

# 2017 Annual Groundwater Monitoring and Corrective Action Report

Joppa Landfill – CCR Unit ID 402  
Joppa Power Station  
2100 Portland Road  
Joppa, Illinois 62953

**Electric Energy, Inc.**

January 31, 2018



JANUARY 31, 2018 | PROJECT #67719

# 2017 Annual Groundwater Monitoring and Corrective Action Report

Joppa Landfill – CCR Unit ID 402  
Joppa Power Station  
Joppa, Illinois

Prepared for:  
*Electric Energy, Inc.*



---

KRISTEN L. THEESFELD  
Hydrogeologist



---

ERIC J. TLACHAC, PE  
Senior Engineer

## TABLE OF CONTENTS

---

<b>LIST OF TABLES</b> .....	<b>i</b>
<b>LIST OF FIGURES</b> .....	<b>i</b>
<b>ACRONYMS AND ABBREVIATIONS</b> .....	<b>ii</b>
<b>1 INTRODUCTION</b> .....	<b>1</b>
1.1 Overview.....	1
1.2 Monitoring and Corrective Action Program Status.....	1
<b>2 KEY ACTIONS COMPLETED IN 2017</b> .....	<b>2</b>
2.1 Summary.....	2
2.2 Problems Encountered and Actions to Resolve the Problems.....	2
<b>3 KEY ACTIVITIES PLANNED FOR 2018</b> .....	<b>3</b>
3.1 Summary.....	3
<b>REFERENCES</b> .....	<b>4</b>

### LIST OF TABLES

---

Table 1	Joppa Landfill: Appendix III Analytical Results
Table 2	Joppa Landfill: Appendix IV Analytical Results

### LIST OF FIGURES

---

Figure 1	Groundwater Sampling Well Location Map
----------	--



## ACRONYMS AND ABBREVIATIONS

---

CCR	Coal Combustion Residuals
CFR	Code of Federal Regulations
mg/L	milligrams per liter
NRT/OBG	Natural Resource Technology, an OBG Company
OBG	O'Brien & Gere Engineers, Inc.
SSI	statistically significant increase
STD	standard units

## 1 INTRODUCTION

### 1.1 OVERVIEW

This report has been prepared on behalf of Electric Energy, Inc. by O'Brien & Gere Engineers, Inc. (OBG), to provide the information required by 40 CFR 257.90(e) for the Joppa Landfill located at Joppa Power Station near Joppa, Illinois.

In accordance with 40 CFR 257.90(e), the owner or operator of an existing 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.<sup>1</sup>

This report provides the required information for the Joppa Landfill for calendar year 2017.

### 1.2 MONITORING AND CORRECTIVE ACTION PROGRAM STATUS

The final three independent samples of the minimum eight required by 40 CFR 257.94(b) were collected and analyzed from each background and downgradient well in 2017 before October 17. The other five independent samples were collected and analyzed in 2015 and 2016.

The first semi-annual monitoring sample for the Detection Monitoring Program was collected in November 2017 from each well.

Using the last of the minimum eight samples required to be collected by October 17, 2017 to determine whether a statistically significant increase (SSI) of Appendix III parameters over background concentrations has occurred, evaluation of analytical data from the downgradient wells was initiated beginning no later than October 17, 2017 for the initial eight samples. SSI determinations will be completed within 90 days (January 15, 2018). In addition, SSI determinations will be completed within 90 days of completion of analysis for the first semi-annual detection monitoring sample collected on November 30, 2017, for which analytical data was received on December 12, 2017.

---

<sup>1</sup> For calendar year 2017, corrective action and other information required to be included in the annual report as specified in §§ 257.90 through 257.98 is inapplicable.

## 2 KEY ACTIONS COMPLETED IN 2017

### 2.1 SUMMARY

Three groundwater sampling events were completed in 2017 as part of an effort initiated in 2015 to collect eight independent samples from background and downgradient monitoring wells in accordance with 40 CFR 257.94(b).

Subsequent to collection of the eight independent samples, an additional sampling event was completed in November 2017 for parameters listed in Appendix III, 40 CFR Part 257, to supplement the background data set and as the first semi-annual monitoring sampling event for the Detection Monitoring Program.

A map showing the groundwater monitoring system, including the CCR unit and all background and downgradient monitoring wells with well identification numbers, for the Joppa Landfill is presented in Figure 1. No monitoring wells were installed or decommissioned from the monitoring system in 2017.

Samples were collected and analyzed in accordance with the Sampling and Analysis Plan (NRT/OBG, 2017a) prepared for the Joppa Landfill.

All monitoring data obtained under 40 CFR §§ 257.90 through 257.98 (as applicable) in 2017, as well as monitoring data for the previously collected five independent samples are presented in Tables 1 and 2. Sample collection dates in 2017 were March 7, June 14, July 19, and November 30. Sample collection dates for previously collected five independent samples are identified in Tables 1 and 2. One ground water sample was collected from each background and downgradient well in each sampling event.

Statistical evaluation of analytical data from the eight independent samples required to be collected by October 17, 2017 and the first semi-annual detection monitoring event on November 30, 2017 was initiated and will be completed within 90 days of October 17, 2017 (January 15, 2018) or 90 days from receipt of the data from the first semi-annual detection monitoring event, respectively (March 12, 2018). Statistical evaluation of analytical data is being performed in accordance with the Statistical Analysis Plan, Joppa Power Station, Electric Energy, Inc. (NRT/OBG, 2017b).

### 2.2 PROBLEMS ENCOUNTERED AND ACTIONS TO RESOLVE THE PROBLEMS

No problems were encountered with the groundwater monitoring program during 2017. Groundwater samples were collected and analyzed in accordance with the Sampling and Analysis Plan, and all data was accepted.

### 3 KEY ACTIVITIES PLANNED FOR 2018

---

#### 3.1 SUMMARY

The following key activities are planned for 2018:

- Continuation of the Detection Monitoring Program with semi-annual sampling scheduled for the 2nd and 4th quarters of 2018.
- Complete evaluation of analytical data from the downgradient wells, using both the eight samples required to be collected by October 17, 2017 and the first semi-annual detection monitoring sample taken in November 2017 to determine whether a SSI of Appendix III parameters over 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 detection and included in the annual groundwater monitoring and corrective action report for 2018.
  - » If an alternate source(s) is not identified to be the cause of the SSI, the applicable requirements of 40 CFR §§ 257.94 through 257.98 (*e.g.*, assessment monitoring) as may apply in 2018 will be met, including associated recordkeeping/notifications required by 40 CFR §§ 257.105 through 257.108.

## REFERENCES

---

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





## Tables

Joppa

January 12, 2018

Table 1. Joppa Landfill: Appendix III Analytical Results

3:05:50 PM

Location ID	Sample Date	B, tot, mg/L	Ca, tot, mg/L	Cl, tot, mg/L	F, tot, mg/L	pH (field), STD	SO4, tot, mg/L
G101	12/22/2015	<0.02500	22.90	<5.000	0.2800	6.540	33.00
	3/16/2016	<0.02500	13.30	5.000	0.2700	6.570	86.00
	6/14/2016	<0.02500	10.20	<5.000	0.2600	6.300	53.00
	9/13/2016	<0.01000	10.20	<5.000	0.2700	6.400	47.00
	12/14/2016	<0.02500	9.490	6.000	0.2400	6.740	35.00
	3/7/2017	<0.02500	10.20	5.000	0.2400	5.990	37.00
	6/14/2017	<0.02500	9.910	<5.000	0.2700	6.350	51.00
	7/19/2017	<0.02500	9.980	<5.000	0.2800	6.740	52.00
	11/30/2017	<0.02500	9.280	<5.000	0.2900	6.600	35.00
G102	12/22/2015	<0.02500	42.40	9.000	0.2400	6.930	15.00
	3/16/2016	<0.02500	14.70	15.00	0.1800	6.360	58.00
	6/14/2016	<0.02500	13.30	16.00	0.1500	6.100	65.00
	9/13/2016	<0.02500	12.40	14.00	0.1500	5.790	49.00
	12/15/2016	<0.02500	12.10	13.00	0.1200	6.230	24.00
	3/7/2017	<0.02500	8.940	7.000	0.1300	5.830	22.00
	6/14/2017	<0.02500	7.950	7.000	0.1300	6.060	27.00
	7/19/2017	<0.02500	8.000	6.000	0.1400	6.420	28.00
	11/30/2017	<0.02500	8.550	6.000	0.1400	6.320	20.00

Joppa

January 12, 2018

Table 1. Joppa Landfill: Appendix III Analytical Results

3:05:50 PM

---

Location ID	Sample Date	TDS, mg/L
G101	12/22/2015	222.0
	3/16/2016	268.0
	6/14/2016	204.0
	9/13/2016	208.0
	12/14/2016	210.0
	3/7/2017	172.0
	6/14/2017	212.0
	7/19/2017	242.0
	11/30/2017	128.0
G102	12/22/2015	204.0
	3/16/2016	270.0
	6/14/2016	268.0
	9/13/2016	246.0
	12/15/2016	216.0
	3/7/2017	144.0
	6/14/2017	160.0
	7/19/2017	182.0
	11/30/2017	128.0

Joppa

January 12, 2018

Table 1. Joppa Landfill: Appendix III Analytical Results

3:05:50 PM

Location ID	Sample Date	B, tot, mg/L	Ca, tot, mg/L	Cl, tot, mg/L	F, tot, mg/L	pH (field), STD	SO4, tot, mg/L
G105	12/22/2015	<0.01000	45.30	15.00	0.2900	6.610	12.00
	3/16/2016	<0.01000	30.50	21.00	0.1900	6.380	11.00
	6/14/2016	<0.02500	27.80	24.00	0.1700	6.410	12.00
	9/13/2016	<0.02500	25.20	35.00	0.1700	6.420	13.00
	12/15/2016	<0.02500	25.70	38.00	0.1500	6.220	11.00
	3/7/2017	<0.02500	23.80	29.00	0.1600	5.720	12.00
	6/14/2017	<0.02500	21.80	27.00	0.1500	6.050	16.00
	7/19/2017	<0.02500	22.30	29.00	0.1600	6.400	13.00
	11/30/2017	<0.02500	24.40	37.00	0.1600	6.300	12.00
G107	12/22/2015	0.03650	101.0	74.00	0.1600	6.870	29.00
	3/16/2016	<0.02500	73.60	139.0	0.1200	6.290	11.00
	6/14/2016	0.03110	90.20	118.0	0.1800	6.910	58.00
	9/13/2016	<0.02500	98.80	108.0	0.2100	6.700	127.0
	12/15/2016	<0.02500	90.50	115.0	0.1700	6.580	67.00
	3/7/2017	<0.02500	96.00	118.0	0.1800	6.120	93.00
	6/14/2017	<0.02500	86.80	130.0	0.1600	6.380	50.00
	7/19/2017	<0.02500	85.50	113.0	0.2200	6.760	123.0
	11/30/2017	0.02950	93.10	110.0	0.1700	6.450	88.00

**Table 1. Joppa Landfill: Appendix III Analytical Results**

---

Location ID	Sample Date	TDS, mg/L
G105	12/22/2015	238.0
	3/16/2016	222.0
	6/14/2016	218.0
	9/13/2016	216.0
	12/15/2016	172.0
	3/7/2017	230.0
	6/14/2017	218.0
	7/19/2017	252.0
	11/30/2017	238.0
G107	12/22/2015	280.0
	3/16/2016	436.0
	6/14/2016	586.0
	9/13/2016	692.0
	12/15/2016	560.0
	3/7/2017	618.0
	6/14/2017	540.0
	7/19/2017	712.0
	11/30/2017	580.0

Joppa

January 12, 2018

Table 1. Joppa Landfill: Appendix III Analytical Results

3:05:50 PM

Location ID	Sample Date	B, tot, mg/L	Ca, tot, mg/L	Cl, tot, mg/L	F, tot, mg/L	pH (field), STD	SO4, tot, mg/L
G109	12/22/2015	0.03150	61.60	9.000	0.2400	6.740	23.00
	3/16/2016	<0.02500	29.80	9.000	0.2200	6.540	22.00
	6/14/2016	<0.02500	20.20	9.000	0.1800	6.430	29.00
	9/13/2016	<0.02500	16.90	9.000	0.1700	6.540	41.00
	12/15/2016	<0.02500	15.80	9.000	0.1500	6.500	33.00
	3/7/2017	<0.02500	15.20	9.000	0.1600	5.980	37.00
	6/14/2017	<0.02500	18.60	12.00	0.2100	6.520	68.00
	7/19/2017	<0.02500	19.60	12.00	0.2300	6.670	65.00
	11/30/2017	<0.02500	14.40	10.00	0.1800	6.510	48.00
G111	12/22/2015	<0.02500	21.40	15.00	0.3300	6.520	27.00
	3/16/2016	<0.02500	18.50	16.00	0.2900	6.520	37.00
	6/14/2016	0.02650	15.60	16.00	0.3300	6.710	39.00
	9/13/2016	0.02510	13.90	15.00	0.3200	6.840	23.00
	12/15/2016	<0.02500	11.60	16.00	0.2800	6.750	13.00
	3/7/2017	0.03080	17.60	12.00	0.3000	6.190	29.00
	6/14/2017	<0.02500	17.90	10.00	0.3200	6.620	37.00
	7/19/2017	<0.02500	16.00	13.00	0.3400	6.820	29.00
	11/30/2017	<0.02500	11.00	16.00	0.2900	6.690	<10.00

**Table 1. Joppa Landfill: Appendix III Analytical Results**

---

Location ID	Sample Date	TDS, mg/L
G109	12/22/2015	112.0
	3/16/2016	230.0
	6/14/2016	184.0
	9/13/2016	192.0
	12/15/2016	<20.00
	3/7/2017	174.0
	6/14/2017	258.0
	7/19/2017	292.0
	11/30/2017	166.0
G111	12/22/2015	236.0
	3/16/2016	308.0
	6/14/2016	312.0
	9/13/2016	298.0
	12/15/2016	246.0
	3/7/2017	272.0
	6/14/2017	318.0
	7/19/2017	338.0
	11/30/2017	242.0

Joppa

January 12, 2018

Table 2. Joppa Landfill: Appendix IV Analytical Results

3:05:57 PM

Location ID	Sample Date	As, tot, mg/L	Ba, tot, mg/L	Be, tot, mg/L	Cd,tot, mg/L	Co, tot, mg/L	Cr, tot, mg/L
G101	12/22/2015	0.01660	0.2830	0.001500	<0.001000	0.008400	0.03840
	3/16/2016	0.001400	0.04880	<0.001000	<0.001000	<0.001000	0.003100
	6/14/2016	<0.001000	0.04970	<0.001000	<0.001000	<0.001000	<0.001000
	9/13/2016	<0.001000	0.05270	<0.001000	<0.001000	<0.001000	<0.001000
	12/14/2016	<0.001000	0.05500	<0.001000	<0.001000	<0.001000	0.001100
	3/7/2017	<0.001000	0.07010	<0.001000	<0.001000	<0.001000	0.003900
	6/14/2017	<0.001000	0.04950	<0.001000	<0.001000	<0.001000	<0.001000
	7/19/2017	<0.001000	0.05350	<0.001000	<0.001000	<0.001000	<0.001000
G102	12/22/2015	0.005700	0.2110	<0.001000	<0.001000	0.001000	0.01830
	3/16/2016	<0.001000	0.01540	<0.001000	<0.001000	<0.001000	0.001300
	6/14/2016	<0.001000	0.05910	<0.001000	<0.001000	<0.001000	0.001100
	9/13/2016	0.002100	0.07010	<0.001000	<0.001000	<0.001000	0.004400
	12/15/2016	0.001200	0.05550	<0.001000	<0.001000	<0.001000	0.003600
	3/7/2017	<0.001000	0.04630	<0.001000	<0.001000	<0.001000	0.002000
	6/14/2017	<0.001000	0.04080	<0.001000	<0.001000	<0.001000	<0.001000
	7/19/2017	<0.001000	0.04280	<0.001000	<0.001000	<0.001000	<0.001000
G105	12/22/2015	0.002100	0.2730	<0.001000	<0.001000	0.001800	0.006400
	3/16/2016	<0.001000	0.1840	<0.001000	<0.001000	<0.001000	<0.001000



Joppa

January 12, 2018

Table 2. Joppa Landfill: Appendix IV Analytical Results

3:05:57 PM

Location ID	Sample Date	F, tot, mg/L	Hg, tot, mg/L	Li, tot, mg/L	Mo, tot, mg/L	Pb, tot, mg/L	Ra-226,228, tot, pCi/L
G101	12/22/2015	0.2800	<0.0002000	0.01670	0.003400	0.02400	2.300
	3/16/2016	0.2700	<0.0002000	0.001600	<0.001000	0.001700	0.2200
	6/14/2016	0.2600	<0.0002000	<0.001000	<0.001000	<0.001000	0.1100
	9/13/2016	0.2700	<0.0002000	<0.001000	<0.001000	<0.001000	1.690
	12/14/2016	0.2400	<0.0002000	<0.001000	<0.001000	<0.001000	0.7100
	3/7/2017	0.2400	<0.0002000	0.002000	<0.001000	0.001500	0.9700
	6/14/2017	0.2700	<0.0002000	<0.001000	<0.001000	<0.001000	0.2600
	7/19/2017	0.2800	<0.0002000	<0.001000	<0.001000	<0.001000	1.150
G102	12/22/2015	0.2400	<0.0002000	0.003200	0.002800	0.008100	1.090
	3/16/2016	0.1800	<0.0002000	0.001800	<0.001000	<0.001000	0.2700
	6/14/2016	0.1500	<0.0002000	0.001900	<0.001000	<0.001000	0.5800
	9/13/2016	0.1500	<0.0002000	0.001500	<0.001000	0.002200	1.390
	12/15/2016	0.1200	<0.0002000	0.001200	<0.001000	0.001400	0.5000
	3/7/2017	0.1300	<0.0002000	0.001100	<0.001000	<0.001000	0.9600
	6/14/2017	0.1300	<0.0002000	0.001200	<0.001000	<0.001000	0.7900
	7/19/2017	0.1400	<0.0002000	0.001300	<0.001000	<0.001000	3.590
G105	12/22/2015	0.2900	<0.0002000	0.002700	0.001400	0.002000	1.000
	3/16/2016	0.1900	<0.0002000	<0.001000	<0.001000	<0.001000	0.5300

Joppa

January 12, 2018

Table 2. Joppa Landfill: Appendix IV Analytical Results

3:05:57 PM

Location ID	Sample Date	Sb, tot, mg/L	Se, tot, mg/L	Tl, tot, mg/L
G101	12/22/2015	<0.001000	<0.001000	<0.001000
	3/16/2016	<0.001000	<0.001000	<0.001000
	6/14/2016	<0.001000	<0.001000	<0.001000
	9/13/2016	<0.001000	<0.001000	<0.001000
	12/14/2016	<0.001000	<0.001000	<0.001000
	3/7/2017	<0.001000	<0.001000	<0.001000
	6/14/2017	<0.001000	<0.001000	<0.001000
	7/19/2017	<0.001000	<0.001000	<0.001000
G102	12/22/2015	<0.001000	<0.001000	<0.001000
	3/16/2016	<0.001000	<0.001000	<0.001000
	6/14/2016	<0.001000	<0.001000	<0.001000
	9/13/2016	<0.001000	<0.001000	<0.001000
	12/15/2016	<0.001000	<0.001000	<0.001000
	3/7/2017	<0.001000	<0.001000	<0.001000
	6/14/2017	<0.001000	<0.001000	<0.001000
	7/19/2017	<0.001000	<0.001000	<0.001000
G105	12/22/2015	<0.001000	<0.001000	<0.001000
	3/16/2016	<0.001000	<0.001000	<0.001000

Joppa

January 12, 2018

Table 2. Joppa Landfill: Appendix IV Analytical Results

3:05:57 PM

Location ID	Sample Date	As, tot, mg/L	Ba, tot, mg/L	Be, tot, mg/L	Cd,tot, mg/L	Co, tot, mg/L	Cr, tot, mg/L
G105	6/14/2016	<0.001000	0.1910	<0.001000	<0.001000	<0.001000	<0.001000
	9/13/2016	<0.001000	0.1900	<0.001000	<0.001000	<0.001000	<0.001000
	12/15/2016	<0.001000	0.1850	<0.001000	<0.001000	<0.001000	0.002800
	3/7/2017	<0.001000	0.1710	<0.001000	<0.001000	<0.001000	<0.001000
	6/14/2017	<0.001000	0.1580	<0.001000	<0.001000	<0.001000	<0.001000
	7/19/2017	<0.001000	0.1710	<0.001000	<0.001000	<0.001000	<0.001000
G107	12/22/2015	0.06510	1.170	0.01100	<0.001000	0.09520	0.2160
	3/16/2016	0.001100	0.2310	<0.001000	<0.001000	0.001800	0.003200
	6/14/2016	<0.001000	0.2750	<0.001000	<0.001000	0.001200	<0.001000
	9/13/2016	0.001300	0.2000	<0.001000	<0.001000	0.005000	<0.001000
	12/15/2016	0.002500	0.1710	<0.001000	<0.001000	0.003900	0.006600
	3/7/2017	<0.001000	0.1610	<0.001000	<0.001000	<0.001000	0.001300
	6/14/2017	<0.001000	0.1740	<0.001000	<0.001000	<0.001000	<0.001000
	7/19/2017	<0.001000	0.1650	<0.001000	<0.001000	<0.001000	<0.001000
G109	12/22/2015	0.05500	0.6630	0.004200	<0.001000	0.04020	0.1170
	3/16/2016	0.009300	0.1570	<0.001000	<0.001000	0.006700	0.01820
	6/14/2016	0.002700	0.1530	<0.001000	<0.001000	0.002000	0.005300
	9/13/2016	0.002700	0.1460	<0.001000	<0.001000	0.002100	0.005400

Joppa

January 12, 2018

Table 2. Joppa Landfill: Appendix IV Analytical Results

3:05:57 PM

Location ID	Sample Date	F, tot, mg/L	Hg, tot, mg/L	Li, tot, mg/L	Mo, tot, mg/L	Pb, tot, mg/L	Ra-226,228, tot, pCi/L
G105	6/14/2016	0.1700	<0.0002000	<0.001000	<0.001000	<0.001000	0.3600
	9/13/2016	0.1700	<0.0002000	<0.001000	<0.001000	<0.001000	0.8800
	12/15/2016	0.1500	<0.0002000	0.001600	<0.001000	<0.001000	0.2400
	3/7/2017	0.1600	<0.0002000	<0.001000	<0.001000	<0.001000	1.190
	6/14/2017	0.1500	<0.0002000	<0.001000	<0.001000	<0.001000	0.8500
	7/19/2017	0.1600	<0.0002000	<0.001000	<0.001000	<0.001000	1.260
G107	12/22/2015	0.1600	0.0003500	0.07290	0.008200	0.1420	1.840
	3/16/2016	0.1200	<0.0002000	0.002100	<0.001000	0.001800	0.1900
	6/14/2016	0.1800	<0.0002000	0.002100	<0.001000	<0.001000	1.150
	9/13/2016	0.2100	<0.0002000	0.001900	<0.001000	<0.001000	1.720
	12/15/2016	0.1700	<0.0002000	0.003500	0.001200	0.004700	0.7700
	3/7/2017	0.1800	<0.0002000	0.001500	<0.001000	<0.001000	1.120
	6/14/2017	0.1600	<0.0002000	0.001500	<0.001000	<0.001000	1.200
	7/19/2017	0.2200	<0.0002000	0.001800	<0.001000	<0.001000	3.840
G109	12/22/2015	0.2400	<0.0002000	0.03350	0.006200	0.06890	1.490
	3/16/2016	0.2200	<0.0002000	0.005500	0.001700	0.008600	0.4300
	6/14/2016	0.1800	<0.0002000	0.002900	<0.001000	0.002300	1.040
	9/13/2016	0.1700	<0.0002000	0.002700	<0.001000	0.002400	1.180

Joppa

January 12, 2018

Table 2. Joppa Landfill: Appendix IV Analytical Results

3:05:57 PM

Location ID	Sample Date	Sb, tot, mg/L	Se, tot, mg/L	Tl, tot, mg/L
G105	6/14/2016	<0.001000	<0.001000	<0.001000
	9/13/2016	<0.001000	<0.001000	<0.001000
	12/15/2016	<0.001000	<0.001000	<0.001000
	3/7/2017	<0.001000	<0.001000	<0.001000
	6/14/2017	<0.001000	<0.001000	<0.001000
	7/19/2017	<0.001000	<0.001000	<0.001000
G107	12/22/2015	<0.004000	<0.001000	<0.004000
	3/16/2016	<0.001000	<0.001000	<0.001000
	6/14/2016	<0.001000	<0.001000	<0.001000
	9/13/2016	<0.001000	<0.001000	<0.001000
	12/15/2016	<0.001000	<0.001000	<0.001000
	3/7/2017	<0.001000	<0.001000	<0.001000
	6/14/2017	<0.001000	<0.001000	<0.001000
	7/19/2017	<0.001000	<0.001000	<0.001000
G109	12/22/2015	<0.001000	<0.001000	<0.001000
	3/16/2016	<0.001000	<0.001000	<0.001000
	6/14/2016	<0.001000	<0.001000	<0.001000
	9/13/2016	<0.001000	<0.001000	<0.001000

Joppa

January 12, 2018

Table 2. Joppa Landfill: Appendix IV Analytical Results

3:05:57 PM

Location ID	Sample Date	As, tot, mg/L	Ba, tot, mg/L	Be, tot, mg/L	Cd,tot, mg/L	Co, tot, mg/L	Cr, tot, mg/L
G109	12/15/2016	0.001800	0.1180	<0.001000	<0.001000	0.001300	0.004100
	3/7/2017	<0.001000	0.1100	<0.001000	<0.001000	<0.001000	0.001100
	6/14/2017	<0.001000	0.1280	<0.001000	<0.001000	<0.001000	0.001300
	7/19/2017	<0.001000	0.1410	<0.001000	<0.001000	<0.001000	0.003100
G111	12/22/2015	0.003700	0.2410	<0.001000	<0.001000	0.002800	0.006700
	3/16/2016	0.003300	0.1840	<0.001000	<0.001000	0.002700	0.007200
	6/14/2016	<0.001000	0.1950	<0.001000	<0.001000	<0.001000	<0.001000
	9/13/2016	<0.001000	0.1600	<0.001000	<0.001000	<0.001000	<0.001000
	12/15/2016	<0.001000	0.1490	<0.001000	<0.001000	<0.001000	0.002100
	3/7/2017	<0.001000	0.2180	<0.001000	<0.001000	<0.001000	<0.001000
	6/14/2017	<0.001000	0.1960	<0.001000	<0.001000	<0.001000	<0.001000
	7/19/2017	<0.001000	0.1760	<0.001000	<0.001000	<0.001000	<0.001000

Joppa

January 12, 2018

Table 2. Joppa Landfill: Appendix IV Analytical Results

3:05:57 PM

Location ID	Sample Date	F, tot, mg/L	Hg, tot, mg/L	Li, tot, mg/L	Mo, tot, mg/L	Pb, tot, mg/L	Ra-226,228, tot, pCi/L
G109	12/15/2016	0.1500	<0.0002000	0.002100	<0.001000	0.001800	0.4100
	3/7/2017	0.1600	<0.0002000	0.001400	<0.001000	<0.001000	0.6200
	6/14/2017	0.2100	<0.0002000	0.002000	<0.001000	<0.001000	1.390
	7/19/2017	0.2300	<0.0002000	0.001700	<0.001000	<0.001000	1.320
G111	12/22/2015	0.3300	<0.0002000	0.003200	0.001000	0.003300	0.2200
	3/16/2016	0.2900	<0.0002000	0.002800	<0.001000	0.003300	0.4700
	6/14/2016	0.3300	<0.0002000	<0.001000	<0.001000	<0.001000	0.2500
	9/13/2016	0.3200	<0.0002000	<0.001000	<0.001000	<0.001000	0.4100
	12/15/2016	0.2800	<0.0002000	<0.001000	<0.001000	<0.001000	0.1200
	3/7/2017	0.3000	<0.0002000	<0.001000	<0.001000	<0.001000	0.6400
	6/14/2017	0.3200	<0.0002000	0.001200	<0.001000	<0.001000	1.360
	7/19/2017	0.3400	<0.0002000	<0.001000	<0.001000	<0.001000	0.1300

Joppa

January 12, 2018

Table 2. Joppa Landfill: Appendix IV Analytical Results

3:05:57 PM

---

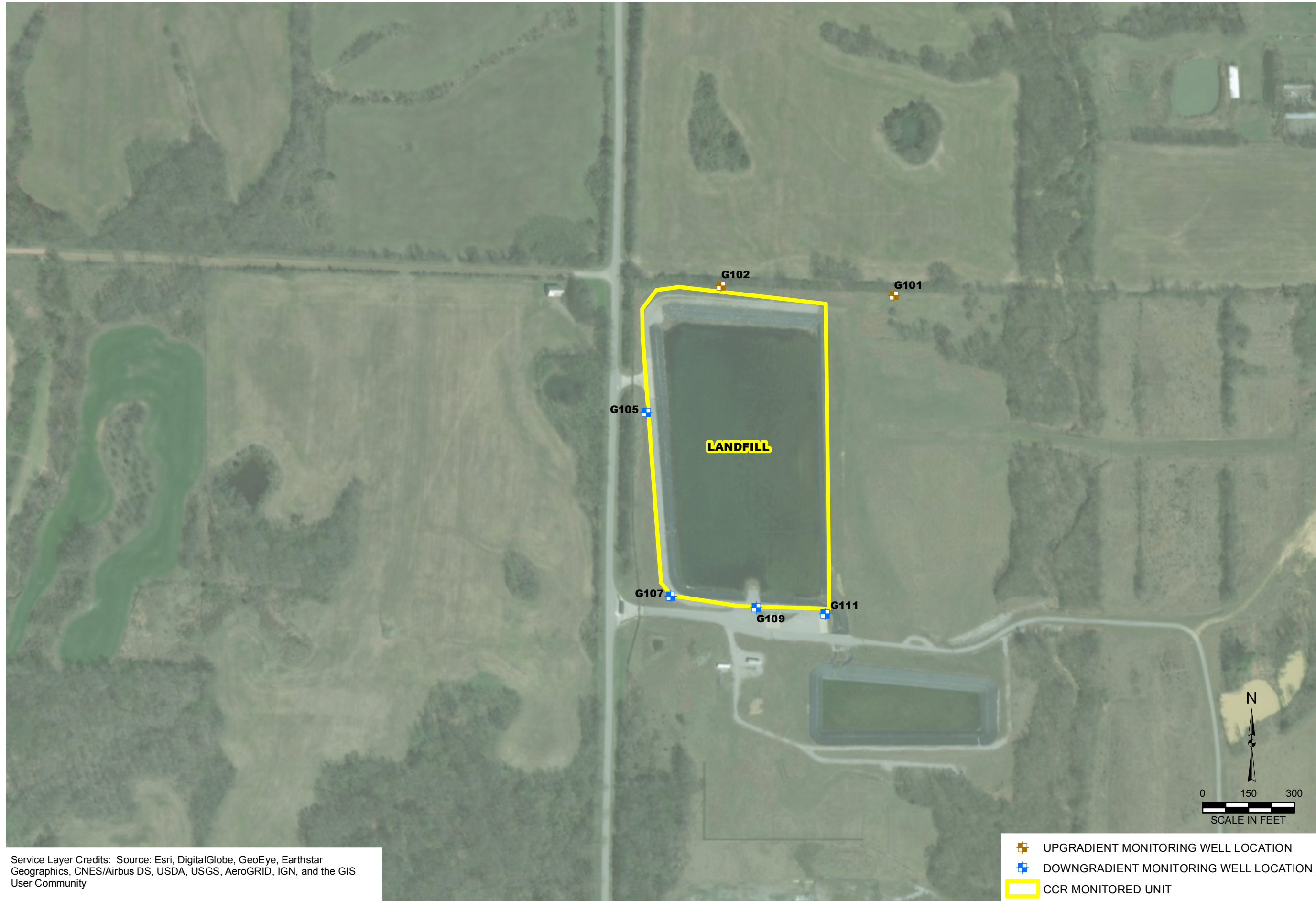
Location ID	Sample Date	Sb, tot, mg/L	Se, tot, mg/L	Tl, tot, mg/L
G109	12/15/2016	<0.001000	<0.001000	<0.001000
	3/7/2017	<0.001000	<0.001000	<0.001000
	6/14/2017	<0.001000	<0.001000	<0.001000
	7/19/2017	<0.001000	<0.001000	<0.001000
G111	12/22/2015	<0.001000	<0.001000	<0.001000
	3/16/2016	0.001300	<0.001000	<0.001000
	6/14/2016	<0.001000	<0.001000	<0.001000
	9/13/2016	<0.001000	<0.001000	<0.001000
	12/15/2016	<0.001000	<0.001000	<0.001000
	3/7/2017	<0.001000	<0.001000	<0.001000
	6/14/2017	<0.001000	<0.001000	<0.001000
	7/19/2017	<0.001000	<0.001000	<0.001000








## Figures

Y:\Mapping\Projects\222285\MXD\2017\_AnnualGWM\_CAR\Figure 1\_GWS\_WellLoc\_JoppaL.F.mxd Author: stobsd Date/Time: 1/26/2018, 6:05:41 PM



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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

DRAWN BY/DATE:  
SDS 1/8/18  
REVIEWED BY/DATE:  
KLT 1/8/18  
APPROVED BY/DATE:  
SJC 1/25/18

GROUNDWATER SAMPLING WELL LOCATION MAP  
 JOPPA LANDFILL  
 UNIT ID: 402  
 2017 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT  
 DYNEGY CCR RULE GROUNDWATER MONITORING  
 JOPPA POWER STATION  
 JOPPA, ILLINOIS

PROJECT NO: 67719

FIGURE NO: 1



**OBG**

THERE'S A WAY

