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2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

JOPPA LANDFILL, JOPPA POWER STATION



Bright ideas. Sustainable change.

**2019 ANNUAL GROUNDWATER MONITORING AND
CORRECTIVE ACTION REPORT
JOPPA LANDFILL, JOPPA POWER STATION**

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ACRONYMS AND ABBREVIATIONS

CCR	Coal Combustion Residuals
LF	Landfill
SAP	Sampling and Analysis Plan

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EXECUTIVE SUMMARY

This report has been prepared to provide the information required by Title 40 of the Code of Federal Regulations (40 C.F.R.) § 257.90(e) for the Joppa Landfill (LF) located at Joppa Power Station near Joppa, Illinois.

Groundwater is being monitored at Joppa LF in accordance with the Detection Monitoring Program requirements specified in 40 C.F.R. § 257.94.

No changes were made to the monitoring system in 2019 (no wells were installed or decommissioned).

No Statistically Significant Increases of 40 C.F.R. Part 257 Appendix III parameter concentrations greater than background concentrations were determined in 2019 and Joppa LF remains in the Detection Monitoring Program.

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1. INTRODUCTION

This report has been prepared by Ramboll on behalf of Electric Energy, Inc., to provide the information required by 40 C.F.R. § 257.90(e) for Joppa LF located at Joppa Power Station near Joppa, Illinois.

In accordance with 40 C.F.R. § 257.90(e), the owner or operator of a 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 relative to background levels).
5. Other information required to be included in the Annual Report as specified in §§ 257.90 through 257.98.

This report provides the required information for Joppa LF for calendar year 2019.

2. MONITORING AND CORRECTIVE ACTION PROGRAM STATUS

No changes have occurred to the monitoring program status in calendar year 2019, and Joppa LF remains in the Detection Monitoring Program in accordance with 40 C.F.R. § 257.94.

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3. KEY ACTIONS COMPLETED IN 2019

The Detection Monitoring Program is summarized in Table A. The groundwater monitoring system, including the CCR unit and all background and downgradient monitoring wells, is presented in Figure 1. No changes were made to the monitoring system in 2019 (no wells were installed or decommissioned). In general, one groundwater sample was collected from each background and downgradient well during each monitoring event. All samples were collected and analyzed in accordance with the Sampling and Analysis Plan (SAP) (NRT/OBG, 2017a). All monitoring data obtained under 40 C.F.R. §§ 257.90 through 257.98 (as applicable) in 2019 are presented in Table 1. Analytical data were evaluated in accordance with the Statistical Analysis Plan (NRT/OBG, 2017b) to determine any SSIs of Appendix III parameters relative to background concentrations.

Statistical background values are provided in Table 2.

Analytical results for the December 2018 sampling event were provided in the 2018 Annual Groundwater Monitoring and Corrective Action Report.

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Table A – 2018–2019 Detection Monitoring Program Summary

Sampling Date	Analytical Data Receipt Date	Parameters Collected	SSI(s)	SSI(s) Determination Date
December 6, 2018	January 14, 2019	Appendix III	none	April 15, 2019
March 27, 2019	April 18, 2019	Appendix III	none	July 17, 2019
September 9, 2019	October 15, 2019	Appendix III	TBD	TBD

Notes:

NA: Not Applicable
 TBD: To Be Determined

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4. PROBLEMS ENCOUNTERED AND ACTIONS TO RESOLVE THE PROBLEMS

No problems were encountered with the Groundwater Monitoring Program during 2019. Groundwater samples were collected and analyzed in accordance with the SAP (NRT/OBG, 2017a), and all data were accepted.

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5. KEY ACTIVITIES PLANNED FOR 2020

The following key activities are planned for 2020:

- Continuation of the Detection Monitoring Program with semi-annual sampling scheduled for the first and third quarters of 2020.
- Complete evaluation of analytical data from the downgradient wells, using background data to determine whether an SSI of Appendix III parameters detected at concentrations greater than background concentrations has occurred.
- If an SSI is identified, potential alternate sources (i.e., a source other than the CCR unit caused the SSI or that that SSI 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 SSI, a written demonstration will be completed within 90 days of SSI determination and included in the 2020 Annual Groundwater Monitoring and Corrective Action Report.
 - If an alternate source(s) is not identified to be the cause of the SSI, the applicable requirements of 40 C.F.R. §§ 257.94 through 257.98 as may apply in 2020 (e.g., Assessment Monitoring) will be met, including associated recordkeeping/notifications required by 40 C.F.R. §§ 257.105 through 257.108.

6. REFERENCES

Natural Resource Technology, an OBG Company (NRT/OBG), 2017a. Sampling and Analysis Plan, Joppa Landfill, Joppa Power Station, Joppa, Illinois, Project No. 2285, Revision 0, October 17, 2017.

Natural Resource Technology, an OBG Company (NRT/OBG), 2017b, Statistical Analysis Plan, Joppa Power Station, Electric Energy, Inc., October 17, 2017.

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TABLES

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TABLE 1.
2019 ANALYTICAL RESULTS - GROUNDWATER ELEVATION AND APPENDIX III PARAMETERS
2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
 JOPPA POWER STATION
 UNIT ID 402 - JOPPA LANDFILL
 JOPPA, ILLINOIS
 DETECTION MONITORING PROGRAM

Well Identification Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Date & Time Sampled	Depth to Groundwater (ft) ¹	Groundwater Elevation (ft NAVD88)	40 C.F.R. Part 257 Appendix III						
						Boron, total (mg/L)	Calcium, total (mg/L)	Chloride, total (mg/L)	Fluoride, total (mg/L)	pH (field) (S.U.)	Sulfate, total (mg/L)	Total Dissolved Solids (mg/L)
						6020A ²	6020A ²	9251 ²	9214 ²	SM 4500 H+B ²	9036 ²	SM 2540C ²
Background / Upgradient Monitoring Wells												
G101	37.228599	-88.873091	3/27/2019 13:32	44.36	330.93	<0.0250	8.35	<5	0.29	6.7	46	194
			9/9/2019 14:20	44.88	330.41	<0.0250	9.22	<5.0	0.28	6.3	35	190
G102	37.228679	-88.875032	3/27/2019 13:52	55.54	331.77	<0.0250	6.81	5	0.19	6.5	44	212
			9/9/2019 14:42	56.73	330.58	<0.0250	7.42	<5.0	0.18	6.1	34	190
Downgradient Monitoring Wells												
G105	37.227541	-88.875866	3/27/2019 13:06	52.75	327.98	<0.0250	22.1	26	0.16	6.3	11	232
			9/9/2019 13:56	55.60	325.13	<0.0250	29.7	51	0.16	6.1	12	252
G107	37.225894	-88.875577	3/27/2019 12:44	47.97	329.36	<0.0250	79.7	120	0.15	6.4	30	476
			9/9/2019 13:31	55.65	321.68	0.0373	101	89	0.23	6.5	112	668
G109	37.225792	-88.874615	3/27/2019 12:02	45.02	330.97	0.0309	33.5	12	0.37	6.7	55	378
			9/9/2019 13:14	51.75	324.24	0.0255	30.9	19	0.30	6.5	59	348
G111	37.225739	-88.873841	3/27/2019 14:18	43.91	329.73	0.0256	20.9	<5	0.34	6.8	46	286
			9/9/2019 12:52	50.64	323.00	0.0258	26.1	11	0.32	5.9	33	288

[O: RAB 12/23/19, C: KLT 12/24/19]

Notes:
 40 C.F.R. = Title 40 of the Code of Federal Regulations
 ft = foot/feet
 mg/L = milligrams per liter
 NAVD88 = North American Vertical Datum of 1988
 S.U. = Standard Units
 < = concentration is less than the concentration shown, which corresponds to the reporting limit for the method; estimated concentrations below the reporting limit and associated qualifiers are not provided since not utilized in statistics to determine Statistically Significant Increases (SSIs) over background.
¹All depths to groundwater were measured on the first day of the sampling event.
²4-digit numbers represent SW-846 analytical methods.

TABLE 2.
STATISTICAL BACKGROUND VALUES
2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

JOPPA POWER STATION
 UNIT ID 402 - JOPPA LANDFILL
 JOPPA, ILLINOIS
 DETECTION MONITORING PROGRAM

G105	
Parameter	Statistical Background Value (UPL)
40 C.F.R. Part 257 Appendix III	
Boron (mg/L)	DQR*
Calcium (mg/L)	45
Chloride (mg/L)	50.8
Fluoride (mg/L)	0.29
pH (S.U.)	5.7/6.8
Sulfate (mg/L)	16
Total Dissolved Solids (mg/L)	274

[O: RAB 12/23/19, C: KLT 12/24/19]

G107	
Parameter	Statistical Background Value (UPL)
40 C.F.R. Part 257 Appendix III	
Boron (mg/L)	0.04
Calcium (mg/L)	111
Chloride (mg/L)	150.6
Fluoride (mg/L)	0.26
pH (S.U.)	6.0/7.2
Sulfate (mg/L)	157.39
Total Dissolved Solids (mg/L)	836

[O: RAB 12/23/19, C: KLT 12/24/19]

G109	
Parameter	Statistical Background Value (UPL)
40 C.F.R. Part 257 Appendix III	
Boron (mg/L)	0.03
Calcium (mg/L)	63
Chloride (mg/L)	25
Fluoride (mg/L)	0.42
pH (S.U.)	6.0/7.2
Sulfate (mg/L)	103.616
Total Dissolved Solids (mg/L)	555

[O: RAB 12/23/19, C: KLT 12/24/19]

G111	
Parameter	Statistical Background Value (UPL)
40 C.F.R. Part 257 Appendix III	
Boron (mg/L)	0.04
Calcium (mg/L)	27
Chloride (mg/L)	21.9
Fluoride (mg/L)	0.37
pH (S.U.)	5.9/6.8
Sulfate (mg/L)	56.323
Total Dissolved Solids (mg/L)	375

[O: RAB 12/23/19, C: KLT 12/24/19]

Notes:

40 C.F.R. = Title 40 of the Code of Federal Regulations

DQR = Double Quantification Rule

mg/L = milligrams per liter

S.U. = Standard Units

UPL = Upper Prediction Limit

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

FIGURES

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PROJECT: 169000XXXX | DATED: 1/14/2020 | DESIGNER: GALARNIC
Y:\Mapping\Projects\222285\MXD\2019_AnnualGWM_CAR\Figure 1_GWS_WellLoc_JoppaL.mxd



- UPGRADIENT MONITORING WELL LOCATION
- DOWNGRADIENT MONITORING WELL LOCATION
- CCR MONITORED UNIT

0 150 300 Feet

MONITORING WELL LOCATION MAP JOPPA LANDFILL UNIT ID:402

2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
VISTRA CCR RULE GROUNDWATER MONITORING
JOPPA POWER STATION
JOPPA, ILLINOIS

FIGURE 1

O'BRIEN & GERE ENGINEERS, INC.
A RAMBOLL COMPANY

