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October 16, 2017

Tennessee Valley Authority
1101 Market Street
Chattanooga, Tennessee 37402

Groundwater Monitoring System
Gypsum Disposal Area Multiunit
TVA Paradise Fossil Plant
Muhlenberg County, Kentucky

1.0 Introduction

This letter documents AECOM's certification of the groundwater monitoring system for the Tennessee Valley Authority (TVA) Paradise Fossil Plant Gypsum Disposal Area Multiunit. The Multiunit includes the Gypsum Disposal Area, Gypsum Disposal Area Stilling Pond 1, and Gypsum Disposal Area Stilling Pond 2 coal combustion residuals (CCR) units. Based on the information evaluated by AECOM, the groundwater monitoring system, first year baseline monitoring phase of TVA's CCR-Rule Groundwater Quality Monitoring Program, meets the performance standard specified in the Final CCR Rule at 40 CFR § 257.91.

2.0 Summary of Findings

In establishing the groundwater monitoring system for the Gypsum Disposal Area Multiunit at the Paradise Fossil Plant in Muhlenberg County, Kentucky, AECOM developed a hydrogeologic characterization of the site, designed and reviewed the installation of the monitoring wells, and evaluated available groundwater data. Based upon review of the available information, the groundwater monitoring system at the Gypsum Disposal Area Multiunit meets the performance standard specified in 40 CFR § 257.91, based on the following criteria:

- The Gypsum Disposal Area, Gypsum Disposal Area Still Pond 1 and Gypsum Disposal Area Stilling Pond 2 are monitored as a single multiunit groundwater monitoring system, in accordance with 40 CFR § 257.91(d).
- There are a sufficient number of wells installed at appropriate locations and depths to yield groundwater samples that accurately represent the quality of background groundwater unaffected by CCR and the quality of groundwater at the downgradient waste boundary (257.91(a)(1) and (2)).
- The wells provide samples from the uppermost aquifer (257.91(a) and 257.53).
- The groundwater monitoring system contains three background and five downgradient monitoring wells, thus the number of wells in the system exceeds the minimum specified in 257.91(c)(1).

- The system contains one background well (95-48A) representing conditions unaffected by CCR, and two upgradient wells (PAF-101, PAF-104) (257.91(a)(1) and (c)(1)).
- The system contains five downgradient wells (94-35A, PAF-103, PAF-114, PAF-115, PAF-116) monitoring groundwater near the waste boundary (257.91(a)(2) and (c)(1)).
- The system includes additional wells beyond the minimum requirements as needed to meet the performance standard (257.91(c)(2)).
- Wells are constructed appropriately (257.91(e)).

3.0 Qualified Professional Engineer Certification

I, Nicholas Golden, being a Registered Professional Engineer in good standing in the State of Kentucky do hereby certify, to the best of my knowledge, information, and belief that the information contained in this certification is prepared in accordance with the accepted practice of engineering; that the information contained herein is accurate as of the date of my signature below; and that the design and construction of the groundwater monitoring system as described above meets the requirements of 40 CFR § 257.91. Opinions relating to environmental, geologic, and hydrogeologic conditions or other estimates are based on available data; actual conditions may vary from those encountered at the times and locations where data are obtained, despite the use of due care.

SIGNATURE: _____ DATE: 10/16/17

PRINTED NAME: Nicholas Golden, PE

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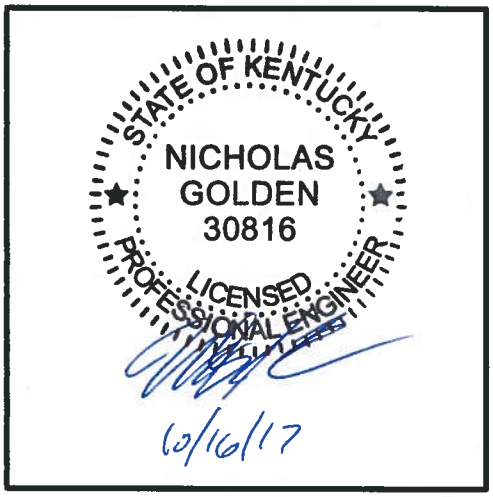
TELEPHONE: 330-800-2769

Attachments:
CCR Rule Monitoring System Plan
Table 1 – Well Construction Information



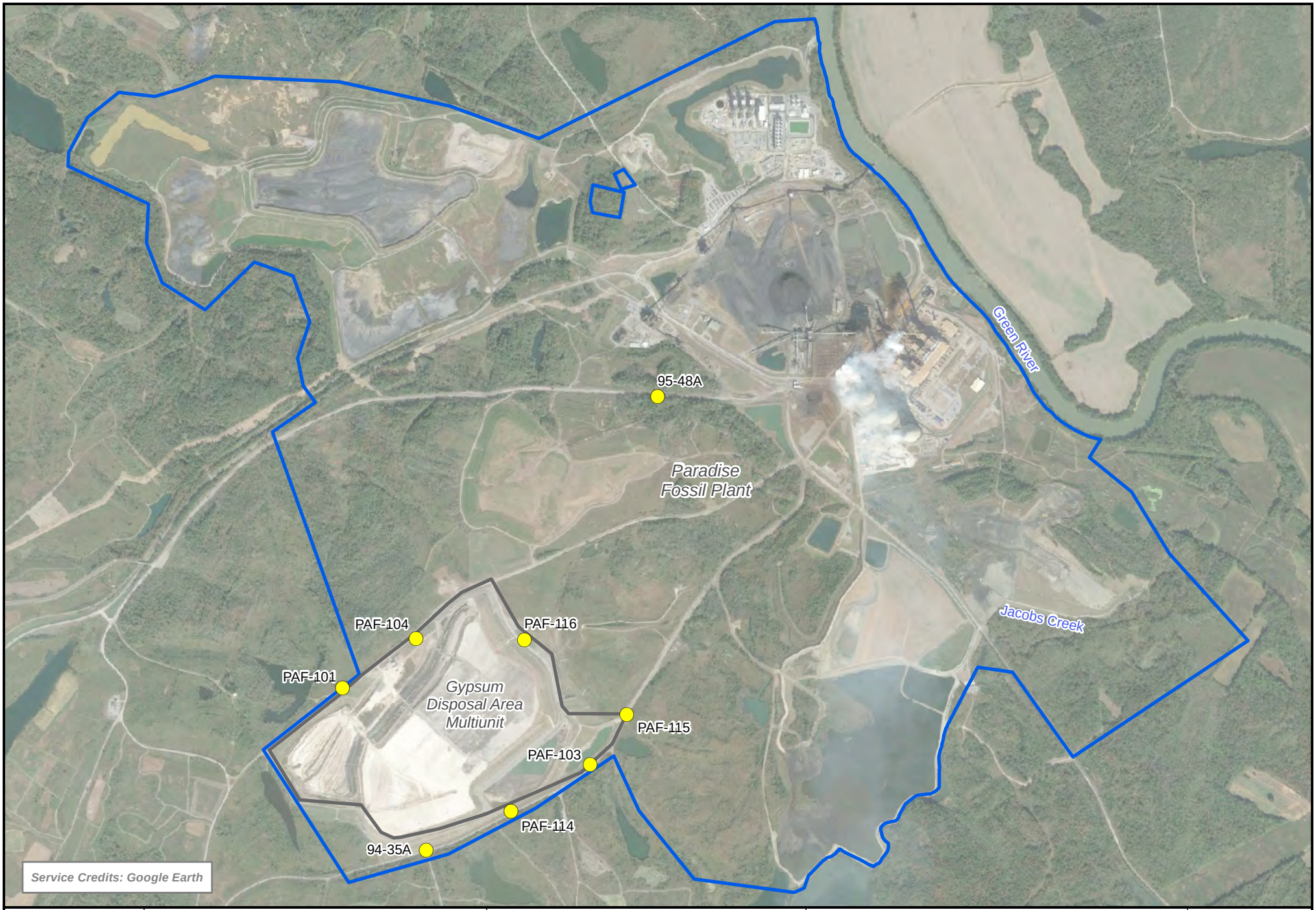


FIGURE:

1

CCR Rule Monitoring System Plan
Gypsum Disposal Area Multiunit
Paradise Fossil Plant
Tennessee Valley Authority

DATE:	DRAWN BY:	PROJECT NUMBER:
10/12/2017	TEG	60439352

N

0 2,000 4,000 Feet

Legend

- CCR Rule Monitoring System Wells
- TVA PAF Property Boundary

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Document Path: L:\Group\IT_GIS\GIS Projects\TVA\PAF\Maps\20171012\Figure 1b_PAF CCR Rule Monitoring System Plan.mxd

Table 1
WELL CONSTRUCTION INFORMATION
CCR RULE GROUNDWATER MONITORING SYSTEM
GYPSUM DISPOSAL AREA MULTIUNIT
TVA PARADISE FOSSIL PLANT

Well ID	UNID#	Position Relative to CCR Unit	Top of Casing Elevation	Ground Elevation	Screened Interval (ft btoc)	Screened Formation	Well Depth (ft btoc)	Pump Intake Depth (ft btoc)	Well Diameter (in) / Material	Well Coordinates	
										KY South State Plane Northing NAD 27 (ft)	KY South State Plane Easting NAD 27 (ft)
94-35A	PAF-00-GW-43-010	Downgradient	454.99	452.2	38.6 - 48.6	Mine Spoils / Shale	48.7	47	2-in PVC	331740.98	1634531.27
95-48A	PAF-00-GW-43-017	Background	450.91	449.7	12.5 - 22.5	Mine Spoils / Shale	22.5	19.5	2-in PVC	339018.37	1638241.96
PAF-101	PAF-00-GW-43-023	Upgradient	535.80	532.7	73.0 - 83.0	Mine Spoils / Shale	83.0	81	4-in PVC	334338.64	1633182.23
PAF-103	PAF-00-GW-43-024	Downgradient	462.56	459.1	49.0 - 59.0	Mine Spoils	59.1	57	4-in PVC	333106.30	1637157.02
PAF-104	PAF-00-GW-43-025	Upgradient	534.18	531.2	69.0 - 79.0	Mine Spoils	79.0	77	4-in PVC	335134.50	1634364.31
PAF-114	PAF-00-GW-43-034	Downgradient	477.25	473.5	22.6 - 32.8	Mine Spoils	32.8	31	4-in PVC	332360.44	1635888.15
PAF-115	PAF-00-GW-43-035	Downgradient	461.37	457.6	28.8 - 39.1	Mine Spoils	39.4	37.5	4-in PVC	333915.07	1637751.55
PAF-116	PAF-00-GW-43-036	Downgradient	500.48	496.7	38.2 - 48.4	Mine Spoils	48.8	46	4-in PVC	335115.83	1636106.71

Well information based on data provided by TVA Well Inventory, October 1, 2017.
Screened Formation based on data provided in boring logs.
ft btoc - feet below top of casing
Elevation in National Geodetic Vertical Datum 1929