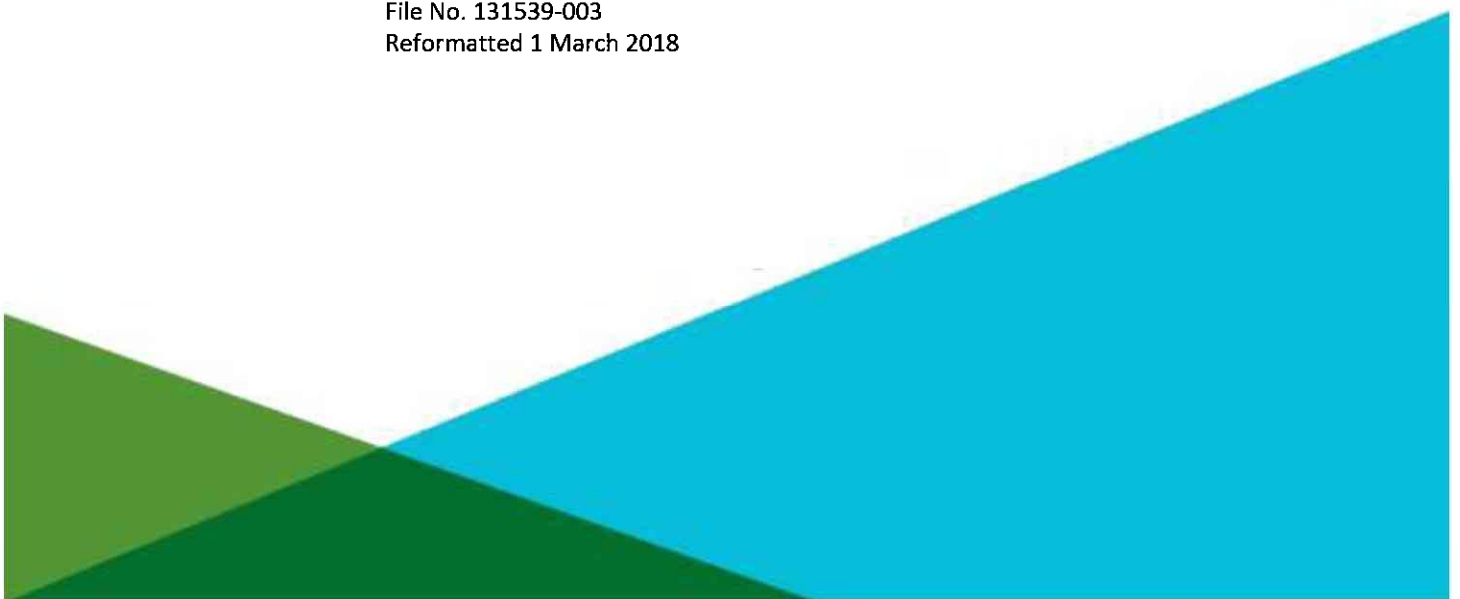


**REPORT ON  
2017 ANNUAL GROUNDWATER MONITORING AND  
CORRECTIVE ACTION REPORT  
CROSS GENERATING STATION; ASH POND  
CROSS, SOUTH CAROLINA**

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## Annual Groundwater Monitoring Report Summary

Haley & Aldrich, Inc. (Haley & Aldrich) has prepared this 2017 Annual Groundwater Monitoring Corrective Action Report for the Cross Generating Station (CGS). This 2017 Annual Report was developed to comply with the United States Environmental Protection Agency (USEPA) Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals (CCR) from Electric Utilities, 40 CFR Part 257, Subpart D dated 17 April 2015 (Rule), specifically subsection §257.90(e)(1) through (5). South Carolina Public Service Authority (Santee Cooper) operates the existing coal combustion residuals (CCR) management unit referred to as the Ash pond at CGS located in Berkeley County, South Carolina near the community of Cross. This CCR unit is subject to the Rule since it was active as of the effective date of the Rule.

This annual report addresses the CCR management unit, referred to as the Ash pond, at CGS, as described in the Groundwater Monitoring Program report, which was certified and placed in the facility's operating record on October 17, 2017 as required by §257.105(h)(2) and posted on the facility's website on November 16, 2017 as required by §257.107(h)(2).

To report on the activities conducted during the prior calendar year and document compliance with the Rule, the specific requirements listed in §257.90(e)(1) through (5) are provided below in bold/italic type followed by a short narrative addressing how that specific requirement was met.

### **§257.90 APPLICABILITY**

***§257.90(e) 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).***

As required, this annual report documents the status of the groundwater monitoring program for the CCR management unit at CGS and summarizes key actions completed during the prior calendar year.

In 2018, statistical analysis of the groundwater quality data collected under the Detection Monitoring program for constituents in Appendix III will be completed. Detection Monitoring is planned for 2018 unless the analysis indicates that a Statistically Significant Increase (SSI) over background levels for one or more of the Appendix III constituents has been detected at any downgradient well during Detection Monitoring at the waste boundary. If an SSI occurs either Assessment Monitoring or an Alternate Source Demonstration (ASD) would be initiated for the CCR unit.

If an ASD is successful, a report will be completed with results certified by a qualified professional engineer and the CCR unit will continue with Detection Monitoring. If the ASD is not successful or is not completed within 90 days after completing the statistical analysis, the unit would enter Assessment Monitoring.

***At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:***

#### **§257.90(e)(1) AERIAL IMAGE OF GROUNDWATER MONITORING PROGRAM**

***§257.90(e)(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;***

As required by §257.90(e)(1), a map showing the location of the Ash pond and associated upgradient and downgradient monitoring wells is included in this report as **Figure 1**. In addition, this information is presented in the Groundwater Monitoring Program report prepared for CGS, which was placed in the facility's operating record on October 17, 2017 as required by §257.105(h)(2).

#### **§257.90(e)(2) ADJUSTMENTS TO GROUNDWATER MONITORING PROGRAM**

***§257.90(e)(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;***

To comply with the requirements of §257.91, a groundwater monitoring network of seven (7) wells (two upgradient and five downgradient) were installed for the Ash pond at CGS. Details of the design, and construction of the monitoring wells are summarized in the Groundwater Monitoring Program Report which was placed in the facility's operating record on October 17, 2017, as required by §257.105(h)(2). None of the wells installed to monitor groundwater quality upgradient and downgradient of the Ash Pond were installed or decommissioned in 2017.

#### **§257.90(e)(3) SUMMARY OF GROUNDWATER ANALYSIS**

***§257.90(e)(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 [upgradient] and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs;***

In accordance with §257.94(b), a minimum of eight independent samples from each upgradient and downgradient monitoring well were collected prior to October 17, 2017. A summary of the groundwater monitoring program for the Ash pond, including the analytical results for the Appendix III and Appendix IV list of constituents, is presented in **Table 1** of this report. All the samples obtained were required by the detection monitoring program.

#### **§257.90(e)(4) CURRENT GROUNDWATER MONITORING PROGRAM**

***§257.90(e)(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);***

Consistent with §257.90(e), the 2017 annual report documents activities conducted during the prior calendar year at the CCR management units subject to the Rule. The statistical analysis of the initial minimum eight rounds of groundwater sampling was not completed in 2017 and therefore is not reported in this Annual Report. 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) will be provided, as appropriate, in subsequent annual reports.

#### **§257.90(e)(5) OTHER REQUIRED INFORMATION**

***§257.90(e)(5) Other information required to be included in the annual report as specified in §257.90 through §257.98.***

This initial Annual Report documents activities conducted to comply with Sections §257.90 through §257.94 of the Rule. There are no applicable requirements from Sections §257.95 through §257.98.

#### **Attachments**

Table 1. Summary of Analytical Results

Figure 1. Location of Groundwater Monitoring Wells for CCR Compliance - 2017



Well ID	Purpose	Date of Sample Event	Appendix III Constituents								Appendix IV Constituents																	Field Parameters														
			Boron	Boron	Calcium	Calcium	Chloride	Fluoride	Sulfate	Total Dissolved Solids	pH	Antimony	Arsenic	Barium	Barium	Beryllium	Cadmium	Chromium	Cobalt	Fluoride	Lead	Lithium	Lithium	Mercury	Molybdenum	Radium 226	Radium 228	Selenium	Selenium	Thallium	Depth to Groundwater	Groundwater Elevation	pH	Specific Conductivity	Temperature	Oxidation Reduction Potential	Turbidity	Dissolved Oxygen				
			ug/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	SU	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	Feet (blc)	Feet (msl)	SU	uS	C	mV	NTU	ppm			
			EPA 8010D	EPA 8020B	EPA 8010D	EPA 8020B	EPA 306.0	EPA 306.0	EPA 306.0	SM 2540C		EPA 6020B	EPA 6020B	EPA 6010D	EPA 6020B	EPA 6020B	EPA 6020B	EPA 6020B	EPA 6020B	EPA 6020B	EPA 306.0	EPA 6020B	EPA 6010D	EPA 6020B	EPA 7470	EPA 6010D	EPA 900.1 Mod	EPA 904.0	EPA 6010D	EPA 6020B	EPA 6020B						SM2580					
CAP-9	DUPLICATE	1/26/2017		5130		457	1010	2.22	327	2406																																
CAP-9	Resample Hg	3/1/2017																																								
CAP-9	DUPLICATE for Resample Hg	3/1/2017																																								
CAP-9	Baseline	4/19/2017	5600			497	1020	2.16	358	3074	3.67	<5.0	6.8		69.3	14.2	<0.50	<5.0	32.7	2.16	10.6	62	<0.200	<10.0	1.74	<3.00		<10	<1.0	14.5	77.09	3.67	3940	21.86	325	0	0.61					
CAP-9	DUPLICATE	4/19/2017	5600			484	1030	2.33	349	3032		<5.0	6.6		76.6	13.2	<0.50	<5.0	29.6	2.33	11	62	<0.200	<10.0	2.05	<3.00		<10	<1.0													
CAP-9	Baseline	9/27/2017	6300			469	1160	4.4	498	2806	3.75	<5.0	7.1		60.8	12.6	<0.50	<5.0	33.5	4.4	11.3	63	<0.20	<10.0	2.06	3.52		<10	<1.0	14.31	77.28	3.75	3850	27.29	279	0	0.6					
CAP-9	DUPLICATE	9/27/2017	6000			470	1160	3.1	452	2830		<5.0	7		64	12.4	<0.50	<5.0	33.3	3.1	11.8	61	<0.20	<10.0	2.68	3		<10	<1.0													
CAP-9	Detection	10/10/2017	6200		490		1090	3.92	485	3013	3.92																		14.67	76.92	3.92	4050	25.62	256	0	0.62						
CAP-9	DUPLICATE	10/10/2017	6500		520		1070	3.9	452	3155																																
CAP-9	total samples		6	10	4	12	16	16	16	16	9	14	14	2	12	14	14	14	14	14	4	10	16	14	14	2	12	14	10	10	10	10	10	10	10	10	10	10				



GIS FILE PATH: G:\Projects\42122\_Santee\_Copper\Global\GIS\Map\_Projects\Cross\2015\_08\42122\_000\_01A\MW\_Location\_submittal.mxd — USER: ganson — LAST SAVED: 9/3/2015 11:21:06 AM



**LEGEND**

BACKGROUND WELLS  
EXISTING

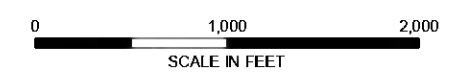
CLASS 2 LANDFILL WELLS  
EXISTING

CLASS 3 LANDFILL AREA B WELLS  
EXISTING

ASH POND WELLS  
EXISTING

**NOTE:**

IMAGE SOURCE: GOOGLE EARTH (DIGITAL GLOBE) 2015



**HALEY ALDRICH**  
SANTÉE COOPER  
CROSS GENERATING STATION  
CROSS, SOUTH CAROLINA

**LOCATION OF GROUNDWATER  
MONITORING WELLS FOR  
CCR COMPLIANCE - 2017**



FIGURE 1