<0.001	0.004	NA	<0.0015	0.6	<0.001	NA
	2/19/2019	<0.001	0.003	0.35	<0.001	<0.001	<0.002	<0.001	0.26	<0.001	0.004	<0.0002	0.002	0.82	<0.001	<0.002
	9/20/2019	<0.001	0.0017	0.227	<0.001	<0.001	<0.0015	<0.001	0.28	<0.001	0.0039	<0.0002	<0.0015	0.81	<0.001	<0.002
	11/19/2019	<0.001	0.0021	0.242	<0.001	<0.001	<0.0015	0.0001	0.26	<0.001	0.0039	<0.0002	<0.0015	0.85	<0.001	<0.002
Downgradient Monitoring Wells																
2	5/2/2018	<0.001	0.0025	0.111	<0.001	<0.001	<0.0015	0.002	0.15	<0.001	0.0292	<0.0002	0.0015	0.42	<0.001	<0.002
	8/1/2018	<0.001	0.0021	0.0927	NA	<0.001	<0.0015	0.0017	0.15	<0.001	0.0235	NA	<0.0015	0.53	<0.001	NA
	2/19/2019	<0.001	0.002	0.097	<0.001	<0.001	<0.002	<0.001	0.15	<0.001	0.025	<0.0002	<0.002	0.13	<0.001	<0.002
	5/29/2019	<0.001	0.0016	0.103	<0.001	<0.001	<0.0015	0.0031	0.17	<0.001	0.0221	<0.0002	0.0009	0.34	<0.001	<0.002
	9/20/2019	<0.001	0.0016	0.0649	<0.001	<0.001	<0.0015	0.0021	0.17	<0.001	0.0204	<0.0002	<0.0015	0.09	<0.001	<0.002
	11/19/2019	<0.001	0.0013	0.0618	<0.001	<0.001	<0.0015	0.0017	0.15	<0.001	20.7	<0.0002	0.0007	0.76	<0.001	<0.002
4	5/2/2018	<0.001	0.0321	0.33	<0.001	<0.001	<0.0015	0.001	0.18	<0.001	0.0026	<0.0002	0.0015	0.57	0.001	<0.002
	7/31/2018	<0.001	0.0283	0.279	NA	<0.001	<0.0015	<0.001	0.18	<0.001	0.0028	NA	<0.0015	0.29	<0.001	NA
	2/19/2019	<0.001	0.039	0.333	<0.001	<0.001	<0.002	<0.001	0.21	<0.001	0.003	<0.0002	<0.002	0.4	<0.001	<0.002
	5/29/2019	<0.001	0.0215	0.28	<0.001	<0.001	<0.0015	0.0005	0.18	<0.001	0.003	<0.0002	0.0008	1.41	<0.001	<0.002
	9/20/2019	<0.001	0.0292	0.306	<0.001	<0.001	<0.0015	<0.001	0.19	<0.001	<0.003	<0.0002	<0.0015	0.58	<0.001	<0.002
	11/19/2019	<0.001	0.0345	0.309	<0.001	<0.001	<0.0015	0.0004	0.2	<0.001	0.0027	<0.0002	0.0008	1.3	<0.001	<0.002
32R	5/2/2018	0.001	0.001	0.314	<0.001	<0.001	<0.0015	0.001	0.36	<0.001	0.0271	<0.0002	0.0225	1.77	0.0287	<0.002
	8/1/2018	<0.001	<0.001	0.182	NA	<0.001	<0.0015	<0.001	0.33	<0.001	0.021	NA	0.0158	1.42	0.0158	NA
	2/19/2019	<0.001	<0.001	0.174	<0.001	<0.001	<0.002	<0.001	0.27	<0.001	0.02	<0.0002	0.012	1.19	0.007	<0.002
	5/29/2019	0.0005	0.0006	0.155	<0.001	<0.001	<0.0015	<0.001	0.35	<0.001	0.0164	<0.0002	0.0172	0.86	0.0057	<0.002
	9/19/2019	<0.001	<0.001	0.132	<0.001	<0.001	<0.0015	<0.001	0.21	<0.001	0.0149	<0.0002	0.0055	0.49	0.0015	<0.002
	11/19/2019	<0.001	0.0007	0.156	<0.001	<0.001	<0.0015	0.0002	0.24	<0.001	0.0184	<0.0002	0.0103	1.48	0.0011	<0.002
34	5/2/2018	<0.001	0.0153	0.356	<0.001	<0.001	<0.0015	0.001	0.69	<0.001	0.0022	<0.0002	0.0015	1.46	<0.001	<0.002
	7/31/2018	<0.001	0.0156	0.347	NA	<0.001	<0.0015	<0.001	0.67	<0.001	0.0028	NA	<0.0015	0.9	<0.001	NA
	2/19/2019	<0.001	0.015	0.399	<0.001	<0.001	<0.002	<0.001	0.67	<0.001	0.003	<0.0002	<0.002	0.66	<0.001	<0.002
	5/29/2019	<0.001	0.0692	0.355	<0.001	<0.001	<0.0015	0.0004	0.52	<0.001	0.0024	<0.0002	0.0024	2.0	<0.001	<0.002
	9/20/2019	<0.001	0.0307	0.278	<0.001	<0.001	<0.0015	<0.001	0.41	<0.001	<0.003	<0.0002	<0.0015	0.21	<0.001	<0.002
	11/19/2019	<0.001	0.0437	0.3	<0.001	<0.001	<0.0015	0.0003	0.42	<0.001	0.0021	<0.0002	0.0012	0.71	<0.001	<0.002

Notes:
mg/L = milligrams per liter
S.U. = Standard Units
TDS = Total Dissolved Solids
< = Concentration is less than the reporting limit