



REPORT

**Active Coal Combustion Residuals Disposal Facility
2023 Annual Inspection**
Escalante Station

Submitted to:

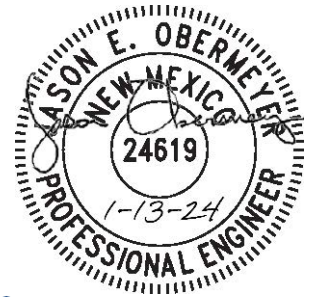
Tri-State Generation and Transmission Association, Inc.

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Submitted by:

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21453429.000-001-RPT-0

January 13, 2024



Table of Contents

1.0 INTRODUCTION 1

 1.1 Background 1

 1.2 Facility Description 1

2.0 REVIEW OF AVAILABLE INFORMATION 1

 2.1 Information Reviewed 1

 2.2 Changes in Facility Geometry 2

 2.3 CCR Volume Contained in the Facility 2

 2.4 Changes Affecting Stability or Operation 2

3.0 VISUAL OBSERVATION 3

 3.1 Overview 3

 3.2 Visual Observation Terminology 3

 3.3 Findings 3

 3.3.1 Deposition Area 3

 3.3.2 Embankment Crest 4

 3.3.3 Embankment Slopes 5

 3.3.4 Embankment Toe 7

 3.3.5 Stormwater Control Features 8

4.0 CONCLUSIONS AND RECOMMENDATIONS 9

5.0 REFERENCES 10

FIGURES

Photograph 1: Typical Condition of the Deposition Area 4

Photograph 2: Typical Condition of the Embankment Crest 5

Photograph 3: Typical Condition of the South Embankment Slope 6

Photograph 4: Condition of the East Embankment Slope at the Time of the Visual Observation 7

Photograph 5: Typical Condition of the Embankment Toe 8

Photograph 6: Typical Condition of the Run-on Control Channel 9

APPENDICES

APPENDIX A

Annual Inspection Form

1.0 INTRODUCTION

1.1 Background

WSP USA Inc. (WSP) has prepared this annual inspection report for Tri-State Generation and Transmission Association, Inc. (Tri-State) to summarize our review of available information and visual observation of the active disposal facility for coal combustion residuals (CCRs) at Escalante Station. The facility classifies as an existing CCR landfill under 40 CFR 257. The purpose of WSP's review of available information and visual observation was to satisfy the requirements of 40 CFR 257.84(b)(1), which prescribes periodic completion of these activities by a qualified Professional Engineer (PE) to verify that the design, construction, operation, and maintenance of the facility are consistent with recognized and generally accepted good engineering practice. The discussion presented in this report is limited to the active CCR disposal facility at Escalante Station and does not include consideration of the inactive CCR disposal facility at the site. WSP's visual observation took place on November 29, 2023.

This report presents a description of the facility (Section 1.0), a summary of WSP's review of available information about the facility (Section 2.0), the findings from WSP's visual observation of the facility (Section 3.0), and WSP's conclusions and recommendations (Section 4.0).

1.2 Facility Description

Escalante Station operated as a 270-megawatt coal-fired electric generation plant from 1984 until its retirement in August 2020. The plant site is located approximately 4.2 miles northwest of Prewitt, New Mexico. Tri-State generated fly ash, bottom ash, and flue gas desulfurization (FGD) material at Escalante Station and disposed of these materials in the facility. The facility is expected to continue receiving permitted waste materials and remains an active CCR disposal facility. The facility is one of several site features regulated by the New Mexico Environmental Department, Ground Water Quality Bureau, under Discharge Permit DP-206. Filling began at the facility in 2009, and CCRs have been deposited over approximately 25 acres to date. The total facility footprint is approximately 48 acres.

The facility is located immediately south of the inactive CCR disposal facility at the site. Placement of CCRs commenced at the east end of the facility and has progressed westward as design grades or interim grades were reached. As the height of the fill increased, CCRs have been placed such that they abut (piggyback) the inactive CCR disposal facility on the north side of the active CCR disposal facility. The outer embankment slopes for the facility are designed at a slope ratio of 3 horizontal to 1 vertical.

2.0 REVIEW OF AVAILABLE INFORMATION

2.1 Information Reviewed

40 CFR 257.84(b)(1)(i) requires the annual inspection to include a review of information pertaining to the status and condition of the facility, including files that are available in the operating record. WSP has reviewed information provided by Tri-State as part of our effort to verify that the design, construction, operation, and maintenance of the facility are consistent with recognized and generally accepted good engineering practice. The information WSP has reviewed includes the following:

- Ground Water Discharge Permit Modification DP-206, which authorizes operation of the facility (New Mexico Environment Department 2023)
- the design and operation plan for the facility (Metric Corporation 2006)

- the fugitive dust control plan for the facility (Golder 2015)
- the run-on and runoff control system plan for the facility (Geosyntec Consultants 2021)
- the closure plan for the facility (Golder 2016a)
- the closure design plan for the facility under Ground Water Discharge Permit DP-206 (Geosyntec Consultants 2023)
- previous annual inspection reports for the facility (Golder 2016b, 2017, 2018, 2019, 2020, 2021, and 2022; WSP 2023)
- weekly inspection forms documenting weekly inspections conducted by qualified persons employed by Tri-State between December 27, 2022, and November 8, 2023

The weekly inspection forms provided valuable information regarding the status and condition of the facility throughout 2023.

2.2 Changes in Facility Geometry

40 CFR 257.84(b)(2)(i) requires the annual inspection report to include a summary of changes in facility geometry since the previous annual inspection. Across the top surface, a layer of interim cover soil had been placed to reduce the potential for windblown CCR particles. On the east embankment slope, work was underway at the time of the visual observation to prepare for construction of a mid-slope bench. Interim cover soil was being removed from the east embankment slope and stockpiled. Since the previous annual inspection, the CCR deposition area had moved from an area north of the facility access road to a new location south of the facility access road. At the time of the visual observation, this area was primarily receiving waste materials (CCR and soil) resulting from improvements that are being made to the inactive CCR disposal facility at the site.

2.3 CCR Volume Contained in the Facility

40 CFR 257.84(b)(2)(ii) requires the annual inspection report to include an estimate of the volume of CCRs contained within the facility at the time of the visual observation. Based on historical information and CCR placement data provided by Tri-State, WSP estimates that the volume of CCRs contained within the facility was 1,148,000 cubic yards at the time of the visual observation.

2.4 Changes Affecting Stability or Operation

40 CFR 257.84(b)(2)(iv) requires the annual inspection report to include a summary of changes that may have affected the stability or operation of the facility since the previous annual inspection. WSP's review of the weekly inspection forms completed between December 27, 2022, and November 8, 2023, indicates that changes affecting the stability or operation of the facility have not been identified during the weekly inspections. Indications of changes that affect stability or operation of the facility were not identified during WSP's visual observation on November 29, 2023 (refer to Section 3.0). It is noteworthy, however, that waste deposition rates have diminished since retirement of the generating unit in August 2020 and are expected to remain relatively low leading up to eventual closure of the facility.

3.0 VISUAL OBSERVATION

3.1 Overview

40 CFR 257.84(b)(1)(ii) requires the annual inspection to include visual observation of the facility that is intended to identify signs of distress or malfunction. 40 CFR 257.84(b)(2)(iii) requires the annual inspection report to include a description of appearances of structural weakness at the facility and existing conditions that are disrupting or have the potential to disrupt the operation and safety of the facility. These requirements are addressed in this section.

3.2 Visual Observation Terminology

Condition of Facility Component

Good:	A condition that is generally better than the minimum expected condition based on the design criteria and maintenance performed at the facility.
Fair:	A condition that is generally consistent with the minimum expected condition based on the design criteria and maintenance performed at the facility.
Poor:	A condition that is generally worse than the minimum expected condition based on the design criteria and maintenance performed at the facility.

Severity of Deficiency

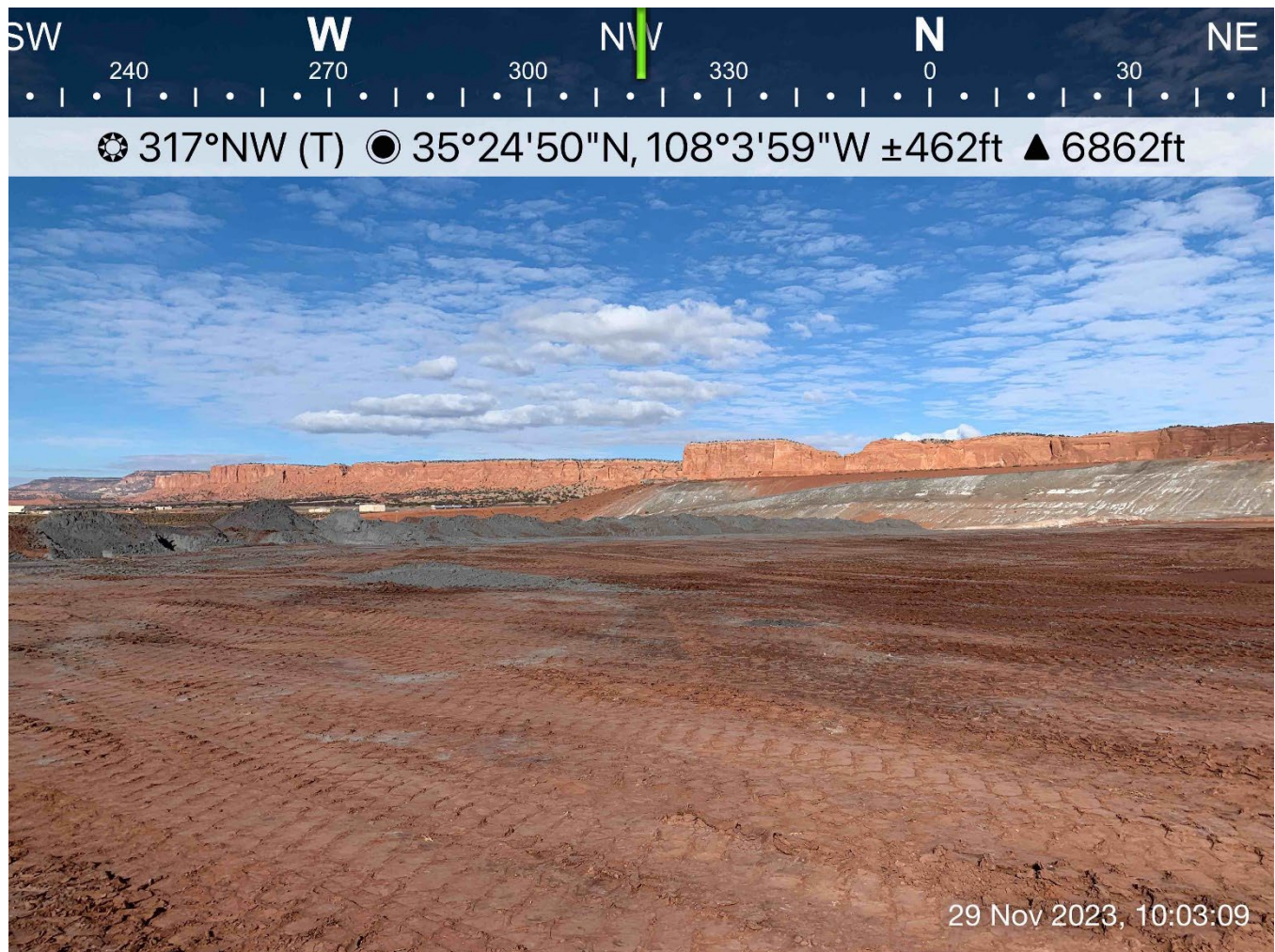
Minor:	An observed deficiency where the current condition is worse than the minimum expected condition but does not currently pose a threat to structural stability.
Significant:	An observed deficiency where the current condition is worse than the minimum expected condition and could pose a threat to structural stability if it is not addressed.
Excessive:	An observed deficiency where the current condition is worse than the minimum expected condition and either hinders the ability of an inspector to evaluate the facility component or poses a threat to structural stability.

3.3 Findings

WSP conducted a visual observation of the facility on November 29, 2023. The condition of the deposition area, embankment slopes, embankment crest, embankment toe, and stormwater control features was observed. The annual inspection form is included in Appendix A. The locations and orientations of photographs presented in this section are shown on the annual inspection form.

3.3.1 Deposition Area

The deposition area was observed to be in good condition. Appendix A shows the deposition area location at the time of the visual observation. Signs of ground movement, such as sloughing or sliding, cracking, subsidence, or bulging, were not observed in the deposition area. Appropriate grading had been established to collect CCR contact water within the facility. Fugitive dust was not observed at the time of the visual observation. The typical condition of the deposition area is depicted in Photograph 1.



Photograph 1: Typical Condition of the Deposition Area

3.3.2 Embankment Crest

The embankment crest was observed to be in good condition. Cracking that would be indicative of ground movement was not observed along the embankment crest. Low areas that would be indicative of differential settlement were not observed along the embankment crest. The typical condition of the embankment crest is depicted in Photograph 2.



Photograph 2: Typical Condition of the Embankment Crest

3.3.3 Embankment Slopes

The embankment slopes were observed to be in fair condition. Signs of ground movement, such as sloughing or sliding, subsidence, or bulging, were not observed on the embankment slopes. Evidence of excessive erosion or slope deterioration was not observed on the embankment slopes, but minor rilling was observed on the south embankment slope. The severity of the rilling appeared to be about the same as during previous annual inspections in December 2022 and October 2021 and was similarly observed to increase near the western end of the embankment slope. The rilling does not currently pose a threat to structural stability and is not disrupting the operation or safety of the facility, but it should be monitored and addressed if it becomes excessive. While localized repairs may periodically be needed for rills that become excessively deep or wide, WSP recommends that broad-scale rill repair efforts be deferred until the rills become more severe or a reseeding attempt is planned, as repair efforts would disturb the vegetation and the crust remaining from hydraulic mulch application and may therefore be counterproductive.

As a noted improvement over conditions observed during the previous annual inspection in December 2022, no wind-deposited CCR particles were observed on the east embankment slope. At the time of the visual observation, Tri-State had recently placed a layer of interim cover soil across the top surface to reduce the

potential for windblown CCR particles. Additionally, Tri-State personnel indicated that the upper zone of interim cover soil on the northern segment of the east embankment slope, where wind-deposited CCR particles were observed during the previous annual inspection in December 2022, had been removed and disposed in the facility.

Native vegetation was observed on the south embankment slope but not on the east embankment slope due to the ongoing construction work and associated removal of interim cover soil. Unusually poor or thriving vegetative growth was not observed on the south embankment slope, but establishment of a mature vegetative community continues to be challenging given the climatic conditions at the site. No trees were observed on the embankment slopes. Active animal burrows were not observed on the embankment slopes. The typical condition of the south embankment slope is depicted in Photograph 3. The condition of the east embankment slope at the time of the visual observation is depicted in Photograph 4. The east embankment slope will need to be revegetated or armored after the ongoing construction work is complete.



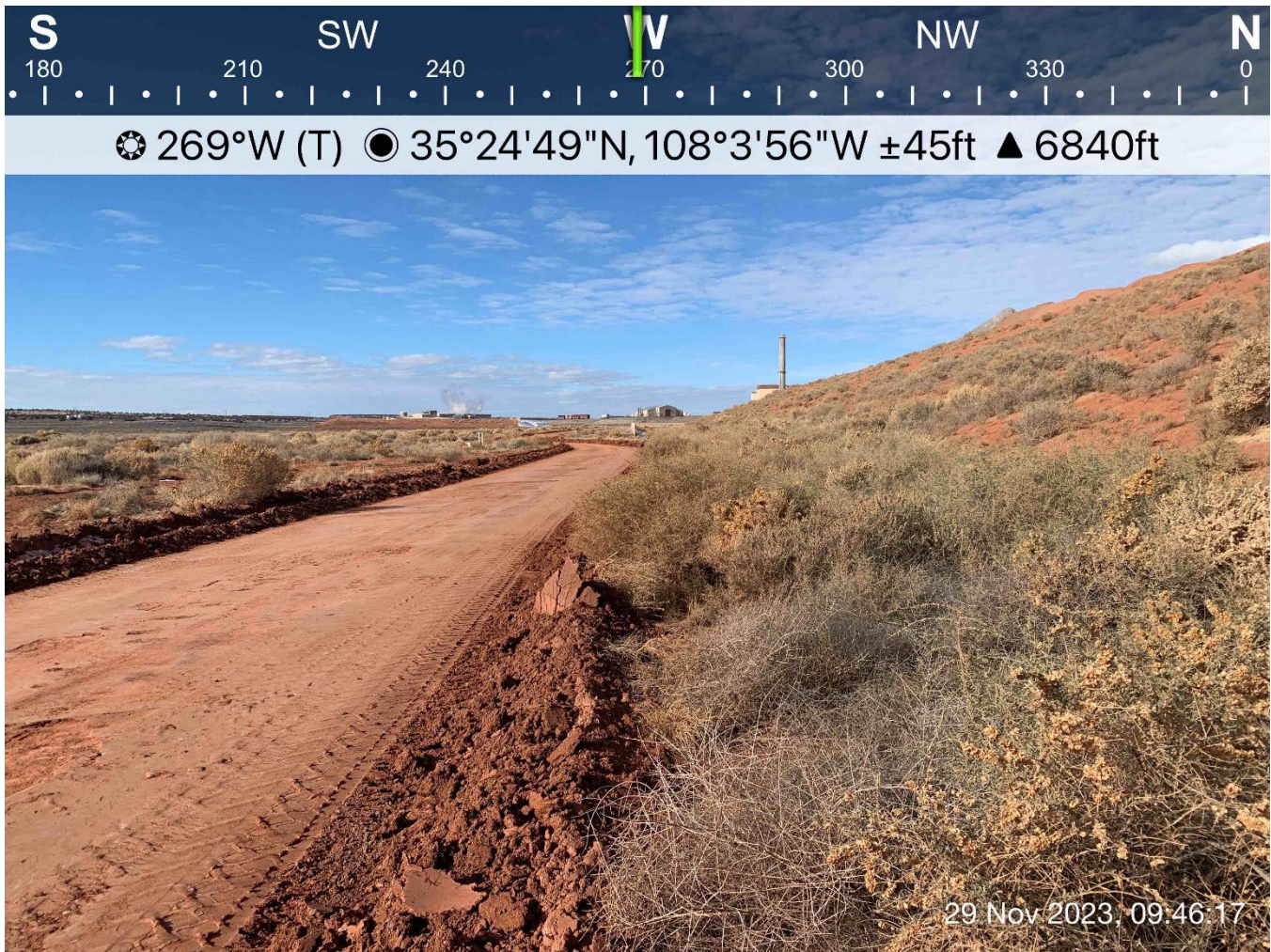
Photograph 3: Typical Condition of the South Embankment Slope



Photograph 4: Condition of the East Embankment Slope at the Time of the Visual Observation

3.3.4 Embankment Toe

The embankment toe was observed to be in good condition. Signs of seepage, such as springs or boggy areas, were not observed along the embankment toe. The typical condition of the embankment toe is depicted in Photograph 5.



Photograph 5: Typical Condition of the Embankment Toe

3.3.5 Stormwater Control Features

The stormwater control features at the facility were observed to be in fair condition. At the time of the visual observation, the only permanent stormwater control feature at the facility was a run-on control channel that is designed to convey stormwater from west to east outside the southern limit of the facility. The run-on control channel is armored with riprap. Shrubs were observed to be growing in the flow path, and an area of sediment accumulation was observed near the east end of the channel. The shrubs and sediment are not disrupting the operation or safety of the facility, but they should be removed periodically to help maintain the channel’s flow capacity. The typical condition of the run-on control channel is depicted in Photograph 6.



Photograph 6: Typical Condition of the Run-on Control Channel

4.0 CONCLUSIONS AND RECOMMENDATIONS

WSP completed an annual inspection of the active CCR disposal facility at Escalante Station to address the requirements of 40 CFR 257.84(b)(1). Signs of distress or malfunction of the facility were not observed, and appearances of actual or potential structural weakness of the facility were not identified. Facility maintenance activities that should be carried out as the need is indicated by weekly inspections conducted in accordance with 40 CFR 257.84(a) include control of burrowing animals, repair of significant erosion damage on embankment slopes, revegetation of embankment slopes, control and containment of CCR contact water, and periodic removal of shrubs and sediment from the run-on control channel.

5.0 REFERENCES


- Geosyntec Consultants. 2021. Run-On and Run-Off Control System Plan Periodic Update for CCR Landfill, Escalante Generating Station. Plan prepared for Tri-State Generation and Transmission Association, Inc. October 30.
- Geosyntec Consultants. 2023. Active and Inactive Landfill Closure Design Plan, Revision 0. Plan prepared for Tri-State Generation and Transmission Association, Inc. April.
- Golder (Golder Associates Inc.). 2015. Escalante Generating Station Coal Combustion Residuals Fugitive Dust Control Plan. Plan prepared for Tri-State Generation and Transmission Association, Inc. October.
- Golder. 2016a. Escalante Generating Station Active Ash Landfill Closure Plan. Plan prepared for Tri-State Generation and Transmission Association, Inc. October.
- Golder. 2016b. Coal Combustion Residuals Landfill Annual Inspection Report, Escalante Generating Station. Report prepared for Tri-State Generation and Transmission Association, Inc. January 18.
- Golder. 2017. Coal Combustion Residuals Landfill Annual Inspection Report, Escalante Generating Station. Report prepared for Tri-State Generation and Transmission Association, Inc. January 18.
- Golder. 2018. Active Coal Combustion Residuals Landfill Annual Inspection Report, Escalante Generating Station. Report prepared for Tri-State Generation and Transmission Association, Inc. January 15.
- Golder. 2019. Active Coal Combustion Residuals Landfill Annual Inspection, Escalante Generating Station. Report prepared for Tri-State Generation and Transmission Association, Inc. January 15.
- Golder. 2020. Active Coal Combustion Residuals Landfill Annual Inspection, Escalante Generating Station. Report prepared for Tri-State Generation and Transmission Association, Inc. January 15.
- Golder. 2021. Active Coal Combustion Residuals Disposal Facility 2020 Annual Inspection, Escalante Generating Station. Report prepared for Tri-State Generation and Transmission Association, Inc. January 15.
- Golder. 2022. Active Coal Combustion Residuals Disposal Facility 2021 Annual Inspection, Escalante Generating Station. Report prepared for Tri-State Generation and Transmission Association, Inc. January 14.
- Metric Corporation. 2006. Scrubber Sludge/Fly Ash Landfill Expansion Plan for the Tri-State Escalante Generating Station. Plan prepared for Tri-State Generation and Transmission Association, Inc. August 14.
- New Mexico Environment Department. 2023. Discharge Permit DP-206. July 26.
- WSP (WSP USA Inc.). 2023. Active Coal Combustion Residuals Disposal Facility 2022 Annual Inspection, Escalante Station. Report prepared for Tri-State Generation and Transmission Association, Inc. January 13.

Signature Page

WSP USA Inc.



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JEO/TJS/rm

[https://golderassociates.sharepoint.com/sites/170819/project files/6 deliverables/001-rpt-a-2023_annual_inspection/rev0/21453429.000-001-rpt-0-escalante_annual_insp_2023_13jan24.docx](https://golderassociates.sharepoint.com/sites/170819/project%20files/6%20deliverables/001-rpt-a-2023_annual_inspection/rev0/21453429.000-001-rpt-0-escalante_annual_insp_2023_13jan24.docx)

APPENDIX A

Annual Inspection Form



TRI-STATE GENERATION AND TRANSMISSION ASSOCIATION
ESCALANTE STATION ACTIVE CCR DISPOSAL FACILITY
ANNUAL INSPECTION FORM

Inspection Date: November 29, 2023	Inspection Time: 9:25-10:15am, 1:30-2:05pm	Legend: Y Yes N No NI Not inspected NA Not applicable RA Requires action
Inspector(s): Jason Obermeyer, PE	Title(s): Vice President	
Reviewer: Todd Stong, PE	Title: Vice President	

Instructions: Complete each part of the annual inspection form. Indicate areas of concern on the plan view on page 3. Elaborate on deficiencies in Section J.

A. Previous Open Items

1. List open items from the previous inspection form (Section I.) and indicate whether or not the open items have been resolved:

a. The northern segment of the east embankment slope needs to be seeded	Y	N	NI	NA	RA	If N and/or RA, please elaborate.
b.	Y	N	NI	NA	RA	If N and/or RA, please elaborate.
c.	Y	N	NI	NA	RA	If N and/or RA, please elaborate.

B. Atmospheric Conditions

1. Briefly describe precipitation conditions (rainy, dry, snowy) or notable precipitation events over the last five days: Snow on November 24 (2 to 3 inches), dry thereafter

2. Briefly describe wind (calm, breezy, windy, gusty) and weather (cold, warm, cloudy, sunny) conditions during the inspection: Cool, partly cloudy, calm

C. Facility Access

1. Are facility access roads in good condition?	Y	N	NI	NA	RA	If N and/or RA, please elaborate.
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D. Deposition Area

1. Where are CCRs and/or other materials currently being deposited (indicate on the plan view on page 3 or write N/A)? See page 3

2. Do you observe signs of ground movement in the deposition area?	Y	N	NI	NA	RA	If Y and/or RA, please elaborate.
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If Y, circle those that apply: Slough or Slide Cracking Subsidence Bulging

3. Do you observe ponding in the deposition area (if Y, sketch on the plan view on page 3)?	Y	N	NI	NA	RA	If RA, please elaborate.
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4. Does it appear that fugitive dust is being adequately controlled?	Y	N	NI	NA	RA	If N and/or RA, please elaborate.
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5. Are controls in place to keep CCR contact water from migrating away from the facility?	Y	N	NI	NA	RA	If N and/or RA, please elaborate.
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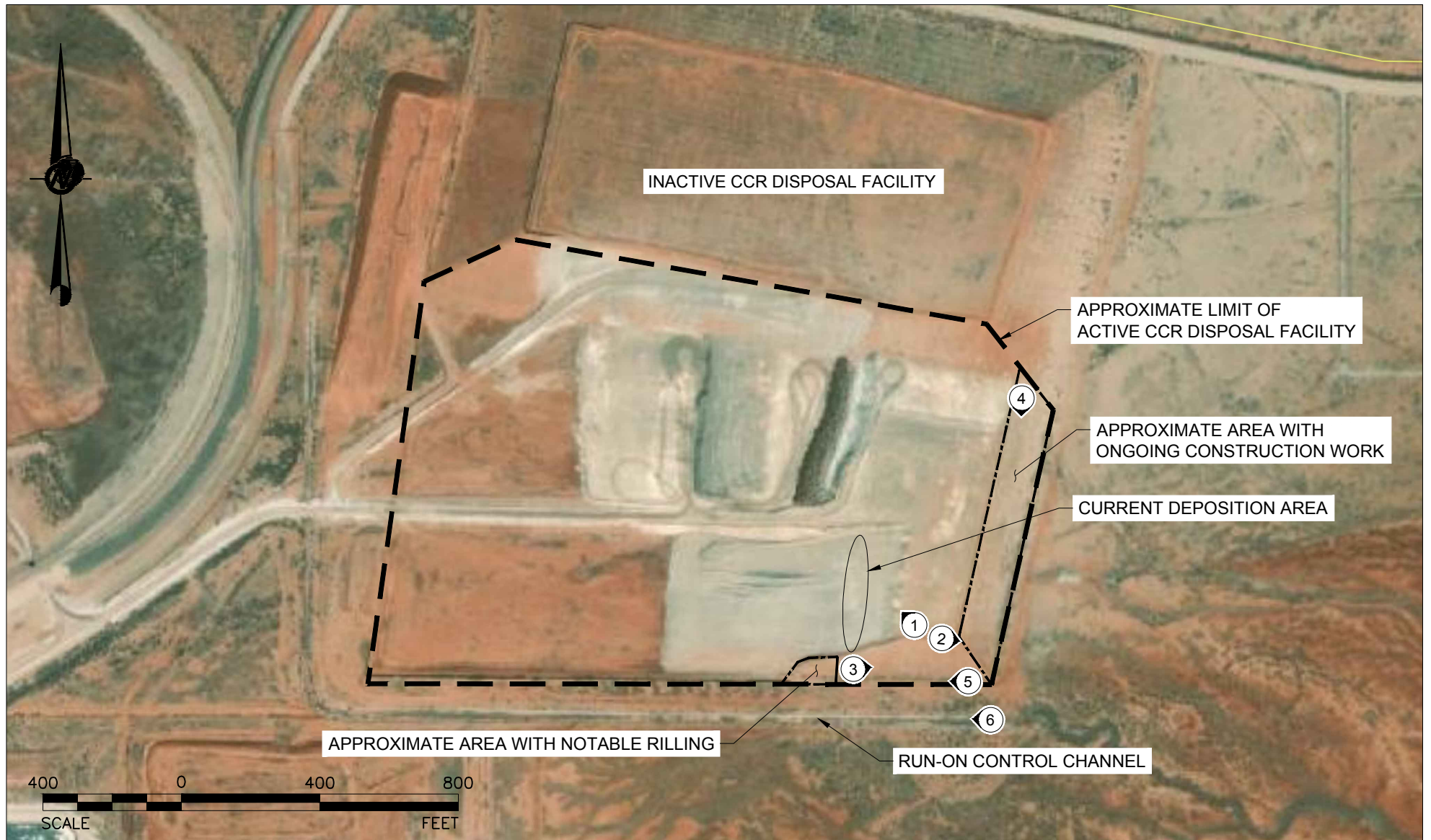
E. Embankment Crest

1. Do you observe cracks along the embankment crest?	Y	N	NI	NA	RA	If Y and/or RA, please elaborate.
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2. Do you observe differential settlement (low areas) along the embankment crest?	Y	N	NI	NA	RA	If Y and/or RA, please elaborate.
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3. Are the roads around and on the facility in good condition?	Y	N	NI	NA	RA	If N and/or RA, please elaborate.
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F. Embankment Slopes						
1. Briefly describe ground conditions (wet, dry, soft, firm). North: N/A East: Firm, dry South: Soft, dry West: N/A						
2. Do you observe signs of movement or instability on the embankment slopes? If Y, circle those that apply: Slough or Slide Cracking Subsidence Bulging	Y	N	NI	NA	RA	If Y and/or RA, please elaborate.
3. Do you observe signs of notable erosion or slope deterioration?	Y	N	NI	NA	RA	If Y and/or RA, please elaborate.
4. Do you observe inadequate, unwanted, or unusual (thriving or poor) vegetative growth?	Y	N	NI	NA	RA	If Y and/or RA, please elaborate.
5. Do you observe notable animal burrows on the embankment slopes?	Y	N	NI	NA	RA	If Y and/or RA, please elaborate.
G. Embankment Toe						
1. Do you observe signs of seepage (springs or boggy areas) at the embankment toe?	Y	N	NI	NA	RA	If Y and/or RA, please elaborate.
2. Do you observe CCRs outside of the disposal footprint?	Y	N	NI	NA	RA	If Y and/or RA, please elaborate.
H. Storm Water Control Features						
1. Are run-on control features in satisfactory condition?	Y	N	NI	NA	RA	If N and/or RA, please elaborate.
I. Open Items						
1. List unresolved items from previous annual inspections (RA in Section A.) and new items identified during the annual inspection (RA in Sections B. through H.):						
a.						
b.						
c.						
d.						
e.						
J. Elaboration						
Identify the specific item number (for instance, F.2.) and elaborate on each deficiency or issue identified during the annual inspection. Attach documentation (photographs or sketches) if practical.						
A.1.a. Work was underway on the east embankment slope to prepare for construction of a mid-slope bench (see page 3 for the approximate extents of construction work on the east embankment slope at the time of the visual observation), and the referenced area was disturbed and unvegetated. The east embankment slope will need to be revegetated or armored after the construction work is complete.						
F.3. Rilling was observed on the south embankment slope, with severity increasing near the western end (see page 3 for the approximate extents of notable rilling). The severity of the rilling was observed to be about the same as during the two previous annual inspections. The rilling does not currently pose a threat to structural stability and is not disrupting the operation or safety of the facility, so immediate repair is not required. The rilling should be monitored and addressed if it becomes excessive.						



Aerial Image: ESRI, Vivid, Maxar. Image captured in March 2022.

LEGEND

② PHOTOGRAPH LOCATION AND DIRECTION



ANNUAL INSPECTION FORM
TRI-STATE GENERATION AND TRANSMISSION ASSOCIATION
ESCALANTE STATION ACTIVE CCR DISPOSAL FACILITY



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