2017 Annual Groundwater Monitoring and Corrective Action Report

Zimmer Gypsum Recycle Pond – CCR Unit ID 124
Zimmer Power Station
1781 Route 52
Moscow, Ohio 45153

Dynegy Zimmer, LLC

January 31, 2018

OBG

JANUARY 31, 2018 | PROJECT #67720

2017 Annual Groundwater Monitoring and Corrective Action Report

Zimmer Gypsum Recycle Pond – CCR Unit ID 124
Zimmer Power Station
Moscow, Ohio

Prepared for:
Dynegy Zimmer, LLC

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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 Dynegy Zimmer, LLC by O'Brien & Gere Engineers, Inc. (OBG), to provide the information required by 40 CFR 257.90(e) for the Zimmer Gypsum Recycle Pond located at Zimmer Power Station near Moscow, Ohio.

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.[1]

This report provides the required information for the Zimmer Gypsum Recycle Pond 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 13-14, 2017, for which analytical data was received on November 30, 2017.

[1] 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 Zimmer Gypsum Recycle Pond 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 (AECOM, 2017) prepared for the Zimmer Gypsum Recycle Pond.

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 9-10, June 8, July 13, and November 13-14. 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 13-14, 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 (February 28, 2018), respectively. Statistical evaluation of analytical data is being performed in accordance with the Statistical Analysis Plan, Zimmer Power Station, Dynegy Zimmer, LLC (NRT/OBG, 2017).

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

AECOM, 2017, Sampling and Analysis Plan, CCR Rule Groundwater Monitoring, Zimmer Gypsum Recycle Pond, Unit 124, Zimmer Power Station, Moscow, Ohio, Job Number 60442412, Revision 0, October 17, 2017.

Natural Resource Technology, an OBG Company, 2017, Statistical Analysis Plan, Zimmer Power Station, Dynegy Zimmer, LLC, October 17, 2017.

Tables

Table 1. Zimmer Gypsum Recycle Pond: Appendix III Analytical Results

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
MW-10	12/29/2015	5.420	135.0	57.30	0.2180	7.740	234.0
	3/16/2016	9.050	189.0	122.0	0.1810	7.090	550.0
	6/16/2016	4.910	81.50	146.0	<1.000	7.170	409.0
	9/27/2016	0.2700	137.0	149.0	<1.000	7.060	606.0
	12/13/2016	6.630	127.0	221.0	<1.000	6.830	527.0
	3/10/2017	6.000	103.0	77.90	<1.000	7.850	426.0
	6/8/2017	5.870	99.70	99.50	<1.000	6.910	452.0
	7/13/2017	4.870	79.10	75.70	<1.000	7.130	367.0
	11/14/2017	4.070	126.0	<150.0	1.440	6.910	582.0
MW-11	12/29/2015	0.5810	176.0	70.40	0.1750	7.040	252.0
	3/16/2016	0.4890	270.0	126.0	0.09520	6.830	447.0
	6/16/2016	0.5720	130.0	81.10	<1.000	6.940	170.0
	9/27/2016	0.4440	137.0	74.80	<1.000	6.910	196.0
	12/13/2016	1.450	225.0	131.0	<1.000	6.760	545.0
	3/10/2017	0.4340	147.0	66.90	<1.000	8.080	209.0
	6/8/2017	0.5080	167.0	69.90	<1.000	6.760	248.0
	7/13/2017	0.8250	149.0	66.70	<1.000	6.830	195.0
	11/14/2017	0.4980	133.0	68.10	<1.000	6.800	188.0

Table 1. Zimmer Gypsum Recycle Pond: Appendix III Analytical Results

Location ID	Sample Date	TDS, mg/L
MW-10	12/29/2015	1050.
	3/16/2016	1230.
	6/16/2016	960.0
	9/27/2016	1400.
	12/13/2016	1190.
	3/10/2017	1160.
	6/8/2017	1050.
	7/13/2017	883.0
	11/14/2017	1210.
MW-11	12/29/2015	768.0
	3/16/2016	1140.
	6/16/2016	640.0
	9/27/2016	703.0
	12/13/2016	1110.
	3/10/2017	736.0
	6/8/2017	767.0
	7/13/2017	728.0
	11/14/2017	634.0

Table 1. Zimmer Gypsum Recycle Pond: Appendix III Analytical Results

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
MW-7A	12/30/2015	1.630	135.0	81.40	0.2060	6.950	259.0
	3/16/2016	2.820	180.0	134.0	0.06550	6.570	444.0
	6/16/2016	0.8400	122.0	90.70	<1.000	6.840	261.0
	9/27/2016	4.510	198.0	108.0	<1.000	6.650	512.0
	12/13/2016	1.410	121.0	160.0	<1.000	6.660	553.0
	3/10/2017	6.140	260.0	156.0	<1.000	7.700	682.0
	6/8/2017	1.580	146.0	78.60	<1.000	6.680	311.0
	7/13/2017	1.220	116.0	69.10	<1.000	6.800	247.0
	11/14/2017	1.400	118.0	64.70	<1.000	6.660	277.0
MW-8	12/30/2015	0.07830	108.0	10.30	0.07660	7.290	52.00
	3/16/2016	0.03590	165.0	32.40	0.1060	7.090	59.10
	6/15/2016	0.04550	114.0	13.80	<1.000	7.090	64.40
	9/27/2016	0.04130	119.0	13.10	<1.000	6.990	66.00
	12/13/2016	0.04050	128.0	19.20	<1.000	6.950	65.20
	3/9/2017	<0.08000	114.0	21.10	<1.000	8.590	57.30
	6/8/2017	<0.08000	118.0	31.60	<1.000	7.470	63.40
	7/13/2017	<0.08000	109.0	27.50	<1.000	6.930	61.10
	11/13/2017	<0.08000	113.0	15.00	<1.000	6.790	<50.00

Table 1. Zimmer Gypsum Recycle Pond: Appendix III Analytical Results

Location ID	Sample Date	TDS, mg/L
MW-7A	12/30/2015	737.0
	3/16/2016	1090.
	6/16/2016	765.0
	9/27/2016	1180.
	12/13/2016	721.0
	3/10/2017	1870.
	6/8/2017	854.0
	7/13/2017	725.0
	11/14/2017	718.0
MW-8	12/30/2015	370.0
	3/16/2016	468.0
	6/15/2016	474.0
	9/27/2016	446.0
	12/13/2016	455.0
	3/9/2017	474.0
	6/8/2017	534.0
	7/13/2017	491.0
	11/13/2017	434.0

Table 2. Zimmer Gypsum Recycle Pond: Appendix IV Analytical Results

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
MW-10	12/29/2015	0.002280	0.1300	<0.001000	<0.0004000	0.01000	0.002930
	3/16/2016	0.002630	0.1140	<0.001000	<0.0004000	0.008350	<0.0005000
	6/16/2016	0.001390	0.07290	<0.001000	<0.001000	0.004100	<0.002000
	9/27/2016	0.002030	0.05770	<0.001000	<0.001000	0.007560	<0.002000
	12/13/2016	0.001270	0.04360	<0.001000	<0.001000	0.008830	<0.002000
	3/10/2017	0.001640	0.05640	<0.001000	<0.001000	0.005930	<0.002000
	6/8/2017	0.002860	0.06180	<0.001000	<0.001000	0.004170	<0.002000
	7/13/2017	<0.001000	0.04530	<0.001000	<0.001000	0.003710	<0.002000
MW-11	12/29/2015	0.001940	0.009770	<0.001000	<0.0004000	0.009200	0.0007940
	3/16/2016	0.003500	0.1160	<0.001000	<0.0004000	0.004220	<0.0005000
	6/16/2016	<0.001000	0.05390	<0.001000	<0.001000	0.001920	<0.002000
	9/27/2016	<0.001000	0.06430	<0.001000	<0.001000	0.001470	<0.002000
	12/13/2016	<0.001000	0.09210	<0.001000	<0.001000	0.001900	<0.002000
	3/10/2017	<0.001000	0.05850	<0.001000	<0.001000	0.001760	<0.002000
	6/8/2017	0.001660	0.06430	<0.001000	<0.001000	0.002000	<0.002000
	7/13/2017	<0.001000	0.05890	<0.001000	<0.001000	0.001720	<0.002000
MW-7A	12/30/2015	0.002170	0.05970	<0.001000	<0.0004000	0.01260	<0.0005000
	3/16/2016	0.09780	0.05430	<0.001000	<0.0004000	0.007830	0.01230

Table 2. Zimmer Gypsum Recycle Pond: Appendix IV Analytical Results

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
MW-10	12/29/2015	0.2180	<0.0001000	<0.008000	0.01460	<0.0002000	0.4340
	3/16/2016	0.1810	<0.0001000	0.001320	0.007500	<0.0002000	0.3820
	6/16/2016	<1.000	<0.0002000	<0.05000	0.007930	<0.001000	0.7870
	9/27/2016	<1.000	<0.0002000	<0.05000	0.01090	<0.001000	0.5210
	12/13/2016	<1.000	<0.0002000	<0.05000	0.005900	<0.001000	0.1350
	3/10/2017	<1.000	<0.0002000	<0.05000	0.005130	<0.001000	0.4460
	6/8/2017	<1.000	<0.0002000	<0.05000	0.007520	<0.001000	0.4870
	7/13/2017	<1.000	<0.0002000	<0.05000	0.007310	<0.001000	1.410
MW-11	12/29/2015	0.1750	<0.0001000	<0.008000	0.004710	<0.0002000	0.4710
	3/16/2016	0.09520	<0.0001000	0.001400	0.002190	<0.0002000	0.5230
	6/16/2016	<1.000	<0.0002000	<0.05000	<0.005000	<0.001000	0.5250
	9/27/2016	<1.000	<0.0002000	<0.05000	<0.005000	<0.001000	0.8910
	12/13/2016	<1.000	<0.0002000	<0.05000	<0.005000	<0.001000	0.6000
	3/10/2017	<1.000	<0.0002000	<0.05000	<0.005000	<0.001000	0.5250
	6/8/2017	<1.000	<0.0002000	<0.05000	<0.005000	<0.001000	0.3470
	7/13/2017	<1.000	<0.0002000	<0.05000	<0.005000	<0.001000	0.5690
MW-7A	12/30/2015	0.2060	<0.0001000	<0.008000	0.003690	<0.0002000	0.1740
	3/16/2016	0.06550	<0.0001000	0.001360	0.001400	<0.0002000	0.6450

Table 2. Zimmer Gypsum Recycle Pond: Appendix IV Analytical Results

Location ID	Sample Date	Sb, tot, mg/L	Se, tot, mg/L	Tl, tot, mg/L
MW-10	12/29/2015	<0.0005000	<0.0006000	<0.0005000
	3/16/2016	<0.0005000	<0.0006000	<0.0005000
	6/16/2016	<0.002000	<0.005000	<0.001000
	9/27/2016	<0.002000	<0.005000	<0.001000
	12/13/2016	<0.002000	<0.005000	<0.001000
	3/10/2017	<0.002000	<0.005000	<0.001000
	6/8/2017	<0.002000	<0.005000	<0.001000
	7/13/2017	<0.002000	<0.005000	<0.001000
MW-11	12/29/2015	<0.0005000	<0.0006000	<0.0005000
	3/16/2016	<0.0005000	<0.0006000	<0.0005000
	6/16/2016	<0.002000	<0.005000	<0.001000
	9/27/2016	<0.002000	<0.005000	<0.001000
	12/13/2016	<0.002000	<0.005000	<0.001000
	3/10/2017	<0.002000	<0.005000	<0.001000
	6/8/2017	<0.002000	<0.005000	<0.001000
	7/13/2017	<0.002000	<0.005000	<0.001000
MW-7A	12/30/2015	<0.0005000	<0.0006000	<0.0005000
	3/16/2016	0.0006340	0.002670	<0.0005000

Table 2. Zimmer Gypsum Recycle Pond: Appendix IV Analytical Results

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
MW-7A	6/16/2016	<0.001000	0.03770	<0.001000	<0.001000	0.002910	<0.002000
	9/27/2016	<0.001000	0.05440	<0.001000	<0.001000	0.004110	<0.002000
	12/13/2016	<0.001000	0.03190	<0.001000	<0.001000	0.002980	<0.002000
	3/10/2017	<0.001000	0.04370	<0.001000	<0.001000	0.005280	<0.002000
	6/8/2017	<0.001000	0.02870	<0.001000	<0.001000	0.001490	<0.002000
	7/13/2017	<0.001000	0.02630	<0.001000	<0.001000	0.001130	<0.002000
MW-8	12/30/2015	0.001150	0.03780	<0.001000	<0.0004000	<0.0005000	<0.0005000
	3/16/2016	<0.002950	0.06810	<0.0008750	<0.0002500	<0.0005430	<0.002500
	6/15/2016	<0.001000	0.04180	<0.001000	<0.001000	<0.0005000	<0.002000
	9/27/2016	<0.001000	0.04300	<0.001000	<0.001000	<0.0005000	<0.002000
	12/13/2016	<0.001000	0.04580	<0.001000	<0.001000	<0.0005000	<0.002000
	3/9/2017	<0.001000	0.04230	<0.001000	<0.001000	<0.0005000	<0.002000
	6/8/2017	<0.001000	0.04910	<0.001000	<0.001000	<0.0005000	<0.002000
	7/13/2017	<0.001000	0.04470	<0.001000	<0.001000	<0.0005000	<0.002000

Table 2. Zimmer Gypsum Recycle Pond: Appendix IV Analytical Results

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
MW-7A	6/16/2016	<1.000	<0.0002000	<0.05000	<0.005000	<0.001000	0.2560
	9/27/2016	<1.000	<0.0002000	<0.05000	<0.005000	<0.001000	0.4710
	12/13/2016	<1.000	<0.0002000	<0.05000	<0.005000	<0.001000	0.3770
	3/10/2017	<1.000	<0.0002000	<0.05000	<0.005000	<0.001000	0.1900
	6/8/2017	<1.000	<0.0002000	<0.05000	<0.005000	<0.001000	0.3470
	7/13/2017	<1.000	<0.0002000	<0.05000	<0.005000	<0.001000	0.8210
MW-8	12/30/2015	0.07660	<0.0001000	<0.008000	<0.0005000	<0.0002000	0.1730
	3/16/2016	0.1060	<0.0001000	0.006350	<0.002500	<0.0004330	0.4080
	6/15/2016	<1.000	<0.0002000	<0.05000	<0.005000	<0.001000	0.06940
	9/27/2016	<1.000	<0.0002000	<0.05000	<0.005000	<0.001000	0.2140
	12/13/2016	<1.000	<0.0002000	<0.05000	<0.005000	<0.001000	0.7100
	3/9/2017	<1.000	<0.0002000	<0.05000	<0.005000	<0.001000	0.3610
	6/8/2017	<1.000	<0.0002000	<0.05000	<0.005000	<0.001000	0.02830
	7/13/2017	<1.000	<0.0002000	<0.05000	<0.005000	<0.001000	0.2690

Table 2. Zimmer Gypsum Recycle Pond: Appendix IV Analytical Results

Location ID	Sample Date	Sb, tot, mg/L	Se, tot, mg/L	Tl, tot, mg/L
MW-7A	6/16/2016	<0.002000	<0.005000	<0.001000
	9/27/2016	<0.002000	<0.005000	<0.001000
	12/13/2016	<0.002000	<0.005000	<0.001000
	3/10/2017	<0.002000	<0.005000	<0.001000
	6/8/2017	<0.002000	<0.005000	<0.001000
	7/13/2017	<0.002000	<0.005000	<0.001000
MW-8	12/30/2015	<0.0005000	<0.0006000	<0.0005000
	3/16/2016	<0.004180	<0.003980	<0.001380
	6/15/2016	<0.002000	<0.005000	<0.001000
	9/27/2016	<0.002000	<0.005000	<0.001000
	12/13/2016	<0.002000	<0.005000	<0.001000
	3/9/2017	<0.002000	<0.005000	<0.001000
	6/8/2017	<0.002000	<0.005000	<0.001000
	7/13/2017	<0.002000	<0.005000	<0.001000

Figures

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

MW-11

GYPSUM RECYCLE POND

MW-7A

MW-10

MW-8

N

0 50 100

SCALE IN FEET

DOWNGRADIENT MONITORING WELL LOCATION

UPGRADIENT MONITORING WELL LOCATION

CCR MONITORED UNIT

GROUNDWATER SAMPLING WELL LOCATION MAP
ZIMMER GYPSUM RECYCLE POND
UNIT ID: 124

2017 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
DYNEGY CCR RULE GROUNDWATER MONITORING
ZIMMER POWER STATION
MOSCOW, OHIO

DRAWN BY/DATE:
SDS 12/21/17
REVIEWED BY/DATE:
KLT 12/21/17
APPROVED BY/DATE:
SJC 1/25/18

PROJECT NO: 67720

FIGURE NO: 1

OBG

THERE'S A WAY