2018 Annual Groundwater Monitoring and Corrective Action Report

Havana East Ash Pond (Cells 1, 2, 3, and 4) – CCR Multi-Unit ID 701
Havana Power Station
15260 North State Route 78
Havana, Illinois 62644

Dynegy Midwest Generation, LLC

January 31, 2019

OBG
Part of Ramboll

JANUARY 31, 2019 | PROJECT #70098

2018 Annual Groundwater Monitoring and Corrective Action Report

Havana East Ash Pond (Cells 1, 2, 3, and 4)
CCR Multi-Unit ID 701
Havana Power Station
Havana, Illinois

Prepared for:
Dynegy Midwest Generation, LLC

RACHEL A. BANOFF
Environmental Engineer

KRISTEN L. THEESFELD, PG
Hydrogeologist

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

CCR	Coal Combustion Residuals
CFR	Code of Federal Regulations
GWPS	Groundwater Protection Standard
mg/L	milligrams per liter
NRT/OBG	Natural Resource Technology, an OBG Company
OBG	O'Brien & Gere Engineers, part of Ramboll
pCi/L	picoCuries per liter
SSI	Statistically Significant Increase
SSL	Statistically Significant Level
S.U.	Standard Units
TDS	Total Dissolved Solids

SECTION 1: INTRODUCTION

This report has been prepared on behalf of Dynegy Midwest Generation, LLC by O'Brien & Gere Engineers, part of Ramboll (OBG), to provide the information required by the Code of Federal Regulations (CFR) found in 40 CFR 257.90(e) for the Havana East Ash Pond (Cells 1, 2, 3, and 4) located at Havana Power Station near Havana, Illinois.

In accordance with 40 CFR § 257.90(e), the owner or operator of an existing Coal Combustion Residuals (CCR) unit must 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, summarizes key actions completed, describes any problems encountered, discusses actions to resolve the problems, and projects key activities for the upcoming year. At a minimum, the annual report must contain the following information, to the extent available:

1. A map, aerial image, or diagram showing the CCR unit and all background (or upgradient) and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program for the CCR unit.
2. Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken.
3. In addition to all the monitoring data obtained under §§ 257.90 through 257.98, a summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs.
4. A narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels).
5. Other information required to be included in the annual report as specified in §§ 257.90 through 257.98[1].

This report provides the required information for the Havana East Ash Pond (Cells 1, 2, 3, and 4) for calendar year 2018.

[1] For calendar year 2018, corrective action and other information required to be included in the annual report as specified in §§ 257.96 through 257.98 is not applicable.

SECTION 2: MONITORING AND CORRECTIVE ACTION PROGRAM STATUS

Detection Monitoring Program sampling event dates and parameters collected are provided in the detection monitoring program summary table below. One sample was collected from each background and downgradient well in the monitoring system during each sampling event. Analytical data was evaluated after each event in accordance with the Statistical Analysis Plan, Havana Power Station, Dynegy Midwest Generation, LLC (NRT/OBG, 2017a) to identify any statistically significant increases (SSIs) of Appendix III parameters over background concentrations. The sampling event and whether SSIs were identified are provided in the detection monitoring program summary table below.

Detection Monitoring Program Summary

Sampling Dates	Parameters Collected	SSIs	Assessment Monitoring Program Established
November 15, 2017	Appendix III	Yes	April 9, 2018

Alternate source evaluations were inconclusive for one or more of the SSIs. Consequently, and in accordance with 40 CFR § 257.94(e)(2), an Assessment Monitoring Program was established for Havana East Ash Pond (Cells 1, 2, 3, and 4) on April 9, 2018 and the required notifications completed.

The first Assessment Monitoring sampling event was completed on May 17, 2018. One sample was collected from each background and downgradient well in the monitoring system and analyzed for Appendix III and Appendix IV parameters. In accordance with 40 CFR § 257.95(d)(1), all wells were resampled on September 11, 2018 for all Appendix III parameters and Appendix IV parameters detected during the first Assessment Monitoring sampling event. One sample was collected from each background and downgradient well in the monitoring system. Analytical data from the resampling event was evaluated in accordance with the statistical analysis plan (NRT/OBG, 2017a) to determine any SSIs of Appendix III parameters over background concentrations or statistically significant levels (SSLs) of Appendix IV parameters over Groundwater Protection Standards (GWPSs). The assessment monitoring program summary table below provides a summary of the Assessment Monitoring Program and results of SSL determinations.

Assessment Monitoring Program Summary

Sampling Dates	Parameters Collected	SSLs
May 17, 2018	Appendix III Appendix IV	Not Applicable
September 11, 2018	Appendix III Appendix IV Detected	To Be Determined

Statistical background values are provided in Table 1 and GWPSs in Table 2. Analytical results from the events summarized in the detection and assessment monitoring summary tables above are included in Tables 3 and 4.

The Havana East Ash Pond (Cells 1, 2, 3, and 4) remains in the Assessment Monitoring Program in accordance with 40 CFR § 257.95.

SECTION 3: KEY ACTIONS COMPLETED IN 2018

Two groundwater monitoring events were completed in 2018 under the Assessment Monitoring Program. These events occurred in May and September, and are detailed in Section 2. One groundwater sample was collected from each background and downgradient well in the monitoring system during each event. All samples were collected and analyzed in accordance with the Sampling and Analysis Plan (NRT/OBG, 2017b). All monitoring data obtained under 40 CFR §§ 257.90 through 257.98 (as applicable) in 2018 are presented in Tables 3 and 4. The groundwater monitoring system, including the CCR multi-unit and all background and downgradient monitoring wells, is presented in Figure 1.

SECTION 4: PROBLEMS ENCOUNTERED AND ACTIONS TO RESOLVE THE PROBLEMS

No problems were encountered with the groundwater monitoring program during 2018. Groundwater samples were collected and analyzed in accordance with the Sampling and Analysis Plan (NRT/OBG, 2017b), and all data was accepted.

SECTION 5: KEY ACTIVITIES PLANNED FOR 2019

The following key activities are planned for 2019:

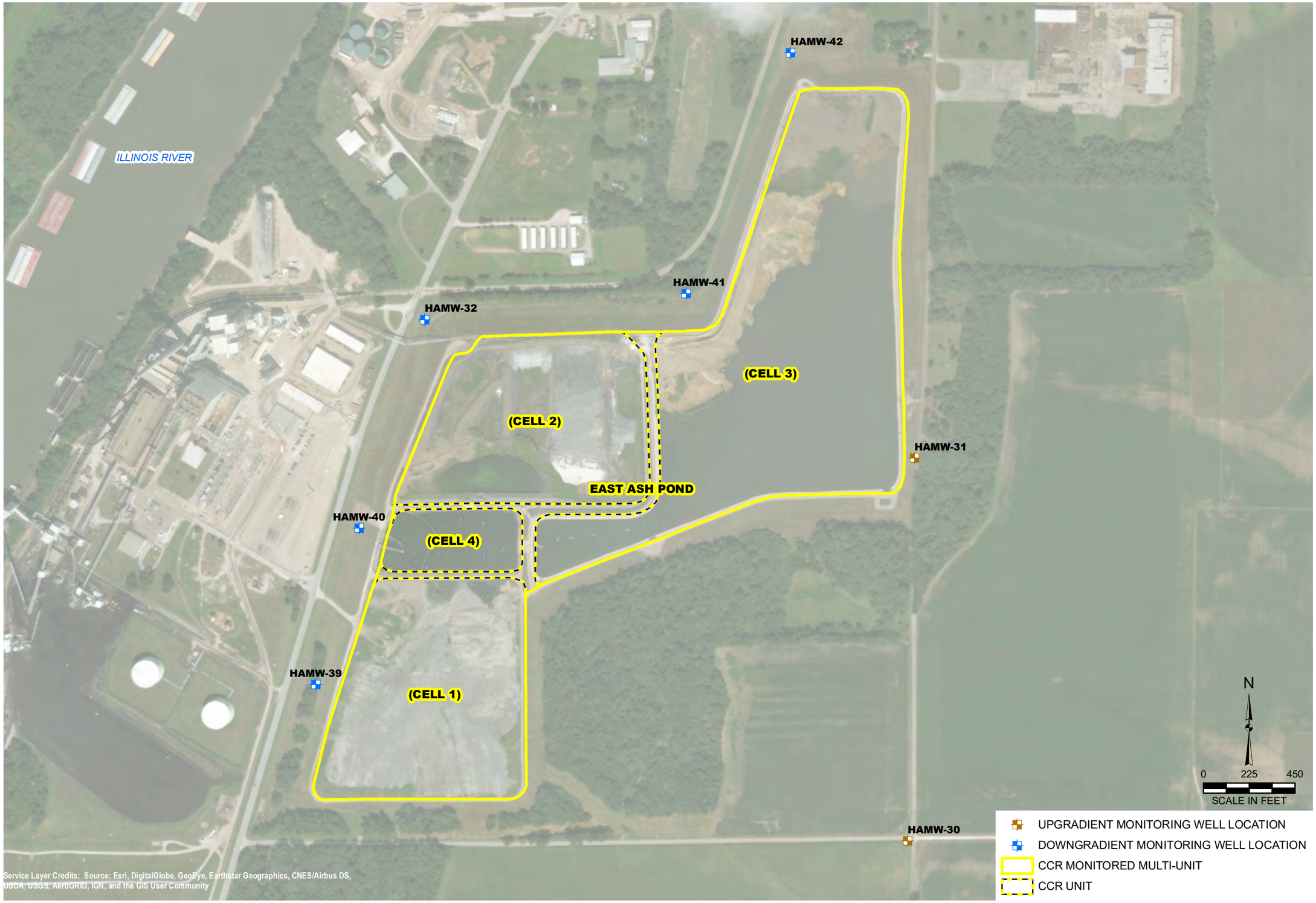
- Continuation of the Assessment Monitoring Program with semi-annual sampling scheduled for the first and third quarters of 2019.
- Complete evaluation of analytical data from the downgradient wells, using GWPSs to determine whether an SSL of Appendix IV parameters has occurred.
- If an SSL is identified, potential alternate sources (i.e., a source other than the CCR unit caused the SSL or that SSL resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality) will be evaluated. If an alternate source is demonstrated to be the cause of the SSL, a written demonstration will be completed within 90 days of SSL determination and included in the annual groundwater monitoring and corrective action report for 2019.
  - If an alternate source(s) is not identified to be the cause of the SSL, the applicable requirements of 40 CFR §§ 257.94 through 257.98 (e.g., assessment of corrective measures) as may apply in 2019 will be met, including associated recordkeeping/notifications required by 40 CFR §§ 257.105 through 257.108.

REFERENCES

Natural Resource Technology, an OBG Company, 2017a, Statistical Analysis Plan, Baldwin Energy Complex, Havana Power Station, Hennepin Power Station, Wood River Power Station, Dynegy Midwest Generation, LLC, October 17, 2017.

Natural Resource Technology, an OBG Company, 2017b, Sampling and Analysis Plan, Havana East Ash Pond (Cells 1, 2, 3, and 4), Havana Power Station, Havana, Illinois, Project No. 2285, Revision 0, October 17, 2017.

Figures



GROUNDWATER SAMPLING WELL LOCATION MAP
HAVANA EAST ASH POND CELLS 1, 2, 3, AND 4
MULTI-UNIT ID: 701

2018 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
VISTRA CCR RULE GROUNDWATER MONITORING
HAVANA POWER STATION
HAVANA, ILLINOIS

DRAWN BY/DATE: SDS 11/28/18
REVIEWED BY/DATE: RAB 1/24/19
APPROVED BY/DATE: KLT 1/28/19

PROJECT NO: 70098

FIGURE NO: 1

OBG
Part of Ramboll

Y:\Mapping\Projects\222285\MXD\2018_AnnualGWM_CAR\Figure 1_GWS_WellLoc_Havana.mxd Author: stolzsd Date/Time: 1/28/2019, 3:32:51 PM

Tables

Table 1. Statistical Background Values

2018 Annual Groundwater Monitoring and Corrective Action Report
Havana Power Station
Multi-Unit ID 701 - Havana Eash Ash Pond (Cells 1, 2, 3, and 4)

Parameter	Statistical Background Value
Appendix III	
Boron (mg/L)	0.0948
Calcium (mg/L)	75.6
Chloride (mg/L)	18
Fluoride (mg/L)	DQR*
pH (S.U.)	6.7 / 8.3
Sulfate (mg/L)	26
TDS (mg/L)	324

[O: KLS 8/22/18, C: RAB 8/30/18]

Notes:

DQR = Double Quantification Rule
mg/L = milligrams per liter
S.U. = Standard Units
TDS = Total Dissolved Solids

*All upgradient results are non-detect values. A detected downgradient value is considered to be an exceedance and will be automatically resampled.

Table 2. Groundwater Protection Standards

2018 Annual Groundwater Monitoring and Corrective Action Report
Havana Power Station
Multi-Unit ID 701 - Havana Eash Ash Pond (Cells 1, 2, 3, and 4)

Parameter	Groundwater Protection Standard
Appendix IV	
Antimony (mg/L)	0.006
Arsenic (mg/L)	0.01
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)	0.04
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

[O: KLS 8/22/18, C: RAB 8/30/18]

Notes:

mg/L = milligrams per liter

pCi/L = picoCuries per liter

Table 3. Appendix III Analytical Results

2018 Annual Groundwater Monitoring and Corrective Action Report
Havana Power Station
Multi-Unit ID 701 - Havana Eash Ash Pond (Cells 1, 2, 3, and 4)

Sample Location	Date Sampled	B, total (mg/L)	Ca, total (mg/L)	Cl, total (mg/L)	F, total (mg/L)	pH (field) (S.U.)	SO4, total (mg/L)	TDS (mg/L)
Background / Upgradient Monitoring Wells								
HAMW-30	11/15/2017	0.0365	52.7	18	<0.1	7.6	20	292
	5/17/2018	0.0402	47.1	15	<0.1	7.5	17	224
	9/11/2018	0.0371	46.8	16	<0.1	7.7	19	246
HAMW-31	11/15/2017	0.0581	64.8	15	<0.1	7.4	19	320
	5/17/2018	0.0819	65.6	13	<0.1	7.2	20	298
	9/11/2018	0.0534	59.1	15	<0.1	7.5	20	280
Downgradient Monitoring Wells								
HAMW-32	11/15/2017	0.0541	70.8	14	<0.1	7.4	22	192
	5/17/2018	0.0585	66.0	14	<0.1	7.0	26	316
	9/11/2018	0.0570	65.5	15	<0.1	7.3	27	308
HAMW-39	11/15/2017	0.0482	54.7	13	<0.1	7.4	19	274
	5/17/2018	0.0543	58.8	14	<0.1	7.2	25	276
	9/11/2018	0.0544	56.8	15	<0.1	7.5	27	284
HAMW-40	11/15/2017	0.202	88.6	19	<0.1	7.3	42	402
	5/17/2018	0.338	86.8	23	<0.1	6.9	49	408
	9/11/2018	0.308	93.5	28	<0.1	7.0	60	450
HAMW-41	11/15/2017	0.0438	63.4	13	<0.1	7.6	31	294
	5/17/2018	0.0536	61.5	13	<0.1	7.2	28	300
	9/11/2018	0.0432	60.5	14	<0.1	7.5	38	294
HAMW-42	11/15/2017	0.0533	69.5	11	<0.1	7.7	31	298
	5/17/2018	0.0524	68.5	10	<0.1	7.2	29	306
	9/11/2018	0.0473	62.6	11	<0.1	7.4	32	288

[O: RAB 12/27/18, C: JQW 12/27/18]

Notes:

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

Table 4. Appendix IV Analytical Results

2018 Annual Groundwater Monitoring and Corrective Action Report

Havana Power Station

Multi-Unit ID 701 - Havana Eash Ash Pond (Cells 1, 2, 3, and 4)

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)	Ra226/228 Combined (pCi/L)	Se, total (mg/L)	Tl, total (mg/L)
Background / Upgradient Monitoring Wells																
HAMW-30	5/17/2018	<0.001	0.001	0.0162	<0.001	<0.001	0.0018	<0.001	<0.1	<0.001	<0.0015	<0.0002	<0.0015	0.24	<0.001	<0.002
	9/11/2018[a]	NA	0.001	0.0172	NA	NA	<0.0015	NA	<0.1	NA	NA	NA	NA	0.40	<0.001	NA
HAMW-31	5/17/2018	<0.001	<0.001	0.0227	<0.001	<0.001	0.0024	<0.001	<0.1	<0.001	<0.0015	<0.0002	<0.0015	0.35	<0.001	<0.002
	9/11/2018[a]	NA	<0.001	0.0213	NA	NA	<0.0015	NA	<0.1	NA	NA	NA	NA	0.09	<0.001	NA
Downgradient Monitoring Wells																
HAMW-32	5/17/2018	<0.001	<0.001	0.0194	<0.001	<0.001	0.0017	<0.001	<0.1	<0.001	<0.0015	<0.0002	<0.0015	0.22	<0.001	<0.002
	9/11/2018[a]	NA	<0.001	0.0202	NA	NA	<0.0015	NA	<0.1	NA	NA	NA	NA	0.00	<0.001	NA
HAMW-39	5/17/2018	<0.001	<0.001	0.0121	<0.001	<0.001	<0.0015	<0.001	<0.1	<0.001	<0.0015	<0.0002	<0.0015	0.39	0.0012	<0.002
	9/11/2018[a]	NA	<0.001	0.0117	NA	NA	<0.0015	NA	<0.1	NA	NA	NA	NA	0.66	<0.001	NA
HAMW-40	5/17/2018	<0.001	<0.001	0.0265	<0.001	<0.001	0.0019	<0.001	<0.1	<0.001	<0.0015	<0.0002	<0.0015	0.15	<0.001	<0.002
	9/11/2018[a]	NA	<0.001	0.0323	NA	NA	<0.0015	NA	<0.1	NA	NA	NA	NA	1.05	0.001	NA
HAMW-41	5/17/2018	<0.001	<0.001	0.0185	<0.001	<0.001	<0.0015	<0.001	<0.1	<0.001	<0.0015	<0.0002	<0.0015	0.76	0.0012	<0.002
	9/11/2018[a]	NA	<0.001	0.0165	NA	NA	<0.0015	NA	<0.1	NA	NA	NA	NA	1.41	0.0011	NA
HAMW-42	5/17/2018	<0.001	<0.001	0.0197	<0.001	<0.001	<0.0015	<0.001	<0.1	<0.001	<0.0015	<0.0002	<0.0015	0.50	<0.001	<0.002
	9/11/2018[a]	NA	<0.001	0.0162	NA	NA	<0.0015	NA	<0.1	NA	NA	NA	NA	0.15	<0.001	NA

[O: RAB 12/27/18, C: JQW 12/27/18, U: AJB 1/28/19]

Notes:

mg/L = milligrams per liter

pCi/L = picoCuries per liter

NA = Not Analyzed

< = concentration is less than the reporting limit

[a]Only the parameters detected during the previous sampling event were analyzed during this sampling event, in accordance with 40CFR § 257.95(d)(1).

OBG
Part of Ramboll