2015 Initial Annual Inspection Report

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

Pawnee Station

14940 Morgan County Road 24
Brush, Colorado 80723

January 18, 2016

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Appendices

Certification

Pawnee 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 Pawnee Station meets the inspection and operation standards specified in 40 CFR Part 257.84(b) of the Federal CCR Rule. The Pawnee 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). Pawnee 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 Pawnee CCR unit (i.e. landfill) was conducted by a Professional Engineer on November 19th, 2015. This site 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 Brian Brown, a professional engineer with HDR; and Richard Ferguson, an Xcel Energy Environmental Analyst. The landfill base was originally constructed as an incised CCR unit below existing grade. Final design build out will be above grade except on the south edge where build out is to meet the existing grade. As landfill disposal activities have continued, areas of the fill have extended above the existing grade. The inspection covered both the north half (the current active CCR disposal area) and the south half (the current active lime slurry disposal area). Although the current active CCR disposal area is in the north half, the entire landfill is the CCR unit, and ash has been disposed in the south half.

The weather during the site visit was sunny 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) (EDOP dated February, 2011, Rev. 2.0).

2. Xcel Energy Memo by Jennifer McCarter dated August 27, 2014 pertaining to the results of an informal site inspection with Colorado Department of Public Health and Environment (CDPHE) staff on August 21, 2014.

3. Available Weekly CCR Landfill Inspection Forms (per Section 257.84(a)).

4. As-Built topographic survey with photogrammetry date of December 12th, 2014, and an Issue Date of January 29, 2015, by Edward-James Surveying, Inc. This survey covered the entire landfill footprint and the potential landfill expansion area to the west.

5. As-Built topographic survey with photogrammetry date of August 13th, 2015, and an Issue Date of September 9, 2015, by Edward-James Surveying, Inc. This survey covered the future stormwater detention area immediately east of the northeast corner of the landfill.

Review of the above documents did not contain any indications of operation, safety, or structural concerns regarding the CCR landfill. In fact, the August 27, 2014 memo pertaining to the results of the informal site inspection with CDPHE staff indicated “No issues or findings.” The CDPHE has not conducted formal site inspections and therefore inspection reports do not exist.

4 Visual Inspection

Brian Brown, escorted by Richard Ferguson, an Xcel Environmental Analyst, completed a site inspection, walking the perimeter of the landfill and observing all landfill slopes. As the CCR Rule pertains only to the CCR landfill itself, this report does not address existing topsoil stockpiles outside of the landfill area and native earth excavations to the south of the landfill.

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

1. Interior landfill and exterior landfill perimeter road side slopes;

2. contact water pond;

3. bottom ash slope surface treatment in the southwest corner of interior landfill side slopes.

4. access roads;

5. active CCR fill areas north of the contact water pond (CCR disposal, spreading, and compaction);

6. temporary soil covered CCR landfill areas, and;

7. active lime slurry fill area south of the contact water pond.

The following are the findings of the site inspection:

- There is a perimeter landfill access road that is incised into the native soil side slopes or is a ridge road on a constructed embankment, depending on location. The ridge road embankment sections are on the east and west side of the landfill and are in the northern half of the landfill area. The western ridge road embankment showed limited signs of rill erosion in two areas. These areas can be temporarily repaired with localized grading and vegetation. However, a long term fix such as routing the perimeter road drainage to the interior of the landfill, or controlling the flow in another manner, should be considered. The areas of rill erosion showed no signs of operational or functional concern.
    - Northwest corner of the site – observed minor rill erosion that will need to be addressed if it deepens or becomes more widespread.
    - West side slopes – the contractor has regraded an area roughly 40 feet south of the northwest corner. No topsoil or vegetation was placed over the regraded area and rill erosion is expected to reoccur soon unless further preventative or stormwater control measures are performed.
- The eastern ridge road embankment showed rill erosion and limited areas of gulley erosion. As a corrective action, the top access road was regraded to eliminate the source of stormwater flow causing the erosion. This action appears to have eliminated to stormwater erosive source and stabilized the outside embankment. There is no immediate structural concern but the area should be monitored until the area is regraded and revegetated.
- The interior side slope on the north half of the landfill (the current active CCR disposal area) has some signs of rill erosion. This is likely due to the relatively steep side slope. The amount of rill erosion is most prevalent on the west side where the embankment vertical height is the greatest. As this is an interior slope, the continued filling of this area will eliminate the slope itself. The rate, depth, and spread of the rill erosion should be monitored and site grading, surface hardening or other erosion control measures undertaken, as necessary. The areas of rill erosion throughout the northern CCR landfill showed no signs of operational or functional concern.
- The interior side slopes on the southern half of the landfill (the current active lime slurry disposal area) showed signs of minor to deep rill erosion. Erosion was particularly deep in steeper slope areas and areas with larger up-gradient stormwater drainage areas. As this is an interior slope, the continued filling of this area will eliminate the slope itself. The

rate, depth, and spread of the rill erosion should be monitored and further site grading, surface hardening, or other erosion control measures undertaken, as necessary. The areas of rill erosion showed no signs of operational or functional concern. Interior erosion areas of particular note are listed below:

  - The west side slopes showed varying depths of rill erosion with limited areas of gulley erosion. These areas have been redressed in the past but the issues have returned. PSCo is considering the use of bottom ash surface treatment to repair the worst areas of erosion. This approach should help minimize future erosion and stabilize the embankment face.
  - Severe gully erosion in the southwest interior side slope was repaired with hardened bottom ash, creating a riprap-like surface. This area showed no signs of erosion or slope stability concerns.
  - The south side slope had two areas of previous severe rill or gulley erosion that, according to PSCo, were repeatedly repaired. These areas were regraded to cover the erosion but the stormwater drainage patterns have not changed and renewed erosion is expected. Without creating an armored downchute for stormwater conveyance, or other measures, this area will require continued periodic maintenance.
  - The east interior side slopes showed limited areas of erosion on the sloped embankment. Maintenance to address these areas is ongoing or no maintenance activities are occurring, depending on the severity of the erosion.

- The perimeter access road showed no signs of operational or structural concern.
- The site inspection included observation of CCR unloading, but not spreading or compacting. Wind blown CCR was not observed during dumping operations.
- The capped CCR landfill areas, excluding areas immediately adjacent the contact water pond, appeared to have adequate soil cover and showed no signs of operational and 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

Xcel Energy reviewed known and extrapolated ash generation rates, reviewed known beneficial ash usage between 1996 and 2014, and calculated landfill volumes based on the EDO Plan dated February 2011, Rev. 2.0. After analyzing the calculated volumes, Xcel estimates that the total combined volume of CCR on-site at the time of this inspection to be 1.2 million cubic yards.

7 Appearance of Structural Weakness

Based on the site inspection, no apparent or potential structural weaknesses were observed. Per Section 4 above and in areas that are retaining CCR, continued monitoring and minor repairs should be completed to address rill and gully erosion before it becomes a potential structural landfill weakness. The site's observed interior rill erosion areas will be covered over time with continued CCR and lime slurry disposal. Depending on severity, proximity to CCR fill elevation, and continued stormwater source water, the erosion impacted areas along the exterior of the ridge road embankment may require mitigation measures.

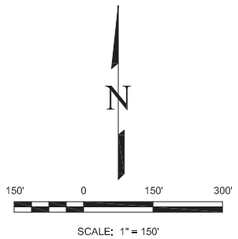
8 Changes Affecting Stability or Operation

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. Observations made in this initial annual inspection will be used as a basis for comparison to conditions observed in subsequent inspections.

Appendix A – Landfill Site Map

PAWNEE ASH LANDFILL

TOPOGRAPHIC SURVEY



SCALE: 1" = 150'

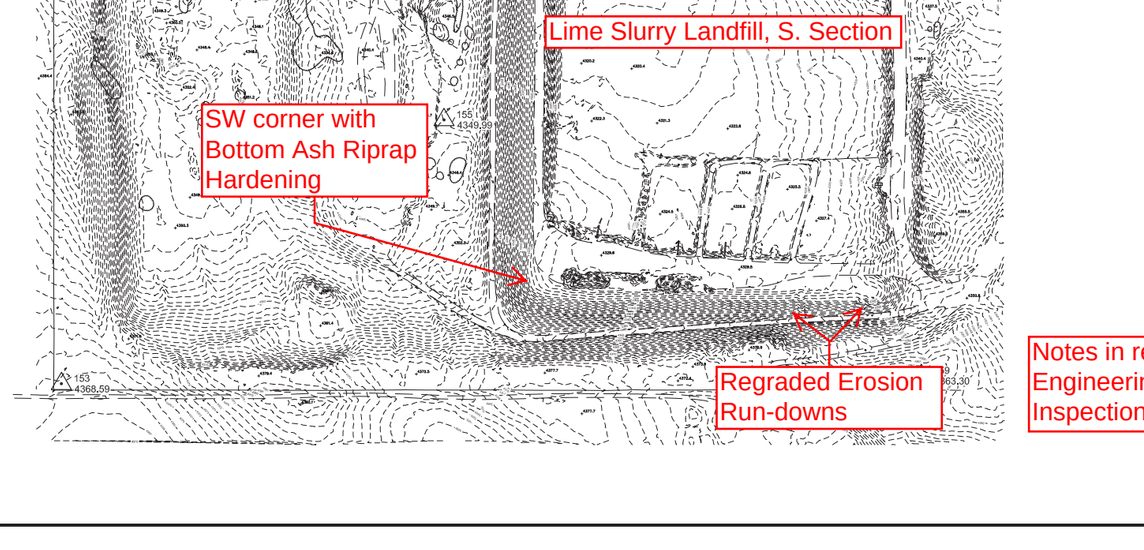
GENERAL NOTES:

1. COORDINATE DATUM: PROJECT COORDINATES ARE MODIFIED COLORADO STATE PLANE NORTH 0501 ZONE NAD83 (2011) US SURVEY FEET (GROUND) COORDINATES. THE COMBINED ELEVATION/SCALE FACTOR USED TO MODIFY THE COORDINATES FROM STATE PLANE TO PROJECT COORDINATES IS 1.0002432762 APPLIED AT A 0,0 ORIGIN.

2. PROJECT BENCHMARK: PUBLIC SERVICE COMPANY OF COLORADO POINT #491. FOUND 3-1/4" BRASS CAP IN CONCRETE STAMPED "PUBLIC SERVICE COMPANY OF COLORADO NO #491 EL = 4401.32".

3. LAST FIELD INSPECTION OF THIS SITE WAS ON DECEMBER 11, 2014.

POINT	LATITUDE (N)	LONGITUDE (W)	
TOWER ET	N40°12'54.29009"	W103°41'47.40980"	
POINT	**STATE PLANE NORTHING**	**STATE PLANE EASTING**	
TOWER ET	1326317.72	3503628.02	
POINT	**PROJECT NORTHING**	**PROJECT EASTING**	**ELEVATION**
TOWER ET	1326640.38	3504480.37	
150	1325863.29	3506587.71	4373.01
151	1325469.79	3506574.00	4365.39
152	1324408.35	3506568.01	4373.96
153	1323332.54	3506573.65	4368.59
154	1325016.76	3507404.06	4347.50
155	1323902.24	3507399.98	4349.99
156	1325765.20	3508720.91	4323.87
157	1325379.12	3508452.91	4321.91
158	1324457.53	3508469.66	4340.59
159	1323349.65	3508430.68	4363.30



Inspected site grades in the CCR landfill bottom area are higher than shown due to continued activity between the survey date and inspection date. The general site layout remains the same.

Notes in red added by HDR Engineering for CCR Annual Inspection Report, January 2016

LEGEND

- SIGN
- FENCE
- MISC
- TREE
- RIP-RAP
- SPOT ELEVATION
- CONTROL POINT

DATE OF PHOTOGRAPHY:
12-11-2014

MAP AND AUTOCAD FILE MADE IN AMERICA
BY LANDMARK MAPPING, LTD.
7500 WEST MISSISSIPPI AVE., SUITE 860 , LAKEWOOD, COLORADO 80226
PHONE: (303) 922-2417 FAX: (303) 922-2866
LANDMARK MAPPING PROJECT NUMBER: LM1413

NO.	REVISIONS DESCRIPTION	DATE

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PAWNEE ASH LAND FILL
TOPOGRAPHIC SURVEY

AERIAL TOPOGRAPHIC SURVEY
DATE OF PHOTOGRAPHY: DECEMBER 12, 2014

DRAWN BY	JWT
CHECKED BY	ERF
H-SCALE	1"=150'
JOB NO.	1357-01
DATE CREATED	1-08-15
DATE ISSUED	1-29-15
SHEET NO	1 OF 6