



**Amended
CCR Landfill Closure Plan**

**W. A. Parish Electric Generating Station
Thompsons, Texas**

February 2020

Prepared For

NRG Texas Power LLC

CERTIFICATION

Amended CCR Landfill Closure Plan

W. A. Parish Electric Generating Station

I, the undersigned Texas Professional Engineer, hereby certify that I am familiar with the technical requirements of Title 40 Code of Federal Regulations Part 257 Subpart D (§257). I certify that it is my professional opinion that this document meets the requirements for a written closure plan pursuant to 40 CFR 257.102. I also certify that this document was prepared by me and that I am a registered professional engineer under the laws of the State of Texas.

For the purpose of this document, "certify" and "certification" shall be interpreted and construed to be a "statement of professional opinion". The certification is understood and intended to be an expression of my professional opinion as a Texas Licensed Professional Engineer, based upon knowledge, information, and belief. The statement(s) of professional opinion are not and shall not be interpreted or construed to be a guarantee or a warranty of the analysis herein.

Richard D. Varnell
Printed Name of Professional Engineer


Signature of Professional Engineer

135525
Texas License Number

2/27/2020
Date



FIAM #3775

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1. INTRODUCTION & PURPOSE

Federal CCR Rule Reference: 40 CFR 257.102(b)

Pursuant to 40 CFR 257.102(b), this document provides the written closure plan for the existing coal combustion residual (CCR) landfill, Unit 001 Landfill, at NRG Texas Power LLC's (NRG) W. A. Parish Electric Generating Station. The four currently active cells in the Unit 001 Landfill are:

- Cell 1C;
- Cell 2A;
- Cell 2B; and
- Cell 3.

NRG intends to close each of the preceding CCR landfill cells in accordance with the requirements of 40 CFR 257.102(d) by leaving the CCR in place and installing a final cover system.

2. CLOSURE PLAN NARRATIVE DESCRIPTION

Federal CCR Rule Reference: 40 CFR 257.102(b)(1)(i) and 257.102(d)(1)

As a landfill cell reaches capacity, the stored CCR will be graded to designed contours, and a protective final cover system will be installed to minimize infiltration and prevent storm water contact with the CCR. Materials for the final cover system will be placed and compacted so as to limit erosion, settling, and future maintenance, and to maintain positive drainage. As the final cover system is installed, soil properties, compaction, permeability, and thickness testing will be performed to confirm compliance with the closure plan and federal and state regulations in effect at the time of closure.

At the time this closure plan was prepared, NRG has installed the final cover system over several closed landfill cells in Unit 001. Those cells include Cells 1, 1A, 1B, 2, and 2A (outside of the pugmill area). Each ceased accepting CCR and the final cover system had been installed prior to the effective date of the CCR Rule on October 19, 2015. Soil properties, compaction, and thickness testing of the cover material were performed during installation.

3. FINAL COVER SYSTEM DESCRIPTION

Federal CCR Rule Reference: 40 CFR 257.102(b)(1)(iii) and 257.102(d)(1)

Pursuant to the closure performance standards prescribed in 40 CFR 257.102(d)(1), the final cover system for Unit 001 Landfill will:

1. Ensure the design of the final cover system accommodates settling and subsidence to protect the integrity of the final cover system.
2. Minimize the post-closure infiltration of liquid into the CCR.
3. Minimize the risk of release of CCR or contaminated run-off to the ground or surface waters, or to the atmosphere.
4. Preclude the probability of future impoundment of water, sediment, or slurry.

5. Provide major slope stability to prevent sloughing of the final cover system during the post-closure care period.
6. Minimize future maintenance.
7. Allow closure activities to be completed as quickly as practical consistent with recognized and good engineering practices.

3.1 ESTABLISH GRADE AND SUPPORT FOR FINAL COVER SYSTEM

Federal CCR Rule Reference: 257.102(d)(1)(ii), 257.102(d)(1)(iii) & 257.102(d)(3)(i)(D)

Per the CCR Rule, the upper surface of the stored CCR, or possibly general fill if sufficient quantities of CCR are not available, will be graded to form a mounded profile. The top of the mound will be graded from a high point or ridge with 3 to 5 percent slope outward. Along the interior faces of the cell's perimeter containment dikes, perimeter drainage swales will be constructed where necessary to intercept storm water and minimize flow from the upper area to the side slopes. These drainage swales will be directed to armored or paved drainage ditches that will channelize flow down the side slope and empty into a network of existing and/or new ditches at the toes of the cell's perimeter containment dikes. The slopes of the final cover system will be designed to be stable from a global geotechnical basis. In addition, these slopes will be designed to accommodate settling and subsidence while maintaining this positive drainage strategy.

3.2 INFILTRATION LAYER

Federal CCR Rule Reference: 257.102(d)(1)(i), 257.102(d)(3)(i)(A), & 257.102(d)(3)(i)(B)

Per 257.102(d)(i)(A) and (B), an infiltration layer consisting of compacted, low permeability clay material will be placed on top of the graded CCR or general fill to minimize the infiltration of liquids into the closed CCR unit. Per the CCR Rule, the infiltration layer will consist of a minimum thickness of 18 inches of compacted clay material. Each clay layer will have a maximum permeability of 1×10^{-7} centimeters per second (cm/sec), which is a typical permeability exhibited by the native soils underlying Unit 001's CCR storage cells.

3.3 EROSION LAYER

Federal CCR Rule Reference: 257.102(d)(3)(i)(C)

Per 257.102(d)(i)(C), an erosion layer consisting of topsoil capable of sustaining native plant growth will be provided above the infiltration layer to minimize erosion of the final cover system. Per the CCR Rule, the erosion layer will consist of at least 6 inches of topsoil. The entire surface of the final cover system for a closed landfill cell will be seeded with native vegetation (e.g., Bermudagrass), and regular maintenance of the seeding will take place until a vegetative cover is established and self-sustaining. The storm water run-off management scheme described in Section 3.1 further minimizes erosion of the final cover system.

4. ESTIMATED MAXIMUM INVENTORY OF CCR

Federal CCR Rule Reference: 40 CFR 257.102(b)(1)(iv)

NRG anticipates that Unit 001’s existing landfill cells will remain open until they reach their respective capacities. Therefore, a reasonable estimate of the maximum inventory of CCR that may be contained within each cell may be taken as each cell’s capacity. Based on this assumption, Table 1 lists the estimated maximum inventories of CCR within Cells 1C, 2A, 2B, and 3 at the W. A. Parish Electric Generating Station at any one time during their active lives.

Table 1: Estimated Maximum Inventory of CCR that May be Stored Within Each CCR Landfill Cell	
Landfill 001 CCR Landfill Cell	Estimated Maximum Inventory of CCR (cy)
Cell 1C	445,000
Cell 2A (Pugmill Operation)	99,800
Cell 2B	1,690,000
Cell 3	745,000

5. ESTIMATED COVER SURFACE AREA

Federal CCR Rule Reference: 40 CFR 257.102(b)(1)(v)

The final cover system required to close each active landfill cell is estimated to encapsulate each cell’s active storage area (i.e., the area bounded by a cell’s perimeter containment dikes). It is estimated that each cell’s active storage area represents the largest surface area that will ever require a final cover at any point over the cell’s active life. Table 2 lists these estimated cover surface areas.

Table 2: Estimated Largest Areas Ever Requiring a Final Cover Per CCR Landfill Cell	
Landfill 001 CCR Landfill Cell	Estimated Maximum Surface Area of Final Cover System (acres)
Cell 1C	18.45
Cell 2A (Pugmill Operation and 2A Pond)	8.29
Cell 2B	45.60
Cell 3	32.21

6. CLOSURE SCHEDULE

Federal CCR Rule Reference: 40 CFR 257.102(b)(1)(vi)

Table 3 identifies major milestones necessary to close each landfill cell with an estimated duration and year of completion for each milestone. NRG estimates that all closure activities for the existing CCR landfill cells at W. A. Parish Electric Generating Station will be completed by the year 2030.

Table 3: Planning Level Schedule for Closure of Existing CCR Landfill		
Task Description	Estimated Duration	Estimated Completion Year
Place Amended Closure Plan into the Facility's Operating Record (FOR).	1 Day	2020 (All Cells)
Send Notification of the Availability of Amended Closure Plan to the Texas Commission of Environmental Quality (TCEQ) and the Amended Post Closure Plan to NRG's CCR Website.	1 Month	2020 (All Cells)
Deposit CCR into the Landfill Until Disposal Capacity is Reached.	Ongoing	2020 (Cell 1C) 2029 (Cells 2A, 2B, 3)
Place Notification of Intent to Close into FOR.	1 Day	2020 (Cell 1C) 2029 (Cells 2A, 2B, 3)
Final Grading of CCR Material to Designed Slopes and Contours.	2 Months	2021 (Cell 1C) 2030 (Cells 2A, 2B, 3)
Place Final Cover System.	2 Months	2021 (Cell 1C) 2030 (Cells 2A, 2B, 3)
Certification of Completion of Closure by a Qualified Texas Professional Engineer.	1 Month	2021 (Cell 1C) 2030 (Cells 2A, 2B, 3)
Place Notification of Landfill Closure Completion into FOR.	1 Month	2021 (Cell 1C) 2030 (Cells 2A, 2B, 3)
Send Notification of Completion of Closure to the TCEQ & Post Notification of Completion of Closure to NRG's CCR Website.	1 Month	2021 (Cell 1C) 2030 (Cells 2A, 2B, 3)
Record a Notation of CCR Landfill Closure on the Deed of the Property.	1 Month	2021 (Cell 1C) 2030 (Cells 2A, 2B, 3)
Place Notification of the Deed Notation into Station's Operating Record.	1 Month	2021 (Cell 1C) 2030 (Cells 2A, 2B, 3)
Send Notification of the Deed Notation to the TCEQ & Post Notification Recording a Notation on the Deed to NRG's CCR Website.	1 Month	2021 (Cell 1C) 2030 (Cells 2A, 2B, 3)

7. AMENDMENTS TO CLOSURE PLAN

Federal CCR Rule Reference: 40 CFR 257.102(b)(3)

NRG will amend this plan prior to a change in the operation of the CCR landfill or any of the existing landfill cells that would substantially affect the written closure plan in effect or after an unanticipated event necessitates a revision to the written closure plan. If this written closure plan is revised, NRG will retain a qualified professional engineer licensed in the State of Texas to provide written certification that amendments to this plan meet the requirements of 40 CFR 257.102(b).

8. COMPLETION OF CLOSURE ACTIVITIES

Federal CCR Rule Reference: 40 CFR 257.102(f)(3)

Upon completion of closure (of either an individual cell or the entire landfill), NRG will obtain a certification from a qualified professional engineer licensed in the State of Texas verifying that the Unit 001 Landfill has been closed in accordance with the closure plan in effect at the time of closure.