

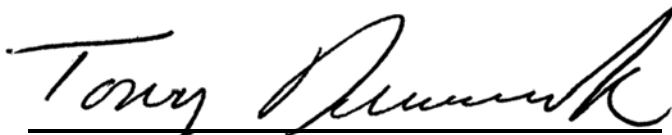
2018 Annual Inspection of CCR Landfill Cells

W.A. Parish Electric Generating Station
Thompsons, Texas

January 2019

Prepared For

NRG Texas Power LLC



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Certification

Annual Inspection of CCR Units

WA Parish 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 also certify that it is my professional opinion that, to the best of my knowledge, information, and belief, that the information in this demonstration is in accordance with current good and accepted engineering practice(s) and standard(s), and meets the requirements of §257.60 through §257.64. I certify that this Report 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.

Jason Leik, P.E.



Signature of Professional Engineer

91043

Texas License Number

11/8/19

Date



FIRM #3775

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1. EXECUTIVE SUMMARY

On November 7, 2018, a representative of TRC Environmental Corporation (TRC) performed an inspection of the CCR landfill at the W.A. Parish Generating Station, located at 2500 Y U Jones Road near Thompsons, Texas. This work was performed to satisfy the requirement for an Annual Inspection by a qualified professional engineer, as required by 40 CFR Part 257, the U.S. Environmental Protection Agency rule on Disposal of Coal Combustion Residuals From Electric Utilities, which is referred to herein as the Federal CCR Rule.

The applicable CCR landfill cells were visually inspected by Mr. Jason Leik, P.E. (licensed in Texas). The inspection included performing a visual inspection of the applicable landfill cells to identify areas requiring maintenance and showing signs of distress or malfunction of the CCR landfill cells. TRC also reviewed the available documentation related to the CCR landfill cells at the W.A. Parish Generating Station.

This inspection evaluated:

- Landfill Cell 3,
- Landfill Cell 2A,
- Landfill Cell 1C, and
- Landfill Cell 2B.

Considering the good to excellent condition in which the landfill facilities were found, it is evident that the ongoing inspection and maintenance activities at the W.A. Parish Generating Station are very effective.

TRC did not observe any evidence of ongoing or imminent failure of these landfill cells. There were no structural deficiencies noted based on TRC's observations.

Since the Federal CCR Rule does not apply to landfills that no longer receive CCR materials after October 19, 2015, closed landfill cells (Cells 1, 1A, 1B and 2, which are not shown on Figure 1 for clarity) were not inspected during this work.

No maintenance items were identified in this annual inspection.

Based on a review of available documents and the visual inspection, it is TRC's opinion that Landfill Cells 3, 2A, 1C and 2B have been designed, constructed, are currently operated, and are maintained in a manner that is consistent with and in accordance with recognized and generally accepted good engineering standards.

2. INTRODUCTION

This document presents the observations and findings of the 2018 annual inspection at the W.A. Parish Generating Station. The W.A. Parish Generating Station is located near Thompsons, Texas, in Fort Bend County. The power station is owned and operated by NRG Texas Power LLC.

The station includes four coal fired generating units with a total gross rated capacity of 2,667 MW from the coal fired units. The station is fueled by coal imported from the Powder River Basin in Wyoming.

The general arrangement of the station and active landfill cells is depicted in Figure 1.

3. PURPOSE/OBJECTIVE

This document is prepared to provide compliance with the annual inspection requirements for CCR units as required by 40 CFR Part 257, the U.S. Environmental Protection Agency rule on Disposal of Coal Combustion Residuals From Electric Utilities (Reference 1). Specifically, Section 257.84(b) of the Federal CCR Rule pertains to the annual inspection requirements for CCR landfills.

This document reports the annual inspection by a qualified professional engineer for all existing landfills (landfills that receive CCR material after October 19, 2015).

The tasks included with this annual report are:

- Inspection of CCR units by a qualified professional engineer to evaluate if the design, construction, operation, and maintenance of the units are consistent with recognized and generally accepted good engineering standards.
- Review of available operational records and information concerning the status and condition of the CCR unit, including, but not limited to, files available in the operating record, and the results of weekly inspections by a qualified person;
- Visual inspection of the CCR unit to identify signs of distress or malfunction of the CCR unit and appurtenant structures.
- Preparation of this inspection report, as required by the CCR Rule, addresses the following:
 - Any changes in geometry of the CCR units since the previous annual inspection;
 - The approximate volume of CCR contained in the units at the time of inspection;
 - Any appearances of actual or potential structural weaknesses of the CCR units, in addition to any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the CCR units and appurtenant structures; and
 - Any other change(s) which may have affected the stability or operation of the CCR units since the previous annual inspection.

NRG provided prior reports and design drawings as inputs to this inspection.

4. CCR LANDFILL DESIGN & BACKGROUND

The following CCR units are considered in this annual inspection:

- Landfill Cell 3,
- Landfill Cell 2A,
- Landfill Cell 1C, and

- Landfill Cell 2B.

The following paragraphs summarize the design and construction of these CCR units and evaluate the applicability of the Federal CCR Rule to each CCR unit.

4.1. LANDFILL CELL 3

Landfill Cell 3 receives bottom ash, which is trucked from the plant. The landfill is constructed over a significant deposit of in situ clay soils. Storm water is directed to an incised storm water collection pond in the western portion of Cell 3. The storm water outlet from this pond is pumped on an as-needed basis under permit to TPDES-permitted Outfall 004. Generally, the cell is constructed of berms with the exterior slope vegetated and the inside slope and crest surfaced with stabilized CCR material to control vegetation and act as an erosion protection layer.

Landfill Cell 3 is designed as a Class 2 non-hazardous landfill under criteria of the Texas Commission on Environmental Quality (TCEQ) (Reference 2).

Since Landfill Cell 3 is an active landfill, an annual inspection is required as documented in subsequent sections of this document.

4.2. LANDFILL CELL 2A

Landfill Cell 2A is a small active portion of Cell 2, which has been closed. This open portion of Cell 2A is an active pugmill operation for mixing and stabilizing CCR material for disposal in other landfill cells or for beneficial use outside the landfill cells. The landfill is constructed over a significant deposit of in situ clay soils. Storm water is directed to the southwestern portion of Cell 2A, where it is pumped manually into Cell 3 as needed. Generally, the cell is constructed of berms with the exterior slope vegetated and the inside slope and crest surfaced with stabilized CCR material to control vegetation and act as an erosion protection layer.

Landfill Cell 2A is designed as a Class 2 non-hazardous landfill under criteria of the TCEQ.

Since Landfill Cell 2A is an active landfill, an annual inspection is required as documented in subsequent sections of this document.

4.3. LANDFILL CELL 1C

Landfill Cell 1C receives nonmarketable CCR materials, which are trucked from the plant. The landfill is constructed over a significant deposit of in situ clay soils. Storm water is directed to an incised storm water collection pond in the western portion of Cell 1C. The storm water outlet from this pond is pumped on an as-needed basis to Cell 3. Generally, the cell is constructed of berms with the exterior slope vegetated and the inside slope and crest surfaced with stabilized CCR material to control vegetation and act as an erosion protection layer.

Landfill Cell 1C is designed as a Class 2 non-hazardous landfill under criteria of the TCEQ.

Since Landfill Cell 1C is an active landfill, an annual inspection is required as documented in subsequent sections of this document.

4.4. LANDFILL CELL 2B

Landfill Cell 2B receives marketable CCR materials, which are trucked from the plant. The landfill is constructed over a significant deposit of in situ clay soils. Storm water is directed to an incised storm water collection pond in the southern portion of Cell 2B. The storm water outlet from this pond is pumped on an as-needed basis to Cell 3. Generally, the cell is constructed of berms with the exterior slope vegetated and the inside slope and crest surfaced with stabilized CCR material to control vegetation and act as an erosion protection layer.

Landfill Cell 2B is designed as a Class 2 non-hazardous landfill under criteria of the TCEQ.

Since Landfill Cell 2B is an active landfill, an annual inspection is required as documented in subsequent sections of this document.

5. CCR LANDFILL INSPECTION OBSERVATIONS & FINDINGS

On November 7, 2018, Mr. Jason Leik, PE (Texas) along with Bob Been of NRG, visually inspected the CCR landfill cells (CCR units) at the W.A. Parish Generating Station. This visual inspection was performed to evaluate if the design, construction, operation, and maintenance of each applicable CCR unit is consistent with recognized and generally accepted good engineering standards.

5.1. LANDFILL CELL 3

The location and general arrangement of Landfill Cell 3 is depicted on Figure 1 and also Photographs P-1 and P-2.

Landfill Cell 3 consists of an active marketable bottom ash storage area and an incised storm water detention pond (approximately five acres), located within the perimeter berm in the western portion of the landfill cell.

At the time of the inspection, the water level in the storm water pond was lower than the ground surface outside the western and southern berms of the pond. Thus, lateral pressure from the retained water on the landfill berms was minimal.

In general, the exterior slopes of the berms are well vegetated and demonstrate good alignment and slope grade. In general, the interior slopes of the berms and the berm crest are surfaced with stabilized CCR material that resists erosion.

The crest of the berms around Cell 3 are free of rutting and misalignment.

Landfill Cell 3 was found to be in good condition as observed without indications of risk of catastrophic or operational failure. The repairs made since the prior annual inspection have improved the condition of the landfill containment dikes and berms, which are considered to be in excellent condition.

5.2. LANDFILL CELL 2A

The location and general arrangement of Landfill Cell 2A are depicted on Figure 1 and also Photographs P-3 and P-4.

At the time of the inspection, Landfill Cell 2A was not used to store or dispose of significant quantities of CCR material. Moreover, mixing ash products for stabilization was not in progress during the inspection. Since the cell did not contain significant CCR materials and since it appears the CCR contained within Cell

2A is stable and rigid as shown in Photograph P-4, the lateral loads on the perimeter berms are considered to be minimal.

In general, the exterior slopes of the berms are well vegetated and demonstrate good alignment and slope grade. Portions of the interior slopes were well vegetated and other areas of the interior slopes of the berms and the berm crest are surfaced with stabilized CCR material that resists erosion.

Landfill Cell 2A was found to be in excellent condition as observed, without indications of risk of catastrophic or operational failure.

5.3. LANDFILL CELL 1C

The location and general arrangement of Landfill Cell 1C are depicted on Figure 1 and also Photographs P-5 and P-6.

At the time of the inspection, Landfill Cell 1C was used to store or dispose nonmarketable CCR material. Given the volume of CCR material stored in the cell, the only area where inside berms were observable was in the vicinity of the incised storm water pond in the southwest portion of the cell.

The interior slopes of Cell 1C typically exhibited good alignment, grades and vegetation or erosion resistant stabilized CCR material. No adverse conditions were identified for the inside slopes of the perimeter berms.

The exterior slopes typically exhibited good alignment and grades. No significant adverse conditions were identified for the outside slopes of the perimeter berm.

The crest of the berms around Cell 1C are generally free of rutting and misalignment as shown in Photos P-5 and P-6. Photograph P-6 shows that the berm along the southeast portion of the cell was recently improved.

Landfill Cell 1C was found to be in good condition as observed, without indications of risk of catastrophic or operational failure and is considered to be in excellent condition.

5.4. LANDFILL CELL 2B

The location and general arrangement of Landfill Cell 2B are depicted on Figure 1 and also Photograph P-7 and P-8.

An incised storm water pond is located in the southern portion of the cell.

The outside slopes of the perimeter berms typically exhibited good alignment, grades and vegetation. There were no observed indications of instability of the outside slopes of the perimeter berms and dikes.

The crest of the berms and dikes around Cell 2B are generally free of rutting and misalignment as shown on Photograph P-7. The berm crest and roadway surface are well maintained and considered to be in good to excellent condition.

The inside slopes of the perimeter dikes and berms around Cell 2B as well as the berm crest are surfaced with stabilized CCR material to prevent erosion. In general, these slopes were well graded and uniform in slope.

Landfill Cell 2B was found to be in excellent condition as observed, without indications of risk of imminent catastrophic or operational failure.

6. REVIEW OF WEEKLY INSPECTIONS

The weekly inspections by a qualified person (by NRG) have been performed and TRC has reviewed the reports. The inspections appear to be thorough and appropriately executed. Maintenance items were identified, resolved and documented in subsequent inspections.

7. REVIEW OF CCR INVENTORY

As required by the Federal CCR Rule, the approximate volume of stored CCR in the landfill, as provided by NRG, is:

- Cell 1C: Approximately 353,000 cubic yards
- Cell 2A: Approximately 0 cubic yards
- Cell 2B: Approximately 469,100 cubic yards
- Cell 3: Approximately 416,700 cubic yards

8. MAINTENANCE RECOMMENDATIONS

At the time of this inspection, there are no repairs needed that pose immediate operational or safety concerns for the CCR units inspected. Based on the observations made by TRC on November 7, 2018, TRC recommends that the current maintenance practices such as control of vegetation and feral hogs, and repair of minor erosion areas before they become significant, be continued.

9. CRITERIA

This inspection been performed in accordance with the inspection requirements of the Federal CCR Rule (Reference 1) and generally accepted engineering practice. The TCEQ Guidelines for Operation and Maintenance of Dams in Texas (Reference 2) is considered to represent generally accepted practices and is considered to be an applicable criterion.

10. LIMITATIONS

Given the visual nature of this inspection, it must be recognized that latent conditions may be present that are not visually evident.

Given the work in progress nature of active pond and landfiling operations, this document only considers the conditions present at the time of the field inspection and information provided by NRG.

11. REFERENCES

1) 40 CFR Part 257, Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Final Rule, April 17, 2015.

2) Texas Commission on Environmental Quality, Guidelines for Operation and Maintenance of Dams in Texas, November 2006.

12. CONCLUSIONS

This annual inspection considered the following CCR Units:

- Landfill Cell 3,
- Landfill Cell 2A,
- Landfill Cell 1C, and
- Landfill Cell 2B.

TRC did not identify any evidence of ongoing or imminent failure of the landfill cells. No structural deficiencies were noted during the 2018 inspection.

Based on the review of available documents and the visual inspection, it is TRC's opinion that Landfill Cell 3, Landfill Cell 2A, Landfill Cell 1C and Landfill Cell 2B have been designed, constructed, are currently operated, and are maintained in a manner that is consistent with recognized and generally accepted good engineering standards.

Based on the good to excellent condition in which the landfill facilities were found, it is evident that the ongoing inspection and maintenance activities at the W.A. Parish Generating Station are effective.

As discussed in Section 8, the ongoing maintenance efforts to promote grass vegetation and mitigate damage from feral hogs should continue. No other maintenance items were identified in this annual inspection.

FIGURES

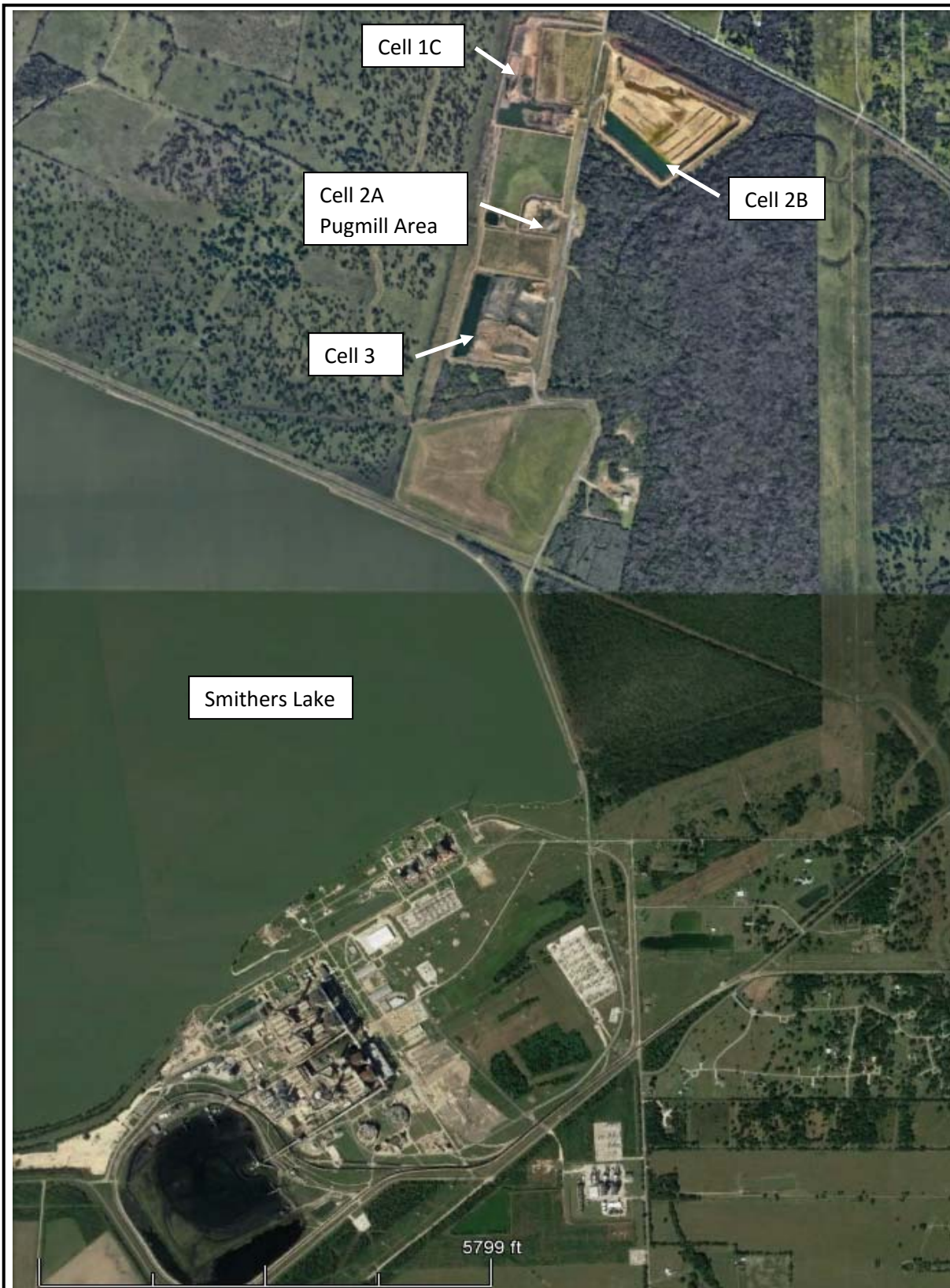


Figure 1
Location of CCR Landfill Cells
W.A. Parish Station



700 Highlander Blvd
Suite 210
Arlington, Texas 76015

Note: Aerial Image obtained using Google Earth Pro 7.3.2

PHOTOGRAPHS

Photographic Log – 2018 WA Parish Annual Inspection



Photograph P-1 Taken September 11, 2018 by Jason Leik, P.E. (During Location Restriction Inspection)
Landfill Cell 3 – Looking north along west crest and inside slope of west berm of landfill.



Photograph P-2 Taken September 11, 2018 by Jason Leik, P.E. (During Location Restriction Inspection)
Landfill Cell 3 – Looking east along southern berm of landfill Cell 3.

Photographic Log – 2018 WA Parish Annual Inspection



Photograph P-3 Taken November 7, 2018 by Jason Leik, P.E.
Landfill Cell 2a Pugmill – Looking north along west crest and inside slope of west berm of landfill. Pugmill loading conveyor visible on right



Photograph P-4 Taken November 7, 2018 by Jason Leik, P.E.
Landfill Cell 2a Pugmill – Looking northeast into center of landfill Cell 2a Pugmill.

Photographic Log – 2018 WA Parish Annual Inspection



Photograph P-5 Taken September 11, 2018 by Jason Leik, P.E. (During Location Restriction Inspection)
Landfill Cell 1C – Looking east along crest and inside slope of south berm of landfill.



Photograph P-6 Taken November 7, 2018 by Jason Leik, P.E.
Landfill Cell 1C – Looking south at inside slope of newly improved eastern berm.

Photographic Log – 2018 WA Parish Annual Inspection



Photograph P-7 Taken November 7, 2018 by Jason Leik, P.E.
Landfill Cell 2B – Looking west along crest of north berm. CCR material placed on left.



Photograph P-8 Taken November 7, 2018 by Jason Leik, P.E.
Landfill Cell 2B – Looking south into interior of Cell 2B from top of north berm. West and south berms visible.