



NRG Texas Power LLC  
W. A. Parish Station, Units 5, 6, 7, & 8

## CCR Landfill Closure Plan

Prepared by



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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, at NRG Texas Power LLC's (NRG) W. A. Parish Station. Unit 001 is subdivided into the following four cells:

- 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) & 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.

## 3 FINAL COVER SYSTEM DESCRIPTION

### **Federal CCR Rule References: 40 CFR 257.102(b)(1)(iii) & 257.102(d)(1)**

Pursuant to the closure performance standards prescribed in 40 CFR 257.102(d)(1), each landfill cell's final cover system will:

1. Minimize the post-closure infiltration of liquid into the CCR,
2. Minimize the risk of release of CCR or contaminated run-off to the ground or surface waters, or to the atmosphere,
3. Preclude the probability of future impoundment of water, sediment, or slurry,
4. Provide major slope stability to prevent sloughing of the final cover system during the post-closure care period,
5. Minimize future maintenance, and
6. Allow closure activities to be completed as quickly as practical consistent with recognized and good engineering practices.

### **3.1 ESTABLISH GRADE & SUPPORT FOR FINAL COVER SYSTEM**

**Federal CCR Rule Reference: 40 CFR 257.102(d)(1)(ii), 257.102(d)(1)(iii), & 257.102(d)(3)(i)(D)**

To accomplish the closure goals promulgated by 40 CFR 257, 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 a 3 to 5 percent slope outward. Along the interior faces of the cell's perimeter containment dikes, perimeter drainage swales will be constructed to intercept storm water and minimize flow from the upper area to the side slopes. These drainage swales will be directed to armored downcomers, which will 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: 40 CFR 257.102(d)(1)(i), 257.102(d)(3)(i)(A), & 257.102(d)(3)(i)(B)**

Using the nomenclature in 40 CFR 257, an infiltration layer consisting of compacted, low permeability clay material will be placed on top of the graded CCR to minimize the infiltration of liquids through the closed CCR unit. Specifically, the infiltration layer along a cell's perimeter containment dikes will consist of at least 3 feet of compacted clay material, while all other areas of the cell will be covered by at least 2 feet of compacted clay material. Each clay layer will have a maximum permeability of  $1 \times 10^{-7}$  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: 40 CFR 257.102(d)(3)(i)(C)**

Continuing with the nomenclature in 40 CFR 257, 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. Specifically, the erosion layer along a cell's perimeter containment dikes will consist of at least 12 inches of topsoil, while all other areas of the cell will receive 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 INVENTORIES 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 W. A. Parish 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**

CCR Landfill Cell	Estimated Maximum Inventory of CCR (cy)
Cell 1C	445,000
Cell 2A	99,800
Cell 2B	1,690,000
Cell 3	745,000

## 5 ESTIMATED COVER SURFACE AREAS

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

The final cover system required to close each 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**

CCR Landfill Cell	Estimated Maximum Surface Area of Final Cover System (ac)
Cell 1C	18.45
Cell 2A	8.05
Cell 2B	48.00
Cell 3	34.12

## 6 CLOSURE SCHEDULE

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

Table 3 lists the 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 Station will be completed by the year 2030.



**Table 3: Planning Level Schedule for Closure of Existing CCR Landfill Cells**

Task Description	Estimated Duration	Estimated Completion Year
Place Closure Plan into Station's Operating Record	1 Day	2016 (All Cells)
Send Notification of the Availability of Closure Plan to Texas Commission of Environmental Quality (TCEQ) and Post the Closure Plan to NRG's CCR Website	1 Month	2016 (All Cells)
Deposit CCR into Landfill Cell Until Disposal Capacity is Reached	Ongoing	2019 (Cell 1C) 2029 (Cells 2A, 2B, 3)
Place Notification of Intent to Close into Station's Operating Record	1 Day	2019 (Cell 1C) 2029 (Cells 2A, 2B, 3)
Final Grading of CCR to Designed Slopes and Contours	2 Months	2020 (Cell 1C) 2030 (Cells 2A, 2B, 3)
Place Final Cover System	2 Months	2020 (Cell 1C) 2030 (Cells 2A, 2B, 3)
Certification of Completion of Closure by a Qualified Professional Engineer	1 Month	2020 (Cell 1C) 2030 (Cells 2A, 2B, 3)
Place Notification of Completion of Closure into Station's Operating Record	1 Month	2020 (Cell 1C) 2030 (Cells 2A, 2B, 3)
Send Notification of Completion of Closure to TCEQ and Post Notification of Completion of Closure to NRG's CCR Website	1 Month	2020 (Cell 1C) 2030 (Cells 2A, 2B, 3)
Record a Notation of CCR Landfill Closure on the Deed of the Property	1 Month	2020 (Cell 1C) 2030 (Cells 2A, 2B, 3)
Place Notification of the Deed Notation into Station's Operating Record	1 Month	2020 (Cell 1C) 2030 (Cells 2A, 2B, 3)
Send Notification of the Deed Notation to TCEQ and Post Notification of Recording a Notation on the Deed to NRG's CCR Website	1 Month	2020 (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 any of the existing CCR 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 ACTIVITES

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

Upon completion of closure of each landfill cell, NRG will obtain a certification from a qualified professional engineer licensed in the State of Texas verifying that the landfill cell has been closed in accordance with the closure plan in effect at the time of closure.

## 9 CERTIFICATIONS

### Federal CCR Rule Reference: 40 CFR 257.102(b)(4)

This document meets the requirements for a written closure plan pursuant to 40 CFR 257.102(b).

I certify that this document was prepared by me or under my supervision and that I am a registered professional engineer under the laws of the State of Texas.

This document is released for use under the authority of James H. Staehlin, Texas PE #87527 on September 30, 2016. Sargent & Lundy LLC Texas Registered Engineering Firm #F-2202.

Certified By: JAMES H. STAEHLIN Date: 9-30-2016

Seal:

