

SOUTH CAROLINA ELECTRIC & GAS



PLACEMENT ABOVE THE UPPERMOST AQUIFER CERTIFICATION

FOR THE
**WILLIAMS STATION
FGD POND**
BERKELEY COUNTY, SOUTH CAROLINA

OCTOBER 2018



1 OVERVIEW

The EPA Administrator, Gina McCarthy, signed the Disposal of Coal Combustion Residuals from Electric Utilities final rule on December 19, 2014, and it was published in the Federal Register (FR) on April 17, 2015. The regulations provide a comprehensive set of requirements for the safe disposal of coal combustion residuals (CCRs), commonly known as coal ash, from coal-fired power plants. The rule is administered as part of the Resource Conservation and Recovery Act [RCRA, 42 United States Code (U.S.C.) §6901 et seq.], using the Subtitle D approach.

South Carolina Electric & Gas (SCE&G) is subject to the CCR Rule. Based on SCE&G's review of the rule, the **FGD Pond at SCE&G Williams Station** have been determined to be existing CCR surface impoundment subject to the CCR rule requirements.

2 PURPOSE

The purpose of this report is to document that the Williams Station FGD Pond meets the requirements of CCR rule §257.60 – *Placement Above the Uppermost Aquifer*.

3 APPLICABLE REGULATIONS

CCR rule §257.60 – *Placement Above the Uppermost Aquifer* states the following:

(a) New CCR landfills, existing and new CCR surface impoundments, and all lateral expansions of CCR units must be constructed with a base that is located no less than 1.52 meters (five feet) above the upper limit of the uppermost aquifer, or must demonstrate that there will not be an intermittent, recurring, or sustained hydraulic connection between any portion of the base of the CCR unit and the uppermost aquifer due to normal fluctuations in groundwater elevations (including the seasonal high water table). The owner or operator must demonstrate by the dates specified in paragraph (c) of this section.

4 CCR UNIT DESCRIPTION

Williams Station is coal-fired electric generation plant located in Goose Creek, Berkeley County, South Carolina. The FGD Pond is used to manage wastewater generated from the flue gas desulfurization scrubber system. The FGD Pond was constructed in accordance with construction permit (permit 19263-IW) issued from DHEC on March 9, 2009, and placed into operation in accordance with an operation approval issued by DHEC on October 6, 2009.

5 DISCUSSION OF THE POND AND THE UPPERMOST AQUIFER

Extensive work has been completed in association with hydrogeology and uppermost aquifer levels at the CCR unit including work associated with the following:

- *Groundwater Monitoring Well Installation Report, EPA CCR Rule Compliance Monitoring Wells, South Carolina Electric & Gas, July 2016, revised January 2017, revised February 2018, for CCR facilities at Cope Station, Wateree Station and Williams Station*

- *Analysis of Groundwater Flow Rate and Direction, March 2018 Monitoring Data, EPA CCR Rule Compliance Monitoring Wells, South Carolina Electric & Gas, July 2018, for CCR facilities at Cope Station, Wateree Station and Williams Station*
- *NPDES Groundwater Monitoring Data - 2005 to present*

To evaluate the separation between the base of the pond and the uppermost aquifer, the above reports and data were reviewed as well as the as-built record surveys for the pond construction. Figure 1 presents a plan view of the FGD Pond to include groundwater monitoring wells in the vicinity of the pond. Figure 2 presents a cross-section view of the FGD Pond showing existing conditions, the base of the pond liner system, and groundwater elevation levels for the uppermost aquifer for groundwater monitoring events during the period 2005 to present. The cross-section profile alignment was selected based on the general groundwater flow direction per the above reports, with the alignment consistent with the general west to east flow of groundwater under the FGD Pond. Table 1 provides a summary of the groundwater elevations data.

As demonstrated in Figure 2, the separation between the base of the pond and the uppermost aquifer is less than the required 1.52 meters (five feet).

The FGD Pond is located on an upland area. Based on the groundwater levels and flow direction documented in the above discussed reports and data and as shown in Figure 2, groundwater generally flows from west to east and toward the lowland Cooper River tributary area located immediately to the general east of the facility, with the topographic relief observed east of the facility serving to transition the groundwater to the nearby lower surface water elevation.

The quantity of groundwater elevation data is significant (14 years of monitoring data including summer and winter monitoring for 12 years and quarterly monitoring for 2 years) and is therefore considered representative of normal groundwater conditions and fluctuations including seasonal highs. Based on the 14 years of groundwater elevation data as shown on Figure 2, the observed normal fluctuation in groundwater elevations generally remains several feet beneath the bottom of the pond liner system, with no connection to the base of the pond.

6 CONCLUSION

Given the hydrogeologic site conditions and significant existing groundwater elevation data, the normal fluctuations in groundwater elevations including seasonal high water tables do not result in an intermittent, recurring, or sustained hydraulic connection between any portion of the base of the CCR unit and the uppermost aquifer, and therefore CCR rule §257.60 is satisfied.

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SCE&G WILLIAMS STATION

**GROUNDWATER MONITORING WELLS
 AND CROSS-SECTION**

JOB NUMBER

SHEET
1

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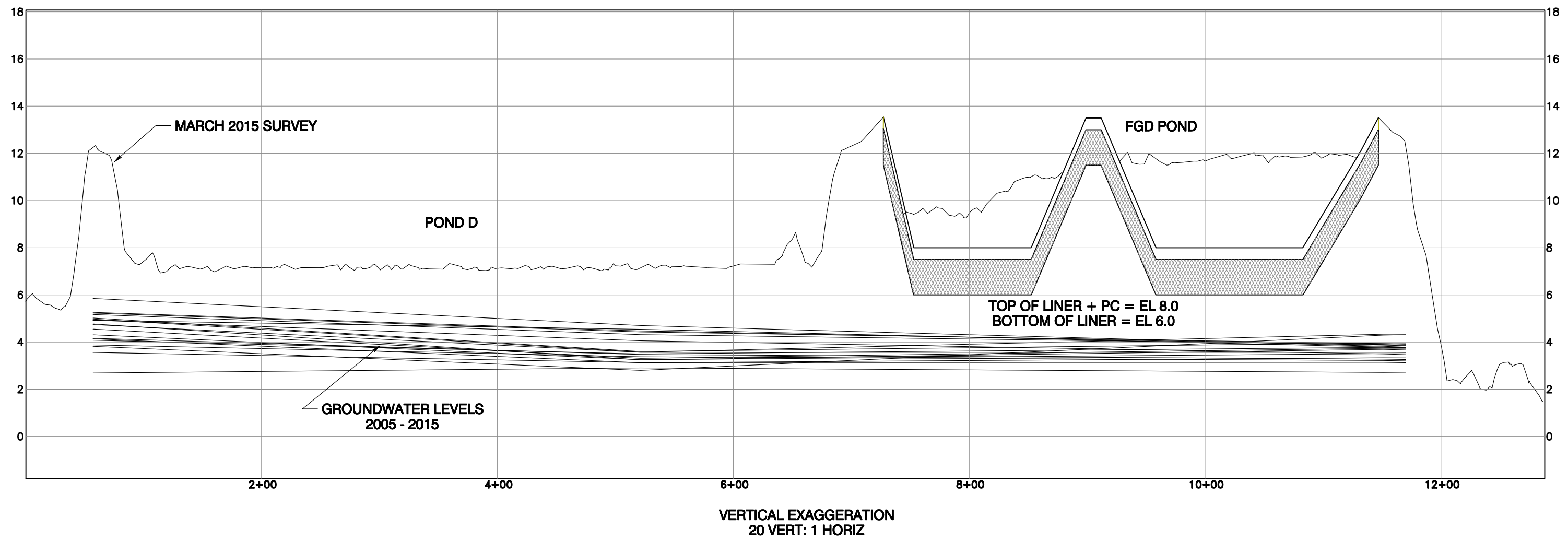


Table 1
NPDES & EPA CCR Rule Compliance Monitoring Wells
Historical Groundwater Elevations
South Carolina Electric & Gas
Williams Station FGD Pond

	Northing	Easting	6/20/2005	12/13/2005	6/5/2006	11/29/2006	6/5/2007	12/11/2007	6/19/2008	12/10/2008	6/10/2009	9/24/2009	1/13/2010
			Groundwater Elevation, ft.	Groundwater Elevation, ft.	Groundwater Elevation, ft.	Groundwater Elevation, ft.	Groundwater Elevation, ft.	Groundwater Elevation, ft.	Groundwater Elevation, ft.	Groundwater Elevation, ft.	Groundwater Elevation, ft.	Groundwater Elevation, ft.	Groundwater Elevation, ft.
GW-01	434595.66	2328648.25	4.49	4.59	3.86	4.30	3.72	3.51	3.51	4.05	3.35	4.12	4.14
GW-02	434331.22	2328586.25	nm	4.37	3.76	3.98	3.52	4.37	3.35	3.57	2.95	3.67	3.74
GW-04	433723.22	2327914.00	3.74	3.56	3.28	3.62	3.28	2.67	2.97	3.43	nm	nm	4.94
GW-06	434132.00	2327476.50	5.27	4.97	4.55	5.02	4.31	3.82	4.14	4.74	3.92	4.88	4.92
GW-07	434789.66	2327355.50	2.78	3.32	1.82	3.16	1.22	0.62	1.41	3.61	4.41	2.94	3.89
GW-08	434836.31	2327962.25	3.60	3.59	3.35	3.57	3.22	2.97	3.33	3.74	3.67	3.75	4.02
GW-09	433370.41	2328591.00	3.12	2.99	2.72	3.19	2.80	2.26	2.47	2.94	3.38	3.56	3.01
GW-12	432769.44	2328458.00	2.96	2.77	2.43	3.00	2.55	1.79	2.18	2.60	6.26	3.63	2.74
GW-13	432444.97	2328814.75	2.38	1.98	1.79	2.39	1.97	1.40	1.67	2.05	3.05	2.50	2.23
GW-15	432687.91	2327506.00	2.47	2.32	2.04	2.78	2.15	1.36	1.85	2.27	3.29	3.36	2.38

	Northing	Easting	9/28/2010	6/7/2011	8/8/2011	10/20/2011	5/30/2012	11/12/2012	4/23/2013	3/10/2014	8/5/2014	2/11/2015	8/5/2015
			Groundwater Elevation, ft.	Groundwater Elevation, ft.	Groundwater Elevation, ft.	Groundwater Elevation, ft.	Groundwater Elevation, ft.	Groundwater Elevation, ft.	Groundwater Elevation, ft.	Groundwater Elevation, ft.	Groundwater Elevation, ft.	Groundwater Elevation, ft.	Groundwater Elevation, ft.
GW-01	434595.66	2328648.25	4.04	2.97	3	3.06	3.56	3.18	4.01	3.88	3.56	3.95	2.66
GW-02	434331.22	2328586.25	3.77	3.14	3.21	3.26	3.67	3.78	3.9	3.83	3.45	3.86	2.72
GW-04	433723.22	2327914.00	5.01	3.17	3.42	3.68	4.2	3.7	4.75	4.83	4.5	4.67	2.59
GW-06	434132.00	2327476.50	5.85	3.56	3.88	4.16	4.77	4.08	5.23	5.26	4.93	5.17	2.69
GW-07	434789.66	2327355.50	3.12	0.52	1.02	1.27	1.18	0.39	4.32	4.3	3.12	4.53	2.17
GW-08	434836.31	2327962.25	4.3	3.08	3.32	3.2	2	3.23	4.01	4	3.48	3.85	3.32
GW-09	433370.41	2328591.00	3.41	2.37	2.56	2.8	2.93	2.81	3.42	3.58	3.39	3.43	2.86
GW-12	432769.44	2328458.00	3.62	1.8	2.19	2.15	3.1	2.37	3.31	3.34	2.94	3.23	2.64
GW-13	432444.97	2328814.75	3.07	1.29	1.65	1.9	1.98	2.05	2.82	2.62	2.44	3.17	2.81
GW-15	432687.91	2327506.00	3.91	1.58	2.05	2.71	2.42	2.1	3.42	3.67	3.23	3.18	2.68

	Northing	Easting	5/10/2016	7/11/2016	9/12/2016	11/28/2016	1/23/2017	3/21/2017	5/22/2017	7/24/2017	9/19/2017	3/13/2018
			Groundwater Elevation, ft.	Groundwater Elevation, ft.	Groundwater Elevation, ft.	Groundwater Elevation, ft.	Groundwater Elevation, ft.	Groundwater Elevation, ft.	Groundwater Elevation, ft.	Groundwater Elevation, ft.	Groundwater Elevation, ft.	Groundwater Elevation, ft.
MW-FGD-16	433589.64	2327433.60	2.59	2.58	2.82	2.37	3.71	2.2	2.79	4.2	4.34	3.49
MW-FGD-17	434414.50	2328304.82	3.31	3.55	3.34	3.35	3.72	2.99	3.64	4.35	4.38	4.15
MW-FGD-18	434361.01	2328461.38	3.14	2.62	1.79	2.92	2.43	2.58	2.3	2.95	3.06	3.03
MW-FGD-19	434248.36	2328548.02	-0.94	2.37	3.93	3.28	2.25	1.7	2.58	3.75	4.88	1.9
MW-FGD-19D	434254.04	2328550.03	2.95	2.8	2.58	3.28	2.9	2.35	2.75	3.54	4.15	3.33
MW-FGD-20	434137.83	2328480.26	-3.58	-2.26	NM	1.14	1.34	1.26	1.43	1.97	2.26	NM
MW-FGD-20D	434141.58	2328482.77	2.8	2.71	2.52	3.08	2.86	2.33	2.78	3.39	4.05	NM
MW-FGD-20A	434128.30	2328509.58	NM	NM	NM	NM	NM	NM	NM	NM	NM	0.71
MW-FGD-21	433737.35	2326861.16	NM	NM	NM	2.5	4.46	2.48	2.95	4.63	4.69	3.64