

Prepared for
Zimmer Power Company, LLC

Date
January 31, 2022

Project No.
1940100711-013

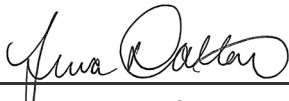
**2021 ANNUAL GROUNDWATER
MONITORING AND CORRECTIVE
ACTION REPORT**
COAL PILE RUNOFF POND
ZIMMER POWER PLANT
MOSCOW, OHIO
CCR UNIT 125

**2021 ANNUAL GROUNDWATER MONITORING AND
CORRECTIVE ACTION REPORT
ZIMMER POWER PLANT COAL PILE RUNOFF POND**

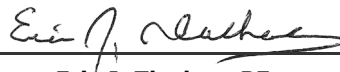
Project name **Zimmer Power Plant**
Project no. **1940100711-013**
Recipient **Zimmer Power Company, LLC**
Document type **Annual Groundwater Monitoring and Corrective Action Report**
Version **FINAL**
Date **January 31, 2022**
Prepared by **Terra A. Dalton**
Checked by **Lauren Cook**
Approved by **Eric J. Tlachac**
Description **Annual Report in Support of the CCR Rule Groundwater Monitoring Program**

Ramboll
234 W. Florida Street
Fifth Floor
Milwaukee, WI 53204
USA

T 414-837-3607
F 414-837-3608
<https://ramboll.com>



Terra A. Dalton
Senior Project Scientist



Eric J. Tlachac, PE
Senior Managing Engineer

CONTENTS

EXECUTIVE SUMMARY	3
1. Introduction	4
2. Monitoring and Corrective Action Program Status	6
3. Key Actions Completed in 2021	7
4. Problems Encountered and Actions to Resolve the Problems	9
5. Key Activities Planned for 2022	10
6. References	11

TABLES (IN TEXT)

Table A 2020-2021 Assessment Monitoring Program Summary

TABLES (ATTACHED)

Table 1 Groundwater Elevations
Table 2 Analytical Results - Appendix III Parameters
Table 3 Analytical Results - Appendix IV Parameters
Table 4 Statistical Background Values
Table 5 Groundwater Protection Standards

FIGURES (ATTACHED)

Figure 1 Monitoring Well Location Map

ACRONYMS AND ABBREVIATIONS

§	Section
40 C.F.R.	Title 40 of the Code of Federal Regulations
ASD	Alternate Source Demonstration
CCR	coal combustion residuals
CMA	Corrective Measures Assessment
CPRP	Coal Pile Runoff Pond
GWPS	groundwater protection standard
NA	not applicable
NRT/OBG	Natural Resource Technology, an OBG Company
Ramboll	Ramboll Americas Engineering Solutions, Inc.
SAP	Sampling and Analysis Plan
SSI	Statistically Significant Increase
SSL	Statistically Significant Level
TBD	to be determined
ZPP	Zimmer Power Plant

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.) Section (§) 257.90(e) for the Coal Pile Runoff Pond (CPRP) located at Zimmer Power Plant (ZPP) near Moscow, Ohio.

Groundwater is being monitored at the CPRP in accordance with the Assessment Monitoring Program requirements specified in 40 C.F.R. § 257.95. Assessment Monitoring was initiated at the CPRP on April 9, 2018.

No changes were made to the monitoring system in 2021 (no wells were installed or decommissioned).

No Statistically Significant Levels (SSLs) of 40 C.F.R. § 257 Appendix IV parameters were determined. Consequently, a Corrective Measures Assessment (CMA) is not required and the CPRP remains in the Assessment Monitoring Program.

1. INTRODUCTION

This report has been prepared by Ramboll Americas Engineering Solutions, Inc. (Ramboll) on behalf of Zimmer Power Company, LLC, to provide the information required by 40 C.F.R. § 257.90(e) for the CPRP located at the ZPP near Moscow, Ohio.

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 [SSI] relative to background levels).
5. Other information required to be included in the annual report as specified in §§ 257.90 through 257.98.
6. A section at the beginning of the annual report that provides an overview of the current status of groundwater monitoring and corrective action programs for the CCR unit. At a minimum, the summary must specify all of the following:
 - i. At the start of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in §257.94 or the assessment monitoring program in §257.95.
 - ii. At the end of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in §257.94 or the assessment monitoring program in §257.95.
 - iii. If it was determined that there was a SSI over background for one or more constituents listed in Appendix III of §257 pursuant to §257.94(e):
 - A. Identify those constituents listed in Appendix III of §257 and the names of the monitoring wells associated with the SSI(s).
 - B. Provide the date when the assessment monitoring program was initiated for the CCR unit.

- iv. If it was determined that there was a SSL above the Groundwater Protection Standard [GWPS] for one or more constituents listed in Appendix IV of §257 pursuant to §257.95(g) include all of the following:
 - A. Identify those constituents listed in Appendix IV of §257 and the names of the monitoring wells associated with the SSL(s).
 - B. Provide the date when the CMA was initiated for the CCR unit.
 - C. Provide the date when the public meeting was held for CMA for the CCR unit.
 - D. Provide the date when the CMA was completed for the CCR unit.
- v. Whether a remedy was selected pursuant to §257.97 during the current annual reporting period, and if so, the date of remedy selection.
- vi. Whether remedial activities were initiated or are ongoing pursuant to § 257.98 during the current annual reporting period.

This report provides the required information for the CPRP for calendar year 2021.

2. MONITORING AND CORRECTIVE ACTION PROGRAM STATUS

No changes have occurred to the Monitoring Program status in calendar year 2021 and the CPRP remains in the Assessment Monitoring Program in accordance with 40 C.F.R. § 257.95.

3. KEY ACTIONS COMPLETED IN 2021

The Assessment Monitoring Program is summarized in **Table A** on the following page. The groundwater monitoring system, including the CCR unit and all background and compliance monitoring wells, is presented in **Figure 1**. No changes were made to the monitoring system in 2021. In general, one groundwater sample was collected from each background and compliance well during each monitoring event. All samples were collected and analyzed in accordance with the Sampling and Analysis Plan (SAP; AECOM, 2017). All monitoring data obtained under 40 C.F.R. § 257.90 through 257.98 (as applicable) in 2021, and analytical results for the September 2020 sampling event, are presented in **Tables 1 to 3**. Analytical data were evaluated in accordance with the Statistical Analysis Plan (Natural Resource Technology, an OBG Company [NRT/OBG], 2017) to determine any SSLs of Appendix IV parameters over GWPSs.

Statistical background values are provided in **Table 4** and GWPSs in **Table 5**. The background values reported in **Table 4** are slightly different from those reported previously because different software was utilized to calculate these values in 2021.

Table A. 2020-2021 Assessment Monitoring Program Summary

Sampling Dates	Analytical Data Receipt Date	Parameters Collected	SSL(s)	SSL(s) Determination Date	ASD Determination Date
September 16, 2020	October 19, 2020	Appendix III Appendix IV Detected ¹	none	January 17, 2021	NA
March 22 - 23, 2021	April 14, 2021	Appendix III Appendix IV	none	July 13, 2021	NA
September 13 - 14, 2021	September 28, 2021	Appendix III Appendix IV Detected ¹	none	December 27, 2021	NA

Notes:

ASD: Alternate Source Demonstration

NA: not applicable

TBD: to be determined

¹ Groundwater sample analysis was limited to Appendix IV parameters detected during previous events in accordance with 40 C.F.R. § 257.95(d)(1).

4. PROBLEMS ENCOUNTERED AND ACTIONS TO RESOLVE THE PROBLEMS

No problems were encountered with the Groundwater Monitoring Program during 2021. Groundwater samples were collected and analyzed in accordance with the SAP (AECOM, 2017), and all data were accepted.

5. KEY ACTIVITIES PLANNED FOR 2022

The following key activities are planned for 2022:

- Continuation of the Assessment Monitoring Program with semi-annual sampling scheduled for the first and third quarters of 2022.
- Complete evaluation of analytical data from the compliance 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 the 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 2022 Annual Groundwater Monitoring and Corrective Action Report.
 - If an alternate source(s) is not identified to be the cause of the SSL, the applicable requirements of 40 C.F.R. § 257.94 through 257.98 (*e.g.*, assessment of corrective measures) as may apply in 2022 will be met, including associated recordkeeping/notifications required by 40 C.F.R. § 257.105 through 257.108.

6. REFERENCES

AECOM, 2017, Sampling and Analysis Plan, CCR Rule Groundwater Monitoring, Coal Pile Runoff Pond, Unit 125, Zimmer Power Station, Moscow, Ohio, Job Number: 60442412, Revision 0, October 17, 2017.

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

TABLES

TABLE 1
GROUNDWATER ELEVATIONS
 2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
 ZIMMER POWER PLANT
 125 - COAL PILE RUNOFF POND
 MOSCOW, OH

Well ID	Well Type	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Date	Depth to Groundwater (ft BMP)	Groundwater Elevation (ft NAVD88)
MW-1	Background	38.87748	-84.22717	09/16/2020	51.76	459.16
				03/22/2021	41.40	469.52
				09/13/2021	50.37	460.55
MW-3S	Compliance	38.87706	-84.23023	09/16/2020	53.52	456.69
				03/22/2021	41.88	468.33
				09/13/2021	52.46	457.75
MW-16	Compliance	38.87747	-84.23022	09/16/2020	54.97	456.69
				03/22/2021	43.68	467.98
				09/13/2021	53.81	457.85
MW-17	Compliance	38.87727	-84.23026	09/16/2020	54.62	456.63
				03/22/2021	43.28	467.97
				09/13/2021	53.46	457.79
MW-18	Compliance	38.87682	-84.23023	09/16/2020	54.93	456.70
				03/22/2021	43.62	468.01
				09/13/2021	53.88	457.75

Notes:
 BMP = below measuring point
 ft = foot/feet
 NAVD88 = North American Vertical Datum of 1988

TABLE 2
ANALYTICAL RESULTS - APPENDIX III PARAMETERS
 2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
 ZIMMER POWER PLANT
 125 - COAL PILE RUNOFF POND
 MOSCOW, OH

Well ID	Well Type	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Date	Boron, total (mg/L)	Calcium, total (mg/L)	Chloride, total (mg/L)	Fluoride, total (mg/L)	pH (field) (SU)	Sulfate, total (mg/L)	Total Dissolved Solids (mg/L)
MW-1	Background	38.87748	-84.22717	09/16/2020	0.0365	169	84.3	<0.15	7.1	99.1	644
				03/22/2021	0.082	173	79.2	0.166	7.0	99.2	613
				09/13/2021	0.0475	165	84.1	0.155	7.1	94.2	663
MW-3S	Compliance	38.87706	-84.23023	09/16/2020	2.44	210	26.5	<0.15	7.2	550	1030
				03/23/2021	1.14	190	25.4	<0.15	6.7	382	833
				09/14/2021	2.34	212	32.4	<0.15	6.9	541	1000
MW-16	Compliance	38.87747	-84.23022	09/16/2020	0.087	169	48.6	<0.15	7.1	253	741
				03/23/2021	0.133	170	47.1	<0.15	6.9	232	709
				09/14/2021	0.27	182	40.6	<0.15	7.0	325	809
MW-17	Compliance	38.87727	-84.23026	09/16/2020	0.301	184	46.7	<0.15	7.1	337	840
				03/23/2021	0.209	192	46.9	0.169	7.0	346	783
				09/14/2021	0.669	191	41.6	0.156	7.1	364	864
MW-18	Compliance	38.87682	-84.23023	09/16/2020	2.76	179	19.1	<0.15	7.3	548	976
				03/23/2021	3.57	215	27.5	0.178	7.2	669	1160
				09/14/2021	3.43	228	60.5	0.18	7.1	692	1250

Notes:

mg/L = milligrams per liter

SU = 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 they are not utilized in statistics to determine Statistically Significant Increases (SSIs) over background

TABLE 3
ANALYTICAL RESULTS - APPENDIX IV PARAMETERS
 2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
 ZIMMER POWER PLANT
 125 - COAL PILE RUNOFF POND
 MOSCOW, OH

Well ID	Well Type	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Date	Antimony, total (mg/L)	Arsenic, total (mg/L)	Barium, total (mg/L)	Beryllium, total (mg/L)	Cadmium, total (mg/L)	Chromium, total (mg/L)	Cobalt, total (mg/L)	Fluoride, total (mg/L)	Lead, total (mg/L)	Lithium, total (mg/L)	Mercury, total (mg/L)	Molybdenum, total (mg/L)	Radium 226+228, total (pCi/L)	Selenium, total (mg/L)	Thallium, total (mg/L)	
MW-1	Background	38.87748	-84.22717	09/16/2020	--	<0.002	0.073	<0.002	<0.001	<0.002	<0.002	<0.15	<0.005	0.00966	--	<0.005	0.215	<0.002	--	
				03/22/2021	<0.004	<0.002	0.0713	<0.002	<0.001	<0.002	<0.002	<0.002	0.166	<0.002	0.00782	<0.0002	<0.005	0.0171	<0.002	<0.002
				09/13/2021	<0.004	<0.002	0.0708	<0.002	<0.001	<0.002	<0.002	<0.002	0.155	<0.002	0.00806	<0.0002	<0.005	0.17	<0.002	<0.002
MW-3S	Compliance	38.87706	-84.23023	09/16/2020	--	<0.002	0.0589	--	<0.001	<0.002	<0.002	<0.15	<0.005	0.00495	--	<0.005	0.373	0.00601	--	
				03/23/2021	<0.004	<0.002	0.0512	<0.002	<0.001	<0.002	<0.002	<0.15	<0.002	0.00512	<0.0002	<0.005	0.149	0.00681	<0.002	
				09/14/2021	<0.004	<0.002	0.0563	<0.002	<0.001	<0.002	<0.002	<0.15	<0.002	0.00548	<0.0002	<0.005	0.322	0.00588	<0.002	
MW-16	Compliance	38.87747	-84.23022	09/16/2020	--	<0.002	0.051	--	<0.001	<0.002	<0.002	<0.15	<0.005	0.00467	--	<0.005	0.869	0.0043	--	
				03/23/2021	<0.004	<0.002	0.0539	<0.002	<0.001	<0.002	0.00222	<0.15	<0.002	0.00552	<0.0002	<0.005	0.353	0.00312	<0.002	
				09/14/2021	<0.004	<0.002	0.058	<0.002	<0.001	<0.002	0.00202	<0.15	<0.002	0.00575	<0.0002	<0.005	0.197	<0.01	<0.002	
MW-17	Compliance	38.87727	-84.23026	09/16/2020	--	<0.002	0.0641	--	<0.001	<0.002	<0.002	<0.15	<0.005	0.0057	--	<0.005	0.456	0.00467	--	
				03/23/2021	<0.004	<0.002	0.0664	<0.002	<0.001	<0.002	<0.002	0.169	<0.002	0.0053	<0.0002	<0.005	0.905	0.00377	<0.002	
				09/14/2021	<0.004	<0.002	0.0653	<0.002	<0.001	<0.002	<0.002	0.156	<0.002	0.00557	<0.0002	<0.005	1.93	0.00468	<0.002	
MW-18	Compliance	38.87682	-84.23023	09/16/2020	--	<0.002	0.02	--	<0.001	<0.002	<0.002	<0.15	<0.005	0.00407	--	<0.005	0.325	0.00615	--	
				03/23/2021	<0.004	<0.002	0.0274	<0.002	<0.001	<0.002	<0.002	0.178	<0.002	0.00477	<0.0002	<0.005	0.175	0.00502	<0.002	
				09/14/2021	<0.004	<0.002	0.0318	<0.002	<0.001	<0.002	<0.002	0.18	<0.002	0.00484	<0.0002	<0.005	0.811	0.00907	<0.002	

Notes:

mg/L = milligrams per liter

pCi/L = picoCuries per liter

< = 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 they are not utilized in statistics to determine Statistically Significant Levels (SSLs) over the groundwater protection standard.

-- = not analyzed

TABLE 4
STATISTICAL BACKGROUND VALUES
 2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
 ZIMMER POWER PLANT
 125 - COAL PILE RUNOFF POND
 MOSCOW, OH

Parameter	Statistical Background Value (LPL/UPL)
40 C.F.R. Part 257 Appendix III	
Boron (mg/L)	0.0846
Calcium (mg/L)	214
Chloride (mg/L)	74.1
Fluoride (mg/L)	0.200
pH (field) (SU)	6.9/7.3
Sulfate (mg/L)	103
Total Dissolved Solids (mg/L)	680

Notes:
 40 C.F.R. = Title 40 of the Code of Federal Regulations
 LPL = Lower Prediction Limit (applicable for pH only)
 mg/L = milligrams per liter
 SU = Standard Units
 UPL = Upper Prediction Limit

TABLE 5
GROUNDWATER PROTECTION STANDARDS
 2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
 ZIMMER POWER PLANT
 125 - COAL PILE RUNOFF POND
 MOSCOW, OH

Parameter	Groundwater Protection Standard*
40 C.F.R. Part 257 Appendix IV	
Antimony (mg/L)	0.006
Arsenic (mg/L)	0.010
Barium (mg/L)	2
Beryllium (mg/L)	0.004
Cadmium (mg/L)	0.005
Chromium (mg/L)	0.1
Cobalt (mg/L)	0.006
Fluoride (mg/L)	4.0
Lead (mg/L)	0.015
Lithium (mg/L)	0.04
Mercury (mg/L)	0.002
Molybdenum (mg/L)	0.1
Radium-226 + Radium 228 (pCi/L)	5
Selenium (mg/L)	0.05
Thallium (mg/L)	0.002

Notes:
 * Groundwater Protection Standard is the higher of the Maximum Contaminant Level/Health-Based Level or background.
 40 C.F.R. = Title 40 of the Code of Federal Regulations
 mg/L = milligrams per liter
 pCi/L = picoCuries per liter

FIGURES



OHIO RIVER



- BACKGROUND WELL
- COMPLIANCE WELL
- PART 257 REGULATED UNIT (SUBJECT UNIT)
- SITE FEATURE
- PROPERTY BOUNDARY

0 150 300 Feet

MONITORING WELL LOCATION MAP

2021 ANNUAL GROUNDWATER MONITORING
AND CORRECTIVE ACTION REPORT
COAL PILE RUNOFF POND
ZIMMER POWER PLANT
MOSCOW, OHIO

FIGURE 1

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.

