

# 2015 Initial Annual Inspection Report

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

## **Hayden Station**

*13125 U.S. Highway 40  
Hayden, Colorado 81638*

**January 18, 2016**



## Table of Contents

Certification .....	ii
1 Introduction .....	1
2 Site Inspection .....	1
3 Review of Available Information .....	2
4 Visual Inspection.....	2
5 Changes in Geometry.....	4
6 Approximate CCR Volume.....	4
7 Appearance of Structural Weakness .....	5
8 Changes Affecting Stability or Operation.....	5

## Appendices

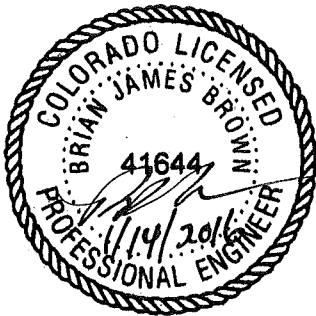
Appendix A: Landfill Site Map

# Certification

## Hayden Station CCR Unit 2015 Initial 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 Hayden Station meets the inspection and operation standards specified in 40 CFR Part 257.84(b) of the Federal CCR Rule. The Hayden 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.



Brian Brown, PE

Colorado PE License 0041644

License renewal date October 31, 2017

# 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). Hayden Station has one CCR unit: a landfill. 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.”* As this is a new requirement for CCR landfills, the initial inspection report for existing CCR landfills must be completed no later than January 19, 2016. Subsequent inspections and reports must be must filed on an annual basis.

The requirements of 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 Hayden CCR unit was conducted by an independent Professional Engineer on October 29<sup>th</sup> and October 30<sup>th</sup>, 2015. This site inspection was performed well in advance of the CCR submittal deadline to ensure that the inspection was completed prior to snow covering the ground given the high elevation of this facility. The October 29<sup>th</sup>, 2015 inspection was conducted by Brian Brown, a professional engineer with HDR; and Mark Stewart, an Xcel Energy Environmental Analyst. The October 30<sup>th</sup>, 2015 inspection was conducted solely by Brian Brown.

The weather during the site visit was partly cloudy with temperatures ranging from 40 to 60 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) (DRAFT EDOP dated November 2013, prepared by Walsh Environmental Scientists and Engineers, LLC.). This included an Existing Conditions Plan, a Site Development Plan, and a Final Closure Plan.
2. Solid Waste Facility Inspection Forms, completed by the Colorado Department of Public Health and Environment (CDPHE) from 2002 to 2010. No state inspections have occurred since 2010.
3. Available Weekly CCR Landfill Inspection Forms (per Section 257.84(a)).
4. As-Built topographic survey with field work dates of October 22<sup>nd</sup> – 23<sup>rd</sup>, 2014, performed by Fremont Engineering & Surveying.
5. As-Built topographic survey with field work dates of October 14<sup>th</sup> – 15<sup>th</sup>, 2015, performed by Four Points Surveying and Engineering, provided via email by PSCo on November 4<sup>th</sup>, 2015.
6. Records of annual ash tonnage delivered to the CCR landfill from the generation facility from January 2000 to August 2015. These records included an aggregate of per unit ash volume prior to the running totals beginning in January 2000.

Review of the above documents did not contain any indications of operation, safety, or structural concerns regarding the CCR landfill. Information gaps included two items; 1) the Draft EDOP from 2013 has not been finalized; and 2) that there are no CDPHE site inspections reports after 2010. According to Xcel Energy, the EDOP remains in draft status pending changes in regulations. The CDPHE has not conducted any site inspections since January 2010.

### 4 Visual Inspection

Brian Brown completed an extensive site inspection covering the entire landfill area. As the CCR rule pertains only to the CCR landfill itself, this report does not address existing topsoil stockpiles and native earth excavations that lie east of the landfill (located on native ground), nor does this report include an inspection of the off-landfill grading and stormwater management channels located east of the landfill.

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

1. landfill side slopes and toe of slope;
2. landfill side slope benches;

3. contact storm water pond;
4. upper storm water pond (northwest pond);
5. stormwater drainage conveyance channel (southern);
6. articulated concrete block lined stormwater conveyance channel (northwestern);
7. lower storm water pond (toe of landfill, northwest);
8. access roads;
9. active CCR fill areas (CCR disposal, spreading, and compaction); and
10. temporary soil covered CCR landfilled areas.

The following are the findings of the site inspection:

- The landfill side slopes have sloped grades, excepting the benches, of approximately 4 horizontal to 1 vertical (4H:1V); well established vegetation; and show no signs of erosion or operational or functional concerns.
- Graded landfill benches are well defined for the entire cap construction. Benches are approximately 10 feet in width. In areas of more recent filling, benches were developed with a back slope to create a swale that directs stormwater runoff to a downchute channel. In older portions of the landfill, benches simply create a flat area to slow stormwater flow. The older portions of the benches have limited areas of minor rill erosion but also had substantial vegetation cover. The benches showed no signs of operational or functional concern.
- In general, areas that had a topsoil layer were stabilized with a dense stand of vegetation and were functioning as intended. The sole exception was an area approximately 40 vertical feet up the western landfill face on the southern edge of the upper stormwater pond where a small area of rill to gully erosion was evident. Based on Site Development Plans, this area will be filled as the landfill operation continues and the isolated erosion is not of immediate structural concern. PSCo should continue monitoring this area during their weekly inspections.
- In general, areas more recently constructed where a topsoil layer has not yet been installed and vegetation not yet established were showing signs of 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. Once the topsoil layer is placed, seeded, and a dense stand of vegetation established, the bank faces are anticipated to be stabilized.
- All three site ponds appear to be functioning as intended with no operational or structural concerns. The contact storm water pond at the current landfill working elevation had steep side slope banks and showed gully erosion at one of the conveyance channels to the pond. This small, shallow pond is an interior pond and the gully erosion is not anticipated to have an impact on the larger site stability. There are some site safety

concerns due to the steep gully side slopes as they relate to worker access and equipment operation. This potential safety concern should be addressed as part of a safety plan or as part of a near-term regrading effort. The other ponds do not pose structural or safety concerns.

- The southern stormwater conveyance channel has moderate to severe gully erosion and should be repaired and stabilized. At the time of inspection, this gully erosion was only impacting areas off the landfill, down-gradient of the landfill footprint and therefore was not an immediate concern. If this erosion continues unchecked, there is a potential it could have a future impact the landfill operation and structural integrity. It is recommended that PSCo address this condition in the near-term to stabilize the conveyance channel.
- The western conveyance channel between the upper pond and the lower northwestern storm water pond is surface hardened with articulated concrete block armor. Vegetation is growing between many of the blocks, per design. This channel showed no apparent signs of operational or structural concern and appeared to be functioning as intended.
- The access roads to the top of the landfill showed no signs of operational or structural concern. The sides were vegetated and had minimal rill erosion. The plateau road showed no signs of operational or structural concern. The east side of the most eastern access road was experiencing rill and minor gulley erosion. This erosion drained into the landfill fill area and had no larger operational or structural concerns for the landfill.
- The site inspection included monitoring of CCR disposal, spreading and compacting in an active portion of the landfill. The CCR was placed in lifts of less than 12 inches and compacted using a sheeps foot compactor. Wind blown CCR was not observed during placement and compacting operations. The lift side slopes were graded to 3H:1V and the observed operation was carried out in a generally safe manner.
- The capped CCR landfill areas, excluding areas immediately adjacent the contact storm water pond, appeared to have adequate soil cover, had established vegetation, and showed no signs of operational or structural concern.

## 5 Changes in Geometry

The Federal CCR Rules require that site geometry changes be identified since the last inspection. Since this is the initial annual inspection, the geometry changes will be addressed in subsequent annual inspections. The site geometry was noted during this initial annual inspection and will be used as a basis for subsequent inspections.

## 6 Approximate CCR Volume

The reported estimated CCR volume is based on the tonnage of CCR delivered to the landfill from the power plant. The CCR volume was estimated based on the power plant operation and electric load type from 1984 to December 1999. From January 2000 up to the present, PSCo has recorded monthly CCR volumes. The total combined volume of CCR deposited within the landfill is estimated to be 3,879,644 cubic yards through August of 2015.

## 7 Appearance of Structural Weakness

Based on the site inspection, no apparent or potential structural weaknesses were observed. Per Section 4 above, continued monitoring and minor repairs should be completed to address rill and gully erosion before it becomes a potential structural landfill weakness. Much of the site's exterior rill erosion will be addressed as the recent lifts are covered in topsoil, seeded, and vegetation is established.

## 8 Changes Affecting Stability or Operation

The Federal CCR Rule requires that changes that affect site stability or operation be identified since the last inspection. Since this is the initial annual inspection, no comparison can be made to previous conditions. Reported, observed, or suspected changes that have impacts on site stability or operations will be addressed in subsequent annual inspections.



## Appendix A – Landfill Site Map



