2021 Annual Inspection Report

for Compliance with the Coal Combustion Residuals Rule (40 CFR Part 257)

Comanche Station

2005 Lime Road
Pueblo, Colorado 81006

January 15, 2022

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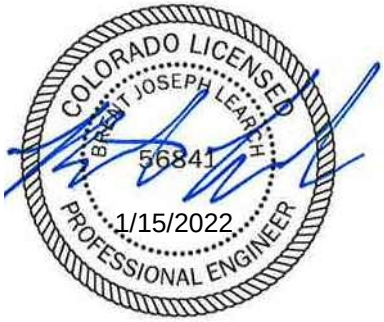
Appendices

Certification

Comanche Station CCR Unit 2021 Annual Inspection for Compliance with the Federal Coal Combustion Residuals Rule

I hereby certify that the Coal Combustion Residuals (CCR) unit (i.e. the landfill) at Comanche Station meets the inspection and operation standards specified in 40 CFR Part 257.84(b) of the Federal CCR Rule. The Comanche Station is owned by the Public Service Company of Colorado (PSCo), an Xcel Energy Company.

I am duly licensed Professional Engineer under the laws of the State of Colorado.



Brent Learch, PE

Colorado PE License 0056841

License renewal date October 31, 2023

1 Introduction

On April 17, 2015 the U.S. Environmental Protection Agency (EPA) published regulations under Subtitle D of the Resources Conservation and Control Act (RCRA) meant to control the safe disposal of coal combustion residuals (CCR) generated by coal fired electric utilities. The rule defines a set of requirements for the disposal and handling of CCR within CCR units (defined as either landfills or surface impoundments). As specified in 40 CFR 257.84(b), *"Existing and new CCR landfills and any lateral expansion of a CCR landfill must be inspected on a periodic basis by a qualified professional engineer to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards."* Comanche Station has one (1) CCR landfill subject to the inspection requirement.

This is the 2021 annual inspection report for the existing Comanche CCR landfill. This report must be completed and placed into the facility operating record no later than January 15, 2022.

The requirements for the annual inspection include:

- A review of available information regarding the status and condition of the CCR unit - §257.84 (B)(1)(i),
- A visual inspection of the CCR unit to identify signs of distress or malfunction - §257.84 (B)(1)(ii),
- An inspection report that includes the following:
  - Changes in geometry since the last inspection - §257.84 (B)(2)(i)
  - Approximate volume of CCR in unit at time of inspection - §257.84 (B)(2)(ii)
  - Appearance of actual or potential structural weakness of the CCR unit - §257.84 (B)(2)(iii)
  - Any other changes which may have affected the stability or operation of the CCR unit since the last inspection - §257.84 (B)(2)(iv)

2 Site Inspection

In accordance with §257.84(b)(ii) a site inspection of the Comanche CCR landfill was conducted by an independent Professional Engineer on December 2, 2021. This inspection was performed in advance of the CCR submittal deadline to ensure that the inspection was completed prior to snow covering the ground. The inspection was conducted by Brent Learch, a Colorado Professional Engineer of HDR Engineering Inc. (HDR).

The weather during the site visit was cloudy with temperatures ranging from 70 to 75 degrees Fahrenheit. The site was free of snow cover.

3 Review of Available Information

Numerous documents pertaining to the site operation and structural integrity were reviewed including:

1. Engineering Design and Operation Plan (EDOP) (EDOP Revised: January 19, 2018, prepared by Tetra Tech). Xcel continues to operate following this document.

2. Weekly CCR Landfill Inspection Forms (per Section 257.84(a)). Review of the Weekly Inspection Forms did not contain any indications of operational, safety, or structural concerns regarding the CCR landfill.

3. Topographic Map based on multiple sources including June 2021 Cell 2E tie-in preconstruction survey, Cell 2E tie-in Issued for Construction Design Grades, and historic site surveys. The Cell 2E as-built survey is currently pending due to survey staffing shortages caused by COVID-19.

4 Visual Inspection

Brent Learch of HDR completed a site inspection by walking or driving the entire landfill toe of slope, walking areas of the landfill side slopes, driving the landfill top access road, and driving and walking the top of the active landfill cells. As the CCR Rule pertains only to the CCR landfill itself, this report does not address existing topsoil stockpiles and native earth excavations outside the landfill cell.

The site inspection included an evaluation of the following landfill features:

1. Access roads;

2. Active CCR fill area; and

3. Areas that have soil cover in place, and stormwater conveyance features.

The following are the findings of the site inspection:

- The Cell 1 landfill side slopes range from approximately 80 feet to 100 feet in vertical height from toe to plateau and are a constant grade of approximately 4H:1V without benching.
    - The lower portion of the west side slope of Cell 1 had little vegetative cover. The slopes have been tracked and grubbed due to Cell 2 East tie-in construction with the adjacent to the Cell 1 west slope. Phase 1 of the Cell 2 East tie-in was completed in the fall of 2021 with Phase 2 and 3 anticipated to be completed in subsequent years. Approximately 30 feet above the Cell 2 East tie-in construction area was disturbed due to construction activities. This area has been tracked and prepared for reseeding which is scheduled for the spring.

    - The north side slope of Cell 1 had a uniform grade with topsoil and dense vegetation with the exception of the newly constructed drainage downchute structure constructed with an HDPE Geomembrane, cover soil and turf reinforcement matting. Stabilized conditions were observed on the entire sideslope and no exposed ash was found.
    - The east side slope of Cell 1 had a uniform grade with topsoil and dense vegetation. Stabilized conditions were observed on the entire sideslope and no exposed ash was found.
    - The drainage downchute structure on the southeast corner of Cell 1 was inspected and generally appears to be functioning as designed. Construction of the drainage rundown structure to extend to the top of the landfill slope was completed in April 2020. Localized rill erosion at the top of the downchute was observed during the inspection and repair of the area is scheduled for Spring of 2022.
    - The south side slope of Cell 1 had a uniform grade with topsoil and dense vegetation with the exception of the newly constructed drainage downchute structure constructed with an HDPE Geomembrane, cover soil and turf reinforcement matting. Stabilized conditions were observed on the entire sideslope and no exposed ash was found.
    - CCR placement in Cell 2E continued in 2021 throughout the entire footprint of the cell. At the time of inspection, the top of CCR fill was observed to be approximately 30-feet above surrounding native grade. The top of Cell 2E is graded to drain to the east and all contact water is collected by the leachate collection stand pipes. There were no structural or operational concerns observed on the outside CCR sideslopes, and placement and compaction operations were consistent with the EDOP.
- The top of Cell 1 is graded to a flat plateau with intermediate cover placed on the top crown of the cell. Final cover in this area has not been placed due to anticipated additional CCR placement. The intermediate cover is EDOP compliant as long as wind erosion is not an issue. A fair stand of vegetation was observed on the crown of the landfill, water is reportedly used when necessary for dust control, and no wind erosion of the CCR was observed during the inspection.
- In general, landfill areas recently covered with soil, primarily the perimeter of Cell 2, and areas with little vegetation established, showed signs of minor rill erosion. This is expected due to the slope grades and lack of vegetation. Rill erosion in these areas posed no apparent operational or structural concerns. These landfill areas are anticipated to stabilize as vegetation is established.
- The storm water pond, immediately north of Cell 1, appears to be functioning as designed and receives only non-contact water from the landfill area. However, at the time of the inspection, the pond had no standing water due to the area's normal scarce precipitation. The pond showed no signs of stability, functional or operational issues.
- The access road to the top of the landfill showed no signs of operational or structural concern. The sides were vegetated and did not show signs of erosion.

- The perimeter access road at the toe of slope showed no signs of operational or structural concern.
- The leachate collection tank constructed for Cell 2E is reportedly functioning as designed.

5 Changes in Geometry

The Federal CCR Rules require that site geometry changes be identified since the last inspection. The site geometry changed since the prior inspection due to continued CCR disposal and soil cover placement. Normal CCR disposal operations have increase the height of the Cell 2E by approximately 20 feet to a top deck elevation of 4850 feet. The landfill sides slopes continue to be maintained at approximately a 4H:1V slope for Cell 2E. Cell 2E has an approximate depth of 35 feet.

6 Approximate CCR Volume

As reported by Xcel Energy, prior to 1987 the CCR for the Comanche Station was disposed of off-site. From 1987 to 2007, the CCR was predominately utilized off-site for beneficial use. Since 2007, the CCR has been disposed of within the on-site CCR landfill. From 2007 through December of 2021, Xcel estimates the total combined volume of CCR on-site to be 4,272,415 cubic yards (CY). In addition, fly ash and bottom ash disposed in the CCR landfill from December 2020 through November 2021 is estimated to be 226,263 CY.

7 Appearance of Structural Weakness

Based on the site inspection and review of available materials, the site showed no signs of operational and structural concern. Continued monitoring and minor repairs or surface vegetation should be completed to address rill and gully erosion as needed .

8 Changes Affecting Stability or Operation

There were no observed or reported operation changes that are anticipated to negatively impact the site’s near-term or long-term stability.

Appendix A – 2021 Annual Inspection Figure

N

0 200' 400'

APPROXIMATE LOCATION
OF NORTH DOWNCHUTE

APPROXIMATE LOCATION
OF SOUTH DOWNCHUTE

CELL 1

CELL 2E

VOLUME PLACED WITHIN CELL 2E DECEMBER 2020 - NOVEMBER 2021 - 226,263 CY

COMANCHE STATION
COAL ASH LANDFILL
2021 ANNUAL INSPECTION
JANUARY 2022

FIGURE DEVELOPED BY HDR