

POST-CLOSURE PLAN

PLANT MCINTOSH COAL COMBUSTION RESIDUALS (CCR) INACTIVE LANDFILL NO. 3 EFFINGHAM COUNTY, GEORGIA

FOR



Georgia Power

November 2018



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1. POST-CLOSURE PLAN

This Post-Closure Plan fulfills the requirements of Rule 391-3-4-.10(7) for the Inactive CCR Landfill No. 3 in accordance with Rules 391-3-4-.10(9)(c)4. and 391-3-4-.10(9)(c)3.(i)–(iv). Landfill No. 3 was closed in 2005 with the completion of the final cover system and submittal of the closure certification report to the Georgia EPD. Georgia EPD approved the certification report and issued a Closure Certificate for Landfill No. 3, Permit No. 051-008D(LI) on March 21, 2008. The 30-year post-closure care period began on March 21, 2008. The closure certification and deed notification are provided in Part B, Section 2 of this application.

1.1 Amendments to the Post-Closure Care Plan

GPC may amend the initial or any subsequent plan at any time. GPC must amend whenever there is a change in the operation of the unit that would substantially affect the written post-closure plan, or after post-closure care activities have commenced unanticipated events necessitate a revision of the written plan. The Post-Closure Plan must be amended at least 60 days prior to a planned change in operation of the facility, and no later than 60 days following an unanticipated event, or 30 days following a trigger event. Post-Closure Plan Amendments will be certified by a Georgia Professional Engineer.

1.2 Post-Closure Care Period

Post-closure care is required for a period of 30 years and must consist of at least the following:

- Maintaining the integrity and effectiveness of the final cover system, including making repairs to the final cover system as necessary to correct the effects of settlement, subsidence, erosion, or other events, and preventing stormwater run-on and run-off from eroding or otherwise damaging the final cover.
- Maintaining the groundwater monitoring system and monitoring program in accordance with the requirements of Rule 391-3-4-.10(6).

If under assessment monitoring at the end of the post-closure care period, GPC will continue to conduct post-closure care until the site returns to detection monitoring. The release from the post-closure care requirements in this plan must be approved by the Director of the Georgia EPD.

1.3 Post-Closure Use of the Property

The post-closure use of Landfill No. 3 will be for green space. Prior to any other future use, Georgia EPD approval will be obtained by GPC. GPC is responsible for continuing the post-closure care of the property for the 30-year post-closure care period, which will begin upon issuance of the closure certification by the Georgia EPD.

1.4 Final Cover System Maintenance

GPC will maintain the integrity and effectiveness of the final cover system, including making repairs to the final cover, as necessary. The final cover system for Inactive CCR Landfill No. 3 was designed and constructed to minimize leachate generation by limiting percolation through the final cover barrier layer, promoting subsurface drainage to limit head on the barrier layer, and establishing vigorous plant growth to maximize evapotranspiration. The final cover system was also designed and constructed for stability and to reduce maintenance. The Inactive CCR Landfill No. 3 final cover consists of the following from bottom to top:

- Prepared ash surface or soil surface
- Geosynthetic clay liner (GCL)
- Protective soil cover layer (minimum 12-inches thick)
- Topsoil layer (6-inches thick)
- Permanent vegetation

A construction documentation report was submitted to the Georgia EPD and approval of the report was granted with the issuance of the Closure Certificate. The constructed final cover system for Landfill No. 3 meets the requirements Rules 391-3-4-.10(9)(c)(4) and 391-3-4-.10(9)(c)(3)(iv) and the final cover performance standards of 40 CFR 257.102(d).

Erosion repairs to the vegetation, topsoil, and protective soil layers are typical for maintenance of final cover systems. Erosion repairs will be made as soon as feasible to prevent damage to the final cover. Any repairs to the liner shall be documented and certified by a professional engineer and placed in the facility Operating Record.

Any identified areas that require repair will be reseeded immediately after any repairs are completed. Areas which are slow to establish vegetation shall receive additional temporary seeding. The operator may submit soil samples to the County Extension Agent for analysis and determination of proper soil conditioners including lime. Planting dates, fertilizer rates, and seeding rates shall meet the requirements in the *Manual for Erosion and Sediment Control in Georgia*.

The erosion control measures shall remain in place until a satisfactory stand of grass is growing. A satisfactory stand of grass is defined as a full cover: 100 percent of the soil surface is uniformly covered in permanent vegetation with a density of 70 percent or greater.

1.5 Environmental Monitoring

Georgia Power is responsible for conducting all monitoring activities in accordance with the Groundwater Monitoring Plan. The monitoring plan requires the semi-annual detection monitoring of 16 groundwater wells (nine upgradient and seven downgradient), to evaluate the water table aquifer immediately underlying the landfill. Following each semi-annual sampling event, results are provided to Georgia EPD. If the results indicate that there is a statistically significant increase over background levels for one or more of the constituents, Georgia Power will either prepare a report to demonstrate that a source other than the CCR unit caused the statistically significant increase or initiate the assessment monitoring program under 391-3-4-.10(6). If a successful demonstration is not completed within 90-days of determining statistically significant increase/s, Georgia Power must initiate the assessment monitoring program under 391-3-4-.10(6) and comply with all requirements of Rule 391-3-4-.10(6).

The Groundwater Monitoring Plan for this site shall be maintained throughout the 30-year post-closure care period. If at the end of the 30-year post-closure care period, the site is operating under assessment monitoring in accordance with 391-3-4-.10(6), then Georgia Power will continue to conduct post-closure care and monitoring until the site returns to detection monitoring.

1.6 Notification of Monitoring Standards Exceeded

GPC will be responsible for conducting all monitoring activities. If at any time the monitoring results indicate an exceedance of established standards or indicate a threat to human health or the environment, GPC shall notify the Georgia EPD and comply with all requirements of Georgia Rule 391-3-4-.10(6).

1.7 Routine Inspections

Throughout the post-closure care period, the site shall be inspected on a quarterly basis and after any extreme weather event by a qualified person, and on an annual basis by a Professional Engineer to ensure that all CCR disposed of in the facility remains properly covered and that the final cover is in good condition. Repairs to the final cover system shall be made as necessary to maintain the integrity and effectiveness of the final cover system. The repairs shall meet or exceed the original construction requirements. Areas noted to have less than the required cover from the effects of erosion, vehicular traffic, settlement, subsidence, or other events shall be repaired as soon as practical. All areas lacking proper vegetation shall be grassed and maintained according to the *Manual for Erosion and Sediment Control in Georgia*.

1.8 Storm Water Management System Maintenance

The storm water management features shall be maintained in proper working condition in accordance with the permit application to prevent run-on and run-off from eroding or otherwise damaging the final cover. Inspections of the ditches, culverts, storm water diversion berms, slope drains, rock lined flumes, and sedimentation ponds checking for signs of erosion, areas lacking vegetation, ponding water, and accumulation of sediments will be performed. Inspections should be completed quarterly, and after significant storm events (greater than 3 inches in 24 hours) by a qualified person. Deficiencies identified shall be addressed as soon as practical.

1.9 Limited Access

Inactive CCR Landfill No. 3 is located entirely on Georgia Power property. Access is controlled by fencing, gates, and property buffers. Access to the site is limited to authorized personnel or personnel under the supervision/permission of authorized personnel.

1.10 Responsible Official

The post-closure care of the site will be the responsibility of the General Manager of Environmental Affairs. The contact information is:

Facility Contact:	General Manager – Environmental Affairs Georgia Power Company
Address:	241 Ralph McGill Boulevard Atlanta, Georgia 30308
Telephone Number:	(404) 506-6505

1.11 Site Equipment

Georgia Power will make available necessary equipment to ensure that post-closure care requirements are executed correctly and efficiently. Dedicated landfill or rental equipment will be used as necessary. The equipment required will depend on the type and extent of the necessary repair.

1.12 Removal of CCR for Beneficial Use

Georgia Power will request and receive written approval from Georgia EPD prior to conducting any activities to remove CCR from the landfill for beneficial use.

1.13 Dust Control

The final cover of Inactive CCR Landfill No. 3 is fully vegetated. There is no active source of dust during the post-closure period. However, if work (such as cover repairs) is performed at the landfill with the potential to create dust, Georgia Power will implement dust control measures such as the application of water or other approved dust control agent on haul roads to limit and control airborne dust in accordance with 391-3-4-.10(5) and 40 CFR 257.80.

1.14 Final Cover Repairs

Georgia Power will continue to conduct post-closure care of Inactive CCR Landfill No. 3, which includes making repairs to the final cover, as necessary, to maintain the integrity and effectiveness of the final cover system. Typical maintenance items include repairs due to erosion which should be made as soon as practical to prevent unintended damage to the GCL. If any repairs to the final cover system require repair of the GCL, a written repair plan will be prepared by a professional engineer. The repair plan will specify the materials of construction, contractor means and methods or performance criteria, and provide construction quality assurance to document that the repair is completed in accordance with the original design of the final cover. Any repairs to the GCL shall be documented and placed in the facility's operating record.

1.15 Vegetative Plan

Vegetative cover should be re-established within 2 weeks after any repairs. Permanent covers which are slow to establish shall receive additional seeding. Deep rooting plants such as weeping love grass and lespedeza should not be used to reseed areas. Planting dates, fertilizer rates, and seeding rates shall follow the requirements in the *Manual for Erosion and Sediment Control in Georgia*.

The erosion control measures shall remain in place until a satisfactory stand of grass is growing. A satisfactory stand of grass is defined as a full cover: 100 percent of the soil surface is uniformly covered in permanent vegetation with a density of 70 percent or greater.

1.16 Post-Closure Care Cost Estimate

Georgia EPD issued a Closure Certificate on March 21, 2008. In accordance with the Conditions for Post-Closure Care, Georgia Power is responsible for conducting Post-Closure Care of the landfill for a minimum of 30 years after the date of the Closure Certificate.

The third-party cost estimated for post-closure care is \$102,571 per year or \$2,051,420 for the remaining 20 years of post-closure care. This figure is based on 2018 dollars with the 30-year post closure care period ending on March 21, 2038. The post-closure care costs are estimated below in Table 1. These costs were determined based on 2018 cost estimates to perform the work and previous estimates for similar work in the same general area.

Table 1. Post-Closure Care Cost Estimates (2018 dollars)

No.	Item	Quantity	UOM	Unit Price	Total
1	Cover Maintenance				
1A	Erosion repair, fertilizer, seed/mulch	0.54	AC	\$6,410	\$3,482 ^{1,2}
1B	Vegetation mowing	32.6	AC	\$250	\$8,150 ^{3,4}
1C	Road maintenance	1	EA	\$750	\$750 ^{5,6}
2	Storm Water Management System Maintenance				
2A	Sediment basin cleaning	1	EA	\$15,000	\$15,000 ^{7,8}
2B	Site storm water system maintenance	1	EA	\$750	\$750 ^{5,6}
3	Site Inspections				
3A	Inspection of final cover system (Annual)	1	LS	\$2,500	\$2,500 ⁹
4	Groundwater Sampling and Analysis (Semi-Annual)				
4A	Field preparation & coordination	2	EA	\$2,500	\$5,000 ^{10,14}
4B	Field sampling & field parameters (16 wells)	2	EA	\$5,700	\$11,400 ^{11,12,15}
4C	Laboratory analytical testing services (16 wells)	32	EA	\$375	\$12,000 ^{13,14,15}
4D	Laboratory analytical testing (2 duplicates, 2 free	4	EA	\$375	\$1,500 ^{13,14,15}
5	Groundwater Reporting and Expense				
5A	Semi-annual groundwater reporting	2	EA	\$9,857	\$19,714 ^{10,15}
5B	Field expense, equipment rental, H&S, & misc.	2	EA	\$6,500	\$13,000 ^{10,15}
Subtotal Post-Closure Care Cost Per Year					\$93,246
<i>Contingency (10%)</i>					\$9,325
Total Post-Closure Care Cost Per Year					\$102,571
Total Post-Closure Cost for Remaining PCC Period (Year 2038)					\$2,051,420

Notes:

1. Site restoration and seeding unit rates w ith Georgia Pacific Savannah River Mill Project Berm Restoration (2018).
2. Quantity assumes re-seed entire cover once during PCC period 16.3/30 = 0.54 ac/yr.
3. Cost source from mow ing estimate w ith Riverview Construction Project (2017).
4. Quantity assumes 16.3 acre area is mow ed 2/yr.
5. Cost source is based on values presented in the 2008 GPC ARO Update Costs 12-05-2017 Spreadsheet.
6. Quantity assumes that half 2008 GPC ARO Dike and Road Maintenance budget for this care item.
7. Cost source based on a 2018 GEI estimate developed for basin sediment removal.
8. Quantity assumes that the existing basin w ill be cleaned out once during the PCC period.
9. Cost source generally based on a 2018 GEI estimate for annual inspection and letter report production.
10. Estimate based on budgets from previous sampling events.
11. Cost source based on similar costs projected in 2018 approved GEI Groundw ater Monitoring Plan.
12. Cost assumes: 2 people 30 hrs/event@\$95/hr each = \$5,700
13. Cost source per 2018 PACE Analytical reference.
14. Analytical testing for Approved Groundw ater Monitoring Plan, Appendix III Parameters.
15. Assumes that groundw ater monitoring plan w ill be conducted semi-annually (tw ice a year) for 20 years.

1.17 Financial Assurance

Rule 391-3-4-.10(10)(a) requires financial assurance for all CCR units be provided in accordance with Rule 391-3-4-.13. Georgia Power will submit the financial assurance mechanism for closure on forms as provided or in a format as prescribed by the Director, Georgia EPD. Georgia Power will provide a demonstration of financial assurance upon approval of closure cost estimates by Georgia EPD.

1.18 Notification and Certification

Georgia Power shall obtain written certification from a professional engineer registered in the State of Georgia that the post-closure care plan meets the requirements of Rule 391-3-4-.10(7).

No later than 60 days following the completion of the post-closure care period, the owner or operator of the CCR unit must prepare a notification verifying that post-closure care has been completed. The notification must include the certification by a qualified professional engineer verifying that post-closure

care has been completed in accordance with this plan. The owner or operator has completed the notification when it has been placed in the facility's operating record as required by 391-3-4-.10(8) and provided to the Director of Georgia EPD. The release of the CCR unit of post-closure care must be approved by the Georgia EPD.

1.19 Recordkeeping/Notifications

Georgia Power will comply with all recordkeeping, notification, and posting of information on the internet in accordance with 391-3-4-.10(8)(a). The quality control records of inspection and testing during the post-closure care period will be compiled and maintained by Georgia Power. This records document compliance with the solid waste handling permit and post-closure care responsibilities for Landfill No. 3. All records will be forwarded to the Plant McIntosh's permanent operating record to be retained as a permanent record of the project.