TRI-STATE

November 1, 2023

Mr. Zach Trujillo
Environmental Protection Specialist
Colorado Division of Reclamation, Mining & Safety
Department of Natural Resources
1313 Sherman Street, Room 215
Denver, CO 80203

RE: Colowyo Coal Company L.P.
Permit No. C-1981-019
Technical Revision 160 (TR-160)
Adequacy Response

Dear Mr. Trujillo,

Tri-State Generation and Transmission Association Inc. (Tri-State), is the parent company to Axial Basin Coal Company, which is the general partner to Colowyo Coal Company L.P. (Colowyo). Therefore, Tri-State on behalf of Colowyo is submitting this adequacy response for technical revision 160 (TR-160) to Permit No. C-1981-019.

Tri-State received the Division adequacy letter dated October 18, 2023 and has the following responses to the Division's concerns:

1. *When reviewing proposed Map 41B, it appears to the Division there is an error in the post-mining drainage profiles. The drainage profiles provided with the above mentioned map appear to correspond to the previously approved profiles prior to the issuance of TR-154. Please provide an updated proposed Map 41B with the correct post-mining drainage profiles or provide updated demonstrations to support the drainage profiles provided under TR-160.*

   Response: The issue with the drainages (post mine channels and temporary channels) was an old external reference file that was incorrect. This correct file has been referenced and the post mine channels and temporary channels shown on Map 41B have been corrected.

2. *When reviewing Proposed Map 13C-1 Sheet 1, channel C-14 is outside the disturbance boundary as shown. Please provide an updated Map 13C-1 Sheet 1 with an adjusted disturbance boundary to include channel C-14.*

   Response: The correct reference file was updated on Map 13C-1 which correctly shows the disturbance boundary around C-14 Ditch.

3. *On proposed Figure 7-23B-1 – Section 25 Pond Watersheds During Mining, there is a 4 acre area that is not associated with any designation or curve number when reviewing the map legend. For additional reference, please see the provided figure below this comment. Please provide additional clarification for this area and ensure proper designation on the proposed*

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Figure 7-23B-1 as well as well as the associated hydrology demonstration in proposed Exhibit 7, Item 23, Part B.

Response: The 4.0 acres (3 plus year reclamation parcel) has been updated on the legend on Figure 7-23B-1 as noted. This parcel has been included in the SEDCAD™ model under Structure #14.

4. *When comparing proposed Exhibit 7, Item 25E hydrology demonstration for channels C-1, C-12 and C-13 with proposed Figure 7-25E-1, there appears to be an acreage discrepancy of 0.3 acres. This discrepancy appears to coincide with the immediate contributing acreage associated with the Collom Haul Road channel C-1, specifically the area of CN 85 designation. The total as shown in Figure 7-25E-1 has an acreage of 4.9 while the subwatershed hydrology details in Exhibit 7, Item 25E totals to 4.6 acres. For additional reference, please see the provided figure below this comment. Please provide and updated Exhibit 7, Item 25E hydrology demonstration and/or Figure 7-25E-1 with the correct acreage for Collom Haul Road channel C-1.*

   Response: The 0.3-acre discrepancy was a typo in the SEDCAD™ model. The 1.1 acre (CN-85) subwatershed under structure #3 has been corrected to 1.4 acres (CN-85).

5. *On proposed Exhibit 13C, Table 13C-6C, it was observed that Topsoil volume for C-2 was increased from 0 c.y. to 968 c.y. when comparing to the currently approved Table 13C-6C. It was also observed that the revegetation acreage associated with C-2 increased from 0.1 acres to 0.6 acres. Since this volume and acreage differences were not previously captured in the last reclamation cost estimate (RCE) conducted with Renewal No. 8, the Division has included this change in volume and acreage as part of TR-160 RCE. The difference in these increases will be added to the addition of the newly proposed Collom Haul Road channels.*

   Response: No response required.

6. *It is observed that two new culverts, 71 and 72, were included in proposed Exhibit 13C, Table 13C-8. These culvers have been included in the Division's RCE for TR-160.*

   Response: No response required.

7. *Under TR-160, Colowyo has proposed an addition of 23.6 acres of disturbance associated with the addition of Collom Haul Road channels and associated sumps. When reviewing proposed Exhibit 13C, the only new disturbance acreage accounted for is associated with channels C-10 through C-15 and this totals 6 acres of the 23.6 acres under TR-160. Please provide the Division with additional information regarding the unaccounted 17.6 acres and provide updates to Exhibit 13C as necessary documenting the additional disturbance under the Collom Cumulative Bond Schedule.*

Response: Exhibit 13C, Table 13C-6C, revegetation acreages for C-2, C-10, C-11, C12, C-13, C-14, and C-15 channels have been corrected and total 21.3 acres. The remaining 2.3 acres of proposed disturbance are associated with CS-11 (1.4 acres) and CS-12 (0.9 acres) which are shown on Exhibit 13C-1 Sheet 2.

8. *At this time, the Division has insufficient information to conduct an accurate reclamation cost estimate associated with the proposed changes associated with TR-160. Once the Division receives additional information regarding some of the above comments, a reclamation cost estimate will be provided under a second adequacy letter.*

Response: No response required.

If you should have any additional questions or concerns regarding this adequacy response, please feel free to contact Tony Tennyson at (970) 824-1232 or at ttennyson@tristategt.org.

Sincerely,

DocuSigned by:
Chris Gilbreath
D250C711D0BF450...

Chris Gilbreath
Senior Manager
Remediation and Reclamation

CG:TT:der

Enclosure

cc: Foster Beckett (BLM-LSFO)
Tony Tennyson (via email)
File: C. F. 1.1.2.144 - G471-11.3(21)d

CHANGE SHEET FOR PERMIT REVISIONS, TECHNICAL REVISION, AND MINOR REVISIONS

Mine Company Name: **Colowyo Coal Company L.P.** Permit Number: **C-1981-019**

Date: **October 31, 2023** Revision Description: **TR-160 Collom Haul Road Channels**

Volume Number	Page, Map or other Permit Entry to be REMOVED		Page, Map or other Permit Entry to be ADDED		Description of Change
1					No Change
2A					No Change
2B					No Change
2C					No Change
2D					No Change
2E					No Change
3					No Change
4					No Change
5A					No Change
5B					No Change
6					No Change
7					No Change
8					No Change
9					No Change
10					No Change
12					No Change
13					No Change
14					No Change
15					No Change
16					No Change
17					No Change
18A					No Change
18B	Figure 7-23B-1 (1 page)		Figure 7-23B-1 (1 page)		Figure 7-23B-1 has been updated.
18C	C-1, 12, 13 Channel SEDCAD Outputs (9 pages)		C-1, 12, 13 Channel SEDCAD Outputs (9 pages)		C-1, 12, 13 SEDCAD has been updated.
18D					No Change

CHANGE SHEET FOR PERMIT REVISIONS, TECHNICAL REVISION, AND MINOR REVISIONS

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Volume Number	Page, Map or other Permit Entry to be REMOVED		Page, Map or other Permit Entry to be ADDED		Description of Change
19					No Change
20	Exhibit 13C Page 7 (1 page)		Exhibit 13C Page 7 (1 page)		Tables 13C-6C has been updated.
20	Map 13C-1 Sheet 1		Map 13C-1 Sheet 1		Map 13C-1 Sheet 1 has been updated.
21					No Change
22	Map 41B		Map 41B		Map 41B has been updated.

C-1, C-12, and C-13 Channel Configurations

10-Year 24-Hour Storm Event

Tony Tennyson

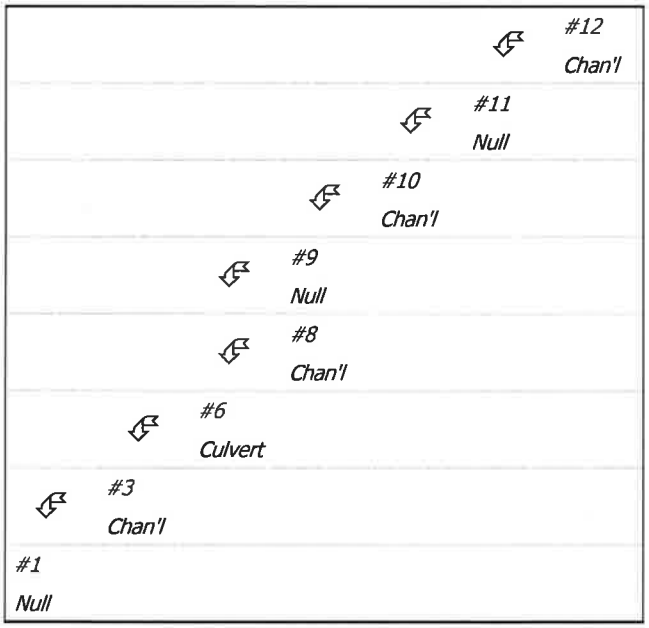
General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	10 yr - 24 hr
Rainfall Depth:	1.800 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Null	#1	==>	End	0.000	0.000	Null At End of C-1 Ditch
Channel	#3	==>	#1	0.000	0.000	C-1 Channel
Culvert	#6	==>	#3	0.000	0.000	Culvert 40A - Half Culvert
Channel	#8	==>	#6	0.000	0.000	Collom Haul Road Ditch South
Null	#9	==>	#6	0.000	0.000	Null at Confluence with Culvert 40A and C-12 Channel
Channel	#10	==>	#9	0.000	0.000	C-12 Channel
Null	#11	==>	#10	0.000	0.000	Null at Confluence with C-12 and C-13 Channel
Channel	#12	==>	#11	0.000	0.000	C-13 Channel



Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#12	3.600	3.600	1.00	0.10
#11	0.000	3.600	1.00	0.10
#10	17.300	20.900	1.87	0.20
#9	0.000	20.900	1.87	0.20
#8	7.100	7.100	6.55	0.51
#6	0.000	28.000	7.95	0.71
#3	4.900	32.900	8.97	0.78
#1	0.000	32.900	8.97	0.78

Structure Detail:

Structure #12 (Erodible Channel)

C-13 Channel

Trapezoidal Erodible Channel Inputs:

Material: Shales and hardpans

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
2.00	2.0:1	2.0:1	10.0	0.0250	2.89			6.0

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	1.00 cfs	
Depth:	0.11 ft	3.00 ft
Top Width:	2.44 ft	14.00 ft
Velocity:	4.03 fps	
X-Section Area:	0.25 sq ft	
Hydraulic Radius:	0.099 ft	
Froude Number:	2.23	

Structure #11 (Null)

Null at Confluence with C-12 and C-13 Channel

Structure #10 (Erodible Channel)

C-12 Channel

Trapezoidal Erodible Channel Inputs:

Material: Shales and hardpans

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
3.00	2.0:1	2.0:1	5.0	0.0250	2.84			6.0

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	1.87 cfs	
Depth:	0.16 ft	3.00 ft
Top Width:	3.63 ft	14.99 ft

	w/o Freeboard	w/ Freeboard
Velocity:	3.60 fps	
X-Section Area:	0.52 sq ft	
Hydraulic Radius:	0.140 ft	
Froude Number:	1.68	

Structure #9 (Null)

Null at Confluence with Culvert 40A and C-12 Channel

Structure #8 (Erodible Channel)

Collom Haul Road Ditch South

Triangular Erodible Channel Inputs:

Material: Shales and hardpans

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
7.0:1	1.5:1	5.9	0.0250				6.0

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	6.55 cfs	
Depth:	0.52 ft	
Top Width:	4.39 ft	
Velocity:	5.77 fps	
X-Section Area:	1.13 sq ft	
Hydraulic Radius:	0.251 ft	
Froude Number:	2.00	

Structure #6 (Culvert)

Culvert 40A - Half Culvert

Culvert Inputs:

Length (ft)	Slope (%)	Manning's n	Max. Headwater (ft)	Tailwater (ft)	Entrance Loss Coef. (Ke)
300.00	52.00	0.0150	2.00	0.00	0.90

Culvert Results:

Design Discharge = 7.95 cfs

Minimum pipe diameter: 1 - 18 inch pipe(s) required

Structure #3 (Riprap Channel)

C-1 Channel

Trapezoidal Riprap Channel Inputs:

Material: Riprap

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)
10.00	2.0:1	2.0:1	10.0	2.87		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	8.97 cfs	
Depth:	0.12 ft	2.99 ft
Top Width:	10.50 ft	21.98 ft
Velocity*:		
X-Section Area:	1.28 sq ft	
Hydraulic Radius:	0.121 ft	
Froude Number*:		
Manning's n*:		
Dmin:	2.00 in	
D50:	6.00 in	
Dmax:	7.50 in	

Velocity and Manning's n calculations may not apply for this method.

Structure #1 (Null)

Null At End of C-1 Ditch

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#12	1	0.700	0.012	0.000	0.000	47.000	S	0.00	0.000
	2	2.900	0.266	0.000	0.000	80.000	F	1.00	0.102
	Σ	**3.600**						**1.00**	**0.102**
#11	Σ	**3.600**						**1.00**	**0.102**
#10	1	12.000	0.187	0.000	0.000	47.000	S	0.00	0.000
	2	2.600	0.024	0.000	0.000	47.000	S	0.00	0.000
	3	2.700	0.309	0.000	0.000	80.000	F	0.88	0.094
	Σ	**20.900**						**1.87**	**0.196**
#9	Σ	**20.900**						**1.87**	**0.196**
#8	1	7.100	0.121	0.000	0.000	89.000	F	6.55	0.511
	Σ	**7.100**						**6.55**	**0.511**
#6	Σ	**28.000**						**7.95**	**0.707**
#3	1	1.400	0.005	0.000	0.000	85.000	F	1.02	0.076
	2	1.400	0.024	0.000	0.000	47.000	S	0.00	0.000
	3	2.100	0.044	0.000	0.000	47.000	S	0.00	0.000
	Σ	**32.900**						**8.97**	**0.783**
#1	Σ	**32.900**						**8.97**	**0.783**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#3	1	5. Nearly bare and untilled, and alluvial valley fans	52.00	74.36	143.00	7.210	0.005
#3	**1**	**Time of Concentration:**					**0.005**
#3	2	3. Short grass pasture	22.00	71.94	327.00	3.750	0.024
#3	**2**	**Time of Concentration:**					**0.024**
#3	3	3. Short grass pasture	11.00	46.97	427.00	2.650	0.044
#3	**3**	**Time of Concentration:**					**0.044**
#8	1	7. Paved area and small upland gullies	5.90	125.72	2,131.00	4.880	0.121
#8	**1**	**Time of Concentration:**					**0.121**
#10	1	3. Short grass pasture	8.00	122.32	1,529.00	2.260	0.187
#10	**1**	**Time of Concentration:**					**0.187**
#10	2	3. Short grass pasture	11.00	25.63	233.00	2.650	0.024
#10	**2**	**Time of Concentration:**					**0.024**

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#10	3	5. Nearly bare and untilled, and alluvial valley fans	1.70	24.61	1,448.00	1.300	0.309
#10	**3**	**Time of Concentration:**					**0.309**
#12	1	3. Short grass pasture	17.00	24.48	144.00	3.290	0.012
#12	**1**	**Time of Concentration:**					**0.012**
#12	2	5. Nearly bare and untilled, and alluvial valley fans	1.90	24.98	1,315.00	1.370	0.266
#12	**2**	**Time of Concentration:**					**0.266**

Table 13C-6A Demolition of Country Road 51 Crossing

Structure Name	Dimensions
County Road 51 Haul Road Crossing (Circular Area)	48'x24'217'

Note: Regrade requirements for this structure are contained in Table 13C-4 (stations 0+00 to 208+00). Topsoil requirements for this structure are contained in Table 13C-5 (stations 0+00 to 149+00), and revegetation requirements are contain in Table 13C-6.

Table 13C-6B Collom Haul Road Lighting

Task	
Remove Power Lines	9,617 Feet

Table 13C-6C Collom Haul Road Channels

Name	Topsoil (Cubic Yards)	Riprap (Cubic Yards)	Revegetation (Acres)
C-1	1606	121	1.2
C-2	968	10	3.6
C-3	268	61	0.2
C-4	1,339	28	1.0
C-5	67	39	0.05
C-6	254	15	0.2
C-7	241	0	0.2
C-8	803	0	0.3
C-9	0	0	0.3
C-10	807	0	1.7
C-11	484	0	1.4
C-12 & C-13	3,227	0	10.5
C-14	3,549	0	4.5
C-15	1,613	0	1.0