

2018 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

SLAG SETTLING IMPOUNDMENT SIBLEY GENERATING STATION SIBLEY, MISSOURI

Presented To:
KCP&L Greater Missouri Operations Company

SCS ENGINEERS

27213169.18 | January 2019

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CERTIFICATIONS

I, John R. Rockhold, being a qualified groundwater scientist and Registered Geologist in the State of Missouri, do hereby certify that the 2018 Annual Groundwater Monitoring and Corrective Action Report for the Slag Settling Impoundment at the Sibley Generating Station was prepared by me or under my direct supervision and fulfills the requirements of 40 CFR 257.90(e).



John R. Rockhold, R.G.

SCS Engineers

I, Douglas L. Doerr, being a qualified licensed Professional Engineer in the State of Missouri, do hereby certify that the 2018 Annual Groundwater Monitoring and Corrective Action Report for the Slag Settling Impoundment at the Sibley Generating Station was prepared by me or under my direct supervision and fulfills the requirements of 40 CFR 257.90(e).



Douglas L. Doerr, P.E.

SCS Engineers

2018 Groundwater Monitoring and Corrective Action Report

Revision Number	Revision Date	Revision Section	Summary of Revisions

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1 INTRODUCTION

This 2018 Annual Groundwater Monitoring and Corrective Action Report was prepared to support compliance with the groundwater monitoring requirements of the “Coal Combustion Residuals (CCR) Final Rule” (Rule) published by the United States Environmental Protection Agency (USEPA) in the *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule*, dated April 17, 2015 (USEPA, 2015). Specifically, this report was prepared to fulfill the requirements of 40 CFR 257.90 (e). The applicable sections of the Rule are provided below in *italics*, followed by applicable information relative to the 2018 Annual Groundwater Monitoring and Corrective Action Report for the Slag Settling Impoundment at the Sibley Generating Station.

2 § 257.90(E) ANNUAL REPORT REQUIREMENTS

Annual groundwater monitoring and corrective action report. For existing CCR landfills and existing CCR surface impoundments, no later than January 31, 2018, and annually thereafter, the owner or operator must prepare an annual groundwater monitoring and corrective action report. For new CCR landfills, new CCR surface impoundments, and all lateral expansions of CCR units, the owner or operator must prepare the initial annual groundwater monitoring and corrective action report no later than January 31 of the year following the calendar year a groundwater monitoring system has been established for such CCR unit as required by this subpart, and annually thereafter. For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year. For purposes of this section, the owner or operator has prepared the annual report when the report is placed in the facility’s operating record as required by § 257.105(h)(1). At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:

2.1 § 257.90(E)(1) SITE MAP

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;

A site map with an aerial image showing the Slag Settling Impoundment and all background (or upgradient) and downgradient monitoring wells with identification numbers for the Slag Settling Impoundment groundwater monitoring program is provided as **Figure 1** in **Appendix A**.

2.2 § 257.90(E)(2) MONITORING SYSTEM CHANGES

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;

No new monitoring wells were installed and no wells were decommissioned as part of the CCR groundwater monitoring program for the Slag Settling Impoundment in 2018.

2.3 § 257.90(E)(3) SUMMARY OF SAMPLING EVENTS

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;

Only detection monitoring was conducted during the reporting period (2018). Samples collected in 2018 were collected and analyzed for Appendix III detection monitoring constituents as indicated in **Appendix B, Table 1** (Appendix III Detection Monitoring Results, and **Table 2** (Detection Monitoring Field Measurements). The dates of sample collection, the monitoring program requiring the sample, and the results of the analyses are also provided in these tables. These tables include both the Spring 2018 semiannual detection monitoring data and the Fall 2018 semiannual detection monitoring data.

2.4 § 257.90(E)(4) MONITORING TRANSITION NARRATIVE

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); and

There was no transition between monitoring programs in 2018. Only detection monitoring was conducted in 2018.

2.5 § 257.90(e)(5) OTHER REQUIREMENTS

Other information required to be included in the annual report as specified in §§ 257.90 through 257.98.

A summary of potentially required information and the corresponding section of the Rule is provided in the following sections. In addition, the information, if applicable, is provided.

2.5.1 § 257.90(e) Program Status

Status of Groundwater Monitoring and Corrective Action Program.

The groundwater monitoring and corrective action program is in detection monitoring.

Summary of Key Actions Completed.

- a. completion of the statistical evaluation of the initial Fall 2017 semiannual detection monitoring event per the certified statistical method,
- b. completion of the 2017 Annual Groundwater Monitoring and Corrective Action Report,
- c. completion of the Spring 2018 semiannual detection monitoring sampling and analysis event, and subsequent verification sampling per the certified statistical method,
- d. completion of the statistical evaluation of the Spring 2018 semiannual detection monitoring event per the certified statistical method, and
- e. initiation of the Fall 2018 semiannual detection monitoring sampling and analysis event.

Description of Any Problems Encountered.

No noteworthy problems were encountered.

Discussion of Actions to Resolve the Problems.

Not applicable because no noteworthy problems were encountered.

Projection of Key Activities for the Upcoming Year (2019).

Semiannual Spring and Fall 2019 groundwater sampling and analysis. Completion of verification sampling and analyses and statistical evaluation of Fall 2018 and Spring 2019 detection monitoring data and, if required, alternative source demonstration(s).

2.5.2 § 257.94(d)(3) Demonstration for Alternative Detection Monitoring Frequency

The owner or operator must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority stating that the demonstration for an alternative groundwater sampling and analysis frequency meets the requirements of this section. The owner or operator must include the demonstration providing the basis for the alternative monitoring frequency and the certification by a qualified professional engineer or the approval from the Participating State Director or approval from EPA where EPA is the permitting authority in the annual groundwater monitoring and corrective action report required by § 257.90(e).

Not applicable because no alternative monitoring frequency for detection monitoring and certification was pursued.

2.5.3 § 257.94(e)(2) Detection Monitoring Alternate Source Demonstration

Demonstration that a source other than the CCR unit caused the statistically significant increase (SSI) over background levels for a constituent or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. In addition, certification of the demonstration is to be included in the annual report.

Not applicable because no such demonstration was conducted.

2.5.4 § 257.95(c)(3) Demonstration for Alternative Assessment Monitoring Frequency

The owner or operator must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority stating that the demonstration for an alternative groundwater sampling and analysis frequency meets the requirements of this section. The owner or operator must include the demonstration providing the basis for the alternative monitoring frequency and the certification by a qualified professional engineer or the approval from the Participating State Director or the approval from EPA where EPA is the permitting authority in the annual groundwater monitoring and corrective action report required by § 257.90(e).

Not applicable because there was no assessment monitoring conducted.

2.5.5 § 257.95(d)(3) Assessment Monitoring Concentrations and Groundwater Protection Standards

Include the concentrations of Appendix III and detected Appendix IV constituents from the assessment monitoring, the established background concentrations, and the established groundwater protection standards.

Not applicable because there was no assessment monitoring conducted.

2.5.6 § 257.95(g)(3)(ii) Assessment Monitoring Alternate Source Demonstration

Demonstrate that a source other than the CCR unit caused the contamination, or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Any such demonstration must be supported by a report that includes the factual or evidentiary basis for any conclusions and must be certified to be accurate by a qualified professional engineer. If a successful demonstration is made, the owner or operator must continue monitoring in accordance with the assessment monitoring program pursuant to this section, and may return to detection monitoring if the constituents in appendices III and IV to this part are at or below background as specified in paragraph (e) of this section. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer or the approval from the Participating State Director or approval from EPA where EPA is the permitting authority.

Not applicable because there was no assessment monitoring conducted.

2.5.7 § 257.96(a) Demonstration for Additional Time for Assessment of Corrective Measures

Within 90 days of finding that any constituent listed in appendix IV to this part has been detected at a statistically significant level exceeding the groundwater protection standard defined under § 257.95(h), or immediately upon detection of a release from a CCR unit, the owner or operator must initiate an assessment of corrective measures to prevent further releases, to remediate any releases and to restore affected area to original conditions. The assessment of corrective measures must be completed within 90 days, unless the owner or operator demonstrates the need for additional time to complete the assessment of corrective measures due to site-specific conditions or circumstances. The owner or operator must obtain a certification from a qualified professional engineer attesting that the demonstration is accurate. The 90-day deadline to complete the assessment of corrective measures may be extended for no longer than 60 days. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer or the approval from the Participating State Director or approval from EPA where EPA is the permitting authority.

Not applicable because there was no assessment monitoring conducted.

3 GENERAL COMMENTS

This report has been prepared and reviewed under the direction of a qualified groundwater scientist and qualified professional engineer. The information contained in this report is a reflection of the

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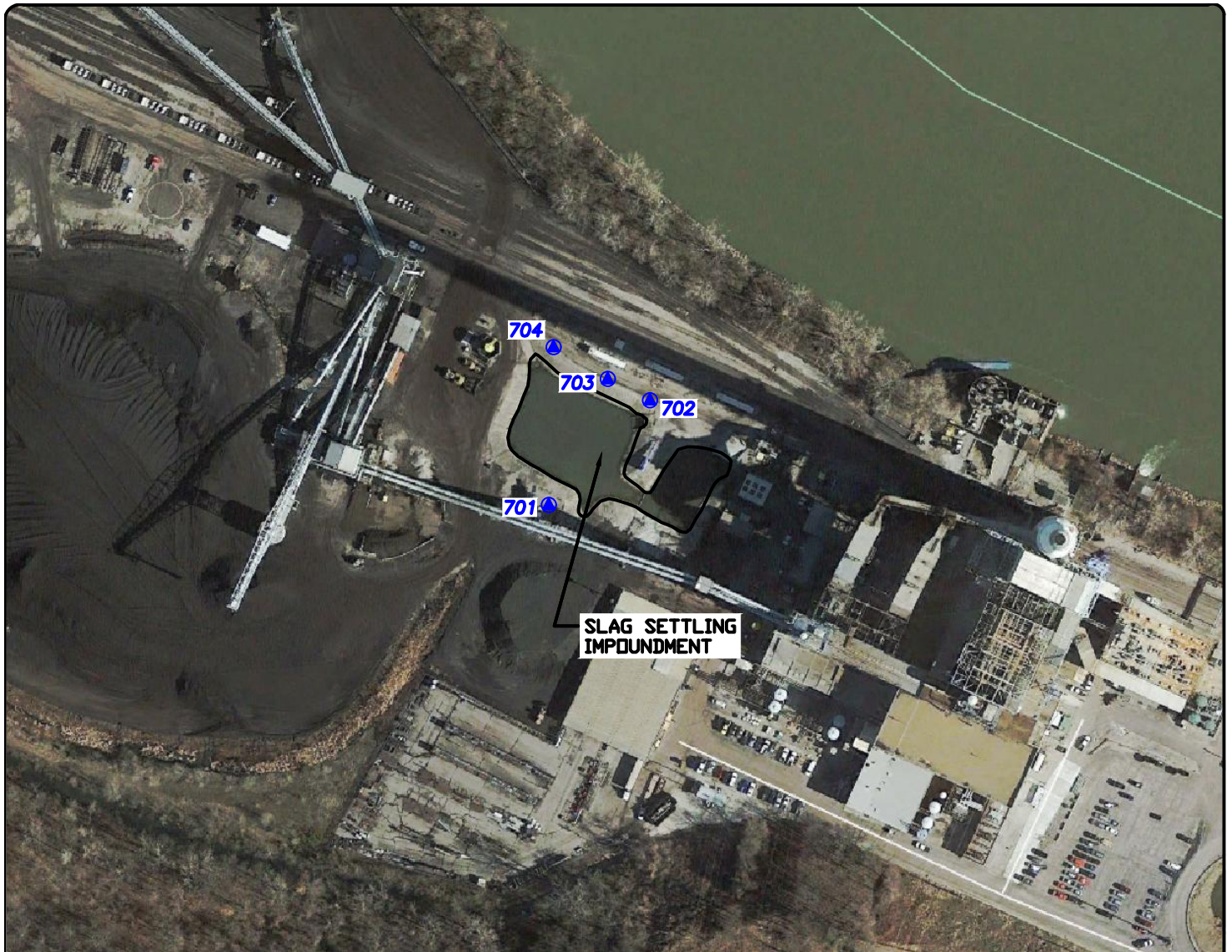
conditions encountered at the Sibley Generating Station at the time of fieldwork. This report includes a review and compilation of the required information and does not reflect any variations of the subsurface, which may occur between sampling locations. Actual subsurface conditions may vary and the extent of such variations may not become evident without further investigation.

Conclusions drawn by others from the result of this work should recognize the limitation of the methods used. Please note that SCS Engineers does not warrant the work of regulatory agencies or other third parties supplying information used in the assimilation of this report. This report is prepared in accordance with generally accepted environmental engineering and geological practices, within the constraints of the client's directives. It is intended for the exclusive use of KCP&L Greater Missouri Operations Company for specific application to the Sibley Generating Station Slag Settling Impoundment. No warranties, express or implied, are intended or made.

APPENDIX A

FIGURES

Figure 1: Site Map



LEGEND:

- 701 CCR GROUNDWATER MONITORING SYSTEM WELLS
- CCR UNIT BOUNDARY



NOTES:

1. HORIZONTAL & VERTICAL DATUM: URS PLANS FOR CONSTRUCTION, KCP&L SIBLEY GENERATING STATION, DESIGN FILE 16530511.00001, DATED JANUARY 2010
2. GOOGLE EARTH AERIAL IMAGE, MARCH 2015. MONITOR WELL LOCATIONS ARE APPROXIMATE.
3. BOUNDARY AND MONITORING WELL WELL LOCATIONS SHOWN ARE APPROXIMATE.

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**KCP&L GREATER MISSOURI OPERATIONS COMPANY
SIBLEY SLAG SETTLING IMPOUNDMENT
SIBLEY GENERATING STATION
2018 GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT**

CHK. BY: JRR	DWN. BY: TGW	DSN. BY: TGW	PROJ. NO. 27213169.18
PROJ. MGR: JRR	DATE: 1/21/19	CADD FILE: FIG 1 - SIBLEY SLAG IMP.DWG	FIG. NO. 1

APPENDIX B

TABLES

Table 1: Appendix III Detection Monitoring Results

Table 2: Detection Monitoring Field Measurements

Table 1
Slag Settling Impoundment
Appendix III Detection Monitoring Results
KCP&L GMO Sibley Generating Station

Well Number	Sample Date	Appendix III Constituents						
		Boron (mg/L)	Calcium (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	pH (S.U.)	Sulfate (mg/L)	Dissolved Solids (mg/L)
MW-701	5/16/2018	<0.200	85.3	8.83	0.107	7.39	15.2	507
MW-701	6/27/2018	---	---	---	---	**7.22	---	*297
MW-701	11/15/2018	<0.200	86.4	8.09	0.122	7.11	13.1	296
MW-702	5/16/2018	<0.200	87.7	8.66	0.134	7.53	20.0	521
MW-702	6/27/2018	---	---	---	---	**7.45	---	*297
MW-702	11/15/2018	<0.200	88.0	8.87	0.119	7.24	20.0	292
MW-703	5/16/2018	0.824	123	18.1	0.284	7.34	<5.00	499
MW-703	11/15/2018	0.752	138	20.3	0.307	7.07	<5.00	546
MW-704	5/16/2018	<0.200	91.4	12.8	0.142	7.44	24.6	361
MW-704	11/15/2018	<0.200	91.4	12.8	0.162	7.09	22.7	319

* Verification Sample obtained per certified statistical method and Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, March 2009.

**Extra Sample for Quality Control Validation or per Standard Sampling Procedure

mg/L - milligrams per liter

S.U. - Standard Units

--- Not Sampled

Table 2
Slag Settling Impoundment
Detection Monitoring Field Measurements
KCP&L GMO Sibley Generating Station

Well Number	Sample Date	pH (S.U.)	Specific Conductivity (µS)	Temperature (°C)	ORP (mV)	Turbidity (NTU)	DO (mg/L)	Water Level (ft btoc)	Groundwater Elevation (ft NGVD)
MW-701	5/16/2018	7.39	450	15.69	234	0.0	3.38	19.00	708.26
MW-701	6/27/2018	**7.22	546	17.48	159	0.0	2.79	17.60	709.66
MW-701	11/15/2018	7.11	510	14.16	146	7.8	3.66	17.03	710.23
MW-702	5/16/2018	7.53	469	15.10	-149	0.0	1.27	23.42	703.87
MW-702	6/27/2018	**7.45	555	18.45	-126	0.0	0.11	21.48	705.81
MW-702	11/15/2018	7.24	530	14.35	-151	9.7	2.29	21.17	706.12
MW-703	5/16/2018	7.34	891	15.78	-192	0.0	0.96	23.05	704.26
MW-703	11/15/2018	7.07	1160	14.66	-195	5.4	0.40	21.03	706.28
MW-704	5/16/2018	7.44	491	16.12	20	0.0	1.20	23.11	704.54
MW-704	11/15/2018	7.09	561	14.86	-20	2.8	0.63	21.35	706.30

**Extra Sample for Quality Control Validation or per Standard Sampling Procedure

S.U. - Standard Units

µS - microsiemens

°C - Degrees Celsius

ft btoc - Feet Below Top of Casing

ft NGVD - National Geodetic Vertical Datum (NAVD 88)

NTU - Nephelometric Turbidity Unit