DOMINION ENERGY

CCR RULE CLOSURE PLAN

CLOVER POWER STATION STAGE 3 ASH LANDFILL
SOLID WASTE PERMIT NO. 556

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FIGURES

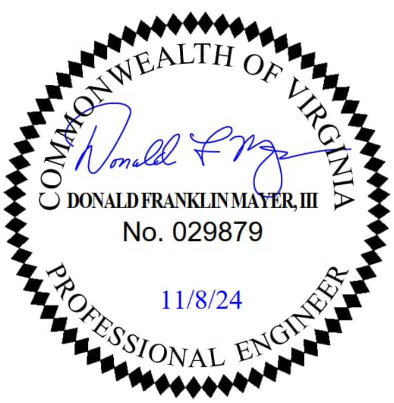
FIGURE 1 Site Location

1 PLAN CERTIFICATION

I certify that the information contained within this Closure Plan was prepared by me or under my direct supervision and meets the requirements of Section §257.102 of the Federal Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals (CCR) from Electric Utilities; Final Rule (40 CFR 257; the CCR rule) and the Virginia Solid Waste Management Regulations.

I also certify that the design of the final cover system described in this plan meets the requirements of Section §257.102(d)(3).

Donald Mayer, PE	Vice President
Print Name	Title
	11/8/2024
Signature	Date



2 CLOSURE PURPOSE

This Closure Plan is written for the Clover Power Station Coal Combustion Residuals (CCR) Stage 3 Landfill (landfill) at Dominion Energy's[1] Clover Power Station (Station) in Halifax County, Virginia. The location of the site is shown on Figure 1. Dominion Energy plans to continue filling the Stage 3 landfill until it reaches its final design grades. This landfill is a captive industrial landfill and at final capacity will contain approximately 8,000,000 cubic yards (CY) of CCR material. The landfill is operated under the Virginia Department of Environmental Quality (DEQ) Solid Waste Permit No. 556. The Stage 1 and 2 landfill was closed in 2003 and is not the subject of this plan.

2.1 GENERAL LANDFILL INFORMATION

Dominion Energy has operated the Stage 3 landfill for disposal of CCRs produced at the Station since June 2002. The CCRs include fly ash, bottom ash, coal mill rejects, and gypsum. The landfill is approximately one-half mile west of the Station on Black Walnut Road. The permitted area of the landfill comprises approximately 78.5 acres designated for CCR disposal. The area was subdivided into phases, all of which have now been constructed. Approximately 24 acres of final cover was constructed on the southern section of the landfill in 2008 (Phase 1), leaving approximately 54.5 acres left to close.

Non-contact stormwater runoff from the perimeter and areas under intermediate and final cover discharge to six stormwater ponds around the border of the landfill. Discharges from these ponds are regulated under a Virginia Pollutant Discharge Elimination System (VPDES) permit (Permit No. VA0083097) issued by DEQ.

Leachate and contact stormwater are collected in two pairs of lined basins (1A / 1B and 2A / 2B) that are located immediately within the landfill footprint. Water from the lined basins is pumped from the landfill through a dedicated force main to the station's wastewater treatment plant for treatment and discharge. Discharge from this treatment system is regulated under VPDES Permit No. VA0083097 issued by the DEQ.

2.2 CLOSURE PLAN IMPLEMENTATION

The goal of the closure plan design at the landfill is to provide a low maintenance cover system with appropriate stormwater runoff controls to prevent erosion and exposure of the CCRs. The maximum permitted side slope is 3H:1V, and stormwater benches are located to intercept sheet flow before it can concentrate into an erosive flow. The final cover soil will have a vigorous stand of vegetation established to minimize soil erosion. A Linear Low-Density Polyethylene (LLDPE) geomembrane liner serves as the infiltration barrier to prevent water percolation into the CCR. CCRs by their nature are non-putrescible, and do not decompose or produce landfill gas. Gas migration and odor is not anticipated to be a post-closure concern. Leachate will continue to be collected and transported by the existing leachate collection and conveyance system for treatment and disposal.

[1] The Clover Power Station and associated landfills are jointly and equally owned by Dominion Virginia Power and Old Dominion Electric Cooperative (ODEC).

3 CLOSURE TIMEFRAMES

The estimated remaining life of the landfill is approximately 15 years, depending on the volume of CCR received. It is anticipated the landfill will cease accepting CCR in approximately 2039. Progressive closure construction is anticipated to be in accordance with the table below, with the final closure date varying depending on the ash generation rate. Construction of the final closure cap of the facility will take place in three interim phases:

Closure Phase	Approximate Area, Acres	Approximate Closure Year
1	24	2008 (completed)
2	27	2040
3	27.5	2040
Final		2040

Selection of an interim closure phase is based on the landfill fill sequence and when an area of approximately 27 acres is at final grades and can be closed. The timeframes for closure presented in this plan are subject to variability due to Station operations and material generation rates.

4 CLOSURE OF SUPPORT PONDS AND BASINS

The stormwater ponds around the landfill perimeter will remain in place to continue providing stormwater attenuation for the site post-closure. Discharges for these ponds will continue to be permitted under the Station's VPDES Permit.

The leachate basins will remain in service post-closure to receive leachate from the landfill. The pump station and wastewater treatment plant will remain in operation.

5 CLOSURE OF LANDFILL UNITS

5.1 FINAL COVER DESIGN AND PERFORMANCE

The Final Cover System to be installed is as described in the landfill's solid waste permit #556. This cover system, in accordance with 9VAC20-81-160-D.2.e, consists of, from the bottom to the top:

- 40 mil LLDPE geomembrane;
- 250 mil double-sided geocomposite drainage layer;
- A minimum 18-inch protective cover layer of compacted soil; and
- A minimum 6-inch layer of vegetative support soil that is subsequently seeded.

The final cover system will be placed directly on the prepared subgrade after the intermediate cover soil vegetative cover is stripped and it is shaped as needed to achieve design grades. The Design Plans in the solid waste permit (February 7, 2004) show the final cover system (Drawings 18 & 19). Technical Specifications and the Construction Quality Assurance (CQA) plan for the closure system components are also in the landfill permit. A detailed description of each component of the final cover system is presented in the following paragraphs.

5.1.1 BARRIER LAYER

The barrier layer is a 40-mil, Linear Low-Density textured polyethylene geomembrane (LLDPE). Section 02597 of the Technical Specifications describes the material requirements, installation and seaming procedures, and CQA documentation to be recorded during construction of the barrier layer. The CQA Plan stipulates that prior to geosynthetic panel deployment, the installer and CQA consultant will inspect the subgrade and provide a written subgrade acceptance indicating that the subgrade is acceptable.

5.1.2 GEOCOMPOSITE DRAINAGE LAYER

To provide drainage for the cover soils, a 250-mil geocomposite drainage layer will be placed on top of the geomembrane. The geonet core will be faced on both sides with a nonwoven geotextile to provide filtration and prevent the intrusion of soil into the core. At the toe of slope, the geocomposite will be tied into a dedicated perimeter drainage system, which will then discharge into the perimeter stormwater channel at regular intervals. This collected water will not have come in contact with the CCR and will be treated as ordinary stormwater.

5.1.3 EROSION CONTROL / PROTECTIVE COVER LAYER

The 18-inch protective cover layer will be constructed of soil. The protective cover layer will be placed and compacted to at least 90% of its Standard Proctor Density, in accordance with Section 02200 (Earthworks) of the Technical Specifications.

5.1.4 VEGETATIVE SUPPORT LAYER

The top six inches of the Final Cover System will be the vegetative support layer soil. This soil will be placed, but not compacted, and then seeded with the either the seed mix specified in Section 02936 (Seeding) or a site-specific mixture based on recommendations from a soils report. In either case, the seed mixture will consist mainly of turf-type grasses and nurse crops that will lend themselves to quickly establishing a healthy stand of grass. Woody vegetation is not allowed on the Final Cover System.

5.1.5 PERFORMANCE OF THE FINAL COVER SYSTEM

The final cover system design as proposed conforms to the requirements in the CCR rule at 40 CFR 257.102(d)(3)(i) as follows:

(A) The permeability of the final cover system is less than or equal to the permeability of the bottom liner system due to the combination of an LLDPE geomembrane, geocomposite drainage layer, 24-inch soil layer, and slopes ranging from 2% minimum to 33% maximum.

(B) The 18-inch protective cover layer soil meets the requirements for the 18-inch layer of earthen material noted as the *infiltration layer*.

(C) The 6-inch vegetative support soil layer meets the requirements for the 6-inch layer of earthen material capable of sustaining native plant growth noted as the *erosion layer*.

(D) The integrity of the final cover system is optimized through the use of flexible design components that are well suited to accommodate small changes over time due to settlement and subsidence.

The 24-inch thickness of the final cover system soils is sufficiently thick to protect the underlying geosynthetics from freezing. The maximum anticipated depth of frost penetration for south-central Virginia is approximately 18 inches.

The cover system soils will consist of on-site soils that are fine-grained loamy soils that generally exhibit some degree of plasticity and are classified as low to moderately erodible by wind and water. The calculated soil loss by the Revised Universal Soil Loss Equation (RUSLE) is 1.36 tons per acre per year.

The final seeding mixture will be applied in accordance with Section 02936 of the Technical Specifications immediately following the placement of the vegetative support layer soil to the design grades. The soil will be seeded with the mix as presented in the Technical Specifications, or with a site-specific mix based on soil testing. While vegetation is being established, soil stabilization matting or other approved erosion control materials will be used to protect the bare soil surface and foster vegetative growth.

5.2 FINAL SLOPES

The maximum final slope for the landfill is 3H:1V (33%). The minimum final slope per the landfill's permit is 2%. Approximately every 25 to 30 vertical feet, a stormwater diversion bench is graded into the slope to intercept and collect sheet flow runoff before it concentrates into erosive concentrated flow. The graded-in benches provide additional slope stability by limiting the uninterrupted slope length to approximately 90 feet. Calculations from the permit design (WSP/Golder, 2004) show that the 3:1 final slope is stable under static conditions and seismic conditions.

5.3 RUN-OFF CONTROLS

Sheet flow from the final cover surface will be collected into stormwater diversion benches and diverted into armored downchutes that lead into the perimeter channels. These benches are formed of soil with grass lining and are sized to convey the runoff from at least the 25-year, 24-hour storm event. The benches are lined with a non-biodegradable erosion control matting to resist erosion and enhance vegetative growth. The average longitudinal slope of the stormwater diversion channels is 1.0%.

Stormwater benches discharge into downchute channels which convey the flow to the perimeter channels surrounding the landfill. The downchute channels are trapezoidal-shaped and are armored with rip rap stone, Articulating Concrete Blocks (ACB), gabions, or fabric-formed concrete. Drainage from underneath the stormwater benches is also discharged into the downchutes. At the end of the downchute, a plunge pool or other energy dissipating device will be installed to mitigate erosive forces.

The perimeter channels flow to the existing stormwater basins for attenuation and eventual discharge through the VPDES-permitted outfalls. The perimeter channels are sized to convey the runoff from at least the 25-year, 24-hour storm event. The stormwater basins are sized to meet the Virginia Erosion and Sediment Control Handbook (VESCH) Standard and Specification 3.14, as well as being designed as permanent structures capable of safely passing at least the 25-year, 24-hour storm event.

Calculations for the design of the stormwater control system were prepared during the solid waste permitting process for the Stage 3 landfill (WSP/Golder, March 2000). Details for the components of the conveyance system and ponds are in the Design Plans, Drawings 8 and 18 – 21A.

5.4 SETTLEMENT, SUBSIDENCE, AND DISPLACEMENT

It is anticipated that the great majority of foundation settlement to be experienced by the landfill has already occurred, as the landfill has been in operation for approximately 22 years. When CCRs are placed and compacted in a bulk fill, such as a landfill, the material consolidates very rapidly and does not experience further secondary consolidation. Once CCRs are placed, secondary consolidation is negligible. In addition, the landfill is being closed at less than the original design height, resulting in lower than anticipated foundation loading.

Calculations from the permit design (WSP/Golder, 2004) show the post-closure settlement of the landfill is minimal and is anticipated to have negligible effects on the ability of the cover to shed excess stormwater and prevent infiltration. Localized settlement of the final cover is not anticipated to occur as the CCRs do not decompose and leave voids. Global settlement of the landfill, however small, would cause the liner material to shorten, rather than stretch. Small compressive forces would not affect the integrity or performance of the liner.

6 CLOSURE OF STORAGE AND/OR TREATMENT UNITS

The Clover Power Station operates a wastewater treatment plant that services specific wastewater streams from the landfill (leachate commingled with contact stormwater) and from other station operations. As this treatment plant is integral to the station and landfill operations, it will remain active following closure of the Stage 3 landfill.

7 SCHEDULE FOR CLOSURE

Phase 3 of the landfill is anticipated to remain in service until approximately 2039. At this point in the operation, it is anticipated there will be approximately 27.5 acres remaining to be closed. Based on previous closure construction at Clover, the construction is anticipated to take approximately 8 to 10 months to complete final closure. Table 1 outlines the anticipated sequence of closure schedule activities.

Table 1 Closure Schedule

Activity	Tentative Date
Last receipt of CCR	4Q 2039
Initiate closure activities (e.g. engineering & procurement)	4Q 2039
Commence closure construction	1Q 2040
Closure construction complete	By 4Q 2040
Certification of closure	December 2040

8 CLOSURE IMPLEMENTATION

8.1 CLOSURE POSTING

One sign will be posted at the site entrance to the landfill notifying all persons of the final closure of the landfill and prohibition against further receipt of CCRs. Unauthorized access to the site will be controlled by fencing (as needed) and lockable gates across the access roads.

8.2 NOTIFICATION

Halifax County, Virginia will be notified upon the completion of closure of the landfill. The closure notification will also be sent to the DEQ, posted on a publicly accessible internet site, and placed in the facility's operating record as outlined in the Final CCR Rule.

The survey plat will be prepared showing the final closure grades and the locations of the groundwater monitoring wells. The survey plat and deed will have the following notification language:

> This property has been used for the management and disposal of CCRs. Any future use of the site shall not disturb the integrity of the final cover, liners, or any other components of the containment systems, or the function of the monitoring system unless necessary to comply with the Virginia Solid Waste Management Regulations and the Final CCR Rule or approved by the Department of Environmental Quality.

Within 30 days of recording a notation on the deed to the property, a notification indicating the notation has been recorded will be sent to the DEQ, posted on a publicly accessible internet site, and placed in the facility's operating record.

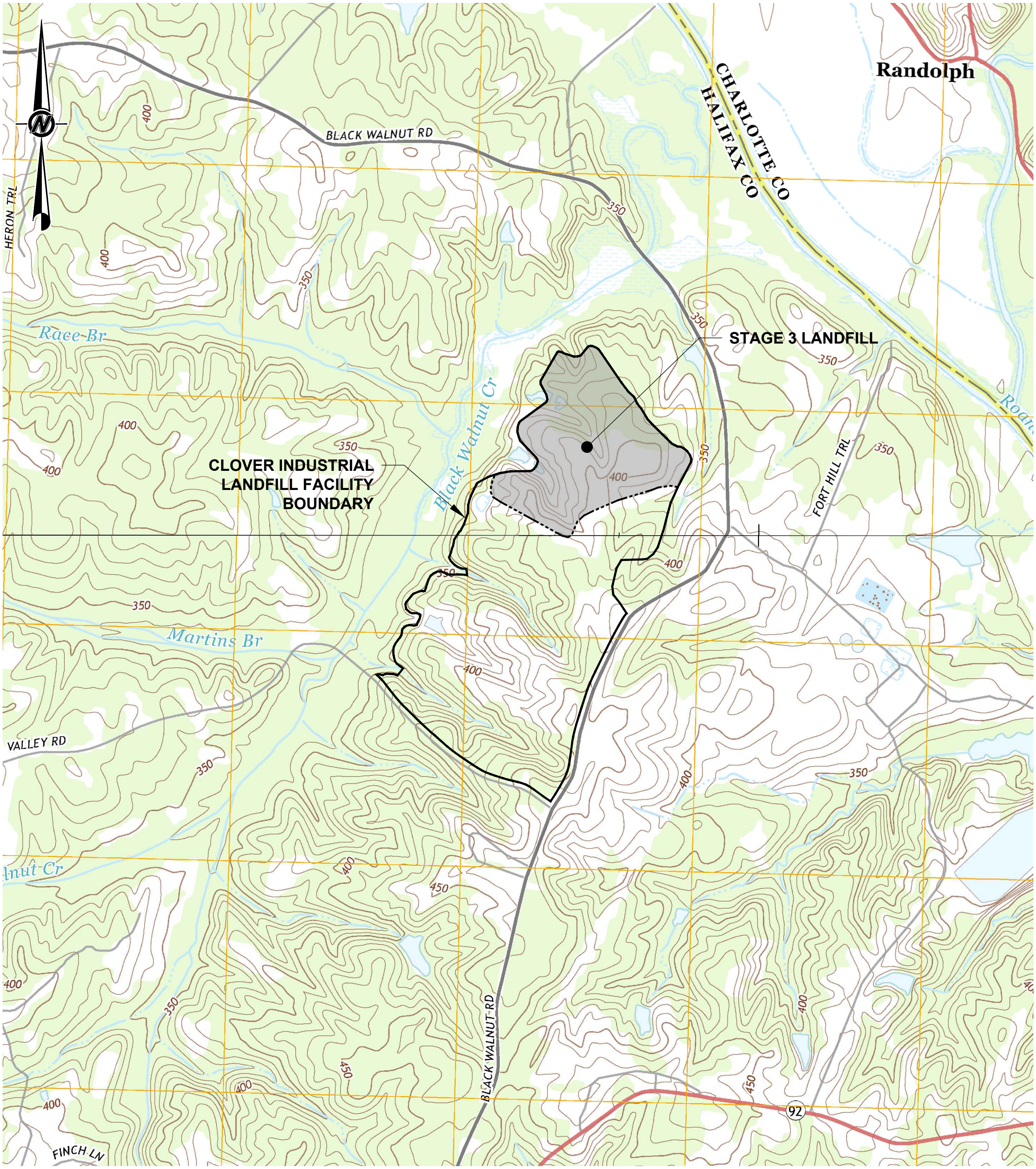
8.3 CERTIFICATION

Upon completion of closure construction, a certification statement, signed by a licensed professional engineer, will be submitted to the DEQ along with the results of the CQA plan. The certification statement shall read as follows:

> I certify that closure has been completed in accordance with the Closure Plan dated [DATE] for solid waste permit number 556 issued to Dominion Energy, with the exception of the following discrepancies: [To Be Determined]
>
> In addition, a sign(s) was (were) posted on [DATE] at the landfill entrance notifying all persons of the closing [and state other notification procedures if applicable] and barriers [indicate type] were installed at [location] to prevent new waste from being deposited.
>
> A survey plat prepared by [NAME] was submitted to Halifax County, Virginia on [DATE]. A copy of the survey plat is included with this certification.
>
> A notation was recorded on the deed to the landfill property on [DATE]. A copy of the revised deed is attached to this certification.
>
> [Signature, date and seal of Professional Engineer]

9 CLOSURE COST ESTIMATE

The estimated cost for closure of the remaining area of the 54.5-acre± landfill is $6,300,000. Dominion Energy will hire a construction contractor to provide closure construction services.



REFERENCE

BASE MAP CONSISTS OF USGS 7.5 MINUTE QUADRANGLE SERIES TITLED SAXE, VIRGINIA, 2013, AND CLOVER, VIRGINIA, 2013.

2000 0 2000

SCALE FEET

CLIENT
DOMINION ENERGY

PROJECT
CLOVER POWER STATION
STAGE 3 INDUSTRIAL LANDFILL
HALIFAX COUNTY, VIRGINIA

CONSULTANT

wsp

YYYY-MM-DD	2020-05-29
DESIGNED	AR
PREPARED	RIP
REVIEWED	MGW
APPROVED	MGW

TITLE
SITE LOCATION MAP

PROJECT NO.	REV.	FIGURE
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