AECOM Environment

Submitted to:
Basin Electric Power Cooperative
Laramie River Station
Wheatland, WY

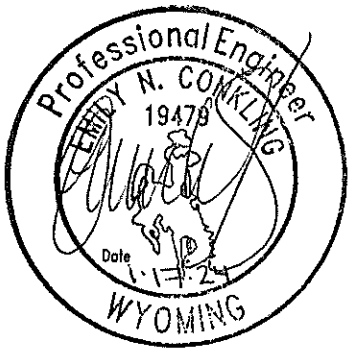
Submitted by:
AECOM
Fort Collins, CO
60632474
January 17, 2024

Basin Electric Power Cooperative
Laramie River Station

Coal Combustion Residual Landfill Annual Inspection Report – 2023

Inspection Completed by:

I certify that this report has been prepared in accordance with 40 Code of Federal Regulations (CFR) 257.84(b)(2) requiring a written Annual Inspection Report prepared by a Qualified Professional Engineer (QPE) as set forth in the *Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments* for the Basin Electric Power Cooperative (BEPC) Laramie River Station (LRS) landfill for 2023.



Emily Conkling, PE
Environmental Engineer
Wyoming PE #19479
Expires 12-31-2024

Contents

List of Attachments

Acronyms

AECOM	AECOM Technical Services, Inc.
Barr	Barr Engineering Co.
BEPC	Basin Electric Power Cooperative
CCR	coal combustion residual
CFR	Code of Federal Regulations
FGD	flue gas desulfurization
LRS	Laramie River Station
QPE	Qualified Professional Engineer
WDEQ	Wyoming Department of Environmental Quality

1.0 Introduction

In accordance with 40 Code of Federal Regulations (CFR) 257.84(b)(2), the purpose of this document is to fulfill the requirements for an Annual Inspection Report prepared by a Qualified Professional Engineer (QPE) to ensure the design, construction, operation, and maintenance or the Basin Electric Power Cooperative (BEPC) Laramie River Station (LRS) landfill is consistent with recognized and generally accepted good engineering standards.

LRS operates three coal-fired boilers, resulting in the production of coal combustion residuals (CCRs). CCRs are defined in 40 CFR 257.53 as: "CCR means fly ash, bottom ash, boiler slag, and flue gas desulfurization materials generated from burning coal for the purpose of generating electricity by electric utilities and independent power producers."

CCRs generated at LRS (and thus regulated under 40 CFR 257) include bottom ash, flue gas desulfurization (FGD) materials, and fly ash.

1.1 CCR Production and Handling

On a daily average, approximately 1,200 tons of FGD materials and fly ash are generated at LRS. The moisture conditioned CCRs (fly ash and FGD material) are transported by haul truck to the on-site LRS landfill, where the CCRs are dumped, spread, and compacted. Bottom ash is managed in surface impoundments adjacent to the landfill. The surface impoundments are addressed in a separate Annual Inspection Report.

1.2 Facility Description

The LRS landfill, designated as File #20.066 by the Wyoming Department of Environmental Quality (WDEQ), was placed into operation in April 1980. The landfill is located in Platte County, Wyoming on the west side of the property. A series of landfill "cells" (i.e., specific areas of the landfill footprint) have been constructed throughout the operating life of the facility. Approximately 66.75 acres of the landfill have undergone partial sequential closure through six discrete landfill closure/capping projects, referred to as "tracts." Currently, the tracts associated with Cells 1 through 5 have been closed, and the active part of the landfill is on the western side.

Tract I was reclaimed in the spring of 1992 (Barr Engineering Co. [Barr] 2023). It occupies approximately 4.75 acres and consists of the area along the toe of the southern slope to the bench of the southern slope of Cells 1 and 2. The seeding was completed on April 13, 1992.

Tract II was reclaimed in the spring of 1996 (Barr 2023). It occupies approximately 4.50 acres and covers the area along the south slope from the bench, including the bench area, up to the break to the 10:1 slope. The seeding was completed on June 3, 1996.

Tract III was reclaimed in the spring of 1997 (Barr 2023). It occupies approximately 18.50 acres and covers the area along the top from the 10:1 slope break point to the crest of the landfill above the 1992 cell. The seeding was completed in early July 1997.

Reclamation began in Tract IV in September 2001 (Barr 2023). It occupies approximately 13 acres and covers the area from the north bench to the crest of the landfill on the 1992 and 1989 cells. Soil was placed too late in the year to allow for final seeding to be placed without risk of losing it to wind over the winter; therefore, the seeding was completed in June 2002.

Reclamation in Tract V began in fourth quarter 2008 and was completed by late August 2009 (Barr 2023). This area occupies approximately 20 acres and encompasses the north portion of the 1979 cell (i.e., Cell 1) and the abutting portion of the 1999 cell (i.e., Cell 5) (Barr 2023).

Tract VI was reclaimed in September 2010 (Barr 2023). It occupies approximately 6 acres and includes the southern portion of Cell 6. Some reseeding was completed in September 2011 to promote more thorough coverage.

Tract VII was reclaimed in the fall of 2016 (Barr 2023). It occupies approximately 3.74 acres on the western slope of Cells 6 and 7, and 4.16 acres on the eastern slope of Cells 6 and 7.

BEPC began to place final cover on approximately 20 acres of the existing CCR landfill during the 2023 construction season. The proposed final cover system includes a low hydraulic conductivity geosynthetic clay liner in addition to cover soil that is compliant with the final cover requirements of the CCR Rule.

The landfill leachate collection system was plugged and abandoned in late 2015 (Barr 2023). However, minor amounts of precipitation can still collect in the system. An estimated 175 gallons was vacuumed out of the abandoned leachate collection system during fourth quarter 2023 (BEPC 2023a).

2.0 Review of Existing Information

A review of existing facility records confirms the design, construction, operation, and maintenance of the landfill has been generally consistent with recognized and accepted good engineering standards.

2.1 CCR Unit Documents and Operating Records

Below is a list of documents reviewed with respect to the landfill:

- Coal Combustion Residual Landfill Post-Closure Plan (BEPC 2016)
- Engineer's Certification of Unstable Areas Demonstration, Existing CCR Landfill (AECOM 2018)
- Coal Combustion Residual Landfill Annual Inspection Report 2020 (BEPC 2021a)
- Coal Combustion Residual Landfill Run-on and Run-off Control Plan (BEPC 2021b)
- Coal Combustion Residual Landfill Annual Inspection Report 2021 (BEPC 2022)
- Coal Combustion Residual Landfill Annual Inspection Report 2022 (BEPC 2023b)

2.2 Weekly Inspection Review

During 2023, qualified individuals (generally the LRS Environmental Coordinator) conducted weekly inspections for any appearance of actual or potential structural weakness and other conditions which were disrupting or had the potential to disrupt the operation or safety of the CCR unit. Appearances of structural weakness may include but are not limited to: (1) signs of piping and other internal erosion; (2) transverse, longitudinal, and desiccation cracking; (3) slides, bulges, boils, sloughs, scarps, sinkholes, or depressions; (4) animal burrows; (5) excessive or lacking vegetation cover; and (6) slope erosion. A review of the periodic inspection reports for the LRS CCR landfill indicated no signs of actual or potential structural weakness or other adverse conditions as described above. The completed weekly inspection checklists are filed in the operating record.

3.0 On-site Annual Inspection of Facility

The annual inspection was conducted on Wednesday, December 6, 2023, starting at 7:00 a.m. mountain standard time outside of the LRS administrative offices with site orientation training. The weather was sunny and approximately 60 degrees Fahrenheit. No snow cover was observed during the inspection visit.

Personnel in attendance for the inspection included:

- Emily Conkling, PE (WY #19479), AECOM Technical Services, Inc. (AECOM)
- Olivia Helinski, AECOM

The completed annual inspection form is provided as **Attachment A**. A sample weekly inspection form used by LRS staff is provided as **Attachment B**. A photo log and figure for the December 6, 2023, inspection is included as **Attachment C**.

3.1 Findings

The total volume of CCRs present in the LRS landfill as of December 2023 is estimated to be approximately 9,350,000 cubic yards. The annual inspection revealed no appearance of actual or potential structural weakness of the CCR unit. No significant signs of distress or malfunction of the CCR unit were observed during the inspection and no changes have occurred that appear to affect the stability or operation of the facility. Previously closed tracts appeared to be well-vegetated and were graded in accordance with the WDEQ landfill permit. No erosion or signs of slope instability were observed. Approximately 15 small, surficial animal burrows (i.e., less than 2 inches in diameter, shallow in nature) were observed over the southern slope of Cells 1 and 2 (**Attachment C**). However, no large burrows (i.e., larger than 4 inches in diameter) were observed, and the cover appears to be intact. The design, construction, operation, and maintenance of the facility are consistent with recognized and generally accepted good engineering standards and industry practices.

4.0 Conclusions

As noted in the CCR Rules §257.84(b)(5), “If a deficiency or release is identified during an inspection, the owner or operator must remedy the deficiency or release as soon as feasible and prepare documentation detailing the corrective measures taken.”

4.1 Recommendations Other Than Normal Maintenance

Recommendation is to continue normal maintenance. Additionally, approximately 15 small animal burrows (less than 2 inches in diameter) were observed on the southern slope of Cells 1 and 2. There does not appear to be larger burrows in the area, and cover appears to be intact. While this issue appears to be controllable, it is recommended that this area be monitored, and if the number of burrows significantly increases, removal steps may be required.

4.2 Deficiencies Discovered

No significant deficiencies were noted as part of this annual inspection or document review. No releases were identified during the annual inspection.

4.3 Corrective Measures Taken

No corrective measures for significant deficiencies were noted that need to be addressed by LRS as part of this 2023 annual inspection.

5.0 References

AECOM Technical Services, Inc. (AECOM). 2018. Engineer's Certification of Unstable Areas Demonstration, Existing CCR Landfill, EPA Final CCR Rule, Laramie River Station, Wheatland, Wyoming. October 12.

Barr Engineering Co. (Barr). 2023. 2022 Annual Report, Laramie River Station, WYDEQ Permit #20.666, Platte County, Wyoming. March

Basin Electric Power Cooperative (BEPC). 2016. Coal Combustion Residual Landfill Post-Closure Plan, Basin Electric Power Cooperative, Laramie River Station. October.

BEPC. 2021a. Coal Combustion Residual Landfill Annual Inspection Report 2020, Basin Electric Power Cooperative Laramie River Station. January.

BEPC. 2021b. Coal Combustion Residuals Landfill Run-on and Run-off Control Plan, Basin Electric Power Cooperative Laramie River Station, Wheatland, WY. October.

BEPC. 2022. Coal Combustion Residual Landfill Annual Inspection Report 2021, Basin Electric Power Cooperative Laramie River Station. January.

BEPC. 2023a. In-person meeting with AECOM during annual inspection, Wheatland, Wyoming. December 6.

BEPC. 2023b. Coal Combustion Residual Landfill Annual Inspection Report 2022, Basin Electric Power Cooperative Laramie River Station. January.

Attachment A
Federal CCR Annual Inspection Form – 2023

Federal CCR Annual Inspection Form

Station: LRS CCR Unit: Landfill

Date: 12/6/2023 Inspector(s): Emily Conkling and Olivia Helinski

Weather Conditions: warm, sunny (mid-60s °F), breezy Ground Conditions: no snow, not muddy

Purpose of Inspection: Per the CCR Rule published by the USEPA and entered into the federal register on April 17, 2015, existing and new CCR landfills are required to be inspected annually by a qualified professional engineer to ensure that the design, construction, operation, and maintenance of the CCR facility is in good condition and conforms to standard engineering practices for this type of facility.
Please refer to the attached figure to mark location of any identified conditions.

CCR UNIT FEATURE	Yes	No	NA	Location ID # or map identifier
CCR Placement				
1) Is waste being handled or placed differently than standard station practices?		X		
Bench Conditions				
2) Any signs of surface cracking?		X		
3) Any signs of depressions or sunken areas?		X		
Slope Conditions				
4) Any signs of surface cracking?		X		
5) Any signs of surface movement? If yes, please categorize		X		
5a) Sloughing (sliding of materials in sheets)		X		
5b) Sliding		X		
5c) Sinking		X		
6) Any signs of erosion rills greater than 3 inches?		X		
7) Any signs of erosion gullies greater than 6 inches?		X		
8) Any signs of holes or animal burrows?	X			small burrows (less than 2" diameter); see figure and photo log
Haul Road Conditions				
9) Any obstructions?		X		
10) Any noticeable damage? If yes, please categorize		X		
10a) Rutting		X		
10b) Sinking		X		
10c) Pot holes		X		
Erosion Controls				
11) Any areas of active construction lacking erosion controls (silt fence)?		X		
12) Any signs that existing erosion controls are not properly functioning?		X		
13) Any evidence of insufficient vegetative cover?		X		
Liner System Conditions (prior to CCR placement or during active liner construction)				
14) Any damage to liner protective cover?			X	
15) Any damage to liner system observed?			X	

Federal CCR Annual Inspection Form - CCR Landfills

Station: LRS CCR Unit: Landfill Date: 12/6/2023

CCR UNIT FEATURE	Yes	No	NA	Location ID # or map identifier
Leachate Collection/Detection System			X	
16) Any signs of obstruction to leachate collection/detection pipe outlets?			X	Leachate system is not in operation; has been plugged and abandoned
17) Any signs of obstruction to leachate flow(s) to storage lagoon(s)?			X	LRS vacuumed out approx. 175 gallons of precipitation from it this year
Surface Water Controls (Diversion Channels/Collection Channels/Sedimentation Ponds)				
18) Any signs of uncontrolled run-on to the landfill?		X		
19) Any signs of uncontrolled run-off from the landfill?		X		
20) Any signs of obstruction in surface water conveyance channels?		X		
21) Any cracking or separation in surface water conveyance channels?		X		
22) Any signs of heaving or sinking of surface water conveyance channels?		X		
23) Any signs of obstruction in culverts, drop boxes, or sumps?		X		
24) Any signs of sedimentation pond malfunction (excessive sediment buildup)?		X		
25) Any signs of excessive sedimentation pond water loss (leaking)?		X		
26) Any signs of obstruction to sedimentation pond outlet structure (in pond)?		X		
27) Any signs of obstruction to sedimentation pond effluent discharge?		X		
Fugitive Dust Controls				
28) Any evidence that fugitive dust controls are not being used?		X		
Other				
29) Any nontypical operations occurring at facility? If yes, please describe.		X		
30) Have weekly inspections been conducted by a qualified person?	X			
31) Did the weekly inspections indicate any appearances of structural weakness?		X		
32) Did the weekly inspections indicate any other conditions which are disrupting or have the potential to disrupt the operation and safety of the CCR unit?		X		
33) Have the weekly inspections been recorded in the facility's operating record?	X			
34) Have there been any changes in geometry of the structure since the previous annual inspection?		X		
35) What is the approximate volume of CCR contained in the unit?				average 1,200 tons per day; LRS will send value

Additional Comments:

Individual Completing Form: Emily Conkling
Print

Signature

Attachment B
Sample LRS Weekly Inspection Form

Basin Electric Power Cooperative –Laramie River Station (LRS)
CCR Surface Impoundment and CCR Landfill
Periodic Inspection Checklist

Inspector: David Cummings **Date:** 9/26/23

Surface Impoundment Standards: At intervals not exceeding seven days, inspect the surface impoundment for any appearances of actual or potential structural weakness and other conditions which are disrupting or have the potential to disrupt the operation or safety of the CCR surface impoundment unit.

Yes	No	N/A	
	X		1. Does vegetation growth exceed 6" in height on surface impoundment dikes?
	X		2. Is there excessive, turbid, or sediment-laden seepage present?
	X		3. Are there signs of piping and other internal erosion?
	X		4. Is transverse, longitudinal, and severe desiccation cracking present?
	X		5. Are slides, bulges, boils, sloughs, scarps, sinkholes, or depressions present?
	X		6. Are there abnormally high or low pool levels?
	X		7. Are there animal burrows?
	X		8. Are there areas with excessive or lacking vegetative cover?
	X		9. Is any slope erosion present?
	X		10. Is any unusual debris present in the impoundment?

Actions taken to correct deficiencies (any question answered "Yes") or other comments:

Surface Impoundment Hydraulic Structure Standards: At intervals not exceeding seven days, inspect the discharge of all outlets of hydraulic structures which pass underneath the base of the CCR surface impoundment or through the dike of the CCR surface impoundment. Facilities may have more than one outlet requiring periodic inspection.

Yes	No	N/A	
	X		1. Is there any abnormal discoloration at discharge outlets?
	X		2. Is there any flow or discharge of debris or sediment?

Actions taken to correct deficiencies (any question answered "Yes") or other comments :

Landfill Standards: At intervals not exceeding seven days, inspect for any appearances of actual or potential structural weakness and other conditions which are disrupting or have the potential to disrupt the operation or safety of the CCR unit.

Yes	No	N/A	
	X		1. Are there signs of piping and other internal erosion?
	X		2. Is transverse, longitudinal, and severe desiccation cracking present?
	X		3. Are slides, bulges, boils, sloughs, scarps, sinkholes, or depressions present?
	X		4. Are there animal burrows?
	X		5. Is any slope erosion present?

Actions taken to correct deficiencies (any question answered "Yes") or other comments:

CCR Fugitive Dust Standards: At intervals not exceeding seven days, inspect for CCR fugitive dust originating from CCR units, roads, and other CCR material management and material handling activities.

Yes	No	N/A	
	X		1. Is there any CCR dust observed at landfill(s)?
	X		2. Is there any CCR dust observed at surface impoundments(s)?
	X		3. Is there any CCR dust observed during ash loading or unloading activities?
	X		4. Is there any CCR dust observed during ash transport or other handling??

Actions taken to correct deficiencies (any question answered "Yes") or other comments:

Surface Impoundment Instrumentation Standards: At intervals not exceeding 30 days, inspect all CCR surface impoundment unit instrumentation.

Yes	No	N/A	
		X	1. Is XXX instrumentation in good working order and functioning as designed?
		X	2. Is XXX instrumentation in good working order and functioning as designed?

Actions taken to correct deficiencies (any question answered "No") or other comments:

Signature of Qualified Person: Title: Env. Coord.

Attachment C
Photo Log of Annual Inspection – 2023

Aerial Source: Google Earth Pro

Basin Electric Power Cooperative
Landfill
Wheatland, Wyoming
Project No.: 60632474 Date: 12/21/2023

Landfill
Photo Map
December 6, 2023

N

350 0 700

1"=700'

AECOM

Attachment C

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Basin Electric Power Cooperative	Laramie River Station, Wheatland, WY	60632474

Photo No.	Date:
1	12/6/23

Direction Photo Taken:

Birds-eye view

Description:

Location: southern side of top of landfill

Example of animal burrows observed on the southern slope of Cells 1 and 2.

Client Name:	Site Location:	Project No.
Basin Electric Power Cooperative	Laramie River Station, Wheatland, WY	60632474

Photo No.	Date:
2	12/6/23

Direction Photo Taken:

West

Description:

Location: Top of the capped landfill

Good vegetation cover is shown.