2017 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, 2018

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Appendices

Certification

Pawnee Station - CCR Unit 2017 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, 2019

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."* Pawnee Station has one CCR landfill subject to the inspection requirements.

This is the third annual inspection report for the existing Pawnee CCR landfill. This report must be completed and placed into the facility operating record no later than January 18, 2018.

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 on November 6, 2017. 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 Colorado Professional Engineer of HDR Engineering Inc. and Richard Ferguson, an Xcel Energy Environmental Analyst at the Pawnee Station. Review of the associated paper work and inspection reports was conducted by Brian Brown and Richard Ferguson.

The landfill base was originally constructed as an incised CCR unit below existing grade. Final design build out will be above grade. Through historical site operational review, PSCo has determined that only the northern portion of the overall landfill footprint, including the contact water pond, is defined as the CCR landfill, and is subject to the CCR Rule. The area historically

used for lime disposal located to the south of the CCR landfill is not part of the CCR Annual Inspection.

The weather during the site visit was sunny with temperatures ranging from 60 to 70 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) was updated with a Revision 3.0 dated September, 2017 developed by HDR Engineering. This revision primarily increased the maximum design height, steepened the side slopes, and modified the final design cover to a geomembrane cap with integrated artificial turf.

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

3. As-Built topographic survey with an issue date of July 20, 2017, by Edward-James Surveying, Inc. As this topographic survey only covered the northern portion of the site within the perimeter road and does not include the contact water pond, the prior year's survey with aerial background is included in this report.

Review of the above documents did not contain any indications of operation, safety, or structural concerns regarding the CCR landfill.

4 Visual Inspection

Brian Brown, escorted by Richard Ferguson, completed a site inspection, driving and 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 or earthwork outside of the landfill area.

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

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

2. Contact water pond;

3. Access roads;

4. Active CCR fill area (CCR disposal, spreading, compaction), and;

5. Temporarily soil covered CCR landfill areas.

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. The western ridge road embankment showed no substantial signs of rill erosion as the two areas in the northwest side of the landfill identified in the prior year's inspection had apparently been regraded to address rill erosion. Vegetation was not established in these areas and signs of seeding or mulching were not apparent. Rill erosion is likely to reoccur in these areas and PSCo should consider a long term fix such as routing the perimeter road drainage to the interior of the landfill, or controlling the flow in another manner. The areas of rill erosion showed no signs of operational or functional concern.
- 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 mitigated stormwater flow and stopped active erosion. The area of previously identified erosion was difficult to locate due to vegetation growth and the area presents no apparent structural concern. The area should be monitored.
- The interior side slope of the CCR landfill 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 primarily above the contact water pond 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 in the CCR landfill showed no signs of operational or functional concern.
- The perimeter access road showed no signs of operational or structural concern.
- The site inspection included observation of CCR unloading and spreading. Compaction was not observed as PSCo is reportedly able to achieve adequate material density by the truck and equipment traffic as part of normal operation. Wind blown CCR was not observed during dumping operations.
- The capped CCR landfill areas 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. The CCR landfill footprint has not changed since the last inspection except the fill elevation and soil cover is higher due to the continued disposal of CCR at the site.

6 Approximate CCR Volume

PSCo reviewed known and extrapolated ash generation rates, reviewed known beneficial ash usage between 1996 and 2014, and calculated landfill volumes based on a prior EDOP dated February 2011, Rev. 2.0. After analyzing the calculated volumes, PSCo estimates that the total combined volume of CCR on-site as of September 2016 to be 1,366,840 cubic yards. The additional CCR deposited from October 2016 to October 2017 is estimated to be 230,785 CY, assuming one cubic yard of CCR material equates to one ton. The total CCR volume in the landfill as of October 2017 is estimated to be 1,597,630 CY.

7 Appearance of Structural Weakness

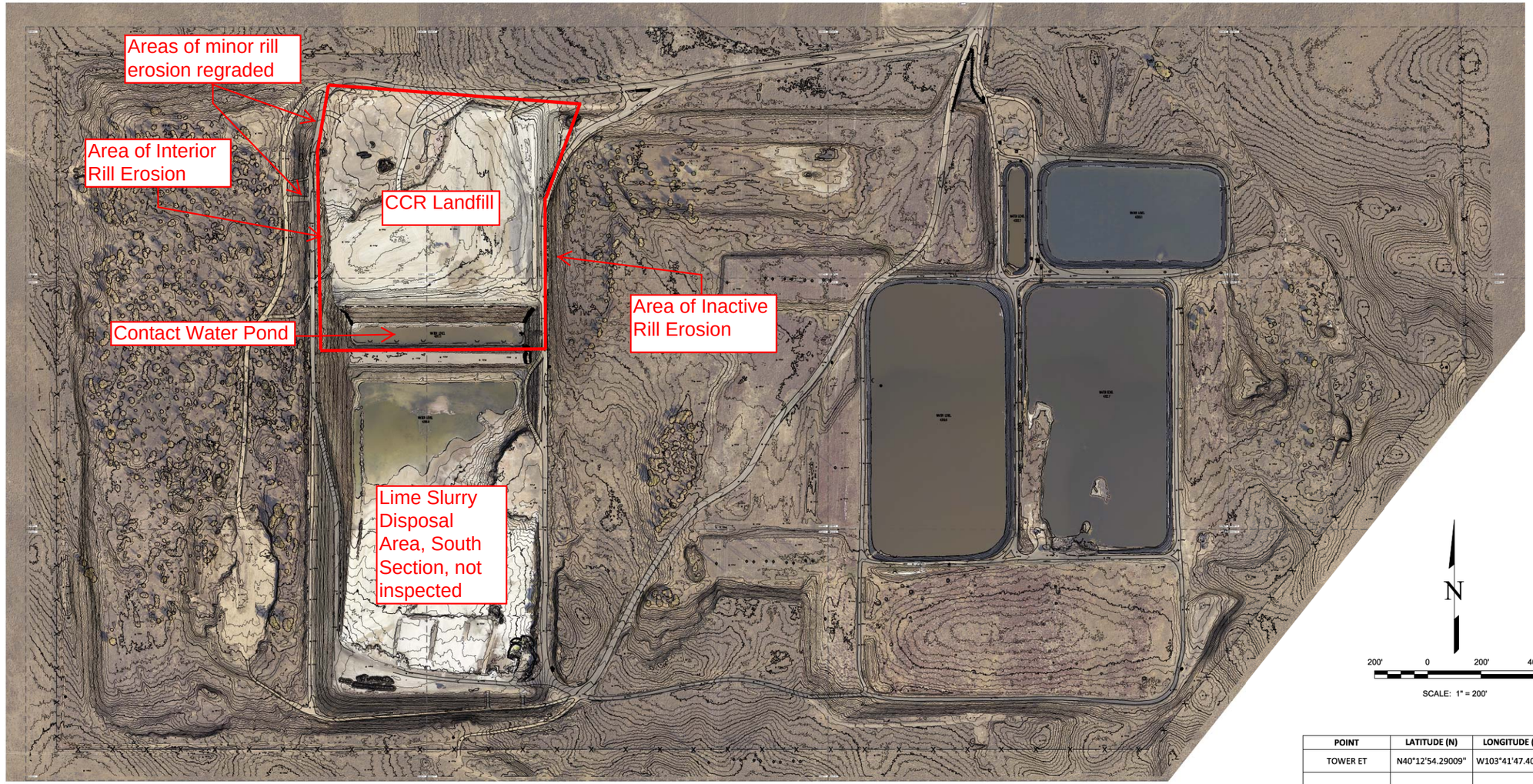
Based on the site inspection, no apparent or potential structural weaknesses were observed. Per Section 4 above and in areas that are retaining CCR, continued monitoring and minor repairs should be completed to address rill and gully erosion as it occurs with the potential to impact the landfill structural embankment. The site's observed interior rill erosion areas will be covered over time with continued on-site 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

There were no observed or reported operation changes that are anticipated to impact the site's near-term or long-term stability. Areas of severe rill, or gully erosion that had the potential to lead to long term stability concerns were remedied but may be reoccurring without additional erosion prevention measures. There were no new stability concerns observed or reported at the time of inspection.

Appendix A – Landfill Site Map

PAWNEE STATION
TOPOGRAPHIC SURVEY



Notes in red added by HDR Engineering for CCR Annual Inspection Report, January 2018. See 7/2017 survey for updated survey surface within landfill cell.

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 OCTOBER 17, 2016.
4. MAPPING PERFORMED BY WILLIAMS AERIAL & MAPPING BY LIDAR METHOD ON OCTOBER 10, 2016.

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	
101	1326136.65	3510046.07	4312.00
102	1324039.25	3510644.93	4328.65
103	1325557.72	3510150.32	4327.88
104	1323318.68	3510642.06	4340.88
105	1325863.29	3506587.71	4373.01
106	1325377.11	3507513.61	4360.05
153	1323332.54	3506573.65	4368.59
154	1325016.76	3507404.06	4347.50
158	1324457.53	3508469.66	4340.59
202	1325792.57	3508439.30	4330.22
204	1323390.10	3509472.48	4350.09
205	1323382.34	3510024.61	4342.63

NO.	REVISIONS DESCRIPTION	DATE

EDWARD-JAMES SURVEYING, INC.
1005 Elkton Drive
Colorado Springs, CO 80907
Office: (719) 576-1216
Fax: (719) 576-1206
4732 Eagleridge Circle
Pueblo, CO 81008
Office: (719) 545-6240
Fax: (719) 545-6247

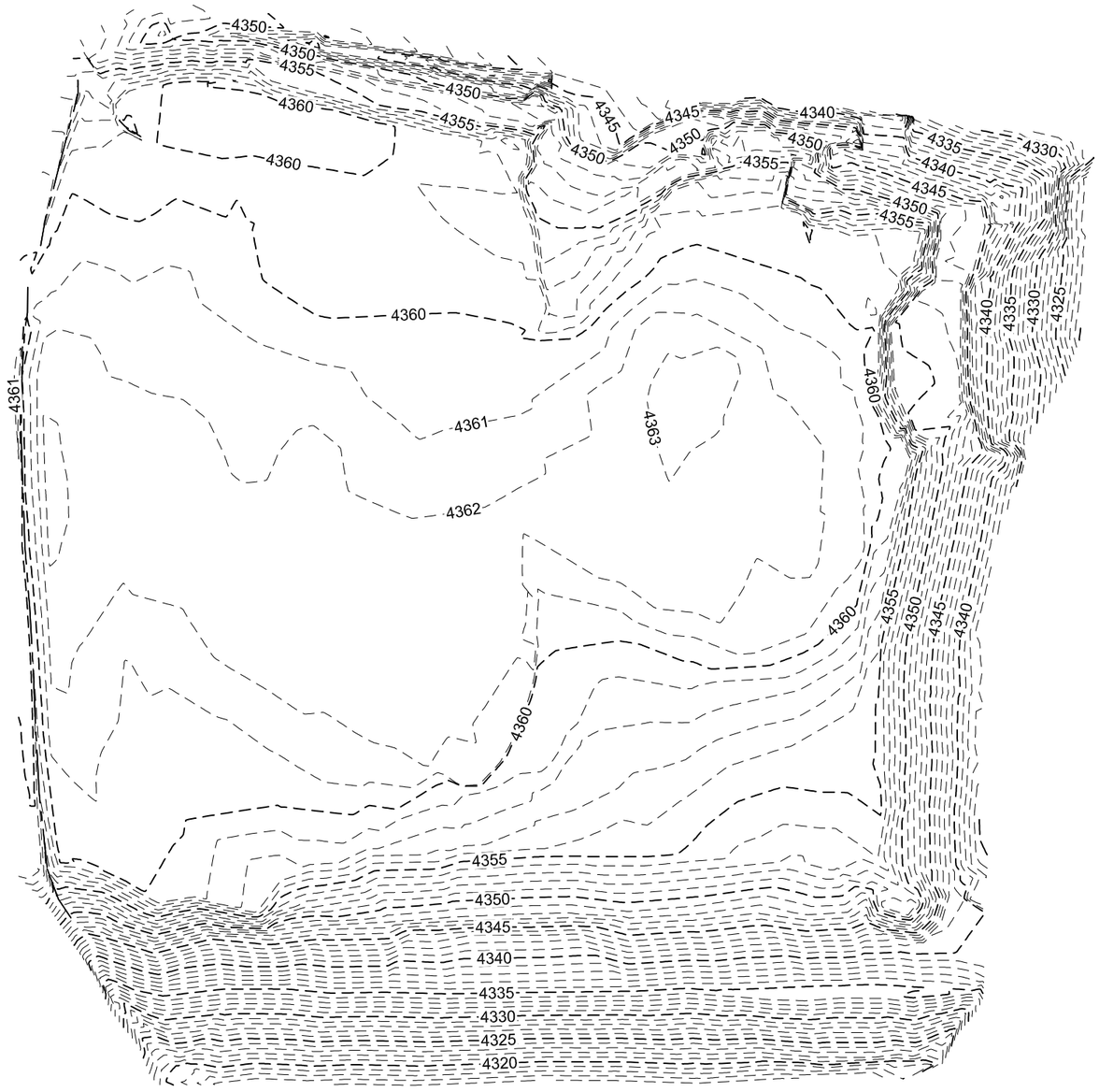
PAWNEE STATION
TOPOGRAPHIC SURVEY

AERIAL TOPOGRAPHIC SURVEY
DATE OF PHOTOGRAPHY: OCTOBER 10, 2016

DRAWN BY	JwT
CHECKED BY	ERF
H-SCALE	1"=200'
JOB NO.	1357-02
DATE CREATED	11-02-16
DATE ISSUED	11-08-16
SHEET NO	1 OF 13

PAWNEE STATION

ASH LANDFILL - TOPOGRAPHIC SURVEY



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POINT	**STATE PLANE NORTHING**	**STATE PLANE EASTING**	
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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
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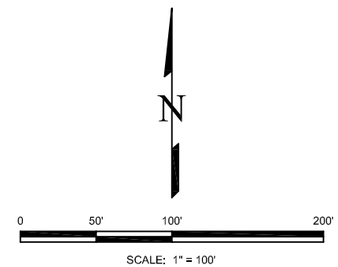

Survey, by others, provided to support topographic survey changes for CCR annual Inspection Report, January 2018 developed by HDR.

NO.	REVISIONS DESCRIPTION	DATE

EDWARD-JAMES SURVEYING, INC.
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Colorado Springs, CO 80907
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PAWNEE STATION
ASH LANDFILL - TOPOGRAPHIC SURVEY

DRAWN BY	ERF
CHECKED BY	ERF
H-SCALE	1" = 120'
JOB NO.	1357.00
DATE CREATED	07/06/17
DATE ISSUED	07/20/17
SHEET NO.	1 OF 1