# Post-Closure Care Plan

*Chesterfield Power Station FFCP Management Facility*
*Solid Waste Permit No.609*

Submitted to:

**Dominion Energy**
Chesterfield Power Station
500 Coxendale Rd
Chester, Virginia 23836

Submitted by:

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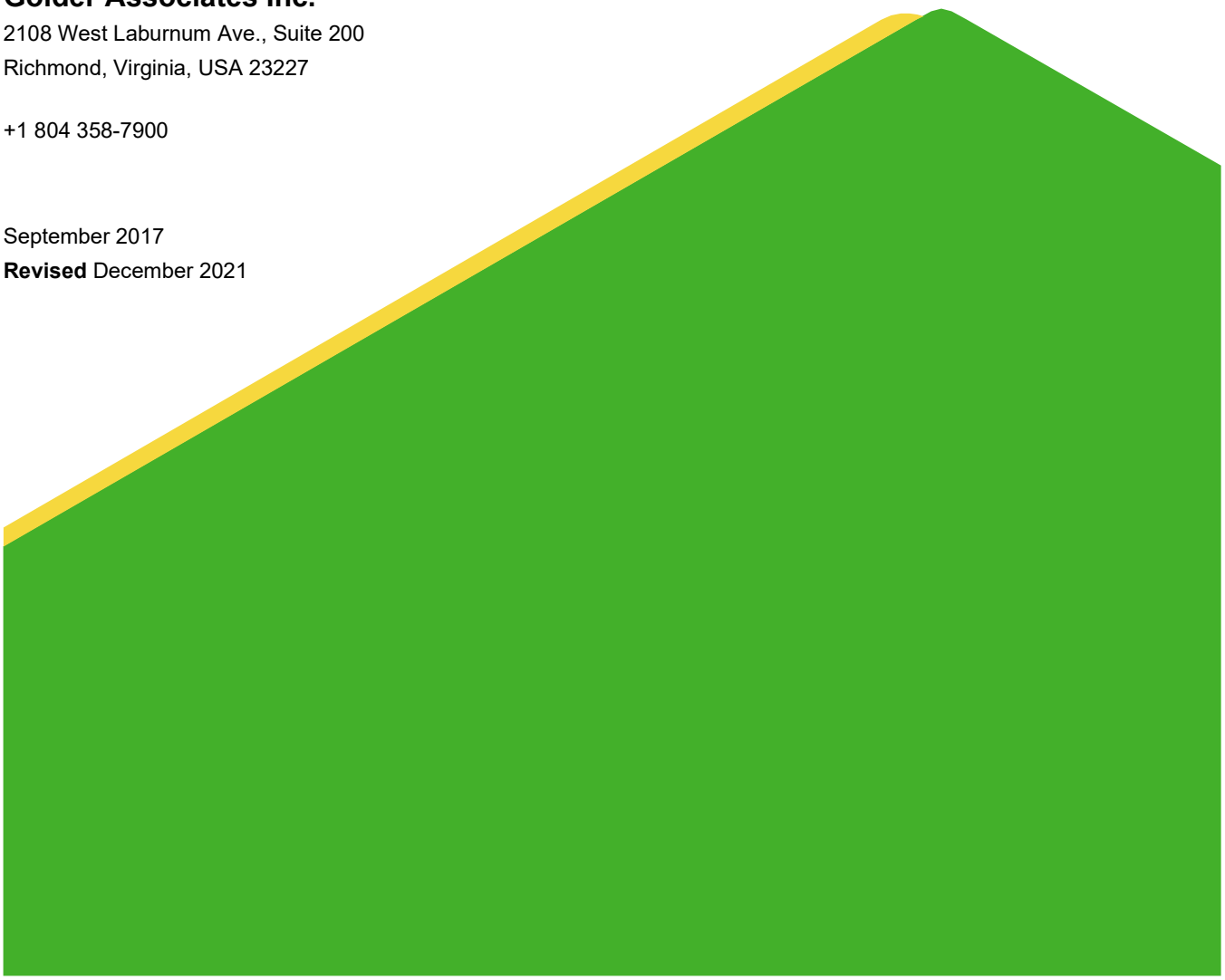

September 2017
**Revised** December 2021

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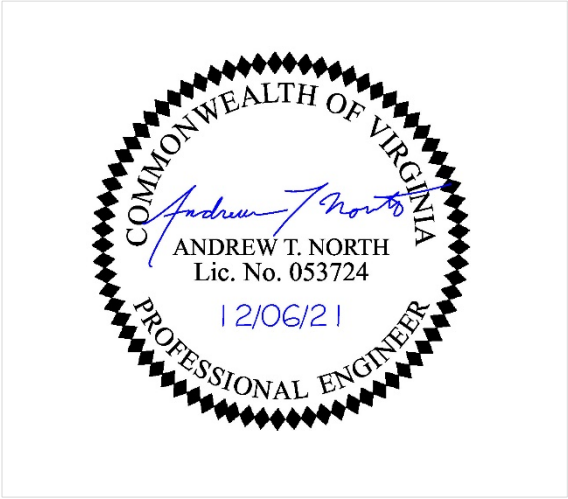
**Attachments**

# 1.0 PLAN CERTIFICATION

I certify that the information contained within this Post-Closure Care Plan was prepared by me or under my direct supervision and meets the requirements of Section §257.104 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.

| Andrew T. North, P.E. | Senior Civil Engineer |
|---|---|
| Print Name | Title |
| Signature | 12/6/2021 |
| | Date |



# 2.0 PURPOSE

This Post-Closure Care Plan (Plan) is for the Chesterfield Power Station Fossil Fuel Combustion Products (FFCP) Management Facility (Facility) at the Chesterfield Power Station (Station), Chesterfield County, Virginia. This Facility is a captive industrial landfill and at final capacity will contain approximately 9,360,000 cubic yards of Fossil Fuel Combustion Products, including Coal Combustion Residuals (CCRs).

## 2.1 Post-Closure Period

The required post-closure care period for this landfill is 30 years in conformance with the Federal Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities; Final Rule (the CCR Final Rule); 40 CFR 257.

## 2.2 Post-Closure Contact

The post-closure contact for this Facility will be:

Dennis Slade
120 Tredegar Street
Richmond, VA 23219
804-317-7079
dennis.a.slade@dominionenergy.com

# 3.0 INSPECTION, MONITORING, AND MAINTENANCE PLAN

## 3.1 Security Control Devices

The perimeter of the landfill and access points into the landfill will be inspected at least once per calendar month to verify the proper functioning of gates, fencing, and other perimeter security measures. If repairs are found to be needed, the maintenance request will be routed through the Station.

## 3.2 Final Cover Integrity

The final cover of the landfill will be inspected at least once per calendar month and after severe storms to assess the condition of the cover and identify maintenance needs. Inspection items will include:

- Erosion damage to cover, stormwater channels, or stormwater basins;
- Settlement, subsidence, or displacement of the final cover;
- Evidence of animal intrusion or burrowing;
- Bare or dead vegetative cover;
- Woody vegetation growing on final cover areas; and,
- Evidence of seeps or saturated areas.

The landfill shall be mowed at least once per growing season or more as necessary to facilitate growth of grasses on the cover, enable inspection, and preclude the establishment of woody vegetation. Application of fertilizer and/or reseeding shall take place as needed to maintain a healthy stand of vegetative cover.

## 3.3 Run-on and Run-off Controls

As part of the monthly or post-storm inspection, the stormwater run-off control system shall be inspected. Stormwater conveyances shall be observed for erosion damage, accumulated sediment, unusual settlement, and excessive or insufficient vegetative growth. Culverts shall be checked for blockage due to accumulated debris or sediment. Drop inlets shall be checked for debris accumulation.

Small amounts of sediment or debris shall be removed from areas if possible, and the removal will be noted on the inspection record. Areas requiring repairs or debris removal that are beyond the inspector's capacity shall be reported to the Station's maintenance personnel for correction.

## 3.4 Repair of Erosion Damaged Areas

Areas of the cover system that have been eroded will be backfilled. The areas will be seeded, then mulched or protected with erosion control matting to deter new erosion. Adjacent areas surrounding the covered area that have been eroded will be graded to allow positive drainage, seeded, and mulched or protected with erosion control matting to deter new erosion.

## 3.5 Leachate Collection System

The leachate collection system shall be inspected as part of the monthly site inspection. Each leachate headworks area (8 in all) will be inspected for proper opertation. Pump run-time meters shall be observed for change since the last inspection to identify nonworking or overworking pumps. Areas around the pump station shall be inspected for leaks. The leachate flowmeter and collection manhole / pump station will be inspected for proper operation. Identified maintenance needs will be directed to the Station maintenance personnel.

The perimeter of the landfill will be inspected for the presence of wet or saturated areas that appear out of place during dry weather, as this may be indicative of a leachate seep. If a leachate seep is identified, the Station maintenance personnel shall be notified to repair the seep and complete the following actions:

- Take all immediate steps necessary to protect public health and safety including those required by the contingency plan (included in the landfill operations manual);
- Take immediate action to safely contain and properly manage the leachate at the source of the seep; and,
- As feasible, to minimize, control, or eliminate the seep.

Following the immediate response to the seep, an evaluation shall be made to consider if further remedial action is required to prevent further seeps or to collect and contain leachate before it can seep uncontrolled from the facility.

## 3.6 Groundwater Monitoring System

Groundwater monitoring throughout the post-closure period shall be performed semi-annually and comply with requirements outlined in 40 CFR 257.90-98 and in the Facility's *Groundwater Monitoring Plan*. Identified maintenance needs will be coordinated through the Station's environmental representative as needed.

## 3.7 Landfill Gas Monitoring System

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 concern post-closure. Therefore, no post-closure landfill gas monitoring is proposed for this Facility.

## 3.8 Inspections

Inspections will be performed by a Dominion employee or independent licensed engineer or other qualified person. The Closed Unit Inspection Form, or equivalent, provided in Attachment 1 will be used to document inspections. The closed unit will be inspected at a frequency appropriate to maintain environmental and structural integrity of the final cover system.

# 4.0 POST-CLOSURE USES

Post-closure use will be in accordance with the provisions of the Virginia Solid Waste Management Regulations and the Final CCR Rule. Access to the site will be restricted. Possible future uses of the closed Facility include a wildlife management area. At the time of closure, Dominion may explore other safe uses for the Facility under the regulations in place at the time. Post-closure activities will be designed and conducted so as to not disturb the integrity of the final cover, the components of any containment system, or the function of the Facility's monitoring systems. Any post-closure uses not specifically addressed in this Post-Closure Care Plan must have prior approval from the DEQ.

# 5.0 POST-CLOSURE CARE COST ESTIMATE

The estimated cost for 30-year post-closure care of the 66-acre landfill is $5,250,000.

# 6.0 POST-CLOSURE CARE TERMINATION

At the end of the 30-year post-closure care period, Dominion will submit a request to terminate post-closure care in accordance with the Virginia Solid Waste Management Regulations and the Final CCR Rule.

## 6.1 Notification

Within 60 days of completion of post-closure care, a certification statement, signed by a licensed professional engineer, will be posted on a publicly accessible internet site, placed in the facility’s operating record, and submitted to the DEQ in accordance with the Final CCR Rule.

**ATTACHMENT 1**

# Inspection Checklist

**Attachment 1**
**Post-Closure Inspection Schedule**
**Chesterfield FFCP Management Facility – Permit #609**

| Item | Inspection Items | Frequency of Inspection |
|---|---|---|
| Facility Area | Gate and Fence | Monthly |
| | Erosion of closure cover | Monthly or after severe storms |
| | Settlement & Subsidence | Monthly |
| | Deterioration of vegetative cover | Monthly or after severe storms |
| | Trash, litter | Monthly |
| | Stormwater control system | Monthly or after severe storms |
| Leachate Collection System | Leachate levels, pump operation hours / flows, manholes | Monthly |
| Groundwater Monitoring System | See Groundwater Monitoring Plan | See Groundwater Monitoring Plan |

# MONTHLY CLOSED CCR LANDFILL/POND INSPECTION CHECKLIST

| Site Name | | Inspected By | | |
|---|---|---|---|---|
| Date of Inspection | | Rain in Last 2-3 days? Circle One | Yes | No |

| Conditions Present | No Action Required | Investigate | Request Repair | Prompt Action Required | Comments (Include information on corrective actions/routine maintenance procedures that will be implemented to address the condition and any status updates) |
|---|---|---|---|---|---|
| | Place X in Box | | | | |
| **Inactive/Closed Area** | | | | | |
| Animal Burrows | | | | | |
| Areas of Erosion | | | | | |
| Erosion control features | | | | | |
| Drains and drain systems | | | | | |
| Slide, slough, bulges, seeps | | | | | |
| Vegetative cover damage | | | | | |
| Vegetative mowing needed | | | | | |
| **Leachate and Stormwater Pond Area** | | | | | |
| Animal Burrows | | | | | |
| Areas of Erosion | | | | | |
| Leachate System Operation | | | | | |
| Visible liner damage | | | | | |
| Outlet operation | | | | | |
| Vegetative mowing or removal needed | | | | | |

| Conditions Present | No Action Required | Investigate | Request Repair | Prompt Action Required | Comments (Include information on corrective actions/routine maintenance procedures that will be implemented to address the condition and any status updates) |
|---|---|---|---|---|---|
| | Place X in Box | | | | |
| **Other Areas** | | | | | |
| Groundwater wells | | | | | |
| Evidence of spills | | | | | |
| Security/Access | | | | | |
| Trash and Debris | | | | | |

| Previous Conditions for "Request Repair" or "Prompt Action Required" items have been addressed and the condition has returned to "No Action Required"? If no, provide date for completion in Comments box below. | Yes | No |
|---|---|---|
| | | |

**Definitions**

| | |
|---|---|
| **No Action Required** | Observation indicates that landfill is operating in a normal safe condition protective of the environment. No further action is necessary. |
| **Investigate** | Observation indicates a condition that has changed from a "no action required" condition and requires investigation to determine whether condition is unsafe or not protective of the environment. Inspector will notify Operations, Engineering, or Environmental Services to investigate and/or evaluate condition further. |
| **Request Repair** | Observation indicates a condition that requires a near term repair to ensure that condition does not worsen and become a serious concern. Inspector will submit a repair ticket through their internal work order system or make contact with responsible party for repair. |
| **Prompt Action Required** | Observation indicates a condition that must be addressed immediately to ensure the safety of the surface impoundment, related facilities, or public or protection of the environment. Inspector will contact responsible site and/or corporate personnel to initiate an immediate evaluation and corrective measure, as necessary. |

**General Comments [Document any unusual events or conditions]:**

| |
|---|
| |

**Note:** Completed inspection forms must be saved into the facility operating record and Environmental Documentum.

**ATTACHMENT 2**

# Post-Closure Care Cost Estimate

## Worksheet CEW-02: FORMAT FOR THE ESTIMATION OF POST-CLOSURE COSTS

***FILL IN THE BOXES. THE REST WILL BE CALCULATED FOR YOU***

| | | | | Calculation or Conversion | |
|---|---|---|---|---|---|
| **I.** | **Groundwater Monitoring** | | | | |
| a. | Total number of monitoring wells | 10 | wells | | |
| b. | Total number of sampling events/year | 2 | events/yr | a x b | 20 samples/yr |
| c. | Quantity of additional samples (e.g. QA/QC) | 1 | samples/even | a x c | 10 samples/yr |
| d. | Total samples per year | | | b + c | 30 samples/yr |
| e. | Analysis unit cost (Table 3.1 constituents) | $600.00 | /sample | base price, ENCO Cost Sheet, VELAP Accredited | |
| f. | *Total Analysis cost* | | | d x e | *$18,000.00* /yr |
| g. | GW Monitoring unit cost | $3,050.00 | /event | | |
| i. | *Total sampling cost* | | | f + (g x b) | *$24,100.00* /yr |
| j. | Engineering fees & reports | $12,000 | /yr | | |
| | ***Yearly Groundwater Monitoring Cost*** | | | i + j | ***$36,100 /yr*** |
| **II.** | **Landfill Gas Monitoring, Maintenance, and Control** | | | | |
| a. | Frequency of LFG compliance monitoring | 0 | events/yr | | |
| b. | LFG Monitoring unit cost | $549.73 | /event | | |
| c. | *Total perimeter LFG monitoring cost* | | | a x b | *$0* /yr |
| d. | Frequency of suface monitoring (air permit) | 0 | events/yr | | |
| e. | Surface monitoring unit cost | $0.00 | /event | | |
| f. | *Total surface monitoring cost* | | | d x e | *$0* /yr |
| g. | Control system operating unit cost | $0 | /yr | | |
| h. | Frequency of LFG control system inspections | 0 | events/yr | | |
| i. | Control system inspection cost | $0.00 | /event | | |
| j. | *Total constrol system cost* | | | g + (h x i) | *$0* /yr |
| | ***Yearly Landfill Gas Monitoring, Maintenance, & Control Cost*** | | | c + f + j | ***$0 /yr*** |
| **III.** | **Leachate Management** | | | | |
| a. | Quantity of leachate generated | 2,522,880 | gal/yr | (average of first 10 years post-closure, 4.8 GPM) average for Phase 1 Area only | |
| *On-site Leachate Management or Pre-Treatment* | | | | | |
| b. | On-site treatment operating unit cost | $0.03 | /gal | | |
| b.1 | Leachate system maintenance cost | $3,500.00 | /year | | |
| c. | *Total on-site management cost* | | | a x b+b.1 | *$79,186* /yr |
| *Leachate Disposal* | | | | | |
| d. | Private disposal unit cost | $0.02 | /gal | | |
| e. | POTW disposal unit cost | $0.0049 | /gal | | |
| f. | Direct discharge to POTW unit cost | $0.0049 | /gal | | |
| g. | Pump & Haul unit cost | $0.08 | /gal | | |
| h. | Subtotal leachate disposal unit cost | | | d + e + f + g | $0.00 |
| i. | *Total leachate disposal cost* | | | a x h | *$0* /yr |
| j. | Leachate sampling & analysis unit cost | $2,500.00 | /sample | | |
| k. | Frequency of leachate sampling & analysis | 1 | sample/yr | | |
| l. | *Total leachate sampling & analysis cost* | | | j x k | *$2,500.00* /yr |
| | ***Yearly Leachate Management Cost*** | | | c + i + l | ***$81,686 /yr*** |

## IV. Cap Maintenance & Repair

| | | | | | |
|---|---|---|---|---|---|
| a. | Closed Landfill Area | 14.5 | acres | | |
| | *Mowing & Fertilization* | | | | |
| b. | Mowing frequency | 3 | visits/yr | | |
| c. | Mowing unit cost | $85.00 | /acre/visit | | |
| d. | *Total mowing cost* | | | a x b x c | *$3,698 /yr* |
| e. | Fertilizer frequency | 1 | visits/yr | | |
| f. | Fertilizer unit cost | $305.52 | /acre/visit | | |
| g. | *Total fertilizer cost* | | | a x e x f | *$4,430 /yr* |
| | *Cap Erosion & Repair* | | | | |
| h. | Area to reseed/year | | | 33% x a | 4.8 acres |
| i. | Reseeding unit cost | $3,200.00 | /acre | | |
| j. | *Total reseeding cost* | | | h x i | *$15,466.67 /yr* |
| k. | Area of cap erosion/year | | | 10% x a | 1.5 acres |
| l. | Cap erosion repair unit cost | $3,200.00 | /acre | | |
| m. | Mobilization/Demobilization | $500.00 | /yr | | |
| n. | *Total cap erosion repair cost* | | | (k x l) + m | *$5,140 /yr* |
| | ***Yearly Cap Maintenance & Repair cost*** | | | d + g + j + n | ***$28,734 /yr*** |

## V. Sediment Basin Maintenance & Repair

| | | | | | |
|---|---|---|---|---|---|
| a. | Sediment basin cleanout frequency, 1 per | 3 | years | 1 / a | 0.33 event/yr |
| b. | Sediment basin cleanout unit cost | $45,000 | /event | | |
| c. | Mobilization/Demobilization | $2,500 | /event | | |
| d. | *Total sediment basin maintenance cost* | | | a x (b + c) | *$15,833 /yr* |
| e. | Total number of stormwater sampling locations | 1 | locations | | |
| f. | Stormwater sampling frequency | 1 | events/yr | | |
| g. | Total number of stormwater samples | | | e x f | 1 samples/yr |
| h. | Analysis unit cost (VPDES permit parameters) | $350 | /sample | | |
| i. | *Total Analysis cost* | | | g x h | *$350 /yr* |
| j. | Mobilization unit cost | $175.00 | /event | | |
| k. | Technician field unit cost | $180.00 | /event | | |
| l. | *Total sampling cost* | | | f x (j + k) | *$355.00 /yr* |
| m. | Engineering fees & reports | $1,500 | /yr | | |
| n. | *Total Stormwater Sampling & Analysis cost* | | | i + l + m | *$2,205 /yr* |
| | ***Yearly Sediment Basin Maintenance & Repair*** | | | d + n | ***$18,038 /yr*** |

## VI. Vector & Rodent Control

| | | | | | |
|---|---|---|---|---|---|
| a. | Vector and rodent control unit cost | $2,000 | /yr | | |
| | ***Yearly Vector and Rodent Control Cost*** | | | a | ***$2,000 /yr*** |

## VII. Post-Closure Care General Inspections

| | | | | | |
|---|---|---|---|---|---|
| a. | General Inspection unit cost | $5,000 | /inspection | | |
| b. | Number of inspections per year | 1 | | | |
| | ***Yearly Post-Closure Care General Inspection Cost*** | | | a x b | ***$5,000 /yr*** |

| | | | |
|---|---|---|---|
| **Annual Post-Closure Care Cost (APCC)** | | I + ... + VII | $171,559 /yr |
| **Length of post-closure care (LPCC)** | 30 years | | |
| **Post-Closure Care Cost** | | APCC x LPCC | $5,146,769 |
| **City Cost Index (Small City)** | 100%=1 | | 1 |
| **Adjusted Post-Closure Care Cost (AdjPCC)** | | | $5,146,768.79 |
| **Engineering & Documentation** | | Engineering Sum | $50,140 |
| Post-Closure Care Evaluation | $34,312 | 10% of Adj APCC | |
| Post-Closure Care Certification | $8,578 | 2% of Adj APCC | |
| Cost for survey and deed notation (if not completed at time of landfill closure) | $7,250 | $500 per acre (14.5 acres) | |
| **FA Mechanism Maintenance Cost** | $1,716 /yr | FA maintenance x LPCC | $51,468 |
| **Total Post-Closure Care Cost** | | Post-Closure Cost + Engineering + FA Maintenance | **$5,248,376** |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