



WINYAH GENERATING STATION

Post-Closure Plan Narrative For New Class 3 CCR Landfill Area 1

40 CFR Part 257
Operating Criteria
§257.104(d)



WINYAH GENERATING STATION
POST-CLOSURE PLAN NARRATIVE FOR NEW CLASS 3 CCR LANDFILL AREA 1

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1. INTRODUCTION

The United States Environmental Protection Agency (EPA) promulgated regulations (40 CFR Part 257) regarding coal combustion residuals (CCRs). The CCR rule was published in the Federal Register on April 17, 2015 and became effective on October 19, 2015. The Class Three CCR Landfill is subject to the CCR Rule as a new landfill as defined in 40 CFR §257.53. A requirement of the CCR rule is to prepare a written post-closure plan (§257.104(d)) for new CCR landfills. This plan must be placed in the facility operating record no later than the date of the initial receipt of CCR in the CCR unit as required by §257.104(d)(2)(ii).

This document serves as certification that the written post-closure plan for the new CCR landfill Area 1 at Winyah Generating Station in Georgetown, South Carolina meets the requirements of §257.104. The written post-closure plan is documented in the Winyah Generating Station Class Three Landfill Permit Application approved by the South Carolina Department of Health and Environmental Control (DHEC) on 15 September 2017 (Permit #LF3-00042). The written post-closure plan meets the requirements of the South Carolina solid waste management regulation R.61-107.19 as certified by the design engineer-of-record, Scott M. Graves, P.E., Geosyntec Consultants, Inc.. The South Carolina Department of Health and Environmental Control issued a permit to construct on September 15, 2017 with an effective date of September 30, 2017.

2. DISCUSSION

Title 40 CFR §257.104(d)(1)(i) through (iii) specify the minimum required information that must be included in the written post-closure plan. Each requirement is stated below, followed by the specific post-closure plan information, in addition to any supplemental information that may be required. The written post-closure plan must include, at minimum, the following:

257.104(d)(1)(i) A description of the monitoring and maintenance activities required in paragraph (b) of this section for the CCR unit, and the frequency at which these activities will be performed. Paragraph (b) of this section (§257.104(b)) states that following closure of the CCR unit, the owner or operator must conduct post-closure care for the CCR unit, which must consist of at least the following:

(b)(1) Maintaining the integrity and effectiveness of the final cover system, including making repairs to the final cover as necessary to correct the effects of settlement, subsidence, erosion, or other events, and preventing run-on and run-off from eroding or otherwise damaging the final cover;



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The final cover system will be inspected on a quarterly basis. Inspection items will include observations of erosion (rills, sediment deposits, etc.), areas lacking or showing stressed vegetation, animal burrows, areas of settlement or ponding, seepage staining and/or flow areas, cracking, and woody vegetation (especially species with tap roots). Following each inspection, a summary report of the condition of the cap and any items of concern will be recorded in the post-closure logbook for the facility. Any items of concern will be addressed immediately. Repairs will be performed under the supervision of the post-closure maintenance manager. Animal burrows and eroded or depressed areas will be filled with compacted soil and re-seeded. Vegetation will be mowed routinely to maintain healthy vegetation, eliminate woody vegetation, and facilitate visual inspections. In areas where inadequate vegetation is observed, fertilizer will be applied and the area re-seeded. Insecticides may be used to eliminate insect populations detrimental to the vegetation.

The erosion and sedimentation control system will also be inspected on a quarterly basis and after significant storm events. The components of the system, including perimeter berms, drainage terraces, down drain pipe features, perimeter drainage channels, culverts, and ponds will be checked for obstructions and damage. Perimeter drainage channels will be inspected for obstructions, erosion of the side slopes, lack of vegetation, shifting of rip-rap, buildup of sediment, or any item that may compromise the performance of the channel. Stormwater piping & culverts will be checked for blockages and the inlets and outlets inspected for disruption, undercutting, and/or rutting. Observations of the sediment level in the detention pond will also be performed to determine if the pond requires cleanout. The pond outfall structure will be inspected to make sure it is not obstructed or filled with sediment, and the pond berms will be inspected to make sure they are still stable. Following each inspection, a summary report will be entered into the landfill post-closure record along with photographs of any items of concern. Maintenance and/or repairs will be performed in a timely fashion as determined necessary by the inspectors or as prescribed upon follow-up observations. Any repairs or maintenance activities will be recorded.

(b)(2) If the CCR unit is subject to the design criteria under §257.70, maintaining the integrity and effectiveness of the leachate collection and removal system and operating the leachate collection and removal system in accordance with the requirements of §257.70;

The new Class Three CCR Landfill has an operating leachate collection system and it will be inspected on a quarterly basis and routinely maintained for ongoing collection, storage, and disposal during the post-closure period. Periodic repair and cleaning of the leachate management system components, including riser pipes, pumps, clean-outs, and



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related mechanical/electrical controls and flow recording devices, will be conducted to ensure functionality of the system during the post-closure period. Flows to the leachate collection pond will be observed and monitored. Any disruptions will be recorded in a logbook. In the event of an interruption to leachate flow, the collection lines may be observed using video monitoring equipment, and the lines jet cleaned. Following each inspection, a summary report will be entered into the landfill post-closure record along with photographs of any items of concern. Maintenance and/or repairs will be performed in a timely fashion as determined necessary by the inspectors or as prescribed upon follow-up observations. Any repairs or maintenance activities will be recorded.

(b)(3) Maintaining the groundwater monitoring system and monitoring the groundwater in accordance with the requirements of §§257.90 through 257.98.

The post-closure activities associated with the groundwater monitoring system are described in detail in the groundwater monitoring plan which was developed to comply with §§257.90 through 257.98. Groundwater will be monitored in accordance with the requirements of §§257.90 through 257.98 throughout the duration of the post-closure period.

257.104(d)(1)(ii) The name, address, telephone number, and email address of the person or office to contact about the facility during the post-closure period

Facility contact information during the post-closure period is as follows:

South Carolina Public Service Authority
Class Three Landfill Winyah Generating Station
One Riverwood Drive
P.O. Box 2946101
Moncks Corner, SC 29461

Attn: Darla Barnette Manager Generating Station 843-761-8000
darla.barnette@santeecooper.com

257.104(d)(1)(iii) A description of the planned uses of the property during the post-closure period. Post-closure use of the property shall not disturb the integrity of the final cover, liner(s), or any other component of the containment system, or the function of the monitoring systems unless necessary to comply with the requirements in this subpart.



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There is no current planned use for the landfill property during the post-closure period. The property will continue to be maintained by Santee Cooper, and public access will be prohibited.

257.104(d)(4) The owner or operator of the CCR unit must obtain a written certification from a qualified professional engineer that the initial and any amendment of the written post-closure plan meets the requirements of this section.

See Section 4.

3. CONCLUSIONS

The existing permitted closure plan for the new Class Three CCR Landfill Area 1 at Winyah Generating Station I Georgetown, South Carolina, and supplemental information included in this report, satisfy the written closure plan requirements outlined in Title 40 CFR §257.102.



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4. CERTIFICATION

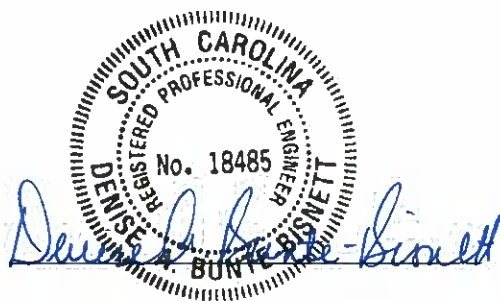
Certification for Post-Closure Plan

Federal CCR Rule: 40 CFR §257.104

CCR Unit: WGS Class Three Landfill Area 1 - New CCR Landfill

I, the undersigned Professional Engineer registered in good standing in the State of South Carolina, do hereby certify under penalty of law that I have personally examined and am familiar with the information submitted in this demonstration, and that, based on my inquiry of the individuals responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. I certify, for the above-referenced CCR Unit, that the written post-closure plan contained herein is in accordance with the requirements of Title 40 CFR §257.104.

Seal and Signature:



Printed Name: Denise A. Bunte-Bisnett

P.E. License Number: 18485 State of South Carolina



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APPENDIX A

Permitted Post-Closure Plan



Prepared for

Santee Cooper Power
1 Riverwood Drive
Moncks Corner, South Carolina 29461

POST-CLOSURE PLAN

WINYAH GENERATING STATION PERMIT APPLICATION NON-COMMERCIAL CLASS THREE LANDFILL Georgetown, South Carolina

Prepared by

Geosyntec 
consultants

engineers | scientists | innovators

104 South Main Street, Suite 115
Greenville, South Carolina 29601

Project Number GSC5242

August 2016



8/9/2016

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Attachment A Post-Closure Cost Estimate



1. INTRODUCTION

1.1 Terms of Reference

This Post-Closure Plan (Plan) has been prepared by Geosyntec Consultants (Geosyntec) for the Class Three Landfill at Santee Cooper’s Winyah Generating Station (WGS) located in Georgetown County, South Carolina. Geosyntec prepared this Plan on behalf of the permit applicant – the South Carolina Public Service Authority doing business as (d.b.a.) Santee Cooper (Santee Cooper). The Class Three Landfill will be composed of two areas, referred to as “Landfill Area 1” and “Landfill Area 2”. Collectively these areas are referred to as the “Class Three Landfill”. Detailed drawings illustrating the Class Three Landfill features including the components described herein are presented on the Engineering Drawings that accompany the permit application.

1.2 Purpose of This Post-Closure Plan

This Plan serves as the Post-Closure Plan required for Class Three Landfills by Part V, Subpart H.5.b.(16) of South Carolina Department of Health and Environmental Control (DHEC) Regulation R.61-107.19. The purpose of this Plan is to provide details of the required monitoring and maintenance activities that will be performed during the post-closure period at the Class Three Landfill to satisfy the applicable post-closure care provisions Part V, Subpart F, Section 258.61 of R.61-107.19. A post-closure cost estimate is also included, pursuant to Part I, Section E.2 of R.61-107.19.

Following DHEC approval of this Plan, Santee Cooper will amend this Plan within 60 days prior to a planned change in the operation of the Class Three Landfill that would substantially affect or cause a deviation from the approved Plan, or no later than 60 days after an unanticipated event necessitates a revision of the approved Plan. Once post-closure activities have commenced at the Class Three Landfill, amendments to the approved Plan will be completed no later than 30 days following the triggering event. Plan amendments will be submitted to DHEC for review and approval prior to implementation. Any updates to this Plan, and any maintenance records and monitoring results as required by Part V, Subpart F, Section 258.61 of R.61-107.19, will be placed in the Class Three Landfill Operating Record.

1.3 Initiation of Post-Closure Care and Duration of Post-Closure Care Period

Following closure of each Class Three Landfill area, Santee Cooper shall conduct post-closure care. The minimum length of the post-closure care period is 30 years. This timeframe may be increased at the direction of DHEC if DHEC determines that a lengthened period is necessary to protect human health and the environment (e.g., if the landfill is operating under an assessment monitoring program that necessitates a longer post-closure care period).

1.4 Overview of Post-Closure Care Activities and Plan Contents

In general, post-closure care will consist of the following activities:

- maintenance of the integrity and effectiveness of the final cover system, including vegetation and the surface-water management system;
- maintenance of the integrity and effectiveness of the leachate collection system, and operation of the leachate collection and management system; and
- groundwater monitoring, including maintenance of the groundwater monitoring system.

The remainder of this Plan includes the following:

- a description of the required monitoring and operation and maintenance (O&M) activities during post-closure care and the frequency at which these activities will be performed;
- contact information for the person/office responsible for post-closure care activities;
- a description of the planned uses of the property during the post-closure care period;
- a description of the post-closure notification and certification to be submitted to DHEC following completion of the post-closure care period.

2. MAINTENANCE AND MONITORING ACTIVITIES

This section describes the maintenance and monitoring activities that will be conducted during the post-closure care period for the Class Three Landfill.

2.1 Maintenance and Monitoring Frequencies

The frequencies of the maintenance and monitoring activities to be conducted during the post-closure care period for the Class Three Landfill are presented below in Table 1. Details of the activities are provided subsequently in this section.

**Table 1
 Schedule of Post-Closure Maintenance and Monitoring Activities**

Activity	Minimum Frequency
Landfill Inspections (final cover system, surface-water management system, facility vegetation, and general site conditions and access control)	Quarterly
Leachate Management System Inspections	Monthly
Groundwater Monitoring Well Inspections	When Sampled
Mowing of Landfill Final Cover	Semi-Annual
Leachate Management System Operation and Maintenance	Ongoing collection, storage, and disposal during post-closure care period
Groundwater Monitoring Events	Frequency per the approved Groundwater Monitoring Plan.
Facility Maintenance and Repairs (final cover system, surface-water management system, landfill vegetation, access controls, leachate management system, and groundwater monitoring system)	Maintenance and repairs as needed

2.2 Final Cover System

Santee Cooper will inspect the final cover system during each landfill inspection event, at the frequency identified above in Table 1, to assess its integrity and effectiveness. Maintenance will be conducted as needed to correct the effects of settlement, subsidence, erosion, stressed or dead vegetation, or other events, and preventing run-on and run-off from eroding or otherwise damaging the final cover. Mowing of the final cover system and adjacent vegetated berms and channels at the Class Three Landfill will be conducted at the frequency identified in Table 1.

The final cover system maintenance activities during post-closure care will include the following:

- The final cover system vegetation will be mowed routinely to maintain healthy vegetation, avoid die-out due to shading, eliminate woody-stemmed vegetation, and provide for adequate inspection of the final cover system.
- The final cover system will be inspected for conditions that could impact cover integrity, including settlement, subsidence, ponding water, burrowing animals, erosion, stressed or dead vegetation, and leachate seeps.
- Settled, depressed or eroded areas will be filled with soil, graded to provide positive drainage, and then revegetated. Repair materials will be placed in a manner consistent with the original final cover system construction.
- Areas with stressed or dead vegetation will be evaluated to determine the problem, and appropriate actions will be taken, such as reseeding the areas.

2.3 Surface Water Management System

Santee Cooper will inspect the landfill surface water management system during each landfill inspection event, at the frequency identified above in Table 1, to ensure functionality of the surface water management system and related erosion and sedimentation controls and verify that surface run-on or run-off is not eroding or otherwise damaging the final cover system. Maintenance will be conducted as necessary. It is anticipated that the required level of maintenance will decrease over time during the post-closure period as vegetation placed during closure becomes

increasingly established. The surface water management system monitoring and maintenance activities during post-closure care will include the following:

- Inspections of all components for damage, silting, and erosion.
- Periodic repair as needed, of damaged or washed-out drainage terraces, down drain pipe features, perimeter drainage channels, and culverts; to restore functionality.
- Periodic removal as needed, of excess sediment, weeds, and other debris from drainage terraces, down drain pipe features, perimeter drainage channels, and culverts; to restore their design configuration and functionality, followed by revegetation of disturbed areas as appropriate.
- Repair of eroded areas as needed, by grading and revegetation.

2.4 Leachate Management System

During the post-closure period, the leachate management system (leachate collection system, removal system, and storage/disposal operations) will continue to be maintained and operated as described in the Operations and Maintenance (O&M) Plan. The system will be routinely inspected at the frequency given in Table 1 of this Plan. The leachate management system monitoring and maintenance activities during post-closure care will include the following:

- Inspections of the leachate collection system (riser pipes, pumps, clean-outs, and related mechanical/electrical controls and flow recording devices).
- Inspections of the leachate removal, transmission, and storage components, including the integrity of the lined storage pond.
- Periodic repair and cleaning as needed, of damaged leachate management system components, to restore proper leachate collection and ensure functionality of the system.

- Periodic maintenance and repair/replacement of mechanical/electrical components as needed (e.g., pumps, sensors, electrical systems) that typically have a finite service life.
- Notation of any abnormally high or low leachate flows, which may include temporarily instituting an increased inspection frequency, performing a video inspection of leachate system piping, and/or jet-cleaning of affected piping.

2.5 Groundwater Monitoring System

During the post-closure period, the groundwater monitoring system will be maintained and monitored in the same manner as during the active life of the Class Three Landfill, in accordance with Part V, Subpart E of R.61-107.19 and the approved Groundwater Monitoring Plan. The monitoring wells will be inspected during each groundwater monitoring/sampling event as described in the Groundwater Monitoring Plan. Specific inspection and sampling/monitoring requirements and procedures for groundwater monitoring wells are given in the Groundwater Monitoring Plan. Maintenance will be conducted as necessary.

2.6 Landfill Gas

As discussed in the Engineering Report and O&M Plan, the large majority of the wastes that will be disposed of at the facility are coal combustion product (CCP) wastes. The wastes will be non-putrescible and not of a type expected to biodegrade; municipal solid waste will not be accepted. Thus, the composition of the waste that will be disposed at the landfill is not expected to generate methane or other explosive landfill gases. Therefore, neither a methane monitoring system, nor a methane control system, are proposed for this Class Three Landfill. As a result, landfill gas monitoring and maintenance is not applicable to this Post-Closure Plan.

2.7 Post-Closure Maintenance and Monitoring Documentation

Following each monitoring and inspection activity described herein, Santee Cooper will prepare a summary report detailing the condition of the applicable Class Three Landfill components and the items of concern, if any. Documentation and reporting of groundwater monitoring activities will be in accordance with the approved Groundwater

Monitoring Plan. Items and/or areas that require further attention should be photographed and identified on a map. The summary report, relevant photographs, and field maps will be incorporated into a landfill post-closure log book. To facilitate review and in change of personnel, the post-closure log book should be kept in a standardized format that allows for personnel to easily review the results of past post-closure monitoring events and inspections of the Class Three Landfill.

As mentioned, actions should be taken immediately to address any items of concern identified during the routine monitoring and inspections. Repairs should be performed under the supervision and direction of Santee Cooper. If an item of concern requires further evaluation to determine the appropriate course of action, the design engineer should be consulted.

3. OTHER INFORMATION

3.1 Post-Closure Contact Information

The contact information of the office responsible for overseeing the post-closure management of the Class Three Landfill is as follows:

South Carolina Public Service Authority
Winyah Generating Station
661 Steam Plant Dr.
Georgetown, SC 29440
(843) 546-4171
Attn: Manager, Generating Station

3.2 Planned Land Use During Post-Closure Care Period

At the time of this Plan, there is no current planned land use for the Class Three Landfill areas at the WGS site during the post-closure care period. The WGS site will remain Santee Cooper property, public access will be prohibited, and the Class Three Landfill will be maintained as vegetated open space during the post-closure period.

Any post-closure use of the Class Three Landfill shall not disturb the integrity of the final cover, liners, or any other components of the containment system, or the function of the monitoring systems unless necessary to comply with the maintenance requirements described in this Plan. DHEC may approve any other disturbance of the containment system if Santee Cooper demonstrates that disturbance of the final cover, liner or other component of the containment system, including any removal of waste, will not increase the potential threat to human health or the environment. Such a demonstration will be certified by a qualified professional engineer and will be placed in the Operating Record upon DHEC's approval.

3.3 Notification and Certification of Completion of Post-Closure Care Period

Within 60 days of completion of the post-closure care period for each Class Three Landfill area and in accordance with the requirements of Part V, Subpart F, Section 258.61.e of R.61-107.19, Santee Cooper will prepare and submit to DHEC for review and approval, a notification package informing DHEC that post-closure care has been completed. This notification package will include a certification that is signed by a

duly-licensed South Carolina professional engineer (other than the design engineer), verifying that post-closure care has been completed in accordance with this Plan. . After DHEC approval, the notification/certification will be placed in the Operating Record, and post-closure care activities will end.

3.4 Financial Assurance

A detailed written cost estimate for post-closure care is provided as Attachment A of this Plan. This cost estimate is in current dollars and is based on hiring a third party to conduct post-closure care for the landfill in accordance with this Plan and for a period of 30 years. Santee Cooper will adjust the estimate annually for inflation and any changes to this Plan. Additionally, Santee Cooper will provide a demonstration of financial assurance, using an allowable mechanism, for the Class Three Landfill in accordance with the requirements of Part I, Section E.2 of R.61-107.19.

If conditions call for a reduction in the amount to be financially assured, Santee Cooper will submit justification to DHEC for review and approval prior to officially reducing the amount. Financial assurance for post-closure activities will be maintained until DHEC approves the certification of completion of the post-closure care period and Santee Cooper is released from financial assurance requirements.

Santee Cooper Winyah Generating Station
Class Three Landfill Permit Application
Post-Closure Plan

ATTACHMENT A

POST-CLOSURE COST ESTIMATE

Attachment A
Post-Closure Cost Estimate
Class Three Landfill

Winyah Generating Station, Georgetown County, South Carolina

Total Class Three Landfill Area: 106.6 AC Date Prepared: August 2016 Length of Post-Closure Care (Years): 30

Item Number	Description	Estimated Event Quantity	Unit Price Per Event	Extended Total	Annual Quantity	Annual Costs	Total Post-Closure Cost
1	Administration/Recordkeeping	80 hrs.	\$130	\$10,400	1	\$10,400	\$312,000
2	Groundwater Monitoring and Reporting	19 Well	\$1,600	\$30,400	2	\$60,800	\$1,824,000
3	Groundwater Analytical Testing	1 EA	\$4,750	\$4,750	2	\$9,500	\$285,000
4	Leachate Samples	1 EA	\$1,000	\$1,000	1	\$1,000	\$30,000
5	Mowing	106.6 AC	\$125	\$13,325	2	\$26,650	\$799,500
6	Stormwater Structures Maintenance	1 EA	\$5,000	\$5,000	1	\$5,000	\$150,000
7	Leachate Collection System Maintenance	106.6 AC	\$80	\$8,528	1	\$8,528	\$255,840
8	Final Cover System Repair	1 EA	\$8,000	\$8,000	1	\$8,000	\$240,000
9	Groundwater Well Maintenance	1 LS	\$6,000	\$6,000	1	\$6,000	\$180,000
10	Annual Contingency	5%	\$135,878	\$6,794	1	\$6,794	\$203,817
				Total Post-Closure Cost		\$142,672	\$4,280,157
				<i>Post-Closure Cost per Acre (for informational purposes)</i>		<i>\$1,338</i>	<i>\$40,152</i>