Dominion Energy South Carolina, Inc.
Mailing Address:
220 Operation Way, Cayce SC 29033

October 10, 2024

Mr. Byron Amick
Industrial Wastewater Permitting
South Carolina Department of Environmental Services
2600 Bull Street
Columbia, South Carolina 29201

Subject: Dominion Energy South Carolina, Inc.,
NOPP-VIP for FGD Discharges, 2024 Annual Progress Report,
DESC-Wateree Station, NPDES Permit No. SC0002038,
Eastover, South Carolina, Richland County

Dear Mr. Amick;

The Dominion Energy South Carolina, Inc. (DESC) Wateree Station is a two-unit, coal-fired electric generating station that is located in Eastover, South Carolina. The station discharges to the Wateree River in accordance with South Carolina's Department of Environmental Services (SCDES) National Pollutant Discharge Elimination System (NPDES) permit SC0002038. Wateree Station is subject to EPA's 2024 Effluent Limit Guidelines (ELGs) under 40 CFR 423: Steam Electric Power Generating Point Source. Revised ELGs under the Steam Electric Reconsideration Rule were published on May 9, 2024, with a rule effective date of July 8, 2024. In the 2024 ELGs, EPA allowed continuation of the Voluntary Incentive Plan (VIP) option for flue gas desulfurization (FGD) wastewaters that was established in the 2020 ELGs.

The purpose of this document is to provide an annual update for the FGD VIP option. A document related to the ELG applicability dates for combustion residual leachate (CRL) and bottom ash transport water is being submitted separately. DESC originally filed a Notice of Planned Participation (NOPP) for the Voluntary Incentive Plan (VIP) that required achievement of the VIP limits by December 31, 2028, consistent with the 2020 ELGs. Many of the activities are already in progress for the VIP option and will continue in order to comply with the VIP requirement. Candidate technologies such as brine encapsulation, various membrane filtrations options, and thermal evaporation have been identified for further consideration to comply with these limits and the activities are detailed in the attached progress report.

In compliance with 40 CFR 423.13(h)(3), the attached Annual Progress Report details the steps taken to implement the VIP option since the last update to the original Notice of Planned Participation (NOPP), that was submitted in October 2022. This package has been submitted via the SCDES e-permitting portal.

If you have any questions or need additional information, feel free to contact Mark Ferguson at (803) 331-5298 or mark.ferguson@dominionenergy.com.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,

Darrell Shier
Manager, Environmental Services

enclosure
cc: E. Brown/R. Salley
M. Quattlebaum/M Hindman/C. Pearson
D. Shier/ M. Ferguson/file

Dominion Energy South Carolina, Inc. – Wateree Power Plant
Updated 2024 FGD Voluntary Incentive Plan (VIP) Progress Report

Introduction

Dominion Energy South Carolina, Inc (DESC) Wateree Station is a two-unit, coal-fired electric generating station located in Eastover, South Carolina. The station discharges to the Wateree River in accordance with South Carolina's Department of Environmental Services (SCDES) National Pollutant Discharge Elimination System (NPDES) permit SC0002038. Wateree Station is subject to EPA's 2024 Effluent Limit Guidelines (ELGs) under 40 CFR 423: Steam Electric Power Generating Point Source. Revised ELGs under the Steam Electric Reconsideration Rule were published on May 9, 2024, with a rule effective date of July 8, 2024. In the 2024 ELGs, EPA allowed continuation of the Voluntary Incentive Plan (VIP) option for flue gas desulfurization (FGD) wastewaters that was established in the 2020 ELGs.

Purpose of Document

The purpose of this document is to provide an annual update for the FGD VIP option. A document related to the ELG applicability dates for combustion residual leachate (CRL) and bottom ash transport water is being submitted separately.

FGD Wastewater VIP Update

DESC originally filed a Notice of Planned Participation (NOPP) for the Voluntary Incentive Plan (VIP) that required achievement of the VIP limits by December 31, 2028, consistent with the 2020 ELGs.

Many of the activities are already in progress for the VIP option and will continue in order to comply with the VIP requirement. These activities are described below:

Candidate technologies have been identified for further consideration to comply with these limits. These include thermal evaporation with no resultant discharge. Also evaluated is traditional reverse osmosis (RO) with brine encapsulation, and multi-pass, high-shear membranes with brine encapsulation. These latter approaches will use the high quality permeate from these processes (if present) as makeup water for the FGD scrubber or boiler makeup water as allowed in the 2024 ELGs or would otherwise be used in no discharge applications.

Encapsulation of the brine is intended to solidify the RO reject solution to allow for disposal in a landfill. Various constituents are mixed with the RO reject solution to form a flowable fill that rapidly solidifies. For FGD wastewater encapsulation, typical constituents mixed with the RO reject are fly ash, bottom ash, gypsum, lime, and/or Portland cement in varying ratios. Encapsulation will require a site-specific brine solidification formula as FGD wastewater is highly variable from site to site. Due to this variability, it is expected that significant research and development will be required. DESC Wateree would work with industry groups and academia, along with consulting engineers, to determine the brine solidification formula that chemically and physically stabilizes the material and minimizes the operating costs of

encapsulation. DESC Wateree sells fly ash and its use in brine encapsulation would reduce the amount of this material being beneficially reused.

Significant experimentation and testing with varying formulations for encapsulation may be necessary. One objective of this process is to have a flowable fill that does not set up in pipes going to the landfill, while still achieving the necessary strength, low permeability, and solidification after placement. It will also be necessary to work with permitting authorities in both water and waste to modify NPDES and solid waste permits and to obtain approval for construct. Solid waste permit modification may be necessary to develop dedicated landfill cells or facilities for the flowable fill.

Some activities are in progress. An updated Engineering Dependency Chart is described below and shown in Attachment 1.

FGD WW Characterization / Scrubber Water Balance (complete)

Characterization of Wateree's FGD wastewater as described in the original VIP schedule is complete.

Develop Specifications, Bench & Pilot Testing (In progress)

The original VIP engineering dependency chart stated: Once characterization is complete, specifications will be developed, and vendors approached. Data will be shared with technology providers and bulk samples shipped for testing of prospective system(s). On-site piloting of treatment technologies may be undertaken. Pilot operations should be over several months to allow for variability in FGD scrubber chemistry or other site operations (generating load, startup, shutdown, weather, etc.). Should piloting be pursued, simultaneous testing with multiple vendors is preferable to minimize variability, so scheduling should accommodate multiple vendors' equipment availability. This process is expected to take approximately twelve months, including time to obtain approval for the pilot(s).

Update: Additional time has become necessary to include additional vendor(s). These vendor(s) continue to operate pilots that will continue into later this year. This is reflected in the updated Engineering Dependency Chart.

Complete Detailed Design

Some of the work above has already commenced (e.g., specifications and some piloting). After a technology is selected, the process of detailed design is expected to last approximately seven months.

Update: Completing detailed design is dependent upon vendor selection and has not been completed at this time.

Permitting / SCDES Approval to Construct

DESC will request construction approval from SCDES for the selected system. This effort is expected to take four months and can proceed once the detailed design is sufficiently developed to allow permit applications to be completed.

Update: Portions of the detailed design are needed for the approval to construct from SCDES.

Construction

Once the contracting and detailed design step is complete, construction of the membrane equipment and system tie-ins can begin. Construction of pre-treatment to prevent fouling of the membranes, installation of membrane technology with built-in clean in place systems, and necessary tie-ins is expected to take between approximately eighteen and twenty-four months.

System Startup

Startup of the selected system will commence immediately upon completion of construction and is expected to take three months.

Develop Brine Solidification Formula

If evaporative technology is not selected for brine management, development of the site-specific brine management approach is expected to require expertise from industry and/or academia using brine encapsulation models as appropriate. Research in encapsulation should evaluate various mixtures of fly ash, brine, Portland cement, etc. Various tests of the resulting product (sometimes referred to as paste) would be conducted to determine its flowability, time to solidify, chemical stability, strength, and other properties. Equipment will be designed and installed for brine management and SCDES approval will be needed for paste management.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,

RSalley 10-10-24

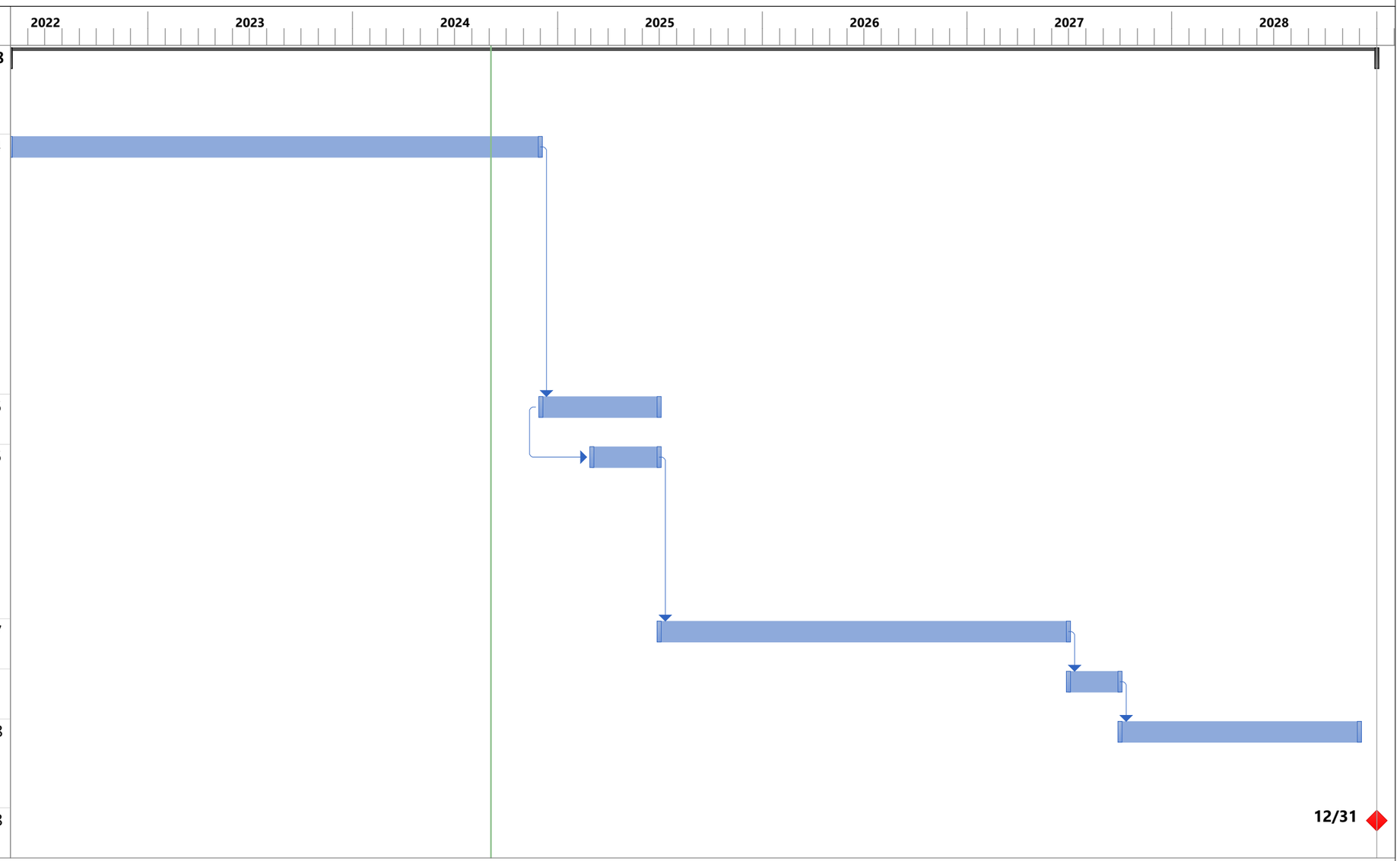
Richard Salley
Wateree Plant Manager

Attachment 1

Updated Engineering Dependency Chart for FGD VIP

Updated Wateree FGD Engineering Dependency Chart

ID	Task Name	Start	Finish
1	**Updated Wateree FGD ELG Engineering Dependency Chart**	**Sun 5/1/22**	**Sun 12/31/28**
2	Provide FGD characterization data, develop specifications, provide bulk volumes for bench testing w/vendors, obtain pilot approval, Conduct pilots (expanded to include additional vendor)	Sun 5/1/22	Sat 11/30/24
3	Complete detailed design	Mon 12/2/24	Mon 6/30/25
4	Submit Request/Obtain Approval to Construct from SCDES (some parallel activities with detailed design); obtain permits	Mon 3/3/25	Mon 6/30/25
5	Construction	Tue 7/1/25	Wed 6/30/27
6	System startup	Thu 7/1/27	Thu 9/30/27
7	Develop brine solidification formula (if selected)	Fri 10/1/27	Thu 11/30/28
8	FGD ELG Applicability date		Sun 12/31/28



Project: Wateree Applicability Study
Date: Wed 9/4/24

Task	Project Summary	Manual Task	Start-only	Deadline	
Split	Inactive Task	Duration-only	Finish-only	Progress	
Milestone	Inactive Milestone	Manual Summary Rollup	External Tasks	Manual Progress	
Summary	Inactive Summary	Manual Summary	External Milestone		