


TRI-STATE GENERATION AND TRANSMISSION ASSOCIATION, INC.
HEADQUARTERS: P.O. BOX 33695 DENVER, COLORADO 80233-0695 303-452-6111

January 12, 2021

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 No. 146
Work Area Pond

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 technical revision 146 (TR-146) to Permit No. C-1981-019.

TR-146 proposes to make the Work Area Pond a non-discharging structure by providing a hydrology model that demonstrates the pond can fully contain the 100-year, 24-hour storm event. The primary discharge structure for the Work Area Pond is also proposed to be removed under this technical revision.

Also included in this technical revision are a proposed public notice, and a change of index sheet to ease incorporation of this technical revision into the permit document. If you should have any additional questions or concerns, please feel free to contact Tony Tennyson at (970) 824-1232 at your convenience.

Sincerely,

DocuSigned by:

Daniel Casiraro

B70D69F114324DE...

Daniel J. Casiraro
 Senior Manager
 Environmental Services

DJC:TT:der

Enclosure

cc: Jennifer Maiolo (BLM-LSFO)
 Chris Gilbreath (via email)
 Tony Tennyson (via email)
 Angela Aalbers (via email)
 File: C. F. 1.1.2.127 - G471-11.3(21)d

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

Mine Company Name: Colowyo Coal Company

Permit Number: **C-1981-019**

Date: **January 6, 2021**

Revision Description: **TR-146 Work Area Pond**

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	Page Exh. 7-14TOC-2 (1 page)	Page Exh. 7-14TOC-2 (1 page)	Exh. 7-14TOC has been updated.
2C	Page Exh. 7-14TOC-2 (1 page)	Page Exh. 7-14TOC-2 (1 page)	Exh. 7-14TOC has been updated.
2D	Page Exh. 7-14TOC-2 (1 page)	Page Exh. 7-14TOC-2 (1 page)	Exh. 7-14TOC has been updated.
2D	Work Area Pond All Pages (95 pages)	Appendix Exh. 7-14WA Pages Exh. 7-14WA-1 and Exh. 7-14WA-2 (2 pages)	Appendix Exh. 7-14WA has updated the Work Area Pond.
2D		Figures Exh. 7-14WA-1 and 2 (2 pages)	Appendix Exh. 7-14WA figures have been updated.
2D		Appendix Exh. 7-14WA SEDCAD models (18 pages)	Appendix Exh. 7-14WA SEDCAD has been updated.
2E	Page Exh. 7-14TOC-2 (1 page)	Page Exh. 7-14TOC-2 (1 page)	Exh. 7-14TOC has been updated.
3			No Change
4			No Change
5A			No Change
5B			No Change
6			No Change
7	Map 12	Map 12	Map 12 has been updated.
8			No Change
9			No Change
10			No Change
12			No Change
13			No Change
14			No Change
15			No Change
16			No Change

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

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Date: **January 6, 2021**

Revision Description: **TR-146 Work Area Pond**

Volume Number	Page, Map or other Permit Entry to be REMOVED	Page, Map or other Permit Entry to be ADDED	Description of Change
17			No Change
18A			No Change
18B			No Change
18C			No Change
18D			No Change
19			No Change
20			No Change
21			No Change
22			No Change

- 16) Adjudicated and permitted surface and groundwater locations within 1 mile of the Permit boundary
- 18) Gulch A Small Area Exemption

Volume 2D

SEDCAD Modeling and Pond Design Maps — Sedimentation Ponds, 2002

Introductory Text

Methodologies and Assumptions for Sediment Pond Design

Streeter Pond

Appendix Exh 7-14WA Work Area Pond

Gossard Pond

Stoker Siding Pond

Rail Loop Pond

Volume 2E

SEDCAD Modeling and Pond Design Maps — Sedimentation Ponds, 2002

Prospect Pond – 007A

West Pit Pond – 008A

Section 16 Pond – 009A

East Taylor Pond – 010A

Taylor Pump Pond

(Note: For hydrology information in the South Taylor Area, See Volume 13, Exhibit 7-20.)

- 16) Adjudicated and permitted surface and groundwater locations within 1 mile of the Permit boundary
- 18) Gulch A Small Area Exemption

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- 16) Adjudicated and permitted surface and groundwater locations within 1 mile of the Permit boundary
- 18) Gulch A Small Area Exemption

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East Taylor Pond – 010A

Taylor Pump Pond

(Note: For hydrology information in the South Taylor Area, See Volume 13, Exhibit 7-20.)

Appendix Exh. 7-14WA Work Area Pond and Temporary Ditches

The location of the Work Area Pond is presented on Map 12. The as-built configuration for the Work Area Pond is presented on Figure Exh. 7-14WA-1, and Figure Exh. 7-14WA-2 provides the breakdown of drainage areas and hydrologic conditions for this sediment pond in the post mining condition.

Exhibit 7, Item 14 in Volume 2D describes the hydrologic methodology used in sediment pond and post mine channel assumptions. Runoff curve numbers assigned to the undisturbed and reclaimed lands in various stages of reclamation have been selected in accordance with Table 1 in the Introductory Text for Exhibit 7 in Volume 2D. For channels protected by a riprap liner, selection of minimum riprap size is done using the Simons/OSM method in SEDCADTM. For channels to be protected by a vegetative liner, the permissible velocities are also determined using SEDCADTM routines.

Work Area Pond

The following pages present the results of the SEDCADTM models for a conservative model conditions under the post mining condition. At this stage, the majority of the Colowyo facilities area is topsoil, seeded, does not have any vegetative growth, and is fully reporting to the Work Area Pond.

The SEDCADTM model herein provides the results of the 100 year 24 hour design storm and demonstrates the Work Area Pond will fully contain the model storm event below the emergency spillway.

The final post mining topographic surface as presented on Map 12 was used to model the watershed for the post-mining condition.

In summary, the post mining case at the Work Area Pond, the 100-year, 24-hour storm produces 8.16-acre feet of runoff. The storm peaks at the 7,153.17 elevation which is well below the emergency spillway elevation of 7,157'.

Temporary Conveyance Channels

The Work Area Pond has two temporary conveyance ditches that route water from the disturbances areas around the Colowyo facilities area to the Work Area Pond. The locations of both ditches are presented on Map 12 and Figure Exh. 7-14WA-2.

The assumed hydrologic condition for both temporary ditches is the post mine condition when the entire Work Area watershed is topsoiled, seeded, and reporting to the Work Area Pond.

North and South Facilities Ditches

The temporary North and South Facilities Ditches have been modeled under the 10-year, 24-hour storm event. Both ditches are trapezoidal in structure with a vegetative lining.

A SEDCAD model has been included below which evaluates the peak flow and total runoff volume for both ditches for the 10 year, 24-hour storm event. The ditch configurations for the 10 year, 24 hour storm event for both temporary ditches are summarized on the table below.

Facilities Ditches

<u>Station</u>	<u>Peak Flow (CFS)</u>	<u>Average Slope (%)</u>	<u>Channel Type</u>	<u>Side Slopes</u>	<u>Minimum Depth (Feet)</u>	<u>Erosion Protection</u>
South Facilities Ditch 0+00 to 33+92	16.44	5.2	Trapezoidal 2' bottom	1H:1V 1H:7V	1.18	Vegetation
North Facilities Ditch 0+00 to 5+00	20.24	5.1	Trapezoidal 2' bottom	2H:1V	1.38	Vegetation
North Facilities Ditch 5+00 to 21+76	14.86	2.8	Trapezoidal 2' bottom	1H:1V 1H:7V	1.36	Vegetation

Work Area Pond **100 Yr - 24 Hour Storm Event**

Emergency Spillway Demonstration
Post Mining Scenario
Total Containment

Tony Tennyson

Tri-State Generation & Transmission Association, Inc.
1100 West 116th Avenue
Westminster, CO 80234

Phone: 970-824-1232
Email: ttennyson@tristategt.org

General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	100 yr - 24 hr
Rainfall Depth:	2.700 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Null	#1	==>	End	0.000	0.000	Null Below Work Area Pond
Pond	#2	==>	#1	0.000	0.000	Work Area Pond
Channel	#3	==>	#2	0.000	0.000	South Facilities Ditch
Channel	#4	==>	#2	0.000	0.000	0+00 to 5+00 North Facilities Ditch
Culvert	#5	==>	#4	0.000	0.000	Culvert
Channel	#6	==>	#5	0.000	0.000	0+00 to 22+42 North Facilities Ditch



Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#6	48.200	48.200	35.60	3.26
#5	0.000	48.200	35.60	3.26
#4	14.300	62.500	48.54	4.43
#3	47.000	47.000	40.50	3.74
#2 In	0.000	109.500	88.91	8.16
Out			0.00	0.00
#1	0.000	109.500	0.00	0.00

Structure Detail:**Structure #6 (Vegetated Channel)***0+00 to 22+42 North Facilities Ditch*

Trapezoidal Vegetated Channel Inputs:

Material: Smooth brome

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
2.00	1.0:1	7.0:1	2.8	D, B				7.0

Vegetated Channel Results:

	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	35.60 cfs		35.60 cfs	
Depth:	1.16 ft		1.69 ft	
Top Width:	11.31 ft		15.54 ft	
Velocity:	4.59 fps		2.40 fps	
X-Section Area:	7.75 sq ft		14.85 sq ft	
Hydraulic Radius:	0.668 ft		0.930 ft	
Froude Number:	0.98		0.43	
Roughness Coefficient:	0.0414		0.0991	

Structure #5 (Culvert)*Culvert*

Culvert Inputs:

Length (ft)	Slope (%)	Manning's n	Max. Headwater (ft)	Tailwater (ft)	Entrance Loss Coef. (Ke)
200.00	1.50	0.0150	3.00	0.00	0.90

Culvert Results:

Design Discharge = 35.60 cfs

Minimum pipe diameter: 1 - 42 inch pipe(s) required

Structure #4 (Erodible Channel)*0+00 to 5+00 North Facilities Ditch*

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	1.0:1	7.0:1	5.1	0.0250				6.0

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	48.54 cfs	
Depth:	0.93 ft	
Top Width:	9.47 ft	
Velocity:	9.06 fps	
X-Section Area:	5.36 sq ft	
Hydraulic Radius:	0.552 ft	
Froude Number:	2.12	

Structure #3 (Vegetated Channel)

South Facilities Ditch

Trapezoidal Vegetated Channel Inputs:

Material: Smooth brome

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
2.00	1.0:1	7.0:1	5.2	D, B				6.0

Vegetated Channel Results:

	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	40.50 cfs		40.50 cfs	
Depth:	1.04 ft		1.49 ft	
Top Width:	10.34 ft		13.89 ft	
Velocity:	6.29 fps		3.43 fps	
X-Section Area:	6.44 sq ft		11.80 sq ft	
Hydraulic Radius:	0.607 ft		0.828 ft	
Froude Number:	1.41		0.66	
Roughness Coefficient:	0.0387		0.0873	

Structure #2 (Pond)

Work Area Pond

Pond Inputs:

Initial Pool Elev:	7,147.01 ft
Initial Pool:	0.00 ac-ft

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
7,157.00	50.00	2.00:1	2.00:1	15.00

Pond Results:

Peak Elevation:	7,153.17 ft
Dewater Time:	0.00 days

Dewatering time is calculated from peak stage to lowest spillway

Elevation-Capacity-Discharge Table

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)
7,147.00	0.000	0.000	0.000	
7,147.01	0.005	0.000	0.000	
7,148.00	0.523	0.191	0.000	
7,149.00	0.861	0.876	0.000	
7,150.00	0.971	1.791	0.000	
7,151.00	1.943	3.220	0.000	
7,152.00	2.300	5.340	0.000	
7,153.00	2.488	7.733	0.000	
7,153.17	2.479	8.159	0.000	0.00 Peak Stage
7,154.00	2.607	10.281	0.000	
7,155.00	2.690	12.929	0.000	
7,156.00	2.792	15.670	0.000	
7,157.00	2.913	18.522	0.000	Spillway #1
7,158.00	3.033	21.494	28.839	
7,159.00	3.172	24.596	112.896	

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
7,147.00	0.000	0.000
7,147.01	0.000	0.000
7,148.00	0.000	0.000
7,149.00	0.000	0.000
7,150.00	0.000	0.000
7,151.00	0.000	0.000
7,152.00	0.000	0.000
7,153.00	0.000	0.000
7,154.00	0.000	0.000
7,155.00	0.000	0.000
7,156.00	0.000	0.000
7,157.00	0.000	0.000
7,158.00	28.839	28.839
7,159.00	112.896	112.896

Structure #1 (Null)

Null Below Work Area Pond

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)
#6	1	37.100	0.139	0.000	0.000	80.000	F	35.10	3.067
	2	6.600	0.064	0.000	0.000	57.000	S	0.80	0.089
	3	4.500	0.052	0.000	0.000	62.000	M	1.38	0.107
	Σ	48.200						35.60	3.264
#5	Σ	48.200						35.60	3.264
#4	1	14.300	0.199	0.000	0.000	80.000	F	13.03	1.162
	Σ	62.500						48.54	4.426
#3	1	45.800	0.231	0.000	0.000	80.000	F	40.50	3.738
	2	1.200	0.032	0.000	0.000	47.000	S	0.00	0.000
	Σ	47.000						40.50	3.738
#2	Σ	109.500						88.91	8.163
#1	Σ	109.500						0.00	0.000

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	6.10	125.17	2,052.00	2.460	0.231
#3	1	Time of Concentration:					0.231
#3	2	3. Short grass pasture	1.50	1.69	113.00	0.970	0.032
#3	2	Time of Concentration:					0.032
#4	1	5. Nearly bare and untilled, and alluvial valley fans	5.80	99.76	1,720.00	2.400	0.199
#4	1	Time of Concentration:					0.199
#6	1	5. Nearly bare and untilled, and alluvial valley fans	6.10	75.45	1,237.00	2.460	0.139
#6	1	Time of Concentration:					0.139
#6	2	3. Short grass pasture	2.00	5.24	262.00	1.130	0.064
#6	2	Time of Concentration:					0.064
#6	3	3. Short grass pasture	2.00	4.25	213.00	1.130	0.052
#6	3	Time of Concentration:					0.052

Work Area Pond

10 Yr - 24 Hour Storm Event

Temporary Ditch Demonstration
Post Mining Scenario

Tony Tennyson

Tri-State Generation & Transmission Association, Inc.
1100 West 116th Avenue
Westminster, CO 80234

Phone: 970-824-1232
Email: ttennyson@tristategt.org

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 Below Work Area Pond
Pond	#2	==>	#1	0.000	0.000	Work Area Pond
Channel	#3	==>	#2	0.000	0.000	South Facilities Ditch
Channel	#4	==>	#2	0.000	0.000	0+00 to 5+00 North Facilities Ditch
Culvert	#5	==>	#4	0.000	0.000	Culvert
Channel	#6	==>	#5	0.000	0.000	0+00 to 22+42 North Facilities Ditch



Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#6	48.200	48.200	14.86	1.34
#5	0.000	48.200	14.86	1.34
#4	14.300	62.500	20.24	1.85
#3	47.000	47.000	16.44	1.61
#2 In	0.000	109.500	36.65	3.46
Out			0.00	0.00
#1	0.000	109.500	0.00	0.00

Structure Detail:**Structure #6 (Vegetated Channel)***0+00 to 22+42 North Facilities Ditch*

Trapezoidal Vegetated Channel Inputs:

Material: Smooth brome

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
2.00	1.0:1	7.0:1	2.8	D, B				7.0

Vegetated Channel Results:

	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	14.86 cfs		14.86 cfs	
Depth:	0.86 ft		1.36 ft	
Top Width:	8.86 ft		12.89 ft	
Velocity:	3.19 fps		1.47 fps	
X-Section Area:	4.66 sq ft		10.13 sq ft	
Hydraulic Radius:	0.514 ft		0.766 ft	
Froude Number:	0.77		0.29	
Roughness Coefficient:	0.0502		0.1422	

Structure #5 (Culvert)*Culvert*

Culvert Inputs:

Length (ft)	Slope (%)	Manning's n	Max. Headwater (ft)	Tailwater (ft)	Entrance Loss Coef. (Ke)
200.00	1.50	0.0150	3.00	0.00	0.90

Culvert Results:

Design Discharge = 14.86 cfs

Minimum pipe diameter: 1 - 21 inch pipe(s) required

Structure #4 (Vegetated Channel)*0+00 to 5+00 North Facilities Ditch*

Trapezoidal Vegetated Channel Inputs:

Material: Smooth brome

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
2.00	2.0:1	2.0:1	5.1	D, B				6.0

Vegetated Channel Results:

	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	20.24 cfs		20.24 cfs	
Depth:	0.92 ft		1.38 ft	
Top Width:	5.67 ft		7.50 ft	
Velocity:	5.76 fps		3.10 fps	
X-Section Area:	3.52 sq ft		6.53 sq ft	
Hydraulic Radius:	0.576 ft		0.801 ft	
Froude Number:	1.29		0.59	
Roughness Coefficient:	0.0404		0.0937	

Structure #3 (Vegetated Channel)

South Facilities Ditch

Trapezoidal Vegetated Channel Inputs:

Material: Smooth brome

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
2.00	1.0:1	7.0:1	5.2	D, B				6.0

Vegetated Channel Results:

	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	16.44 cfs		16.44 cfs	
Depth:	0.76 ft		1.18 ft	
Top Width:	8.07 ft		11.46 ft	
Velocity:	4.30 fps		2.07 fps	
X-Section Area:	3.82 sq ft		7.95 sq ft	
Hydraulic Radius:	0.463 ft		0.677 ft	
Froude Number:	1.10		0.44	

	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Roughness Coefficient:	0.0472		0.1267	

Structure #2 (Pond)

Work Area Pond

Pond Inputs:

Initial Pool Elev:	7,147.01 ft
Initial Pool:	0.00 ac-ft

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
7,157.00	50.00	2.00:1	2.00:1	15.00

Pond Results:

Peak Elevation:	7,151.11 ft
Dewater Time:	0.00 days

Dewatering time is calculated from peak stage to lowest spillway

Elevation-Capacity-Discharge Table

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)
7,147.00	0.000	0.000	0.000	
7,147.01	0.005	0.000	0.000	
7,148.00	0.523	0.191	0.000	
7,149.00	0.861	0.876	0.000	
7,150.00	0.971	1.791	0.000	
7,151.00	1.943	3.220	0.000	
7,151.11	1.710	3.458	0.000	0.00 Peak Stage
7,152.00	2.300	5.340	0.000	
7,153.00	2.488	7.733	0.000	
7,154.00	2.607	10.281	0.000	
7,155.00	2.690	12.929	0.000	
7,156.00	2.792	15.670	0.000	
7,157.00	2.913	18.522	0.000	Spillway #1
7,158.00	3.033	21.494	28.839	
7,159.00	3.172	24.596	112.896	

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
7,147.00	0.000	0.000
7,147.01	0.000	0.000
7,148.00	0.000	0.000
7,149.00	0.000	0.000
7,150.00	0.000	0.000
7,151.00	0.000	0.000
7,152.00	0.000	0.000
7,153.00	0.000	0.000
7,154.00	0.000	0.000
7,155.00	0.000	0.000
7,156.00	0.000	0.000
7,157.00	0.000	0.000
7,158.00	28.839	28.839
7,159.00	112.896	112.896

Structure #1 (Null)

Null Below Work Area Pond

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)
#6	1	37.100	0.139	0.000	0.000	80.000	F	14.86	1.325
	2	6.600	0.064	0.000	0.000	57.000	S	0.01	0.001
	3	4.500	0.052	0.000	0.000	62.000	M	0.03	0.018
	Σ	48.200						14.86	1.344
#5	Σ	48.200						14.86	1.344
#4	1	14.300	0.199	0.000	0.000	80.000	F	5.38	0.502
	Σ	62.500						20.24	1.845
#3	1	45.800	0.231	0.000	0.000	80.000	F	16.44	1.614
	2	1.200	0.032	0.000	0.000	47.000	S	0.00	0.000
	Σ	47.000						16.44	1.614
#2	Σ	109.500						36.65	3.460
#1	Σ	109.500						0.00	0.000

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	6.10	125.17	2,052.00	2.460	0.231
#3	1	Time of Concentration:					0.231
#3	2	3. Short grass pasture	1.50	1.69	113.00	0.970	0.032
#3	2	Time of Concentration:					0.032
#4	1	5. Nearly bare and untilled, and alluvial valley fans	5.80	99.76	1,720.00	2.400	0.199
#4	1	Time of Concentration:					0.199
#6	1	5. Nearly bare and untilled, and alluvial valley fans	6.10	75.45	1,237.00	2.460	0.139
#6	1	Time of Concentration:					0.139
#6	2	3. Short grass pasture	2.00	5.24	262.00	1.130	0.064
#6	2	Time of Concentration:					0.064
#6	3	3. Short grass pasture	2.00	4.25	213.00	1.130	0.052
#6	3	Time of Concentration:					0.052

- 16) Adjudicated and permitted surface and groundwater locations within 1 mile of the Permit boundary
- 18) Gulch A Small Area Exemption

Volume 2D

SEDCAD Modeling and Pond Design Maps — Sedimentation Ponds, 2002

Introductory Text

Methodologies and Assumptions for Sediment Pond Design

Streeter Pond

Appendix Exh 7-14WA Work Area Pond

Gossard Pond

Stoker Siding Pond

Rail Loop Pond

Volume 2E

SEDCAD Modeling and Pond Design Maps — Sedimentation Ponds, 2002

Prospect Pond – 007A

West Pit Pond – 008A

Section 16 Pond – 009A

East Taylor Pond – 010A

Taylor Pump Pond

(Note: For hydrology information in the South Taylor Area, See Volume 13, Exhibit 7-20.)