ATTACHMENT IX – LANDFILL GAS DEMONSTRATION

LANDFILL GAS DEMONSTRATION

Bremo Bluff FFCP Management Facility
Solid Waste Permit 627
Fluvanna County, Virginia

Prepared for:

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Schnabel Reference No. 22130437.031

November 2024

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1.0 INTRODUCTION

This Landfill Gas Demonstration (LFGD) has been prepared for the Bremo Bluff Fossil Fuel Combustion Products (FFCP) Management Facility (Facility) located in Bremo Bluff, Virginia. The Facility will accept coal combustion residuals (CCR) previously generated at the Bremo Station (Station) and operate as a new, captive industrial landfill (CCR Unit) under the Virginia Department of Environmental Quality (DEQ) Solid Waste Permit (SWP) 627. Schnabel Engineering (Schnabel) has prepared this LFGD on behalf of the Virginia Electric and Power Company d/b/a Dominion Energy Virginia (Dominion Energy).

The Facility is subject to the design requirements in the United States Environmental Protection Agency's "Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments" (CCR Rule, 40 CFR §257 Subpart D) as well as the DEQ's Virginia Solid Waste Management Regulations (VSWMR, 9VAC20-81).

2.0 OBJECTIVE

The objective of this demonstration is to show that landfill gas formation is not a concern at the Facility in accordance with 9VAC20-81.130.K.

3.0 TYPES OF WASTE

This Facility is being proposed for the disposal of CCR generated during the operation of the Station, to include CCR currently stored in the North Ash Pond (NAP); materials generated during the closure of the NAP; coal fines and CCR debris related to other work at the Station; cleaning of sumps and wet wells; soils in contact with CCR; solids and filter bags from the proposed Dominion Energy-owned contact wastewater treatment activities; and inert NAP infrastructure demolition wastes, such as aggregate, concrete, geosynthetics, piping, etc. (CCR wastes).

The CCR material consists of fine particles containing a mixture of minerals such as clays, quartz, iron oxides, and aluminosilicate glass, formed by melting of mineral matter at the high temperatures of combustion, and unburned carbon remaining after the combustion process.

The CCR wastes are non-putrescible by VSWMR definition, meaning that these solid wastes do not contain organic material capable of being decomposed by micro-organisms and causing odors or generating landfill gas (LFG), which, by VSWMR definition, primarily consists of methane and carbon dioxide as a byproduct of the decomposition of organic materials in a landfill.

Additionally, Dominion Energy has operated and currently operates several CCR landfills and, due to the inert nature of the wastes managed, has never had LFG issues at any of these facilities. The wastes proposed at the Facility are analogous to the wastes in the Dominion Energy landfills referenced above.

4.0 BARRIERS TO MIGRATION

Although the generation of LFG through the decomposition of organic materials is not expected, the CCR Unit will be constructed with a bottom liner and leachate collection system that act as a physical barrier to any LFG migration.

The bottom liner and leachate collection system consists of the following components (from top to

bottom):

- 18-inch-thick aggregate leachate collection layer with a hydraulic conductivity greater than or equal to $1x10^{-3}$ centimeters per second (cm/s)
- 250-mil geocomposite, double-sided with 8-ounce per square yard (oz) non-woven geotextile
- 60-mil double-sided, textured high-density polyethylene (HDPE) geomembrane
- Geosynthetic clay liner (GCL) with a hydraulic conductivity less than or equal to $3.4x10^{-9}$ cm/s
- Minimum 12-inch-thick controlled subgrade

Details for the bottom liner system are shown in the Design Plans.

The Facility is also designed to have a minimum 5-foot separation from the base of the CCR Unit to the upper limit of the uppermost aquifer, and is surrounded by topographical highs relative to the base grades to the east, west ,and north.

5.0 LANDFILL GAS DEMONSTRATION

As LFG generation is not expected at the Facility due to the absence of organic materials, LFG-specific monitoring components are not proposed (e.g., LFG monitoring boundary probes) and a plan to assess future LFG generation and migration is not included in this LFGD.

A screening level activity for the presence of LFG odors, however, is included as part of the weekly self-inspection requirements contained in the Facility Inspection and Maintenance Plan in the Operations Manual. Evidence of this screening level activity will be documented and placed in the operating record as part of the Inspection and Maintenance Plan requirements.

No other screening level activities for the presence of LFG are proposed for the Facility. Should the presence of potential LFG odors be noted during the weekly self-inspections, the Facility shall notify the DEQ and investigate the source of the potential LFG odor within 30 days of detection. The Facility will implement an LFG monitoring program in accordance with 9VAC20-81-200 within 60 days of a confirmed detection of LFG. Should an LFG monitoring program need to be implemented, a Landfill Gas Management Plan will be developed in accordance with the DEQ Solid Waste Permitting Submission Instruction No. 13.