

2018 Annual Groundwater Monitoring and Corrective Action Report

Zimmer D Basin – CCR Unit ID 121
Zimmer Power Station
1781 Route 52
Moscow, Ohio 45153

Dynegy Zimmer, LLC

January 31, 2019



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2018 Annual Groundwater Monitoring and Corrective Action Report

Zimmer D Basin – CCR Unit ID 121
Zimmer Power Station
Moscow, Ohio

Prepared for:
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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

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SECTION 1: INTRODUCTION

This report has been prepared on behalf of Dynegey Zimmer, 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 Zimmer D Basin located at Zimmer Power Station near Moscow, Ohio.

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 257.98¹.

This report provides the required information for the Zimmer D Basin 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, Zimmer Power Station, Dynegy Zimmer, LLC (NRT/OBG, 2017) 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.

Sampling Dates	Parameters Collected	SSIs	Assessment Monitoring Program Established
November 13, 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 the Zimmer D Basin on April 9, 2018 and the required notifications completed.

The first Assessment Monitoring sampling event was completed on May 8 thru 9, 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 19 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. The contract laboratory’s delivery service delayed delivery causing samples in 3 coolers to be over the recommended temperature of 6 degrees Celsius at the time of delivery to the lab. The sampling team returned to Zimmer D Basin on September 27, 2018 to collect additional samples from monitoring wells MW-1 and MW-8. Analytical data from the resampling event was evaluated in accordance with the statistical analysis plan (NRT/OBG, 2017) 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.

Sampling Dates	Parameters Collected	SSLs
May 8 and 9, 2018	Appendix III Appendix IV	Not Applicable
September 19 and 27, 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 Zimmer D Basin 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.

In general, one groundwater sample was collected from each background and downgradient well in the monitoring system during each event. The sampling team returned to Zimmer D Basin to collect samples from monitoring wells MW-1 and MW-8 because the original samples collected earlier in the September sampling event arrived at the laboratory above the recommended temperature of 6 degrees Celsius.

All samples were collected and analyzed in accordance with the Sampling and Analysis Plan (AECOM, 2017). 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 unit and all background and downgradient monitoring wells, is presented in Figure 1.

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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 (AECOM, 2017), and all data was accepted.

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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 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

AECOM, 2017, Sampling and Analysis Plan, CCR Rule Groundwater Monitoring, Basin D, Unit 121, 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.

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Figures

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

-  UPGRAIDENT MONITORING WELL LOCATION
-  DOWNGRAIDENT MONITORING WELL LOCATION
-  CCR MONITORED UNIT

DRAWN BY/DATE:
SDS 11/28/18
REVIEWED BY/DATE:
AJB 1/24/19
APPROVED BY/DATE:
NMP 1/28/19

GROUNDWATER SAMPLING WELL LOCATION MAP
 ZIMMER D BASIN
 UNIT ID: 121
 2018 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
 VISTRA CCR RULE GROUNDWATER MONITORING
 ZIMMER POWER STATION
 MOSCOW, OHIO

PROJECT NO: 70096
 FIGURE NO: 1



Tables

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Table 1. Statistical Background Values

2018 Annual Groundwater Monitoring and Corrective Action Report

Zimmer Power Station

Unit ID 121 - Zimmer D Basin

Parameter	Statistical Background Value
Appendix III	
Boron (mg/L)	0.3815
Calcium (mg/L)	200
Chloride (mg/L)	72.87
Fluoride (mg/L)	0.2
pH (S.U.)	6.7 / 7.4
Sulfate (mg/L)	129.2
TDS (mg/L)	695

[O: RAB 8/22/18, C: KLS: 8/27/18]

Notes:

mg/L = milligrams per liter

S.U. = Standard Units

TDS = Total Dissolved Solids

Table 2. Groundwater Protection Standards

2018 Annual Groundwater Monitoring and Corrective Action Report
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Unit ID 121 - Zimmer D Basin

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: RAB 8/22/18, C: KLS: 8/27/18]

Notes:

mg/L = milligrams per liter

pCi/L = picoCuries per liter

Table 3. Appendix III Analytical Results

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 Zimmer Power Station
 Unit ID 121 - Zimmer D Basin

Sample Location	Date Sampled	B, total (mg/L)	Ca, total (mg/L)	Cl, total (mg/L)	F, total (mg/L)	pH (field) (SU)	SO4, total (mg/L)	TDS (mg/L)
Background / Upgradient Monitoring Wells								
MW-1	11/13/2017	<0.08	150	53.1	<1	6.9	89.1	571
	5/9/2018	<1	157	71.0	<1	7.0	88.9	631
	9/27/2018	<0.08	163	62.7	<1	6.9	113	578
MW-8	11/13/2017	<0.08	113	15.0	<1	6.8	<50	434
	5/8/2018	<1	127	33.8	<1	7.0	62.8	491
	9/27/2018	<0.08	121	14.5	<1	7.0	66.5	439
MW-12	11/13/2017	0.199	146	30.0	<1	6.8	95.5	550
	5/9/2018	<1	143	30.7	<1	6.9	104	584
	9/19/2018	0.272	163	31.9	<1	6.8	104	577
Downgradient Monitoring Wells								
MW-9	11/13/2017	0.869	264	50.7	<1	7.0	650	1190
	5/9/2018	2.47	360	110	<1	6.9	905	1870
	9/19/2018	1.62	277	53.5	<1	6.8	658	1320
MW-13	11/13/2017	<0.08	151	19.0	<1	6.9	<250	667
	5/9/2018	<1	147	17.2	<1	7.1	236	674
	9/19/2018	<0.08	167	19.2	<1	6.9	260	732
MW-14	11/13/2017	<0.08	194	30.6	<1	7.0	340	893
	5/9/2018	<1	199	27.9	<1	7.1	398	947
	9/19/2018	<0.08	207	31.6	<1	6.9	416	1000
MW-15	11/13/2017	<0.08	224	36.5	<1	6.8	498	1110
	5/9/2018	<1	203	31.1	<1	7.0	414	1000
	9/19/2018	0.0939	240	38.7	<1	6.9	529	1170

[O: RAB 12/27/18, C: JQW 12/27/18][U: RAB 1/17/19]

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

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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																
MW-1	5/9/2018	<0.003	<0.005	<0.2	<0.004	<0.005	<0.005	<0.005	<1	<0.005	<0.04	<0.0002	<0.01	0.370	<0.01	<0.002
	9/27/2018 ^a	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	0.231	NA	NA
MW-8	5/8/2018	<0.003	<0.005	<0.2	<0.004	<0.005	<0.005	<0.005	<1	<0.005	<0.04	<0.0002	<0.01	0.182	<0.01	<0.002
	9/27/2018 ^a	NA	<0.001	NA	NA	NA	<0.002	NA	<1	NA	NA	NA	NA	0.215	NA	NA
MW-12	5/9/2018	<0.003	<0.005	<0.2	<0.004	<0.005	<0.005	<0.005	<1	<0.005	<0.04	<0.0002	<0.01	0.411	<0.01	<0.002
	9/19/2018 ^a	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	0.522	NA	NA
Downgradient Monitoring Wells																
MW-9	5/9/2018	<0.003	<0.005	<0.2	<0.004	<0.005	<0.005	<0.005	<1	<0.005	<0.04	<0.0002	<0.01	0.446	<0.01	<0.002
	9/19/2018 ^a	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	0.342	NA	NA
MW-13	5/9/2018	<0.003	<0.005	<0.2	<0.004	<0.005	<0.005	<0.005	<1	<0.005	<0.04	<0.0002	<0.01	0.565	<0.01	<0.002
	9/19/2018 ^a	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	0.478	NA	NA
MW-14	5/9/2018	<0.003	<0.005	<0.2	<0.004	<0.005	<0.005	<0.005	<1	<0.005	<0.04	<0.0002	<0.01	0.618	<0.01	<0.002
	9/19/2018 ^a	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	0.933	NA	NA
MW-15	5/9/2018	<0.003	<0.005	<0.2	<0.004	<0.005	<0.005	<0.005	<1	<0.005	<0.04	<0.0002	<0.01	0.707	<0.01	<0.002
	9/19/2018 ^a	NA	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	1.08	NA	NA

[O: RAB 12/27/18, C: JQW 12/27/18][U: RAB 1/17/19, 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

^aOnly the parameters detected during the previous sampling event were analyzed during this sampling event, in accordance with 40CFR § 257.95(d)(1).

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