TRI-STATE

April 10, 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 159 (TR-159)
East Pit Access Roads

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 159 (TR-159) to Permit No. C-1981-019.

TR-159 proposes access roads in the East Pit reclamation areas to construct sediment ponds and manage post mine channels and stock ponds. TR-159 also includes disturbance acres for a borrow area directly north of the Section 3 Ponds locations to facilitate construction of both ponds this summer, and TR-159 proposes to revised Reach 1 of the Final East Pit Ditch from a nonerobile channel to a riprap lined channel.

Included in this technical revision is a change of index sheet to ease incorporation of this revision into the permit document, and a public notice for the Division's review. Finally, it is requested that the Division calculate the revised reclamation liability proposed under this technical revision. If you should have any additional questions or concerns, 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

P.O. BOX 33695
DENVER, CO 80233-0695
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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: **April 6, 2023**

Revision Description: **TR-159 East Pit Access Roads and Borrow Area**

Volume Number	Page, Map or other Permit Entry to be REMOVED		Page, Map or other Permit Entry to be ADDED		Description of Change
1	Pages 4-5 and 4-6 (2 pages)		Pages 4-5 and 4-6 (2 pages)		Section 4.03.2 has been updated.
2A					No Change
2B					No Change
2C	Appendix Exh. 7-14R All pages (36 pages)		Appendix Exh. 7-14R, Pages Exh. 7-14R-1 and 2 (2 pages), SEDCAD output (2 pages), and Figure Exh. 7-14R-1		Appendix Exh. 7-14R has been updated with access roads for the East Pit.
2D			.		No Change
2E	Appendix Exh. 7-14PP Page Exh. 7-14PP-4 and SEDCAD Models 10-Yr, 24-Hr (51 pages) and 25-Yr, 24-Hr (39 pages)		Appendix Exh. 7-14PP Page Exh. 7-14PP-4 and SEDCAD Models 10-Yr, 24-Hr (51 pages) and 25-Yr, 24-Hr (39 pages)		Reach 1 of the Final East Pit Ditch was revised from a nonerobile channel to a riprap lined channel.
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

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Date: **April 6, 2023**

Revision Description: **TR-159 East Pit Access Roads and Borrow Area**

Volume Number	Page, Map or other Permit Entry to be REMOVED		Page, Map or other Permit Entry to be ADDED		Description of 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

4.03.2 Access Roads

The Taylor Creek Access Road provides access to the East Taylor Ponds from Haul Road A. The Taylor Creek Access Road is a pre-mining two-track or ranch road that has been upgraded for a more stable driving surface than the pre-mining road provided. The Taylor Creek Access Road will not meet all the requirements for an access road under Rule 4.03.2 as the existing road will be graveled, and a small berm is constructed to meet MSHA requirements. Please see Map 25C for design details for the Taylor Creek Access Road. The Taylor Creek Access Road has been requested by the surface landowner to remain as a permanent structure. Please see Volume 2B, Exhibit 1B for request of the Taylor Creek Access Road to remain post mine.

Information related to the Sturgeon Access Road is found in Volume 12, Section 4.03.2.

Several access roads will be constructed in the East Pit to allow access to manage post-mine channels, stock ponds, and to construct sediment ponds. Please refer to Volume 2E, Appendix Exh. 7-14R for additional details on the East Pit Access Roads.

4.03.3 Light-Use Roads

The location of light-use roads will be determined on the basis of the progress of the mining operation and specific design and environmental considerations. Typical light-use roads will be "access" roads of recent construction in the pit areas for blasting and maintenance, exploration roads, and reclamation access roads.

Light-use roads, whether in the pit or other areas, will be constructed using the best technology currently available, to the extent possible, to avoid damage to fish, wildlife, and related environmental values and to prevent additional contribution of suspended solids to runoff outside the permit area. Roads in the pit areas will be constructed on an already disturbed material. Reclamation access roads and exploration roads will be restored immediately after they are no longer needed. Information contained in Section 2.05.6 reveals that no fish and wildlife damage will result from mining operations, including the construction or operation of light-use roads. The light-use roads will be used by pick-ups, light-duty service trucks, track-mounted overburden drilling rigs and tractors.

The location of the light-use roads will be determined largely by the immediate need of the mining operations. They will not be located in the channel of any major drainage unless specifically approved by the Division.

Light-use road construction will generally require no topsoil removal. Roads in pit areas will already have been pre-stripped of topsoil for mining and the construction of exploration roads will only require removal of any large vegetation.

Light-use road maintenance will include maintaining natural drainages across the roadway and periodic dozing to remove loose material which might contribute to sedimentation or road instability.

A number of light use roads (See Maps 21 and 22) consist of pre-existing ranch roads which existed prior to mining activities and will be left in place after mining activities have ceased and, as such, they will not be reclaimed. Colowyo intends to infrequently travel or use such roads, with the main usage being pond monitoring and maintenance, sediment control ditch monitoring and maintenance, groundwater monitor well access, meteorological/air monitoring station access, etc. Examples of such light use roads include, but are not limited to, roads to the West Pit, East Taylor, and Prospect Ponds, access to the south collection ditch, etc.

A light-use road will be used to facilitate shorter equipment movements to additional areas of the northern end of the mine. This light-use road begins south of the fuel storage tanks and continues in a northwest direction towards the main coal haulage road with an approximate width of 30 feet and a length of approximately 1200 feet. It enters the main coal haulage road just below the traffic pattern crossover. Topsoil was stripped in accordance with Rule 4.06.2 and placed on topsoil pile 15A directly to the west of the road. Maintenance will include maintaining natural drainage across the roadway and maintenance of a swale on the northern portion of the road which will transfer runoff to the existing ditch. Reclamation of this light-use road will be completed immediately after the road is no longer needed for operations and will be reclaimed in accordance with Rule 4.03.3(7). The road was field designed in accordance with Rule 4.03.3.

4.04 SUPPORT FACILITIES

The support facilities used at the mining operation, including the office, shop and warehouse complex, the coal handling and loadout facilities are shown on the Existing Structures - North Map (Map 21) and the Existing Structures - South Map (Map 22). Many of the support structures were constructed at the mine start-up in 1976-1977. The complete discussion on all the support facilities is found under Section 2.05.3. Detailed drainage and sediment control has been developed for the mining operation as discussed in Section 2.05.3. All sediment control measures have been designed to prevent damage to wildlife and other related environmental values; also, sediment control structures have been designed to prevent contributions of suspended solids to runoff outside the permit area in excess of the limitations of both federal and state law.

There are no operating oil or gas wells at or around the planned mine; likewise, there is no coal slurry pipeline planned or around the mining area. The only operating railroad in the vicinity of the mine is the Colowyo spur line that serves the operation. All White River Electric power lines are located out of the actual mining area. Colorado-Ute Electric Association has a power line in the path of future mining. Portions of this line will be relocated as required. The Mountain Bell telephone lines are located at a distance from the actual mining areas. All water and sewer lines located in the permit area serve the Colowyo structures and are located away from the actual mining areas.

Appendix Exh. 7-14R
East Pit Access Roads

This section addresses access roads within the disturbed area of the East Pit and Section 16 reclamation areas to build, operate, and maintain sediment ponds, post mine channels, and stock ponds.

Figure Exh. 7-14R-1 provides the locations of the access roads. The alignments shown on Figure Exh. 7-14R-1 are approximated with the most up to date data available to Colowyo's engineering team. Final alignment will be determined during construction as several of the access roads are on steep slopes, and the alignment may need to be adjusted during construction to take advantage of actual on the ground conditions encountered to guarantee the access roads can be constructed properly for the safe passage of equipment.

Topsoil will be removed from all access road footprints, and the access road will be graveled except for the Temporary Access Road. The Temporary Access Road will, as the name implies, will be temporarily constructed for equipment to access Reach 1 of the Final East Pit Ditch. This access road will be reclaimed in accordance with Rule 4.03.2(7) once construction of Reach 1 is completed.

Surface water drainage from the access roads is within the primary sediment controls systems of Prospect, Section 3, and Section 15 Ponds. However, local erosion control measures for all access roads as required by Rule 4.03.2(4)(b) will consist of graveled surfaces (except for the Temporary Access Road), localized swales to route surface water runoff from the access road to vegetated sediment filters. Temporary sediment control measures for the Temporary Access Road will wattles, silt fence or other products as deemed necessary by Colowyo, which will be moved once the Temporary Access Road is reclaimed.

Culverts will be installed in two locations where segments of the East Pit Access Road will cross the North Tributary East Pit Ditch Reach 1 and Reach 2. Please refer to Figure Exh. 7-14R-1 for the crossing locations. Culverts have been designed to safely pass the 25-Year, 24-Hour event.

The peak discharge flow for both culverts can be found in Appendix Exh. 7-14PP, 25-Year, 24-Hour storm event (Structure Nos. 16 and 20). For ease and a conservative design, the North Tributary East Pit Ditch Reach 2 design flow (Structure 16 at 4.07 cfs) was used to model culverts in both reaches. As indicated on the attached SEDCAD™ a 10-inch culvert will suffice for both crossings. Colowyo may installed larger culverts than 10-inch depending on availability.

Additionally, Colowyo may decide to install a polyethylene pipe instead of a corrugated metal pipe, the included SEDCAD™ is for a corrugated metal pipe with a Manning's n of 0.015. In SEDCAD™ a polyethylene pipe has a Manning's n of 0.014; which does not change the minimum required culvert size. Two SEDCAD™ demonstrations for the culverts are included to demonstrate this.

All access roads will be used for long-term monitoring and maintenance of the East Pit and Section 16 sediment control structures and post-mine features. Unless the landowner requests the access roads to remain permanently at a later date, all access roads will be reclaimed in accordance with 4.03.2(7).

Culvert Inputs:

Length (ft)	Slope (%)	Manning's n	Max. Headwater (ft)	Tailwater (ft)	Entrance Loss Coef. (Ke)
50.00	12.00	0.0150	3.00	0.00	0.90

Culvert Results:

Minimum pipe diameter: 1 - 10 inch pipe(s) required

Detailed Performance Curves

Design Discharge = 4.07 cfs

Maximum Headwater = 3.00 ft

(BOLD indicates design pipe size)

Headwater (ft)	Discharge (cfs) (8 in)	**Discharge (cfs) (10 in)**	Discharge (cfs) (12 in)
0.30	0.23	**0.29**	0.35
0.60	0.66	**0.81**	0.98
0.90	1.10	**1.48**	1.79
1.20	1.46	**2.09**	2.70
1.50	1.75	**2.56**	3.44
1.80	1.98	**2.96**	4.05
2.10	2.20	**3.32**	4.58
2.40	2.40	**3.63**	5.06
2.70	2.58	**3.93**	5.49
3.00	2.75	**4.20**	5.90
3.30	2.91	**4.45**	6.28
3.60	3.06	**4.70**	6.63
3.90	3.21	**4.92**	6.96
4.20	3.35	**5.14**	7.29
4.50	3.47	**5.36**	7.59

Culvert Inputs:

Length (ft)	Slope (%)	Manning's n	Max. Headwater (ft)	Tailwater (ft)	Entrance Loss Coef. (Ke)
50.00	12.00	0.0140	3.00	0.00	0.90

Culvert Results:

Minimum pipe diameter: 1 - 10 inch pipe(s) required

Detailed Performance Curves

Design Discharge = 4.07 cfs

Maximum Headwater = 3.00 ft

(BOLD indicates design pipe size)

Headwater (ft)	Discharge (cfs) (8 in)	**Discharge (cfs) (10 in)**	Discharge (cfs) (12 in)
0.30	0.23	**0.29**	0.35
0.60	0.66	**0.81**	0.98
0.90	1.10	**1.48**	1.79
1.20	1.46	**2.09**	2.70
1.50	1.75	**2.56**	3.44
1.80	1.98	**2.96**	4.05
2.10	2.20	**3.32**	4.58
2.40	2.40	**3.63**	5.06
2.70	2.58	**3.93**	5.49
3.00	2.75	**4.20**	5.90
3.30	2.91	**4.45**	6.28
3.60	3.06	**4.70**	6.63
3.90	3.21	**4.92**	6.96
4.20	3.35	**5.14**	7.29
4.50	3.47	**5.36**	7.59

EP3 Inlet Ditch	0.68	4.8	Trapezoidal 12' bottom	2H:1V	Riprap, D50 = 3"
EP3 Outlet Ditch	0.34	3.6	Trapezoidal 12' bottom	2H:1V	Riprap, D50 = 9"

Final East Pit Ditch

Station	Peak Flow (CFS)	Average Slope (%)	Channel Type	Side Slopes	Erosion Protection
Reach 1*	2.24	21.1	Trapezoidal 12' bottom	2H:1V	Riprap D50 = 6"
Reach 2*	3.47	10.0	Trapezoidal 12' bottom	2H:1V	Riprap, D50 = 3"
Reach 3	5.43	6.4	Trapezoidal 12' bottom	3H:1V	Riprap, D50 = 3"

***** Within Reaches 1 and 2, at intervals determined by the field engineer intervals, stability structures (gabion walls) will be constructed within the these reaches to ensure riprap lining remains in place and the ditch functions as designed.

Section 16 Fill Ditch

Station	Peak Flow (CFS)	Average Slope (%)	Channel Type	Side Slopes	Erosion Protection
0+00 to 8+60	0.64	17.8	Trapezoidal 12' bottom	3H:1V	Riprap, D50 = 6"

Appendix Exh. 7-14PP
Prospect Pond

10- Year 24-Hour Storm Event

Effluent Deomonstration

General Information

Storm Information:

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

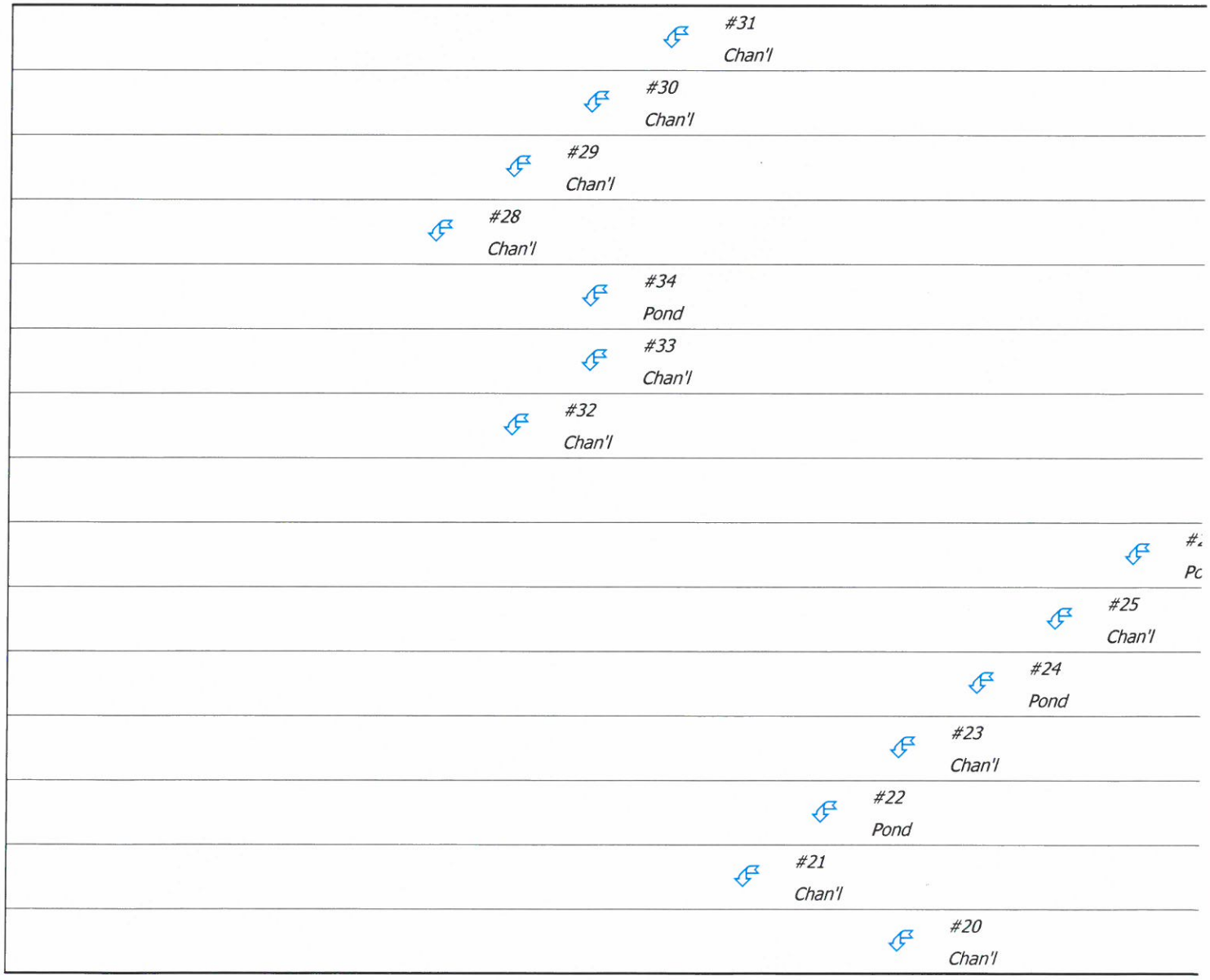
Particle Size Distribution:

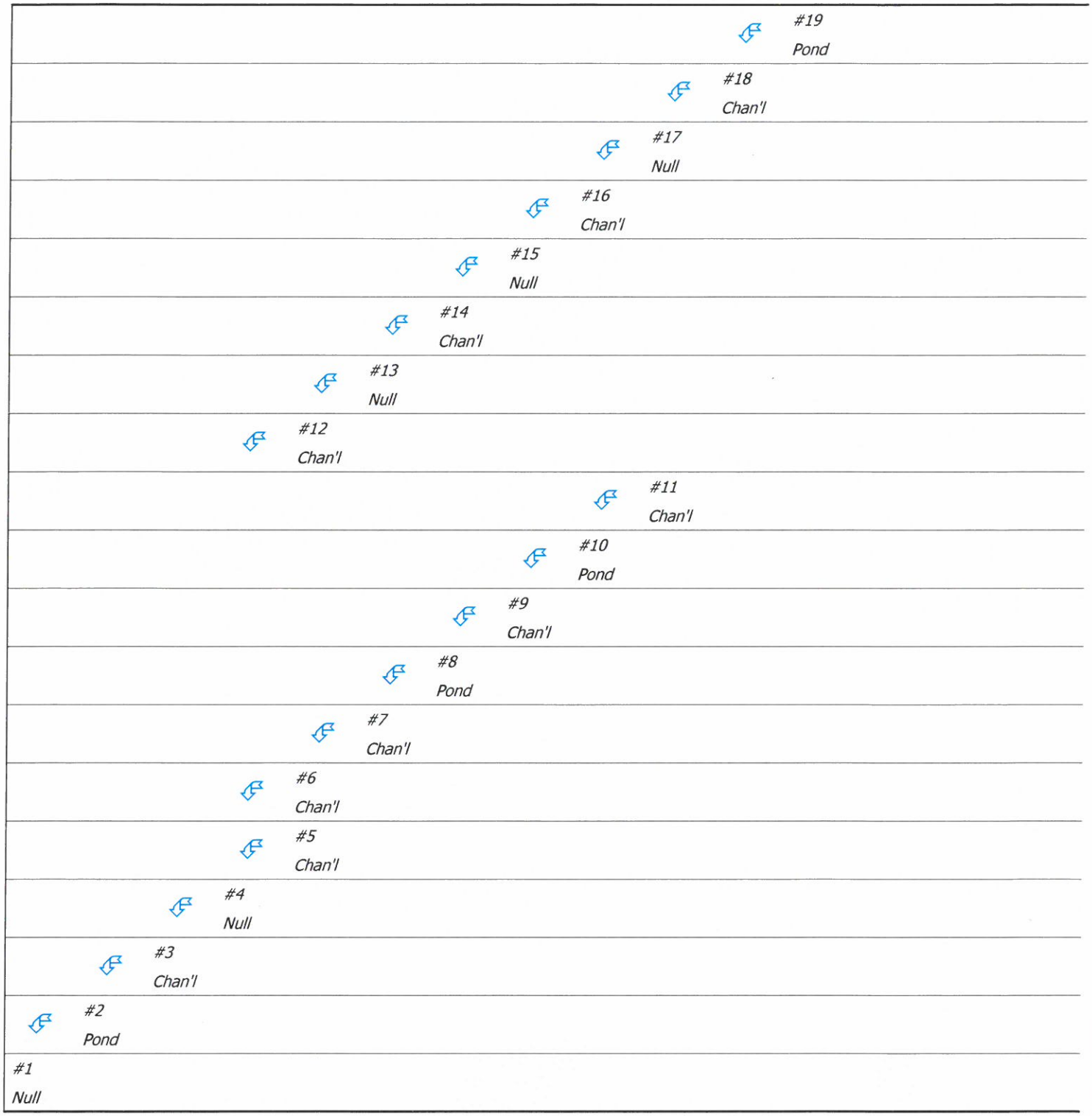
Size (mm)	Colowyo Particle Size
4.7500	100.000%
0.0750	73.000%
0.0400	33.000%
0.0010	20.000%

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Null	#1	==>	End	0.000	0.000	Null Below Prospect Pond
Pond	#2	==>	#1	0.000	0.000	Prospect Pond
Channel	#3	==>	#2	0.000	0.000	Natural Channel Above Prospect Pond
Null	#4	==>	#3	0.000	0.000	Confluence Prospect & South Collection Ditches
Channel	#5	==>	#4	0.000	0.000	Prospect Collection Ditch
Channel	#6	==>	#4	0.000	0.000	Natural Channel Below Reach 1 Prospect Ditch
Channel	#7	==>	#6	0.000	0.000	Prospect Ditch Reach 1
Pond	#8	==>	#7	0.000	0.000	PD1 Stockpond
Channel	#9	==>	#8	0.000	0.000	Prospect Ditch Reach 2
Pond	#10	==>	#9	0.000	0.000	PD2 Stockpond
Channel	#11	==>	#10	0.000	0.000	Prospect Ditch Reach 3
Channel	#12	==>	#4	0.000	0.000	South Collection Ditch Station 0+00 to 30+00
Null	#13	==>	#12	0.000	0.000	Confluence of Final East Pit Ditch & South Collection Ditch at Station 30+00
Channel	#14	==>	#13	0.000	0.000	Final East Pit Ditch Reach 1 to Confluence w/North Trib Final East Pit Ditch
Null	#15	==>	#14	0.000	0.000	Confluence Final East Pit Ditch and North Tributary East Pit Ditch
Channel	#16	==>	#15	0.000	0.000	North Tributary Final East Pit Ditch Reach 1 to Confluence w/EP3 Outlet Ditch
Null	#17	==>	#16	0.000	0.000	Confluence North Tributary East Pit Ditch and EP3 Outlet Ditch
Channel	#18	==>	#17	0.000	0.000	North Tributary Final East Pit Ditch Reach 1 from Confluence of EP3 Outlet to NTEP1
Pond	#19	==>	#18	0.000	0.000	NTEP1 Stockpond
Channel	#20	==>	#19	0.000	0.000	North Tributary Final East Pit Ditch Reach 2
Channel	#21	==>	#17	0.000	0.000	EP3 Stockpond Outlet Ditch
Pond	#22	==>	#21	0.000	0.000	EP3 Stockpond
Channel	#23	==>	#22	0.000	0.000	EP3 Stockpond Inlet Ditch
Pond	#24	==>	#23	0.000	0.000	EP1 Stockpond (to EP3 Stockpond)
Channel	#25	==>	#24	0.000	0.000	Final East Pit Ditch Reach 2
Pond	#26	==>	#25	0.000	0.000	EP2 Stockpond
Channel	#27	==>	#26	0.000	0.000	Final East Pit Ditch Reach 3
Channel	#28	==>	#13	0.000	0.000	South Collection Ditch 30+00 to 90+00

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#29	==>	#28	0.000	0.000	South Collection Ditch 90+00 to 92+68
Channel	#30	==>	#29	0.000	0.000	Natural Channel from Section 16 Fill Ditch to South Collection Ditch
Channel	#31	==>	#30	0.000	0.000	Section 16 Fill Ditch
Channel	#32	==>	#14	0.000	0.000	Final East Pit Ditch Reach 1 from NTEP confluence to Station 8+06
Channel	#33	==>	#32	0.000	0.000	Final East Pitch Ditch Reach 1 from Station 8+06 to EP1
Pond	#34	==>	#32	0.000	0.000	EP1 Stockpond (to Final East Pit Ditch) Reach 1




#19
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Structure Summary:

		Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)	Sediment (tons)	Peak Sediment Conc. (mg/l)	Peak Settleable Conc. (ml/l)	24VW (ml/l)
#31		21.500	21.500	0.08	0.06	0.3	4,344	2.01	1.73
#30		19.600	41.100	0.08	0.06	0.3	4,344	2.01	1.73
#29		2.400	43.500	0.08	0.06	0.3	4,344	2.01	1.73
#28		181.700	225.200	0.13	0.08	0.3	3,438	1.60	1.26
#34	In	5.000	5.000	0.46	0.05	0.0	104	0.06	0.02
	Out			0.10	0.05	0.0	1	0.00	0.00
#33		3.000	3.000	0.02	0.01	0.0	417	0.24	0.19
#32		12.300	20.300	0.22	0.11	0.1	436	0.25	0.20
#27		69.700	69.700	3.09	0.43	9.4	65,396	37.25	8.98
#26	In	0.000	69.700	3.09	0.43	9.4	65,396	37.25	8.98
	Out			0.38	0.43	0.0	1	0.00	0.00
#25		22.300	92.000	0.49	0.52	0.1	245	0.14	0.06
#24	In	0.000	92.000	0.49	0.52	0.1	245	0.14	0.06
	Out			0.49	0.52	0.0	1	0.00	0.00
#23		4.900	96.900	0.52	0.54	0.0	37	0.02	0.01
#22	In	0.000	96.900	0.52	0.54	0.0	37	0.02	0.01
	Out			0.51	0.54	0.0	1	0.00	0.00
#21		1.300	98.200	0.51	0.54	0.0	1	0.00	0.00
#20		44.500	44.500	0.14	0.09	0.0	365	0.18	0.16
#19	In	0.000	44.500	0.14	0.09	0.0	365	0.18	0.16
	Out			0.00	0.00	0.0	0	0.00	0.00
#18		11.200	55.700	0.05	0.03	0.0	353	0.27	0.20
#17		0.000	153.900	0.54	0.57	0.0	52	0.04	0.01
#16		1.900	155.800	0.56	0.57	0.1	103	0.08	0.01
#15		0.000	155.800	0.56	0.57	0.1	103	0.08	0.01
#14		6.100	182.200	0.73	0.69	0.1	245	0.16	0.06
#13		0.000	407.400	0.85	0.78	0.4	541	0.28	0.20
#12		59.000	466.400	0.99	0.86	0.5	963	0.50	0.23
#11		18.300	18.300	0.07	0.04	0.0	182	0.10	0.08
#10	In	0.000	18.300	0.07	0.04	0.0	182	0.10	0.08
	Out			0.06	0.04	0.0	0	0.00	0.00
#9		21.400	39.700	0.09	0.06	0.0	131	0.07	0.05
#8	In	0.000	39.700	0.09	0.06	0.0	131	0.07	0.05
	Out			0.09	0.06	0.0	0	0.00	0.00
#7		59.200	98.900	0.24	0.15	0.1	397	0.23	0.15
#6		56.600	155.500	0.26	0.16	0.3	1,343	0.77	0.67
#5		28.300	28.300	0.08	0.06	0.2	2,687	1.34	1.19

		Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)	Sediment (tons)	Peak Sediment Conc. (mg/l)	Peak Settleable Conc. (ml/l)	24VW (ml/l)
#4		0.000	650.200	1.31	1.09	1.0	1,110	0.59	0.36
#3		16.300	666.500	1.35	1.12	1.5	1,510	0.82	0.54
#2	In	0.000	666.500	1.35	1.12	1.5	1,510	0.82	0.54
	Out			0.30	0.75	0.0	51	0.00	0.00
#1		0.000	666.500	0.30	0.75	0.0	51	0.00	0.00

Particle Size Distribution(s) at Each Structure

Structure #31 (Section 16 Fill Ditch):

Size (mm)	In/Out
4.7500	100.000%
0.0750	100.000%
0.0400	48.495%
0.0010	29.391%

Structure #30 (Natural Channel from Section 16 Fill Ditch to South Collection Ditch):

Size (mm)	In/Out
4.7500	100.000%
0.0750	100.000%
0.0400	48.495%
0.0010	29.391%

Structure #29 (South Collection Ditch 90+00 to 92+68):

Size (mm)	In/Out
4.7500	100.000%
0.0750	100.000%
0.0400	48.495%
0.0010	29.391%

Structure #28 (South Collection Ditch 30+00 to 90+00):

Size (mm)	In/Out
4.7500	100.000%
0.0750	99.373%
0.0400	48.135%
0.0010	29.173%

Structure #34 (EP1 Stockpond (to Final East Pit Ditch) Reach 1):

Size (mm)	In	Out
4.7500	100.000%	100.000%
0.0750	73.000%	100.000%
0.0400	33.000%	100.000%
0.0010	20.000%	100.000%

Structure #33 (Final East Pitch Ditch Reach 1 from Station 8+06 to EP1):

Size (mm)	In/Out
4.7500	100.000%
0.0750	73.000%
0.0400	33.000%
0.0010	20.000%

Structure #32 (Final East Pit Ditch Reach 1 from NTEP confluence to Station 8+06):

Size (mm)	In/Out
4.7500	100.000%
0.0750	73.000%
0.0400	33.000%
0.0010	20.000%

Structure #27 (Final East Pit Ditch Reach 3):

Size (mm)	In/Out
4.7500	100.000%
0.0750	73.116%
0.0400	33.052%
0.0010	20.032%

Structure #26 (EP2 Stockpond):

Size (mm)	In	Out
4.7500	100.000%	100.000%
0.0750	73.116%	100.000%
0.0400	33.052%	100.000%
0.0010	20.032%	100.000%

Structure #25 (Final East Pit Ditch Reach 2):

Size (mm)	In/Out
4.7500	100.000%
0.0750	73.000%
0.0400	33.000%
0.0010	20.000%

Structure #24 (EP1 Stockpond (to EP3 Stockpond)):

Size (mm)	In	Out
4.7500	100.000%	100.000%
0.0750	73.000%	100.000%
0.0400	33.000%	100.000%
0.0010	20.000%	100.000%

Structure #23 (EP3 Stockpond Inlet Ditch):

Size (mm)	In/Out
4.7500	100.000%
0.0750	73.000%
0.0400	33.000%
0.0010	20.000%

Structure #22 (EP3 Stockpond):

Size (mm)	In	Out
4.7500	100.000%	100.000%
0.0750	73.000%	100.000%
0.0400	33.000%	100.000%
0.0010	20.000%	100.000%

Structure #21 (EP3 Stockpond Outlet Ditch):

Size (mm)	In/Out
4.7500	0.000%
0.0750	0.000%
0.0400	0.000%
0.0010	0.000%

Structure #20 (North Tributary Final East Pit Ditch Reach 2):

Size (mm)	In/Out
4.7500	100.000%
0.0750	94.485%
0.0400	42.712%
0.0010	25.886%

Structure #19 (NTEP1 Stockpond):

Size (mm)	In	Out
4.7500	100.000%	0.000%
0.0750	94.485%	0.000%
0.0400	42.712%	0.000%
0.0010	25.886%	0.000%

Structure #18 (North Tributary Final East Pit Ditch Reach 1 from Confluence of EP3 Outlet to NTEP1):

Size (mm)	In/Out
4.7500	19.243%
0.0750	14.048%
0.0400	6.350%
0.0010	3.849%

Structure #17 (Confluence North Tributary East Pit Ditch and EP3 Outlet Ditch):

Size (mm)	In/Out
4.7500	19.243%
0.0750	14.048%
0.0400	6.350%
0.0010	3.849%

Structure #16 (North Tributary Final East Pit Ditch Reach 1 to Confluence w/EP3 Outlet Ditch):

Size (mm)	In/Out
4.7500	22.985%
0.0750	16.779%
0.0400	7.585%
0.0010	4.597%

Structure #15 (Confluence Final East Pit Ditch and North Tributary East Pit Ditch):

Size (mm)	In/Out
4.7500	22.985%
0.0750	16.779%
0.0400	7.585%
0.0010	4.597%

Structure #14 (Final East Pit Ditch Reach 1 to Confluence w/North Trib Final East Pit Ditch):

Size (mm)	In/Out
4.7500	64.361%
0.0750	46.984%
0.0400	21.239%
0.0010	12.872%

Structure #13 (Confluence of Final East Pit Ditch & South Collection Ditch at Station 30+00):

Size (mm)	In/Out
4.7500	90.547%
0.0750	85.477%
0.0400	41.001%
0.0010	24.849%

Structure #12 (South Collection Ditch Station 0+00 to 30+00):

Size (mm)	In/Out
4.7500	92.149%
0.0750	83.363%
0.0400	39.645%
0.0010	24.027%

Structure #11 (Prospect Ditch Reach 3):

Size (mm)	In/Out
4.7500	100.000%
0.0750	73.000%
0.0400	33.000%

Size (mm)	In/Out
0.0010	20.000%

Structure #10 (PD2 Stockpond):

Size (mm)	In	Out
4.7500	100.000%	100.000%
0.0750	73.000%	100.000%
0.0400	33.000%	100.000%
0.0010	20.000%	100.000%

Structure #9 (Prospect Ditch Reach 2):

Size (mm)	In/Out
4.7500	100.000%
0.0750	73.002%
0.0400	33.005%
0.0010	20.006%

Structure #8 (PD1 Stockpond):

Size (mm)	In	Out
4.7500	100.000%	100.000%
0.0750	73.002%	100.000%
0.0400	33.005%	100.000%
0.0010	20.006%	100.000%

Structure #7 (Prospect Ditch Reach 1):

Size (mm)	In/Out
4.7500	100.000%
0.0750	73.002%
0.0400	33.005%
0.0010	20.005%

Structure #6 (Natural Channel Below Reach 1 Prospect Ditch):

Size (mm)	In/Out
4.7500	100.000%
0.0750	73.000%
0.0400	33.001%

Size (mm)	In/Out
0.0010	20.001%

Structure #5 (Prospect Collection Ditch):

Size (mm)	In/Out
4.7500	100.000%
0.0750	95.850%
0.0400	43.329%
0.0010	26.260%

Structure #4 (Confluence Prospect & South Collection Ditches):

Size (mm)	In/Out
4.7500	95.897%
0.0750	83.119%
0.0400	38.599%
0.0010	23.394%

Structure #3 (Natural Channel Above Prospect Pond):

Size (mm)	In/Out
4.7500	97.260%
0.0750	79.756%
0.0400	36.739%
0.0010	22.266%

Structure #2 (Prospect Pond):

Size (mm)	In	Out
4.7500	97.260%	100.000%
0.0750	79.756%	100.000%
0.0400	36.739%	100.000%
0.0010	22.266%	100.000%

Structure #1:

Size (mm)	In/Out
4.7500	100.000%
0.0750	100.000%
0.0400	100.000%

Size (mm)	In/Out
0.0010	100.000%

Structure Detail:

Structure #31 (Riprap Channel)

Section 16 Fill Ditch

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)
12.00	3.0:1	3.0:1	17.8	2.98		

Riprap Channel Results:

Simons/OSM Method - Mild Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.08 cfs	
Depth:	0.02 ft	3.00 ft
Top Width:	12.09 ft	29.97 ft
Velocity:	0.45 fps	
X-Section Area:	0.18 sq ft	
Hydraulic Radius:	0.015 ft	
Froude Number:	0.65	
Manning's n:	0.0327	
Dmin:	2.00 in	
D50:	6.00 in	
Dmax:	9.00 in	

Structure #30 (Erodible Channel)

Natural Channel from Section 16 Fill Ditch to South Collection Ditch

Parabolic Erodible Channel Inputs:

Material: Shales and hardpans

Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
22.0	0.0250				6.0

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.08 cfs	
Depth:	0.09 ft	
Top Width:	0.35 ft	
Velocity:	3.77 fps	
X-Section Area:	0.02 sq ft	
Hydraulic Radius:	0.049 ft	
Froude Number:	2.76	

Structure #29 (Vegetated Channel)

South Collection Ditch 90+00 to 92+68

Trapezoidal Vegetated Channel Inputs:

Material: Tall fescue

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	3.0	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:	0.08 cfs		0.08 cfs	
Depth:	0.11 ft		0.33 ft	
Top Width:	2.89 ft		4.61 ft	
Velocity:	0.30 fps		0.08 fps	
X-Section Area:	0.27 sq ft		1.08 sq ft	
Hydraulic Radius:	0.093 ft		0.230 ft	
Froude Number:	0.17		0.03	
Roughness Coefficient:	0.1737		1.2727	

Structure #28 (Vegetated Channel)

South Collection Ditch 30+00 to 90+00

Trapezoidal Vegetated Channel Inputs:

Material: Tall fescue

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	4.0	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:	0.13 cfs		0.13 cfs	
Depth:	0.12 ft		0.34 ft	
Top Width:	2.97 ft		4.70 ft	
Velocity:	0.42 fps		0.11 fps	
X-Section Area:	0.30 sq ft		1.13 sq ft	
Hydraulic Radius:	0.100 ft		0.237 ft	
Froude Number:	0.23		0.04	
Roughness Coefficient:	0.1538		1.0282	

Structure #34 (Pond)

EP1 Stockpond (to Final East Pit Ditch) Reach 1

Pond Inputs:

Initial Pool Elev:	7,376.00 ft
Initial Pool:	0.39 ac-ft
*Sediment Storage:	0.00 ac-ft
Dead Space:	0.00 %

**No sediment capacity defined*

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
7,379.00	20.00	2.00:1	2.00:1	20.00

Straight Pipe

Barrel Diameter (in)	Barrel Length (ft)	Barrel Slope (%)	Manning's n	Spillway Elev (ft)	Entrance Loss Coefficient	Tailwater Depth (ft)
12.00	100.00	4.00	0.0150	7,376.00	0.90	0.00

Pond Results:

Peak Elevation:	7,376.05 ft

H'graph Detention Time:	0.65 hrs
Pond Model:	CSTRS
Dewater Time:	0.52 days
Trap Efficiency:	100.00 %

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)	
7,370.00	0.000	0.000	0.000		Top of Sed. Storage
7,371.00	0.046	0.015	0.000		
7,372.00	0.059	0.068	0.000		
7,373.00	0.070	0.132	0.000		
7,374.00	0.081	0.208	0.000		
7,375.00	0.092	0.294	0.000		
7,376.00	0.105	0.392	0.000		Spillway #2
7,376.05	0.106	0.398	0.101	12.50	Peak Stage
7,377.00	0.118	0.504	2.094		
7,378.00	0.140	0.633	4.414		
7,379.00	0.165	0.786	5.883		Spillway #1
7,380.00	0.165	0.951	55.203		
7,381.00	0.166	1.116	174.677		
7,382.00	0.166	1.282	352.543		
7,383.00	0.167	1.449	585.314		
7,384.00	0.167	1.616	873.793		
7,385.00	0.168	1.783	1,219.515		

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Straight Pipe (cfs)	Combined Total Discharge (cfs)
7,370.00	0.000	0.000	0.000
7,371.00	0.000	0.000	0.000
7,372.00	0.000	0.000	0.000
7,373.00	0.000	0.000	0.000
7,374.00	0.000	0.000	0.000
7,375.00	0.000	0.000	0.000
7,376.00	0.000	0.000	0.000
7,377.00	0.000	(3)>2.094	2.094
7,378.00	0.000	(5)>4.414	4.414

Elevation (ft)	Emergency Spillway (cfs)	Straight Pipe (cfs)	Combined Total Discharge (cfs)
7,379.00	0.000	(5)>5.883	5.883
7,380.00	48.400	(5)>6.803	55.203
7,381.00	167.398	(6)>7.279	174.677
7,382.00	344.812	(6)>7.732	352.543
7,383.00	577.178	(6)>8.136	585.314
7,384.00	865.254	(6)>8.540	873.793
7,385.00	1,210.609	(6)>8.906	1,219.515

Structure #33 (Riprap Channel)

Final East Pitch Ditch Reach 1 from Station 8+06 to EP1

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)
12.00	2.0:1	2.0:1	15.7	2.98		

Riprap Channel Results:

Simons/OSM Method - Mild Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.02 cfs	
Depth:	0.02 ft	3.00 ft
Top Width:	12.07 ft	23.99 ft
Velocity:	0.11 fps	
X-Section Area:	0.21 sq ft	
Hydraulic Radius:	0.018 ft	
Froude Number:	0.14	
Manning's n:	0.0320	
Dmin:	2.00 in	
D50:	6.00 in	
Dmax:	9.00 in	

Structure #32 (Nonerodible Channel)

Final East Pit Ditch Reach 1 from NTEP confluence to Station 8+06

Trapezoidal Nonerodible Channel Inputs:

Material: Shotcrete

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)
12.00	2.0:1	2.0:1	18.0	0.0170	2.99		

Nonerodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.22 cfs	
Depth:	0.01 ft	3.00 ft
Top Width:	12.04 ft	24.00 ft
Velocity:	1.72 fps	
X-Section Area:	0.12 sq ft	
Hydraulic Radius:	0.010 ft	
Froude Number:	3.04	

Structure #27 (Riprap Channel)

Final East Pit Ditch Reach 3

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)
12.00	2.0:1	2.0:1	6.4	2.93		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	3.09 cfs	
Depth:	0.07 ft	3.00 ft
Top Width:	12.28 ft	24.00 ft
Velocity*:		
X-Section Area:	0.86 sq ft	
Hydraulic Radius:	0.070 ft	
Froude Number*:		
Manning's n*:		
Dmin:	1.00 in	
D50:	3.00 in	
Dmax:	3.75 in	

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

Structure #26 (Pond)

EP2 Stockpond

Pond Inputs:

Initial Pool Elev:	7,500.00 ft
Initial Pool:	4.26 ac-ft
*Sediment Storage:	0.00 ac-ft
Dead Space:	0.00 %

**No sediment capacity defined*

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
7,505.00	60.00	2.00:1	2.00:1	20.00

Straight Pipe

Barrel Diameter (in)	Barrel Length (ft)	Barrel Slope (%)	Manning's n	Spillway Elev (ft)	Entrance Loss Coefficient	Tailwater Depth (ft)
12.00	160.00	9.00	0.0150	7,500.00	0.50	0.00

Pond Results:

Peak Elevation:	7,500.18 ft
H'graph Detention Time:	4.13 hrs
Pond Model:	CSTRS
Dewater Time:	1.05 days
Trap Efficiency:	100.00 %

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)	
7,492.00	0.385	0.000	0.000		Top of Sed. Storage
7,493.00	0.419	0.402	0.000		
7,494.00	0.454	0.839	0.000		
7,495.00	0.491	1.311	0.000		
7,496.00	0.529	1.821	0.000		
7,497.00	0.568	2.370	0.000		
7,498.00	0.609	2.958	0.000		

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
7,499.00	0.651	3.588	0.000		
7,500.00	0.694	4.260	0.000		Spillway #2
7,500.18	0.704	4.390	0.378	25.10	Peak Stage
7,501.00	0.741	4.978	2.094		
7,502.00	0.787	5.741	4.414		
7,503.00	0.834	6.552	5.883		
7,504.00	0.884	7.411	7.060		
7,505.00	0.932	8.319	8.069		Spillway #1
7,506.00	0.933	9.251	45.188		
7,507.00	0.934	10.185	151.737		
7,508.00	0.935	11.119	305.349		
7,509.00	0.936	12.055	524.315		
7,510.00	0.937	12.991	798.632		

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Straight Pipe (cfs)	Combined Total Discharge (cfs)
7,492.00	0.000	0.000	0.000
7,493.00	0.000	0.000	0.000
7,494.00	0.000	0.000	0.000
7,495.00	0.000	0.000	0.000
7,496.00	0.000	0.000	0.000
7,497.00	0.000	0.000	0.000
7,498.00	0.000	0.000	0.000
7,499.00	0.000	0.000	0.000
7,500.00	0.000	0.000	0.000
7,501.00	0.000	(3)>2.094	2.094
7,502.00	0.000	(5)>4.414	4.414
7,503.00	0.000	(5)>5.883	5.883
7,504.00	0.000	(5)>7.060	7.060
7,505.00	0.000	(5)>8.069	8.069
7,506.00	36.222	(5)>8.966	45.188
7,507.00	142.050	(5)>9.687	151.737
7,508.00	295.305	(5)>10.045	305.349
7,509.00	513.913	(6)>10.402	524.315
7,510.00	787.934	(6)>10.698	798.632

Structure #25 (Riprap Channel)

Final East Pit Ditch Reach 2

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)
12.00	2.0:1	2.0:1	10.0	2.97		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.49 cfs	
Depth:	0.03 ft	3.00 ft
Top Width:	12.12 ft	24.00 ft
Velocity*:		
X-Section Area:	0.36 sq ft	
Hydraulic Radius:	0.030 ft	
Froude Number*:		
Manning's n*:		
Dmin:	1.00 in	
D50:	3.00 in	
Dmax:	3.75 in	

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

Structure #24 (Pond)

EP1 Stockpond (to EP3 Stockpond)

Pond Inputs:

Initial Pool Elev:	7,379.00 ft
Initial Pool:	0.79 ac-ft
*Sediment Storage:	0.00 ac-ft
Dead Space:	0.00 %

**No sediment capacity defined*

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
7,379.00	20.00	2.00:1	2.00:1	20.00

Pond Results:

Peak Elevation:	7,379.01 ft
H'graph Detention Time:	0.04 hrs
Pond Model:	CSTRS
Dewater Time:	1.08 days
Trap Efficiency:	100.00 %

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)	
7,370.00	0.000	0.000	0.000		Top of Sed. Storage
7,371.00	0.046	0.015	0.000		
7,372.00	0.059	0.068	0.000		
7,373.00	0.070	0.132	0.000		
7,374.00	0.081	0.208	0.000		
7,375.00	0.092	0.294	0.000		
7,376.00	0.105	0.392	0.000		
7,377.00	0.118	0.504	0.000		
7,378.00	0.141	0.633	0.000		
7,379.00	0.165	0.786	0.000		Spillway #1
7,379.01	0.153	0.788	0.492	25.90	Peak Stage
7,380.00	0.165	0.951	48.400		
7,381.00	0.166	1.117	167.398		
7,382.00	0.166	1.283	344.812		
7,383.00	0.167	1.449	577.178		
7,384.00	0.167	1.616	865.254		
7,385.00	0.168	1.784	1,210.609		

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
7,370.00	0.000	0.000
7,371.00	0.000	0.000
7,372.00	0.000	0.000
7,373.00	0.000	0.000
7,374.00	0.000	0.000
7,375.00	0.000	0.000
7,376.00	0.000	0.000
7,377.00	0.000	0.000

Elevation (ft)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
7,378.00	0.000	0.000
7,379.00	0.000	0.000
7,380.00	48.400	48.400
7,381.00	167.398	167.398
7,382.00	344.812	344.812
7,383.00	577.178	577.178
7,384.00	865.254	865.254
7,385.00	1,210.609	1,210.609

Structure #23 (Riprap Channel)

EP3 Stockpond Inlet Ditch

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)
12.00	2.0:1	2.0:1	4.8	2.99		

Riprap Channel Results:

Simons/OSM Method - Mild Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.52 cfs	
Depth:	0.05 ft	3.04 ft
Top Width:	12.21 ft	24.17 ft
Velocity:	0.81 fps	
X-Section Area:	0.64 sq ft	
Hydraulic Radius:	0.053 ft	
Froude Number:	0.62	
Manning's n:	0.0279	
Dmin:	0.00 in	
D50:	3.00 in	
Dmax:	0.00 in	

Structure #22 (Pond)

EP3 Stockpond

Pond Inputs:

Initial Pool Elev:	7,357.00 ft
Initial Pool:	2.90 ac-ft
*Sediment Storage:	0.00 ac-ft
Dead Space:	0.00 %

**No sediment capacity defined*

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
7,357.00	216.00	2.00:1	2.00:1	12.00

Pond Results:

Peak Elevation:	7,357.04 ft
H'graph Detention Time:	0.28 hrs
Pond Model:	CSTRS
Dewater Time:	1.07 days
Trap Efficiency:	100.00 %

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)	
7,340.00	0.032	0.000	0.000		Top of Sed. Storage
7,341.00	0.045	0.038	0.000		
7,342.00	0.060	0.091	0.000		
7,343.00	0.077	0.159	0.000		
7,344.00	0.095	0.245	0.000		
7,345.00	0.115	0.350	0.000		
7,346.00	0.129	0.472	0.000		
7,347.00	0.144	0.608	0.000		
7,348.00	0.160	0.760	0.000		
7,349.00	0.176	0.928	0.000		
7,350.00	0.192	1.112	0.000		
7,351.00	0.210	1.313	0.000		
7,352.00	0.227	1.531	0.000		
7,353.00	0.246	1.768	0.000		
7,354.00	0.264	2.023	0.000		
7,355.00	0.284	2.297	0.000		
7,356.00	0.304	2.591	0.000		
7,357.00	0.322	2.904	0.000		Spillway #1
7,357.04	0.314	2.916	0.511	25.65	Peak Stage

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)
7,358.00	0.322	3.226	14.150	
7,359.00	0.323	3.549	61.776	
7,360.00	0.324	3.873	147.685	
7,361.00	0.325	4.197	264.762	

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
7,340.00	0.000	0.000
7,341.00	0.000	0.000
7,342.00	0.000	0.000
7,343.00	0.000	0.000
7,344.00	0.000	0.000
7,345.00	0.000	0.000
7,346.00	0.000	0.000
7,347.00	0.000	0.000
7,348.00	0.000	0.000
7,349.00	0.000	0.000
7,350.00	0.000	0.000
7,351.00	0.000	0.000
7,352.00	0.000	0.000
7,353.00	0.000	0.000
7,354.00	0.000	0.000
7,355.00	0.000	0.000
7,356.00	0.000	0.000
7,357.00	0.000	0.000
7,358.00	14.150	14.150
7,359.00	61.776	61.776
7,360.00	147.685	147.685
7,361.00	264.762	264.762

Structure #21 (Riprap Channel)

EP3 Stockpond Outlet Ditch

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)
12.00	2.0:1	2.0:1	3.6	2.99		

Riprap Channel Results:

Simons/OSM Method - Mild Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.51 cfs	
Depth:	0.04 ft	3.03 ft
Top Width:	12.18 ft	24.14 ft
Velocity:	0.94 fps	
X-Section Area:	0.54 sq ft	
Hydraulic Radius:	0.044 ft	
Froude Number:	0.79	
Manning's n:	0.0377	
Dmin:	2.00 in	
D50:	9.00 in	
Dmax:	12.00 in	

Structure #20 (Riprap Channel)

North Tributary Final East Pit Ditch Reach 2

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)
12.00	2.0:1	2.0:1	12.2	2.98		

Riprap Channel Results:

Simons/OSM Method - Mild Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.14 cfs	
Depth:	0.02 ft	3.00 ft
Top Width:	12.10 ft	24.02 ft
Velocity:	0.48 fps	
X-Section Area:	0.29 sq ft	
Hydraulic Radius:	0.024 ft	
Froude Number:	0.55	

	w/o Freeboard	w/ Freeboard
Manning's n:	0.0309	
Dmin:	0.00 in	
D50:	3.00 in	
Dmax:	0.00 in	

Structure #19 (Pond)

NTEP1 Stockpond

Pond Inputs:

Initial Pool Elev:	7,385.00 ft
Initial Pool:	0.92 ac-ft
*Sediment Storage:	0.00 ac-ft
Dead Space:	0.00 %

**No sediment capacity defined*

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
7,389.00	20.00	2.00:1	2.00:1	20.00

Pond Results:

Peak Elevation:	7,385.41 ft
H'graph Detention Time:	0.00 hrs
Pond Model:	CSTRS
Dewater Time:	0.00 days
Trap Efficiency:	0.00 %

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)	
7,378.00	0.041	0.000	0.000		Top of Sed. Storage
7,379.00	0.071	0.055	0.000		
7,380.00	0.096	0.138	0.000		
7,381.00	0.119	0.245	0.000		
7,382.00	0.143	0.376	0.000		
7,383.00	0.168	0.531	0.000		
7,384.00	0.194	0.712	0.000		
7,385.00	0.220	0.919	0.000		

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
7,385.41	0.231	1.013	0.000	0.00	Peak Stage
7,386.00	0.247	1.152	0.000		
7,387.00	0.275	1.413	0.000		
7,388.00	0.304	1.702	0.000		
7,389.00	0.338	2.023	0.000		Spillway #1
7,390.00	0.400	2.392	48.400		

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
7,378.00	0.000	0.000
7,379.00	0.000	0.000
7,380.00	0.000	0.000
7,381.00	0.000	0.000
7,382.00	0.000	0.000
7,383.00	0.000	0.000
7,384.00	0.000	0.000
7,385.00	0.000	0.000
7,386.00	0.000	0.000
7,387.00	0.000	0.000
7,388.00	0.000	0.000
7,389.00	0.000	0.000
7,390.00	48.400	48.400

Structure #18 (Riprap Channel)

North Tributary Final East Pit Ditch Reach 1 from Confluence of EP3 Outlet to NTEP1

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)
12.00	2.0:1	2.0:1	7.2	2.96		

Riprap Channel Results:

Simons/OSM Method - Mild Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.05 cfs	
Depth:	0.04 ft	3.00 ft
Top Width:	12.16 ft	24.00 ft
Velocity:	0.10 fps	
X-Section Area:	0.47 sq ft	
Hydraulic Radius:	0.038 ft	
Froude Number:	0.09	
Manning's n:	0.0289	
Dmin:	0.00 in	
D50:	3.00 in	
Dmax:	0.00 in	

Structure #17 (Null)

Confluence North Tributary East Pit Ditch and EP3 Outlet Ditch

Structure #16 (Riprap Channel)

North Tributary Final East Pit Ditch Reach 1 to Confluence w/EP3 Outlet Ditch

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)
12.00	2.0:1	2.0:1	21.5	2.99		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.56 cfs	
Depth:	0.01 ft	3.00 ft
Top Width:	12.05 ft	24.01 ft
Velocity*:		
X-Section Area:	0.15 sq ft	
Hydraulic Radius:	0.012 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 #15 (Null)

Confluence Final East Pit Ditch and North Tributary East Pit Ditch

Structure #14 (Riprap Channel)

Final East Pit Ditch Reach 1 to Confluence w/North Trib Final East Pit Ditch

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)
12.00	2.0:1	2.0:1	21.1	4.00		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.73 cfs	
Depth:	0.01 ft	4.01 ft
Top Width:	12.06 ft	28.06 ft
Velocity*:		
X-Section Area:	0.17 sq ft	
Hydraulic Radius:	0.014 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 #13 (Null)

Confluence of Final East Pit Ditch & South Collection Ditch at Station 30+00

Structure #12 (Vegetated Channel)

South Collection Ditch Station 0+00 to 30+00

Trapezoidal Vegetated Channel Inputs:

Material: Tall fescue

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	5.0	D, B	0.87			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:	0.99 cfs		0.99 cfs	
Depth:	0.26 ft	1.13 ft	0.57 ft	1.44 ft
Top Width:	4.11 ft	11.07 ft	6.53 ft	13.49 ft
Velocity:	1.22 fps		0.41 fps	
X-Section Area:	0.81 sq ft		2.41 sq ft	
Hydraulic Radius:	0.193 ft		0.362 ft	
Froude Number:	0.49		0.12	
Roughness Coefficient:	0.0906		0.4135	

Structure #11 (Vegetated Channel)

Prospect Ditch Reach 3

Trapezoidal Vegetated Channel Inputs:

Material: Tall fescue

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)
12.00	2.0:1	2.0:1	12.0	D, B				5.0

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:	0.07 cfs		0.07 cfs	
Depth:	0.03 ft		0.11 ft	
Top Width:	12.13 ft		12.44 ft	
Velocity:	0.17 fps		0.05 fps	
X-Section Area:	0.39 sq ft		1.36 sq ft	
Hydraulic Radius:	0.032 ft		0.109 ft	
Froude Number:	0.17		0.03	
Roughness Coefficient:	0.2849		2.3618	

Structure #10 (Pond)

PD2 Stockpond

Pond Inputs:

Initial Pool Elev:	7,565.00 ft
Initial Pool:	1.49 ac-ft
*Sediment Storage:	0.00 ac-ft
Dead Space:	0.00 %

**No sediment capacity defined*

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
7,565.00	20.00	2.00:1	2.00:1	20.00

Pond Results:

Peak Elevation:	7,565.00 ft
H'graph Detention Time:	0.12 hrs
Pond Model:	CSTRS
Dewater Time:	0.46 days
Trap Efficiency:	99.99 %

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)	
7,556.00	0.054	0.000	0.000		Top of Sed. Storage
7,557.00	0.086	0.069	0.000		
7,558.00	0.106	0.165	0.000		
7,559.00	0.127	0.282	0.000		
7,560.00	0.150	0.420	0.000		
7,561.00	0.175	0.582	0.000		
7,562.00	0.200	0.770	0.000		
7,563.00	0.227	0.983	0.000		
7,564.00	0.253	1.222	0.000		
7,565.00	0.280	1.489	0.000		Spillway #1
7,565.00	0.277	1.489	0.057	11.10	Peak Stage
7,566.00	0.300	1.779	48.400		

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
7,556.00	0.000	0.000
7,557.00	0.000	0.000
7,558.00	0.000	0.000
7,559.00	0.000	0.000
7,560.00	0.000	0.000
7,561.00	0.000	0.000
7,562.00	0.000	0.000
7,563.00	0.000	0.000
7,564.00	0.000	0.000
7,565.00	0.000	0.000
7,566.00	48.400	48.400

Structure #9 (Vegetated Channel)

Prospect Ditch Reach 2

Trapezoidal Vegetated Channel Inputs:

Material: Tall fescue

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)
12.00	2.0:1	2.0:1	13.0	D, B				5.0

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:	0.09 cfs		0.09 cfs	
Depth:	0.04 ft		0.12 ft	
Top Width:	12.14 ft		12.48 ft	
Velocity:	0.22 fps		0.06 fps	
X-Section Area:	0.43 sq ft		1.47 sq ft	
Hydraulic Radius:	0.036 ft		0.117 ft	
Froude Number:	0.20		0.03	
Roughness Coefficient:	0.2571		1.9805	

Structure #8 (Pond)

PD1 Stockpond

Pond Inputs:

Initial Pool Elev:	7,355.00 ft
Initial Pool:	0.88 ac-ft
*Sediment Storage:	0.00 ac-ft
Dead Space:	0.00 %

**No sediment capacity defined*

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
7,355.00	20.00	2.00:1	2.00:1	20.00

Pond Results:

Peak Elevation:	7,355.00 ft
H'graph Detention Time:	0.05 hrs
Pond Model:	CSTRS
Dewater Time:	0.46 days
Trap Efficiency:	99.95 %

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)	
7,348.00	0.031	0.000	0.000		Top of Sed. Storage
7,349.00	0.074	0.051	0.000		
7,350.00	0.097	0.136	0.000		
7,351.00	0.120	0.244	0.000		
7,352.00	0.140	0.374	0.000		
7,353.00	0.159	0.523	0.000		
7,354.00	0.180	0.692	0.000		
7,355.00	0.201	0.882	0.000		Spillway #1
7,355.00	0.201	0.883	0.089	11.15	Peak Stage
7,356.00	0.223	1.094	48.400		

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
7,348.00	0.000	0.000
7,349.00	0.000	0.000
7,350.00	0.000	0.000
7,351.00	0.000	0.000
7,352.00	0.000	0.000
7,353.00	0.000	0.000
7,354.00	0.000	0.000
7,355.00	0.000	0.000
7,356.00	48.400	48.400

Structure #7 (Riprap Channel)

Prospect Ditch Reach 1

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)
12.00	2.0:1	2.0:1	23.6			

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.24 cfs	
Depth:	0.01 ft	
Top Width:	12.03 ft	
Velocity*:		
X-Section Area:	0.09 sq ft	
Hydraulic Radius:	0.007 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 #6 (Erodible Channel)

Natural Channel Below Reach 1 Prospect Ditch

Parabolic Erodible Channel Inputs:

Material: Coarse gravel noncolloidal

Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
21.0	0.0250				6.0

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.26 cfs	
Depth:	0.14 ft	
Top Width:	0.55 ft	
Velocity:	5.03 fps	
X-Section Area:	0.05 sq ft	
Hydraulic Radius:	0.079 ft	
Froude Number:	2.92	

Structure #5 (Vegetated Channel)

Prospect Collection Ditch

Trapezoidal Vegetated Channel Inputs:

Material: Tall fescue

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)
12.00	2.0:1	2.0:1	11.9	D, B				5.0

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:	0.08 cfs		0.08 cfs	
Depth:	0.03 ft		0.12 ft	
Top Width:	12.14 ft		12.47 ft	
Velocity:	0.19 fps		0.06 fps	
X-Section Area:	0.41 sq ft		1.43 sq ft	
Hydraulic Radius:	0.034 ft		0.114 ft	
Froude Number:	0.19		0.03	
Roughness Coefficient:	0.2710		2.1684	

Structure #4 (Null)

Confluence Prospect & South Collection Ditches

Structure #3 (Erodible Channel)

Natural Channel Above Prospect Pond

Parabolic Erodible Channel Inputs:

Material: Asphaltic Concrete, Machine Placed

Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
20.0	0.0140				6.0

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	1.35 cfs	
Depth:	0.21 ft	
Top Width:	0.84 ft	
Velocity:	11.56 fps	
X-Section Area:	0.12 sq ft	
Hydraulic Radius:	0.120 ft	
Froude Number:	5.45	

Structure #2 (Pond)

Prospect Pond

Pond Inputs:

Initial Pool Elev:	6,744.00 ft
Initial Pool:	2.18 ac-ft
*Sediment Storage:	0.00 ac-ft
Dead Space:	0.00 %

**No sediment capacity defined*

Perforated Riser

Riser Diameter (in)	Riser Height (ft)	Barrel Diameter (in)	Barrel Length (ft)	Barrel Slope (%)	Manning's n	Spillway Elev (ft)	Number of Holes per Elev
12.00	8.70	12.00	129.00	9.70	0.0150	6,750.30	2

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
6,752.00	20.00	1.50:1	1.50:1	12.00

Pond Results:

Peak Elevation:	6,746.05 ft
H'graph Detention Time:	12.96 hrs
Pond Model:	CSTRS
Dewater Time:	1.92 days
Trap Efficiency:	97.63 %

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)	
6,734.00	0.029	0.000	0.000		Top of Sed. Storage
6,735.00	0.088	0.056	0.000		
6,736.00	0.117	0.158	0.000		
6,737.00	0.149	0.291	0.000		
6,738.00	0.185	0.457	0.000		
6,739.00	0.225	0.662	0.000		
6,740.00	0.269	0.909	0.000		
6,741.00	0.293	1.190	0.000		
6,742.00	0.317	1.495	0.000		
6,743.00	0.341	1.823	0.000		
6,744.00	0.365	2.176	0.000		Low hole SPW #1
6,745.00	0.390	2.554	0.210	21.74*	
6,746.00	0.418	2.958	0.297	21.50	
6,746.05	0.421	2.980	0.301	2.80	Peak Stage
6,747.00	0.448	3.391	0.364		
6,748.00	0.478	3.854	0.420		
6,749.00	0.509	4.347	0.470		
6,750.00	0.542	4.872	0.515		
6,750.30	0.551	5.036	0.527		Spillway #1
6,751.00	0.572	5.429	3.164		
6,752.00	0.604	6.017	4.931		Spillway #2
6,753.00	0.633	6.636	35.637		
6,754.00	0.664	7.284	110.493		
6,755.00	0.695	7.964	223.581		

**Designates time(s) to dewater have been extrapolated beyond the 50 hour hydrograph limit.*

Detailed Discharge Table

Elevation (ft)	Perf. Riser (cfs)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
6,734.00	0.000	0.000	0.000
6,735.00	0.000	0.000	0.000
6,736.00	0.000	0.000	0.000
6,737.00	0.000	0.000	0.000
6,738.00	0.000	0.000	0.000
6,739.00	0.000	0.000	0.000
6,740.00	0.000	0.000	0.000
6,741.00	0.000	0.000	0.000
6,742.00	0.000	0.000	0.000
6,743.00	0.000	0.000	0.000
6,744.00	2.00>0.000	0.000	0.000
6,745.00	0.210	0.000	0.210
6,746.00	0.297	0.000	0.297
6,747.00	0.364	0.000	0.364
6,748.00	0.420	0.000	0.420
6,749.00	0.470	0.000	0.470
6,750.00	0.515	0.000	0.515
6,750.30	0.527	0.000	0.527
6,751.00	3.164	0.000	3.164
6,752.00	4.931	0.000	4.931
6,753.00	6.214	29.423	35.637
6,754.00	7.274	103.218	110.493
6,755.00	8.199	215.382	223.581

Structure #1 (Null)

Null Below Prospect 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)
#31	1	21.500	0.135	0.000	0.000	62.000	S	0.08	0.059
	Σ	**21.500**						**0.08**	**0.059**
#30	1	12.500	0.089	0.000	0.000	47.000	S	0.00	0.000
	2	6.800	0.030	0.000	0.000	47.000	S	0.00	0.000
	3	0.300	0.031	0.000	0.000	62.000	F	0.00	0.000
	Σ	**41.100**						**0.08**	**0.059**
#29	1	2.400	0.041	0.000	0.000	47.000	S	0.00	0.000
	Σ	**43.500**						**0.08**	**0.059**
#28	1	2.200	0.112	0.000	0.000	62.000	M	0.02	0.004
	2	1.400	0.039	0.000	0.000	62.000	M	0.01	0.000
	3	23.000	0.222	0.000	0.000	47.000	S	0.00	0.000
	4	5.100	0.024	0.000	0.000	62.000	M	0.04	0.021
	5	149.700	0.146	0.000	0.000	47.000	S	0.00	0.000
	6	0.300	0.009	0.000	0.000	62.000	F	0.00	0.000
	Σ	**225.200**						**0.13**	**0.084**
#34	1	5.000	0.019	0.000	0.000	67.000	F	0.46	0.048
	Σ	**5.000**						**0.46**	**0.048**
#33	1	3.000	0.036	0.000	0.000	62.000	F	0.02	0.011
	Σ	**3.000**						**0.02**	**0.011**
#32	1	12.300	0.085	0.000	0.000	62.000	F	0.09	0.050
	Σ	**20.300**						**0.22**	**0.109**
#27	1	6.000	0.014	0.000	0.000	80.000	F	3.09	0.222
	2	63.700	0.237	0.000	0.000	62.000	M	0.30	0.210
	Σ	**69.700**						**3.09**	**0.432**
#26	**Σ**	**69.700**						**3.09**	**0.432**
#25	1	22.300	0.107	0.000	0.000	62.000	M	0.17	0.091
	Σ	**92.000**						**0.49**	**0.523**
#24	**Σ**	**92.000**						**0.49**	**0.523**
#23	1	4.900	0.074	0.000	0.000	62.000	M	0.04	0.020
	Σ	**96.900**						**0.52**	**0.543**
#22	**Σ**	**96.900**						**0.52**	**0.543**

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#21	1	1.300	0.050	0.000	0.000	62.000	M	0.00	0.000
	Σ	**98.200**						**0.51**	**0.543**
#20	1	28.800	0.232	0.000	0.000	62.000	M	0.14	0.095
	2	15.700	0.120	0.000	0.000	47.000	S	0.00	0.000
	Σ	**44.500**						**0.14**	**0.095**
#19	Σ	**44.500**						**0.14**	**0.095**
#18	1	6.400	0.073	0.000	0.000	62.000	M	0.05	0.026
	2	4.800	0.057	0.000	0.000	47.000	S	0.00	0.000
	Σ	**55.700**						**0.05**	**0.026**
#17	Σ	**153.900**						**0.54**	**0.569**
#16	1	1.900	0.035	0.000	0.000	62.000	M	0.01	0.002
	Σ	**155.800**						**0.56**	**0.571**
#15	Σ	**155.800**						**0.56**	**0.571**
#14	1	2.300	0.025	0.000	0.000	47.000	S	0.00	0.000
	2	3.800	0.038	0.000	0.000	62.000	M	0.03	0.015
	Σ	**182.200**						**0.73**	**0.695**
#13	Σ	**407.400**						**0.85**	**0.779**
#12	1	36.000	0.073	0.000	0.000	47.000	S	0.00	0.000
	2	19.400	0.121	0.000	0.000	62.000	M	0.15	0.079
	3	1.200	0.018	0.000	0.000	47.000	S	0.00	0.000
	4	2.400	0.022	0.000	0.000	61.000	F	0.01	0.001
	Σ	**466.400**						**0.99**	**0.859**
#11	1	2.600	0.032	0.000	0.000	47.000	S	0.00	0.000
	2	8.900	0.041	0.000	0.000	62.000	M	0.07	0.036
	3	5.900	0.125	0.000	0.000	47.000	S	0.00	0.000
	4	0.900	0.065	0.000	0.000	47.000	S	0.00	0.000
	Σ	**18.300**						**0.07**	**0.036**
#10	Σ	**18.300**						**0.07**	**0.036**
#9	1	5.400	0.042	0.000	0.000	62.000	M	0.04	0.022
	2	16.000	0.080	0.000	0.000	47.000	S	0.00	0.000
	Σ	**39.700**						**0.09**	**0.058**
#8	Σ	**39.700**						**0.09**	**0.058**
#7	1	12.100	0.093	0.000	0.000	62.000	M	0.09	0.049
	2	34.400	0.192	0.000	0.000	47.000	S	0.00	0.000

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
	3	9.800	0.062	0.000	0.000	62.000	M	0.07	0.040
	4	2.900	0.061	0.000	0.000	47.000	S	0.00	0.000
	Σ	**98.900**						**0.24**	**0.148**
#6	1	1.200	0.019	0.000	0.000	62.000	M	0.00	0.000
	2	1.100	0.029	0.000	0.000	47.000	S	0.00	0.000
	3	5.200	0.047	0.000	0.000	61.000	S	0.02	0.017
	4	4.800	0.025	0.000	0.000	47.000	S	0.00	0.000
	5	17.400	0.134	0.000	0.000	47.000	S	0.00	0.000
	6	26.900	0.234	0.000	0.000	47.000	S	0.00	0.000
	Σ	**155.500**						**0.26**	**0.165**
#5	1	27.800	0.150	0.000	0.000	61.000	S	0.08	0.061
	2	0.500	0.010	0.000	0.000	47.000	S	0.00	0.000
	Σ	**28.300**						**0.08**	**0.061**
#4	Σ	**650.200**						**1.31**	**1.086**
#3	1	7.200	0.036	0.000	0.000	47.000	S	0.00	0.000
	2	9.100	0.012	0.000	0.000	61.000	S	0.04	0.030
	Σ	**666.500**						**1.35**	**1.115**
#2	Σ	**666.500**						**1.35**	**1.115**
#1	Σ	**666.500**						**0.30**	**0.754**

Subwatershed Sedimentology Detail:

Stru #	SWS #	Soil K	L (ft)	S (%)	C	P	PS #	Sediment (tons)	Peak Sediment Conc. (mg/l)	Peak Settleable Conc (ml/l)	24VW (ml/l)
#31	1	0.300	400.00	16.00	0.0310	0.9000	1	0.3	4,344	2.01	1.73
	Σ							**0.3**	**4,344**	**2.01**	**1.73**
#30	1	0.300	400.00	18.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	2	0.300	100.00	37.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	3	0.300	50.00	2.50	0.0310	0.3800	1	0.0	1	0.00	0.00
	Σ							**0.3**	**4,344**	**2.01**	**1.73**
#29	1	0.300	100.00	33.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	Σ							**0.3**	**4,344**	**2.01**	**1.73**
#28	1	0.300	100.00	4.00	0.0100	0.3800	1	0.0	81	0.05	0.04
	2	0.300	75.00	8.00	0.0100	0.3800	1	0.0	6,620	3.77	3.77

Stru #	SWS #	Soil K	L (ft)	S (%)	C	P	PS #	Sediment (tons)	Peak Sediment Conc. (mg/l)	Peak Settleable Conc (ml/l)	24VW (ml/l)
	3	0.300	400.00	10.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	4	0.300	75.00	22.00	0.0100	0.3800	1	0.0	300	0.17	0.13
	5	0.300	400.00	16.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	6	0.300	50.00	20.00	0.0100	0.3800	1	0.0	1	0.00	0.00
	Σ							**0.3**	**3,438**	**1.60**	**1.26**
#34	1	0.300	50.00	2.00	0.0100	0.3800	1	0.0	104	0.06	0.02
	Σ							**0.0**	**104**	**0.06**	**0.02**
#33	1	0.300	100.00	24.00	0.0100	0.3800	1	0.0	417	0.24	0.19
	Σ							**0.0**	**417**	**0.24**	**0.19**
#32	1	0.300	400.00	22.00	0.0100	0.3800	1	0.0	909	0.52	0.39
	Σ							**0.1**	**436**	**0.25**	**0.20**
#27	1	0.300	50.00	13.00	0.8000	0.3800	1	9.4	65,396	37.27	17.37
	2	0.300	400.00	8.00	0.0100	0.3800	1	0.1	210	0.11	0.09
	Σ							**9.4**	**65,396**	**37.25**	**8.98**
#26	**Σ**							**9.4**	**65,396**	**37.25**	**8.98**
#25	1	0.300	400.00	15.00	0.0100	0.3800	1	0.1	621	0.35	0.27
	Σ							**0.1**	**245**	**0.14**	**0.06**
#24	**Σ**							**0.1**	**245**	**0.14**	**0.06**
#23	1	0.300	300.00	15.00	0.0100	0.3800	1	0.0	436	0.25	0.19
	Σ							**0.0**	**37**	**0.02**	**0.01**
#22	**Σ**							**0.0**	**37**	**0.02**	**0.01**
#21	1	0.300	50.00	3.00	0.0100	0.3800	1	0.0	1	0.00	0.00
	Σ							**0.0**	**1**	**0.00**	**0.00**
#20	1	0.300	400.00	11.00	0.0100	0.3800	1	0.0	365	0.18	0.16
	2	0.300	400.00	11.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	Σ							**0.0**	**365**	**0.18**	**0.16**
#19	**Σ**							**0.0**	**365**	**0.18**	**0.16**
#18	1	0.300	200.00	15.00	0.0100	0.3800	1	0.0	353	0.20	0.15
	2	0.300	200.00	13.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	Σ							**0.0**	**353**	**0.27**	**0.20**
#17	**Σ**							**0.0**	**52**	**0.04**	**0.01**
#16	1	0.300	100.00	21.00	0.0100	0.3800	1	0.0	1,274	0.73	0.68

Stru #	SWS #	Soil K	L (ft)	S (%)	C	P	PS #	Sediment (tons)	Peak Sediment Conc. (mg/l)	Peak Settleable Conc (ml/l)	24VW (ml/l)
	Σ							**0.1**	**103**	**0.08**	**0.01**
#15	Σ							**0.1**	**103**	**0.08**	**0.01**
#14	1	0.300	100.00	39.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	2	0.300	150.00	26.00	0.0100	0.3800	1	0.0	528	0.30	0.23
	Σ							**0.1**	**245**	**0.16**	**0.06**
#13	Σ							**0.4**	**541**	**0.28**	**0.20**
#12	1	0.300	300.00	19.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	2	0.300	400.00	12.00	0.0100	0.3800	1	0.0	458	0.26	0.20
	3	0.300	50.00	13.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	4	0.300	50.00	38.00	0.0800	0.9000	1	0.0	38,755	22.09	21.53
	Σ							**0.5**	**963**	**0.50**	**0.23**
#11	1	0.300	50.00	14.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	2	0.300	100.00	12.00	0.0100	0.3800	1	0.0	182	0.10	0.08
	3	0.300	100.00	1.50	0.0310	0.9000	1	0.0	1	0.00	0.00
	4	0.300	50.00	1.50	0.0310	0.9000	1	0.0	1	0.00	0.00
	Σ							**0.0**	**182**	**0.10**	**0.08**
#10	Σ							**0.0**	**182**	**0.10**	**0.08**
#9	1	0.300	100.00	19.00	0.0100	0.3800	1	0.0	304	0.17	0.13
	2	0.300	200.00	14.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	Σ							**0.0**	**131**	**0.07**	**0.05**
#8	Σ							**0.0**	**131**	**0.07**	**0.05**
#7	1	0.300	400.00	22.00	0.0100	0.3800	1	0.0	907	0.52	0.39
	2	0.300	400.00	16.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	3	0.300	100.00	12.00	0.0100	0.3800	1	0.0	184	0.10	0.08
	4	0.300	100.00	6.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	Σ							**0.1**	**397**	**0.23**	**0.15**
#6	1	0.300	50.00	26.00	0.0100	0.3800	1	0.0	1	0.00	0.00
	2	0.300	75.00	10.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	3	0.300	200.00	30.00	0.0800	0.9000	1	0.2	10,504	5.99	5.18
	4	0.300	75.00	38.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	5	0.300	400.00	18.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	6	0.300	400.00	12.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	Σ							**0.3**	**1,343**	**0.77**	**0.67**
#5	1	0.300	200.00	16.00	0.0310	0.9000	1	0.2	2,687	1.34	1.19
	2	0.300	50.00	19.00	0.0310	0.9000	1	0.0	1	0.00	0.00

Stru #	SWS #	Soil K	L (ft)	S (%)	C	P	PS #	Sediment (tons)	Peak Sediment Conc. (mg/l)	Peak Settleable Conc (ml/l)	24VW (ml/l)
	Σ							**0.2**	**2,687**	**1.34**	**1.19**
#4	Σ							**1.0**	**1,110**	**0.59**	**0.36**
#3	1	0.300	200.00	45.00	0.0310	0.9000	1	0.0	1	0.00	0.00
	2	0.300	100.00	59.00	0.0800	0.9000	1	0.5	13,801	7.87	6.81
	Σ							**1.5**	**1,510**	**0.82**	**0.54**
#2	Σ							**1.5**	**1,510**	**0.82**	**0.54**
#1	Σ							**0.0**	**51**	**0.00**	**0.00**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#3	1	2. Minimum tillage cultivation	45.00	198.90	442.00	3.350	0.036
#3	**1**	**Time of Concentration:**					**0.036**
#3	2	4. Cultivated, straight row	59.00	176.40	299.00	6.860	0.012
#3	**2**	**Time of Concentration:**					**0.012**
#5	1	3. Short grass pasture	16.00	276.63	1,729.00	3.200	0.150
#5	**1**	**Time of Concentration:**					**0.150**
#5	2	3. Short grass pasture	19.00	25.46	134.00	3.480	0.010
#5	**2**	**Time of Concentration:**					**0.010**
#6	1	3. Short grass pasture	26.00	76.18	293.00	4.070	0.019
#6	**1**	**Time of Concentration:**					**0.019**
#6	2	3. Short grass pasture	10.00	26.40	264.00	2.520	0.029
#6	**2**	**Time of Concentration:**					**0.029**
#6	3	3. Short grass pasture	30.00	226.20	754.00	4.380	0.047
#6	**3**	**Time of Concentration:**					**0.047**
#6	4	3. Short grass pasture	38.00	174.04	458.00	4.930	0.025
#6	**4**	**Time of Concentration:**					**0.025**
#6	5	3. Short grass pasture	18.00	296.28	1,646.00	3.390	0.134
#6	**5**	**Time of Concentration:**					**0.134**
#6	6	3. Short grass pasture	12.00	280.07	2,334.00	2.770	0.234
#6	**6**	**Time of Concentration:**					**0.234**
#7	1	3. Short grass pasture	22.00	277.63	1,262.00	3.750	0.093
#7	**1**	**Time of Concentration:**					**0.093**
#7	2	3. Short grass pasture	16.00	355.52	2,222.00	3.200	0.192
#7	**2**	**Time of Concentration:**					**0.192**
#7	3	3. Short grass pasture	12.00	75.24	627.00	2.770	0.062
#7	**3**	**Time of Concentration:**					**0.062**

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#7	4	3. Short grass pasture	6.00	25.85	431.00	1.950	0.061
#7	**4**	**Time of Concentration:**					**0.061**
#9	2	3. Short grass pasture	14.00	121.38	867.00	2.990	0.080
#9	**2**	**Time of Concentration:**					**0.080**
#11	1	3. Short grass pasture	14.00	48.58	347.00	2.990	0.032
#11	**1**	**Time of Concentration:**					**0.032**
#11	2	3. Short grass pasture	12.00	49.44	412.00	2.770	0.041
#11	**2**	**Time of Concentration:**					**0.041**
#11	3	3. Short grass pasture	1.50	6.57	438.00	0.970	0.125
#11	**3**	**Time of Concentration:**					**0.125**
#11	4	3. Short grass pasture	1.50	3.44	230.00	0.970	0.065
#11	**4**	**Time of Concentration:**					**0.065**
#12	1	3. Short grass pasture	19.00	174.04	916.00	3.480	0.073
#12	**1**	**Time of Concentration:**					**0.073**
#12	2	3. Short grass pasture	12.00	145.08	1,209.00	2.770	0.121
#12	**2**	**Time of Concentration:**					**0.121**
#12	3	3. Short grass pasture	13.00	24.31	187.00	2.880	0.018
#12	**3**	**Time of Concentration:**					**0.018**
#12	4	3. Short grass pasture	38.00	150.48	396.00	4.930	0.022
#12	**4**	**Time of Concentration:**					**0.022**
#14	1	3. Short grass pasture	39.00	176.67	453.00	4.990	0.025
#14	**1**	**Time of Concentration:**					**0.025**
#14	2	3. Short grass pasture	26.00	148.20	570.00	4.070	0.038
#14	**2**	**Time of Concentration:**					**0.038**
#16	1	3. Short grass pasture	21.00	99.32	473.00	3.660	0.035
#16	**1**	**Time of Concentration:**					**0.035**
#18	1	3. Short grass pasture	15.00	122.70	818.00	3.090	0.073
#18	**1**	**Time of Concentration:**					**0.073**
#18	2	3. Short grass pasture	13.00	77.35	595.00	2.880	0.057
#18	**2**	**Time of Concentration:**					**0.057**
#20	1	3. Short grass pasture	11.00	243.87	2,217.00	2.650	0.232
#20	**1**	**Time of Concentration:**					**0.232**
#20	2	3. Short grass pasture	11.00	126.61	1,151.00	2.650	0.120
#20	**2**	**Time of Concentration:**					**0.120**
#21	1	3. Short grass pasture	3.00	7.58	253.00	1.380	0.050
#21	**1**	**Time of Concentration:**					**0.050**
#23	1	3. Short grass pasture	15.00	123.90	826.00	3.090	0.074
#23	**1**	**Time of Concentration:**					**0.074**
#25	1	3. Short grass pasture	15.00	179.85	1,199.00	3.090	0.107
#25	**1**	**Time of Concentration:**					**0.107**
#27	1	5. Nearly bare and untilled, and alluvial valley fans	13.00	24.96	192.00	3.600	0.014
#27	**1**	**Time of Concentration:**					**0.014**

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#27	2	3. Short grass pasture	8.00	154.39	1,930.00	2.260	0.237
#27	**2**	**Time of Concentration:**					**0.237**
#28	1	3. Short grass pasture	4.00	26.00	650.00	1.600	0.112
#28	**1**	**Time of Concentration:**					**0.112**
#28	2	3. Short grass pasture	8.00	25.43	318.00	2.260	0.039
#28	**2**	**Time of Concentration:**					**0.039**
#28	3	3. Short grass pasture	10.00	201.90	2,019.00	2.520	0.222
#28	**3**	**Time of Concentration:**					**0.222**
#28	4	3. Short grass pasture	22.00	74.14	337.00	3.750	0.024
#28	**4**	**Time of Concentration:**					**0.024**
#28	5	3. Short grass pasture	16.00	269.12	1,682.00	3.200	0.146
#28	**5**	**Time of Concentration:**					**0.146**
#28	6	3. Short grass pasture	20.00	24.60	123.00	3.570	0.009
#28	**6**	**Time of Concentration:**					**0.009**
#29	1	3. Short grass pasture	33.00	225.39	683.00	4.590	0.041
#29	**1**	**Time of Concentration:**					**0.041**
#30	1	3. Short grass pasture	18.00	197.46	1,097.00	3.390	0.089
#30	**1**	**Time of Concentration:**					**0.089**
#30	2	3. Short grass pasture	37.00	200.17	541.00	4.860	0.030
#30	**2**	**Time of Concentration:**					**0.030**
#30	3	3. Short grass pasture	2.50	3.55	142.00	1.260	0.031
#30	**3**	**Time of Concentration:**					**0.031**
#31	1	3. Short grass pasture	16.00	249.60	1,560.00	3.200	0.135
#31	**1**	**Time of Concentration:**					**0.135**
#32	1	3. Short grass pasture	22.00	253.22	1,151.00	3.750	0.085
#32	**1**	**Time of Concentration:**					**0.085**
#33	1	3. Short grass pasture	24.00	122.64	511.00	3.910	0.036
#33	**1**	**Time of Concentration:**					**0.036**
#34	1	5. Nearly bare and untilled, and alluvial valley fans	2.00	2.00	100.00	1.410	0.019
#34	**1**	**Time of Concentration:**					**0.019**

Appendix Exh. 7-14PP
Prospect Pond

25- Year 24-Hour Storm Event

Emergency Spillway Deomonstration

General Information

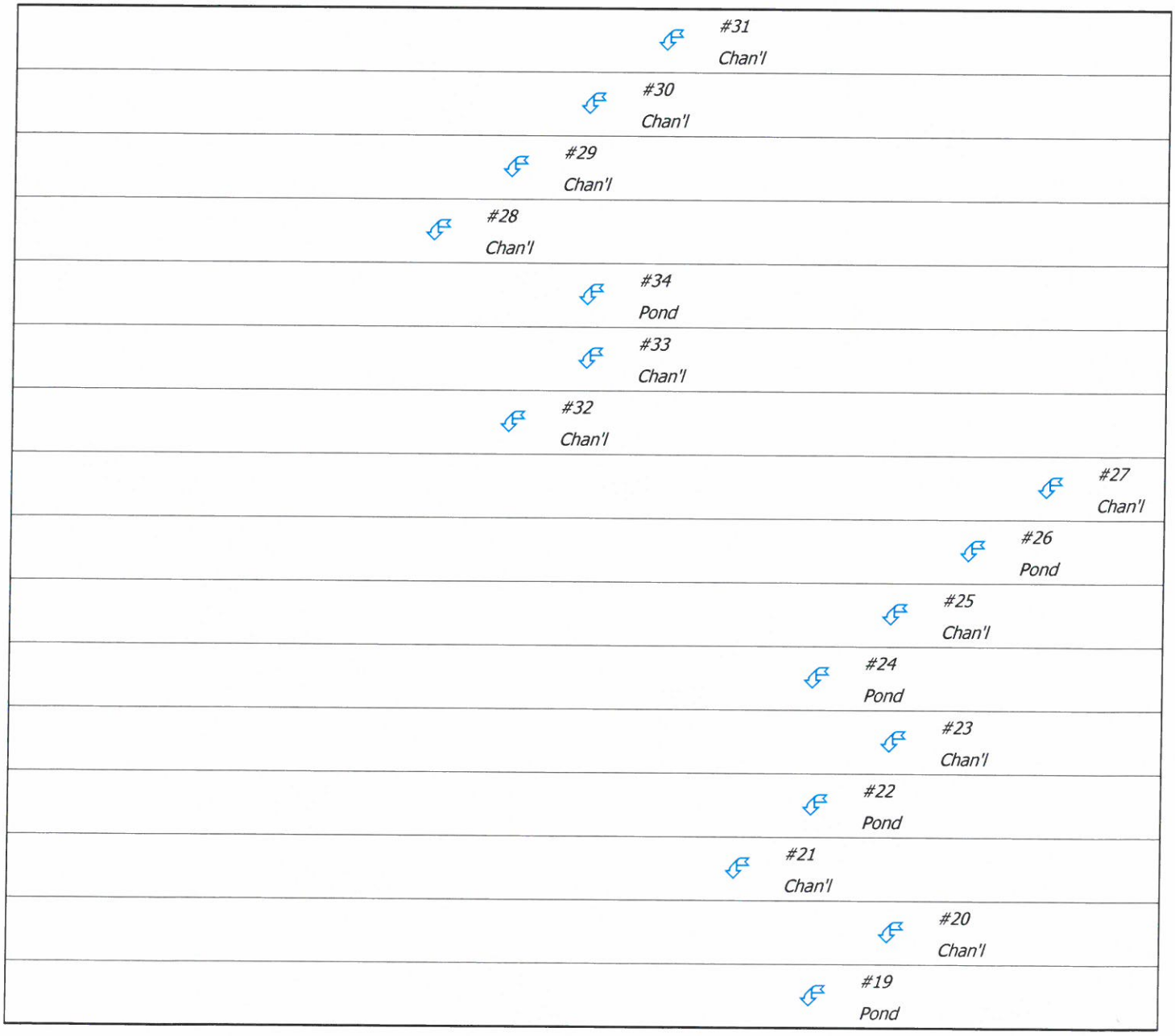
Storm Information:

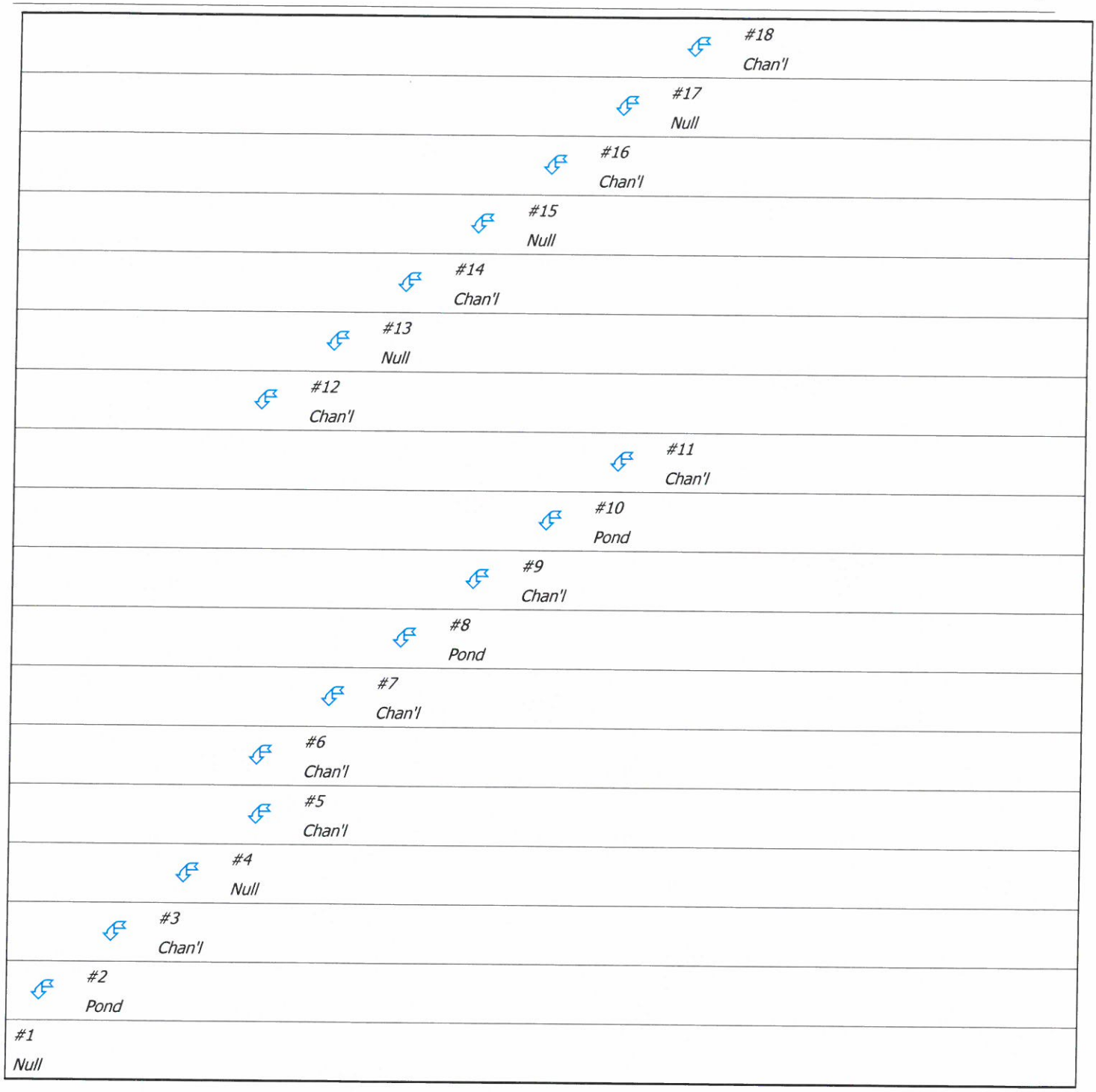
Storm Type:	NRCS Type II
Design Storm:	10 yr - 24 hr
Rainfall Depth:	2.300 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Null	#1	==>	End	0.000	0.000	Null Below Prospect Pond
Pond	#2	==>	#1	0.000	0.000	Prospect Pond
Channel	#3	==>	#2	0.000	0.000	Natural Channel Above Prospect Pond
Null	#4	==>	#3	0.000	0.000	Confluence Prospect & South Collection Ditches
Channel	#5	==>	#4	0.000	0.000	Prospect Collection Ditch
Channel	#6	==>	#4	0.000	0.000	Natural Channel Below Reach 1 Prospect Ditch
Channel	#7	==>	#6	0.000	0.000	Prospect Ditch Reach 1
Pond	#8	==>	#7	0.000	0.000	PD1 Stockpond
Channel	#9	==>	#8	0.000	0.000	Prospect Ditch Reach 2
Pond	#10	==>	#9	0.000	0.000	PD2 Stockpond
Channel	#11	==>	#10	0.000	0.000	Prospect Ditch Reach 3
Channel	#12	==>	#4	0.000	0.000	South Collection Ditch Station 0+00 to 30+00
Null	#13	==>	#12	0.000	0.000	Confluence of Final East Pit Ditch & South Collection Ditch at Station 30+00
Channel	#14	==>	#13	0.000	0.000	Final East Pit Ditch Reach 1 to Confluence w/North Trib Final East Pit Ditch
Null	#15	==>	#14	0.000	0.000	Confluence Final East Pit Ditch and North Tributary East Pit Ditch
Channel	#16	==>	#15	0.000	0.000	North Tributary Final East Pit Ditch Reach 1 to Confluence w/EP3 Outlet Ditch
Null	#17	==>	#16	0.000	0.000	Confluence North Tributary East Pit Ditch and EP3 Outlet Ditch
Channel	#18	==>	#17	0.000	0.000	North Tributary Final East Pit Ditch Reach 1 from Confluence of EP3 Outlet to NTEP1
Pond	#19	==>	#18	0.000	0.000	NTEP1 Stockpond
Channel	#20	==>	#19	0.000	0.000	North Tributary Final East Pit Ditch Reach 2
Channel	#21	==>	#17	0.000	0.000	EP3 Stockpond Outlet Ditch
Pond	#22	==>	#21	0.000	0.000	EP3 Stockpond
Channel	#23	==>	#22	0.000	0.000	EP3 Stockpond Inlet Ditch
Pond	#24	==>	#21	0.000	0.000	EP1 Stockpond (to EP3 Stockpond)
Channel	#25	==>	#24	0.000	0.000	Final East Pit Ditch Reach 2
Pond	#26	==>	#25	0.000	0.000	EP2 Stockpond
Channel	#27	==>	#26	0.000	0.000	Final East Pit Ditch Reach 3
Channel	#28	==>	#13	0.000	0.000	South Collection Ditch 30+00 to 90+00
Channel	#29	==>	#28	0.000	0.000	South Collection Ditch 90+00 to 92+68

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#30	==>	#29	0.000	0.000	Natural Channel from Section 16 Fill Ditch to South Collection Ditch
Channel	#31	==>	#30	0.000	0.000	Section 16 Fill Ditch
Channel	#32	==>	#14	0.000	0.000	Final East Pit Ditch Reach 1 from NTEP confluence to Station 8+06
Channel	#33	==>	#32	0.000	0.000	Final East Pitch Ditch Reach 1 from Station 8+06 to EP1
Pond	#34	==>	#32	0.000	0.000	EP1 Stockpond (to Final East Pit Ditch) Reach 1




#18
Chan'l
#17
Null
#16
Chan'l
#15
Null
#14
Chan'l
#13
Null
#12
Chan'l
#11
Chan'l
#10
Pond
#9
Chan'l
#8
Pond
#7
Chan'l
#6
Chan'l
#5
Chan'l
#4
Null
#3
Chan'l
#2
Pond
#1
Null

Structure Summary:

		Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#31		21.500	21.500	0.64	0.19
#30		19.600	41.100	0.65	0.19
#29		2.400	43.500	0.65	0.19
#28		181.700	225.200	1.40	0.31
#34	In	5.000	5.000	1.54	0.12
	Out			0.36	0.12
#33		3.000	3.000	0.41	0.04
#32		12.300	20.300	2.42	0.32
#27		69.700	69.700	5.43	1.06
#26	In	0.000	69.700	5.43	1.06
	Out			1.05	1.06
#25		22.300	92.000	3.47	1.36
#24	In	0.000	92.000	3.47	1.36
	Out			2.59	1.36
#23		4.900	4.900	0.68	0.07
#22	In	0.000	4.900	0.68	0.07
	Out			0.20	0.07
#21		1.300	98.200	2.93	1.44
#20		44.500	44.500	1.28	0.31
#19	In	0.000	44.500	1.28	0.31
	Out			0.00	0.00
#18		11.200	55.700	0.88	0.09
#17		0.000	153.900	3.81	1.52
#16		1.900	155.800	4.07	1.55
#15		0.000	155.800	4.07	1.55
#14		6.100	182.200	7.02	1.92
#13		0.000	407.400	8.42	2.23
#12		59.000	466.400	11.35	2.51
#11		18.300	18.300	1.23	0.12
#10	In	0.000	18.300	1.23	0.12
	Out			0.73	0.12
#9		21.400	39.700	1.45	0.19
#8	In	0.000	39.700	1.45	0.19
	Out			1.08	0.19
#7		59.200	98.900	3.93	0.48
#6		56.600	155.500	4.65	0.56
#5		28.300	28.300	0.59	0.22

		Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#4		0.000	650.200	16.06	3.29
#3		16.300	666.500	17.03	3.40
#2	In	0.000	666.500	17.03	3.40
	Out			0.52	1.47
#1		0.000	666.500	0.52	1.47

Structure Detail:

Structure #31 (Riprap Channel)

Section 16 Fill Ditch

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)
12.00	3.0:1	3.0:1	17.8	2.98		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.64 cfs	
Depth:	0.02 ft	3.00 ft
Top Width:	12.11 ft	29.99 ft
Velocity*:		
X-Section Area:	0.23 sq ft	
Hydraulic Radius:	0.019 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 #30 (Erodible Channel)

Natural Channel from Section 16 Fill Ditch to South Collection Ditch

Parabolic Erodible Channel Inputs:

Material: Shales and hardpans

Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
22.0	0.0250				6.0

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.65 cfs	
Depth:	0.19 ft	
Top Width:	0.78 ft	
Velocity:	6.46 fps	
X-Section Area:	0.10 sq ft	
Hydraulic Radius:	0.111 ft	
Froude Number:	3.16	

Structure #29 (Vegetated Channel)

South Collection Ditch 90+00 to 92+68

Trapezoidal Vegetated Channel Inputs:

Material: Tall fescue

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	3.0	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:	0.65 cfs		0.65 cfs	
Depth:	0.26 ft		0.59 ft	
Top Width:	4.07 ft		6.69 ft	
Velocity:	0.83 fps		0.26 fps	
X-Section Area:	0.79 sq ft		2.55 sq ft	
Hydraulic Radius:	0.190 ft		0.373 ft	
Froude Number:	0.33		0.07	
Roughness Coefficient:	0.1024		0.5194	

Structure #28 (Vegetated Channel)

South Collection Ditch 30+00 to 90+00

Trapezoidal Vegetated Channel Inputs:

Material: Tall fescue

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	4.0	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:	1.40 cfs		1.40 cfs	
Depth:	0.32 ft		0.66 ft	
Top Width:	4.58 ft		7.31 ft	
Velocity:	1.32 fps		0.45 fps	
X-Section Area:	1.06 sq ft		3.09 sq ft	
Hydraulic Radius:	0.228 ft		0.414 ft	
Froude Number:	0.48		0.12	
Roughness Coefficient:	0.0842		0.3652	

Structure #34 (Pond)

EP1 Stockpond (to Final East Pit Ditch) Reach 1

Pond Inputs:

Initial Pool Elev:	7,376.00 ft
Initial Pool:	0.39 ac-ft

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
7,379.00	20.00	2.00:1	2.00:1	20.00

Straight Pipe

Barrel Diameter (in)	Barrel Length (ft)	Barrel Slope (%)	Manning's n	Spillway Elev (ft)	Entrance Loss Coefficient	Tailwater Depth (ft)
12.00	100.00	4.00	0.0150	7,376.00	0.90	0.00

Pond Results:

Peak Elevation:	7,376.17 ft
Dewater Time:	0.54 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)	
7,370.00	0.000	0.000	0.000		
7,371.00	0.046	0.015	0.000		
7,372.00	0.059	0.068	0.000		
7,373.00	0.070	0.132	0.000		
7,374.00	0.081	0.208	0.000		
7,375.00	0.092	0.294	0.000		
7,376.00	0.105	0.392	0.000		Spillway #2
7,376.17	0.107	0.411	0.356	12.95	Peak Stage
7,377.00	0.118	0.504	2.094		
7,378.00	0.140	0.633	4.414		
7,379.00	0.165	0.786	5.883		Spillway #1
7,380.00	0.165	0.951	55.203		
7,381.00	0.166	1.116	174.677		
7,382.00	0.166	1.282	352.543		
7,383.00	0.167	1.449	585.314		
7,384.00	0.167	1.616	873.793		
7,385.00	0.168	1.783	1,219.515		

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Straight Pipe (cfs)	Combined Total Discharge (cfs)
7,370.00	0.000	0.000	0.000
7,371.00	0.000	0.000	0.000
7,372.00	0.000	0.000	0.000
7,373.00	0.000	0.000	0.000
7,374.00	0.000	0.000	0.000
7,375.00	0.000	0.000	0.000
7,376.00	0.000	0.000	0.000
7,377.00	0.000	(3)>2.094	2.094
7,378.00	0.000	(5)>4.414	4.414
7,379.00	0.000	(5)>5.883	5.883
7,380.00	48.400	(5)>6.803	55.203
7,381.00	167.398	(6)>7.279	174.677
7,382.00	344.812	(6)>7.732	352.543
7,383.00	577.178	(6)>8.136	585.314
7,384.00	865.254	(6)>8.540	873.793
7,385.00	1,210.609	(6)>8.906	1,219.515

Structure #33 (Riprap Channel)

Final East Pitch Ditch Reach 1 from Station 8+06 to EP1

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)
12.00	2.0:1	2.0:1	15.7	2.98		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.41 cfs	
Depth:	0.02 ft	3.00 ft
Top Width:	12.08 ft	24.00 ft
Velocity*:		
X-Section Area:	0.25 sq ft	
Hydraulic Radius:	0.020 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 #32 (Nonerodible Channel)

Final East Pit Ditch Reach 1 from NTEP confluence to Station 8+06

Trapezoidal Nonerodible Channel Inputs:

Material: Shotcrete

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)
12.00	2.0:1	2.0:1	18.0	0.0170	2.99		

Nonerodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	2.42 cfs	
Depth:	0.04 ft	3.03 ft

	w/o Freeboard	w/ Freeboard
Top Width:	12.17 ft	24.13 ft
Velocity:	4.58 fps	
X-Section Area:	0.53 sq ft	
Hydraulic Radius:	0.043 ft	
Froude Number:	3.88	

Structure #27 (Riprap Channel)

Final East Pit Ditch Reach 3

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)
12.00	2.0:1	2.0:1	6.4	2.93		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	5.43 cfs	
Depth:	0.09 ft	3.02 ft
Top Width:	12.37 ft	24.09 ft
Velocity*:		
X-Section Area:	1.12 sq ft	
Hydraulic Radius:	0.091 ft	
Froude Number*:		
Manning's n*:		
Dmin:	1.00 in	
D50:	3.00 in	
Dmax:	3.75 in	

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

Structure #26 (Pond)

EP2 Stockpond

Pond Inputs:

Initial Pool Elev:	7,500.00 ft
Initial Pool:	4.26 ac-ft

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
7,505.00	60.00	2.00:1	2.00:1	20.00

Straight Pipe

Barrel Diameter (in)	Barrel Length (ft)	Barrel Slope (%)	Manning's n	Spillway Elev (ft)	Entrance Loss Coefficient	Tailwater Depth (ft)
12.00	160.00	9.00	0.0150	7,500.00	0.50	0.00

Pond Results:

Peak Elevation:	7,500.50 ft
Dewater Time:	1.22 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)	
7,492.00	0.385	0.000	0.000		
7,493.00	0.419	0.402	0.000		
7,494.00	0.454	0.839	0.000		
7,495.00	0.491	1.311	0.000		
7,496.00	0.529	1.821	0.000		
7,497.00	0.568	2.370	0.000		
7,498.00	0.609	2.958	0.000		
7,499.00	0.651	3.588	0.000		
7,500.00	0.694	4.260	0.000		Spillway #2
7,500.50	0.718	4.618	1.045	29.25	Peak Stage
7,501.00	0.741	4.978	2.094		
7,502.00	0.787	5.741	4.414		
7,503.00	0.834	6.552	5.883		
7,504.00	0.884	7.411	7.060		
7,505.00	0.932	8.319	8.069		Spillway #1
7,506.00	0.933	9.251	45.188		
7,507.00	0.934	10.185	151.737		
7,508.00	0.935	11.119	305.349		
7,509.00	0.936	12.055	524.315		
7,510.00	0.937	12.991	798.632		

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Straight Pipe (cfs)	Combined Total Discharge (cfs)
7,492.00	0.000	0.000	0.000
7,493.00	0.000	0.000	0.000
7,494.00	0.000	0.000	0.000
7,495.00	0.000	0.000	0.000
7,496.00	0.000	0.000	0.000
7,497.00	0.000	0.000	0.000
7,498.00	0.000	0.000	0.000
7,499.00	0.000	0.000	0.000
7,500.00	0.000	0.000	0.000
7,501.00	0.000	(3)>2.094	2.094
7,502.00	0.000	(5)>4.414	4.414
7,503.00	0.000	(5)>5.883	5.883
7,504.00	0.000	(5)>7.060	7.060
7,505.00	0.000	(5)>8.069	8.069
7,506.00	36.222	(5)>8.966	45.188
7,507.00	142.050	(5)>9.687	151.737
7,508.00	295.305	(5)>10.045	305.349
7,509.00	513.913	(6)>10.402	524.315
7,510.00	787.934	(6)>10.698	798.632

Structure #25 (Riprap Channel)

Final East Pit Ditch Reach 2

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)
12.00	2.0:1	2.0:1	10.0	2.97		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	3.47 cfs	
Depth:	0.05 ft	3.02 ft
Top Width:	12.21 ft	24.09 ft
Velocity*:		

	w/o Freeboard	w/ Freeboard
X-Section Area:	0.65 sq ft	
Hydraulic Radius:	0.053 ft	
Froude Number*:		
Manning's n*:		
Dmin:	1.00 in	
D50:	3.00 in	
Dmax:	3.75 in	

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

Structure #24 (Pond)

EP1 Stockpond (to EP3 Stockpond)

Pond Inputs:

Initial Pool Elev:	7,379.00 ft
Initial Pool:	0.79 ac-ft

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
7,379.00	20.00	2.00:1	2.00:1	20.00

Pond Results:

Peak Elevation:	7,379.05 ft
Dewater Time:	1.34 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)	
7,370.00	0.000	0.000	0.000		
7,371.00	0.046	0.015	0.000		
7,372.00	0.059	0.068	0.000		
7,373.00	0.070	0.132	0.000		
7,374.00	0.081	0.208	0.000		
7,375.00	0.092	0.294	0.000		
7,376.00	0.105	0.392	0.000		
7,377.00	0.118	0.504	0.000		
7,378.00	0.141	0.633	0.000		
7,379.00	0.165	0.786	0.000		Spillway #1

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
7,379.05	0.154	0.795	2.592	32.10	Peak Stage
7,380.00	0.165	0.951	48.400		
7,381.00	0.166	1.117	167.398		
7,382.00	0.166	1.283	344.812		
7,383.00	0.167	1.449	577.178		
7,384.00	0.167	1.616	865.254		
7,385.00	0.168	1.784	1,210.609		

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
7,370.00	0.000	0.000
7,371.00	0.000	0.000
7,372.00	0.000	0.000
7,373.00	0.000	0.000
7,374.00	0.000	0.000
7,375.00	0.000	0.000
7,376.00	0.000	0.000
7,377.00	0.000	0.000
7,378.00	0.000	0.000
7,379.00	0.000	0.000
7,380.00	48.400	48.400
7,381.00	167.398	167.398
7,382.00	344.812	344.812
7,383.00	577.178	577.178
7,384.00	865.254	865.254
7,385.00	1,210.609	1,210.609

Structure #23 (Riprap Channel)

EP3 Stockpond Inlet Ditch

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)
12.00	2.0:1	2.0:1	4.8	2.99		

Riprap Channel Results:

Simons/OSM Method - Mild Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.68 cfs	
Depth:	0.05 ft	3.04 ft
Top Width:	12.22 ft	24.18 ft
Velocity:	1.02 fps	
X-Section Area:	0.66 sq ft	
Hydraulic Radius:	0.054 ft	
Froude Number:	0.77	
Manning's n:	0.0279	
Dmin:	0.00 in	
D50:	3.00 in	
Dmax:	0.00 in	

Structure #22 (Pond)

EP3 Stockpond

Pond Inputs:

Initial Pool Elev:	7,357.00 ft
Initial Pool:	2.90 ac-ft

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
7,357.00	216.00	2.00:1	2.00:1	12.00

Pond Results:

Peak Elevation:	7,357.01 ft
Dewater Time:	0.52 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)	
7,340.00	0.032	0.000	0.000		
7,341.00	0.045	0.038	0.000		
7,342.00	0.060	0.091	0.000		
7,343.00	0.077	0.159	0.000		
7,344.00	0.095	0.245	0.000		
7,345.00	0.115	0.350	0.000		
7,346.00	0.129	0.472	0.000		
7,347.00	0.144	0.608	0.000		
7,348.00	0.160	0.760	0.000		
7,349.00	0.176	0.928	0.000		
7,350.00	0.192	1.112	0.000		
7,351.00	0.210	1.313	0.000		
7,352.00	0.227	1.531	0.000		
7,353.00	0.246	1.768	0.000		
7,354.00	0.264	2.023	0.000		
7,355.00	0.284	2.297	0.000		
7,356.00	0.304	2.591	0.000		
7,357.00	0.322	2.904	0.000		Spillway #1
7,357.01	0.314	2.909	0.199	12.45	Peak Stage
7,358.00	0.322	3.226	14.150		
7,359.00	0.323	3.549	61.776		
7,360.00	0.324	3.873	147.685		
7,361.00	0.325	4.197	264.762		

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
7,340.00	0.000	0.000
7,341.00	0.000	0.000
7,342.00	0.000	0.000
7,343.00	0.000	0.000
7,344.00	0.000	0.000
7,345.00	0.000	0.000
7,346.00	0.000	0.000
7,347.00	0.000	0.000
7,348.00	0.000	0.000
7,349.00	0.000	0.000
7,350.00	0.000	0.000

Elevation (ft)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
7,351.00	0.000	0.000
7,352.00	0.000	0.000
7,353.00	0.000	0.000
7,354.00	0.000	0.000
7,355.00	0.000	0.000
7,356.00	0.000	0.000
7,357.00	0.000	0.000
7,358.00	14.150	14.150
7,359.00	61.776	61.776
7,360.00	147.685	147.685
7,361.00	264.762	264.762

Structure #21 (Riprap Channel)

EP3 Stockpond Outlet Ditch

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)
12.00	2.0:1	2.0:1	3.6	2.99		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	2.93 cfs	
Depth:	0.08 ft	3.07 ft
Top Width:	12.31 ft	24.27 ft
Velocity*:		
X-Section Area:	0.94 sq ft	
Hydraulic Radius:	0.076 ft	
Froude Number*:		
Manning's n*:		
Dmin:	1.00 in	
D50:	3.00 in	
Dmax:	3.75 in	

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

Structure #20 (Riprap Channel)

North Tributary Final East Pit Ditch Reach 2

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)
12.00	2.0:1	2.0:1	12.2	2.98		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	1.28 cfs	
Depth:	0.03 ft	3.01 ft
Top Width:	12.13 ft	24.05 ft
Velocity*:		
X-Section Area:	0.39 sq ft	
Hydraulic Radius:	0.032 ft	
Froude Number*:		
Manning's n*:		
Dmin:	1.00 in	
D50:	3.00 in	
Dmax:	3.75 in	

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

Structure #19 (Pond)

NTEP1 Stockpond

Pond Inputs:

Initial Pool Elev:	7,385.00 ft
Initial Pool:	0.92 ac-ft

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
7,389.00	20.00	2.00:1	2.00:1	20.00

Pond Results:

Peak Elevation:	7,386.29 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)	
7,378.00	0.041	0.000	0.000		
7,379.00	0.071	0.055	0.000		
7,380.00	0.096	0.138	0.000		
7,381.00	0.119	0.245	0.000		
7,382.00	0.143	0.376	0.000		
7,383.00	0.168	0.531	0.000		
7,384.00	0.194	0.712	0.000		
7,385.00	0.220	0.919	0.000		
7,386.00	0.247	1.152	0.000		
7,386.29	0.255	1.228	0.000	0.00	Peak Stage
7,387.00	0.275	1.413	0.000		
7,388.00	0.304	1.702	0.000		
7,389.00	0.338	2.023	0.000		Spillway #1
7,390.00	0.400	2.392	48.400		

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
7,378.00	0.000	0.000
7,379.00	0.000	0.000
7,380.00	0.000	0.000
7,381.00	0.000	0.000
7,382.00	0.000	0.000
7,383.00	0.000	0.000
7,384.00	0.000	0.000
7,385.00	0.000	0.000
7,386.00	0.000	0.000
7,387.00	0.000	0.000
7,388.00	0.000	0.000
7,389.00	0.000	0.000
7,390.00	48.400	48.400

Structure #18 (Riprap Channel)

North Tributary Final East Pit Ditch Reach 1 from Confluence of EP3 Outlet to NTEP1

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)
12.00	2.0:1	2.0:1	7.2	2.96		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	0.88 cfs	
Depth:	0.05 ft	3.01 ft
Top Width:	12.19 ft	24.03 ft
Velocity*:		
X-Section Area:	0.56 sq ft	
Hydraulic Radius:	0.046 ft	
Froude Number*:		
Manning's n*:		
Dmin:	1.00 in	
D50:	3.00 in	
Dmax:	3.75 in	

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

Structure #17 (Null)

Confluence North Tributary East Pit Ditch and EP3 Outlet Ditch

Structure #16 (Riprap Channel)

North Tributary Final East Pit Ditch Reach 1 to Confluence w/EP3 Outlet Ditch

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)
12.00	2.0:1	2.0:1	21.5	2.99		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	4.07 cfs	
Depth:	0.03 ft	3.02 ft
Top Width:	12.13 ft	24.09 ft
Velocity*:		
X-Section Area:	0.40 sq ft	
Hydraulic Radius:	0.033 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 #15 (Null)

Confluence Final East Pit Ditch and North Tributary East Pit Ditch

Structure #14 (Riprap Channel)

Final East Pit Ditch Reach 1 to Confluence w/North Trib Final East Pit Ditch

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)
12.00	2.0:1	2.0:1	21.1	4.00		

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	7.02 cfs	
Depth:	0.05 ft	4.05 ft
Top Width:	12.21 ft	28.21 ft
Velocity*:		
X-Section Area:	0.63 sq ft	
Hydraulic Radius:	0.051 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 #13 (Null)

Confluence of Final East Pit Ditch & South Collection Ditch at Station 30+00

Structure #12 (Vegetated Channel)

South Collection Ditch Station 0+00 to 30+00

Trapezoidal Vegetated Channel Inputs:

Material: Tall fescue

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	5.0	D, B	0.87			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:	11.35 cfs		11.35 cfs	
Depth:	0.67 ft	1.54 ft	1.09 ft	1.96 ft
Top Width:	7.37 ft	14.33 ft	10.69 ft	17.65 ft
Velocity:	3.61 fps		1.65 fps	
X-Section Area:	3.14 sq ft		6.89 sq ft	
Hydraulic Radius:	0.417 ft		0.629 ft	
Froude Number:	0.97		0.36	
Roughness Coefficient:	0.0514		0.1484	

Structure #11 (Vegetated Channel)

Prospect Ditch Reach 3

Trapezoidal Vegetated Channel Inputs:

Material: Tall fescue

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)
12.00	2.0:1	2.0:1	12.0	D, B				5.0

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:	1.23 cfs		1.23 cfs	
Depth:	0.11 ft		0.26 ft	
Top Width:	12.42 ft		13.03 ft	
Velocity:	0.95 fps		0.38 fps	
X-Section Area:	1.29 sq ft		3.22 sq ft	
Hydraulic Radius:	0.104 ft		0.245 ft	
Froude Number:	0.52		0.14	
Roughness Coefficient:	0.1183		0.5263	

Structure #10 (Pond)

PD2 Stockpond

Pond Inputs:

Initial Pool Elev:	7,565.00 ft
Initial Pool:	1.49 ac-ft

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
7,565.00	20.00	2.00:1	2.00:1	20.00

Pond Results:

Peak Elevation:	7,565.02 ft
Dewater Time:	0.50 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)
7,556.00	0.054	0.000	0.000	
7,557.00	0.086	0.069	0.000	
7,558.00	0.106	0.165	0.000	
7,559.00	0.127	0.282	0.000	
7,560.00	0.150	0.420	0.000	
7,561.00	0.175	0.582	0.000	
7,562.00	0.200	0.770	0.000	
7,563.00	0.227	0.983	0.000	

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
7,564.00	0.253	1.222	0.000		
7,565.00	0.280	1.489	0.000		Spillway #1
7,565.02	0.277	1.493	0.731	12.10	Peak Stage
7,566.00	0.300	1.779	48.400		

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
7,556.00	0.000	0.000
7,557.00	0.000	0.000
7,558.00	0.000	0.000
7,559.00	0.000	0.000
7,560.00	0.000	0.000
7,561.00	0.000	0.000
7,562.00	0.000	0.000
7,563.00	0.000	0.000
7,564.00	0.000	0.000
7,565.00	0.000	0.000
7,566.00	48.400	48.400

Structure #9 (Vegetated Channel)

Prospect Ditch Reach 2

Trapezoidal Vegetated Channel Inputs:

Material: Tall fescue

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)
12.00	2.0:1	2.0:1	13.0	D, B				5.0

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:	1.45 cfs		1.45 cfs	
Depth:	0.11 ft		0.26 ft	
Top Width:	12.44 ft		13.05 ft	
Velocity:	1.07 fps		0.44 fps	

	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
X-Section Area:	1.36 sq ft		3.29 sq ft	
Hydraulic Radius:	0.109 ft		0.250 ft	
Froude Number:	0.57		0.15	
Roughness Coefficient:	0.1125		0.4823	

Structure #8 (Pond)

PD1 Stockpond

Pond Inputs:

Initial Pool Elev:	7,355.00 ft
Initial Pool:	0.88 ac-ft

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
7,355.00	20.00	2.00:1	2.00:1	20.00

Pond Results:

Peak Elevation:	7,355.02 ft
Dewater Time:	0.51 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)	
7,348.00	0.031	0.000	0.000		
7,349.00	0.074	0.051	0.000		
7,350.00	0.097	0.136	0.000		
7,351.00	0.120	0.244	0.000		
7,352.00	0.140	0.374	0.000		
7,353.00	0.159	0.523	0.000		
7,354.00	0.180	0.692	0.000		
7,355.00	0.201	0.882	0.000		Spillway #1
7,355.02	0.202	0.887	1.079	12.20	Peak Stage
7,356.00	0.223	1.094	48.400		

Detailed Discharge Table

Elevation (ft)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
7,348.00	0.000	0.000
7,349.00	0.000	0.000
7,350.00	0.000	0.000
7,351.00	0.000	0.000
7,352.00	0.000	0.000
7,353.00	0.000	0.000
7,354.00	0.000	0.000
7,355.00	0.000	0.000
7,356.00	48.400	48.400

Structure #7 (Riprap Channel)

Prospect Ditch Reach 1

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)
12.00	2.0:1	2.0:1	23.6			

Riprap Channel Results:

Simons/OSM Method - Steep Slope Design

	w/o Freeboard	w/ Freeboard
Design Discharge:	3.93 cfs	
Depth:	0.03 ft	
Top Width:	12.11 ft	
Velocity*:		
X-Section Area:	0.34 sq ft	
Hydraulic Radius:	0.028 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 #6 (Erodible Channel)

Natural Channel Below Reach 1 Prospect Ditch

Parabolic Erodible Channel Inputs:

Material: Coarse gravel noncolloidal

Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
21.0	0.0250				6.0

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	4.65 cfs	
Depth:	0.41 ft	
Top Width:	1.64 ft	
Velocity:	10.38 fps	
X-Section Area:	0.45 sq ft	
Hydraulic Radius:	0.234 ft	
Froude Number:	3.50	

Structure #5 (Vegetated Channel)

Prospect Collection Ditch

Trapezoidal Vegetated Channel Inputs:

Material: Tall fescue

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)
12.00	2.0:1	2.0:1	11.9	D, B				5.0

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:	0.59 cfs		0.59 cfs	
Depth:	0.08 ft		0.21 ft	
Top Width:	12.31 ft		12.83 ft	
Velocity:	0.62 fps		0.23 fps	
X-Section Area:	0.95 sq ft		2.58 sq ft	
Hydraulic Radius:	0.077 ft		0.200 ft	
Froude Number:	0.40		0.09	
Roughness Coefficient:	0.1475		0.7669	

Structure #4 (Null)

Confluence Prospect & South Collection Ditches

Structure #3 (Erodible Channel)

Natural Channel Above Prospect Pond

Parabolic Erodible Channel Inputs:

Material: Asphaltic Concrete, Machine Placed

Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
20.0	0.0140				6.0

Erodible Channel Results:

	w/o Freeboard	w/ Freeboard
Design Discharge:	17.03 cfs	
Depth:	0.54 ft	
Top Width:	2.17 ft	
Velocity:	21.79 fps	
X-Section Area:	0.78 sq ft	
Hydraulic Radius:	0.310 ft	
Froude Number:	6.39	

Structure #2 (Pond)

Prospect Pond

Pond Inputs:

Initial Pool Elev:	6,744.00 ft
Initial Pool:	2.18 ac-ft

Perforated Riser

Riser Diameter (in)	Riser Height (ft)	Barrel Diameter (in)	Barrel Length (ft)	Barrel Slope (%)	Manning's n	Spillway Elev (ft)	Number of Holes per Elev
12.00	8.70	12.00	129.00	9.70	0.0150	6,750.30	2

Emergency Spillway

Spillway Elev	Crest Length (ft)	Left Sideslope	Right Sideslope	Bottom Width (ft)
6,752.00	20.00	1.50:1	1.50:1	12.00

Pond Results:

Peak Elevation:	6,750.12 ft
Dewater Time:	4.04 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)	
6,734.00	0.029	0.000	0.000		
6,735.00	0.088	0.056	0.000		
6,736.00	0.117	0.158	0.000		
6,737.00	0.149	0.291	0.000		
6,738.00	0.185	0.457	0.000		
6,739.00	0.225	0.662	0.000		
6,740.00	0.269	0.909	0.000		
6,741.00	0.293	1.190	0.000		
6,742.00	0.317	1.495	0.000		
6,743.00	0.341	1.823	0.000		
6,744.00	0.365	2.176	0.000		Low hole SPW #1
6,745.00	0.390	2.554	0.210	21.74*	
6,746.00	0.418	2.958	0.297	16.45*	
6,747.00	0.448	3.391	0.364	14.40*	
6,748.00	0.478	3.854	0.420	13.33*	
6,749.00	0.509	4.347	0.470	12.71*	
6,750.00	0.542	4.872	0.515	14.45	
6,750.12	0.545	4.938	0.520	3.95	Peak Stage
6,750.30	0.551	5.036	0.527		Spillway #1
6,751.00	0.572	5.429	3.164		
6,752.00	0.604	6.017	4.931		Spillway #2
6,753.00	0.633	6.636	35.637		
6,754.00	0.664	7.284	110.493		
6,755.00	0.695	7.964	223.581		

**Designates time(s) to dewater have been extrapolated beyond the 50 hour hydrograph limit.*

Detailed Discharge Table

Elevation (ft)	Perf. Riser (cfs)	Emergency Spillway (cfs)	Combined Total Discharge (cfs)
6,734.00	0.000	0.000	0.000
6,735.00	0.000	0.000	0.000
6,736.00	0.000	0.000	0.000
6,737.00	0.000	0.000	0.000
6,738.00	0.000	0.000	0.000
6,739.00	0.000	0.000	0.000
6,740.00	0.000	0.000	0.000
6,741.00	0.000	0.000	0.000
6,742.00	0.000	0.000	0.000
6,743.00	0.000	0.000	0.000
6,744.00	2.00>0.000	0.000	0.000
6,745.00	0.210	0.000	0.210
6,746.00	0.297	0.000	0.297
6,747.00	0.364	0.000	0.364
6,748.00	0.420	0.000	0.420
6,749.00	0.470	0.000	0.470
6,750.00	0.515	0.000	0.515
6,750.30	0.527	0.000	0.527
6,751.00	3.164	0.000	3.164
6,752.00	4.931	0.000	4.931
6,753.00	6.214	29.423	35.637
6,754.00	7.274	103.218	110.493
6,755.00	8.199	215.382	223.581

Structure #1 (Null)

Null Below Prospect 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)
#31	1	21.500	0.135	0.000	0.000	62.000	S	0.64	0.194
	Σ	**21.500**						**0.64**	**0.194**
#30	1	12.500	0.089	0.000	0.000	47.000	S	0.00	0.000
	2	6.800	0.030	0.000	0.000	47.000	S	0.00	0.000
	3	0.300	0.031	0.000	0.000	62.000	F	0.04	0.001
	Σ	**41.100**						**0.65**	**0.194**
#29	1	2.400	0.041	0.000	0.000	47.000	S	0.00	0.000
	Σ	**43.500**						**0.65**	**0.194**
#28	1	2.200	0.112	0.000	0.000	62.000	M	0.30	0.029
	2	1.400	0.039	0.000	0.000	62.000	M	0.19	0.018
	3	23.000	0.222	0.000	0.000	47.000	S	0.00	0.000
	4	5.100	0.024	0.000	0.000	62.000	M	0.70	0.068
	5	149.700	0.146	0.000	0.000	47.000	S	0.02	0.001
	6	0.300	0.009	0.000	0.000	62.000	F	0.04	0.001
	Σ	**225.200**						**1.40**	**0.312**
#34	1	5.000	0.019	0.000	0.000	67.000	F	1.54	0.115
	Σ	**5.000**						**1.54**	**0.115**
#33	1	3.000	0.036	0.000	0.000	62.000	F	0.41	0.040
	Σ	**3.000**						**0.41**	**0.040**
#32	1	12.300	0.085	0.000	0.000	62.000	F	1.70	0.164
	Σ	**20.300**						**2.42**	**0.319**
#27	1	6.000	0.014	0.000	0.000	80.000	F	5.12	0.376
	2	63.700	0.237	0.000	0.000	62.000	M	2.79	0.684
	Σ	**69.700**						**5.43**	**1.060**
#26	Σ	**69.700**						**5.43**	**1.060**
#25	1	22.300	0.107	0.000	0.000	62.000	M	3.08	0.297
	Σ	**92.000**						**3.47**	**1.357**
#24	Σ	**92.000**						**3.47**	**1.357**
#23	1	4.900	0.074	0.000	0.000	62.000	M	0.68	0.065
	Σ	**4.900**						**0.68**	**0.065**
#22	Σ	**4.900**						**0.68**	**0.065**

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#21	1	1.300	0.050	0.000	0.000	62.000	M	0.18	0.014
	Σ	**98.200**						**2.93**	**1.436**
#20	1	28.800	0.232	0.000	0.000	62.000	M	1.28	0.309
	2	15.700	0.120	0.000	0.000	47.000	S	0.00	0.000
	Σ	**44.500**						**1.28**	**0.309**
#19	Σ	**44.500**						**1.28**	**0.309**
#18	1	6.400	0.073	0.000	0.000	62.000	M	0.88	0.085
	2	4.800	0.057	0.000	0.000	47.000	S	0.00	0.000
	Σ	**55.700**						**0.88**	**0.085**
#17	Σ	**153.900**						**3.81**	**1.522**
#16	1	1.900	0.035	0.000	0.000	62.000	M	0.26	0.025
	Σ	**155.800**						**4.07**	**1.547**
#15	Σ	**155.800**						**4.07**	**1.547**
#14	1	2.300	0.025	0.000	0.000	47.000	S	0.00	0.000
	2	3.800	0.038	0.000	0.000	62.000	M	0.52	0.051
	Σ	**182.200**						**7.02**	**1.917**
#13	Σ	**407.400**						**8.42**	**2.228**
#12	1	36.000	0.073	0.000	0.000	47.000	S	0.00	0.000
	2	19.400	0.121	0.000	0.000	62.000	M	2.68	0.258
	3	1.200	0.018	0.000	0.000	47.000	S	0.00	0.000
	4	2.400	0.022	0.000	0.000	61.000	F	0.26	0.028
	Σ	**466.400**						**11.35**	**2.515**
#11	1	2.600	0.032	0.000	0.000	47.000	S	0.00	0.000
	2	8.900	0.041	0.000	0.000	62.000	M	1.23	0.119
	3	5.900	0.125	0.000	0.000	47.000	S	0.00	0.000
	4	0.900	0.065	0.000	0.000	47.000	S	0.00	0.000
	Σ	**18.300**						**1.23**	**0.119**
#10	Σ	**18.300**						**1.23**	**0.119**
#9	1	5.400	0.042	0.000	0.000	62.000	M	0.75	0.072
	2	16.000	0.080	0.000	0.000	47.000	S	0.00	0.000
	Σ	**39.700**						**1.45**	**0.191**
#8	Σ	**39.700**						**1.45**	**0.191**
#7	1	12.100	0.093	0.000	0.000	62.000	M	1.67	0.161
	2	34.400	0.192	0.000	0.000	47.000	S	0.00	0.000

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
	3	9.800	0.062	0.000	0.000	62.000	M	1.35	0.131
	4	2.900	0.061	0.000	0.000	47.000	S	0.00	0.000
	Σ	**98.900**						**3.93**	**0.482**
#6	1	1.200	0.019	0.000	0.000	62.000	M	0.17	0.012
	2	1.100	0.029	0.000	0.000	47.000	S	0.00	0.000
	3	5.200	0.047	0.000	0.000	61.000	S	0.55	0.061
	4	4.800	0.025	0.000	0.000	47.000	S	0.00	0.000
	5	17.400	0.134	0.000	0.000	47.000	S	0.00	0.000
	6	26.900	0.234	0.000	0.000	47.000	S	0.00	0.000
	Σ	**155.500**						**4.65**	**0.556**
#5	1	27.800	0.150	0.000	0.000	61.000	S	0.59	0.220
	2	0.500	0.010	0.000	0.000	47.000	S	0.00	0.000
	Σ	**28.300**						**0.59**	**0.220**
#4	**Σ**	**650.200**						**16.06**	**3.290**
#3	1	7.200	0.036	0.000	0.000	47.000	S	0.00	0.000
	2	9.100	0.012	0.000	0.000	61.000	S	0.97	0.106
	Σ	**666.500**						**17.03**	**3.396**
#2	**Σ**	**666.500**						**17.03**	**3.396**
#1	**Σ**	**666.500**						**0.52**	**1.465**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#3	1	2. Minimum tillage cultivation	45.00	198.90	442.00	3.350	0.036
#3	**1**	**Time of Concentration:**					**0.036**
#3	2	4. Cultivated, straight row	59.00	176.40	299.00	6.860	0.012
#3	**2**	**Time of Concentration:**					**0.012**
#5	1	3. Short grass pasture	16.00	276.63	1,729.00	3.200	0.150
#5	**1**	**Time of Concentration:**					**0.150**
#5	2	3. Short grass pasture	19.00	25.46	134.00	3.480	0.010
#5	**2**	**Time of Concentration:**					**0.010**
#6	1	3. Short grass pasture	26.00	76.18	293.00	4.070	0.019
#6	**1**	**Time of Concentration:**					**0.019**
#6	2	3. Short grass pasture	10.00	26.40	264.00	2.520	0.029
#6	**2**	**Time of Concentration:**					**0.029**
#6	3	3. Short grass pasture	30.00	226.20	754.00	4.380	0.047
#6	**3**	**Time of Concentration:**					**0.047**

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#6	4	3. Short grass pasture	38.00	174.04	458.00	4.930	0.025
#6	**4**	**Time of Concentration:**					**0.025**
#6	5	3. Short grass pasture	18.00	296.28	1,646.00	3.390	0.134
#6	**5**	**Time of Concentration:**					**0.134**
#6	6	3. Short grass pasture	12.00	280.07	2,334.00	2.770	0.234
#6	**6**	**Time of Concentration:**					**0.234**
#7	1	3. Short grass pasture	22.00	277.63	1,262.00	3.750	0.093
#7	**1**	**Time of Concentration:**					**0.093**
#7	2	3. Short grass pasture	16.00	355.52	2,222.00	3.200	0.192
#7	**2**	**Time of Concentration:**					**0.192**
#7	3	3. Short grass pasture	12.00	75.24	627.00	2.770	0.062
#7	**3**	**Time of Concentration:**					**0.062**
#7	4	3. Short grass pasture	6.00	25.85	431.00	1.950	0.061
#7	**4**	**Time of Concentration:**					**0.061**
#9	2	3. Short grass pasture	14.00	121.38	867.00	2.990	0.080
#9	**2**	**Time of Concentration:**					**0.080**
#11	1	3. Short grass pasture	14.00	48.58	347.00	2.990	0.032
#11	**1**	**Time of Concentration:**					**0.032**
#11	2	3. Short grass pasture	12.00	49.44	412.00	2.770	0.041
#11	**2**	**Time of Concentration:**					**0.041**
#11	3	3. Short grass pasture	1.50	6.57	438.00	0.970	0.125
#11	**3**	**Time of Concentration:**					**0.125**
#11	4	3. Short grass pasture	1.50	3.44	230.00	0.970	0.065
#11	**4**	**Time of Concentration:**					**0.065**
#12	1	3. Short grass pasture	19.00	174.04	916.00	3.480	0.073
#12	**1**	**Time of Concentration:**					**0.073**
#12	2	3. Short grass pasture	12.00	145.08	1,209.00	2.770	0.121
#12	**2**	**Time of Concentration:**					**0.121**
#12	3	3. Short grass pasture	13.00	24.31	187.00	2.880	0.018
#12	**3**	**Time of Concentration:**					**0.018**
#12	4	3. Short grass pasture	38.00	150.48	396.00	4.930	0.022
#12	**4**	**Time of Concentration:**					**0.022**
#14	1	3. Short grass pasture	39.00	176.67	453.00	4.990	0.025
#14	**1**	**Time of Concentration:**					**0.025**
#14	2	3. Short grass pasture	26.00	148.20	570.00	4.070	0.038
#14	**2**	**Time of Concentration:**					**0.038**
#16	1	3. Short grass pasture	21.00	99.32	473.00	3.660	0.035
#16	**1**	**Time of Concentration:**					**0.035**
#18	1	3. Short grass pasture	15.00	122.70	818.00	3.090	0.073
#18	**1**	**Time of Concentration:**					**0.073**
#18	2	3. Short grass pasture	13.00	77.35	595.00	2.880	0.057
#18	**2**	**Time of Concentration:**					**0.057**

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#20	1	3. Short grass pasture	11.00	243.87	2,217.00	2.650	0.232
#20	**1**	**Time of Concentration:**					**0.232**
#20	2	3. Short grass pasture	11.00	126.61	1,151.00	2.650	0.120
#20	**2**	**Time of Concentration:**					**0.120**
#21	1	3. Short grass pasture	3.00	7.58	253.00	1.380	0.050
#21	**1**	**Time of Concentration:**					**0.050**
#23	1	3. Short grass pasture	15.00	123.90	826.00	3.090	0.074
#23	**1**	**Time of Concentration:**					**0.074**
#25	1	3. Short grass pasture	15.00	179.85	1,199.00	3.090	0.107
#25	**1**	**Time of Concentration:**					**0.107**
#27	1	5. Nearly bare and untilled, and alluvial valley fans	13.00	24.96	192.00	3.600	0.014
#27	**1**	**Time of Concentration:**					**0.014**
#27	2	3. Short grass pasture	8.00	154.39	1,930.00	2.260	0.237
#27	**2**	**Time of Concentration:**					**0.237**
#28	1	3. Short grass pasture	4.00	26.00	650.00	1.600	0.112
#28	**1**	**Time of Concentration:**					**0.112**
#28	2	3. Short grass pasture	8.00	25.43	318.00	2.260	0.039
#28	**2**	**Time of Concentration:**					**0.039**
#28	3	3. Short grass pasture	10.00	201.90	2,019.00	2.520	0.222
#28	**3**	**Time of Concentration:**					**0.222**
#28	4	3. Short grass pasture	22.00	74.14	337.00	3.750	0.024
#28	**4**	**Time of Concentration:**					**0.024**
#28	5	3. Short grass pasture	16.00	269.12	1,682.00	3.200	0.146
#28	**5**	**Time of Concentration:**					**0.146**
#28	6	3. Short grass pasture	20.00	24.60	123.00	3.570	0.009
#28	**6**	**Time of Concentration:**					**0.009**
#29	1	3. Short grass pasture	33.00	225.39	683.00	4.590	0.041
#29	**1**	**Time of Concentration:**					**0.041**
#30	1	3. Short grass pasture	18.00	197.46	1,097.00	3.390	0.089
#30	**1**	**Time of Concentration:**					**0.089**
#30	2	3. Short grass pasture	37.00	200.17	541.00	4.860	0.030
#30	**2**	**Time of Concentration:**					**0.030**
#30	3	3. Short grass pasture	2.50	3.55	142.00	1.260	0.031
#30	**3**	**Time of Concentration:**					**0.031**
#31	1	3. Short grass pasture	16.00	249.60	1,560.00	3.200	0.135
#31	**1**	**Time of Concentration:**					**0.135**
#32	1	3. Short grass pasture	22.00	253.22	1,151.00	3.750	0.085
#32	**1**	**Time of Concentration:**					**0.085**
#33	1	3. Short grass pasture	24.00	122.64	511.00	3.910	0.036
#33	**1**	**Time of Concentration:**					**0.036**
#34	1	5. Nearly bare and untilled, and alluvial valley fans	2.00	2.00	100.00	1.410	0.019

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#34	**1**	**Time of Concentration:**					**0.019**