C/007/013 Incoming

UtahAmerican Energy,

Lila Canyon Project
P. O. Box 910
East Carbon, Utah 84520
Phone: (435) 888-4000
(435) 650-3157
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Utah Division of Oil, Gas & Mining
Utah Coal Program
1594 West North Temple, Suite 1210
P.O. Box 145801
Salt Lake City, UT 84114-5801

April 28, 2017

Attn: Daron Haddock
Permit Supervisor

RECEIVED
MAY 01 2017
DIV. OF OIL, GAS & MINING

Re: Lila Canyon Mine, UtahAmerican Energy, Inc. C/007/013
Clean Copies for submittals:

L16-003 Drainage Revisions #5351
L16-007 Pond #1 Culvert #5352
L17-002 Bonding #5439

Dear Mr. Haddock,

Included in this packet you will find the clean copies for the above listed MRP Submittals for Lila Canyon Mine.

If you have any questions, or need any additional information regarding this submittal, please contact me directly at 435-888-4000.

Sincerely,

Karin Madsen
Engineering Tech
UtahAmerican Energy, Inc.

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Application for Permit Processing
Detailed Schedule of Changes to the MRP

Title of Proposal: Task ID# 5439

CLEAN COPIES for submittals:
L16-003 Drainage Revisions
L16-007 Pond 1 Culvert
L17-002 Bonding Revisions

Permit Number: ACT/007/013

Mine: Lila Canyon

Permittee: UtahAmerican Energy, Inc.

Provide a detailed listing of all changes to the mining and reclamation plan which will be required as a result of this proposed permit application. Individually list all maps and drawings which are to be added, replaced, or removed from the plan. Include changes of the table of contents, section of the plan, pages, or other information as needed to specifically locate, identify and revise the existing mining and reclamation plan. **Include page, section and drawing numbers as part of the description.**

			DESCRIPTION OF MAP, TEXT, OR MATERIALS TO BE CHANGED
☐ ADD	☐ REPLACE	☐ REMOVE	Appendix 1-7 in its entirety
☐ ADD	☐ REPLACE	☐ REMOVE	Chapter 2 TOC, Pages 9, 13
☐ ADD	☐ REPLACE	☐ REMOVE	Chapter 5 TOC, Pages 11, 14, 15, 17, 19, 20, 34, 46, 56, 63, 64, 65
☐ ADD	☐ REPLACE	☐ REMOVE	Appendix 5-4 in it's entirety
☐ ADD	☐ REPLACE	☐ REMOVE	Chapter 7 pages 75, 76, 85
☐ ADD	☐ REPLACE	☐ REMOVE	Appendix 7-3 in its entirety
☐ ADD	☐ REPLACE	☐ REMOVE	Appendix 7-4 in its entirety
☐ ADD	☐ REPLACE	☐ REMOVE	Appendix 7-9 in its entirety
☐ ADD	☐ REPLACE	☐ REMOVE	Chapter 8 TOC, page 4
☐ ADD	☐ REPLACE	☐ REMOVE	Plate #1 of 1 Proposed Culvert Revision
☐ ADD	☐ REPLACE	☐ REMOVE	Plate 2-3a Topsoil Salvage
☐ ADD	☐ REPLACE	☐ REMOVE	Plate 5-2 As-Built Surface Facilities
☐ ADD	☐ REPLACE	☐ REMOVE	Plate 7-2 Disturbed Area Hydrology and Watershed Map
☐ ADD	☐ REPLACE	☐ REMOVE	Plate 7-5 Proposed Sediment Control
☐ ADD	☐ REPLACE	☐ REMOVE	Plate 7-6a Proposed Sediment Pond #1
☐ ADD	☐ REPLACE	☐ REMOVE	Plate 7-6b Proposed Sediment Pond #2
☐ ADD	☐ REPLACE	☐ REMOVE	Plate 8-1 Proposed Surface Facilities (Final Configuration)
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	

Any other specific or special instructions required for insertion of this proposal into the Mining and Reclamation Plan?

Application for Permit Processing
Detailed Schedule of Changes to the MRP

L17-002 Bonding Submittal CLEAN COPIES

Permit Number: ACT/007/013

Mine: Lila Canyon

Permittee: UtahAmerican Energy, Inc.

Provide a detailed listing of all changes to the mining and reclamation plan which will be required as a result of this proposed permit application. Individually list all maps and drawings which are to be added, replaced, or removed from the plan. Include changes of the table of contents, section of the plan, pages, or other information as needed to specifically locate, identify and revise the existing mining and reclamation plan. **Include page, section and drawing numbers as part of the description.**

			DESCRIPTION OF MAP, TEXT, OR MATERIALS TO BE CHANGED
☐ ADD	☐ REPLACE	☐ REMOVE	Bonding Information for Lila Canyon Mine
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
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☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	

Any other specific or special instructions required for insertion of this proposal into the Mining and Reclamation Plan?

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Bond Amount

Direct Costs		
Subtotal Demolition and Removal	$781,828	
Subtotal Backfill and Grading	$443,515	
Subtotal Vegetation	$59,426	
Subtotal Direct Costs	$1,284,768	
Indirect Costs		
Mob/Demob	$128,477	10.0%
Contingency	$64,238	5.0%
Engineering Redesign	$32,119	2.5%
Main Office Expense	$87,364	6.8%
Project Management Fee	$32,119	2.5%
Subtotal Indirect Costs	$344,318	26.8%
SubTotal	$1,629,086	
Total	$1,629,086	
Escalation Factor		0.70%
Number of Years		2
Escalation	$22,807	
Total	$1,651,893	
Reclamation Cost 2018	$1,651,893	
Bond Amount (rounded to nearest $1,000 in 2018 dollars)	$1,652,000	
Current Bond	$1,799,000	
Difference between cost estimate and bond	$147,000	

Cost factors

Means Number	Material	Unit Cost	Units
31 23 16 42 0260	Excavation Bulk Bank 2 CY (322BL)	1.44	CY
32 91 13.23 3100	75 HP Dozerw/scarifier	3.93	MSF
32 01 90.13 0180	Fertilizer Hydro Spreader Mat. Only	4.30	MSF
32 01 90.13 0180	Hydro Spreader (equip. & labor)B-81 80MSF	4.99	MSF
Great Basin	Grasses for Lila Canyon	164.70	AC
Great Basin	Forbs for Lial Canyon	42.55	AC
Great Basin	Shrubs for Lila Canyon	85.33	AC
32 01 90.13 0180	Seeding Hydro spread	4.99	MSF
02 41 16.13 0020	Steel Buld.	0.28	CF
Scamp Excavation	Concrete Demolition	18.00	CY
31 23 16.42 1300	Front End Loader 3CY	1.69	CY
31 23 23.20 1025	12 CY (16 Ton) Dump Truck 1/2 rod. Trip	10.80	CY
02 41 16.17 4200	On Site Disposal	9.07	CY
ECDC	ECDC	65.00	/Ton
02 65 10.30 0130	9,000 Gal. To 12,000 Gal. Tank	1325.00	EA.
02 65 10.30 1029	9,000 Gal. To 12,000 Gal. Tank	1050.00	EA.
JennChem	Seal Portals	4320.00	EA.
23 05 05.10 3600	Mechanical Equipment Heavy	795.00	Ton
31 23 16.42 0260	Excavation Bulk Bank 2 CY (322BL)	1.44	CY
31 23 16.13 3080	Backfill Trench Minimal Haul 2 1/4 CY	1.79	CY
01 54 33.20 4360	D9R Semi-U EROPS (9-54 (2H04) Hourly Costs	2392.00	/Day
01 54 33.20 0320	Cat 326 FL Hourly Costs	1582.00	/Day
01 54 33.20 4870	988 G EROPS (9-38)(3Q04) Hourly Costs	3085.00	/Day
01 54 33.20 1200	825G (6-13)(4Q03) Hourly Costs	184.80	/Day
01 54 33.20 3700	631G (9-51)(2nd04) Hourly Costs	2548.00	/Day
01 54 33.20 5610	770 (20-11)(3Q03) Hourly Costs	1861.00	/Day
01 54 33.40 6950	6000 Ga. H2O Truck Diesel 2nd2008) Hourly Costs	1168.00	/Day
01 54 33.40 7100	Pick-up Truck 4x4 1 Ton Hourly Costs	156.80	/Day
R.S.Means Back Page	Foreman Outside	51.90	
R.S.Means Back Page	Equipment Operator, Medium	51.10	
Classic Helicopters	Helicopter	2774	/Day
JennChem	Labor	265.00	/HR
26 05 05.10 1900	Wire Removal	19.75	FT
02 41 16.13 0100	Mixture of types	0.31	CF
02 41 13.60 1700	Chain link, post & fabric 8' 10' high remove only	3.07	FT
02 41 13.17 5050	Pavement Removal 4" to 6"	7.12	SY
02 41 13.30 1600	Median Barruer	10.71	LF
Scamp	Transportation to Nielson Dump	13.63	/Ton
Nielson	Nielson Construction	7.00	/Ton

02 41 13.80 0200	Wood Poles and cross bars	247.00 EA.
33 71 39.13 0820	High Voltage Line	152.25 /Mile
02 65 10.30 0110	3000 to 5000 gal. tank	571.50 EA.
02 65 10.30 1023	3000 to 5000 gal. tank	760.00 EA.
02 65 10.30 0300	3000 to 5000 gal. tank	230.50 EA.
02 41 13.30 0800	Gruadrail Corrugated Steel	12.17 LF
02 41 13.20 0200	End Section	34.15 EA.
02 41 13.40 0180	36" CMP (5)	12.24 LF
02 41 13.40 0200	72" CMP (1)	34.25 LF
13 05 05.60 0050	Silos, Selective Demolition	1875.00
Scamp Quote	To Scamp Yard./Salvage	135.00 Hr
R.S.Means Back Page	Truck Driver	43.20
R.S.Means Back Page	Light Equipmnet Operator	49.15
01 54 33.40 2800	250 KW Diesel Generator	807.60 /Day
01 54 33.40 7660	Water Tank Portable	17.30 /Day
01 54 33.20 4710	Front End Loader, 4WD, 3.5CY., 145 HP	516.00 /Day

Demolition and Removal

Office/Bathhouse 01	100946
Shop/Warehouse 02	126100
Security Shack 03	612
Mine Subtation 04	13531
Surface Power Lines 05	2154
Water Treatment Plant 06	786
Portable Water Tank 07	1354
Process Water Tank 08	1354
Sewer Tank 09	1563
Drain Field 10	0
Ventilation Fan 11	84676
Conveyor Tunnel to Coal Stockpile 12	33260
Conveyor ROM Stockpile to Crusher 13	12008
Crusher Conveyor to Loadout Bin 14	8193
Conveyor Loadout Bin Truck Loadout 15	862
Reclaim Escape Tunnel Fan House 16	17945
Conveyor Storage Pile Staking Tube 17	11598
Crusher/Screen Plant 18	4941
Truck Scale to Loadout 19	7870
Coal Storage Bin 20	4058
Guard Rail 21	18771
Underground Pipes 22	0
Chain Link Fence 23	4605
Mine facilities Rd Truck Loadout Rd 24	47134
Office Bathhouse Warehouse Parking 25	79970
Mine Parking 26	20793
Fuel Tanks 27	2972
Powder & Cap Magazine 28	3180
Culverts 29	24632
Lila Old Fan Portals 30	81102
Pole Barn 31	5664
Rock Dust Silo 32	2701
Power Cable 33	0
Waste Rock Stacking Tube 34	4212
Visual Disconnect 35	4654
Drop Box 36	281
Abandon Concrete Room (2) 37	10226
Median Barrier 38	8140
Concrete Trash Chute 39	2442
Graben Breakout (2) 40	26537
	781,828

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Office/Bathhouse_01																			
	Structure's Demolition Cost	Steel Build.	02 41 16.13 0020	0.28	CF	150	100	15			225000					CF		225000	CF	63000
	Structure's Vol. Demolition																0.3	2500	CY	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck	Transportation to Nielson Dump	Scamp	13.63	/Ton													600	Tons	8178
	Transportation Cost Steel Drive												480			lb/cy				
	Disposal Cost Steel	Nielson Construction	Nielson	7.00	/Ton													600	Tons	4200
	Subtotal																			75378
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition	Concrete Demolition	Scamp Excavation	18.00	CY	150	100	1								FT		555.6	CY	10001
	Concrete Cost																1.3			
	Concrete Vol. Demolished																			
	Loading Costs	Front End Loader 3CY	31 23 16.42 1300	1.69	CY													722	CY	1220
	Transportation Costs	12 CY (16 Ton) Dump Truck 1/2 rod. Trip	31 23 23.20 1025	10.80	CY													722	CY	7798
	Disposal Costs	On Site Disposal	02 41 16.17 4200	9.07	CY													722	CY	6549
	Subtotal																			25568
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Total																			100946

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Shop/Warehouse 02																			
	Structure's Demolition Cost	Steel Build.	02 41 16.13 0020	0.28	CF	150	100	20							300000	CF		300000	CF	84000
	Structure's Vol. Demolition																0.3	3333	CY	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck	Transportation to Nielson Dump	Scamp	13.63	/Ton													800	Ton	10904
	Transportation Cost Steel Drive												480			lb/cy				
	Disposal Cost Steel	Nielson Construction	Nielson	7.00	/Ton													800	Ton	5600
	Subtotal																			100504
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Slab																			
	Concrete Demolition					150	100	1			556									
	Concrete Cost	Concrete Demolition	Scamp Excavation	18.00	CY													556	CY	10008
	Concrete Vol. Demolished																1.3	723	CY	
	Loading Costs	Front End Loader 3CY	31 23 16.42 1300	1.69	CY													723	CY	1222
	Transportation Costs	12 CY (16 Ton) Dump Truck 1/2 rod. Trip	31 23 23.20 1025	10.80	CY													723	CY	7808
	Disposal Costs	On Site Disposal	02 41 16.17 4200	9.07	CY													723	CY	6558
	Subtotal																			25596
	First Bent																			
	Concrete Demolition																			
	Concrete Cost	Concrete Demolition	Scamp Excavation	18.00	CY															
	Concrete Vol. Demolished																			
	Loading Costs	Front End Loader 3CY	31 23 16.42 1300	1.69	CY															
	Transportation Costs	12 CY (16 Ton) Dump Truck 1/2 rod. Trip	31 23 23.20 1025	10.80	CY															
	Disposal Costs	On Site Disposal	02 41 16.17 4200	9.07	CY															
	Subtotal																			
	Total																			126100

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Security Shack 03																			
	Structure's Demolition Cost	Steel Build.	02 41 16.13 0020	0.28	CF	20	10	8								FT		1600	CF	448
	Structure's Vol. Demolition																0.3	480		
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck	Transportation to Nielson Dump	Scamp	13.63	/Ton													4	Ton	52
	Transportation Cost Steel Drive																			
	Disposal Cost Steel	Nielson Construction	Nielson	7.00	/Ton								480			LB/CF		4	Ton	27
	Subtotal																			527
	Concrete Demolition																			
	Concrete Cost	Concrete Demolition	Scamp Excavation	18.00	CY	20	10	0.25								FT		2	CY	33
	Concrete Vol. Demolished																1.3			
	Loading Costs	Front End Loader 3CY	31 23 16.42 1300	1.69	CY													2.4	CY	4
	Transportation Costs	12 CY (16 Ton) Dump Truck 1/2 rod. Trip	31 23 23.20 1025	10.80	CY													2.4	CY	26
	Disposal Costs	On Site Disposal	02 41 16.17 4200	9.07	CY													2.4	CY	22
	Subtotal																			85
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Total																			612

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Mine Subtation 04																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolition																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Drive																			
	Subtotal																			0
	Equipment's Disposal Cost	Mechanical Equipment Heavy	23 05 05.10 3600	795.00	Ton							4			4	Ton		16	Ton	12720
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			12720
	Fence Demolition	Chain link, post & fabric 8' 10' high remove only	02 41 13.60 1700	3.07	FT	160										FT		160	FT	491
	Subtotal																			491
	Concrete Demolition																			
	Concrete Cost	Concrete Demolition	Scamp Excavation	18.00	CY	20	29	0.5				7				CY		7	CY	126
	Concrete Vol. Demolished																1.3			
	Loading Costs	Front End Loader 3CY	31 23 16.42 1300	1.69	CY													9	CY	15
	Transportation Costs	12 CY (16 Ton) Dump Truck 1/2 rod. Trip	31 23 23.20 1025	10.80	CY													9	CY	97
	Disposal Costs	On Site Disposal	02 41 16.17 4200	9.07	CY													9	CY	82
	Subtotal																			320
	Total																			13531

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Surface Power Lines 05																			
	Structure's Demolition Cost	Wood Poles and cross bars	02 41 13.80 0200	247.00	EA.										8	EA		8	EA	1976
	Structure's Vol. Demolition	High Voltage Line	33 71 39.13 0820	152.25	/Mile	2058									3			1.17	Miles	178
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Drive																			
	Disposal Cost Steel																			
	Subtotal																			2154
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Total																			2154

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Water Treatment Plant 06																			
	Structure's Demolition Cost	Steel Build.	02 41 16.13 0020	0.28	CF						1800				CF			1800	CF	504
	Structure's Vol. Demolition																0.3	540	CF	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck	Transportation to Nielson D	Scamp	13.63	/Ton													5	Ton	68
	Transportation Cost Steel Drive																			
	Disposal Cost Steel	Nielson Construction	Nielson	7.00	/Ton								480			lb/cf		5	Ton	35
	Subtotal																			607
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost	Concrete Demolition	Scamp Excavation	18.00	CY	15	15	0.5								FT		4		72
	Concrete Vol. Demolished																1.3			
	Loading Costs	Front End Loader 3CY	31 23 16.42 1300	1.69	CY													5		8
	Transportation Costs	12 CY (16 Ton) Dump Truc	31 23 23.20 1025	10.80	CY													5		54
	Disposal Costs	On Site Disposal	02 41 16.17 4200	9.07	CY													5		45
	Subtotal																			179
	Total																			786

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Portable Water Tank 07																			
	Structure's Demolition Cost	Steel Build	02 41 16.13 0020	0.26	CF			20	15									3533	CF	969
	Structure's Vol. Demolition																0.3	1060	CF	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck	Transportation to Nielson Dump	Scamp	13.63	/Ton													9	Ton	123
	Transportation Cost Steel Drive																			
	Disposal Cost Steel	Nielson Construction	Nielson	7.00	/Ton								480			lb/cf		9	Ton	63
	Subtotal																			1175
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost	Concrete Demolition	Scamp Excavation	18.00	CY	15	15	0.5								FT		4		72
	Concrete Vol. Demolished																1.3			
	Loading Costs	Front End Loader 3CY	31 23 16.42 1300	1.69	CY													5		8
	Transportation Costs	12 CY (16 Ton) Dump Truck 1/2 rod. Trip	31 23 23.20 1025	10.80	CY													5		54
	Disposal Costs	On Site Disposal	02 41 16.17 4200	9.07	CY													5		45
	Subtotal																			179
	Total																			1354

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Process Water Tank 08																			
	Structure's Demolition Cost	Steel Build.	02 41 16.13 0020	0.28	CF			20	15							FT		3533	CF	989
	Structure's Vol. Demolition																0.3	1060	CF	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck	Transportation to Nielson Dump	Scamp	13.63	/Ton													9	Ton	123
	Transportation Cost Steel Drive																			
	Disposal Cost Steel	Nielson Construction	Nielson	7.00	/Ton								460			lb/cf		9	Ton	63
	Subtotal																			1175
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost	Concrete Demolition	Scamp Excavation	18.00	CY	15	15	0.5								FT		4		72
	Concrete Vol. Demolished																1.3			
	Loading Costs	Front End Loader 3CY	31 23 16.42 1300	1.69	CY													5		8
	Transportation Costs	12 CY (16 Ton) Dump Truck 1/2 rod. Trip	31 23 23.20 1025	10.80	CY													5		54
	Disposal Costs	On Site Disposal	02 41 16.17 4200	9.07	CY													5		45
	Subtotal																			179
	Total																			1354

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Sewer Tank 09																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolition																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment's Disposal Cost																			
	Remove Tank	3000 to 5000 gal. tank	02 65 10.30 0110	571.50	EA.										1	EA.		1	EA.	572
	Remove Sludge	3000 to 5000 gal. tank	02 65 10.30 0300	230.50	EA.										1	EA.		1	EA.	231
	Disposal Costs	3000 to 5000 gal. tank	02 65 10.30 1023	760.00	EA.										1	EA.		1	EA.	760
	Subtotal																			1563
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Total																			1563

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Drain Field 10																			
	Structure's Demolition Cost																			0
	Structure's Vol. Demolition																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Drive																			
	Subtotal																			0
	Equipment Disposal Cost																			
	Tank Removal																			
	Remove Sludge																			
	Disposal Cost																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Total																			0

Note: Will remain in place at the time of reclamation

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Ventilation Fan 11																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolition																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Drive																			
	Subtotal																			
	Equipment's Disposal Cost	Mechanical Equipment Heavy	23 05 05.10 3600	795,00	Ton							10			6	Ton		60	Ton	47700
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs	Helicopter	Classic Helicopters	2774	/Day									0		HR		0	HR	0
	Disposal Costs																			
	Subtotal																			47700
	Concrete Demolition																			
	Concrete Cost	Concrete Demolition	Scamp Excavation	18,00	CY	20	20	0,5								FT		300	CY	5400
	Concrete Vol. Demolished																1,3			
	Loading Costs				CY														CY	0
	Transportation Costs				CY														CY	0
	Disposal Costs	On Site Disposal	02 41 16.17 4200	9,07	CY													600	CY	5442
	Subtotal																			10842
	Portal Sealing																			
	Seal Construction		JennChem	4320,00	EA													2	EA	8640
	Labor		JennChem	265,00	HR										8	HR		16	HR	4240
	Helicopter		Classic Helicopters	2774	/Day										10	/Day		2	Day	5548
	Helicopter		Classic Helicopters	2774	/Day			231,17	HR-Stand By						6	HR		12	Hrs	2774
	250 KW Diesel Generator		01 54 33.40 2800	807,60	/Day										5	Day		5	Day	4038
	Water Tank Portable		01 54 33.40 7660	17,30	/Day										5	Day		5	Day	87
	Subtotal																			25327
	Shot Crete	On Site Disposal	02 41 16.17 4200	9,07	CY	120	40	0,5										89	CY	807
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			807
	Total																			84676

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Conveyor Tunnel to Coal Stockpile 12																			
	Structure's Demolition Cost	Steel Bold.	02 41 16.13 0020	0.28	CF	810	6	20								FT		97200	CF	27216
	Structure's Vol. Demolition																0.3	29160	CF	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck	Transportation to Nielson Dump	Scamp	13.63	/Ton													259	Ton	3530
	Transportation Cost Steel Drive																			
	Disposal Cost Steel	Nielson Construction	Nielson	7.00	/Ton								480			lb/cf		259	Ton	1813
	Subtotal																			32559
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost	Concrete Demolition	Scamp Excavation	18.00	CY						15							15	CY	270
	Concrete Vol. Demolished																1.3			
	Loading Costs	Front End Loader 3CY	31 23 16.42 1300	1.69														20	CY	34
	Transportation Costs	12 CY (16 Ton) Dump Truck 1/2 rod. Trip	31 23 23.20 1025	10.80	CY													20	CY	216
	Disposal Costs	On Site Disposal	02 41 16.17 4200	9.07	CY													20	CY	181
	Subtotal																			701
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Total																			33260

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Conveyor ROM Stockpile to Crusher 13																			
	Structure's Demolition Cost	Steel Build.	02 41 16.13 0020	0.28	CF	675	5	10								FT		33750	CF	9450
	Structure's Vol. Demolition																0.3	10125	CF	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck	Transportation to Nielson Dump	Scamp	13.63	/Ton													90	Ton	1227
	Transportation Cost Steel Drive																			
	Disposal Cost Steel	Nielson Construction	Nielson	7.00	/Ton								480			lb/cf		90	Ton	630
	Subtotal																			11307
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost	Concrete Demolition	Scamp Excavation	18.00	CY						15							15	CY	270
	Concrete Vol. Demolished																1.3			
	Loading Costs	Front End Loader 3CY	31 23 16.42 1300	1.69														20	CY	34
	Transportation Costs	12 CY (16 Ton) Dump Truck 1/2 r	31 23 23.20 1025	10.80	CY													20	CY	216
	Disposal Costs	On Site Disposal	02 41 16.17 4200	9.07	CY													20	CY	181
	Subtotal																			701
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Total																			12008

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Crusher Conveyor to Loadout Bin 14																			
	Structure's Demolition Cost	Steel Buld.	02 41 16.13 0020	0.28	CF	230	5	20								FT		23000	CF	6440
	Structure's Vol. Demolition																0.3	6900	CF	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck	Transportation to Nielson Dump	Scamp	13.63	/Ton													51	Ton	695
	Transportation Cost Steel Drive																			
	Disposal Cost Steel	Nielson Construction	Nielson	7.00	/Ton								480					51	Ton	357
	Subtotal																			7492
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost	Concrete Demolition	Scamp Excavation	18.00	CY						15							15	CY	270
	Concrete Vol. Demolished																1.3	20	CY	
	Loading Costs	Front End Loader 3CY	31 23 16.42 1300	1.69	CY													20	CY	34
	Transportation Costs	12 CY (16 Ton) Dump Truck 1/2 rod. Trip	31 23 23.20 1025	10.80	CY													20	CY	216
	Disposal Costs	On Site Disposal	02 41 16.17 4200	9.07	CY													20	CY	181
	Subtotal																			701
	Total																			8193

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Conveyor Loadout Bin Truck Loadout 15																			
	Structure's Demolition Cost	Steel Build.	02 41 16.13 0020	0.28	CF	5	5	20							500	CF		500	CF	140
	Structure's Vol. Demolition																0.3	150	CF	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck	Transportation to Nielson Dump	Scamp	13.63	/Ton													1	Ton	14
	Transportation Cost Steel Drive																			
	Disposal Cost Steel	Nielson Construction	Nielson	7.00	/Ton								480					1	Ton	7
	Subtotal																			161
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost	Concrete Demolition	Scamp Excavation	18.00	CY						15							15	CY	270
	Concrete Vol. Demolished																1.3	20	CY	
	Loading Costs	Front End Loader 3CY	31 23 16.42 1300	1.69	CY													20	CY	34
	Transportation Costs	12 CY (16 Ton) Dump Truck 1/2 rod. Trip	31 23 23.20 1025	10.80	CY													20	CY	216
	Disposal Costs	On Site Disposal	02 41 16.17 4200	9.07	CY													20	CY	181
	Subtotal																			701
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Total																			862

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Reclaim Escape Tunnel Fan House 16																			
	Corrugated Steel	Steel Build.	02 41 16.13 0020	0.28	CF						26880					CF		26880	CF	7526
	Escape Tunnel	Steel Build.	02 41 16.13 0020	0.28	CF						1257							1257	CF	352
	Fan	Steel Build.	02 41 16.13 0020	0.28	CF						64							64	CF	18
	Fan House	Steel Build.	02 41 16.13 0020	0.28	CF						512							512	CF	143
	Structure's Vol. Demolition																0.3	8614	CF	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck	Transportation to Nielson Dump	Scamp	13.63	/Ton													76	Ton	1036
	Transportation Cost Steel Drive																			
	Disposal Cost Steel	Nielson Construction	Nielson	7.00	/Ton								480					76	Ton	532
	Subtotal																			9607
	Excavation and Backfill																			
	Reclaim Tunnel	Excavation Bulk Bank 2 CY (322BL)	31 23 16.42 0260	1.44	CY	350	14	10								FT		1815	CY	2614
	Reclaim Tunnel	Backfill Trench Minimal Haul 2 1/4 CY	31 23 16.13 3080	1.79	CY													1815	CY	3249
	Escape Tunnel	Excavation Bulk Bank 2 CY (322BL)	31 23 16.42 0260	1.44	CY	325	4	10										481	CY	693
	Escape Tunnel	Backfill Trench Minimal Haul 2 1/4 CY	31 23 16.13 3080	1.79	CY													481	CY	861
	Subtotal																			7417
	Concrete Demolition																			
	Concrete Cost	Concrete Demolition	Scamp Excavation	18.00	CY						20							20	CY	360
	Concrete Vol. Demolished																1.3	26	CY	
	Loading Costs	Front End Loader 3CY	31 23 16.42 1300	1.69	CY													26	CY	44
	Transportation Costs	12 CY (16 Ton) Dump Truck 1/2 rod, Trip	31 23 23.20 1025	10.80	CY													26	CY	281
	Disposal Costs	On Site Disposal	02 41 16.17 4200	9.07	CY													26	CY	236
	Subtotal																			921
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Total																			17845

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Conveyor Storage Pile Staking Tube 17																			
	Structure's Demolition Cost	Steel Build.	02 41 16.13 0020	0.28	CF			80	20							CF		25120	CF	7034
	Structure's Vol. Demolition																0.3	7536	CF	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck	Transportation to Nielson Dump	Scamp	13.63	/Ton													67		913
	Transportation Cost Steel Drive																			
	Disposal Cost Steel	Nielson Construction	Nielson	7.00	/Ton								480			lb/cf		67		469
	Subtotal																			8416
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition	Concrete Demolition	Scamp Excavation	18.00	CY	25	25	3								FT		69	CY	1242
	Concrete Cost																1.3			
	Loading Costs	Front End Loader 3CY	31 23 16.42 1300	1.69	CY													90	CY	152
	Transportation Costs	12 CY (16 Ton) Dump Truck 1/2 rod. Trip	31 23 23.20 1025	10.80	CY													90	CY	972
	Disposal Costs	On Site Disposal	02 41 16.17 4200	9.07	CY													90	CY	816
	Subtotal																			3182
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Total																			11598

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Crusher/Screen Plant 18																			
	Structure's Demolition Cost	Steel Build.	02 41 16.13 0020	0.28	CF						12000					CF		12000	CF	3360
	Structure's Vol. Demolition																0.3	3600	CF	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck	Transportation to Nielson Dump	Scamp	13.63	/Ton													32	Ton	436
	Transportation Cost Steel Drive																			
	Disposal Cost Steel	Nielson Construction	Nielson	7.00	/Ton								480			lb/cf		32	Ton	224
	Subtotal																			4020
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost	Concrete Demolition	Scamp Excavation	18.00	CY						20							20	CY	360
	Concrete Vol. Demolished																1.3			
	Loading Costs	Front End Loader 3CY	31 23 16.42 1300	1.69	CY													26	CY	44
	Transportation Costs	12 CY (16 Ton) Dump Truck 1/2 rod. Trip	31 23 23.20 1025	10.80	CY													26	CY	281
	Disposal Costs	On Site Disposal	02 41 16.17 4200	9.07	CY													26	CY	236
	Subtotal																			921
	Total																			4941

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Truck Scale to Loadout 19																			
	Structure's Demolition Cost	Steel Build.	02 41 16.13 0020	0.28	CF						18650					CF		18650	CF	5278
	Structure's Vol. Demolition																0.3	5655		
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck	Transportation to Nielson Dump	Scamp	13.63	/Ton													50	Ton	682
	Transportation Cost Steel Drive																			
	Disposal Cost Steel	Nielson Construction	Nielson	7.00	/Ton								480					50	Ton	350
	Subtotal																			6310
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Take-up Pad																			
	Concrete Demolition																			
	Concrete Cost	Concrete Demolition	Scamp Excavation	18.00	CY						34							34	CY	612
	Concrete Vol. Demolished																1.3	44	CY	
	Loading Costs	Front End Loader 3CY	31 23 16.42 1300	1.69	CY													44	CY	74
	Transportation Costs	12 CY (16 Ton) Dump Truck 1/2 rod. Trip	31 23 23.20 1025	10.80	CY													44	CY	475
	Disposal Costs	On Site Disposal	02 41 16.17 4200	9.07	CY													44	CY	399
	Subtotal																			1560
	First Bent																			
	Concrete Demolition																			
	MCC Pad																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Total																			7870

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Coal Storage Bin 20																			
	Structure's Demolition Cost	Steel Build.	02 41 16.13 0020	0.28	CF						10000					CF		10000	CF	2800
	Structure's Vol. Demolition																0.3	3000		
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck	Transportation to Nielson Dump	Scamp	13.63	/Ton													27	Ton	368
	Transportation Cost Steel Drive																			
	Disposal Cost Steel	Nielson Construction	Nielson	7.00	/Ton								480			lb/cf		27	Ton	189
	Subtotal																			3357
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost	Concrete Demolition	Scamp Excavation	18.00	CY						15					FT		15	CY	270
	Concrete Vol. Demolished																1.3			
	Loading Costs	Front End Loader 3CY	31 23 16.42 1300	1.69	CY													20	CY	34
	Transportation Costs	12 CY (16 Ton) Dump Truck 1/2 rod. Trip	31 23 23.20 1025	10.80	CY													20	CY	216
	Disposal Costs	On Site Disposal	02 41 16.17 4200	9.07	CY													20	CY	181
	Subtotal																			701
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Total																			4058

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Guard Rail 21																			
	Structure's Demolition Cost	Guradrail Corrugated Steel	02 41 13.30 0800	12.17	LF	1520										FT		1520	FT	18496
	End Section	End Section	02 41 13.20 0200	34.15	EA										8	EA		8	EA	273
	Structure's Vol. Demolition																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Drive																			
	Subtotal																			18771
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Total																			18771

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Underground Pipes 22																			
	Structure's Demolition Cost																			0
	Structure's Vol. Demolition																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Drive																			
	Subtotal																			0
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Total																			0

Note: Will remain in place at the time of reclamation

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Chain Link Fence 23																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolition																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Drive																			
	Subtotal																			0
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Fence Demolition	Chain link, post & fabric 8' 10' high remove only	02 41 13.60 1700	3.07	FT	1500										FT		1500	FT	4605
	Subtotal																			4605
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Total																			4605

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Mine facilities Rd Truck Loadout Rd 24																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolition																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Drive																			
	Subtotal																			
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs	Transportation to Nielson Dump	Scamp	13.63	/Ton													674	Ton	9187
	Disposal Costs	Nielson Construction	Nielson	7.00	/Ton								1			CY/Ton		674	Ton	4718
	Subtotal																			13905
	Employee Parking	Pavement Removal 4" to 6"	02 41 13.17 5050	7.12	SY	1750	24									SY		4667	SY	33229
								4								IN	1.3	674	CY	
	Subtotal																			33229
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Total																			47134

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Office Bathhouse Warehouse Parking 25																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolition																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Drive																			
	Subtotal																			
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs	Transportation to Nielson Dump	Scamp	13.63	/Ton													1144	Ton	15593
	Disposal Costs	Nielson Construction	Nielson	7.00	/Ton								1			CY/Ton		1144	Ton	8008
	Subtotal																			23601
	Employee Parking	Pavement Removal 4" to 6"	02 41 13.1	7.12	SY	475	150									SY		7917	SY	56369
								4								IN	1.3	1144	CY	
	Subtotal																			56369
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Total																			79970

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Mine Parking 26																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolition																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Drive																			
	Subtotal																			
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs	Transportation to Nielson Dump	Scamp	13.63	/Ton													241	Ton	3285
	Disposal Costs	Nielson Construction	Nielson	7.00	/Ton								1			CY/Ton		241	Ton	1687
	Subtotal																			4972
	Employee Parking	Pavement Removal 4" to 6"	02 41 13.1	7.12	SY	100	200									SY		2222	SY	15821
								3								IN	1.3	241	CY	
	Subtotal																			15821
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Total																			20793

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Fuel Tanks 27																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolition																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Drive																			
	Subtotal																			0
	Equipment Disposal Cost																			
	Tank Removal	3000 to 5000 gal. tank	02 65 10.30 0110	760.00	EA										3	EA		3	EA	2280
	Remove Sludge	3000 to 5000 gal. tank	02 65 10.30 0300	230.50	EA										3	EA		3	EA	692
	Subtotal																			2972
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Total																			2972

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Powder & Cap Magazine 28																			
	Structure's Demolition Cost	Mechanical Equipment Heavy	23 05 05.10 3600	795.00	Ton							4				Ton		4	Ton	3180
	Structure's Vol. Demolition																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Drive																			
	Subtotal																			3180
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Total																			3180

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Culverts 29																			
	DC-1	Excavation Bulk Bank 2 CY (322BL)	31 23 16.42 0260	1.44	CY	60	1.5	3								FT		10	CY	14
	DC-1	Backfill Trench Minimal Haul 2 1/4 CY	31 23 16.13 3080	1.79	CY	60	1.5	3								FT		10	CY	18
	DC-2	Excavation Bulk Bank 2 CY (322BL)	31 23 16.42 0260	1.44	CY	60	1.5	3								FT		10	CY	14
	DC-2	Backfill Trench Minimal Haul 2 1/4 CY	31 23 16.13 3080	1.79	CY	60	1.5	3								FT		10	CY	18
	DC-3	Excavation Bulk Bank 2 CY (322BL)	31 23 16.42 0260	1.44	CY	65	1.5	3								FT		11	CY	16
	DC-3	Backfill Trench Minimal Haul 2 1/4 CY	31 23 16.13 3080	1.79	CY	65	1.5	3								FT		11	CY	19
	DC-4	Excavation Bulk Bank 2 CY (322BL)	31 23 16.42 0260	1.44	CY	400	2	3								FT		89	CY	128
	DC-4	Backfill Trench Minimal Haul 2 1/4 CY	31 23 16.13 3080	1.79	CY	400	2	3								FT		89	CY	159
	DC-5	Excavation Bulk Bank 2 CY (322BL)	31 23 16.42 0260	1.44	CY	350	2	3								FT		78	CY	112
	DC-5	Backfill Trench Minimal Haul 2 1/4 CY	31 23 16.13 3080	1.79	CY	350	2	3								FT		78	CY	139
	DC-6	Excavation Bulk Bank 2 CY (322BL)	31 23 16.42 0260	1.44	CY	107	2	3								FT		24	CY	34
	DC-6	Backfill Trench Minimal Haul 2 1/4 CY	31 23 16.13 3080	1.79	CY	107	2	3								FT		24	CY	43
	DC-7	Excavation Bulk Bank 2 CY (322BL)	31 23 16.42 0260	1.44	CY	155	2	3								FT		34	CY	50
	DC-7	Backfill Trench Minimal Haul 2 1/4 CY	31 23 16.13 3080	1.79	CY	155	2	3								FT		34	CY	62
	DC-8	Excavation Bulk Bank 2 CY (322BL)	31 23 16.42 0260	1.44	CY	167	2	3								FT		37	CY	53
	DC-8	Backfill Trench Minimal Haul 2 1/4 CY	31 23 16.13 3080	1.79	CY	167	2	3								FT		37	CY	66
	DC-9	Excavation Bulk Bank 2 CY (322BL)	31 23 16.42 0260	1.44	CY	186	2	3								FT		41	CY	60
	DC-9	Backfill Trench Minimal Haul 2 1/4 CY	31 23 16.13 3080	1.79	CY	186	2	3								FT		41	CY	74
	DC-10	Excavation Bulk Bank 2 CY (322BL)	31 23 16.42 0260	1.44	CY	60	2	3								FT		13	CY	19
	DC-10	Backfill Trench Minimal Haul 2 1/4 CY	31 23 16.13 3080	1.79	CY	60	2	3								FT		13	CY	24
	DC-11	Excavation Bulk Bank 2 CY (322BL)	31 23 16.42 0260	1.44	CY	101	2	3								FT		22	CY	32
	DC-11	Backfill Trench Minimal Haul 2 1/4 CY	31 23 16.13 3080	1.79	CY	101	2	3								FT		22	CY	40
	DC-12a	Excavation Bulk Bank 2 CY (322BL)	31 23 16.42 0260	1.44	CY	140	2.5	3.5								FT		45	CY	65
	DC-12a	Backfill Trench Minimal Haul 2 1/4 CY	31 23 16.13 3080	1.79	CY	141	2.5	3.5								FT		46	CY	82
	DC-12b	Excavation Bulk Bank 2 CY (322BL)	31 23 16.42 0260	1.44	CY	79	2.5	3								FT		22	CY	32
	DC-12b	Backfill Trench Minimal Haul 2 1/4 CY	31 23 16.13 3080	1.79	CY	79	2.5	3								FT		22	CY	39
	DC-12c	Excavation Bulk Bank 2 CY (322BL)	31 23 16.42 0260	1.44	CY	357	2.5	3								FT		99	CY	143
	DC-12c	Backfill Trench Minimal Haul 2 1/4 CY	31 23 16.13 3080	1.79	CY	357	2.5	3								FT		99	CY	178
	DC-12d	Excavation Bulk Bank 2 CY (322BL)	31 23 16.42 0260	1.44	CY	9	2.5	3.5								FT		3	CY	4
	DC-12d	Backfill Trench Minimal Haul 2 1/4 CY	31 23 16.13 3080	1.79	CY	9	2.5	3.5								FT		3	CY	5
	DC-13	Excavation Bulk Bank 2 CY (322BL)	31 23 16.42 0260	1.44	CY	60	1.5	3								FT		10	CY	14
	DC-13	Backfill Trench Minimal Haul 2 1/4 CY	31 23 16.13 3080	1.79	CY	60	1.5	3								FT		10	CY	18
	DC-14	Excavation Bulk Bank 2 CY (322BL)	31 23 16.42 0260	1.44	CY	40	1.5	3								FT		7	CY	10
	DC-14	Backfill Trench Minimal Haul 2 1/4 CY	31 23 16.13 3080	1.79	CY	40	1.5	3								FT		7	CY	12
	DC-15	Excavation Bulk Bank 2 CY (322BL)	31 23 16.42 0260	1.44	CY	45	1.5	3								FT		8	CY	11
	DC-15	Backfill Trench Minimal Haul 2 1/4 CY	31 23 16.13 3080	1.79	CY	45	1.5	3								FT		8	CY	13
	DC-16	Excavation Bulk Bank 2 CY (322BL)	31 23 16.42 0260	1.44	CY	25	1.5	3								FT		4	CY	6
	DC-16	Backfill Trench Minimal Haul 2 1/4 CY	31 23 16.13 3080	1.79	CY	25	1.5	3								FT		4	CY	7
	DC-17	Excavation Bulk Bank 2 CY (322BL)	31 23 16.42 0260	1.44	CY	120	1.5	3								FT		20	CY	29
	DC-17	Backfill Trench Minimal Haul 2 1/4 CY	31 23 16.13 3080	1.79	CY	120	1.5	3								FT		20	CY	36
	DC-18	Excavation Bulk Bank 2 CY (322BL)	31 23 16.42 0260	1.44	CY	27	1.5	3								FT		5	CY	6
	DC-18	Backfill Trench Minimal Haul 2 1/4 CY	31 23 16.13 3080	1.79	CY	27	1.5	3								FT		5	CY	8
	SP2-1	Excavation Bulk Bank 2 CY (322BL)	31 23 16.42 0260	1.44	CY	165	1.5	3								FT		28	CY	40
	SP2-1	Backfill Trench Minimal Haul 2 1/4 CY	31 23 16.13 3080	1.79	CY	165	1.5	3								FT		28	CY	49
	UC-1	Excavation Bulk Bank 2 CY (322BL)	31 23 16.42 0260	1.44	CY	120	5	6								FT		133	CY	192
	UC-1	Backfill Trench Minimal Haul 2 1/4 CY	31 23 16.13 3080	1.79	CY	120	5	6								FT		133	CY	239
	UC-1a	Excavation Bulk Bank 2 CY (322BL)	31 23 16.42 0260	1.44		360	5	6								FT		400	CY	576
	UC-1a	Backfill Trench Minimal Haul 2 1/4 CY	31 23 16.13 3080	1.79		360	5	6								FT		400	CY	716
	Subtotal																			3725
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Demolition Cost 36" CMP (5)	36" CMP (5)	02 41 13.40 0180	12.24	LF	365										FT		365	FT	4468
	Demolition Cost 72" CMP (1)	72" CMP (1)	02 41 13.40 0200	34.25	LF	480										FT		480	FT	16440
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			20908
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Total																			24632

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Lila Old Fan Portals 39																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolition																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Drive																			
	Subtotal																			
	Portal Sealing																			
	Old Horse Canyon Lila Fan Portals														2	EA				
	Seal Construction		JennChem	4320.00	EA													2	EA	8640
	Labor		JennChem	265.00	HR										8	HR		16	HR	4240
	Helicopter		Classic Helicopters	2774	/Day										10	/Day		2	Day	5548
	Helicopter		Classic Helicopters	2774	/Day		231.17	HR-Stand By							6	HR		12	Hrs	2774
	250 KW Diesel Generator		01 54 33.40 2800	807.60	/Day										5	Day		5	Day	4038
	Water Tank Portable		01 54 33.40 7660	17.30	/Day										5	Day		5	Day	87
	Subtotal																			25327
	Seal Lila South Portals														3	EA				
	Seal Construction		JennChem	4320.00	EA													3	EA	12960
	Labor		JennChem	265.00	HR										8	HR		24	HR	6360
	Helicopter		Classic Helicopters	2774	/Day										10	/Day		3	Day	8322
	Helicopter		Classic Helicopters	2774	/Day		231.17	HR-Stand By							9	HR		18	Hrs	4161
	250 KW Diesel Generator		01 54 33.40 2800	807.60	/Day										5	Day		5	Day	4038
	Water Tank Portable		01 54 33.40 7660	17.30	/Day										5	Day		5	Day	87
	Subtotal																			35928
	Seal Lila North Portals														3	EA				
	Seal Portals		JennChem	4320.00	EA													3	EA	12960
	Labor		JennChem	265.00	HR										8	HR		24	HR	6360
	Portal Backfilling					25	20	6			111	CY						333	CY	
	Equipment Cost	Front End Loader, 4WD, 3.5CY., 145 HP	01 54 33.20 4710	516.00	/Day						60	CY/HR								
		Equipment Operator, Medium	R.S.Means Back Page	51.10	/HR													5.6	HR	
	Total Equipment Cost			94.10	/HR															527
	Subtotal																			19847
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Total																			81102

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Pole Barn 31																			
	Structure's Demolition Cost	Steel Build.	02 41 16.13 0020	0.28	CF	50	30	10								FT		15000	CF	4200
	Structure's Vol. Demolition																0.3	4500	CF	
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck	Transportation to Nielson Dump	Scamp	13.63	/Ton													40	Ton	545
	Transportation Cost Steel Drive																			
	Disposal Cost Steel	Nielson Construction	Nielson	7.00	/Ton								480			lb/cf		40	Ton	280
	Subtotal																			5025
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost	Concrete Demolition	Scamp Excavation	18.00	CY	50	30	0.25										14	CY	252
	Concrete Vol. Demolished																1.3	18	CY	
	Loading Costs	Front End Loader 3CY	31 23 16.42 1300	1.69	CY													18	CY	30
	Transportation Costs	12 CY (16 Ton) Dump Truck 1/2 rod. Trip	31 23 23.20 1025	10.80	CY													18	CY	194
	Disposal Costs	On Site Disposal	02 41 16.17 4200	9.07	CY													18	CY	163
	Subtotal																			639
	Total																			5664

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Rock Dust Silo 32																			
	Structure's Demolition Cost	Silos, Selective Demolition	13 05 05.60 0050	1875.00	EA										1	EA		1	Ea	1875
	Structure's Vol. Demolition																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck	To Scamp Yard./Salvage	Scamp Quote	135.00	Hr									3		Hr		3	Hr	405
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Drive																			
	Disposal Cost Steel																			
	Subtotal																			2280
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost	Concrete Demolition	Scamp Excavation	18.00	CY	15.5	15.5	1			240					CF		9	CY	162
	Concrete Vol. Demolished																1.3	12	CY	
	Loading Costs	Front End Loader 3CY	31 23 16.42 1300	1.69	CY													12	CY	20
	Transportation Costs	12 CY (16 Ton) Dump Truck	31 23 23.20 1025	10.80	CY													12	CY	130
	Disposal Costs	On Site Disposal	02 41 16.17 4200	9.07	CY													12	CY	109
	Subtotal																			421
	Total																			2701

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Power Cable 33																			
	Structure's Demolition Cost																			0
	Structure's Vol, Demolition																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Drive																			
	Subtotal																			0
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol, Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol, Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol, Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol, Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Total																			0

Note: Will remain in place at the time of reclamation

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Waste Rock Stacking Tube 34																			
	Structure's Demolition Cost	Steel Buld.	02 41 16.13 0020	0.28	CF	15	15	10								FT		2250	CF	630
	Structure's Vol. Demolition																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Drive																			
	Subtotal																			630
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Foundation						30	30	1.33			44				CY				
	Tube											34				CY				
	Concrete Cost	Concrete Demolit	Scamp Excavation	18.00	CY													78	CY	1404
	Concrete Vol. Demolished																1.3	101	CY	
	Loading Costs	Front End Loader	31 23 16.42 1300	1.69	CY													101	CY	171
	Transportation Costs	12 CY (16 Ton) D	31 23 23.20 1025	10.80	CY													101	CY	1091
	Disposal Costs	On Site Disposal	02 41 16.17 4200	9.07	CY													101	CY	916
	Subtotal																			3582
	Total																			4212

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Visual Disconnect 35																			
	Structure's Demolition Cost																			
	Structure's Demolition Cost	Steel Build.	02 41 16.13 0020	0.28	CF	20	30	8								FT		4800	CF	1344
	Structure's Vol. Demolition	Steel Build.	02 41 16.13 0020	0.28	CF	40	10	8								FT		3200	CF	896
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Drive																			
	Subtotal																			2240
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished	Mechanical Equipment Heavy	23 05 05.10 3600	795.00	Ton							1				Ton		3	Ton	2385
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			2385
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost	Concrete Demolition	Scamp Excavation	18.00	CY	4	6	0.5								FT		0.4	CY	7
	Concrete Vol. Demolished																1.3	1	CY	
	Loading Costs	Front End Loader 3CY	31 23 16.42 1300	1.69	CY													1	CY	2
	Transportation Costs	12 CY (16 Ton) Dump Truck 1/2 rod. Trip	31 23 23.20 1025	10.80	CY													1	CY	11
	Disposal Costs	On Site Disposal	02 41 16.17 4200	9.07	CY													1	CY	9
	Subtotal																			29
	Total																			4654

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Drop Box 36																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolition																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Drive																			
	Subtotal																			
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Take-up Pad																			
	Concrete Demolition																			
	Footing					4	4	1.5			4					CY				
	Structure					2	2	3.44			2									
	Concrete Cost	Concrete Demolition	Scamp Excavation	18.00	CY													6	CY	108
	Concrete Vol. Demolished																1.3	8	CY	
	Loading Costs	Front End Loader 3CY	31 23 16.42 1300	1.69	CY													8	CY	14
	Transportation Costs	12 CY (16 Ton) Dump Truck 1/2 rod, Trip	31 23 23.20 1025	10.80	CY													8	CY	86
	Disposal Costs	On Site Disposal	02 41 16.17 4200	9.07	CY													8	CY	73
	Subtotal																			281
	First Bent																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Total																			281

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Abandon Concrete Room (2) 37																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolition																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Drive																			
	Subtotal																			
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Fence Demolition																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost	Concrete Demolit	Scamp Excavation	18.00	CY	15	20	10				222				CY		222	CY	3996
	Concrete Vol. Demolished																1.3			
	Loading Costs	Front End Loader	31 23 16.42 1300	1.69	CY													289	CY	488
	Transportation Costs	12 CY (16 Ton) D	31 23 23.20 1025	10.80	CY													289	CY	3121
	Disposal Costs	On Site Disposal	02 41 16.17 4200	9.07	CY													289	CY	2621
	Subtotal																			10226
	Total																			10226

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Median Barrier 38																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolition																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Drive																			
	Subtotal																			
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Median Barruer		02 41 13.30 1600	10.71	FT	760												760	FT	8140
	Subtotal																			8140
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Total																			8140

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Concrete Trash Chute 39																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolition																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Drive																			
	Subtotal																			
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Subtotal																			
	Concrete Demolition																			
	Walls					10	10	0.67				5								
	Walls					50	10	0.67				25								
	Floor					52	12	1				23								
	Concrete Cost	Concrete Demolition	Scamp Excavation	18.00	CY							53				CY		53	CY	954
	Concrete Vol. Demolished																1.3			
	Loading Costs	Front End Loader 3CY	31 23 16.42 1300	1.69	CY													69	CY	117
	Transportation Costs	12 CY (16 Ton) Dump Truck 1/2 rod. Trip	31 23 23.20 1025	10.80	CY													69	CY	745
	Disposal Costs	On Site Disposal	02 41 16.17 4200	9.07	CY													69	CY	626
	Subtotal																			2442
	Total																			2442

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Graben Breakout (2) 40																			
	Structure's Demolition Cost	Steel Build.	02 41 16.13 0029	0.28	CF	15	18	8			2160				2	EA		4320	CF	1210
	Structure's Vol. Demolition																			
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Drive																			
	Subtotal																			1210
	Portal Sealing																			
	Seal Construction		JennChem	4320.00	EA													2	EA	8640
	Labor		JennChem	265.00	HR										8	HR		16	HR	4240
	Helicopter		Classic Helicopters	2774	/Day										10	Loads		2	Days	5548
	Helicopter		Classic Helicopters	2774	/Day		231.17	HR-Stand by 5mir							6	HR		12	HR	2774
	250 KW Diesel Generator		01 54 33.40 2800	807.60	/Day										5	Day		5	Days	4038
	Water Tank Portable		01 54 33.40 7650	17.30	/Day										5	Day		5	Days	87
	Subtotal																			25327
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Total																			26537

Backfilling and Grading

Grading 1	154930
Topsoil 2	217749
Support 3	70836
	443515

	Eqiupment Cost	Hourly Operating Cost	Equipment Overhead	Operator;s Hourly Rate	Hourly Cost	Number of Men or Eq.	Total Eq. & Lab. Costs	Units	Quanity	Units	Production Rate	Units	Equip. + Labor Time/Dis.	Units	Cost
Horse Canyon Mine Lila Canyon Project Grading 1															
Load and Hual Backfill Material															
631G (9-51)(2nd04)	2548.00	212.33		51.10	263.43	3	790.30	$/HR	33783	CY	393	CY/HR	86.0	HR	67936
D9R Semi-U EROPS (9-54 (2H04)	2392.00	199.33		51.10	250.43	1	250.43	$/HR					86.0	HR	21528
Subtotal															89464
Spread and Compact Material															
Assume 4 passes , 8 mph, 10 in. lift															
D9R Semi-U EROPS (9-54 (2H04)	2392.00	199.33		51.10	250.43	1	250.43	$/HR					86.0	HR	21528
825G (6-13)(4Q03)	184.80	15.40		51.10	66.50	1	66.50	$/HR					86.0	HR	5716
Subtotal															27244
Upper Road Area															
770 (20-11)(3Q03)	1861.00	155.08		43.20	198.28	1	198.28	$/HR	5000	CY	289	CY/HR	17.3	HR	3431
988 G EROPS (9-38)(3Q04)	3085.00	257.08		51.10	308.18	4	1232.73	$/HR					17.3	HR	21328
Cat 326 FL	1582.00	131.83		43.20	175.03	1	175.03	$/HR					17.3	HR	3028
D9R Semi-U EROPS (9-54 (2H04)	2392.00	199.33		51.10	250.43	1	250.43	$/HR	5000	CY	120	CY/HR	41.7	HR	10435
Subtotal															38222
Total															154930

	Eqiupment Cost	Hourly Operating Cost	Equipment Overhead	Operator;s Hourly Rate	Hourly Cost	Number of Men or Eq.	Total Eq. & Lab. Costs	Units	Quantity	Units	Production Rate	Units	Equip. + Labor Time/Dis.	Units	Cost
Horse Canyon Mine Lila Canyon Project Topsoil 2															
Load and Hual Topsoil															
631G (9-51)(2nd04)	2548.00	212.33		51.10	263.43	3	790.29	$/HR	61086	CY	393	CT/HR	155.4	HR	122839
D9R Semi-U EROPS (9-54 (2H04)	2392.00	199.33		51.10	250.43	1	250.43	$/HR					155.4	HR	38926
Subtotal															161765
770 (20-11)(3Q03)	1861.00	155.08		49.15	204.23	1	204.23	$/HR	10000	CY	289	CY/HR	34.6	HR	7067
988 G EROPS (9-38)(3Q04)	3085.00	257.08		51.10	308.18	4	1232.72	$/HR					34.6	HR	42655
Cat 326 FL	1582.00	131.83		49.15	180.98	1	180.98	$/HR					34.6	HR	6262
Subtotal															55984
Total															217749

	Eqiupment Cost	Hourly Operating Cost	Equipment Overhead	Operator;s Hourly Rate	Hourly Cost	Number of Men or Eq.	Total Eq. & Lab. Costs	Units	Production Rate	Units	Equip. + Labor Time/Dis.	Units	Cost
Horse Canyon Mine Lila Canyon Project Support 3													
Support													
6000 Ga. H2O Truck Diesel 2nd2008)	1168.00	97.33		49.15	146.48	1	146.48				335	HR	49072
Pick-up Truck 4x4 1 Ton	156.80	13.07			13.07	1	13.07				335	HR	4377
Foreman Outside					51.90	1	51.90				335	HR	17387
Total													70836

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Vegetation																		
	Ground Preparation																		
	See Chapter 5 page 95-96, Sec. 553.230																		
	Soil to be ripped	75 HP Dozer/w/scarifier	32 91 13.23 3100	3.93	MSF					32.94					AC		1435	MSF	5639
	Gouging/Pocking																		
	Assume 340 CY/AC	Excavation Bulk Bank 2 CY (322BL)	31 23 16.42 0260	1.44	CY					32.94					AC		11200	CY	16127
	Subtotal																		21766
	Seeding																		
	Fertilizer Material	Fertilizer Hydro Spreader Mat. Only	32 01 90.13 0180	4.30	MSF					32.94					AC		1435	MSF	6170
	Seeding Materials	Grasses for Lila Canyon	Great Basin	164.70	AC					32.94					AC	32.94	32.94	AC	5425
	Seeding Materials	Forbs for Lial Canyon	Great Basin	42.55	AC					32.94					AC	32.94	32.94	AC	1402
	Seeding Materials	Shrubs for Lila Canyon	Great Basin	85.33	AC					32.94					AC	32.94	32.94	AC	2811
	Seeding Application	Hydro Spreader (equip. & labor)S-81.60MSF	32 01 90.13 0180	4.99	MSF					32.94					AC	1435	1435	MSF	7160
	Mulch Application	Seeding Hydro spread	32 01 90.13 0180	4.99	MSF					32.94					AC	1435	1435	MSF	7160
	Subtotal																		30127
	Reseeding	Reseeding 25%																	
	Assume 25% reseeding rate																		7532
	Subtotal																		7532
	Total																		59426

Lila Canyon Extension

Appendix 1-7
BLM Rights-of-Way

(PDF files only. No other digital files exist.)

FORM 2800-14
(August 1985)

Issuing Office
Moab District
Price Field Office

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
RIGHT-OF-WAY
SERIAL NUMBER UTU-77122

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1. A right-of-way is hereby granted pursuant to Title V of the Federal Land Policy and Management Act of October 21, 1976 (90 Stat. 2776; 43 U.S.C. 1761).

2. Nature of Interest:

   a. By this instrument, the holder:

   Utah American Energy Inc
   P. O. Box 986
   Price, Utah 84501

   receives a right to construct, operate, maintain and terminate a mine facility right-of-way on public lands described as follows:

   Salt Lake Meridian, Utah,

   T.16 S., R.14 E.,
   Section 15, NW4SE4,S2SE4, E2SW4.

b. The right-of-way granted herein is for mine site facilities and encompasses 40.0 acres, more or less within the described subdivisions.

   c. This instrument shall terminate thirty (30) years from its effective date unless, prior thereto, it is relinquished, abandoned, terminated, or modified pursuant to the terms and conditions of this instrument or of any applicable Federal law or regulation.

   d. This instrument may be renewed. If renewed, the right-of-way or permit shall be subject to the regulations existing at the time of renewal and any other terms and conditions that the authorized officer deems necessary to protect the public interest.

e. Notwithstanding the expiration of this instrument or any renewal thereof, early relinquishment, abandonment, or termination, the provisions of this instrument, to the extent applicable, shall continue in effect and shall be binding on the holder, its successors, or assigns, until they have fully satisfied the obligations and/or liabilities accruing herein before or on account of the expiration or prior termination of the grant.

3. Rental:

For and in consideration of the rights granted, the holder agrees to pay the Bureau of Land Management fair market value rental as determined by the authorized officer, unless specifically exempted from such payment by regulation. Provided, however, the rental may be adjusted by the authorized officer, whenever necessary, to reflect changes in the fair market rental value as determined by the application of sound business management principles, and so far as practicable and feasible, in accordance with comparable commercial practices.

4. Terms and Conditions:

a. This grant or permit is issued subject to the holder's compliance with all applicable regulations contained in Title 43 Code of Federal Regulations, part 2800.

b. Upon grant termination by the authorized officer, all improvements shall be removed from the public lands within 90 days, or otherwise disposed of as provided in paragraph (4)(d), or as directed by the authorized officer.

c. Each grant issued for a term of 20 years or more shall, at a minimum, be reviewed by the authorized officer at the end of the 20th year and at regular intervals thereafter not to exceed 10 years. Provided, however, a right-of-way or permit granted herein may be reviewed at any time deemed necessary by the authorized officer.

d. The stipulations, plans, maps, or designs set forth in Exhibit A and Exhibit B, dated July 23, 2001, attached hereto are incorporated into and made a part of this grant instrument as fully and effectively as if they were set forth herein in their entirety. All commitments referenced in Chapter 2, Alternative B, all mitigation outlined in Chapter IV and all other applicable sections of the environmental assessment for the project entitled *Development of the Lila Canyon Project, Emery County, Utah* (EA NO. UT-070-99-22, July 2000) are incorporated into and made a part of this grant instrument as fully and effectively as if they were set forth herein in their entirety.

e. Failure of the holder to comply with applicable law or any provision of this right-of-way grant or permit shall constitute grounds for suspension or termination thereof.

f. The holder shall perform all operations in a good and workmanlike manner so as to ensure protection of the environment and the health and safety of the public.

g. Ninety (90) days prior to termination of the right-of-way, the holder shall contact the authorized officer to arrange a joint inspection of the right-of-way area. This inspection will be held to agree to an acceptable termination (and rehabilitation) plan. This plan shall include, but is not limited to, removal of facilities, drainage structures or surface material, recontouring, topsoiling, or seeding. The authorized officer must approve the plan in writing prior to the holder's commencement of any termination activities.

IN WITNESS WHEREOF, The undersigned agrees to the terms and conditions of this right-of-way grant or permit.

(Signature of Holder)	(Signature of Authorized Officer)
President (Title)	Field Manager (Title)
7/25/01 (Date)	7/27/01 (Effective Date of Grant)

2001

2890
UTU-77122
(UT-070)

Exhibit A

1. The holder shall operate, and maintain the facilities, improvements, and structures within this right-of-way in strict conformity with its mine permit plan (Utah Division of Oil Gas and Mining No. ACT/007/013). When approved this grant is made part of the permit. Any relocation, additional construction, or use that is not in accord with the approved mine plan shall not be initiated without the prior written approval of the authorized officer. A copy of the complete right-of-way grant, including all stipulations and mine plan, shall be made available on the right-of-way area during construction, operation, and termination to the authorized officer. Noncompliance with the above will be grounds for an immediate temporary suspension of activities if it constitutes a threat to public health and safety or the environment.

2. The holder shall contact the authorized officer at least fourteen (14) days prior to the anticipated start of construction and/or any surface disturbing activities. The authorized officer will require and schedule a preconstruction conference with the holder prior to the holder's commencing construction and/or surface disturbing activities on the right-of-way. The holder and/or his representative shall attend this conference. The holder's contractor, or agents involved with construction and/or any surface disturbing activities associated with the right-of-way, shall also attend this conference to review the stipulations of the grant including the plans(s) of development.

3. The holder shall not initiate any construction or other surface disturbing activities on the right-of-way without the prior written authorization of the authorized officer. Such authorization shall be a written notice to proceed issued by the authorized officer. Any notice to proceed shall authorize construction or use only as therein expressly stated and only for the particular location or use therein described. A notice to proceed shall not be issued until the mine plan is approved by the Office of Surface Mining Reclamation and Enforcement.

4. The authorized officer may suspend or terminate in whole, or in part, any notice to proceed which has been issued when, in his judgement, unforeseen conditions arise which result in the approved terms and conditions being inadequate to protect the public health and safety or to protect the environment.

5. The holder shall designate a representative who shall have the authority to act upon and to implement instructions from the authorized officer. The holder's representative shall be available for communication with the authorized officer within a reasonable time when construction or other surface-disturbing activities are underway.

6. The holder hall conduct all activities associated with the construction, operation and maintenance of the right-of-way within the authorized limits of the right-of-way.

7. The holder shall survey and clearly mark the centerline and or exterior limits of the right-of-way, as determined by the authorized officer.

8. No construction or routine maintenance activities shall be performed during periods when the soil is too wet to adequately support construction equipment. If such equipment creates ruts in excess of six (6) inches deep, the soil shall be deemed to be too wet to adequately support construction equipment.

9. Construction sites shall be maintained in a sanitary condition at all times: waster material at the site shall be disposed of promptly at an appropriate waste disposal facility. "Waste" means all discarded matter including human waste, trash, garbage, refuse, oil drums, petroleum products, ashes, and equipment.

10. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the authorized officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the authorized officer. An evaluation of the discovery will be made by the authorized officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the authorized officer after consulting with the holder.

11. The Holder shall retain a contractor for third party compliance. The compliance contractor shall be separate, independent from, and not subcontracted by anyone preparing the engineering plans, design, construction or operation of the holder's project.

    All costs incurred by the compliance contractor in connection with this project shall be the sole responsibility of the holder, and the holder agrees to hold harmless and indemnify BLM with respect to any and all claims, demands, cause(s) or action and the like which may arise from the performance of the compliance contractor or any services utilized in the compliance of the project.

12. Thirty (30) days prior to termination of the right-of-way, the holder shall contact the authorized officer to arrange a joint inspection of the right-of-way. This inspection will be held to agree to an acceptable termination and rehabilitation plan. This plan shall include, but is not limited to, removal of facilities, recontouring, topsoiling, or seeding. The authorized officer must approve the plan in writing prior to the holder's commencement of any termination activities.

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Green River District
Price Field Office
125 South 600 West
Price, UT 84501
http://www.blm.gov/ut/st/en/fo/price.html

IN REPLY REFER TO:
UTU-91789
2800 (UTG020)

NOV 0 3 2016

CERTIFIED MAIL-RETURN RECEIPT REQUESTED:
No. 7016 1370 0000 0863 1803

PJ Jenson
UtahAmerican Energy Inc.
P.O. Box 910
East Carbon, Utah 84520

Re: New Right-of-Way UTU-91789

DECISION

:

:

Right-of-Way Grant UTU-91789 Issued

Enclosed is a copy of a right-of-way grant (serial number UTU-91789) which has been approved by the Bureau of Land Management and issued under authority of Title V of the Federal Land Policy and Management Act of October 21, 1976, as amended through September 1999, (90 Stat. 2776; 43 U.S.C. 1761). The issuance of this right-of-way grant constitutes a final decision by the Bureau of Land Management in this matter.

This decision may be appealed to the Interior Board of Land Appeals, Office of the Secretary, in accordance with the regulations contained in 43 CFR, Part 4, and the enclosed Form 1842-1. If an appeal is taken, your notice of appeal must be filed in this office (at the above address) within 30 days from receipt of this decision. The appellant has the burden of showing that the decision appealed from is in error.

If you wish to file a petition pursuant to regulation 43 CFR 4.21 (58 FR 4939, January 19, 1993) or 43 CFR 2801.10 for a stay of the effectiveness of this decision during the time that your appeal is being reviewed by the Board, the petition for a stay must accompany your notice of appeal. A petition for a stay is required to show sufficient justification based on the standards listed below. Copies of the notice of appeal and petition for a stay must also be submitted to each party named in this decision and to the Interior Board of Land Appeals and to the appropriate Office of the Solicitor (see 43 CFR 4.413) at the same time the original documents

INCORPORATED
MAY 05 2017
Div. of Oil, Gas & Mining

are filed with this office. If you request a stay, you have the burden of proof to demonstrate that a stay should be granted.

Standards for Obtaining a Stay

Except as otherwise provided by law or other pertinent regulation, a petition for a stay of a decision pending appeal shall show sufficient justification based on the following standards:

(1) The relative harm to the parties if the stay is granted or denied;

(2) The likelihood of the appellant's success on the merits;

(3) The likelihood of immediate and irreparable harm if the stay is not granted; and

(4) Whether the public interest favors granting the stay.

Please note that under the regulations in 43 CFR Group 2800, this decision is effective even if an appeal is filed. If you have any questions, please contact Jaydon Mead, Realty Specialist, at the above address, by e-mail jmead@blm.gov, or by phone (435) 636-3646.

Sincerely,

Don Stephens

Don Stephens
Assistant Field Manager

Enclosure:
Right-of-Way Grant UTU-91789

FORM 2800-14
(August 1985)

Issuing Office
Price Field Office

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
RIGHT-OF-WAY GRANT

SERIAL NUMBER UTU-91789

1. A right-of-way is hereby granted pursuant to Title V of the Federal Land Policy and Management Act of October 21, 1976 (90 Stat. 2776; 43 U.S.C. 1761).

2. Nature of Interest:

   a. By this instrument, the holder:

   UtahAmerican Energy Inc.
   P.O. Box 910
   East Carbon, Utah 84520

   Receives a right to construct, operate, maintain, and terminate an access road within portions of the public lands described as follows:

   T.16 S., R. 14 E., Salt Lake Meridian, Emery County, Utah
   Section 15: SE¼SW¼.

   b. The right-of-way or permit area granted herein is 60 feet wide, 1,300 feet long plus an additional 150 feet by 200 feet area to improve an existing damn, and contains 2.5 acres, more or less.

   c. This instrument shall expire on December 31, 2046. This grant is authorized for 30 years unless, prior thereto, it is relinquished, abandoned, terminated, or modified pursuant to the terms and conditions of this instrument or of any applicable Federal law or regulation.

   d. This instrument may be renewed. If renewed, the right-of-way or permit shall be subject to the regulations existing at the time of renewal and any other terms and conditions that the Field Manager or other authorized officer deems necessary to protect the public interest.

   e. Notwithstanding the expiration of this instrument or any renewal thereof, early relinquishment, abandonment, or termination, the provisions of this instrument, to the extent applicable, shall continue in effect and shall be binding on the holder, its successors, or assigns, until they have fully satisfied the obligations and/or liabilities accruing herein before or on account of the expiration, or prior termination, of the grant.

3. Rental:

   For and in consideration of the rights granted, the holder agrees to pay the Bureau of Land Management fair market value rental as determined by the authorized officer unless specifically exempted from such payment by regulation. Provided, however, that the rental may be adjusted by the authorized officer, whenever necessary, to reflect changes in the fair market rental value as determined by the application of sound business management principles, and so far as practicable and feasible, in accordance with comparable commercial practices.

Terms and Conditions:

4. Standard

   a. This grant or permit is issued subject to the holder's compliance with all applicable regulations contained in

Title 43 Code of Federal Regulations part 2800.

b. Each grant issued for a term of 10 years or more shall, at a minimum, be reviewed by the authorized officer at the end of the 10th year and at regular intervals thereafter not to exceed 10 years. Provided, however, that a right-of-way or permit granted herein may be reviewed at any time deemed necessary by the authorized officer.

c. The maps set forth in exhibit A attached hereto, are incorporated into and made a part of this grant instrument as fully and effectively as if they were set forth herein in their entirety.

d. BLM may suspend or terminate your grant if you do not comply with applicable laws and regulations or any terms, conditions, or stipulations of the grant (such as rent payments), or if you abandon the right-of-way. Your failure to use your right-of-way for its authorized purpose for any continuous 5-year period creates a presumption of abandonment.

e. In the event that the public land underlying the right-of-way (ROW) encompassed in this grant, or a portion thereof, is conveyed out of Federal ownership and administration of the ROW or the land underlying the ROW is not being reserved to the United States in the patent/deed and/or the ROW is not within a ROW corridor being reserved to the United States in the patent/deed, the United States waives any right it has to administer the right-of-way, or portion thereof, within the conveyed land under Federal laws, statutes, and regulations, including the regulations at 43 CFR Part [2800][2880], including any rights to have the holder apply to BLM for amendments, modifications, or assignments and for BLM to approve or recognize such amendments, modifications, or assignments. At the time of conveyance, the patentee/grantee, and their successors and assigns, shall succeed to the interests of the United States in all matters relating to the right-of-way, or portion thereof, within the conveyed land and shall be subject to applicable State and local government laws, statutes, and ordinances. After conveyance, any disputes concerning compliance with the use and the terms and conditions of the ROW shall be considered a civil matter between the patentee/grantee and the ROW Holder.

5. Applicable Laws

a. The holder shall comply with all Federal, State, and local regulations whether or not specifically mentioned within this grant.

b. Use of pesticides shall comply with the applicable Federal and state laws. Pesticides shall be used only in accordance with their registered uses and within limitations imposed by the Secretary of the Interior. Prior to the use of pesticides, the holder shall obtain from the Field Manager or other authorized officer written approval of a plan showing the type and quantity of material to be used, pest(s) to be controlled, method of application, location of storage and disposal of containers, and any other information deemed necessary by the authorized officer. Emergency use of pesticides shall be approved in writing by the authorized officer prior to such use.

c. The holder of this right-of-way grant or the holder's successor in interest shall comply with Title VI of the Civil Rights Act of 1964 (42 U.S.C. 2000d et seq.) and the regulations of the Secretary of the Interior issued pursuant thereto.

d. The holder shall meet Federal, State, and local emission standards for air quality.

e. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder(s) shall comply with the Toxic Substances Control Act of 1976, as amended (15 U.S.C. 2601, et seq.) with regard to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation and Liability Act of 1980, Section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.

f. The holder shall comply with the construction practices and mitigating measures established by 33 CFR 323.4, which sets forth the parameters of the "nationwide permit" required by Section 404 of the Clean Water Act. If the proposed action exceeds the parameters of the nationwide permit, the holder shall obtain an individual permit from the appropriate office of the Army Corps of Engineers and provide the authorized

officer with a copy of same. Failure to comply with this requirement shall be cause for suspension or termination of this right-of-way grant.

g. The holder of Right-of-Way No. UTU- 91789 agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act of 1976, 42 U.S.C. 6901 et seq.) on the right-of-way (unless the release or threatened release is wholly unrelated to the right-of-way holder's activity on the right-of-way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

h. The holder is prohibited from discharging oil or other pollutants into or upon the navigable waters of the United States, adjoining shorelines, or the waters of the contiguous zone in violation of Section 311 of the Clean Water Act as amended, 33 U.S.C. 1321, and the regulations issued there under, or applicable laws of the State and regulations issued there under. Holder shall give immediate notice of any such discharge to the authorized officer and such other Federal and State officials as are required by law to be given such notice.

6. Miscellaneous

a. The holder shall perform all operations in a good and workmanlike manner so as to ensure protection of the environment and the health and safety of the public. All design, material, and construction, operation, maintenance, and termination practices shall be in accordance with safe and proven engineering practices.

b. The holder shall designate a representative who shall have the authority to act upon and to implement instructions from the authorized officer. The holder's representative shall be available for communication with the authorized officer within a reasonable time when construction or other surface disturbing activities are underway.

c. The holder shall permit free and unrestricted public access to and upon the right-of-way for all lawful purposes except for those specific areas designated as restricted by the Field Manager or other authorized officer to protect the public, wildlife, livestock or facilities constructed within the right-of-way.

d. The holder shall inform the Field Manager at (435) 636-3600 within 48 hours of any accidents on federal lands.

e. All surface disturbing activities will have a cultural survey completed (if one has not been previously completed) and submitted to the BLM before activities begin and may be monitored by a BLM permitted archaeologist if determined necessary by the BLM. If any cultural materials are discovered during construction, work in the area will halt immediately and the authorized official notified.

f. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the authorized officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the authorized officer. An evaluation of the discovery will be made by the authorized officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the authorized officer after consulting with the holder.

g. The holder shall protect all survey monuments found within the right-of-way. Survey monuments include, but are not limited to, General Land Office and Bureau of Land Management Cadastral Survey Corners, reference corners, witness points, U.S. Coastal and Geodetic benchmarks and triangulation stations, military control monuments, and recognizable civil (both public and private) survey monuments. In the event of obliteration or disturbance of any of the above, the holder shall immediately report the incident, in writing, to the authorized officer and the respective installing authority if known. Where General Land Office or Bureau of Land Management right-of-way monuments or references are obliterated during operations, the holder shall secure the services of a registered land surveyor or a Bureau cadastral surveyor to restore the disturbed monuments and references using surveying procedures found in the Manual of Surveying Instructions for the Survey of the Public Lands in the United States, latest edition. The holder shall record such survey in the appropriate county and send a copy to the authorized officer. If the Bureau cadastral surveyors or other Federal surveyors are used to restore the disturbed survey monument, the holder shall be responsible for the survey cost.

7. Construction / Maintenance

a. The holder shall conduct all activities associated with the construction, operation, and termination of the right-of-way within the authorized limits of the right-of-way.

b. Equipment and vehicles shall be inspected and cleaned for vegetation matter and seeds prior to entering BLM administered lands. Clothing and animals should also be inspected for vegetation matter and seeds. Vehicles and equipment should be power washed at a commercial facility or other applicable site where invasive species/noxious weeds seeds can be flushed through a waste treatment plant, where seeds will become inert.

c. The holder shall construct, operate, and maintain the facilities, improvements, and structures within this right-of-way in strict conformity with the plan of development which was approved and made part of this grant. Any relocation, additional construction, or use that is not in accord with the approved plan of development, shall not be initiated without the prior written approval of the authorized officer. A copy of the complete right-of-way grant, including all stipulations and approved plan of development, shall be made available on the right-of-way area during construction, operation, and termination to the authorized officer. Noncompliance with the above will be grounds for an immediate temporary suspension of activities if it constitutes a threat to public health and safety or the environment.

d. The map and site plan drawings submitted with the original proposal shall be made a part of this right-of-way grant. All construction must conform to these drawings and maps.

e. The holder shall provide for the safety of the public entering the right-of-way. This includes, but is not limited to barricades for open trenches, flagmen/women with communication systems for single-lane roads without intervisible turnouts, and attended gates for blasting operations.

f. If any clearing is needed, the right-of-way will be brush-hogged to prevent unnecessary disturbance. Only those areas where safety, absolute need for construction or other regulations may warrant the use of topsoil removal by blading or scalping. This right-of-way clearing shall be limited to the limits of the right-of-way. Suitable topsoil material removed in conjunction with clearing and stripping shall be conserved in stockpiles within the right-of-way.

g. Holder shall remove only the minimum amount of vegetation necessary for the construction of structures and facilities. Topsoil shall be conserved during excavation and reused as cover on disturbed areas to facilitate regrowth of vegetation.

h. Prior to fill construction, the existing surface shall be sloped to avoid sharp banks and allow equipment operations. No fills shall be made with frozen or water saturated soils. Construction equipment shall be routed evenly over the entire width of the fill to obtain a thorough compaction.

i. Construction holes left open overnight shall be covered. Covers shall be secured in place and shall be strong enough to prevent livestock or wildlife from falling through and into a hole.

j. Holder shall limit excavation to the areas of construction. No borrow areas for fill material will be permitted on the site. All off-site borrow areas must be approved in writing by the authorized officer in advance of excavation. All waste material resulting from construction or use of the site by holder shall be removed from the site. All waste disposal sites on public land must be approved in writing by the authorized officer in advance of use.

k. All roads and parking areas shall be constructed to provide drainage and minimize erosion. Culverts shall be installed if necessary to maintain drainage. All areas to be used for roads and parking can be surfaced with gravel.

l. Construction sites shall be maintained in a sanitary condition at all times; waste materials at those sites shall be disposed of promptly at an appropriate waste disposal site. "Waste" means all discarded matter including, but not limited to, human waste, trash, garbage, refuse, oil drums, petroleum products, ashes, and equipment.

m. If during any phase of the construction, operation, or termination any oil or other pollutant should be discharged from containers or vehicles and impact Federal lands, the control and total removal, disposal, and cleanup of such oil or other pollutant, wherever found, shall be the responsibility of the holder, regardless of fault. Upon failure of holder to control, cleanup, or dispose of such discharge on or affecting Federal lands, or to repair all damages to Federal lands resulting therefrom, the authorized officer may take such measures as he deems necessary to control and cleanup the discharge and restore the area, including, where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of the holder. Such action by the authorized officer shall not relieve the holder of any liability or responsibility.

n. Fences, gates, brace panels and any other range improvements shall be reconstructed to appropriate Bureau standards and/or specifications as determined by the authorized officer.

o. When construction activity in connection with the right-of-way breaks or destroys a natural barrier used for livestock control, the gap, thus opened, shall be fenced to prevent the drift of livestock. The subject natural barrier shall be identified by the authorized officer and fenced by the holder as per instruction of the authorized officer.

p. Construction-related traffic shall be restricted to routes approved by the authorized officer. New access roads or cross-country vehicle travel will not be permitted unless prior written approval is given by the authorized officer. Authorized roads used by the holder shall be rehabilitated or maintained when construction activities are complete as approved by the authorized officer.

q. Existing roads and trails on public lands that are blocked as the result of the construction project shall be rerouted or rebuilt as directed by the authorized officer.

r. No construction or routine maintenance activities shall be performed during periods when the soil is too wet to adequately support construction equipment. If such equipment creates ruts in excess of four inches deep, the soil shall be deemed too wet to adequately support construction equipment.

s. The holder shall construct waterbars on all disturbed areas as needed. Waterbars are to be constructed to: (1) simulate the imaginary contour lines of the slope (ideally with a grade of one or two percent); (2) drain away from the disturbed area; and (3) begin and end in vegetation or rock whenever possible.

t. A litter policing program shall be implemented by the holder, if requested and approved of in writing by the authorized officer, which covers all roads and sites associated with the right-of-way.

a. The holder is responsible for consultation with the authorized officer and/or local authorities for acceptable weed control methods (within limits imposed in the grant stipulations). The holder shall be responsible for annual surveys, reporting the results of the surveys to the BLM, and weed control on disturbed areas within the limits of the right-of-way.

b. Holder shall maintain the right-of-way in a safe, usable condition, as directed by the authorized officer.

8. Reclamation / Rehabilitation / Termination

a. Upon grant termination by the Field Manager or other authorized officer, all improvements shall be removed from the public lands within 90 days, or otherwise disposed of as provided in paragraph (4)(d) or as directed by the authorized officer.

b. The holder shall restore drainages, to the greatest extent possible, to the original bank configuration, stream bottom width, and channel gradient. Loose soil, fill, and culverts shall be removed from drainage channels as directed by the authorized officer.

c. The holder shall re-contour the disturbed area and obliterate all earthwork by removing embankments, backfilling excavations, and grading to re-establish the approximate original contours of the land in the right-of-way.

d. The holder shall prepare a seedbed by scarifying the disturbed area, distributing topsoil uniformly, or disking the topsoil.

e. The holder shall seed all disturbed areas that have been or are being reclaimed with a seed mixture(s) submitted to and approved by the authorized officer.

f. Ninety (90) days prior to termination of the right-of-way, the holder shall contact the authorized officer to arrange a pre-termination conference. This conference will be held to review the termination provisions of the grant.

IN WITNESS WHEREOF, The undersigned agrees to the terms and conditions of this right-of-way grant or permit.

Dan Hall
(Signature of Holder)

President
(Title)

10/11/16
(Date)

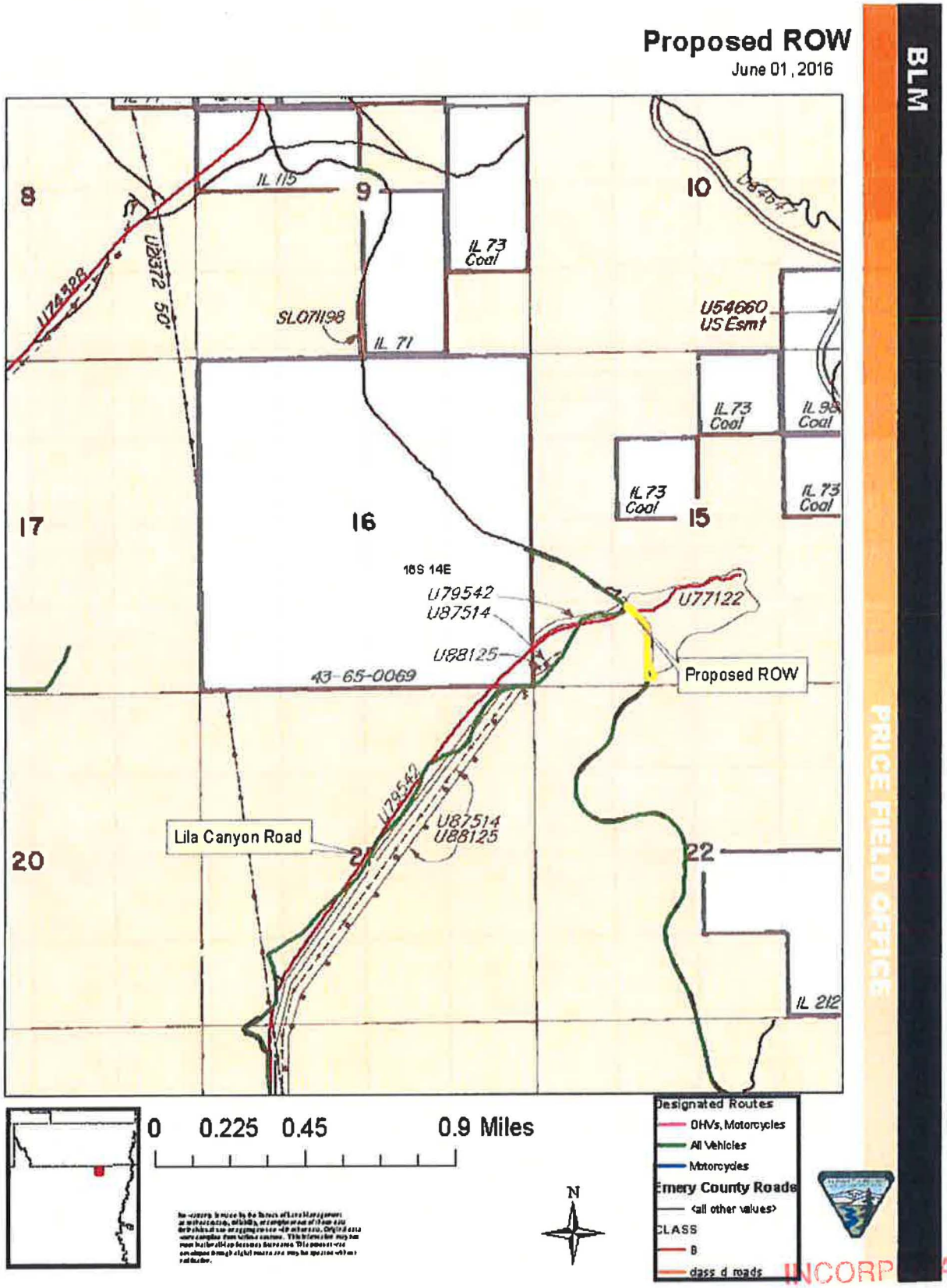
(Signature of BLM Authorized Officer)

Assistant Field Manager, Price Field Office
(Title)

10-25-16
(Effective Date of Grant)

Exhibit A (Map1)

Exhibit A (Map 2)



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place for redistribution on the topsoil pile. Topsoil material will be removed from those areas of the mine yard where material will be excavated in order to achieve final yard configuration and which have been identified as suitable topsoil for reclamation based on the soil survey. This includes the access road to and around the topsoil pile. This material will be used to construct a berm around the topsoil pile.

The following volumes represent soil resources that may be available for salvage, storage and subsequent redistribution during reclamation. The actual amount salvaged will be reported to DOGM following topsoil removal and stockpiling operations.

AVAILABLE SOIL RESOURCES

Map Unit	Potential Salvage Depth In.	Potential Acres	Potential Estimated Volume YD3	**Actual Salvage Depth In.**	**Actual Salvaged Acres**	**Actual Salvaged Top Soil YD3**
SBG	48	11.83	76343	**18**	**11.61**	**28100**
VBJ	30	9.62	38801	**18**	**3.40**	**8227**
XBS	12	12.09	19505	**12**	**8.81**	**14207**
DSH	40	1.56	8389	**18**	**1.16**	**2809**
RBL	8	9.34	10046	**8**	**2.17**	**2340**
RBT	6	3.79	3057	**6**	**0.56**	**450**
TOTAL(2)		48.23	156141		**27.95**	**56133**
Bank to Loose Cubic Yards *1.18 (Amount topsoil pile is designed to hold.)						(1) **66237**

(1) An additional 800 yd^3 will come from the access road around the topsoil pile. This material will be placed in the berm around the topsoil pile.
(2) The 48.23 acres was taken from a soil survey and does not accurately reflect the operators intention to include 42.6 acres of disturbance within the disturbed area boundary.

The actual areas of topsoil salvage and the respective amounts are found on Plate 2-3a. To date topsoil salvaged is 65,746 cubic yards.

The actual topsoil salvage will consist of removing a surface layer up to 18 inches thick over the disturbed area. If shale is encountered within 18 inches only the soil above the shale will be salvaged. (Plate 2-3). This would cover about 34 acres where soil would be salvaged and stored in the topsoil stockpile.

Total volumes of soil stored in the topsoil pile would be

232.410. This section is addressed in 232.700.

232.420. This section is addressed in 232.700.

232.500. Topsoil will be considered as the upper 18 inches of soil in most cases. Subsoil ranging in thickness from 12 to 30 inches from cutslope sites will be used as fill material for site development and replaced in an approximate original sequence during reclamation.

In order to verify subsoil depths, soil pedestals or other survey methods will be utilized for proper identification. Pedestals of undisturbed soil will be left at selected locations as reference points to show the type of soil thickness that has been removed from the slope cut areas. Records will be maintained to keep track of what materials are removed and where they are placed (topsoil storage or fill). Pedestals will vary in size depending on depth of cut. They will be designed to maintain stability of the soil column.

These soil pedestals may have to be removed once they have been properly logged to facilitate the mining operation.

An As-Built map will be prepared to show where soil materials have been used as fill material. This will include thickness records for topsoil, subsoil, and substrata. This information will be used to verify subsoil salvage depths according to Salvageable Soils Map Appendix A-2 of Appendix 2-3. This as built map is incorporated into the Mining Reclamation Plan as Plate 2-3a.

If shale is encountered in the slope cuts, the shale material will be separated from the other soil and returned to or near its original position upon reclamation.

Subsoils that are stored as pad material will be protected by a surface that is covered by asphalt, concrete, or gravel. The subsoil material will be under parking areas, buildings, roads, and storage sites. Graveled areas will have an impervious membrane placed between the subsoil and gravel. Precautions will be taken to avoid contamination. In the

List of Appendixes

List of Plates

The water treatment plant is located on the north-east side of the surface facility area. The plant will rest on a 15' by 15' slab. Process water will flow through the treatment plant at which time it will be treated and made suitable for potable water uses. The potable water will be stored in the potable water tank until it is used. The location of the water treatment plant can be found on Plate 5-2.

Potable Water Tank

Water treated by the water treatment plant and intended to be used as potable water will be stored in this 15' diameter by 20' high tank. The tank will set on a 15' by 15' concrete pad designed for adequate support of the tank. The location of the potable water tank can be found on Plate 5-2.

Process Water Tank

Process water, water to be used for mine use or to be treated for potable use, will be stored in this tank. The 15' diameter by 20' high process water tank will rest on a 15' by 15' concrete pad. Process water tank will be filled by using mine discharge water or may be hauled in from off site. The location of the process water tank can be found on Plate 5-2.

Sewer Tank

The sewer tank has been designed to facilitate 200 employees working on rotating shifts. The sewer tank will be located under the south end of the office and bathhouse parking area. The location of the sewer tank can be found on Plate 5-2. The design for the Sewer Tank can be found in Appendix 5-4.

Drain Field

The drain field has been designed to facilitate 200 employees working on rotating shifts The drain field will be located at a lower elevation and south of the sewer tank. The location of the drain field can be found on Plate 5-2. The design for the drain field can be found in Appendix 5-4.

Ventilation Fan

The ventilation fan will be located at the Northern Breakouts on #0 Portal. The ventilation fan will be accessed and installed from inside the mine. The need for surface access is not anticipated at this time. A concrete pad will be poured as a permanent support for the north fan. The highwall and approximately 40 feet of slope above thenorth breakout ledge will be chain-linked and shot-creted for stability. Prior to installing the chain-liink fence, all trees will be cut off, and the vegetation material will be removed off the area and properly disposed. The location of the portal and fan is shown on Plate 5-2.

Coal Storage Bin

The coal storage bin is part of the truck loadout and is shown of Plate 5-2. The coal storage bin is where crushed coal is stored waiting to be loaded into coal haul trucks. The bin provides for surge capacity and allows for better control of crushing time. The coal storage bin provides for a enclosed dry location for temporary crushed coal storage. Coal is delivered from the crusher to the coal storage bin by use of a 60" covered surface conveyor running at a speed of approximately 700 FPM. The preliminary layout is shown on Plates 5-2 and 5-8.

Coal Stacking Tube.

The final design for the coal stacking tube is not yet complete. Preliminary design indicates that the stacking tube will be approximately 15' Diameter and approximately 80 feet high. Standard practice is to construct the tube of either concrete or steel. The preliminary layout is shown on Plates 5-2 and 5-8.

Culverts

A complete list and design for the culverts can be found in Appendix 7-4 Tables 9 and 10, and are shown on Plate 7-2. A summary of the culverts follows:

Culvert	Length	Size
DC-1	60'	18"
DC-2	60'	18"
DC-3	70'	18"
DC-4	270'	24"
DC-5	250'	24"
DC-6	107'	24"
DC-7	155'	24"
DC-8	167'	24"
DC-9	186'	24"
DC-10	60'	24"
DC-11	35'	24"
DC-12a	141'	30"
DC-12b	79'	30"
DC-12c	357'	30"
DC-12d	9'	30"
DC-13	60'	18"
DC-14	25'	24"
SP2-1	165'	24"
UC-1	480'	60"

Guard Rails

Approximately 1,520 feet of Guard rails will be installed on the mine access road according to the detailed engineering plan being prepared. Appropriate MSHA and UDOT requirements will be taken into consideration.

Underground Pipes

Locations of the underground pipes have yet to be determined. Once detailed engineering design is completed the underground pipes will be added to Plate 5-2 or other appropriate Plates. Under ground pipes will be left in place upon reclamation.

Chain Link Fence

Approximately 1,500' of a six foot high chain link fence will be constructed as shown on Plate 5-2. The fence will be constructed to protect the public, and proved security along the section of county road that runs adjacent to the property.

Non-Coal Waste Area

An area for non-coal waste has been identified on Plate 5-2. Non-coal waste such as papers, timbers, cans, and miscellaneous scrap that is brought to the surface will be disposed of in a metal bin or "dumpster" located in the non-coal waste area identified on Plate 5-2. Metal will be separated from other forms of trash for salvage. Material not salvageable will be transported to the East Carbon Development Corporation (ECDC) dump or other approved disposal site for permanent disposal. Once a dumpster has reached capacity, the full dumpster will be replaced with an empty dumpster, and then the full dumpster will be hauled by a contract hauler to the specified disposal site.

Equipment & Supplies Storage Area

be found in Appendix 7-4 and Plate 7-6. Because the sediment pond does not fit into the requirement of 30 CFR 77.216(a) an MSHA number for the proposed pond is not required. The sediment pond is located on the south-west end of the property and shown on Plate 5-2. Please refer to Chapter 7 for detailed information on drainage reporting to ponds.

Slope Access / Portal Access Road

The slope access road splits off the facility access road near the north-east corner of the equipment and supply storage area, and follows an alignment that takes into consideration grade and direct access. The slope access road will be used to provide access to the rock slopes which in-turn proved access to the underground workings. The slope access road will be used as access for all men, material and equipment need in the mine. Since the slope access road provides for frequent access for men, equipment and materials for a period of six months or longer the slope access road is classified as a primary road and will be paved. The slope access road will be designed, constructed, and maintained according to appropriate R645 regulations. The slope access road is shown on Plate 5-2.

Rock Slopes

Access to the underground workings of the Lila Canyon Mine will be provide by two rock slopes driven from the top of the Mancos shale up-dip to the intersection of the coal seam. One portal will proved for access for men, equipment and material to the mine. The second access slope will contain the run of mine belt line from the underground workings of the mine to the run of mine stock pile. There is a possibility that only one larger slope will be driven and then divided. to provide for two separate entries. The two 1,227 foot long slopes will slope up at approximately 12%, from a starting elevation of approximately 6150'. The intersection of the coal seam and the rock slope will take place at approximately 6,300 feet elevation. The length of the slopes were minimized by taking advantage of the coal seam dip which is approximately 12% to the east. The rock material removed from the slopes will be used as fill material for the surface facilities. The rock slope material / underground development waste will contain mostly shale, sandstone and mudstone. Traces of coal may be found but the amount will be insignificant. There are no known coal seams or significant rider seams found below the Sunnyside Seam in the Lila Canyon Portal Area. The rock slope locations are shown on Plate 5-2.

Mine Facilities Road / Truck Loadout Road

Powder and cap magazines will be mobile temporary, and supplied by the explosive distributer. Upon reclamation the powder and cap magazines will be returned to the distributer.

As per the approved Air Quality Order all roads will be paved and the pad areas used by mobile equipment will be treated with water or dust suppressant, open stockpiles will be watered as conditions warrant.

521. Included in this section are maps, cross sections, narratives, descriptions and calculations used to satisfy the relevant requirements. This section describes and identifies the lands subject to coal mining and reclamation operations covering the estimated life of the project.

521.100 This application includes the cross sections, maps and plans needed to present the relevant information required by the Division. This information includes the following:

521.110. Plate 5-1 Shows area previously mined and approximate dates of mining.

521.111 Plate 5-1 and 2-2 shows the location and extent of known workings of inactive, or abandoned underground mines. The surface portals or mine openings to the surface are shown. Plates 5-1 and 2-2 have been prepared and certified by or under the direction of a registered professional engineer.

Doelling lists several coal mines and mining activity in within or adjacent to the permit area. Doelling lists the Calkins prospect, the Lila Canyon prospect, and the Prentiss prospect. In addition Doellng lists several coal mines Prentiss, Utah Blue Diamond, Blue Diamond and Heiner Mines. The research has shown that the Prentiss, Utah Blue Diamond, Blue Diamond and Heiner Mines were engulfed by the Book Cliffs mine. The Lila Canyon prospect refers to the old Lila Canyon mine fan portals used to ventilate the Geneva (Horse Canyon mine. The Calkins prospect is believed to have been engulfed by the Geneva mine.

An outcrop fire has been detected in an area north of the exiting permit area "A". The fire is off the permit area and located in an area that has been sealed from the old horse canyon works. The outcrop fire is not anticipated to cause any problems with mining at the Lila Canyon Mine.

521.112 No surface mined areas are found within the permit area. Therefore, this section does not apply.

521.120 Three existing structures, a 48" and a 60" CMP culvert located near the new proposed sediment pond, and the Little Park Road can be found at the Lila Canyon Mine. The existing culverts are shown on plate 5-1A and the road on Plate 5-1. Existing Horse Canyonfacilities are discussed in part "A" of this plan.

521.121 There are no buildings within 1000 feet of the proposed permit area except those used as part of the Lila Canyon mining operation.

521.122 There are no subsurface man-made features, other than the culverts discussed in 521.200, within, passing through, or passing over the proposed permit area.

521.123 Plate 4-1, as well as others, shows the existing county road 126 which is located partly within 100 feet of the proposed permit area. In Addition, the Little Park road is located above the surface facilities within the permit area. The Little Park road is also shown on plate 4-1

521.124 There are no known existing areas of spoil, waste, coal development waste, or non-coal waste disposal, dams, embankments, other impoundments, and water treatment and air pollution control facilities except those used as part of the mining operation.

521.125 There are no existing sedimentation ponds, permanent water impoundment, coal processing

525.120 SUBSIDENCE POTENTIAL

A review of renewable resources in and adjacent to the permit area found resources consisting of ground water, grazing, timber, and recharge areas. Subsidence from underground coal mines has been believed to affect overlying forest and grazing resource lands in the following ways:

- Formation of surface fissures which intercept near surface soil moisture thus draining the water away from the root zone with deleterious effects.

- Alterations in ground slope and destabilization of critical slopes and cliffs.

- Modification of surface hydrology due to the general downward migration of surface water through vertical fractures.

- Modification of groundwater hydrology including connection of previously separated aquifers, reduction in flows of seeps and springs which rely upon tight aquitards for their flow, and changes in recharge mechanisms.

- Emissions of methane originating from the coal seam through open fissures to the surface or at least the base of the surficial soil which has been known to have deleterious effects on woody plants.

Because these renewable resources exist with and adjacent to the permit area, a subsidence control plan is required. This plan is presented in Section 525.400.

A great deal of baseline data is available from many mining settings to develop subsidence damage criteria for surface structures (Bhattacharya et al. 1984). The formation of cracks and fissures are the general effects of subsidence and can have minor deleterious effects on groundwater resources without any fissuring to the surface. In the arid areas of Utah, impacts to and modification of the groundwater regime can be disruption of flow from natural seeps and springs which rely on the permeability contrast of interbedded sandstones and shale for their flows. These water resources are generally near

in Chapter 7 Section 731.211. UEI has committed to provide for mitigation of any lost water rights as per Chapter 7 Section 727.

525.490. Other information specified by the Division as necessary to demonstrate that the operation will be conducted in accordance with R645-301-525.300 will be provided.

525.500. Repair of damage.

525.510. If effects of subsidence are confirmed, any material damage to the surface lands will be restored to the extent technologically and economically feasible. The land will be restored to a condition capable of maintaining the value and reasonable foreseeable uses which it was capable of supporting before the subsidence.

525.520. Since no structures exist within or adjacent to the permit area which could be damaged by subsidence, should it occur, this section does not apply.

525.530. The Little Park Road exists in the subsidence zone. In the unlikely event the road is damaged by subsidence, UEI will repair the damage as per Section 525.120.

525.600. Public Notice.

At least six months prior to mining, or within that period if approved by the Division, the underground mine operator will mail a notification to all owners and occupants of surface property and structures above the underground workings. The notification oil include, at a minimum, identification of specific areas in which mining will take placce, dates that specific areas will be undermined, and the location or locations where the operator's subsidence control plan may be examined.

526. A narrative explaining the construction, modification, use, maintenance and removal of the mine facilities follows. Additional information can be found in Appendix 5-4 and Chapter 8.

526.100 Mine Structures and Facilities.

526.110 The only existing structures are found in Horse Canyon and are the remains of the

533. Impoundments.

533.100 Since no impoundments meeting the criteria of 30 CFR 77.216(a) this section does not apply.

533.200 Two impoundments are planned for this site:Pond #1 and Pond #2. The sediment ponds are temporary structures. A detailed design for the Sediment ponds can be found in Appendix 7-4, Section 3.1; and on Plates 7-6a and 7-6b.

533.210 The sediment ponds will be incised, except for the dam/road embankment. This embankment will be reconstructed and compacted to at least 95%. A detailed design for the Sediment ponds can be found in Appendix 7-4, Section 3.1; and on Plates 7-6a and 7-6b.

533.220 Where fill is to be placed, natural ground shall be removed 12" below the structure. A detailed design for the Sediment ponds can be found in Appendix 7-4, Section 3.1; and on Plates 7-6a and 7-6b.

533.300 Rip-rap or other protection (culverts, concrete) will be placed at all inlets and outlets to prevent scouring. A detailed design for the Sediment ponds can be found in Appendix 7-4, Section 3.1. Also see Plates 7-6a and 7-6b.

533.400 External slopes of the impoundment will be planted with an approved seed mix to help prevent erosion and promote stability. A detailed design for the Sediment ponds can be found in Appendix 7-4, Section 3.1; and on Plates 7-6a and 7-6b.

533.500 This section does not apply, there are no vertical highwalls associated with this impoundment.

533.600 Since no impoundments are planned that meet the criteria of MSHA, 30 CFR 77.216(a) this section does not apply.

533.700 Design and construction requirements, as well as

553. The operator will comply with all regulations applicable to underground mining activities relative to backfilling and grading as required by R645 regulations.

Some minor cut slopes along the reclaimed road may be left after reclamation due to the difficulty and inability to reclaim all material pushed over the side while making the road cut. See plate 5-7B-2 cross section 16+00 for details. UEI will make reasonable efforts to minimize the cut slopes being left.

553.100. Disturbed Areas. Disturbed areas will be backfilled and graded to:

553.110 The operator will obtain a post mining topography similar in form as what existed premining.

553.120 Since Lila Canyon is an underground operation, no spoil piles will be created. Minor highwalls may be created with the development of the rock slope portals. Upon completion of mining these entries will be seal as per Closure for Mine Openings Appendix 5-6 and all highwalls will be eliminated during the reclamation phase of the operation. Plate 5-9 shows the proposed portal plan. During reclamation, suitable material will be placed against the portals. This material will be shaped to eliminate the highwall and to bring the slope back to the approximate original contour.

553.130 All fill slope will have a static safety factor of 1.3 as shown in Appendix 5-5.

553.140 Erosion and water pollution will be minimized on site by the use of drainage control structures (burms, channels and silt fence) and the use of small depression, soil tackifiers, mulch and sediment pond design. No water is anticipated leaving the reclaimed site prior to adequate

treatment in the form of retention and/or filtration that does not meet and/or exceed UPDES standards.

553.150 The post mining land use of wildlife and domestic grazing should be enhanced to some degree with the revegetation of a more desirable seed mix and a vegetative cover in excess of what was present premining.

553.200 Spoil and Waste.

553.210 All underground development waste brought to the surface will be placed in the temporary rock pile and then blended back into the ROM product for sale. There will be no coal processing waste generated on the surface. Any oversized from the screens will be crushed and put back into the ROM stream.

553.220 Since no spoil will be produced this section does not apply.

553.221 All vegetation and /or organic material will be removed prior to any coal mine waste being stored.

553.222 All useable topsoil or topsoil substitute will be removed from the structural fill and refuse areas prior to use. Table 2-1 shows estimates of salvageable soil by soil type based on current NRCS soil inventories. The location of the soil storage are shown on Plate 5-2. This material will be spread over the recontoured structural fill and refuse areas prior to seeding and mulching.

553.223 Since no spoil will be produced this section does not apply.

553.230 All recontoured areas will be compacted to minimize slippage. The area will then be over laid with topsoil and ripped. In addition the area will be

"pock-marked" to minimize the potential for erosion as well as enhance revegetation establishment. It is not anticipated that soil will be disturbed in areas to steep for equipment to operate.

553.240 The structural fill area will have slopes of less than 8% upon final recontouring and revegetated to enhance the post mining land use of grazing and wildlife habitat.

553.250 A need for a refuse pile at Lila Canyon is not anticipated.

553.260 The operator will commit to all applicable R645 regulations relative to disposal of coal processing waste.

553.300 All underground development waste brought to the surface will be placed in the temporary rock pile and then blended back into the ROM product for sale. There will be no coal processing waste generated on the surface. Any oversized from the screens will be crushed and put back into the ROM stream.

553.400 Cut-and-fill terraces may be allowed by the Division

553.410 No cut and fill terraces will be required.

553.420 No terraces will be required for post mining land use.

553.500-540 and 553.600-553.650.500
The only area that falls under these provisions are the reclaimed Horse Canyon mine which lies in the north west portion of the lease area and is addressed under approved MRP Act #0013.

553.700-553.900
This operation will only involve underground mining and as such the above referenced regulations do not apply.

560. Performance Standards. Coal mining and reclamation operations will be conducted in accordance with the approved permit and requirements of R645-301-510 through R645-301-553.

APPENDIX 5-4

NEW FACILITY DESIGN

Information for Appendix 5-4 is mostly hard copies. Electronic copies do not exist for all information contained within the Appendix.

APPENDIX 5-4

ROADS

Existing Lila Canyon Road: (County Road 126)

The Lila Canyon road runs from the Horse Canyon Mine to the proposed Lila Canyon surface facilities then continues from the Lila Canyon surface to U.S. Highway 191/6. This road was constructed in the early 1940's to provide access to coal reserves south of the Horse Canyon Mine. The road extends south from Horse Canyon following the base of the Book Cliffs escarpment then turns south connecting to Highway 191/6. The road right-of-way consists of a total width of 100 feet. A small portion of this road is on BLM surface and a BLM right-of-way was issued to Kaiser Steel Corporation and is now owned by UEI. The portions of this road is on private property owned by UEI and William Marsing. Emery County also claims the road under the RS-2477 federal road designation. Any constructed facilities, including the 6 foot chain link fence, would not be placed on the county road right-of-way. County road 126 has been used for years by residents of Carbon and Emery Counties for recreation, ranching, and hunting purposes. Over the last 50 years, the majority portion of this road received little, if any maintenance. However, the first 2.5 miles from U.S. 191/6 to the correl has received frequent maintenance.

Main access to the mine site will be from U.S. Highway 191/6. The proposed access road will be constructed by Emery County and will be designated as Lila

Canyon Road 126. Some areas of the road will be upgraded others areas will be realigned. This road will be a two lane, 30 foot wide gravel surface Class B road, totaling approximately 4.7 miles in length. The proposed road reconstruction and realignment will be designed for a maximum speed of 45 miles per hour, would be constructed according to the standards of the American Department of Transportation 1992 Standard Specifications for Road and Bridge Construction. The realigned and reconstructed road will provide a safer and more direct route to the mine from U.S. Highway 191/6. The road will follow closely the existing RS-2477 road. Only the section of county road 126 from U.S. Highway 191/6 to Lila Canyon surface will be improved and or reconstructed. The county has no current plans to upgrade the section of 126 from Lila Canyon to Horse Canyon. All engineering, construction and maintenance on the reconstructed and realigned road will be implemented and controlled by the Emery County Road Department. Emery County will also control all necessary rights-of-way.

New Mine Facility Road:

The mine facility road shown on Plate 5-2 begins at the edge of County Road 126 and allows for access to the various surface facilities. The road has been located in the most practical location taking into consideration grade, stability, and alignment. Employees will use this road to access the office & bathhouse facilities. Coal haul trucks will use this road to access the scales and truck loadout. All supplies will be hauled on a short portion of this road from the supply storage area to the slope access road. The road will initially be graveled but will be paved in the

long term to minimize dust and provide good surface for heavy truck traffic as well as facility access. The facility access road will be approximately 24' wide to provide for two lane traffic and will have the appropriate drainage controls to insure long term life and low maintenance. The has been constructed and will be maintained according to the appropriate R645-534 and R645-527 regulations.

New Slope Access / Portal Access Road

The slope access road splits off the facility access road near the north-east corner of the equipment and supply storage area, and follows an alignment that takes into consideration grade and direct access. The slope access road will be used to provide access to the rock slopes which in-turn proved access to the underground workings. The slope access road will be used as access for all men, material and equipment need in the mine. Since the slope access road provides for frequent access for men, equipment and materials for a period of six months or longer the slope access road is classified as a primary road. The slope access road will be designed, constructed, and maintained according to appropriate R645 regulations. The slope access road is shown on Plate 5-2.

Coal Pile Road

The Coal Pile Road Is shown on plate 5-2. The Coal Pile Road will be 15' wide and will follow the existing contours approximately 400' from the Portal Access Road to the ROM coal pile. The Coal Pile Road is an ancillary road due to its infrequently used by a front end loader or pickup truck.

Existing Little Park Road:

The Little Park road runs from the Horse Canyon Mine, up to the top of Little Park, and across Little Park to Turtle Canyon, then down Turtle Canyon to the Green River. This road has been used for years by residents of Carbon and Emery Counties for recreation, ranching, and hunting purposes. It is a public road and is maintained by either the BLM and or Emery County. The road is "Cherry Stemed" by the new BLM wilderness reinventories. The road is used by UEI to monitor water and will continue to be used on a frequent basis for subsidence monitoring and water monitoring. Plate 5-1 as well as others show the location of the Little Park road.

Existing Vehicle Ways:

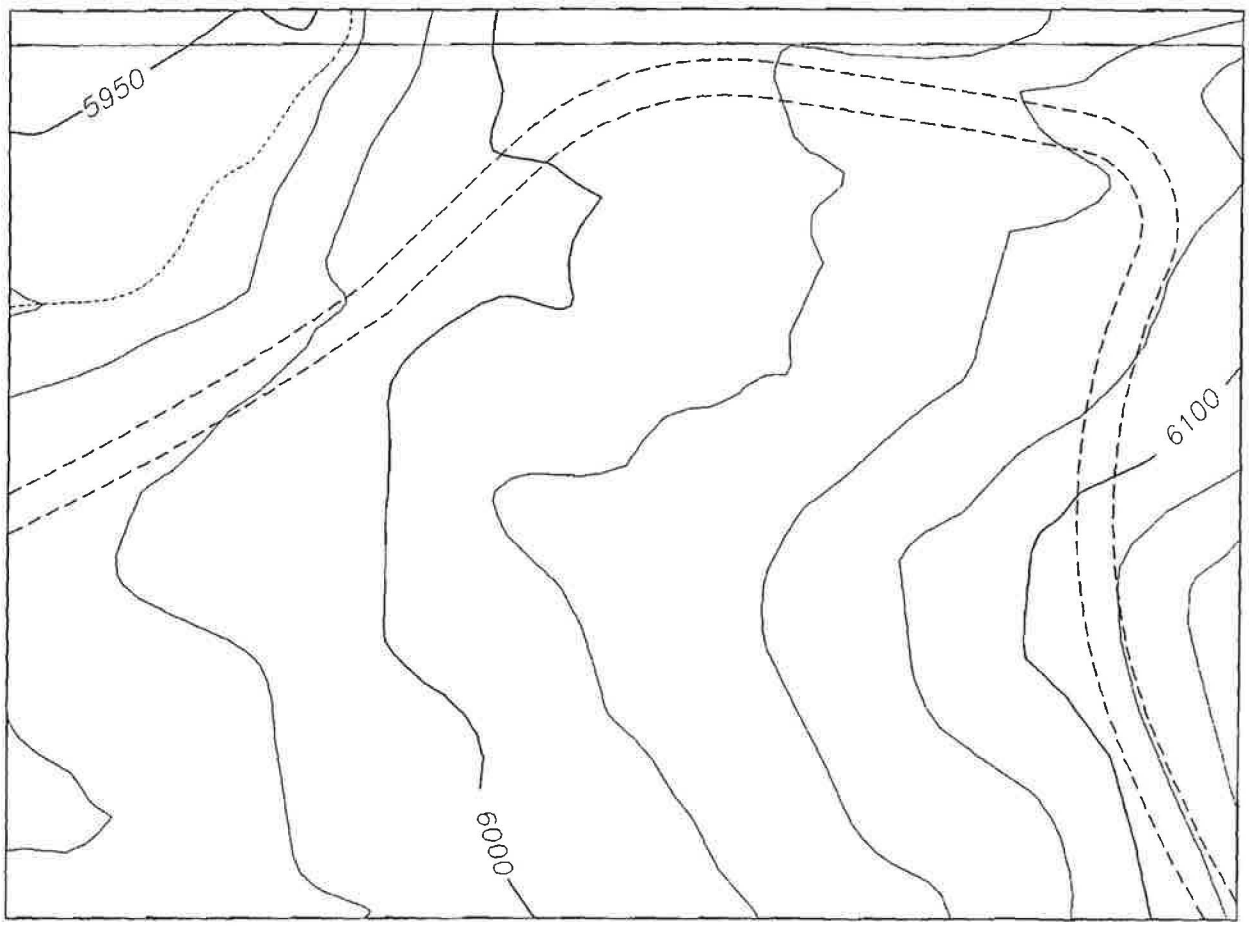
Several vehicle ways off from the Little Park road are used by UEI for water monitoring. UEI will continue to use these vehicle ways frequently for water and subsidence monitoring. The vehicle ways vary from 5 to 15 feet wide. These ways are located either in dry stream channels, or are old drilling roads both accessed by ATV. No future maintenance is projected for these vehicle ways. Plate 5-1 as well as others show the location of the vehicle ways used by UEI.

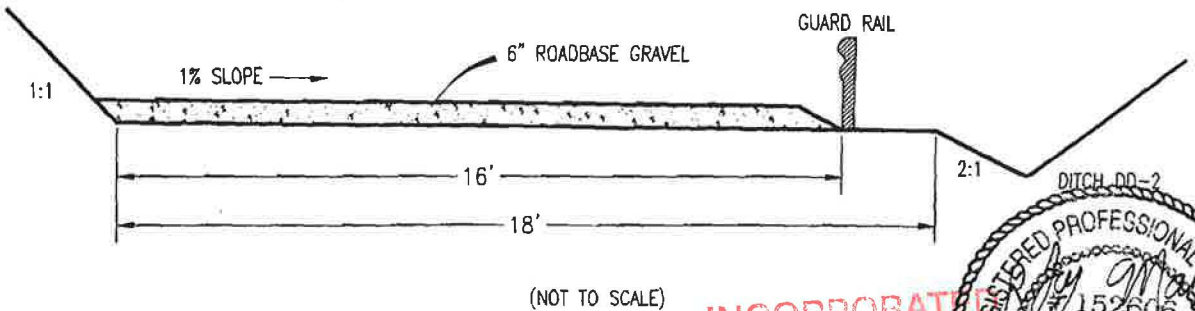
Table 1 Mass Balance Proposed Construciton				
*Section	Cut		Fill	
	Area (ft^2)	Volume (cu. yds.)	Area (ft^2)	Volume (cu. yds.)
0+00	0.00	0.00	0.00	0.00
2+00	0.00	0.00	0.00	0.00
4+00	1784.85	6610.56	964.22	3571.19
6+00	207.65	13990.19	983.96	10786.67
8+00	0.00	14759.26	726.82	17122.89
10+00	1523.94	20403.48	1616.00	25800.00
12+00	2165.36	34067.56	315.45	32953.52
14+00	0.00	42087.41	427.55	35705.37
16+00	0.00	42087.41	38.00	37429.63
18+00	26.39	42185.15	586.22	39741.56
20+00	0.00	42282.89	308.89	43056.78
22+00	0.00	42282.89	0.00	44200.81
24+00	0.00	42282.89	0.00	44200.81
26+00	0.00	42282.89	0.00	44200.81
Totals		**42282.89**		****44200.81**

* See Plates 5-2, 5-7A, and 5-7B.

** Includes 27,540 cu. yds. from rock slopes.

TYPICAL ROAD SECTION





REGISTERED PROFESSIONAL ENGINEER
152606
R. JAY MARSHALL
6/10/05
STATE OF UTAH

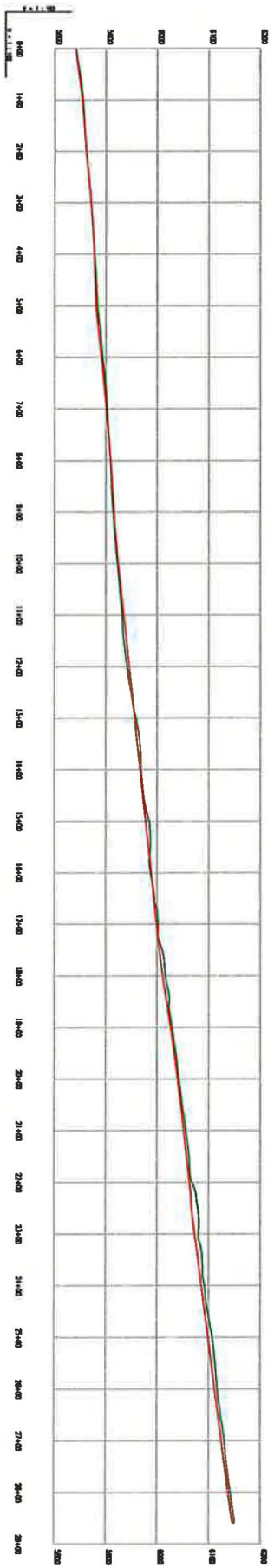
Figure 1

App 5-4

New Slope Access / Portal Access Road
Main Mine Road

DESIGN

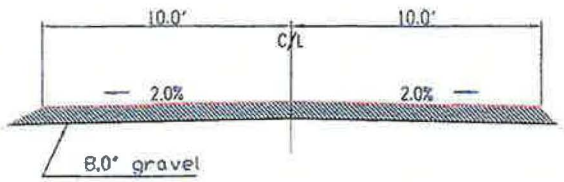
See Appendix 5-4 and Plate 5-2 for additional information:



Main Mine Road Profile
Scale 1" = 200'

Typical Crossection

Portal Access / Main Mine Road



0.5:1 CUT OVER 10.0'

1.0:1 CUT UP TO 10.0'

2.0:1 FILL

REGISTERED PROFESSIONAL ENGINEER
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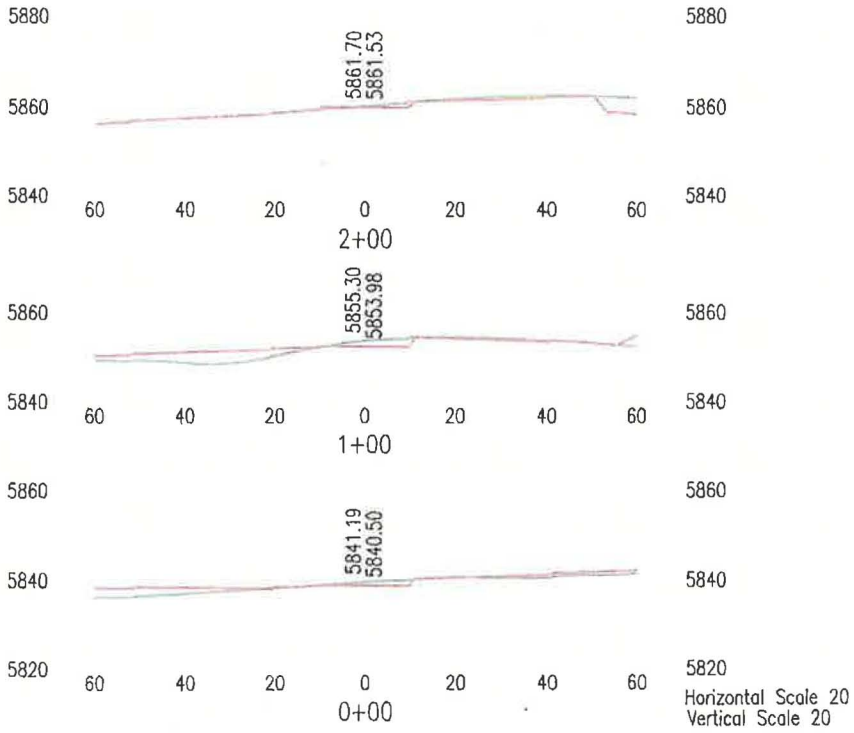
5/9/05
STATE OF UTAH



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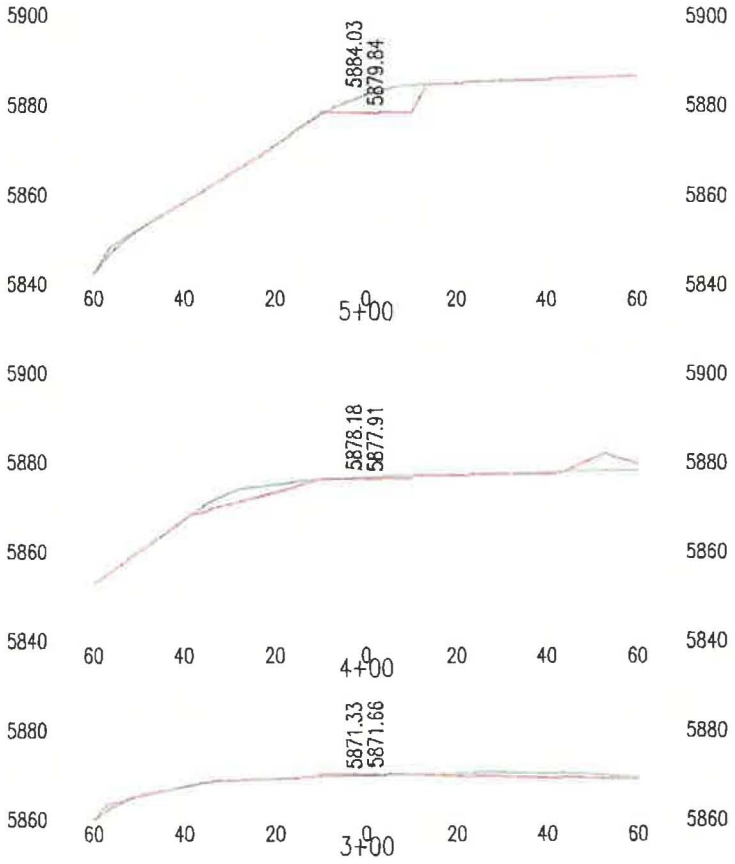

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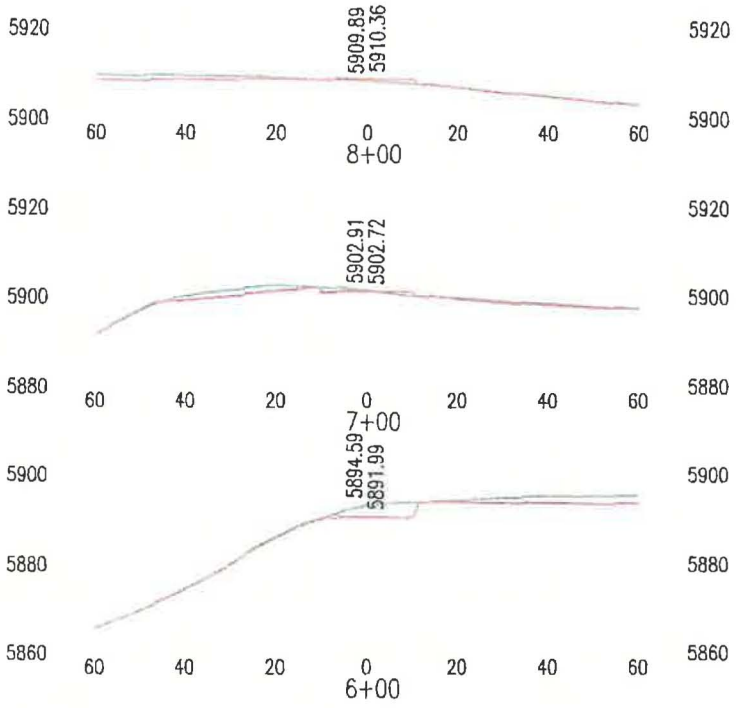

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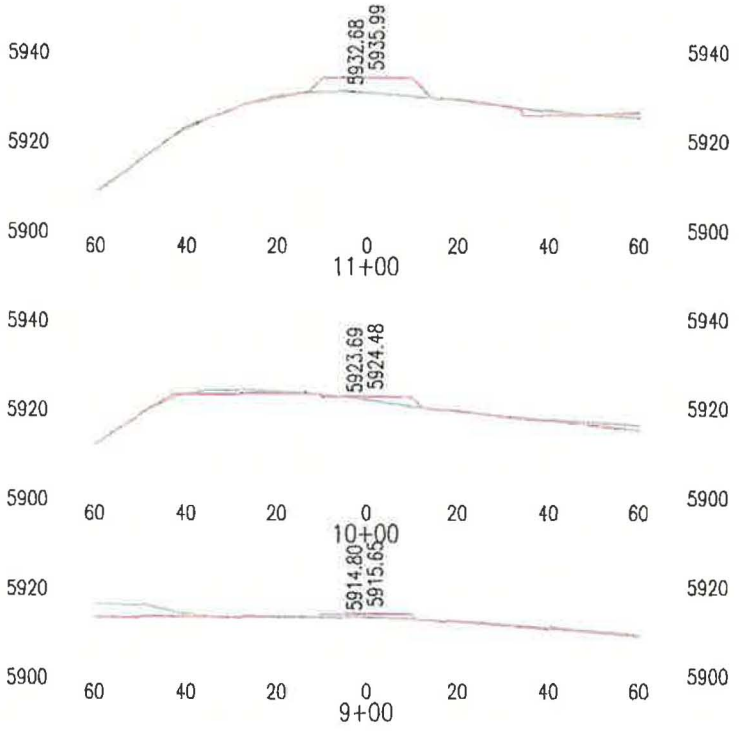

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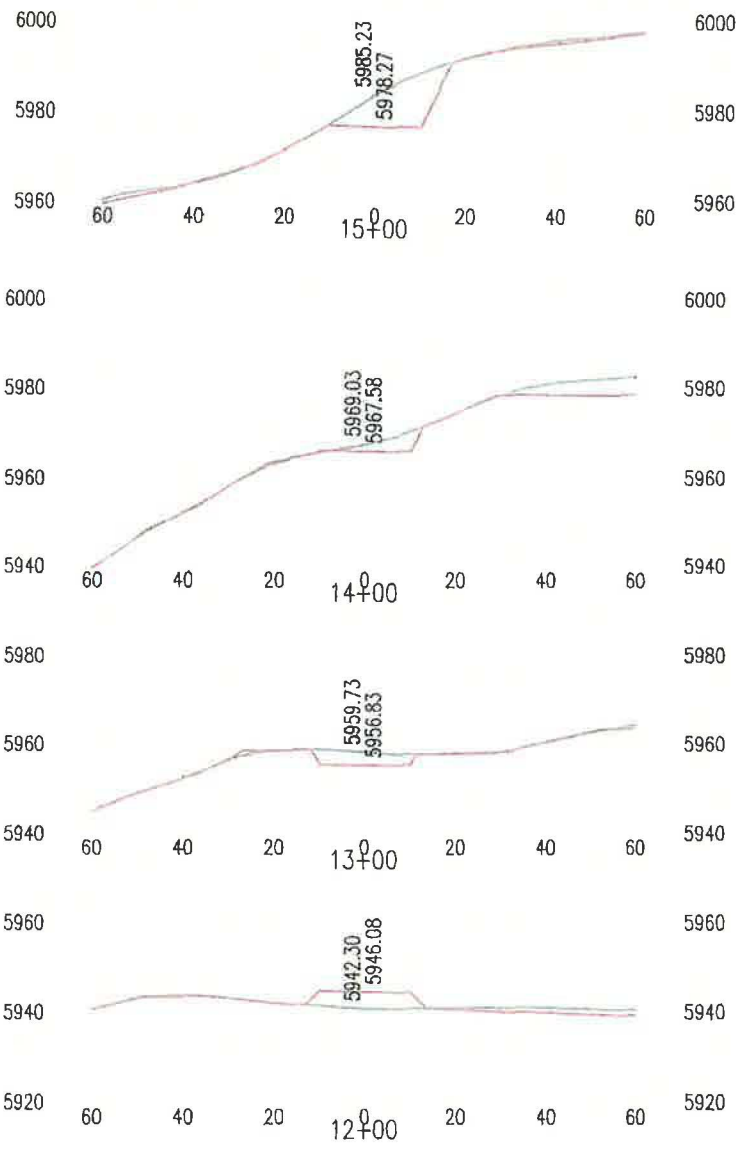

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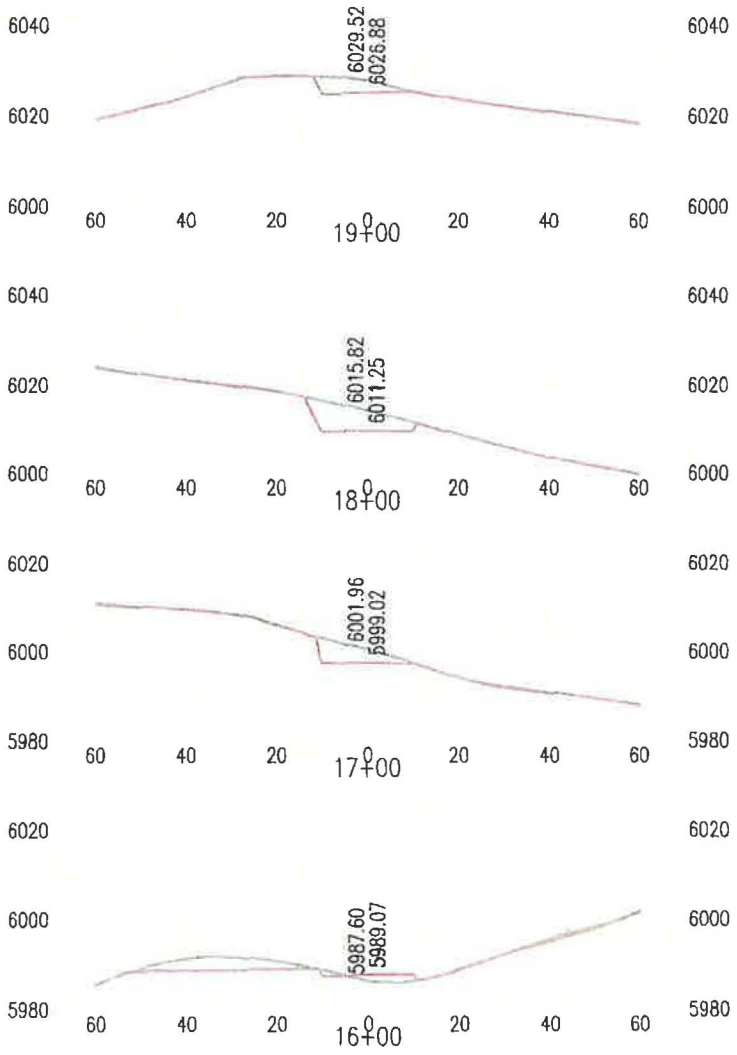

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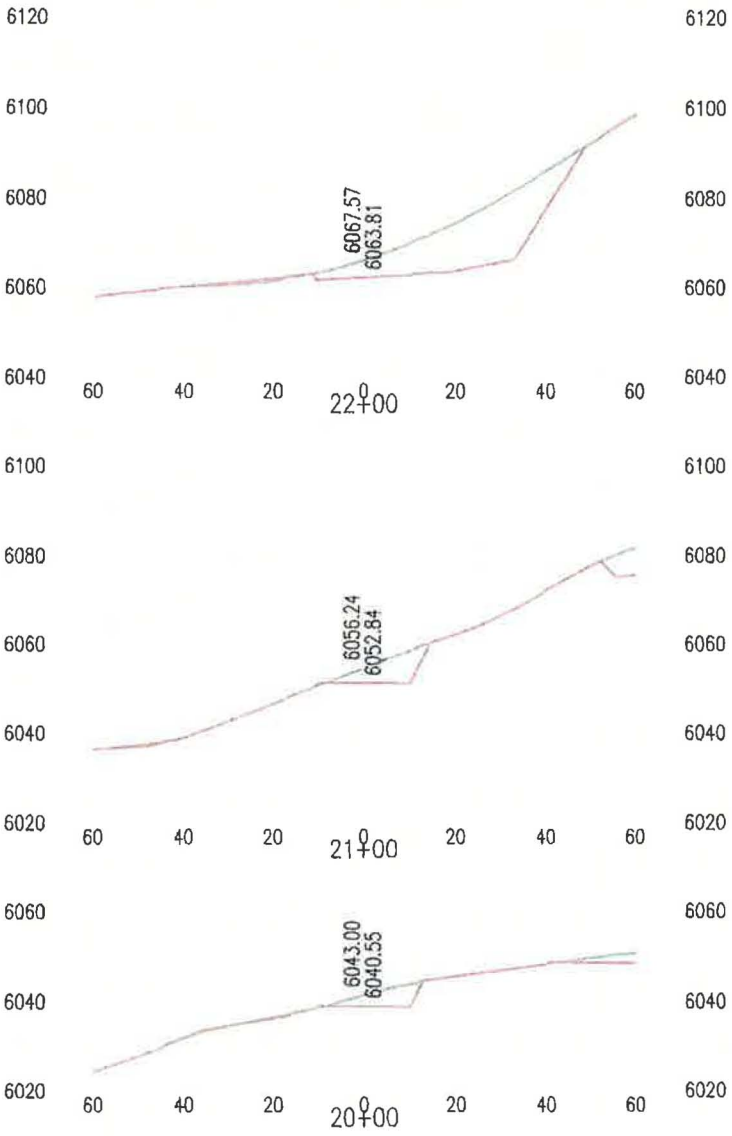

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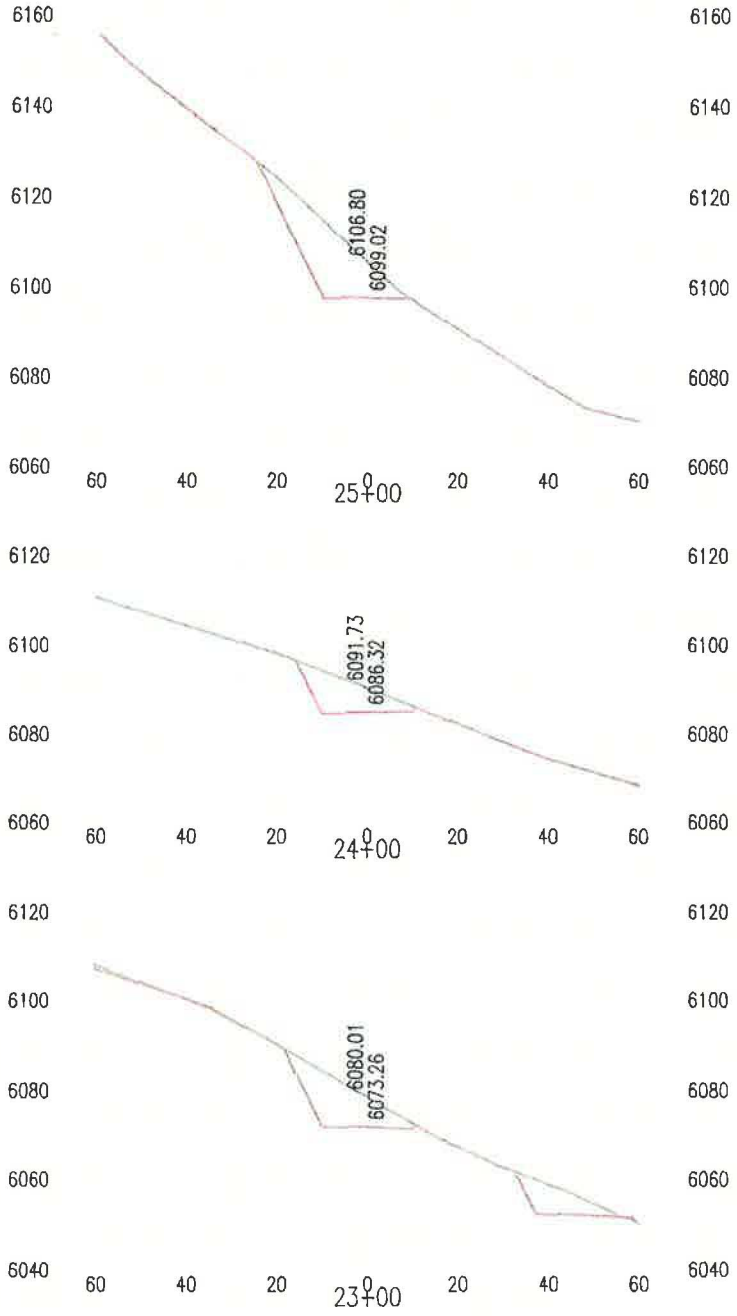

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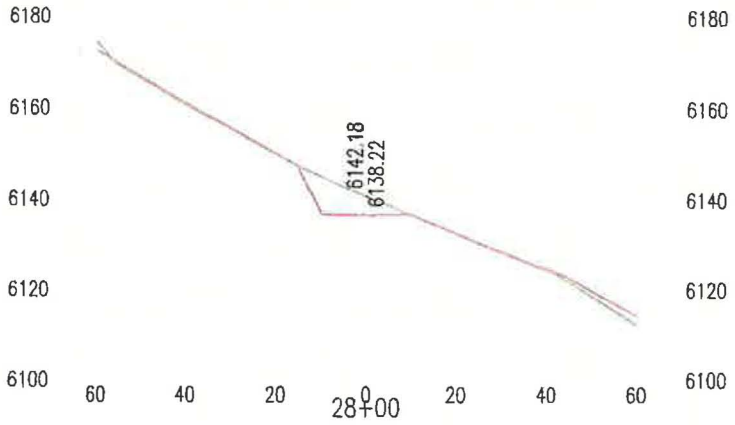

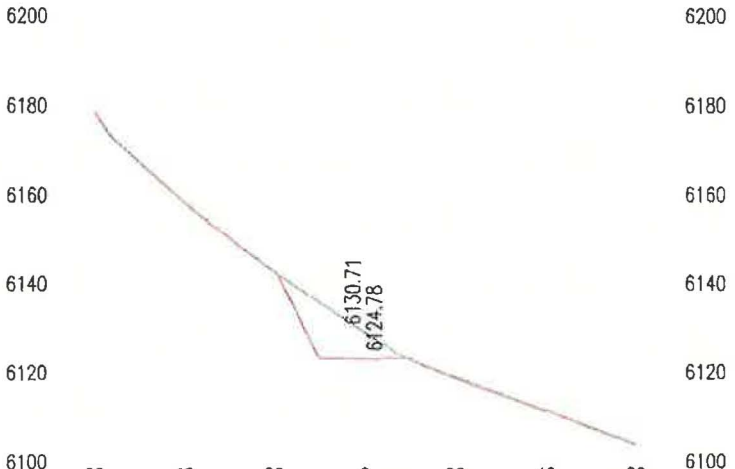

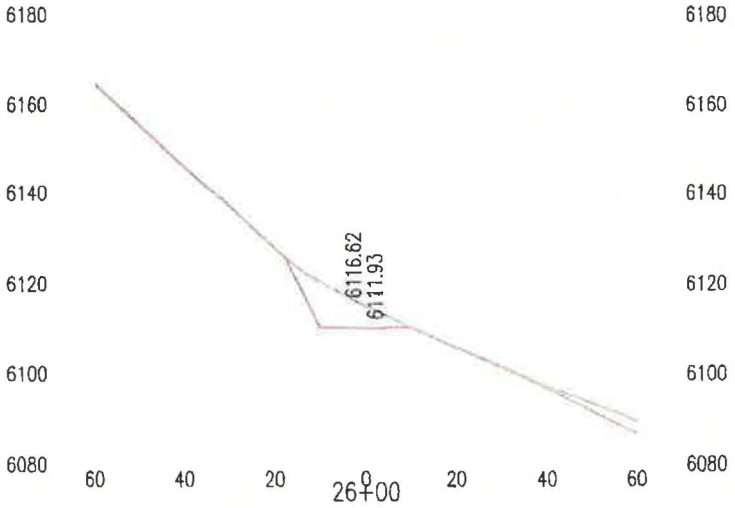

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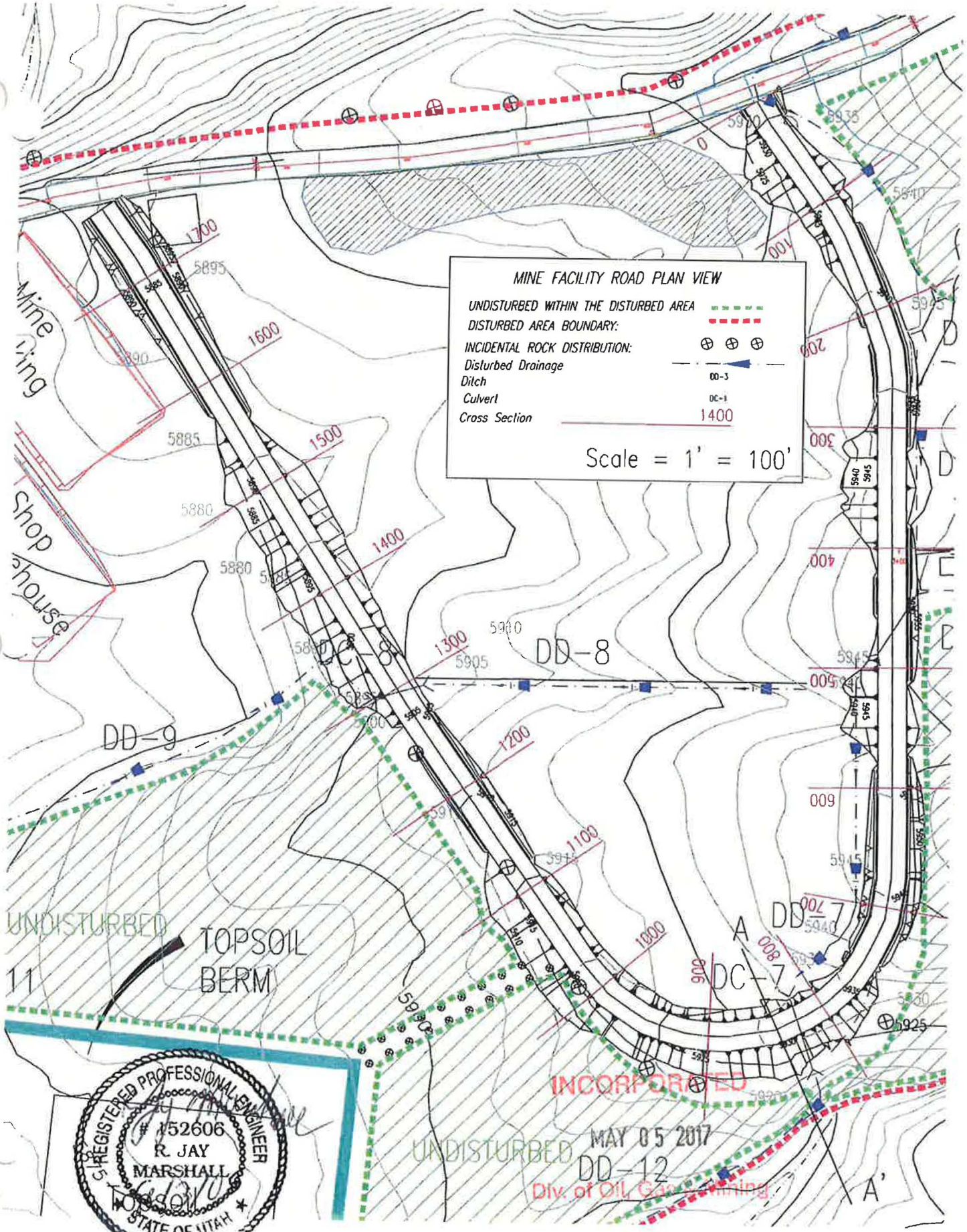
Mine Facility Road

DESIGN

See Appendix 5-4 and Plate 5-2 for additional information:


MINE FACILITY ROAD PLAN VIEW
UNDISTURBED WITHIN THE DISTURBED AREA
DISTURBED AREA BOUNDARY:
INCIDENTAL ROCK DISTRIBUTION:
Disturbed Drainage
Ditch
DD-3
Culvert
DC-1
Cross Section
1400
Scale = 1' = 100'
Mine
Shop
DD-8
DD-9
DC-8
DC-7
DD-7
DD-12
A
A'
UNDISTURBED
TOPSOIL
BERM
UNDISTURBED
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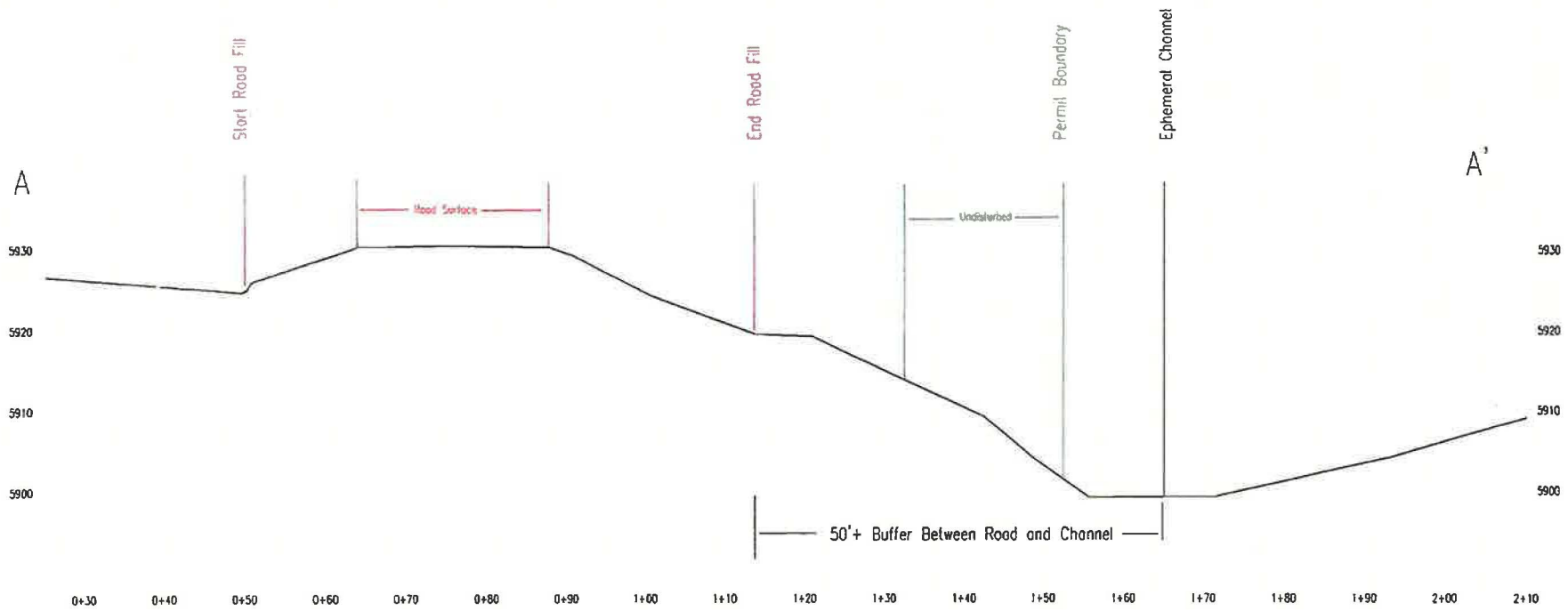

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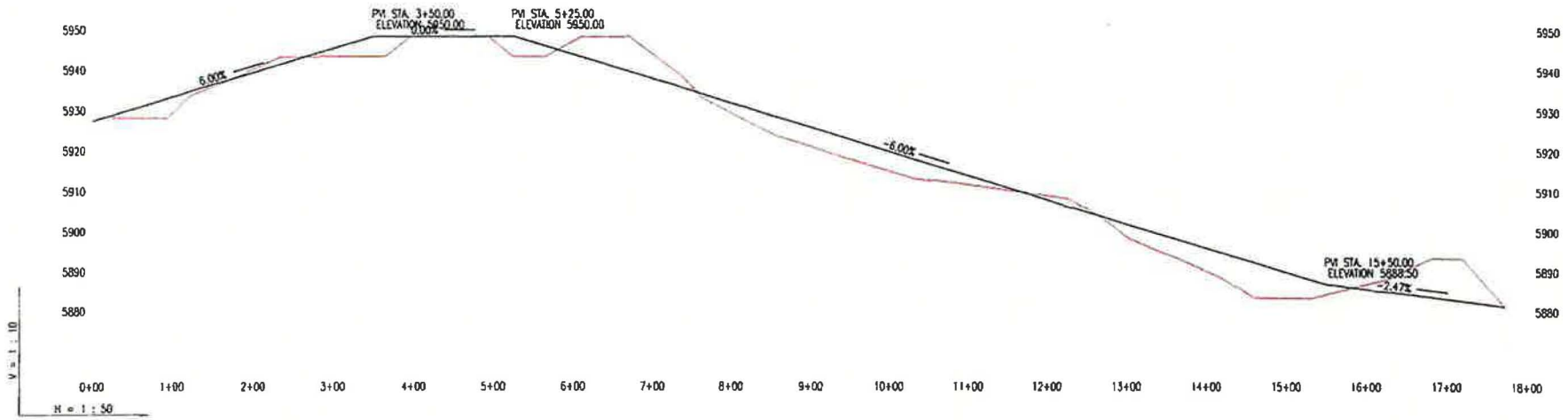
Loadout Road Profile
1"=200'



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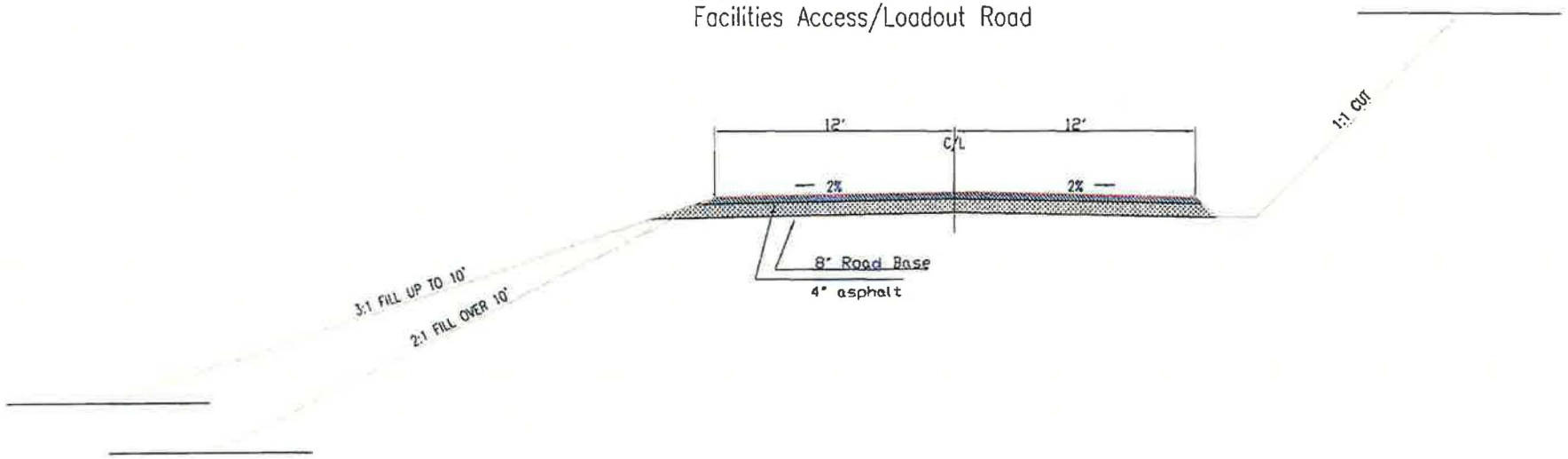
Typical Crossection

Facilities Access/Loadout Road



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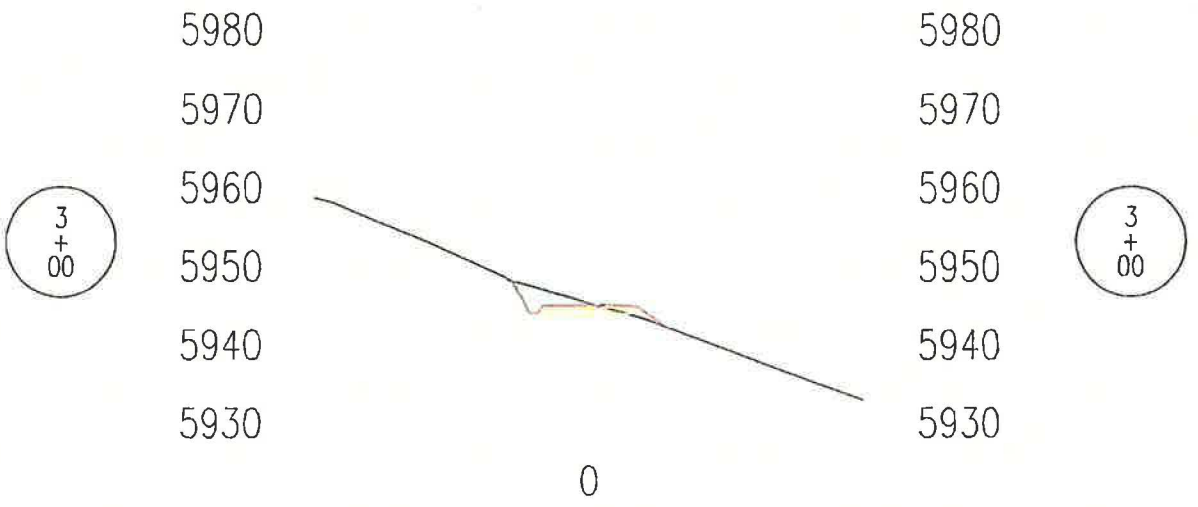

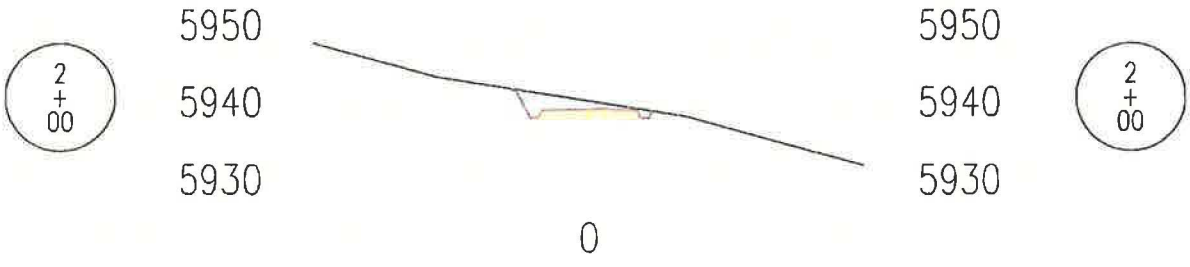

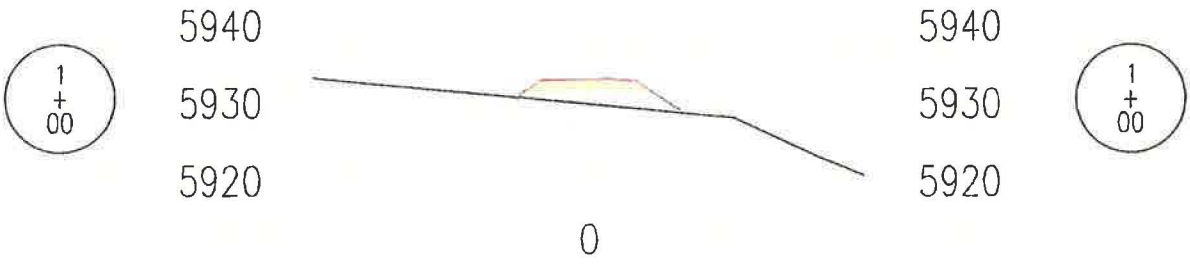

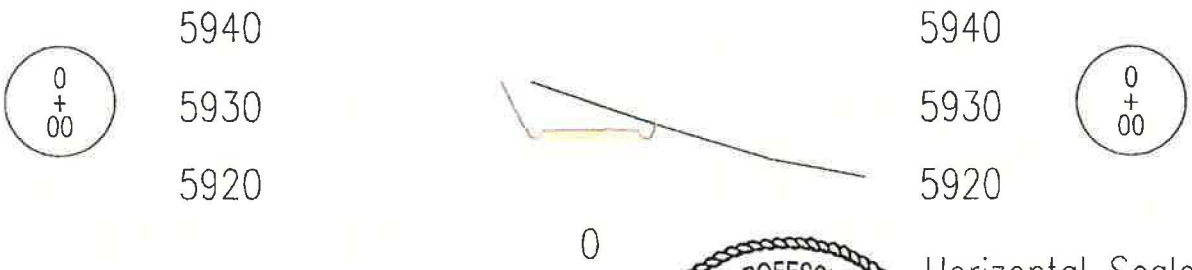

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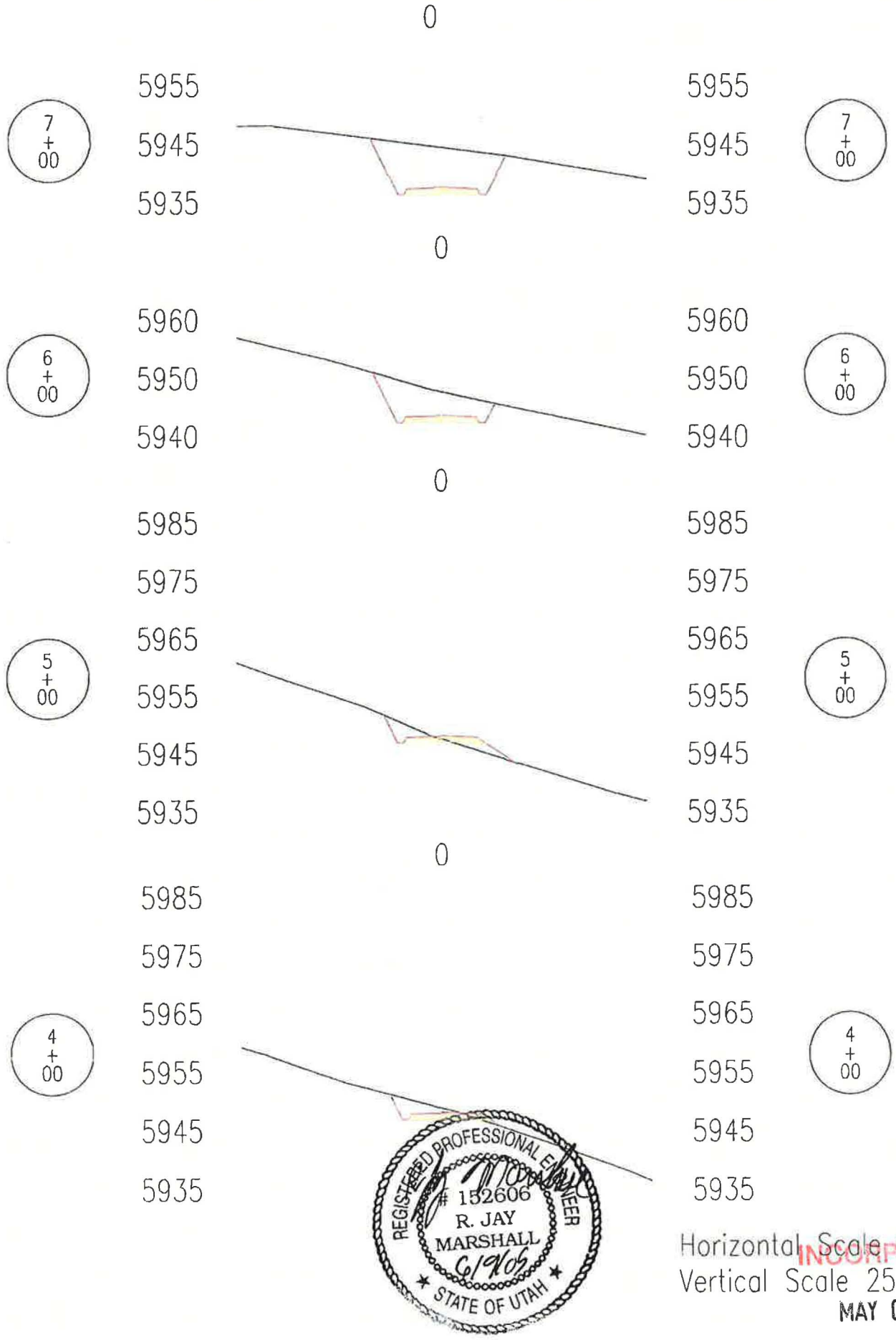

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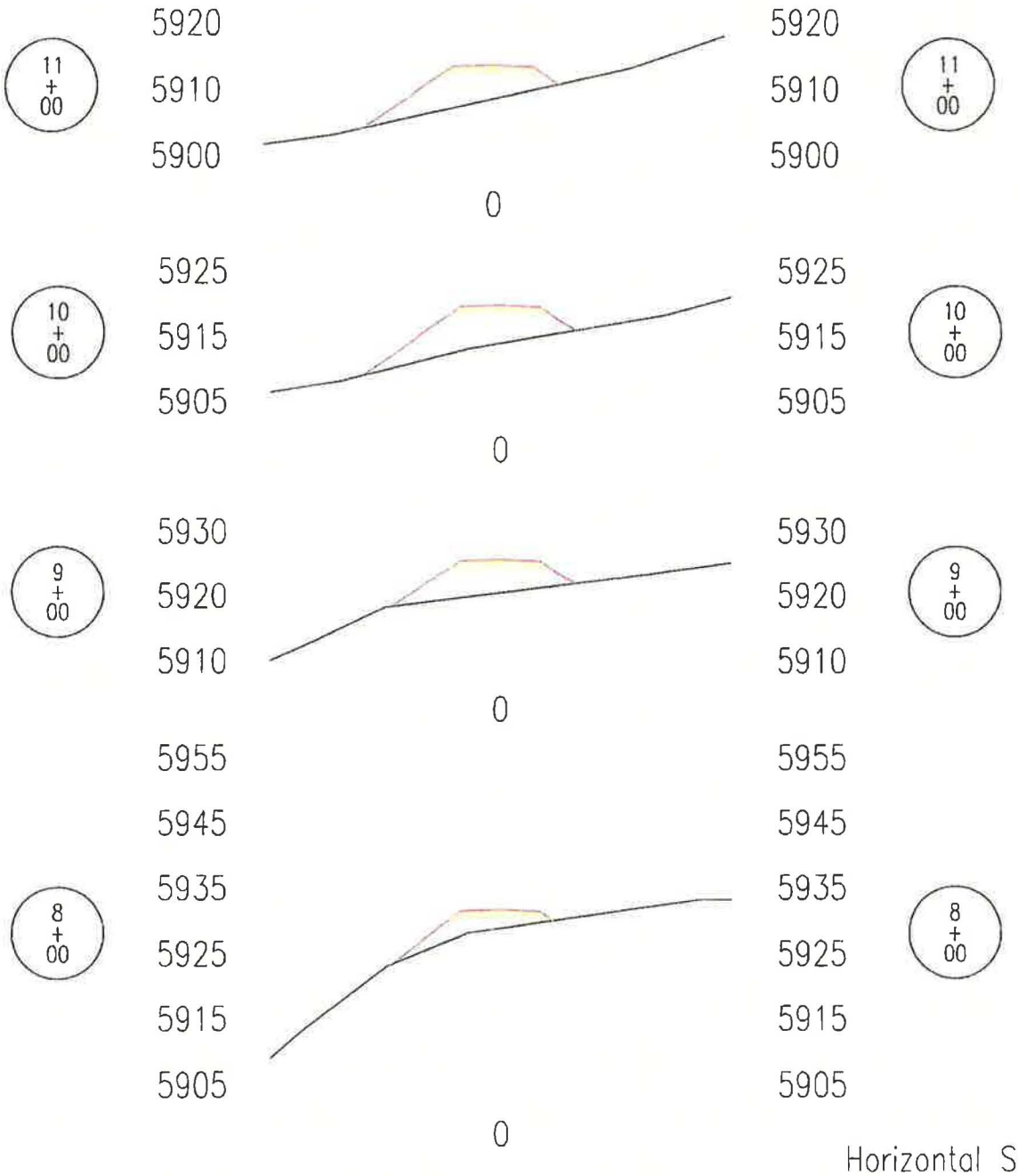

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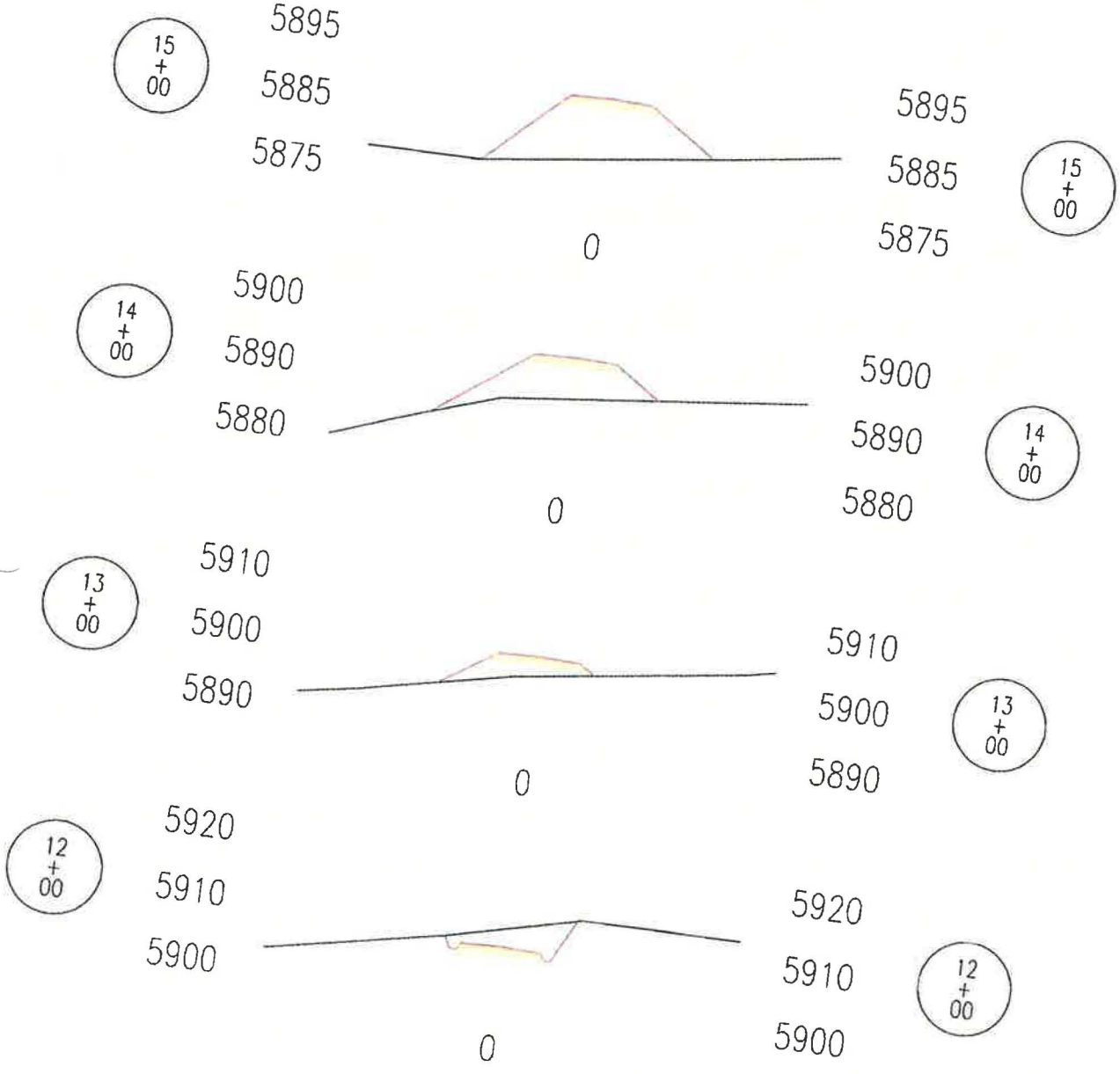

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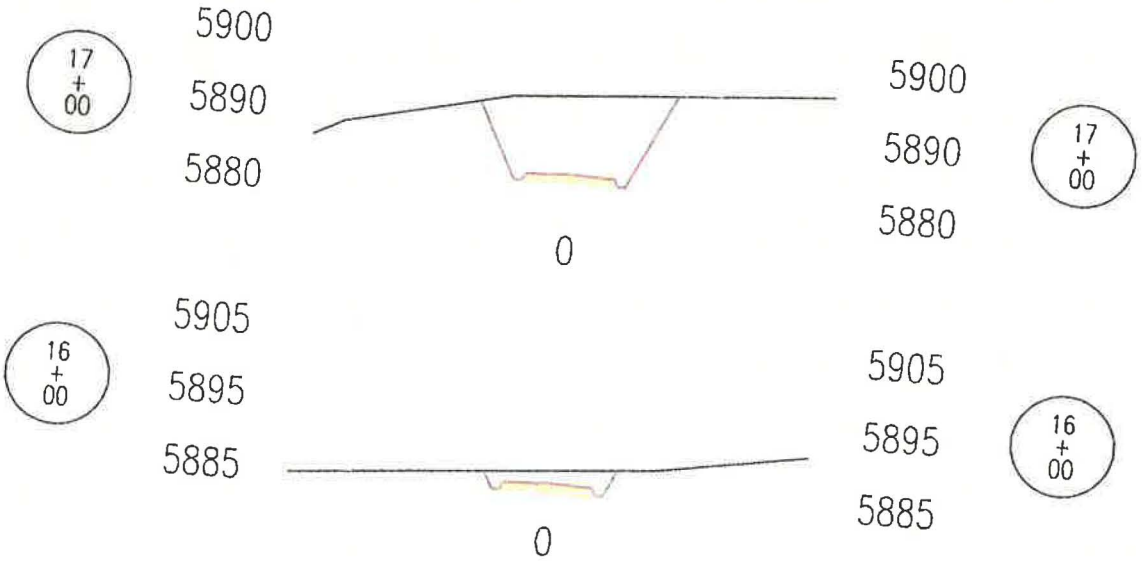

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LILA CANYON MINE
PROPOSED SEWAGE SYSTEM

Lila Canyon Mine
Proposed Sewage System

Introduction

The Lila Canyon Mine facilities will be located in the Right Fork of Lila Canyon, which is in the Book Cliffs of Carbon County, approximately 10 miles south of Sunnyside, Utah. Due to the remote location, no sewage treatment facilities are available; therefore, it is proposed to treat wastewater with septic tank/drainfield systems.

Lila Canyon is an ephemeral drainage, flowing only in response to rainfall or snowmelt. There are no streams, springs or water wells located within 1500 feet of the proposed treatment facilities. Undisturbed drainage above the minesite is carried around the minesite in natural channels and beneath the sediment pond in a large culvert. Runoff from the mine site is directed to a sedimentation pond where it is held and treated as necessary to meet effluent standards according to the U.P.D.E.S. Discharge Permit.

The proposed drainfield will be in a soil type known as the Strych, which is a stony, fine, sandy loam. Complete soil descriptions are provided in Chapter 2 and on Plate 2-1. Test holes in the area to a depth of 10 feet show no evidence of bedrock or ground water.

General

Due to area restrictions and available depth for absorption, it is proposed to use seepage trenches for the drainfield. This allows the main trenches to be installed in native soil beneath the unpaved parking area.

Since the mining permit has not been approved at this time, and the proposed drainfield is in a cut area which would require disturbance, it is not possible to conduct actual percolation tests for the design. Based on recent discussions with the Southeastern Utah Health Department District Engineer, and evaluation of soil types in the area, an allowable volume of 1.0 gal/ft^2/day is considered acceptable for design of the seepage trenches.

It should be noted that the seepage trenches will be constructed per Exhibit 1. Septic tanks, yard boxes and junction boxes will be standard from Dura-Crete, Inc.

Design

The septic system has been designed according to R317-5 regulations for Large Underground Wastewater Disposal Systems. Water quantities have been estimated at 35 gallons per day per person based on Table 5.2 (Industrial Buildings). The design for each of the separate facilities is based on the expected maximum number of people using the site. Based on 140 people, the system is designed for 4900 gallons per day.

Facilities Area

(Includes Office, Shop, Bathhouse and Warehouse)

Criteria

140 people
35 gallons/day/person
Allowable Q = 1 gal/ft^2/day
Area = 4900 gpd/1.00 gal/ft^2/day = 4900 ft^2

Calculations

Q = 140 x 35 = 4900 gpd
Tank = V = 1125 + 0.75 Q = 4800 gallons
Seepage Trench = Allowable Q = 1.00 gal/ft^2/day

Design

Septic Tank - 5000 gallon
Main Drainfield - 4 trenches x 100' long x 6' deep; 18' c-c; Trenches level and connected.
Sidewall Area = 4800 ft^2

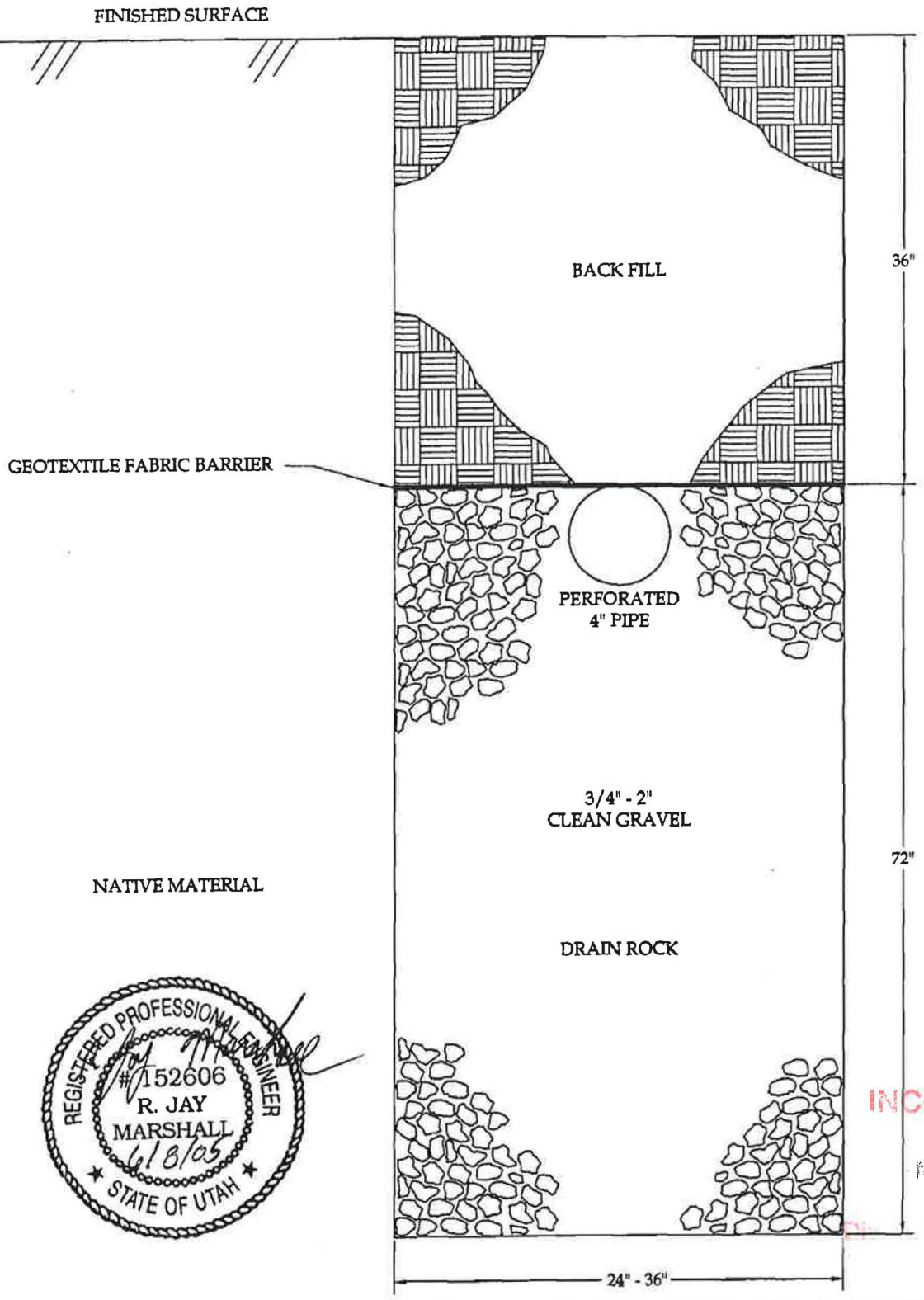
Summary

The following is a summary of the separate wastewater disposal system design proposed for this minesite:

Location	Main Facilities
Number of People	140
Septic Tank (gal. Required)	4900
Septic Tank (gal. Proposed)	5000
Drainfield (ft^2 Required)	4800
Drainfield (ft^2 Proposed)	4800
Number of Trenches	4
Trench Length (ft.)	100
Trench Depth (ft.)	6

EXHIBIT 1

SEEPAGE TRENCH
TYPICAL SECTION



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culverted crossings over ephemeral drainages. There are no plans to alter or relocate any intermittent or perennial drainages in conjunction with road construction.

Road construction and design details are provided in Chapter 5 of this P.A.P. Road drainage and culvert design details are provided in Appendix 7-4.

732.420 Culverts Culvert details are provided in Appendix 7-4. All undisturbed culvert inlets will be provided with headwall protection, consisting of inlet sections, rock or concrete.

733. Impoundments The only water impoundment proposed for this site is the sediment pond. Design details for the pond are provided in Appendix 7-4 and on Plates 7-6a &b.

733.100 General Plans The general plan for this site is to drain runoff from the disturbed area into two sedimentation ponds for treatment prior to discharge. Site drainage and design details are described in Appendix 7-4. The general plan includes the following, at a minimum:

733.110 Certification The sediment control plan and proposed sediment pond designs have been prepared and certified by a Registered Professional Engineer, State of Utah.

733.120 Maps and Cross Sections Sediment pond locations, design plans and cross sections are provided on Plates 7-5 and 7-6a & b, respectively.

733.130 Narrative A complete description of the proposed sediment pond along with volumes and design/construction details in provided in Appendix 7-4.

733.140 Survey The proposed sediment ponds are not located within a potential subsidence area from past underground mining operations.

733.150 Hydrologic and Geologic Information Relevant hydrologic and geologic information for the sediment ponds are provided in Appendix 7-4.

733.160 Certification Statement All proposed sediment pond structures are provided with this submittal. The structure will be constructed prior to construction of the mine site area, but not before receiving Division approval.

733.200 Permanent and Temporary Impoundments As indicated earlier, the proposed sediment pond is classed as temporary.

733.210 Design Requirements The proposed sediment ponds are temporary; therefore, the ponds are not designed to meet requirements of MSHA 30 CFR 77.216.

The proposed ponds are not located where failure would expect to cause loss of life or serious property damage. As shown in Appendix 7-4, the proposed pond embankments will have a minimum of 3H : 1V on the inside slope and 2H : 1V on the outside. These slopes, along with the 95% compaction requirement, will ensure a static safety factor in excess of 1.3, as required.

733.220 Permanent Impoundment Section 733.220 is not applicable since the impoundment will be temporary.

733.230 Temporary Impoundment The proposed sediment pond is a temporary impoundment, and will be removed when reclamation sediment control and revegetation criteria are met, in accordance with Phase II Bond Release criteria.

733.240 Inspections/Potential Hazards As indicated under Section 515.200, if any examination or inspection shows a potential hazard exists, the person who examined the impoundment will promptly notify the Division of the finding and emergency procedures formatted for public protection and remedial action.

734. Discharge Structure All discharges from sedimentation ponds, diversions and culverts will be protected from erosion by the use of adequately sized rip-rap, concrete or other approved protection. Details for outlet protection for all drainage control structures are provided in appendix 7-4. All discharge structures have been designed according to standard engineering design procedures.

743. Impoundments

743.100 General Requirements All impoundments associated with this operation are considered temporary.

743.110 Not applicable there are no impoundments planned that meet the criteria of MSHA, 30 CFR 77.216 (a).

743.120 The design of impoundments have been prepared and certified by a qualified, registered professional engineer. As described in Appendix 7-4, the proposed sediment ponds will have at least 2' of freeboard above the highest flow level in the emergency spillway, which is adequate to resist overtopping by waves and by sudden increases in storage volumes.

743.130 As described in Appendix 7-4, the sediment ponds will be equipped with a culvert riser principal spillway and a culvert riser emergency overflow sized to safely pass the runoff from a 25 year - 6 hour precipitation event.

743.131 The principal spillway design is discussed below.

743.131.1 The principle spillway will be constructed of corrugated metal pipe. The emergency spillway will also be constructed of corrugated metal pipe.

744. Discharge Structures

744.100 The sediment ponds emergency spillway will be a vertical corrugated metal pipe. For Sediment Pond 1, it will flow into the UC-1* C.M.P. beneath the pond and discharge onto an engineered rip-rap apron to prevent scouring or erosion. For Sediment Pond 2, the discharge will be via C.M.P. (See Appendix 7-4).

* UC-1 was abandoned in the fall of 2016 due to severe storm damage. A new culvert UC-1a was constructed to replace it. Both will be reclaimed during final reclamation. Full details can be found in Appendix 7-4.

Diversions and culvert outlets that are expected to have flow velocities in excess of 5 fps will also be equipped with erosion and velocity controls as described in Appendix 7-4.

744.200 Discharge structures have been designed and certified according to standard engineering design procedures. (See Appendix 7-4).

Appendix 7-3

Probable Hydrologic Consequences Determination

Updated June 2016

Probable Hydrologic Consequences Determination

General

The best available adjacent area data to assist in making a determination of probable hydrologic consequences of the proposed operation comes from the adjacent Horse Canyon Mine, and Columbia Mines. The Columbia Mine has been closed since the late 1960's, and the Horse Canyon Mine has been closed since the mid-1980's. The Horse Canyon Mine has also been reclaimed under SMCRA.

Data gathered from these mines and the surrounding hydrologic regime has been used in this determination, as well as baseline data gathered in the area of the proposed Lila Canyon Mine Extension.

Pertinent water monitoring data for the Horse Canyon Mine and Lila Canyon Extension is included in Appendices 7-1, 7-2, and 7-6 of this application and Appendix VII-1 of the Horse Canyon MRP. Additional recent monitoring data are available from the DOGM electronic database. Baseline geologic information is presented in Chapter 6 of this P.A.P. Baseline hydrologic information, descriptions of the function of the streams and groundwater systems, and discussions of various issues regarding the data are presented in Sections 724.100 and 724.200 of this P.A.P. To ensure that this document addresses these issues, these data, descriptions, and discussions are referenced and should be considered a part of this document.

Mining in the Horse Canyon area began in the late 1930's. Detailed hydrologic information was first gathered in the late 1970's. It is impossible to precisely describe the area's pre-mining hydrology due to the adjacent historical mining. The conditions represented by these data help to define the hydrology about the time SMCRA was passed.

Analysis of Data

Potential impacts of coal mining on the quality and quantity of surface and groundwater flow may include:

- Contamination from acid- or toxic-forming materials;
- Increased sediment yield from disturbed areas;
- Increased total dissolved solids concentrations;

- Flooding or stream flow alteration;
- Impacts to groundwater or surface water availability;
- Hydrocarbon contamination from above ground storage tanks or from the use of hydrocarbons in the permit area;
- Contamination of surface and groundwater from road salting; and
- Contamination of surface water from coal spillage due to hauling operations.

Potential Impacts to the Hydrologic Balance. Potential impacts of the Lila Canyon Mine on the hydrologic balance of the permit and adjacent areas are addressed in the following sections:

Acid- or Toxic- Forming Materials. Information on acid-and toxic-forming materials is presented in Chapter 6. These data show that no acid- or toxic-forming materials are present to the north and south of the Lila Canyon Mine. Given the Lila Canyon Mine will be opened in the same strata as has been disturbed to the north at the Horse Canyon Mine and the Boreholes S-24 and S-25 to the south, no impacts from Acid or Toxic forming materials are anticipated.

Additionally, rocks of the Mesa Verde Group are carbonaceous, resulting in persistence of acids and related toxins in water in the mine and adjacent strata unlikely. Also, the design of the refuse pile will prevent any acid or toxic potential from material removed from the mine. Based upon the hydrology, geology, and climate of the area probability of acid or toxic impacts from materials removed from the mine or from mine water discharge is unlikely. Thus, no significant potential exists for the contamination of surface and groundwater in the permit and adjacent areas by acid- or toxic-forming materials.

Sediment Yield. The potential impact of mining and reclamation on sediment yield is an increase in sediment in the surface waters downstream from disturbed areas. Sediment-control measures (such as sedimentation ponds, diversions, etc.) will be installed to minimize this impact. These facilities will be regularly inspected (see Section 514) and maintained to ensure that they remain in proper operating condition.

The implementation of sediment control measures are mandated to minimize the erosion hazard associated with mining operations. Argument has been presented that reducing the sediment load, while the sediment carrying capacity of the stream

remains the same, can result in increased stream bed and stream bank erosion. This would be true, if the flow rate released to the stream remained the same. However, the use of sediment control structures results in the peak flow released from the site being reduced to a controlled rate which is less that the natural peak flow. Therefore, the sediment carrying capacity of the stream is correspondingly reduced. Additionally, the duration of the lower rate controlled release from the sediment control structures aids in enhancing the development of vegetation along the stream banks which provides additional stabilization of the channel banks and bed. While the bed and bank impacts are not anticipated, the applicant has agreed to monitor the conditions of the channel downstream of the site for geomorphic and erosional change as a result of mine discharges.

All construction and upgrading activities will be undertaken during periods of dry weather, commencing in late spring and lasting through fall. For both the mining and reclamation periods, it is expected that construction, upgrading, or regrading activities would cause an increase in sediment load to the stream. Temporary sediment controls will be used whenever possible to lessen the impact of construction activities.

Stream buffer zones have been delineated upstream and downstream of the disturbed area of the mine facilities. These buffer zones will aid in ensuring that no disturbance occurs within the area of the unprotected channel. While these buffer zones are planned and will be installed and maintained for the intermittent by definition stream, it should be recognized that the reach of the channel that is being protected is ephemeral in nature and is not an intermittent or perennial nature reach (see Appendix 7-7 for characterization of the streams).

Subsidence tends to cause a warping or sagging of the surface in the area of the mined out area. Within the stream channel that crosses a subsided area, at the upstream boundary of the subsidence, the stream channel is steepened, resulting in the potential for additional erosion in the steepened reach. As the stream crosses the sagged subsided area, the channel gradient decreases below the pre-subsided slope. This results in increased glides and extended pools in intermittent and perennial streams or areas of increase deposition in ephemeral streams. Subsidence cracks which intersect stream channels with steep gradients could, for a short period of time, result in a local increase in the sediment yield of the stream. However, this sediment increase would also cause the crack to quickly fill, recreating pre-subsidence stream channel conditions. Thus, the potential impact to sediment yield from subsidence in the permit area would be minor and of short duration.

Various sediment-control measures will be implemented during reclamation as the vegetation becomes established. As discussed in Section 542.200 of this P.A.P.,

these measures will include installation of silt fences and straw-bale dikes in appropriate locations to minimize potential contributions of sediment to the Right Fork of Lila Canyon. These measures will reduce the amount of erosion from the reclaimed areas, thereby precluding adverse impacts to the environment.

Acidity, Total Suspended Solids, and Total Dissolved Solids. Probable impacts of mining and reclamation operations on the acidity and total suspended solids concentrations of surface and groundwater in the permit and adjacent areas were addressed previously in this section. Since the proposed Lila Canyon Mine has not started, there is no specific data available on Lila mine water. Therefore, quality information was obtained from the adjacent Horse Canyon Mine workings was used to be representative of the water quality expected in the Lila Cayon Mine. This is due to the mines being adjacent to each other and the same geologic strata being mined..

Data presented in Appendices 7-1 and 7-6 and summarized in Section 724.100 of this P.A.P. indicate that the TDS concentration of water in the Blackhawk Formation (as measured in inflow to the nearby Horse Canyon Mine) ranged from approximately 1400 to 2400 mg/l and is of the sodium-bicarbonate type. As noted in Section 724.200, the TDS concentration of water in the Right Fork of Lila Canyon is unknown, but likely to be similar to the flows in Horse Canyon Creek which are in the range from 1200 to 1500 mg/l. This comparison is justified due to the similar exposures of strata that both stream flow across and the similarity in the watershed conditions. The dominant ions in this water are calcium and bicarbonate during high-flow periods, whereas the dominant ions during low-flow periods are sodium, magnesium, sulfate, and bicarbonate.

These data suggest that the TDS concentration of water in the Right Fork of Lila Canyon can be expected to increase by a factor of 1.5 for the water discharged from the mine to the drainage. This concentration is similar to concentrations found in other streams along the Book Cliffs as described by Waddell, et. al. (1986). It should be noted that it is anticipated that differnet than many of the historic mines in the Book Cliffs, the Lila Canyon Mine will use powdered limestone or dolomite (i.e., calcium-magnesium-carbonate) for rock dust. The historic mines used gypsum rock dust (calcium-sulfate) which raised the TDS of the discharge water. Hence, dissolution of rock dust by water in the mine should not influence the chemical type and concentration of water in the drainage if mine water is discharged to the Right Fork of Lila Canyon.

As indicated in the P.A.P., the total iron and manganese concentrations in potential discharges from the mine are not significantly elevated to an effect downstream uses. Also, as discussed in Appendix 7-9, the worst case mine water discharge rate is expected to affect only 8.5 miles downstream from the mine.

Lila Canyon drainage, as part of the lower Price River basin, is classified according to Section R317-2-13 of the Utah Administrative Code (Standards of Quality for Waters of the State) as a class 2B (secondary contact recreation use), 3C (nongame fish and other aquatic life use), and 4 (agricultural use) water. No TDS standards exist for class 2B and 3C water. The TDS standard for class 4 water is 1,500 mg/l. Hence, if discharges occur from the Lila Canyon Mine to the Right Fork of Lila Canyon, the data indicate that the TDS concentration of these discharges will slightly exceed the agricultural use water-quality standard.

As there is limited agricultural use in the area, this TDS exceedance is not considered significant. The major usable water resources in the area that could potentially be affected are springs and ephemeral channels. These water sources are used by wildlife and livestock. Most of these sources are locate upstream of the proposed discharge point. Therefore, there would be no impact to these existing sources. Additionally, the quality of water discharge from the mine is expected to be significantly better than the other waters which occurs from the Mancos Shale which downstream agriculture currently uses (TDS ranging from 2200 to 4800 mg/l).

Concerns have been raised that there might be impacts of increased salinity from the solution of salts from the Mancos Shale. While it is likely that a small increase in TDS from salts picked up from the Mancos Shale, this is not expected to be a significant problem. Appendix 7-9 includes a calculation of how far a worst case constant mine discharge would be expected to flow. This flow rate is thought to be higher than the expected discharge amount, but it does provide a worse case estimate. Because of infiltration, evapotranspiration, and percolation, the mine discharge effect is limited to a distance of 8.5 miles and is not expected to reach the Price River. Therefore, it is not expected that any salinity increase would affect downstream perennial waters.

It should also be noted that the dissolved iron standard for class 3C water is 1.0 mg/l. No dissolved iron standard exists for class 2B or 4 waters. The data presented above indicate that potential discharge water from the mine will not exceed the dissolved iron standard of Lila Canyon. No standards exist in the R317 regulations for total iron, dissolved manganese, or total manganese. However, the data presented above indicate that potential discharges from the mine to the Right Fork of Lila Canyon will meet the effluent limitations of 40 CFR 434.

No hydrologic impacts have been noted at the adjacent Horse Canyon Mine due to subsidence. Although tension cracks may locally divert water into deeper formations, resulting in increased leaching of the formation and increased TDS concentrations, the potential of this occurring is considered minimal. This conclusion is based on experience at the Horse Canyon Mine and on the fact

that the shale content of the North Horn Formation, the Price River Formation, and the Blackhawk Formation should cause these subsidence cracks to heal quickly where they are saturated by groundwater flow. Thus, potential impacts on TDS concentrations would be minor and not of significant concern.

Flooding or Streamflow Alteration. Runoff from all disturbed areas will flow through a sedimentation pond or other sediment-control device prior to discharge to the Right Fork of Lila Canyon. Three factors indicate that these sediment-control devices will minimize or preclude flooding impacts to downstream areas as a result of mining operations:

1. The sedimentation pond has been designed and will be constructed to be geotechnically stable. Thus, the potential is minimized for breaches of the sedimentation pond to occur that could cause downstream flooding.

2. The flow routing that occurs through the sedimentation pond and other sediment-control devices reduces peak flows from the disturbed areas. This precludes flooding impacts to downstream areas.

3. By retaining sediment on site in the sediment-control devices, the bottom elevations of the Right Fork of Lila Canyon downstream from the disturbed area will not be artificially raised. Thus, the hydraulic capacity of the stream channel will not be altered.

The volume of streamflow will increase in the Right Fork of Lila Canyon if water is discharged from the mine to the drainage. Potential impacts to the drainage channel could include the displacement of fines on the channel bottom, and minor widening of the channel. However, the degree of widening will likely be minimized by the increased vigor and quantity of vegetation which will be sustained along the stream channel by the increased availability of water. In particular, it is anticipated that a phreatophyte streambank vegetative community will develop as a result of mine-water discharges. This effect will occur for the distance downstream that surface flows can be sustained above channel transmission losses. Based on the maximum anticipated estimate of mine water discharge, it is unlikely that any flooding will occur to the downstream channel as the flows (1.1cfs and 4.63cfs) are significantly below the bankfull conditions of the channel. Care will be taken during discharge of this water to avoid erosion at the discharge point or flooding of downstream areas. Once mining ceases, the mine will be sealed and no discharges will occur. The streamflow in the Right Fork of Lila Canyon will then return to pre-mining discharge levels. Downstream impacts from such discharge will be limited to the establishment of a temporary riparian area along the stream channel. The flows are expected to be below the flow threshold to result in changes to the stream channel.

Following reclamation, stream channels which have been altered by mining operations will be returned to a stable state (see Section 762.100). The reclamation channels have been designed to safely pass the peak flow resulting from the 10-year, 6-hour or the 100-year, 6-hour precipitation event as appropriate for the channel and in accordance with the R645 regulations. Thus, flooding in the reclaimed areas will be minimized. Interim sediment-control measures and maintenance of the reclaimed areas during the post-mining period will preclude deposition of significant amounts of sediment in downstream channels following reclamation, thus maintaining the hydraulic capacity of the channels and precluding adverse, off-site flooding impacts.

Subsidence tension cracks that appear on the surface will increase the secondary porosity of the formations overlying the Lila Canyon Mine. During the period prior to healing of these cracks, this increased percolation will decrease runoff during the high-flow season (when the water would have rapidly entered the stream channel rather than flowing into the groundwater system). During low-flow periods, the result of this increased percolation will be an increase in the base flow of the stream. Hence, the net result will be a decrease in the flooding potential of the affected stream.

An additional flooding issue is the potential for flooding of the mine following mining and the discharge of water from the portals. Since the regional geology and hydrologic regimes of the Horse Canyon and Lila Canyon Mines are so similar, data has been extrapolated from the Horse Canyon Mine to the proposed Lila Canyon Mine. The proposed Lila Canyon Mine portals are located up-dip from areas in the mine where water may be expected; therefore, the only mine water expected to reach the surface is that which is pumped. Mine water is not expected to reach the portal level or flow from the reclaimed portal level or flow from the reclaimed portals of either the reclaimed Horse Canyon Mine or the Lila Canyon Mine based on the following information:

1) Mine water level information gathered in 1986 and 1993 indicates that there has been little rise in the water level since mining activities ceased.

2) The Sunnyside Fault is not a large producer of water. As an example, the Columbia Mine located north of the Horse Canyon Mine also encountered the Sunnyside Fault zone and has been closed since the late 1960's. If water inflow rates were high, the mine workings would have flooded, developing a head differential between the Columbia Mine and the Horse Canyon Mine (pumped). If the fault zone were a good conductor of water, the inflow to the Horse Canyon

Mine would have been high, driven by the head from the flooded Columbia Mine Workings. However this was not the case and the water levels have not flooded much beyond the water levels in the Horse Canyon Mine while it was pumped. Suggesting that there is no head to cause a flooding rise and that the Sunnyside Fault is not a significant conduit for water flow.

3) Sieler and Baskins (1986) showed that the water quality for natural waters generally drops significantly when exposed to mine workings (gob, etc). The water quality of the mine water samples from the Horse Canyon Mine sump locations (2 Dip, Main Slope, 2E-B) as compared to the water quality of springs in the lower stratigraphic section of the Horse Canyon permit area show little difference in TDS. This indicates that majority of the water in the mine is not the result of inflow along the fault zone from the Columbia Mine. Suggesting that the fault zone is a poor conductor of water for the poorer quality water expected from the flooded Columbia Mine workings or that the Columbia Mine workings have not flooded much beyond the water levels in the Horse Canyon Mine while it was pumped.

4) The three Piezometers, IPA-1, 2 and 3 shown on Plate 7-1, suggest that the gradient is down dip away from the portal area. The Piezometer readings can be found in Appendix 7-1.

5) The coal mined at Horse Canyon (as well as that at Lila Canyon) is underlain by a marine sheet sandstone (Sunnyside, see Geology, Chapter VI). Lines (1985) did extensive petrographic work on porosity and permeability in the formation (see Table 1). If the water level in the mine were to ever approach the level of the portal, the Sunnyside marine sandstone would likely discharge water, preventing any head development behind the portal closures.

6) Much of the Horse Canyon Mine floor has been fractured by the effects of pillar removal, especially near the outcrop. Fracturing develops secondary porosity and enhances the permeability of the underlying Sunnyside marine sandstone. This would function as a means to dissipate any head which might otherwise develop on the portals. The proposed

longwall mining in the Lila Canyon Mine is also expected to produce floor fracturing.

7) There is a difference in elevation of about 400 to 500 feet between the lowest portal and the approximate water level in the Horse Canyon mine (1986 and 1993). If the water level in the mine continues to rise, the head differential between the discharging aquifer and the mine will decrease. The decrease in head will have the direct effect of decreasing the inflow rate into the mine. Additionally, the volume of water required to "fill the mine" would also have to fill the strata above the mine, which has been dewatered throughout the history of the mine.

Based on these factors it is unlikely that the groundwater level in the lower groundwater zone will ever rise to the level of the portal, at any portal location for either the Horse Canyon or Lila Canyon Mines. Hence, there should be no natural discharge of groundwater through any of the sealed portals. To verify this, stand pipes will be incorporated into the grading plans for the portals so that water levels can be checked annually.

Groundwater and Surface Water Availability. Potential impacts to the availability of surface and groundwater from the Lila Canyon Mine operations include both decreased and increased stream flows and spring discharges caused by mine-related subsidence, bedrock fracturing, and aquifer dewatering. These potential impacts are discussed below.

Potential for Decreased Spring and Stream Flows

To date, while surface subsidence has been identified as a result of coal mining in the nearby Horse Canyon Mine, no impact or disruption of spring and seep or stream flows have been identified. Bedrock fracturing routinely occurs, depending on the overburden thickness, in the rock units overlying mined coal seams. As discussed in the MRP, Section 724.100, the groundwater zones in the proposed mine area is divided into two zones. The upper zone consists of discontinuous, localized perched zones which are separated vertically from the coal or any deeper groundwater bearing zone. This zone is monitored by the spring sampling. The deeper zone of groundwater consists of the Sunnyside sandstone underlying the coal seam. This zone contains groundwater that is under pressure and is the zone monitored by the monitoring wells. Given the limited number of springs and limited groundwater resources of the Castlegate Sandstone and Blackhawk Formations in the permit and adjacent areas, there is essentially no connection between the upper and lower zones. Therefore,

subsidence or fracturing would affect the hydrologic balance in the area only if zones of increased vertical hydraulic conductivity were created which extended through the Price River Formation into the North Horn-Flagstaff and Colton Formations.

When subsidence occurs as a result of mining, there are four zones that occur above the mined out area. As shown in Figure 1, the zones are: a caved zone that occurs in the 6 to 10 times the thickness of the coal seam, a fractured zone which occurs 10 to 30 times the thickness of the coal seam, and deformation zone which occurs 30 to 60 times the thickness of the coal seam, and finally, a soil zone which occurs on the ground surface. Damage to surface and groundwater resources generally occur in the caved and fractured zones. Little or no damage occurs in the deformed zone. With only localized effects felt in the soil zone. As discussed in Section 525.120, the strains for the rock in the proposed mine area, as a result of mining, should limit subsidence deformation to those areas where the overburden is less than 630 feet.

Where surface disruption or cracks appear, the general mechanism is extension of the soil mantle. Natural processes will heal these crack over time. Runoff and snowmelt will wash sediments into the crack and fill any voids created. As this process progresses, the crack disappear and the surface runoff and snowmelt return to normal courses. In the Wasatch Plateau and Book Cliffs area, the clays in the area are expansive and tend to seal these cracks very rapidly. Sidel, et.al. (1996) found that minor surface changes in the area of Burnout Creek recovered within two years.

As indicated in Figure 7-4 of the PAP, the majority of the identified springs and seeps are located outside of the maximum limits of subsidence. Therefore, the potential impact is significantly reduced. Where springs are located within the maximum limits of subsidence (L-9-G), the overburden thickness is estimated to be greater than 1500 feet. Therefore, in these areas, subsidence strains, as described in Section 525.120, will not be enough to result in surface rupture or deformation. Thus, potential impact to the springs within the area of subsidence is not expected.

Concerns have been raised regarding the potential impact from subsidence on state appropriated water in the Right fork of Lila Wash, Stinky Wash, and Water rights 91-2617 through 91-2621. As discussed in the MRP, Section 724.200, these water rights are associated with stock ponds. These stock ponds are located off the main channel, in small side tributaries. A recent site visit with DOGM personnel confirmed the locations of the stock ponds and associated water rights. As these ponds are located off the main channel and do not have diversions from the main channel, none of these pond will store water from the

proposed permit area. Therefore, there can be no subsidence impact to the water rights downstream of the proposed permit area. As part of the subsidence monitoring plan, the area of the streams will be visually inspected during periods of 2nd mining and 3 months after to determine if any impacts occur. If impacts are identified, the mitigation plans described in Chapter 5 will be implemented.

Several lines of evidence suggest that mining-related subsidence and bedrock fracturing have not resulted in decreased stream flows or groundwater discharge in the vicinity of the nearby Horse Canyon Mine. Although considerable seasonal and climatic variability are noted in the hydrographs of springs in the permit and adjacent areas, data for both Horse Canyon Creek and springs which overlie the Horse Canyon Mine workings do not show discharge declines which may be attributed to either subsidence or bedrock fracturing (see Appendices 7-1 and 7-6).

Active groundwater systems in the Colton, Flagstaff-North Horn, and Price River Formations are separated from the Blackhawk Formation by the Castlegate Sandstone. As discussed in Section 724.100, this formation contains no springs and is not considered to be a major groundwater resource. Past mining in the Horse Canyon Mine has not increased the rate of spring discharge from the Price River Formation, indicating that groundwater from the overlying formation is not being diverted into this formation. The absence of increased saturation in the Price River Formation indicates that vertical zones of artificially-increased hydraulic conductivity or secondary porosity do not extend into the Price River Formation and from thence into the overlying active groundwater systems of the North Horn-Flagstaff Formations.

Data presented in Appendices 7-1 and 7-6 and summarized in Section 724.100 indicate that the low-permeability lower groundwater system, in the vicinity of mined coal seams, contains groundwater which is compartmentalized both vertically and horizontally. Coal mining locally dewaters isolated, overlying saturated rock layers in the Blackhawk Formation but does not appear to draw significant additional recharge from overlying or underlying zones.

Additionally, the springs which supply most of the local flow discharge from the upper discontinuous perched aquifers in the Flagstaff-North Horn or Colton Formations. These springs or groundwater zones receive snowmelt and precipitation recharge from local areas above each spring. The recharge area for each spring is limited, as evidenced by the limited flow rates, decreasing flow through the year, ans steep topography above them. Also they are perched above the underlying lower groundwater zone and the intervening formations contains swelling clays which tend to heal small fractures. Since the perched aquifer materials are isolated both vertically and horizontally and are lenticular in nature,

there is a greater probability that fractures in one area will not drain all the different perched aquifers because they are not interconnected. As the strains from subsidence are not expected to reach the level of the upper groundwater zone, there is little chance that the recharge of these springs might be affected.

The very low permeability and vertical gradients in Blackhawk Formation rock layers underlying actively mined coal seams in the Horse Canyon Mine and the absence of significant discharge into the mine from these layers indicates that mining does not draw groundwater from the underling portions of the Blackhawk and Mancos Shale. Additionally, the distinctive solute composition of Mancos Shale groundwater has not been observed inside the Horse Canyon Mine indicating that the saturated zones in the Blackhawk and Mancos are separate.

From the above discussion, it appears that the Horse Canyon Mine has not decreased groundwater discharge in overlying or underlying groundwater systems. Since the conditions of the springs in the area of the Lila Canyon Mine are the same, with the same strata, it is unlikely that coal mining will effect the discharges of any spring as a result of mining in the Lila Canyon permit and adjacent areas.

Concern has been raised that the mining might impact flows in the Range Creek basin. This issue has been addressed in the MRP, Section 724.200, Pages 29-33. As discussed in the MRP, the five to six miles horizontal distance from proposed permit area to Range Creek (see Plate 7-1a) and the isolating effects of the over 1,000 feet of low-permeability, isolating strata between the coal seam and the creek elevation (see Plate 7-1B and Table above) and the limited potential impact of subsidence damage to the recharge area, it is not likely that the Lila Canyon Mine will adversely effect Range Creek. Due to these conditions, no baseline or other sampling has been gathered nor is anticipated on Range Creek. For the above reasons Lila Canyon extension does not present any Probable Hydrologic Consequences to Range Creek.

The contamination, diminution, or interruption of any water resources would not likely occur within the mine permit or adjacent areas. Since surface water flows only a limited part of year and will be provided protection by use of sediment controls, the major usable water resources that could potentially be effected in the area would be springs that are currently in use by wildlife and livestock. Most of these springs are located upstream of the permit area or are in areas where subsidence resulting from post-1977 mining is not documented or expected. To date no known depletion of flow and quality of surveyed springs in the Horse Canyon permit area exists, and none are expected in the Lila Canyon area, based on available data from the Horse Canyon Mine. Although pre-mining data is not available for Horse Canyon, depletion problems from subsidence are not

known to have been filed and are not indicated by sampling results in Appendices 7-1 and 7-2. Therefore, it is unlikely an alternative water supply will be needed, although they have been identified in Section R645-301-727.

L-16-G and L-17-G are seeps being monitored in Stinky Spring Canyon. Bighorn sheep have been observed within the canyon but have never been observed drinking the water.

Flows from these springs are historically less than 0.5 gpm and show a general seasonal decrease throughout the season. These sites were not identified during baseline surveys and are believed to exist intermittently and are not always evident. The low flow rates and intermittent nature of these springs suggest that they are local in nature.

These springs are located within the Central Graben, which is a block that has been downdropped between 145 and 250 feet relative to the adjacent bedrock. They occur near the contact between the Mancos Shale and the overlying Blackhawk Formation. The fractured nature of the bedrock along the edges of the Central Graben, as a result of the faulting, likely are the limits of the areal extent of the recharge or source area to the springs. The low-permeability of the surrounding Mancos Shale likely isolate the graben block from groundwater in the surrounding bedrock. Thus, the recharge to the springs is likely limited to the area of the consolidated graben block.

As indicated previously, there is no evidence that mining in the Horse Canyon Mine had any influence on the underlying formations. Therefore it is likely that the Lila Canyon Mine would have similar affects. Due to the springs location and lateral separation from the mine, outside the permit area, outside the limit of subsidence, being separated from the mine block by faulting within the Central Graben, and being 500 to 600 feet below the coal seam, there is no potential for Lila Canyon Mine to negatively impact this spring or recharge sources.

Based on the review of the information presented in section 724.100 of the MRP, there does not appear to be any regional groundwater zone. The upper groundwater zone is a series of discontinuous, lenticular, isolated perched zones with limited recharge. Generally each zone is isolated, both horizontally and vertically, from those surrounding it. This upper zone is separated vertically from the lower zone in the Sunnyside Sandstone by the Castlegate Sandstone. No impacts to the function and quality of the springs in the upper zone are anticipated from mining subsidence.

The underlying groundwater zone is not used for any purpose and has limited ability to produce water due to the low hydraulic conductivity and the depth to

water from the top of the Book Cliffs. While this lower zone contains water, it does not meet the definition of an aquifer as indicated above (see discussion in Section 724.100 of MRP).

Potential for Increased Stream Flows

If sufficient water is encountered in the Lila Canyon Mine workings to require discharge of that water to the surface, the flow of the Right fork of Lila Canyon will be increased. This flow could be ultimately to the Price and Green Rivers. The impact of such discharge by the development of the Lila canyon extension would be quite limited.

The majority of water discharged from the mine would be water held in storage in the saturated zones above the coal seam. It is unlikely that any water below the coal seam would be affected or drained by the mine workings.

It is difficult to estimate the maximum potential discharge from the mine, however, DOGM has determined that a maximum long-term discharge rate of 500 gpm should be used for design purposes. Additionally, UEI has determined that when crossing the Horse Canyon entries storage groundwater will be encountered and a worst case temporary discharge of 2,080 gpm may be released for a period. Appendix 7-9 estimates that a worst case constant 2,080gpm discharge would extend as surface flow for about 3 miles downstream and as subsurface flow a maximum of 8.5 miles downstream of the mine.

Under the absolute worst case conditions, if this discharge were to extend to reach the Price River, based on this discharge rate, during the life of the operation, the water extracted would be 100,580 ac-ft of water or approximately 3,350 ac-ft per year. Discharge for the Price River at Woodside has a mean annual flow of 88,000 ac-ft/yr. Discharge for the Green River at Green River has a mean annual flow of 4,484,000 ac-ft/yr. Therefore the average discharge at 2,080 gpm from the mine would be 3.8% of the Price River flow volume and 0.075% of the Green River flow volume. Given the standard fluctuations in the stream flows, this small flow addition would have little effect on the streams.

It should be emphasized that the 2,080 gpm estimate is considered to be conservatively high. The adjacent Horse Canyon Mine had a maximum discharge of 90 gpm. While the Soldier Canyon Mine farther to the north in the Book Cliffs, the rate of water discharged was estimated to be 15,000,000 gallons per year (approximately 30 gpm).

If water does need to be discharged, it will be sampled and discharged in accordance with the approved UPDES Discharge Permit. If the quality

parameters of the mine water do not meet UPDES standards, the water will be treated prior to discharge. Treatment may include holding/settling in the mine, pumping to retaining or sediment ponds, chemical treatment or other approved means to prevent non-compliant discharge.

Based on the results of the evaluation presented in Appendix 7-9, the discharge of this amount of water from the mine is not expected to have a significant impact on the downstream resources. Based on the results from Appendix 7-9, the mine discharge flow will be lost due to evapotranspiration, transmission losses, and percolation within 8.5 miles from the discharge point. Therefore, the discharge will not reach the Price, Green, or Colorado Rivers. The discharge of the water will have a temporary positive impact on the vegetation and wildlife of the area by providing a fairly constant supply of water along this limited reach of the channel.

Based on comparison of upstream and downstream data gathered on Horse Canyon Creek which incorporates the analysis from past mine discharges to the channel, water quality will not be drastically affected in the intermittent drainage in the event of discharge of mine water into the channel. The expected impacts to the channels of the Lila Canyon area are very likely to be similar to those at Horse Canyon due to the close proximity, and similarities of mining and drainage conditions.

Concerns have been raised regarding the character of the streams in the area. Utah still uses the Office of Surface Mining two part definition of intermittent streams -

> "means (a) a stream, or reach of a stream, that drains a watershed of at least one square mile, or (b) a stream, or reach of a stream, that is below the local water table for at least some part of the year and obtains its flow from both surface runoff and groundwater discharge." Utah Admin Code R645-100 (2006)

The first part is an arbitrary size determination, while the second part is a scientific definition. While the drainage areas of several of the streams within the proposed permit area are greater than one square mile, the character of the flows in all the channels are ephemeral in nature. Colorado, Montana, New Mexico, and Wyoming regulatory programs have changed their rules to use the scientific definition for an intermittent stream and do not use an arbitrary size to determine the flow condition of a stream.

The stream channels on and adjacent to the Lila Canyon Mine permit area have been characterized in Appendix 7-1, Appendix 7-7, Appendix 7-10, Table 7-1A, Table 7-2 and Table 7-1C to be naturally ephemeral. Perennial and intermittent streams yield a flow that is mostly continuous and dependable, known as baseflow. Baseflow is a water supply from groundwater that keeps flow in the

stream channels after snowmelt and rainfall runoff has ended. Perennial stream channels have a baseflow year around, while intermittent streams maintain a baseflow during part of the year, usually during spring and early summer. A stream with baseflow has a more dependable water source that can support more vegetation, wildlife, agriculture and industry. Ephemeral stream channels do not have a baseflow. They do not support lush vegetation, wildlife, agriculture or industry. All the stream channels draining from the Lila Canyon permit area do not have a baseflow, except immediately next to springs, as discussed earlier. There are no water rights filed down stream of the mine site that can be impacted from mining operations.

Appendix 7-7 presents the characteristics of the channels within the proposed permit area. The characterization is based on the definition of ephemeral streams in the DOGM rules. Reaches of these streams flow only in response to direct precipitation and based on monthly monitoring at no point in the year does the groundwater table extend above the bottom of the channel to provide baseflow to the channel. Therefore, the channels fit the criteria for ephemeral drainages. While DOGM rules for drainages greater than one square mile stipulate that these drainages are to be considered intermittent in nature, that does not change the flow characteristics of the drainages.

The intermittent stream definition creates a problem of expectation. An intermittent stream is expected to have flow for a period of the year when the water table is above the ground surface. As such a standard monthly surface water monitoring program should and would be able to sample the flows. An ephemeral stream which does not flow as a general rule, but only in direct response to precipitation events or significant snowmelt, would be expected to be dry. Therefore, a standard monthly monitoring program would not result in flow data except on a very infrequent basis.

As a result, concerns regarding the lack of flow data have been raised for the intermittent streams within the permit area. For these are intermittent streams, it has become an issue as to why no flow and water quality data has been collected. As indicated above, these streams may be defined as intermittent, but they function as ephemeral drainages. For ephemeral streams, the standard condition for the channel is dry. The monthly monitoring has provided data which document the lack of flow. The flow modeling, described in the MRP section 724.200 for the watersheds within the permit area, suggests that for short duration, frequent storms (2 to 10 yr), while the watershed would be wetted, no generally concentrated flow would be evident. Higher frequency, longer duration events (10yr +) would result in increasing amounts of runoff. Therefore, for a short period (less than 10 years), the expected flow condition for an ephemeral character stream would be no flow.

Based on the data from the Western Regional Climate Center, presented in MRP section 724.400, the probability of precipitation events capable of generating runoff is very low. Table 7-1C shows that the probability of a 1-day event with more than 0.5" of runoff is less than 5 percent. According to the flow simulations in section 724.200, runoff is not common in storms with less than 1.2 inches of rainfall (10 year event).

Also, the lack of monthly water monitoring data for the period of December and January for most years was raised as a concern. Generally, the access to the sites is prevented by snow. This is not considered a significant problem due to the general lack of precipitation and flow during this period. Average precipitation at Sunnyside during December and January is generally under 2 inches of precipitation of the annual average of over 14 inches (see Table 7-1B). Average maximum temperatures during December and January at Sunnyside are reported to be around freezing (see Table 7-1B). At the mine site, the elevation is higher, therefore, the temperatures would be lower. Thus, any precipitation would generally be in the form of snow which would not result in a runoff event. Any snow melt which might occur would be at a very slow rate which would also not result in runoff, but would likely ripen the snowpack and locally infiltrate into the soil.

Further, a concern regarding the identification of seasonal variation in flows and water quality has been raised. Based on the monthly monitoring, there has been no consistent or seasonal flows identified in any of the drainages in the proposed permit area. Thus, the modeling presented in the MRP section 724.200 is representative of the flows in the drainages. These are characterized by infrequent runoff events from isolated, heavy precipitation occurrences with very limited durations. Based on these types of runoff events, the drainages are ephemeral in nature and the use of the downstream waters is very limited. This is evidenced by the limited number of State appropriated waters in the downstream drainages (see Plate 7-3). There are no water rights with flow diversions found on the downstream drainages which collect water from the proposed permit area. A series of stock ponds are found within the Grassy Wash drainage. Information from the BLM presented on Plate 7-3 show the stock ponds and the associate water rights. A series of four ponds have been constructed for which there are no water rights. As discussed in Section 724.200,of these ponds, only one had a diversion structure on the main stream channels that flow from the permit area. Based on a site visit in January 2004, a pond, labeled Blaine's Folley reservoir, was found silted in, though a new diversion works had been constructed at the confluence of the Right Fork of Lila Canyon and Grassy Wash. In checking with the BLM personnel, the pond improvements were not part of agency range improvements. Recent site visits have shown that the diversion structure in the Right Fork of Lila Canyon have been breached. This will result in very limited flow

reaching this pond. Given the lack of flow from the permit area to these ponds, there is little impact that could be caused by the mining activities.

Potential Hydrocarbon Contamination. Diesel fuel, oils, greases, and other hydrocarbon products will be stored and used at the site for a variety of purposes. Diesel and oil stored in above-ground tanks at the mine surface facilities may spill onto the ground during filling of the storage tank, leakage of the storage tank, or filling of vehicle tanks. Similarly, greases and other oils may be spilled during use in surface and underground operations.

The probable future extent of the contamination caused by diesel and oil spillage is expected to be small for three reasons. First, because the tanks will be located above ground, leakage from the tanks will be readily detected and repaired. Second, spillage during filling of the storage or vehicle tanks will be minimized to avoid loss of an economically valuable product. Finally, the Spill Prevention Control and Countermeasure Plan which will be developed for the site will provide inspection, training, and operation measures to minimize the extent of contamination resulting from the use of hydrocarbons at the site. This plan is not required to be submitted. However, a copy will be maintained at the mine site as required by the Utah Division of Water Quality.

Road Salting. No salting of roads will occur within the permit area. Hence, this impact is not a significant concern.

Coal Haulage. Coal will be hauled over the county road from the mine portal area to Utah Highway 6 and thence to its ultimate destination. In the event of an accident which causes coal to spill from the trucks, residual coal following cleanup of the spill may wash into local streams during a runoff event. Possible impacts to the surface water are increased total suspended solids concentrations and turbidity from the fine coal particulates. The probability of a spill occurring in an area sufficiently close to a stream channel to introduce coal to the stream bed is considered small.

In addition to spills, wind may carry coal dust or small pieces of coal from the open top of the coal trucks into drainages near the roads. The impact from fugitive coal dust is considered to be insignificant due to the small amounts lost during haulage in the permit and adjacent areas.

Water Consumption. The USFWS have identified that water consumption by underground coal mining operations could jeopardize the continued existence of and/or adversely modify the critical habitat of the Colorado River endangered fish species: Colorado pikeminnow, humpback chub, bonytailed chub, and razor back sucker. The USFWS has determined that water consumption by underground

operations could potentially have adverse effects on the Colorado River basin. The USFWS considers consumption to include: evaporation from ventilation, coal preparation, sediment pond evaporation, subsidence on springs, alluvial aquifer abstractions into mines, postmining inflow to workings, coal moisture loss, and direct diversions. These consumption process are discussed below.

Bath House/Office
It has been estimated that the Bath House/Office will consume approximately 35 gallon per day per person for shower and human consumption. This estimate results in a usage of 1,260,000 gal/yr or 3.86 ac.ft.yr.

Evaporation from Ventilation - evaporation rates have been estimated at 2.5 gallons per million cubic feet of ventilated air. This number is dependent on temperature and relative humidity. It is estimated that with the projected usage of 473,040 million cf/yr of air and a loss of 2.5 gallons per million c.f. Therefore, the water consumption for evaporation would be approximately 1,183,600 gallons per year or 3.63 acre feet of water.

Coal Preparation - The operator does not anticipate any coal preparation that would result in water usage.

Sediment Pond Evaporation - The sediment pond is used to hold rain and snow runoff that flows over disturbed areas of the coal mining and reclamation operations until accumulated sediment has dropped out. At that point the water is discharged into a receiving stream. The holding time for this water is planned to be short, therefore, no significant evaporation loss is expected. This would not be considered a consumption mechanism.

Subsidence on Springs - As shown in Appendix 7-8 and discussed in Section 525.120 of the application, the majority of springs cannot be adversely effected by subsidence because of their physical location (off the permit area and outside the area of potential subsidence) or for those within the permit area because of the amount of cover, 1000 feet or more, which as discussed in Section 525.120 are not expected to experience any significant deformation for covers over 630 feet. In the adjacent Horse Canyon mine, which was mined for over 45 years, there have been no reported effects on springs due to subsidence.

Alluvial Aquifer Abstractions into Mines - There will be no water infiltrations from alluvial systems into the mine.

Postmining Inflow to Workings - Postmining all openings will be sealed and backfilled. The proposed mine openings for Lila Canyon are at an elevation where

no surface inflow is possible. This coupled with the sealing plan for the portals makes postmining inflows virtually impossible.

Coal Moisture Loss - It has been estimated that coal moisture loss or usage to be estimated at 4.5 gallons per ton of coal mined (see Table 2). Using the estimated usage for mining with an estimated production of 4.5 Million tons per year a usage of 20,250,000 gal per year or 62.12 acre feet can be estimated. It should be noted that due to the extremely low hydraulic conductivity rates measured in the general area, that groundwater movement is very slow. Using the average hydraulic conductivity measured for Blackhawk Sandstone (3.0×10^{-6} cm/sec) (see Table 1) which is equal to 0.1 inch per day. Therefore, water encountered underground would take approximately 1,736 years to travel one mile. This water is considered relatively immobile. The water encountered and used underground would not reach the Colorado Drainage in any reasonable time, if ever, and thus water consumed underground cannot negatively effect the Colorado River Basin.

Surface Dust Suppression It has been estimated that usage on the surface for dust suppression will be approximately 10,000 gallon per day or 3,650,000 gallons per year. This results in a usage of 11.20 acre feet per year.

Direct Diversions - no consumption.

Adding the four losses due to mining equals to 80.81 acre feet which is below the mitigation level of 100 acre feet. UEI does hold 362.76 acre feet of underground water rights to offset any consumption. Therefore, it is the opinion of UtahAmerican Energy, Inc. that water consumption by underground coal mining operation will NOT jeopardize the existence of or adversely modify the critical habitat of the Colorado River endangered fish species.

The Permittee is aware that regardless of state-appropriated water rights held by the Permittee, ay water consumption over 100 acre-feet per year is subject to a per acre-foot fee payable to the USFWS. And, that the actual water consumption reported in the annual report once mining operations have commenced, might be subject to a Section 7 consultation with the USFWS.

Conclusion

Based on available data and expected mining conditions, the proposed mining and reclamation activity is not expected to proximately result in contamination, diminution or interruption of an underground or surface source of water within the proposed permit or adjacent areas which is used for domestic, agricultural, industrial, wildlife or other legitimate purpose.

It should be noted that the determination of no known depletion of flow or quality is based on available data, which is primarily post-mining. UtahAmerican Energy Inc. will report actual water depletion values annually in the Annual Report.

Table 2 Projected Water Usage (Quantitative Water Consumption Impact Assessment)	
1- Bath House/Office a. 150 @ 35 gpd/ea. = 5250 x 240	1,260,000 gal./yr.
2- Mining(Coal moisture loss) a. 2 Sections (1) 4.5 M Ton @ 4.5 gal./ton	20,250,000 gal./yr.
3- Fan (Evaporation from ventilation) a. Evaporation (1) 900,000 cfm @ 473,040 M cf/yr. (2) 2.5 gal./M c.f.	1,183,600gal./yr.
4. Surface Dust Suppression 10,000 gallon per day	3,650,000 gal/yr.
Total Usage	26,343,600 gal./yr. (80.81 ac.ft./yr.)

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Appendix 7-4
Lila Canyon Mine
Sedimentation and Drainage Control Plan

Revised

January 2001
October 2002 RJM
February 2007 TJS
April 2008 TJS
July 2008 TJS
June 2009 TJS
January 2010 TJS
January 2012 TJS
October 2014 TJS

June 2016 KM-PJ

SEDIMENTATION AND DRAINAGE CONTROL PLAN

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SEDIMENTATION AND DRAINAGE CONTROL PLAN

1- Introduction

The Sedimentation and Drainage Control Plan for the Lila Canyon Mine has been designed according to the State of Utah R645- Coal Mining Rules, November 1, 1996. All design criteria and construction will be certified by a Utah Registered Professional Engineer.

This plan has been divided into the following three sections:

1) Design of Drainage Control Structures for the Proposed Construction

2) Design of Sediment Control Structures

3) Design of Drainage Control Structures for Reclamation

The general surface water control plan for this project will consist of the following:

(a) This is a new site construction. All areas proposed for disturbance will be sloped to drain to surface ditches and/or culverts where runoff will be carried to two sediment ponds. All minesite drainage controls and watersheds are shown on Plate 7-5 "Proposed Sediment Control Map" and Plate 7-2 "Disturbed Area Hydrology and Watershed Map" respectively.

1. Disturbed area drainage currently sheet flows to open ditches, then the water travels through a system of ditches and culverts to either Pond #1 or Pond #2. Due to water flowing to Pond #2 that is intended for Pond #1, and to accommodate the forthcoming inclusion of discharged mine water to the surface, revisions are required to the existing ditches and culverts. These changes are as follows:

A. Remove existing culvert DC-9 from approximately 100 feet west of the access to the Lower Pad ,and daylight the opening. The water will then discharge from existing culvert DC-9 to the new ditch DD-7, then to the new culvert DC-10, then to the new ditch DD-8, then to the new culvert DC-11, then to the new ditch DD-9, then to new culvert DC-12a along the existing Emery County Road RS-2477, then to a new 4' diameter manhole, then to new culvert DC-12b, then to a new 4' diameter manhole, then to new culvert DC-12c, then to a new 4' diameter manhole, then to new culvert

DC-12d, which discharges into new ditch DD-16 that extend along the north side of Pond #1, then into Sediment Pond #1. See Plate 7-5, "Proposed Sediment Control," for more details. This new series of ditches and culverts will collect and deliver the vast majority of surface water in the disturbed areas to Pond #1. Furthermore, the forthcoming discharged mine water will report to Pond #1 through new and existing ditches and culverts. New ditch DD-16 is designed to allow the water to enter at the top of pond, thereby allowing for maximum settling time prior to discharge.

B. Raise the elevation of the top of Sediment Pond #1 and raise the elevation of the spillway and emergency spillway structures to allow for added water storage within the sediment pond for mine water discharge.

C. Replace the removed section of the existing culvert DC-9 with new ditch DD-17 along the south side of the Mine Access Road. This new ditch will report to the existing culvert DC-14, then to Pond #2. Now, Pond #2 will only receive surface water from a section of roadway below the access to the Lower Pad to the edge of the disturbed area, and surface water from the Storage Pad; thus making Pond #2 of adequate size for the respective water storage requirements.

2. The drainage areas are color-coded on Plate 7-2, "Disturbed Area Hydrology and Watershed Map," depending upon the pond that receives the surface water from which area.

(b) The majority of undisturbed runoff will be diverted around the minesite and/or beneath the Sediment Pond #1 by properly sized culverts. Undisturbed diversion culvert UC-1, is located on the southwest end of the site. This diversion will allow the majority of undisturbed runoff from the Right Fork of Lila Canyon to bypass the mine area beneath Sediment Pond #1. All undisturbed diversions are designed to carry runoff from a 100 year - 6 hour precipitation event. UC-1 is oversized at 60" diameter.

(c) Two adequately sized sediment ponds will be constructed at the lower end of the site. These ponds are sized to contain and treat the runoff from all of the disturbed area and any contributing undisturbed areas for a 10 year - 24 hour precipitation event. The ponds will be equipped with C.M.P. culvert principle spillway and decant and CMP culvert emergency spillway sized to safely pass runoff from a 25 year - 6 hour precipitation event. The spillways from sediment

pond #1 will discharge into the UC-1 CMP culvert running beneath the pond. This culvert will discharge onto an engineered discharge structure and into the Right Fork of Lila Canyon channel below the minesite. The spillways from sediment pond #2 will discharge onto an engineered discharge structure and into the Middle Fork of Lila Canyon channel below the minesite.

DESIGN OF DRAINAGE CONTROL STRUCTURES

Design Parameters:

2.1 Precipitation
2.2 Flow
2.3 Velocity
2.4 Drainage Areas
2.5 Slope Lengths
2.6 Runoff
2.7 Runoff Curve Numbers
2.8 Culvert Sizing
2.9 Culverts
2.10 Main Canyon Culvert - Outlet Structure
2.11 Ditches

Tables:

Figures:

Design Parameters

2.1 Precipitation

The precipitation-frequency values for the area were taken from the approved Mining and Reclamation Plan, Horse Canyon Mine, Emery County, Utah, Volume III, submitted by I.P.A.

Frequency - Duration	Precipitation
10 year - 6 hour	1.30"
10 year - 24 hour	1.90"
25 year - 6 hour	1.50"
100 year - 6 hour	1.90"

2.2 Flow

Peak flows were determined from rainfall depths, drainage areas, and curve numbers and were calculated using the computer program "Triangular Hydrograph Calculations", based on SCSHYDRO Program developed by Hawkins and Marshall (1979) prepared for the Division of Oil, Gas, and Mining.. All flows are based on the SCS Curve Number Method for both SCS 6-hour and NOAA Type II, 24-hour storms.

Time of concentration of storm events were calculated for each drainage area using SCS Lane's Formula. (U.S. Soil Conservation Service, 1972):

$$L = \frac{l^{0.8} * (S+1)^{0.7}}{1900 * Y^{0.5}}$$

and

$$Tc = 1.67 * L$$

where L = watershed lag (hours)
l = hydraulic length of the watershed, or distance along the main channel to the watershed divide (feet)
S = watershed storage factor defined in Equation (2-2)
Y = average watershed slope (percent)
Tc = time of concentration (hours)

2.3 Velocity

Flow velocities for each ditch structure were also calculated using the Storm computer program with Manning's Formula:

where:

$$V = \frac{1.49}{n} * R^{2/3} * S^{1/3}$$

V = Velocity (fps)

R	=	Hydraulic Radius (ft.)
S	=	Slope (ft. per ft.)
n	=	Manning's n; Table 3.1, p. 159,

"Applied Hydrology and Sedimentology for Disturbed Areas", Barfield, Warner & Haan, 1983.

Note: The following Manning's n were used in the calculations:

Structure	Manning's n
Culverts (cmp)	0.024
Culverts (HDPE)	0.013
Unlined Disturbed Area Ditches	0.030
Lined Disturbed Area Ditches	0.032 - 0.040

2.4 Drainage Areas

All drainage areas were determined directly from Plate 7-1, "Permit Area Hydrology Map", Plate 7-2, "Disturbed Area Hydrology/Watershed", or Plate 7-5 "Proposed Sediment Control".

2.5 Slopes, Lengths

All slopes and lengths were measured directly from the topography on Plates 7-1, 7-2, and/or 7-5.

2.6 Runoff Volume

Runoff was calculated using the SCS Curve Number formula for both NOAA Type II, 24-hour and SCS 6-hour storms; using the SCSHYDRO computer program:

$$Q = \frac{(P - 0.2S)^2}{P + 0.8S}$$

where:

Q	=	Runoff in inches
P	=	Precipitation in inches

$$S = \frac{1000}{CN} - 10$$

CN	=	Runoff Curve Number

2.7 Runoff Curve Numbers

Two curve numbers were utilized for the undisturbed areas. Areas with milder slopes (less than 30%) were given a runoff curve number of 75. All other undisturbed areas (30% slope or greater) were given a runoff curve number of 83. These numbers were taken directly from the approved "Mining and Reclamation Plan, Horse Canyon Mine, Emery County, Utah, Volume III", submitted by I.P.A. The numbers in that plan were based on vegetation and soils data from on-site.

A runoff CN of 90 is used for all disturbed areas. This value is based on commonly used and approved values and from Table 2.20, (p. 82, Barfield, et al, 1983).

The following is a summary of runoff curve numbers used in these calculations:

Watershed	Runoff CN
Undisturbed (<30% slopes):	75
Undisturbed (>30% slopes):	83
Disturbed:	90

2.8 Culvert Sizing

Minimum culvert sizing is based on the either the inlet control nomograph or Manning's Equation. Culverts were evaluated for inlet control conditions to determine the minimum pipe size using the Culvert Nomograph included as Figure 1 of this Appendix. If the pipe had a HW/D ratio equal to or greater than 1.0 or the slope were less than 2% the Hydraulic Toolbox, Version 4.0 or later version computer program was used to determine the pipe flow diameter using:

$$D = \left(\frac{2.16\ Q\ n}{\sqrt{s}}\right)^{0.35}$$

where:

D	=	Required Diameter (feet)
Q	=	QP = Peak Discharge (cfs)
n	=	Roughness Factor (0.025 for CMP)
S	=	Slope (ft. per ft.)

2.9 Culverts

Culverts have been sized according to the calculations previously described, and are shown on Plate 7-5, "Proposed Sediment Control". Culverts carrying undisturbed drainages are designated with UC- Letters (i.e. UC-1). All undisturbed area drainage culverts will be fitted with trash racks to minimize plugging by rocks or other debris.

Trash racks will be provided at the inlet for all undisturbed drainage culverts. These will consist of 3/4" steel bars welded on 6" centers across the flared inlet structures of each culvert. Bars will be sloped from the front of the inlet structure up to the top of the culvert. This ramp configuration will allow trash, branches and other potential obstructions to be swept up and away from the inlet rather than being impinged against the grates during a flow event. Rip rap will be placed around the flared inlet structure and above it to a height of at least 6" above the required headwall for each culvert. (See Figure 4 for details). Trash racks will be checked on a routine schedule and following precipitation events and all trash, branches and other obstructions will be removed.

It should be noted that all undisturbed area culverts are adequately sized to handle the expected runoff from a 100 year - 6 hour event for maximum protection of the mine area, sediment pond and undisturbed drainage. This is well in excess of the 10 year - 6 hour event required by the regulations and is proposed as an extra measure of safety.

Disturbed area culverts and ditches are shown on the "Proposed Sediment Control", Plate 7-5. Culverts carrying disturbed drainage are designated with a DC-number (i.e. DC-1). Calculations for all disturbed area culverts and ditches are also included with this report, along with design criteria. Disturbed drainage areas draining to culverts and ditches are marked with a DA-number (i.e. DA-1). It should be noted that at culvert DC-5, there is accomodation for the introduction of discharge of mine water at a rate of 4.5 cfs (2,020 gpm).

Culverts will be inspected regularly, and cleaned as necessary to provide for passage of drainage flows. Inlets and outlets shall also be maintained so as to prevent plugging or undue restriction of water flow.

All disturbed area culverts are temporary, and will be removed upon final reclamation.

2.10 Main Canyon Culvert - Outlet Structure

The outlet of culvert UC-1 has been designed to flow onto a rip-rap apron to protect against scouring and to allow for energy dissipation. The rip-rap apron is designed to fit the natural channel configuration as closely as possible, and will allow runoff to re-enter the natural channel at a reduced velocity which is no greater than natural flow conditions. Runoff from the 100 year - 6 hour precipitation event in the canyon below the minesite has been calculated at 55.60 cfs, including sediment pond overflow.

The rip-rap apron design is based on Figure 7-26, Design of Outlet Protection - Maximum Tailwater Condition, "Applied Hydrology and Sedimentology for Disturbed Areas", Barfield, Warner and Haan, 1983. Based on the figure, the apron should be a minimum of 15' in length, widening from 5' to 9', with a 0.1% slope. The proposed length has been increased to 20', to ensure adequate time for velocity reduction. The apron slope is kept at 0.1%. Rip-rap size is conservatively placed at 12" D_{50}. Rip-rap will be placed to a depth of 1.5 D_{50} and will be placed on a 6" layer of 2" drain rock filter. Rip-rap will also be placed on the 2H:1V side slopes to the height of the culvert (5') at the culvert outlet tapering to 3' at the outlet of the apron. This rip-rap apron has been sized and designed to adequately dissipate energy from flow velocities of a 100 year - 6 hour precipitation event and resist dislodgement. The drain rock filter bed will also serve to secure the rip-rap boulders firmly in place, to add an additional element of stability, and prevent scouring underneath the armored apron. (See Figure 4A for construction details). The natural channel below the culvert has a gradient of approximately 7.76%. When the flow is routed from the culvert across the apron to the natural channel, the velocity is reduced from 6.31 fps at the culvert outlet to 1.54 fps at the outlet of the apron. (See Culvert Outlet Rip-Rap Apron Flow Velocity Calculations in Appendix 1.)

It should be noted that these calculations are based on a 100 year - 6 hour event.

2.11 Ditches

All ditches will carry disturbed area drainage to the ponds. Ditches are shown on the "Proposed Sediment Control", Plate 7-5, and are designated with a DD-number (i.e. DD-1 for Disturbed Area Ditches) or UD-number (i.e. UD-1 for Undisturbed Area Ditches).

All ditches are designed to carry the expected runoff from a 10 year - 6 hour event with a minimum freeboard of 0.5' (See Table 8 and Figure 3).

Ditches which exhibit expected flow velocities of 5 fps or greater will be lined with rip-rap. A typical cross-section is shown on Figure 3 and flow depths and areas for all lined and unlined ditches are presented in Table 8 of this report.

Ditch slopes have been determined from Plates 7-2 and 7-5.

All ditches will be inspected regularly, and maintained to the minimum dimensions to provide adequate capacity for the design flow. All ditches are temporary and will be removed as described under the reclamation hydrology section. (Section 4)

TABLE 1

Undisturbed Watershed Summary		
Watershed	Drains To	Final
UA-1	UC-1	Right Fork Lila Canyon
UA-2	DD-1	Sediment Pond
UA-3	DD-1	Sediment Pond
UA-4	Sediment Pond	Sediment Pond
UA-5a	DD-14	Sediment Pond
UA-5b	DD-15	By-Pass Culvert
UA-6a	DD-2	Sediment Pond
UA-6b	DD-2	Sediment Pond
UA-7	ASCA Area	Left Fork Lila Canyon

TABLE 2

Disturbed Watershed Summary		
Watershed	Drains To	Final
DA-1	DD-1	Sediment Pond
DA-2	DD-2	Sediment Pond
DA-3	DD-3	Sediment Pond
DA-4	DD-4	Sediment Pond
DA-5	DD-5a	Sediment Pond
DA-6a	DC-6	Sediment Pond
DA-6b	DC-6	Sediment Pond
DA-7	DC-7	Sediment Pond
DA-8	DC-8	Sediment Pond
DA-9	DC-9	Sediment Pond
DA-10	DD-7	Sediment Pond
DA-11	DD-7	Sediment Pond
DA-12	DD-8	Sediment Pond
DA-13a	DD-15	Sediment Pond
DA-13b	DD-9	Sediment Pond
DA-14a	DD-10	Sediment Pond
DA-14b	DD-15	Sediment Pond
DA-15a	DD-11a	Sediment Pond
DA-15b	DD-11b	Sediment Pond
DA-16	DD-13	Sediment Pond
DA-17	POND 2	Sediment Pond
DA-18	DD-17	Sediment Pond
DA-19	Sediment Pond 2	Sediment Pond
Fan Portal	ASCA Area	Right Fork Lila Canyon
TS-1	Topsoil Berm	Sediment Pond
POND 1	Sediment Pond	Sediment Pond
POND 2	Sediment Pond	Sediment Pond

TABLE 3

Watershed Parameters					
Watershed	Area (Acre)	Hydraulic Length (ft.)	Elevation Change (ft.)	% Slope	CN
Undisturbed Watersheds					
UA-1	258.29	9475	2020	21.32	75
UA-2	1.63	1360	1000	74.26	83
UA-3	2.40	660	410	62.12	83
UA-4	14.08	1950	595	30.51	83
UA-5a	1.05	340	54	15.88	75
UA-5b	1.63	600	68	11.33	75
UA-6a	0.54	230	80	34.78	83
UA-6b	0.46	90	30	33.33	83
UA-7	0.90	100	30	30.00	75
Disturbed Watersheds					
DA-1	1.25	610	79	12.95	90
DA-2	0.30	330	47	14.24	90
DA-3	0.25	240	10	4.17	90
DA-4	0.50	295	51	17.29	90
DA-5	2.87	580	103	17.76	90
DA-6a	0.17	150	28	18.67	90
DA-6b	0.50	315	61	19.37	90
DA-7	0.22	170	33	19.41	90
DA-8	0.41	400	50	12.50	90
DA-9	0.30	290	32	11.03	90
DA-10	0.13	250	35	14.00	90
DA-11	0.25	230	20	8.70	90
DA-12	4.38	875	85	9.71	90
DA-13a	1.29	480	59	12.29	90
DA-13b	2.05	470	32	6.81	90
DA-14a	0.59	630	43	6.83	90
DA-14b	0.63	720	43	5.97	90
DA-15a	1.55	650	87	13.38	90
DA-15b	3.11	710	71	10.00	90
DA-16	0.22	200	24	12.00	90
TS-01	1.87	310	53	17.10	75
POND 1	1.92	815	30	3.68	100

TABLE 3 (Continued)

Watershed Parameters					
Watershed	Area (Acre)	Hydraulic Length (ft.)	Elevation Change (ft.)	% Slope	CN
Disturbed Watersheds					
DA-17	1.12	240	11	4.58	90
DA-18	0.48	370	37	10.00	90
DA-19	0.55	710	63	8.87	90
Fan Portal	0.60	195	25	12.82	90
POND 2	0.47	234	30	12.82	100

TABLE 4

Runoff Summary Undisturbed Watersheds (Not Draining to Ponds)					
Watershed	10 yr. / 6 hr. Peak Flow - cfs	25 yr. / 6 hr. Peak Flow - cfs	100 yr. / 6 hr. Peak Flow - cfs	10 yr. / 24 hr. Peak Flow - cfs	10 yr. / 24 hr. Volume - ac.ft.
UA-1	7.99	13.69	30.52	35.07	7.17
UA-7	0.05	0.12	0.29	0.36	0.03

TABLE 5

Runoff Summary Watershed Drainage to Sediment Pond				
Watershed	10 yr. / 6 hr. Peak Flow-cfs	25 yr. / 6 hr. Peak Flow-cfs	10 yr. / 24 hr. Peak Flow-cfs	10 yr. / 24 hr. Volume-ac-ft
Undisturbed Watersheds draining to Pond #1				
UA-2	0.40	0.58	1.12	0.09
UA-3	0.62	0.89	1.70	0.13
UA-4	3.00	4.48	9.00	0.74
UA-5a	0.04	0.12	0.46	0.03
UA-5b	0.06	0.15	0.55	0.05
UA-6a	0.14	0.20	0.39	0.03
UA-6b	0.12	0.18	0.33	0.02
Disturbed Watersheds				
DA-1	0.64	0.82	1.29	0.11
DA-2	0.16	0.20	0.32	0.03
DA-3	0.13	0.17	0.26	0.02
DA-4	0.26	0.34	0.53	0.04
DA-5	1.48	1.90	3.00	0.24
DA-6a	0.09	0.12	0.18	0.01
DA-6b	0.26	0.34	0.53	0.04
DA-7	0.12	0.15	0.23	0.02
DA-8	0.21	0.27	0.43	0.03
DA-9	0.16	0.20	0.32	0.03
DA-10	0.07	0.09	0.14	0.01
DA-11	0.13	0.17	0.26	0.02
DA-12	2.16	2.79	4.46	0.37
DA-13a	0.66	0.85	1.35	0.11
DA-13b	1.04	1.34	2.12	0.37
DA-14a	0.29	0.38	0.60	0.56
DA-14b	0.31	0.40	0.64	0.05
DA-15a	0.79	1.02	1.60	0.13
DA-15b	1.56	2.01	3.20	0.26
DA-16	0.12	0.15	0.23	0.02
TS-1	0.96	1.24	1.95	0.05
POND 1	19.66	24.81	39.74	3.19

TABLE 5 (Continued)

Runoff Summary Watershed Drainage to Sediment Pond				
Watershed	10 yr. / 6 hr. Peak Flow-cfs	25 yr. / 6 hr. Peak Flow-cfs	10 yr. / 24 hr. Peak Flow-cfs	10 yr. / 24 hr. Volume-ac-ft
Disturbed Watersheds				
Fan Portal	0.21	0.27	0.40	0.43
DA-17	0.58	0.74	1.17	0.09
DA-18	0.25	0.32	0.50	0.04
DA-19	0.27	0.35	0.56	0.05
POND 2	1.10	1.41	1.17	0.26

TABLE 6

Runoff Control Structure Watershed Summary		
Structure	Type	Contributing Watersheds/Structures
UC-1	Culvert	UA-1, Fan Portal, Sediment Pond Overflow
DD-1	Ditch	DA-1, UA-2, UA-3
DC-1	Culvert	DD-1
DD-2	Ditch	DC-1, DA-2, UA-6a, UA-6b
DC-2	Culvert	DD-2
DD-3	Ditch	DA-3
DC-3	Culvert	DD-3
DD-4	Ditch	DA-4, DC-2, DC-3
DC-4	Culvert	DD-4
DD-5a	Ditch	DA-5
DD-5b	Ditch	DD-5a
DD-6	Ditch	DA-6a
DC-5	Culvert	DD-5b, DD-6, Mine Water
DC-6	Culvert	DC-4, DC-5, DA-6b
DC-7	Culvert	DC-6, DA-7
DC-8	Culvert	DC-7, DA-8
DC-9	Culvert	DC-8, DA-9
DD-7	Ditch	DC-9, DA-10, DA-11
DC-10	Culvert	DD-7
DD-8	Ditch	DC-7, DA-12
DC-11	Culvert	DD-8
DD-9	Ditch	DC-11, DA-13b

TABLE 6

Runoff Control Structure Watershed Summary		
Structure	Type	Contributing Watersheds/Structures
DC-12a	Culvert	DD-9
DC-12b	Culvert	DC-12a
DC-12c	Culvert	DC-12b
DC-12d	Culvert	DC-12c
DD-10	Ditch	DA-14a
DD-11a	Ditch	DA-15a
DD-11b	Ditch	DA-15b
DD-12	Ditch	DD-11a, DD-11b
DD-13	Ditch	DA-16
DD-14	Ditch	DD-12, DD-13, UA-5a
DD-15	Ditch	DD-14, DA-13a, DA-14b, UA-5b
DD-16	Ditch	DC-12d, DD-10, DD-15
DD-17	Ditch	DA-18
DC-13	Culvert	DA-17
DC-14	Culvert	DA-18, DA-19

TABLE 7

Runoff Control Structure Flow Summary					
Structure	Type	10yr. / 6hr. Peak Flow-cfs	25yr. /6hr. Peak Flow-cfs	10yr. / 24hr. Peak Flow-cfs	100yr. / 6hr. Peak Flow-cfs
UC-1*	Culvert	33.07	38.77	60.15	55.60
DD-1	Ditch	1.66	0.66	4.11	--
DC-1	Culvert	1.66	1.49	4.11	--
DD-2	Ditch	2.08	1.81	5.15	--
DC-2	Culvert	2.08	1.81	5.15	--
DD-3	Ditch	0.13	0.14	0.26	--
DC-3	Culvert	0.13	0.14	0.26	--
DD-4	Ditch	2.47	2.44	5.94	--
DC-4	Culvert	2.47	2.44	5.94	--
DD-5a	Ditch	1.48	0.18	3.00	--
DD-5b	Ditch	1.48	0.18	3.00	--
DD-6	Ditch	0.09	3.46	0.18	--
DC-5	Culvert	6.07	3.61	7.68	--
DC-6	Culvert	8.94	3.89	14.15	--
DC-7	Culvert	9.06	0.11	14.38	--
DC-8	Culvert	9.27	0.11	14.81	--
DC-9	Culvert	9.43	0.11	15.13	--
DD-7	Ditch	9.63	0.11	15.53	--
DC-10	Culvert	9.63	0.11	19.99	--
DD-8	Ditch	11.79	4.00	19.99	--
DC-11	Culvert	11.79	2.06	22.11	--
DD-9	Ditch	12.83	1.52	22.11	--
DC-12a	Culvert	12.83	3.58	22.11	--
DC-12b	Culvert	12.83	3.12	22.11	--
DC-12c	Culvert	12.83	3.12	22.11	--

TABLE 7

Runoff Control Structure Flow Summary					
Structure	Type	10yr. / 6hr. Peak Flow-cfs	25yr. /6hr. Peak Flow-cfs	10yr. / 24hr. Peak Flow-cfs	100yr. / 6hr. Peak Flow-cfs
DC-12d	Culvert	12.83	0.12	22.11	--
DD-10	Ditch	0.29	3.71	0.60	--
DD-11a	Ditch	0.79	0.05	1.60	--
DD-11b	Ditch	1.56	0.05	3.20	--
DD-12	Ditch	2.35	1.68	4.80	--
DD-13	Ditch	0.12	1.68	0.23	--
DD-14	Ditch	2.51	0.62	5.49	--
DD-15	Ditch	3.54	1.56	8.03	--
DD-16	Ditch	16.66	2.18	30.74	--
DD-17	Ditch	0.25	3.86	0.50	--
DC-13	Culvert	0.27	4.50	0.56	--
DC-14	Culvert	0.52	4.74	1.73	--
POND 1	Pond	19.66	24.81	39.74	--
POND 2	Pond	1.10	1.41	1.17	--

* UC-1flow values includes sum of peak flows for UA-1 from Table 4 and 25yr-6hr Sediment Pond 1 peak flow of 24.81 cfs & Fan Portal flow from Table 5- 0.27cfs.

TABLE 8						
Disturbed Ditch Design Summary						
Ditch	DD-1	DD-2	DD-3	DD-4	DD-5a	DD-5b
Slope (%)	12.82	11.64	1.11	13.85	3.33	54.54
Length (ft.)	621	337	180	299	390	126
Manning's No.	0.035	0.035	0.03	0.035	0.03	0.04
Side Slope (H:V)	3:1	3:1	2:1	2:1	2:1	2:1
*Bottom Width (ft.)	2.00	2.00	0.00	2.00	2.00	2.00
Peak Flow 10/6 (cfs)	1.66	2.08	0.13	2.47	1.48	1.48
Peak Flow 10/24 (cfs)	4.11	5.15	0.26	5.94	3.00	3.00
Flow Depth (ft.) 10/6	0.17	0.19	0.24	0.21	0.21	0.11
Flow Depth (ft.) 10/24	0.27	0.32	0.31	0.35	0.32	0.17
Flow Area ($ft.^2$) 10/6	0.41	0.49	0.11	0.51	0.52	0.25
Flow Area ($ft.^2$) 10/24	0.77	0.93	0.18	0.93	0.84	0.40
Velocity (fps) 10/6	4.03	4.22	1.17	4.86	2.84	5.93
Velocity (fps) 10/24	5.35	5.55	1.39	6.39	3.55	7.58
Rip-Rap Req'd (Y/N)	N	N	N	N	N	Y
Rip-Rap D_{50}	-	-	-	-	-	3"
Note: Slope/Lengths from Plate 7-2.						

TABLE 8 (Continued)

Disturbed Ditch Design Summary							
Ditch	DD-6	DD-7	DD-8	DD-9	DD-10	DD-11a	DD-11b
Slope (%)	4.74	7.28	2.22	3.10	6.00	0.97	0.51
Length (ft.)	212	151	142	265	417	206	394
Manning's No.	0.03	0.035	0.03	0.035	0.03	0.03	0.03
Side Slope (H:V)	2:1	2:1	2:1	2:1	2:1	2:1	2:1
*Bottom Width (ft.)	0.00	2.00	2.00	2.00	0.00	0.00	2.00
Peak Flow 10/6 (cfs)	0.09	9.63	11.79	12.83	0.29	0.79	1.56
Peak Flow 10/24 (cfs)	0.18	15.53	19.99	22.11	0.60	1.60	3.20
Flow Depth (ft.) 10/6	0.14	0.52	0.74	0.77	0.23	0.48	0.37
Flow Depth (ft.) 10/24	0.63	0.66	0.97	1.01	0.31	0.62	0.55
Flow Area ($ft.^2$) 10/6	0.04	1.56	2.58	2.72	0.11	0.45	1.03
Flow Area ($ft.^2$) 10/24	0.07	2.21	3.80	3.47	0.19	0.77	1.72
Velocity (fps) 10/6	2.18	6.16	4.56	4.71	2.68	1.74	1.52
Velocity (fps) 10/24	2.59	7.04	5.26	5.45	3.22	2.08	1.87
Rip-Rap Req'd (Y/N)	N	Y	N	N	N	N	N
Rip-Rap D_{50}	-	3"	-	-	-	-	-
Note: Slope/Lengths from Plate 7-2.							

TABLE 8 (Continued)

Disturbed Ditch Design Summary							
Ditch	DD-12	DD-13	DD-14	DD-15	DD-16	DD-17	
Slope (%)	30.86	5.63	10.67	6.50	2.29	7.85	
Length (ft.)	85	160	330	710	260	434	
Manning's No.	0.04	0.03	0.032	0.03	0.03	0.03	
Side Slope (H:V)	2:1	2:1	2:1	2:1	2:1	2:1	
*Bottom Width (ft.)	0.0	2.0	2.0	2.0	4.0	0.0	
Peak Flow 10/6 (cfs)	2.35	0.12	2.51	3.54	16.66	0.25	
Peak Flow 10/24 (cfs)	4.80	0.23	5.49	8.03	30.74	0.50	
Flow Depth (ft.) 10/6	0.17	0.17	0.21	0.30	0.66	0.21	
Flow Depth (ft.) 10/24	0.26	0.22	0.33	0.47	0.92	0.27	
Flow Area ($ft.^2$) 10/6	0.41	0.06	0.52	0.77	3.51	0.09	
Flow Area ($ft.^2$) 10/24	0.66	0.10	0.89	1.38	5.39	0.14	
Velocity (fps) 10/6	5.74	2.03	4.84	4.57	4.75	2.94	
Velocity (fps) 10/24	7.26	2.39	6.18	5.84	5.70	3.49	
Rip-Rap Req'd (Y/N)	Y	N	N	N	N	N	
Rip-Rap D_{50}	3"	-	-	-	-	-	
Note: Slope/Lengths from Plate 7-2.							

TABLE 9

Disturbed Culvert Design Summary						
Culvert	DC-1	DC-2	DC-3	DC-4	DC-5	DC-6
Slope (%)	11.67	10.00	53.85	9.19	4.38	28.97
Length (ft.)	60	60	70	274	250	107
Manning's No.	0.024	0.024	0.024	0.024	0.024	0.024
Peak Flow 10/6 (cfs)	1.66	2.08	0.13	2.47	6.07	8.94
Peak Flow 10/24 (cfs)	2.85	3.37	0.21	0.17	0.17	0.17
Diam. Proposed (ft.)	1.5	1.5	1.5	2.0	2.0	2.0
Velocity (fps) 10/6	6.72	6.79	5.32	6.86	6.80	14.50
Rip-Rap D_{50}	3"	3"	3"	3"	3"-	-*
Note: Slope/Lengths from Plate 7-5. Velocity: (Haestad Methods, Flowmaster Program)						

* Discharge is into manhole - no riprap needed

TABLE 9 (Continued)

Disturbed Culvert Design Summary						
Culvert	DC-7	DC-8	DC-9	DC-10	DC-11	DC-12a
Slope (%)	5.84	5.35	8.06	3.33	4.00	0.71
Length (ft.)	155	168	186	60	35	141
Manning's No.	0.024	0.024	0.024	0.024	0.024	0.015
Peak Flow 10/6 (cfs)	9.06	9.27	9.43	9.63	11.79	12.83
Peak Flow 10/24 (cfs)	14.38	14.81	15.13	15.53	19.99	22.11
Diam. Proposed (ft.)	2.0	2.0	2.0	2.0	2.0	2.5
Velocity (fps) 10/6	9.18	8.41	8.41	5.94	7.20	5.15
Rip-Rap D_{50}	3"	3"	3"	3"	3"	-*
Note: Slope/Lengths from Plate 7-5. Velocity: (Haestad Methods, Flowmaster Program)						

* Discharge is into manhole - no riprap needed

TABLE 9 (Continued)

Disturbed Culvert Design Summary						
Culvert	DC-12b**	DC-12c**	DC-12d	DC-13	DC-14	SP2-1*
Slope (%)	1.32	2.54	-0.12	29.10	11.2	0.50
Length (ft.)	76	354	9	60	25	165
Manning's No.	0.015	0.015	0.015	0.024	0.024	0.024
Peak Flow 10/6 (cfs)	12.83	12.83	12.83	0.27	0.52	-
Peak Flow 10/24 (cfs)	22.11	22.11	22.11	0.56	1.06	2.72*
Diam. Proposed (ft.)	2.5	2.5	2.5	1.5	1.5	1.50
Velocity (fps) 10/6	8.80	10.65	4.74	2.72	5.80	2.45
Rip-Rap D_{50}	3"	3"	-	-	3"	-
Note: Slope/Lengths from Plate 7-5. Velocity: (Haestad Methods, Flowmaster Program)						

* SP2-1 Peak Flow is a 25/6 event

** Discharge is into a manhole - no riprap required

TABLE 10

Undisturbed Culvert Design Summary		
Culvert	UC-1	
Min. Slope (%)**	0.50	
Length (ft.)	480	
Manning's No.	0.025	
Peak Flow 10/6 (cfs)*	33.07	
Peak Flow 100/6 (cfs)*	55.60	
Diam. Proposed (ft.)	5.00	
Velocity (fps) 100/6	5.22	

* Note: Peak flow values include 25 year-6 hour flow from Sediment Pond 1 (see Tables 4 and 7).
** Pipe slope from Plate 7-6a.

References:

Hawkins, R.H. and K.A. Marshall. 1979. Storm Hydrograph Program. Final Report to the Utah Division of Oil, Gas and Mining. Utah State University. Logan, Utah.

DESIGN OF SEDIMENT CONTROL STRUCTURES

Design Specifications:

Tables:

Figures:

3.1 Design and Construction Specifications for Sedimentation Pond

- All construction of sedimentation ponds will be performed under the direction of a qualified, registered professional engineer.

- The sediment pond #1 will be located in an existing low area where the Right Fork of Lila Canyon passes beneath the existing road. The existing road fill and culvert will be removed, and the pond embankment (road fill) will be reconstructed and compacted. The existing culvert will be replaced with UC-1 which will extend approximately 400' up the Right Fork of Lila Canyon. This culvert will be equipped with an inlet section and trash rack, and will allow undisturbed runoff and treated access road drainage to pass beneath the sediment pond. The majority of the pond will be in an existing channel area, and is therefore considered incised. The pond will be equipped with a culvert riser principal spillway with an oil skimmer, a decant, and a second culvert riser emergency spillway with an oil skimmer. Both spillways will discharge to the oversized (60") CMP culvert running beneath the pond.

- The area of pond constructed shall be examined for topsoil, and where present in removable quantities, such soil shall be removed separately and stored in an approved topsoil storage location.

- In areas where fill is to be placed for the pond impoundment structures, natural ground shall be removed to at least 12" below the base of the structure.

- Native materials shall be used where practical. Fill will be placed in lifts not to exceed 6" and compacted prior to placement of next lift. Compaction of all fill materials shall be at least 95%.

- Rip-rap or other protection (culverts, concrete, etc.) will be placed at all pond inlets to prevent scouring. Rip-rap will consist of substantial, angular (non-slaking) rock material of adequate size.

- Decanting of the pond, as required, will be accomplished by use of a decant pipe with an inverted inlet as shown on Plates 7-6a and 7-6b. Samples will be collected prior to decanting of the pond. If the quality of the water meets the requirements of the U.P.D.E.S. Permit, decanting will proceed. Discharge samples will be collected as per the approved U.P.D.E.S. Discharge Permit.

- Slopes of the embankments shall not be steeper than 2h:1v, inside or outside, with a total of the inslope and outslope not less than 5h:1v, except where areas of the pond are incised.

- External slopes of the impoundment will be planted with an approved seed mix to help prevent erosion and promote stability.

- Top width of the embankment shall be not less than (H+35)/5, where H = Height of Dam in feet from the upstream toe.

3.2 Sediment Yield

The Universal Soil Equation (USLE) was used to estimate sediment yield from disturbed areas. All soil loss from this area was assumed to be delivered to, and deposited in the sedimentation pond.

Erosion rate (A) in tons-per-acre-per-year is determined using the USLE as follows:

$$A = (R) (K) (LS) (CP)$$

Where the variables R, K, LS, and CP are defined as follows:

Variable "R" is the rainfall factor which can be estimated from $R = 27P^{2.2}$; where P is the 2-year, 6-hour precipitation value. P for the Lila Canyon area is 0.75" as shown in Figure 5.4, page 315, Barfield, et.al. 1983. Therefore, the estimated value of "R" for this area is 14.34.

Variable "K" is the soil erodibility factor. For disturbed areas, the "K" value is conservatively estimated to be 0.5. For disturbed runoff, but uncompacted and ungraded areas, "K" is estimated at 0.320. "K" is estimated to be 0.035 for undisturbed areas.

Variable "LS" is the length-slope factor. This figure was determined by applying the slope length and percentage for each sub-drainage area to the chart in Figure 5.15, p. 334, "Applied Hydrology and Sedimentology for Disturbed Areas", Barfield, Warner and Haan, 1983.

Variable "CP" is the control practice factor, which can be divided into a cover and practice factor. Values were determined from Appendix 5A, Barfield, et.al., 1983.

Site	CP Factor
Compacted Areas	1.20
Disturbed/Uncompacted Areas	0.20
Undisturbed Areas	0.15

The sediment volume is based on a density of 100 pounds per cubic foot of sediment.

SEDIMENT YIELD CALCULATIONS - USLE - Drainages to Sediment Ponds

Drainage	R	K	Area (ac)	Slope Length (Ft)	Slope (%)	LS	CP	A (T/ac)	Yield (ac-ft)
Draining to Sediment Pond 1									
DA-1	14.34	0.500	1.25	610	12.95	4.99	1.20	42.93	0.0246
DA-2	14.34	0.500	0.30	330	14.24	4.26	1.20	36.67	0.0051
DA-3	14.34	0.500	0.25	240	4.17	0.59	1.20	5.09	0.0006
DA-4	14.34	0.500	0.5	295	17.29	5.50	1.20	47.29	0.0109
DA-5	14.34	0.500	2.87	580	17.76	8.05	1.20	69.26	0.0913
DA-6a	14.34	0.500	0.17	150	18.67	4.44	1.20	38.20	0.0030
DA-6b	14.34	0.500	0.50	315	19.37	6.83	1.20	58.79	0.0135
DA-7	14.34	0.500	0.22	170	19.41	5.04	1.20	43.36	0.0044
DA-8	14.34	0.500	0.41	400	12.50	3.82	1.20	32.90	0.0062
DA-9	14.34	0.500	0.30	290	11.03	2.69	1.20	23.14	0.0032
DA-10	14.34	0.500	0.13	250	14.00	3.61	1.20	31.06	0.0019
DA-11	14.34	0.500	0.25	230	8.70	1.68	1.20	14.50	0.0017
DA-12	14.34	0.500	4.38	875	9.71	3.86	1.20	33.22	0.0668
DA-13a	14.34	0.500	1.29	480	12.29	4.08	1.20	35.12	0.0208
DA-13b	14.34	0.500	2.05	470	6.81	1.71	1.20	14.75	0.0139
DA-14a	14.34	0.500	0.59	630	6.83	1.99	1.20	17.13	0.0046
DA-14b	14.34	0.500	0.63	720	5.97	1.79	1.20	15.36	0.0044
DA-15a	14.34	0.500	1.55	650	13.38	5.42	1.20	46.66	0.0332
DA-15b	14.34	0.500	3.11	710	10.00	3.63	1.20	31.24	0.0446
DA-16	14.34	0.500	0.22	200	12.00	2.54	1.20	21.84	0.0022
UA-2	14.34	0.500	1.63	1360	73.53	110.75	0.15	119.11	0.0891
UA-3	14.34	0.500	2.40	660	62.12	62.05	0.15	66.73	0.0735
UA-4	14.34	0.500	14.08	1950	30.51	36.93	0.15	38.64	0.2498
UA-5a	14.34	0.500	1.05	340	15.88	5.15	0.15	5.53	0.0027
UA-5b	14.34	0.500	1.63	600	11.33	4.03	0.15	4.33	0.0032
UA-6a	14.34	0.500	0.54	230	34.78	15.27	0.15	16.42	0.0041
UA-6b	14.34	0.500	0.46	90	33.33	8.92	0.15	9.59	0.0020
TS-01*	14.34	0.500	1.87	660	17.10	8.08	0.20	11.58	0.0099
POND 1	14.34	0.500	1.92	340	3.68	0.59	1.20	5.11	0.0045
TOTAL									0.7957
Draining to Sediment Pond 2									
DA-17	14.34	0.500	1.12	240	4.58	0.66	1.20	5.68	0.0029
DA-18	14.34	0.500	0.48	370	10.00	2.62	1.20	22.55	0.0050
DA-19	14.34	0.500	0.55	710	8.87	3.05	1.20	26.22	0.0066
POND 2	14.34	0.500	0.47	45	12.82	1.33	1.20	11.48	0.0025
TOTAL									0.0269

* Disturbed Runoff / Uncompacted Area

** Paved Areas

3.3 Sediment Pond Volume

The volumes shown in Tables 11a and 11b are from the volumes calculated from the precipitation, runoff and sediment yield for a 10 year-24 hour precipitation event. The volumes were calculated based on the disturbed areas (and contributing undisturbed areas) runoff values, developed using the design parameters described in this section.

TABLE 11a

Sediment Pond #1 Design	
1. Use 1.90" for 10 year - 24 hour event.	
2. Runoff Volume - (3.17 ac-ft, from Table 5, 10yr/24hr Vol) =	3.17 ac-ft (1)
3. Sediment Storage Volume USLE 0.7957 ac-ft./yr. x 3.5 yrs. =	2.87 ac-ft
4. Total Required Pond Volume 3.17 + 2.87 =	6.04 ac-ft
5. Peak Flow (25 yr. - 6 hr. event) =	24.81 cfs (2)
6. Pond Design Volume @ Principle Spillway = (See Table 12a)	13.04 ac-ft
7. Mine water storage (3)	7.00 ac-ft

(1) This includes flow from UA-5 within mine boundary. There is a possibility that this undisturbed area may be needed if the surface facilities were to be expanded.

(2) This is to allow for flow from UA-5. There is a possibility that UA-5 may be needed if the surface facilities were to be expanded.

(3) difference in storage between the top of the require storm water storage and the spillway elevation

TABLE 12a

Sediment Pond #1 Stage/Volume Data				
Elevation	Area (sq. ft.)	Volume (cu. ft.)	Acc. Volume (ac. ft.)	Remarks
5839	26870	0	0.00	Bottom of Pond
5830	28640	27755	0.64	
5831	30480	29560	1.32	Sediment Storage - 2.87 ac-ft
5842	32320	31400	2.04	
5843	34210	33265	2.80	Sediment Cleanout Level 5843.6
5844	36140	35175	3.61	Decant 5844.6 - 4.21 ac-ft
5845	38110	37125	4.46	Runoff Storage - 3.17 ac-ft
5846	40120	39115	5.36	
5847	42160	41140	6.30	Runoff + Sed Storage - 6.04 ac-ft
5848	44260	43210	7.29	
5849	46390	45325	8.33	
5850	48550	47470	9.42	Mine Water Storage - 7.00 ac-ft
5851	50970	49760	10.57	
5852	53490	52230	11.77	
5853	55010	54250	13.01	Principal Spillway - 5853
5854	56590	55800	14.29	Emergency Spillway - 5854
5855	58380	57485	15.61	Top of Embankment

TABLE 11b

Sediment Pond #2 Design	
1. Use 1.90" for 10 year - 24 hour event.	
2. Runoff Volume - (from Table 5, 10yr/24hr) =	0.31 ac-ft.
3. Sediment Storage Volume USLE 0.0269 ac-ft./yr. x 3 yrs. =	0.08 ac-ft
4. Total Required Pond Volume 0.31 + 0.08 =	0.39 ac-ft
5. Peak Flow (25 yr. - 6 hr. event)* =	1.41 cfs
6. Pond Design Volume @ Principle Spillway = (See Table 12b)	1.36 ac-ft
* Peak Flow values from Table 5, sum of all contributing watersheds.	

TABLE 12b

Sediment Pond #2 Stage/Volume Data				
Elevation	Area (sq. ft.)	Volume (cu. ft.)	Acc. Volume (ac. ft.)	Remarks
5845	0	0	0	Bottom of Pond 5845.0
5846	312	156	0.00	
5847	6935	3623.5	0.08	Sediment Cleanout Level 5847.0
5848	8045	7490	0.26	Decant 5847.9
5849	8650	8348	0.45	
5850	9270	8960	0.65	Principal Spillway 5849.61
5851	9910	9590	0.87	
5852	10560	10235	1.11	Emergency Spillway 5851.25
5853	11230	10895	1.36	
5854	11920	11575	1.62	
5855	12890	12406	1.91	
5855.5	14120	6753	2.06	Top of Embankment

TABLE 13a

Sediment Pond #1 Stage/Discharge Data			
Head above Spillway(ft.)	Q (cfs) Weir Controlled	Q (cfs) Orfice Controlled	Q (cfs) Pipe Flow Controlled
0.0	-	-	-
0.2	2.53	15.22	95.68
0.4	7.15	21.53	96.23
0.6	13.14	26.36	96.77
0.8	20.23	30.44	97.31
1.0	28.27	34.04	97.85
1.2	37.17	37.28	98.38
1.4	46.84	40.27	98.91
1.6	57.22	43.05	98.91
1.8	68.28	45.66	99.44
2.0	79.97	48.13	99.97

Note: 1- 25 year - 6 hour flow = 24.81 cfs.
2- Flow will be weir controlled at a head of 0.91' over riser inlet.

Weir Controlled

$Q = CLH^{1.5}$; where: C= 3.0, L= Circumference of Riser = 9.4248', R=1.5'

Orfice Controlled

$Q = C'a\ (2gH)^{0.5}$; where: C= 0.6, a= Area of Riser = 7.0686 ft^2, R=1.5', g= 32.2 ft/sec^2

Pipe Flow Controlled

$$Q = \frac{a\ (2gH')^{0.5}}{(1+Ke+Kb+KcL)^{0.5}}$$; where

a = Area of Pipe = 7.07 ft^2, R = 1.5'
H' = Head = H + 14.5 (Riser) + 0.35 (Slope) + 0.6*4 (barrel height)
Ke = 1.0
Kb = 0.5
Kc = 0.043
L = 70'

TABLE 13b

Sediment Pond #2 Stage/Discharge Data			
Head above Spillway (ft.)	Q (cfs) Weir Controlled	Q (cfs) Orfice Controlled	Q (cfs) Pipe Flow Controlled
0.0	-	-	-
0.2	0.84	1.69	5.81
0.4	2.38	2.39	5.88
0.6	4.38	2.93	5.95
0.8	6.74	3.38	6.02
1.0	9.42	3.78	6.09
1.2	12.39	4.14	6.16
1.4	15.61	4.47	6.22
1.6	19.07	4.78	6.29
1.8	22.76	5.07	6.36
2.0	26.66	5.35	6.42

Note: 1- 25 year - 6 hour flow =1.41 cfs.
2- Flow will be Weir controlled at a head of 0.36' over riser inlet.

Weir Controlled

$Q = CLH^{1.5}$; where: C= 3.0, L= Circumference of Riser =3.14', R=0.5'

Orfice Controlled

$Q = C'a\ (2gH)^{0.5}$; where: C= 0.6, a= Area of Riser = 0.79 ft^2, R=0.5', g= 32.2 ft/sec^2

Pipe Flow Controlled

$$Q = \frac{a\ (2gH')^{0.5}}{(1+Ke+Kb+KcL)^{0.5}}$$; where

a = Area of Pipe = 0.79 ft^2, R = 0.5'
H' = Head = H + 6.0 (Riser) + 0.8 (Slope) + 0.6*2 (barrel height)
Ke = 1.0
Kb = 0.5
Kc = 0.043
L = 160'

3.4 Sediment Pond Summary

a) The sedimentation ponds have been designed to contain the disturbed area (and contributing undisturbed area) runoff from a 10 year-24 hour precipitation event, along with multiple years of sediment storage capacity. Runoff to the ponds will be directed by various ditches and culverts as described in the plan.

b) The required volume for Sediment Pond #1 is calculated at 6.04 acre feet, including 3.5 years of sediment storage. The proposed sediment pond size will have a volume of approximately 13.01 acre feet (at the principal spillway), which is more than adequate. The extra storage 7 acre-foot in Pond 1 will be used for optional mine water handling. The required volume for Sediment Pond #2 is calculated at 0.39 acre feet, including 3 years of sediment storage. The proposed sediment pond size will have a volume of approximately 0.57 acre feet (at the principal spillway), which is more than adequate.

c) The ponds will meet a theoretical detention time of 24 hours. Both are equipped with a decant, a culvert principal spillway and a culvert emergency spillway. Any discharge from the ponds will be in accordance with the approved UPDES Permit.

d) The pond inlets will be protected from erosion, and the spillways will discharge into the natural drainages in a controlled manner.

e) The ponds are temporary, and will be removed upon final reclamation of the property.

f) The ponds will be constructed according to the regulations and under supervision of a Registered, Professional Engineer.

DESIGN OF DRAINAGE CONTROL STRUCTURES FOR RECLAMATION

Reclamation Hydrology:

Tables:

Figures:

Reclamation Hydrology

4.1 General

Upon completion of operations at the Lila Canyon Minesite, the portals will be sealed and backfilled and all structures will be removed except for the sediment ponds, bypass culvert UC-1, reclamation ditches and temporary sediment controls such as silt fences or straw bales.

Any refuse or mine development waste previously deposited under the approved plan will also be left in place. Concrete will be buried beneath at least 2' of non-toxic, non-acid material. Any potentially toxic or acid-forming material buried on site will be covered with a minimum of 4' of material.

The sediment ponds, and all remaining drainage controls will be removed upon completion of Phase II Bond Release.

4.2 Reclamation Area Drainage Control

During the initial phase of reclamation, all drainage controls will be removed with the exception of the two sediment ponds, bypass culvert UC-1, reclaimed ditches RD-1 and RD-2 and temporary sediment controls such as straw bales or silt fences installed in the undisturbed drainages.

As undisturbed drainage culverts are removed, a minimum of two straw bale or silt fence barriers will be installed downstream of each location for sediment control purposes.

Disturbed areas will be regraded and reclaimed ditches RD-1 and RD-2 will be installed to collect the runoff from the site area and direct it to the outlet structures (see Plate 7-7).

When the vegetation and sediment contribution levels meet requirements for Phase II Bond Release, a series of at least three straw bale or silt fence barriers will be placed downstream of the sediment pond outlets. All upstream sediment controls will be removed. Reclaimed ditches RD-1 and RD-2 will also be removed, regraded and reseeded. Culvert UC-1 will be cut off at the location of the principal pond spillway.

The portion of culvert UC-1 remaining beneath the road will be left as a permanent drainage control. The culvert will be equipped with an inlet section and rip-rapped headwall. The culvert is adequately sized to safely pass runoff from a 100 year - 6 hour event, as shown in Table 10. To ensure that state of the art technology is incorporated, the final reclamation plans for the sedimentation pond areas will be submitted prior to commencement of final reclamation of this area.

The remainder of culvert UC-1 will be removed, and the natural channel restored through the sediment pond #1 area. The sediment pond structures will also be removed, the pond areas regraded as necessary and reseeded. The pond #1 embankment will remain as a permanent feature, since the existing (and proposed future) road through the area passes over the embankment.

Following the successful establishment of vegetation and when effluent standards are met, the sediment ponds will be removed. The same methodologies relative to recontouring, top soil application and seeding will be utilized in grading and revegetating the pond areas as outlined in Chapters 2, 5, and Appendix 5-8.

The pond embankment will be narrowed to facilitate the even character of the Lila Canyon Road. The 60 inch bypass culvert (UC-1) will be removed to within six feet of the road embankment. A newly formed channel will be constructed at an approximate four percent grade to intercept the inlet of the culvert at its intersection of the road. The road embankment and associated new channel will be armored by the Operator with an underlayment of filter gravel, with D_{50} -30 inch rip-rap. The new area of disturbance including the newly formed channel will have top soil spread in and around the rip-rap. The Operator will use the same seeding and mulching methods described in Appendix 5-8 will be used on this area as well. See Figure 4 for a detailed design.

TABLE 14

Final Reclamation Drainage Areas Contributing to Structures	
Channel	Contributing Watershed/Structure
RD-1	RW-1
RD-2	RW-2
UC-1	UA-1, UA-4, RD-1

TABLE 15

Final Reclamation Drainage Structure Flow Summary	
Channel	*100/6 Flow (cfs)
RD-1	13.26
RD-2	10.89
UC-1	**72.62

* CN = 83.
** Combined flow for watersheds UA-1, UA-4, and RW-2.

TABLE 16

Final Reclamation Reclamation Structure Design Parameters					
Channel	Bottom Width (ft.)	Side Slope H:V	Slope %	Reclaimed Depth (ft.)	Manning's No.
RD-1	3	2:1	5.00	1.5	0.035
RD-2	3	2:1	10.00	1.5	0.035
UC-1	60" Diam.	-	0.90*	60" Diam.	0.025

* Pipe slope for Plate 7-6

TABLE 17

Final Reclamation Reclamation Structure Flow Calculations			
Channel	RD-1	RD-2	UC-1
100 year - 6 hour event (in.)	1.90	1.90	1.90
Peak Flow (cfs)	13.26	10.89	72.62
Velocity (fps)	5.44	6.52	6.74
Required Area ($ft.^2$)	2.44	1.67	10.80
Flow Depth (ft.)	0.58	0.43	2.69

Alternate Sediment Control for Fan Site and Topsoil Storage Area

5.1 ASCA Areas

Sediment Control at the slope below water treatment area, and topsoil storage area sites will be accomplished with a combination of one or more of the following: berms, silt fences, and straw bales.

The ventilation breakouts are just punch outs and will have insignificant disturbance associated with them. (Plate 5-2) However, they are addressed as ASCA's and are addressed here even though there will be only insignificant surface disturbance. The ASCA's will be seeded upon final reclamation.

The topsoil collected from the topsoil storage area sites will be located downslope from the sites and will be used in the construction of the berm. The berm will be constructed a minimum of two feet high and have 2:1 side slopes. The berm will control the flow from a 10 year-24 hour precipitation event. Silt fence will be selectively placed to help control run-off. The berm will be stabilized with vegetation to prevent erosion. As much as practical, the vegetation techniques used on the main topsoil pile will be utilized on the fan topsoil berm.

The outside of the berm will be protected with a silt fence or gravel. The gravel, if used, would help augment the revegetation. Construction details of the silt fence/filter fence are shown if Figure 5.

The outslope of the portal access road, outslope of the water treatment pad, and ventilation break outs will have a silt fence located along the disturbed area boundary to treat the runoff from the slope. While some portions of this area will be disturbed as a result of the fill material placed for the pad and road construction, the major portion of this area is expected to remain undisturbed. As an added protection, the portions of the area that are disturbed by the fill placement will be covered with a erosion control mat to minimize the erosion from this slope and that area seeded to aid in the establishment of a vegetative cover.

Due to lack of final engineering details, the exact location of the berms, silt fences, and subsequent erosion techniques will be determined in field with the approval of UDOGM. The final determination will be made prior to the start of topsoil removal.

Run-off Calculations

5.2 Ventilation Break Outs

Insignificant surface disturbance.

5.3 Topsoil Storage Area

Acreage:	2.61 acres
Design Storm:10 year/24 hour:	1.90"
CN:	90
S:	1.111

$Q = \frac{(P-0.25S)^2}{P+0.8S}$ = 1.01" of runoff

Total run-off = 0.22 acre feet

5.4 Water Treatment Area

Acreage:	0.37 acres
Design Storm:10 year/24 hour:	1.90"
CN:	90
S:	1.111

$Q = \frac{(P-0.2S)^2}{P+0.8S}$ = 1.01" of runoff

Total run-off = 0.03 acre feet

Lila Canyon Mine
Watershed Peakflow Calculations

Lila Canyon Mine
Ditch And Culvert Calculations

APPENDIX 7-9

Right Fork of Lila Canyon
Flow and Geomorphic Evaluation

Modified June 2016

INTRODUCTION:

A stream evaluation was conducted of the Right Fork of Lila Canyon and other drainages downstream of the proposed mine facilities toward the Price River. The purpose of the study was to determine the impact of a continuous discharge from the mine would have on the downstream channel.

The evaluation started with a series of cross-section measurements were taken to characterize the channel configuration and the channel bed and bank materials. At each cross-section a series of station and elevation shots were taken with a Trimble 4800 GPS unit. These shots were intended to provide a base condition description of the channel cross-section shape and width of the channel for input into the stream transmission loss modeling. No graphical cross-sections were prepared of the data. Photographs were taken of each cross-section location looking upstream and downstream to help visualize the conditions at the cross-section. Additional photographs of the bed and bank materials were taken to aid in classifying the material type. The photographs are presented in Attachment #1 to this Appendix. A listing of the survey points is presented in Attachment #2.

Figure 1 shows the location of the cross-section sites. The original plan was to collect cross-sections at one-half mile spacings along the channel alignment between the mine site and the Price River. However, at the third cross-section location, a recent diversion structure was found which diverted the normal flow of the Right Fork of Lila Canyon. Previously, the flow from the Right Fork joined with the flows from Grassy Wash. However, with the diversion, the entire flow of the Right Fork was diverted to a diversion channel. The location of the diversion dam and alignment of the diversion channel is presented in Figure 1. Ultimately, the diversion channel will convey the flow to a stock pond located in the SW/4, SW/4 of Section 28, T. 16 S., R. 14 E.

This stock pond was assumed to be a BLM pond. The work appeared to be part of implementation of a range improvement program in the area of the pond. As part of this program, the embankment had been improved and raised, the outlet riprapped, and the diversion structure moved upstream and improved to collect additional flows. However, the pond area was still filled with silt or sediment.

The result of this range improvement project was that the flows from the Right Fork of Lila Canyon would be diverted to the stock pond. If the pond fills, any excess water will be released back to Grassy Wash. Based on the size of the pond, if cleaned, it appears that the pond will hold about 5 to 7 acre-feet.

Subsequent to the field work, discussions were held with the BLM regarding the diversion and stock pond improvements. They indicated that they had no knowledge of them. A few months following the meeting, during other field work in

the area, it was discovered that the diversion on the Right Fork of Lila Canyon had been breached and the flow channel reestablished to Grassy Wash.

Results:

Channel sections

The Right Fork of Lila Canyon is an ephemeral channel which is incised into the pediment surface below the Book Cliffs. At cross-section location 1, the channel is incised about 25 to 30 feet and has a top width of approximately 75 to 100 feet. The channel has a low-flow component that consists of a general trapezoidal shape with 1.5 to 2H:1V slopes, a bottom width of about 5 feet, and a low flow channel depth of almost 1.5 feet. Channel material consists of fine to coarse gravels and fine sands and few silts.

At cross section location 2, the channel is transitioning from the incised section to a broader section at the confluence of the Right Fork with Grassy Wash. In this reach, the channel is incised about 10 to 15 feet and has a top width of approximately 250 to 300 feet. The channel has a low-flow component that consists of a swale shape with gentle sideslopes, a bottom width of about 7.5 to 10 feet, and a low flow channel depth of almost 1.0 foot. Channel material consists of fine to coarse gravels and fine sands and silts.

Upstream of the confluence, at cross-section 3, Grassy Wash consists of a braided channel with several flow channels. The predominant channel has a top width of 10 to 12 feet with a bottom width of 8 or 9 feet and steep side slopes. The depth of this channel is approximately 2.5 feet deep. The overall channel is approximately 50 to 75 feet wide. Channel material consists of fine to coarse gravels and fine sands and silts.

Downstream of the confluence with the Right Fork, at cross-section 4, Grassy Wash is again an incised channel. The channel is approximately 10 to 15 feet wide with a depth of 5 to 6 feet. The channel bends to the west and flow is directed against the outer bank. This results in a steep slope on the outer bank and a gentler slope on the inner bank. Channel materials consist of fine to coarse gravels and fine sands and silts.

Downstream of the pond at cross-section 5, Grassy Wash is a moderately incised channel. The channel is approximately 10 to 15 feet wide with a depth of 4 to 5 feet. Channel materials consist of fine to coarse gravels and fine sands and silts.

Stream Transmission Loss Modeling

Originally, DOGM required an evaluation for an estimated mine discharge of 500 gpm, to determine if this flow would reach the Price River. Subsequent to that evaluation, UEI has determined that the old Horse Canyon workings in the area that the mine will cross during development are flooded. To safely cross these workings it is necessary to drain the water. Based on the anticipated water head identified in the workings, an worst case flow rate of approximately 2080 gpm (3.0MGD) is estimated. Once the initial volume of water stored in the Horse Canyon workings is drained, it is anticipated that the flow rate from the old workings will decrease. However, the duration of that decrease is unknown. Therefore, this evaluation is based on an assumed constant flow rate using the concepts presented in the U.S. Soil Conservation Service National Engineering Handbook Chapter 19 - Transmission Losses (2007). The actual method is based on regression equations derived from Arizona and New Mexico conditions. While the current site is similar to the area developed from, the specific conditions were different. Therefore, the current site was modeled using similar concepts.

The estimated mine discharge was assumed to be introduced to the channel immediately below the mine site. The soil designations of the channel area were determined from preliminary soils maps developed by the NRCS Price Office for the Emery County Soil Survey (personnel communication, Leland Sasser, 2004) (a copy of the preliminary map is presented in Attachment 3). The length of channel crossing each different soil type was determined from this map. Permeability estimates of the soils were determined from the SCS Emery and Carbon County Soil Survey, engineering properties table. Estimates of channel width and depth and valley fill width and depth were derived from the photos and cross-section information. The depth of the valley fill was determined during field investigations based on the site conditions. These data along with the length of soil sections and permeability data were input into the spreadsheet presented in Table 1. Based on the discharge to the channel and the estimates of infiltration, evaporation, and permeability loss over the flow length, an estimate of the distance that the flow would be conveyed was determined.

Given the soils in the area, the constant 2,080 gpm flow from the mine would be expected to have surface flow for a distance of approximately 15,950 feet or 3 miles. The subsurface flow would be expected to extend and additional 29,060 feet or 5.5 miles. Thus, the total flow distance of the mine water is estimated to be about 8.5 miles. All values used for the modeling, presented in Table 1 including the mine water discharge rate, are considered to be conservative values. The distance to the Price River from the mine is about 12.7 miles. Therefore, the flow from the mine will not reach the Price River.

Flow Characteristics

The results of the calculations channel capacity calculations (Attachment 4) show that both the 500 gpm (1.1 cfs) and the 2,080 gpm (4.63 cfs) constant mine discharges would have a flow depth at cross-section 1 of about 0.8 feet and 1.5 feet, respectively. These are significantly less than the bank full condition flow depth expected at this cross-section below the mine site (2.55 feet).

Many reseachers consider the bankfull flow to be the major channel forming flow, due to its probability of occurrence and its channel forming energy. Given the fact that the mine water flow is significantly below this flow, its is not likely that the mine discharge flow will have any significant negative impact on the channel conditions.

The cross-section data has been collected as a baseline to comply with the statement under Section 728.333. UEI has a concern that subsequent surveys made to determine the impact of the mine water discharge on the channel form and shape would not necessarily show that the mine water was impacting the stream channel. This would be not be a viable approach as natural rainfall runoff events would likely have a higher peak flow, based on the flow simulations that have been conducted in Appendix 7-10 and in Appendix 7-4. These higher flows would likely result in channel form and shape changes that had nothing to do with the mine water discharge flows. Therefore, there would be no way to differentiate the changes in the channel between mine water and runoff induced changes.

It is likely that the constant low flow condition within the channel will result in the establishment of a vegetative community adjacent to the channel for the short distance that flow will exist above ground. Additionally, the development of such a community, would increase the evapotranspiration along the flow corridor which would decrease the available flow and ultimately result in a shorter flow distance below the mine.

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under R645-301-830 and 830.400. The scope of work to be guaranteed and the liability assumed under each phase bond will be specified in detail.

820.330. Isolated and clearly defined portions of the permit area requiring extended liability may be separated from the original area and bonded separately with the approval of the Division. Such areas will be limited in extent and not constitute a scattered, intermittent, or checkerboard pattern of failure. Access to the separated areas for remedial work may be included in the area under extended liability if deemed necessary by the Division.

820.340. If the Division approves a long-term, intensive agricultural postmining land-use, in accordance with R645-301-413, the applicable five- or ten-year period of liability will commence at the date of initial planting for such long-term agricultural use.

820.350. General.

820.351. The bond liability of the permittee will include only those actions which he or she is obligated to take under the permit, including completion of the reclamation plan, so that the land will be capable of supporting the postmining land use approved under R645-301-413.

820.352. Implementation of an alternative postmining land-use approved under R645-301-413.300 which is beyond the control of the permittee need not be covered by the bond. Bond liability for prime farmland will be as specified in R645-301-880.320.

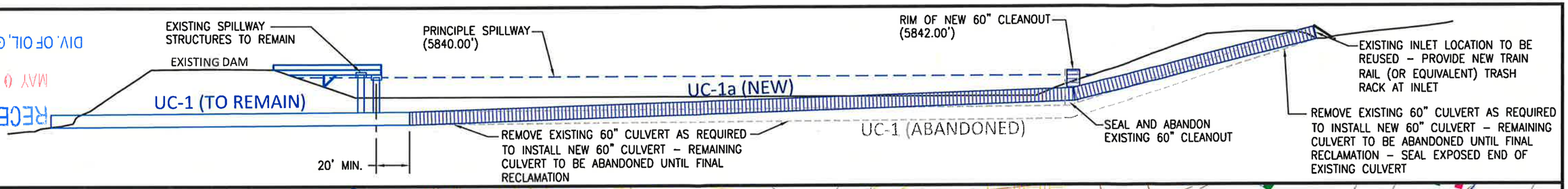
830. Determination of Bond Amount.

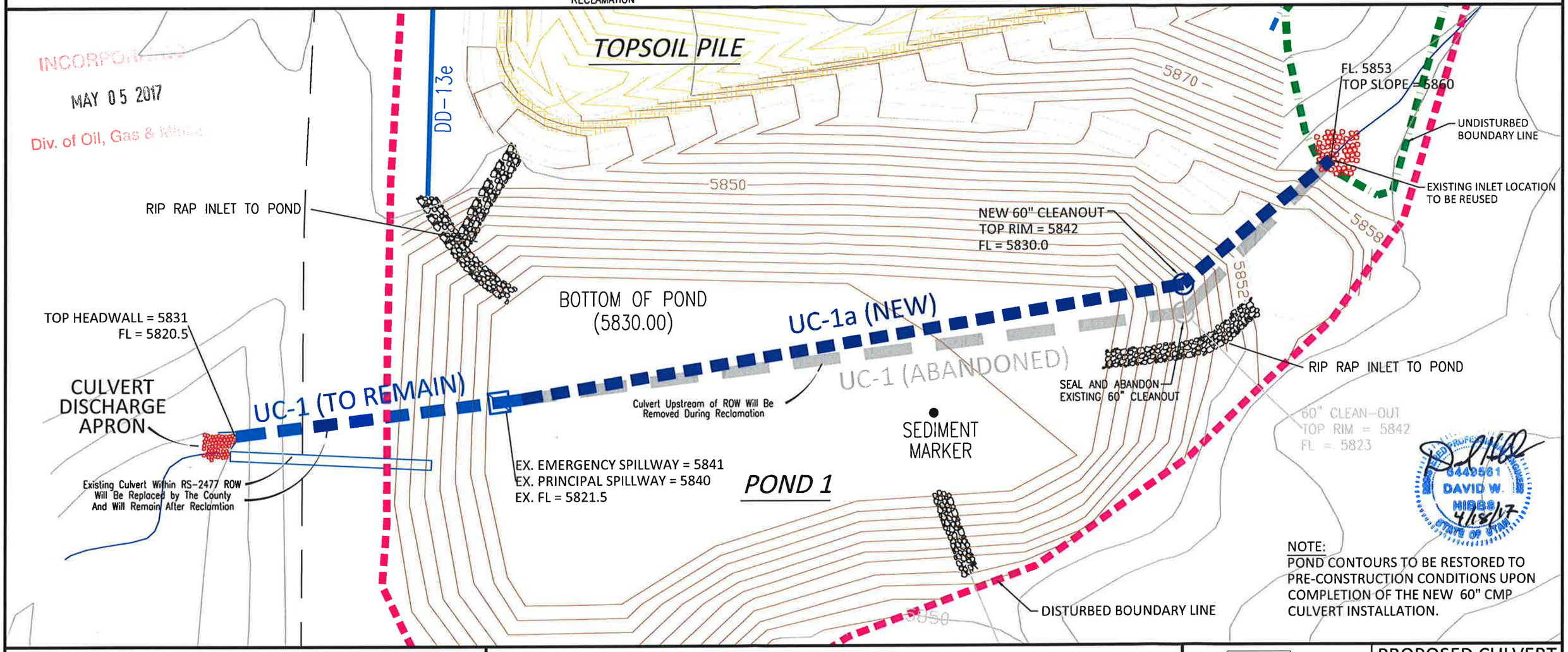
830.100. The amount of the bond required for each bonded area will:

830.110. Be determined by the Division;

830.120. Plate 8-1 shows the final construction plan for Lila Canyon Mine. Used to calculate the bond. Bonding calculations provided in Appendix 8-1 of this chapter are based on the proposed permit and reclamation plan.

830.130. Bonding Calculations provided are based on





NOTE:
POND CONTOURS TO BE RESTORED TO PRE-CONSTRUCTION CONDITIONS UPON COMPLETION OF THE NEW 60" CMP CULVERT INSTALLATION.

LEGEND

- EXISTING 60" CULVERT TO REMAIN
- EXISTING 60" CULVERT TO BE ABANDONED
- NEW 60" CULVERT

NOTES:

1. ABANDONED 60" CULVERT TO REMAIN UNTIL FINAL RECLAMATION, AT WHICH TIME IT SHALL BE REMOVED PER THE APPROVED MRP.
2. THE NEW 60" CULVERT IS TEMPORARY AND SHALL BE REMOVED UPON FINAL RECLAMATION.
3. THE NEW CULVERT SHALL TIE-IN TO EXISTING CULVERT UPSTREAM FROM EXISTING SPILLWAY STRUCTURE.
4. NEW 60" CULVERT LOCATION SHOWN IS THE PROPOSED LOCATION. AS-BUILT DRAWINGS SHALL BE PROVIDED UPON COMPLETION OF PROJECT.

UtahAmerican Energy, Inc.
794 NORTH "C" CANYON ROAD, EAST CARBON, UTAH 84520
P.O. BOX 910, EAST CARBON, UTAH 84520
PHONE: (435) 888-4000 FAX: (435) 888-4002

PROPOSED CULVERT REVISION

LILA CANYON MINE
23415 North Lila Canyon Road
Green River, Utah 84525

MSHA MINE ID # 42-02241

DRAWN BY	PJ	SCALE	1" == 40'
APPROVED BY	DH	DATE	18 OCT. 2016
SHEET			PLATE #1 of 1

TOPSOIL SALVAGE MAP

LILA CANYON MINE

DRAWN BY:	UEI
SCALE:	AS SHOWN
DATE:	19 JULY 2010
PAGE #:	2 - 3a

RECEIVED
MAY 01 2017
Div. of Oil, Gas & Mining

INCORPORATED
MAY 05 2017

REGISTERED PROFESSIONAL ENGINEER
STATE OF UTAH
Brad W. Hill
#6449561
ENGINEER

REVISION DATE:

DATE	BY:
JUNE 2011	PJJ
FEB. 2015	PJJ
JUNE 2015	PJJ
JULY 2016	PJJ

PORTAL ROAD
7,622cu.yds.
(2.73 ACRES)

333 cu.yds.
720 cu.yds.

1,280 cu.yds.
(0.86 ACRES)

1,940
cu.yds.
(0.31 ACRES)

LOWER PAD
12,110 cu.yds.
(4.55 ACRES)

33,012 cu.yds.
(20.75 ACRES)

UPPER PAD
1,040 cu.yds.

MIDDLE PAD

STORAGE PAD

POND #2

SUBSTATION
2,100 cu.yds.
(1.40 ACRES)

UDA-1

UDA-2

DISTURBED

UNDISTURBED

BLM R.O.W. #UTU-77122

TOPSOIL PILE
TOPSOIL SALVAGED
TO DATE: 65,746 C.Y.

646 cu.yds.
(2.90 ACRES)

4,943 cu.yds.
(1.84 ACRES)

POND #1

EXISTING UNPAVED EMERY COUNTY ROAD RS-2477 - R.O.W. WIDTH OF DISTURBANCE

PROPOSED B.L.M. RIGHT-OF-WAY FOR PROPOSED WORK ON EMERY COUNTY ROAD - APPLICATION SUBMITTED MAY 24, 2016

STREAM BUFFER ZONE

PERENNIAL BUFFER ZONE

ACCESS ROAD

TRUCK LOOP

CUT TRAIL

A.S.C.A.
Disturbed

NORTH BREAKOUT

SOUTH BREAKOUT

OUTCROP

ROCK SLOPES

UNDERGROUND MINE WORKINGS

FEDERAL LEASE #SL-066490(M)

FEDERAL LEASE #SL-066490

E 1,965,250 E 1,965,500 E 1,965,750 E 1,966,000 E 1,966,250 E 1,966,500 E 1,966,750 E 1,967,000 E 1,967,250 E 1,967,500 E 1,967,750 E 1,968,000 E 1,968,250

N 6,962,500 N 6,962,250 N 6,962,000 N 6,961,750 N 6,961,500 N 6,961,250 N 6,961,000 N 6,960,750 N 6,960,500

N

R 14 E, T 16 S

200' 100' 0' 50'

KEYED MINE FACILITIES

1. TEMPORARY BATH HOUSE
2. TEMPORARY OFFICE TRAILER
3. TEMPORARY OFFICE / SHOP BUILDING
4. TEMPORARY STORAGE SHED (WOODED)
5. TEMPORARY STORAGE BUILDING (METAL)
6. TEMPORARY CONCRETE WALKWAY
7. TEMPORARY OFFICE BUILDING (CONCRETE)
8. TEMPORARY WATER TANK (METAL)
9. TEMPORARY STORAGE TENT W/ CONC. FLOOR
10. POWER POLE
11. ELECTRICAL TRANSFORMER
12. OVERHEAD POWER TRANSMISSION LINE
13. BURIED POWER TRANSMISSION LINE
14. ROCK DUST SILO
15. TEMPORARY FUEL STORAGE TANK
16. TEMPORARY UNDERGROUND RECLAIM ROOM
17. TEMPORARY CONCRETE RETAINING WALL
18. TEMPORARY LOADOUT CONVEYOR (48")
19. TEMPORARY LOADOUT MCC BUILDING (METAL)
20. TEMPORARY LOADOUT STRUCTURE
21. TEMPORARY CRUSHER CONVEYOR (48")
22. TEMPORARY CRUSHER BUILDING
23. TEMPORARY CRUSHED COAL CONVEYOR (48")
24. TEMPORARY CRUSHER MCC BUILDING
25. TEMPORARY BACKUP CRUSHED COAL CONVEYOR
26. TEMPORARY BACKUP CRUSHER CONVEYOR
27. CONCRETE PAD
28. ELECTRICAL GROUNDING FIELD
29. POND SPILLWAY STRUCTURE
30. RAW COAL CONVEYOR (60")
31. STEEL PORTAL CANOPY STRUCTURE
32. CONCRETE CONVEYOR BAY
33. DISABLED CONVEYOR STRUCTURE
34. MINE MCC BUILDING / ELECTRICAL TOWER
35. BACKUP FAN
36. MAIN MINE BLOWING FAN
37. WATER TREATMENT PLANT
38. POWDER AND CAP MAGAZINES
39. CHAIN-LINK FENCE

TOTAL PERMIT AREA	42.6 ACRES
UNDISTURBED AREA	8.7 ACRES
TOTAL DISTURBED AREA	33.9 ACRES
AREA DISTURBED TO DATE	31.88 ACRES
AREA STILL TO BE DISTURBED	2.02 ACRES

TOPSOIL REMOVAL TABLE

LOCATION	LOADS	VOLUME (cubic yards)
Employee Parking Lot	378	12,110
Portal Road	238	7,622
Storm Water Detention Pond	154	4,943
Small Detention Pond	61	1,940
Coal Stockpile/Warehouse Pad	793*	33,012
Substation	*	2,100
Portal Borrow Area	*	333
Topsoil Area	Push with Dozer	646
Upper and Middle Pad	26	1,040
Temporary Truck Loop Area	18	720
Future Truck Loop Area	*	1,280
Total Cubic Yards:		65,746

Notes:
* Total truck count not reported.

TOPSOIL REMOVAL PROJECT AREA
AREA TO REMAIN UNDISTURBED

ESTIMATED PROJECT TOPSOIL

NAME	AREA (ACRES)	ESTIMATED SALVAGED TOPSOIL
UDA-1	0.36	883 cubic yards
UDA-2	0.73	1,721 cubic yards
TOTALS:	1.09	2,604 cubic yards

*SALVAGED TOPSOIL TO BE STORED AT SOUTHWEST CORNER OF TOPSOIL PILE.

NOTE: AS-BUILT SALVAGED AMOUNTS OF TOPSOIL WILL BE PROVIDED UPON PROJECT COMPLETION.

LEGEND:
DISTURBED AREA BOUNDARY:
NATURAL DRAINAGE:
6' HIGH CHAIN LINK FENCE
INCIDENTAL ROCK DISTRIBUTION:
STREAM BUFFER ZONE SIGNS:
SURFACE CONTOURS (5' INTERVALS):
TEMPORARY ROADWAYS:
BLM R.O.W. BOUNDARY LINE:
LEASE BOUNDARY LINES:

AS-BUILT SURFACE FACILITIES

LILA CANYON MINE

DATE: APRIL 2016 | DESIGNED BY: R. Jay Marshall

SCALE: AS SHOWN | PLATE #: 5-2

RECEIVED
MAY 01 2017
DIV. OF OIL, GAS & MINING

REGISTERED PROFESSIONAL ENGINEER
#6449561
STATE OF UTAH
R. JAY MARSHALL

I CERTIFY THIS MAP TO BE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

MAY 05 2017

Div. of Oil, Gas & Mining

NOTE:
CONTROL POINT COORDINATE SYSTEM IS U.S. STATE PLANE 1983 – UTAH CENTRAL (4302)
ADJUSTED TO SEA LEVEL.

INCOMPLETE

REVISION DATE:

DATE	BY:
JAN 2008	RJM
APR. 2009	PJJ
DEC. 2009	PJJ
AUGUST 2010	PJJ
SEPT. 2010	PJJ
APRIL 2011	PJJ
MAY 2011	PJJ
JUNE 2011	PJJ
JAN. 2012	PJJ
MAR. 2014	PJJ
JULY 2014	PJJ
DEC. 2015	PJJ
JUNE 2016	PJJ

E 1,965,250 E 1,965,600 E 1,965,750 E 1,966,000 E 1,966,250 E 1,966,500 E 1,966,750 E 1,967,000 E 1,967,250 E 1,967,500 E 1,967,750 E 1,968,000 E 1,968,250

N 6,962,500 N 6,962,250 N 6,962,000 N 6,961,750 N 6,961,500 N 6,961,250 N 6,961,000 N 6,960,750 N 6,960,500

STREAM BUFFER ZONE
STREAM BUFFER ZONE
MINE ACCESS ROAD
LOWER PAD
STORAGE PAD
POND #2
LILA CANYON ROAD
CONTROL POINT BETA
NORTHING: 6,961,805.38
EASTING: 1,965,344.01
ELEVATION: 5859.34
UNDISTURBED
UNDISTURBED
SUBSTATION
ACCESS ROAD
UNDISTURBED
UNDISTURBED
EXISTING UNPAVED EMERY COUNTY ROAD RS-2477 – R.O.W. WIDTH OF DISTURBANCE
PROPOSED B.L.M. RIGHT-OF-WAY FOR PROPOSED WORK ON EMERY COUNTY ROAD - APPLICATION SUBMITTED MAY 24, 2016
TOPSOIL PILE
TOPSOIL SALVAGED TO DATE: 65,746 C.Y.
POND #1
STORAGE
TRUCK LOOP
ACCESS ROAD
PORTAL ACCESS ROAD
PORTAL ACCESS ROAD
MIDDLE PAD
UPPER PAD
CAT TRAIL
UNDISTURBED
CONTROL POINT DELTA
NORTHING: 6,962,108.13
EASTING: 1,967,116.52
ELEVATION: 6129.77
BLM R.O.W. #UTU-77122
A.S.C.A. Disturbed
NORTH BREAKOUT
OUTCROP
UNDERGROUND MINE WORKINGS
ROCK SLOPES
FEDERAL LEASE #SL-066490(M)
FEDERAL LEASE #SL-066490
OUTCROP
SOUTH BREAKOUT
A.S.C.A. Disturbed

KEYED MINE FACILITIES

1. TEMPORARY BATH HOUSE
2. TEMPORARY OFFICE TRAILER
3. TEMPORARY OFFICE / SHOP BUILDING
4. TEMPORARY STORAGE SHED (WOODED)
5. TEMPORARY STORAGE BUILDING (METAL)
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7. TEMPORARY OFFICE BUILDING (CONCRETE)
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26. TEMPORARY BACKUP CRUSHER CONVEYOR
27. CONCRETE PAD
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29. POND SPILLWAY STRUCTURE
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32. CONCRETE CONVEYOR BAY
33. DISABLED CONVEYOR STRUCTURE
34. MINE MCC BUILDING / ELECTRICAL TOWER
35. BACKUP FAN
36. MAIN MINE BLOWING FAN
37. WATER TREATMENT PLANT
38. POWDER AND CAP MAGAZINES
39. CHAIN-LINK FENCE

TOPSOIL REMOVAL PROJECT AREA
AREA TO REMAIN UNDISTURBED

R 14 E, T 16 S

N

0' 50' 100' 200'

LEGEND:

UNDISTURBED WITHIN THE DISTURBED AREA
DISTURBED AREA BOUNDARY:
NATURAL DRAINAGE:
6' HIGH CHAIN LINK FENCE
INCIDENTAL ROCK DISTRIBUTION:
STREAM BUFFER ZONE SIGNS:
SURFACE CONTOURS (5' INTERVALS):
TEMPORARY ROADWAYS:
BLM R.O.W. BOUNDARY LINE:
STRUCTURAL FILL:
TOPSOIL BERM:
LEASE BOUNDARY LINES:

NOTES: 1. REFER TO PLATE 5-7A&B FOR CROSS-SECTIONS.

DISTURBED AREA HYDROLOGY AND WATERSHED MAP

LILA CANYON MINE

DRAWN: R. Jay Marshall
DATE: January 2008
SCALE: AS SHOWN
PLATE #: 7-2

NOTE: "UNDISTURBED" DENOTES DRAINAGE AND IS NOT APPLICABLE TO SOILS.

RECEIVED
MAY 05 2017
Div. of Oil, Gas & Mining

REGISTERED PROFESSIONAL ENGINEER
#6449561
David W. Knight
STATE OF UTAH
CERTIFICATION NOT TO INCLUDE CORRECT OPERATION OF EQUIPMENT

REVISION DATE:

BY:	DATE:	BY:
JAN 2008	RJM	Aug. 2014	PJJ
APR 2008	TJS	Dec. 2015	PJJ
JUL 2008	TJS	JUNE 2016	PJJ
JUN 2009	TJS	JULY 2016	PJJ
JAN 2010	TJS		
Dec 2010	RJM		
Nov. 2013	PJJ		

BLM R.O.W. #UTU-77122

A.S.C.A. Disturbed

A.S.C.A. Disturbed

LILA CANYON ROAD

EXISTING UNPAVED EMERY COUNTY ROAD RS-2477 - R.O.W. WIDTH OF DISTURBANCE

PROPOSED B.L.M. RIGHT-OF-WAY FOR PROPOSED WORK ON EMERY COUNTY ROAD - APPLICATION SUBMITTED MAY 24, 2016

STREAM BUFFER ZONE

MINE ACCESS ROAD

STORAGE PAD

POND #2

POND #1

LOWER PAD

MIDDLE PAD

UPPER PAD

SUBSTATION

TOPSOIL PILE

TS-01

TRUCK LOOP

ACCESS ROAD

PORTAL ACCESS ROAD

CAT TRAIL

DITCH

NORTH BREAKOUT

SOUTH BREAKOUT

ROCK SLOPES

UNDISTURBED

TYPICAL RIPRAP SLOPE PROTECTION

BYPASS CULVERT

DA-1 DA-2 DA-3 DA-4 DA-5 DA-6a DA-6b DA-7 DA-8 DA-9 DA-10 DA-11 DA-12 DA-13a DA-13b DA-14a DA-14b DA-15a DA-15b DA-16 DA-17 DA-18 DA-19

UA-1 UA-2 UA-3 UA-4 UA-5a UA-5b UA-6a UA-6b UA-7

KEYED MINE FACILITIES

1. TEMPORARY BATH HOUSE
2. TEMPORARY OFFICE TRAILER
3. TEMPORARY OFFICE / SHOP BUILDING
4. TEMPORARY STORAGE SHED (WOODED)
5. TEMPORARY STORAGE BUILDING (METAL)
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7. TEMPORARY OFFICE BUILDING (CONCRETE)
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35. BACKUP FAN
36. MAIN MINE BLOWING FAN
37. WATER TREATMENT PLANT
38. POWDER AND CAP MAGAZINES
39. CHAIN-LINK FENCE

TOPSOIL REMOVAL PROJECT AREA
AREA TO REMAIN UNDISTURBED

OFF-SITE FOOTPRINT:
1" = 2000'
UA-2
UA-6a&b
UA-1
UA-4
2000'
1000'
0'
500'

T 16 S
R 14 E
22
31

LEGEND:
- UNDISTURBED WITHIN THE DISTURBED AREA
- DISTURBED AREA BOUNDARY:
- NATURAL DRAINAGE:
- 6' HIGH CHAIN LINK FENCE
- INCIDENTAL ROCK DISTRIBUTION:
- STREAM BUFFER ZONE SIGNS:
- WS Area Boundary:
- Earthen Berm:
- EXISTING DITCH:
- NEW DITCH:
- New Buried Culvert:
- Existing Buried Culvert:
- TEMPORARY ROADWAYS:
- BLM R.O.W. BOUNDARY LINE:
- EXISTING DROP BOX:
- NEW MANHOLE:
- DRAINAGE REPORTING TO POND #1:
- DRAINAGE REPORTING TO POND #2:
- UNDISTURBED DRAINAGE:
- UNSHADED

NOTES:
(1) REFER TO PLATE 5-7A&B FOR CROSS-SECTIONS.

PROPOSED SEDIMENT CONTROL

LILA CANYON MINE

DATE: JUNE 1998 | DESIGNED BY: BLACKHAWK ENG.

SCALE: AS SHOWN | PLATE #: 7-5

RECEIVED
MAY 01 2017
DIV. OF OIL, GAS & MINING

MAY 05 2017
Div. of Oil, Gas & Mining

REGISTERED PROFESSIONAL ENGINEER
#6449561
STATE OF UTAH
Brad T. Bays
TO THE BEST OF MY KNOWLEDGE

REVISION DATE:

DATE:	BY:	DATE:	BY:	DATE:	BY:
OCT 1998	WJ	NOV 2003	RJM	JAN. 2012	PJU
JAN 1999	WJ	JAN 2005	RJM	NOV. 2013	PJU
MAR 2000	BHE	APR 2008	TJS	OCT. 2014	TJS
SEP 2000	BHE	JUL 2008	TJS	DEC. 2015	TJS
JAN 2001	BHE	JUN 2009	TJS	JUNE 2016	PJU
MAR 2001	BJ	JAN 2010	TJS	JULY 2016	PJU
NOV 2002	RJM	Dec 2010	RJM		

NOTE:
UNDISTURBED DENOTES DRAINAGE AND IS NOT APPLICABLE TO SOILS.

R 14 E, T 16 S

200' 100' 0' 50'

A.S.C.A.
Disturbed

A.S.C.A.
Disturbed

BLM R.O.W. #UTU-77122

KEYED MINE FACILITIES

1. TEMPORARY BATH HOUSE
2. TEMPORARY OFFICE TRAILER
3. TEMPORARY OFFICE / SHOP BUILDING
4. TEMPORARY STORAGE SHED (WOODED)
5. TEMPORARY STORAGE BUILDING (METAL)
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35. BACKUP FAN
36. MAIN MINE BLOWING FAN
37. WATER TREATMENT PLANT
38. POWDER AND CAP MAGAZINES
39. CHAIN-LINK FENCE

TOPSOIL REMOVAL PROJECT AREA
AREA TO REMAIN UNDISTURBED

NOTES:

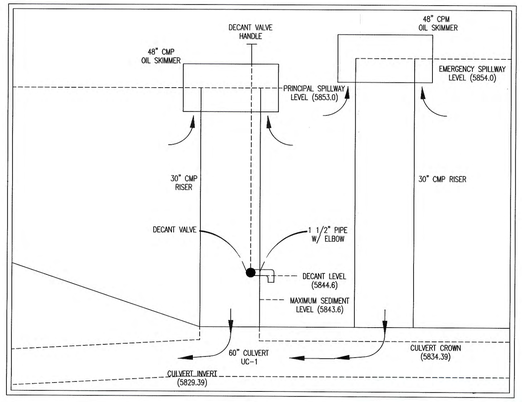
1. REFER TO PLATES 5-7A AND 5-7B FOR CROSS-SECTIONS.

2. AT ALL NEW EXCAVATIONS FOR NEW DITCHES AND CULVERTS IN "UNDISTURBED" AREAS, 18" OF TOPSOIL SHALL BE SALVAGED AND STORED AT THE SOUTHWEST CORNER OF THE TOPSOIL PILE FOR FUTURE RECLAMATION. AFTER THE INSTALLATION OF NEW CULVERTS, BACKFILL SHALL BE PLACED TO APPROXIMATE EXISTING CONTOURS AND SEEDED WITH INTERIM SEED MIXTURE.

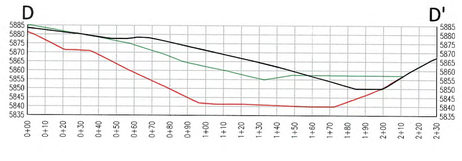
3. AREAS TO REMAIN UNDISTURBED SHALL BE PROTECTED DURING AND AFTER THE CONSTRUCTION / INSTALLATION OF THE CULVERTS AND DITCHES WITH THE USE OF SEDIMENT CONTROL DEVICES SUCH AS SILT FENCES OR EXCELSIOR LOGS.

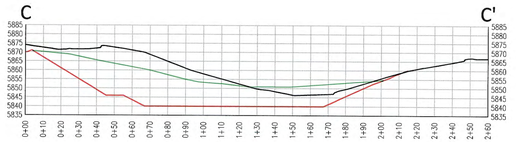
LEGEND:

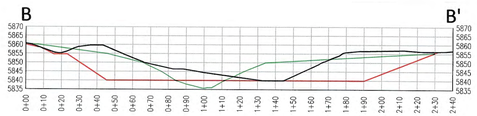
- UNDISTURBED WITHIN THE DISTURBED AREA
- DISTURBED AREA BOUNDARY:
- NATURAL DRAINAGE:
- 6' HIGH CHAIN LINK FENCE
- INCIDENTAL ROCK DISTRIBUTION:
- STREAM BUFFER ZONE SIGNS:
- Earthen Berm
- TEMPORARY ROADWAYS:
- NEW CONTOURS (5' INTERVALS)
- NEW CONTOURS (1' INTERVALS)
- EXISTING CONTOURS (5' INTERVALS)
- NATURAL DRAINAGE
- EXISTING DITCH
- EXISTING CULVERT
- REMOVED CULVERT
- NEW DITCH
- NEW CULVERT
- SHEET FLOW DRAINAGE
- EXISTING DROP BOX
- NEW MANHOLE
- BLM R.O.W. BOUNDARY

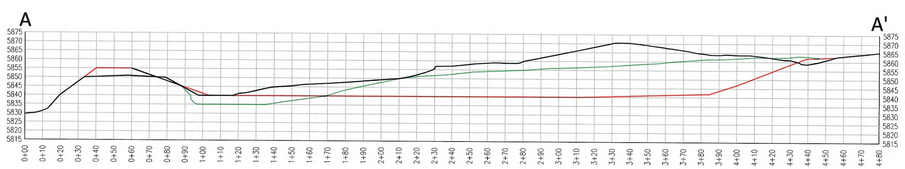


DETAIL A







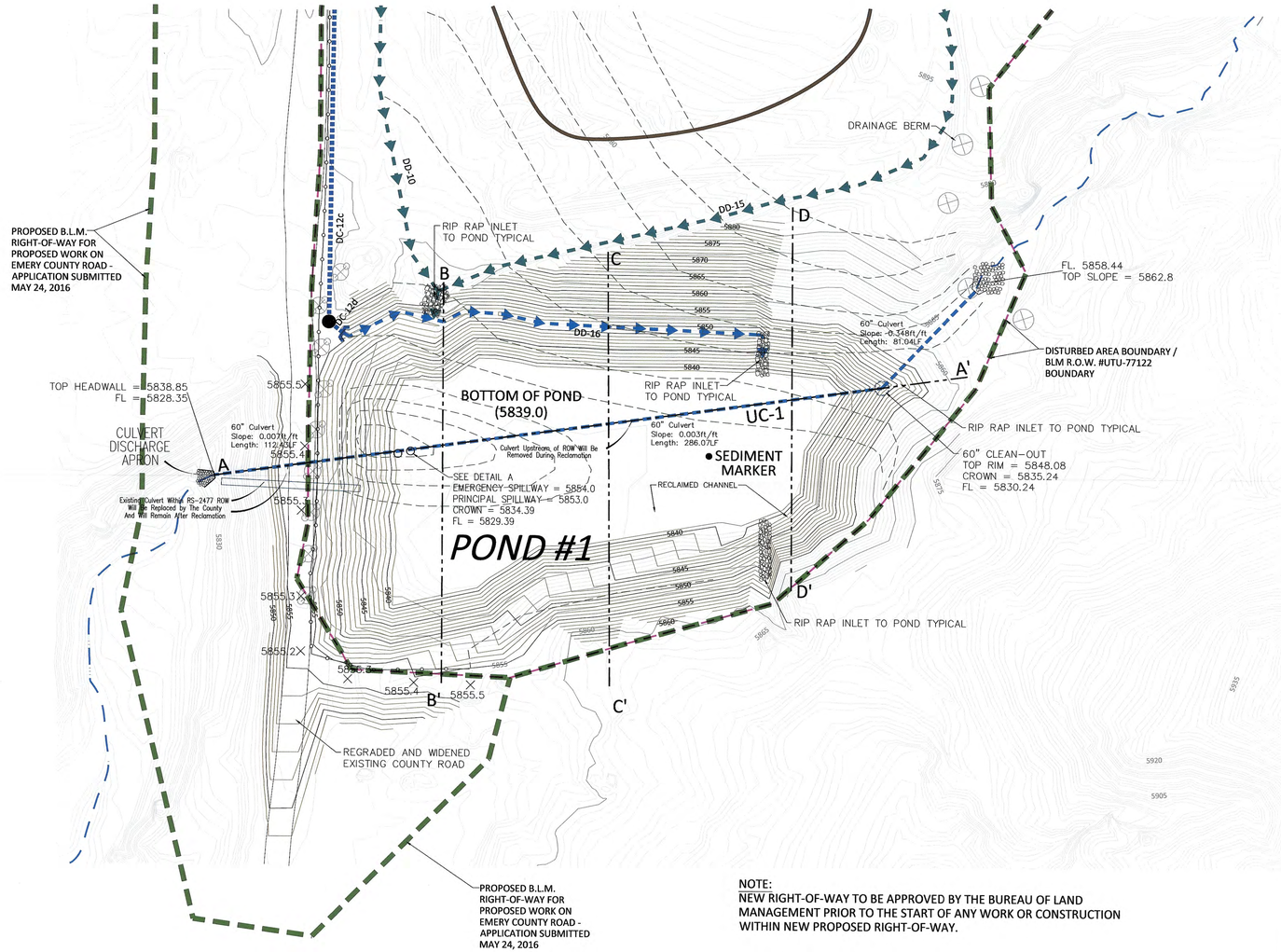


SECTIONS KEY

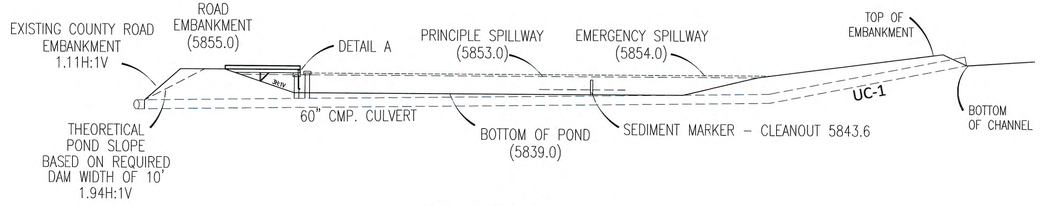
WORKING SURFACE:

PRE-MINING SURFACE:

RECLAIMED SURFACE:



NOTE:
NEW RIGHT-OF-WAY TO BE APPROVED BY THE BUREAU OF LAND MANAGEMENT PRIOR TO THE START OF ANY WORK OR CONSTRUCTION WITHIN NEW PROPOSED RIGHT-OF-WAY.



CULVERT UC-1 DETAIL

R 14 E, T 16 S

LEGEND:

PROPOSED CONTOURS:
EXISTING CONTOURS:
RECLAIMED CONTOURS:
DISTURBED AREA BOUNDARY:
BLM RIGHT-OF-WAY BOUNDARY:
NEW 4' MANHOLE:
NEW CULVERTS:
NEW DITCH:
EXISTING DITCH
NEW FENCE LINE:
BERM (DURING OPERATIONS):
UNDISTURBED DRAINAGE:

REVISION DATE:

DATE	BY:
Apr 2008	TJS
Apr 2009	TJS
Jul 2015	TJS
Oct 2015	TJS
JUNE 2016	PJJ

LILA CANYON MINE

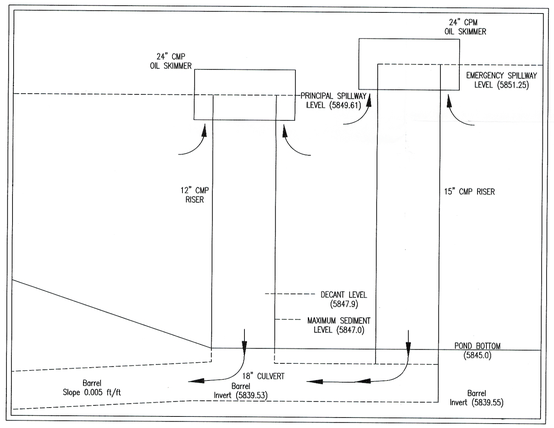
PROPOSED SEDIMENT POND #1

DESIGNED BY: HYDROLOGIC DESIGN
DATE: APRIL 2008
PLATE #: 7-6a
SCALE: AS SHOWN

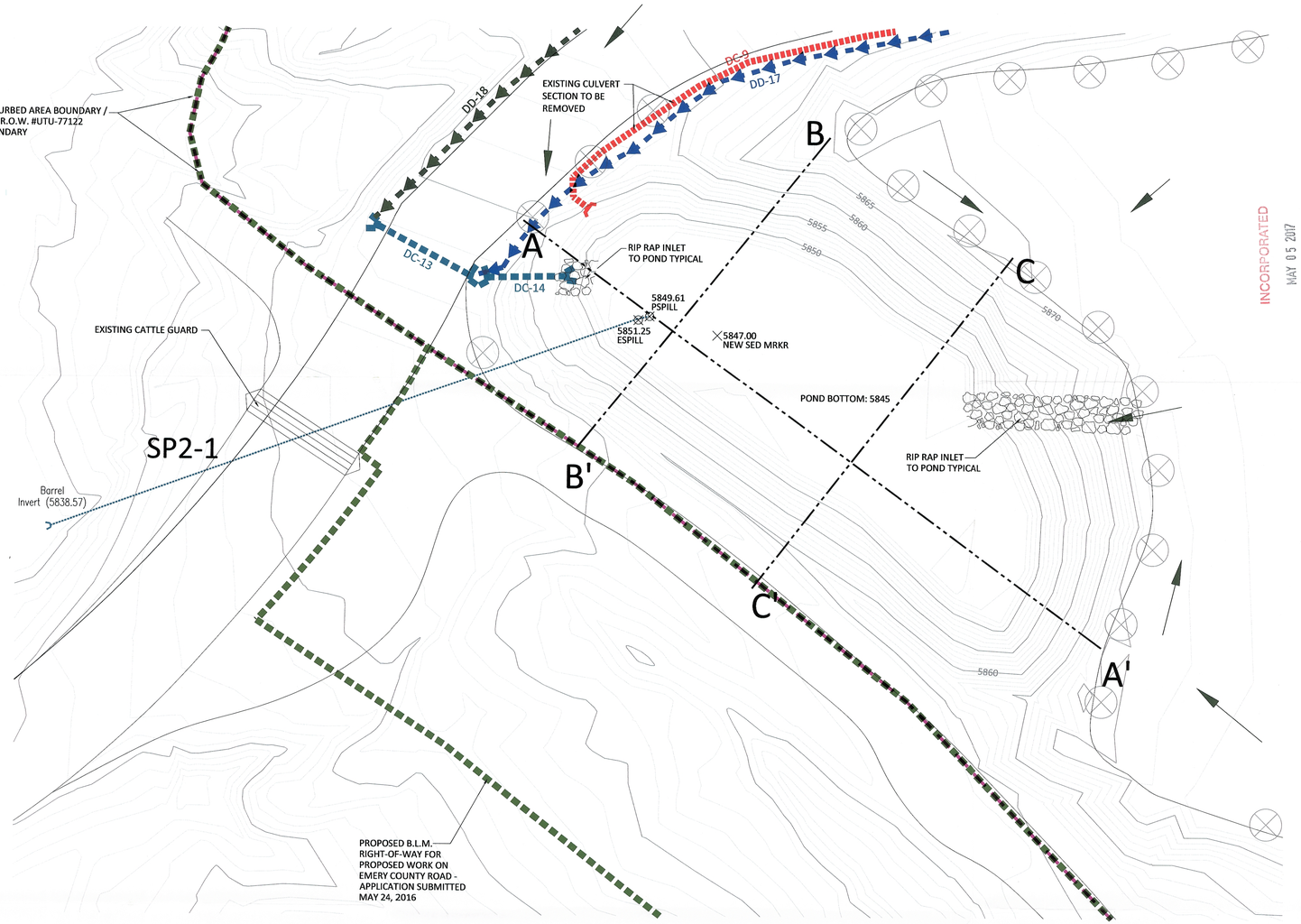
RECEIVED
MAY 01 2017
DIV OF OIL, GAS & MINING

REGISTERED PROFESSIONAL ENGINEER
#6449561
David S. Wiley
5/4/17
STATE OF UTAH
CERTIFICATE NOT VALID UNLESS THIS SEAL IS PRINTED IN BLUE INK AND CONTAINS ORIGINAL SIGNATURE

INCORPORATED
MAY 05 2017
Energy Oil, Gas & Mining



DETAIL A



INCORPORATED
MAY 05 2017

Div. of Oil, Gas & Mining

RECEIVED
MAY 01 2017
DIV. OF OIL, GAS & MINING

LILA CANYON MINE

PROPOSED SEDIMENT POND #2

DWG	APRIL 2008	DESIGNED By:	HYDROLOGIC DESIGN
SCALE	AS SHOWN	PLATE #	7-6b

REVISION DATE:

DATE	BY:	DATE	BY:
Apr 2008	TJS		
Jun 2009	TJS		
Dec. 2015	PJJ		
JUNE 2016	PJJ		

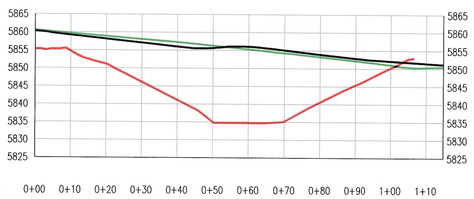
SECTIONS KEY

WORKING SURFACE:

PRE-MINING SURFACE:

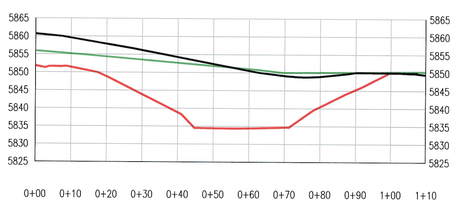
RECLAIMED SURFACE:

C



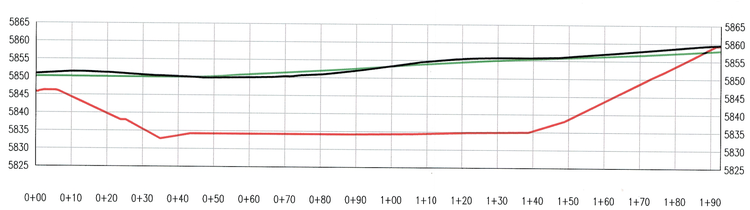
C'

B



B'

A



A'

LEGEND:

DISTURBED AREA BOUNDARY:
6' HIGH CHAIN LINK FENCE
INCIDENTAL ROCK DISTRIBUTION:
TEMPORARY ROADWAYS:
EXISTING CONTOURS (5' INTERVALS)
EXISTING CONTOURS (1' INTERVALS)
EXISTING DITCH
EXISTING CULVERT
REMOVED CULVERT
NEW DITCH
SHEET FLOW DRAINAGE
BLM R.O.W. BOUNDARY

R 14 E, T 16 S

40 FEET
20
0
10

CERTIFIED ENGINEER
#6449561
David K. Hipps
5/1/17
REGISTERED PROFESSIONAL ENGINEER
STATE OF UTAH

I CERTIFY THIS MAP TO BE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

LILA CANYON MINE

PROPOSED SURFACE FACILITIES (FINAL CONFIGURATION)

DRAWN: R. Jay Marshall | DATE: JUNE 2016 | FILE #: | PLATE #: B-1 (FORMERLY PLATE 5-2)
SCALE: AS SHOWN

RECEIVED
MAY 01 2017
DIV. OF OIL, GAS & MINING

REGISTERED PROFESSIONAL ENGINEER
#6449561
David W. Hibbs
STATE OF UTAH

I CERTIFY THIS MAP TO BE TRUE AND CORRECT AS SHOWN AND DESCRIBED HEREON

INCORPORATED
MAY 05 2017
Div. of Oil, Gas & Mining

NOTE:
CONTROL POINT COORDINATE SYSTEM IS U.S. STATE PLANE 1983 UTAH CENTRAL (4302) ADJUSTED TO SEA LEVEL.

REVISION DATE:

DATE:	BY:	
JUNE 2016	PJJ	

FEDERAL LEASE #SL-066490

FEDERAL LEASE #SL-066490(M)

BLM R.O.W. #UTU-77122

A.S.C.A. Disturbed

A.S.C.A. Disturbed

LILA CANYON ROAD

MINE ACCESS ROAD

EXISTING UNPAVED EMERY COUNTY ROAD RS-2477 - R.O.W. WIDTH OF DISTURBANCE

PROPOSED B.L.M. RIGHT-OF-WAY FOR PROPOSED WORK ON EMERY COUNTY ROAD - APPLICATION SUBMITTED MAY 24, 2016

STREAM BUFFER ZONE

STREAM BUFFER ZONE

LOWER PAD
EMPLOYEE PARKING 191 SPACES

MINE PARKING 51 SPACES

POND #2

POND #1

CONTROL POINT BETA
NORTHING: 6,961,805.36
EASTING: 1,965,344.01
ELEVATION: 5859.34'

SUBSTATION

STORAGE

Rock Slope Material
17'+4' Cover
28,000 cy

ACCESS ROAD

PORTAL ACCESS ROAD

PORTAL ACCESS ROAD

CONTROL POINT DELTA
NORTHING: 6,962,108.13
EASTING: 1,967,118.52
ELEVATION: 6129.72'

UPPER PAD

MIDDLE PAD

CAT TRAIL

ESCAPE TUNNEL AND FAN

ROCK SLOPES

OUTCROP

NORTH BREAKOUT

UNDERGROUND MINE WORKINGS

OUTCROP

SOUTH BREAKOUT

UNDISTURBED

Topsoil Storage Area
Bot. pile = 5856
Top pile = 5930
Volume = 65,746 C.Y.

TOPSOIL PILE
TOPSOIL SALVAGED TO DATE: 65,746 C.Y.

N = 6,962,007.69
E = 1,966,469.50

KEYED MINE FACILITIES

1. OFFICE / BATH HOUSE
2. ROM COAL STOCKPILE
3. SHOP/ WAREHOUSE BUILDING
4. SECURITY SHACK
5. PAVED PARKING AREA
6. SUPPLY TRUCK LOADING / UNLOADING AREA
7. EQUIPMENT / MATERIALS STORAGE AREA
8. WATER TANK
9. SEWER TREATMENT PLANT
10. POWER POLE
11. ELECTRICAL TRANSFORMER
12. OVERHEAD POWER TRANSMISSION LINE
13. BURIED POWER TRANSMISSION LINE
14. ROCK DUST SILO
15. FUEL STORAGE TANK
16. UNDERGROUND RECLAIM TUNNEL
17. RECLAIM CONVEYOR ASSEMBLY (48")
18. LOADOUT CONVEYOR ASSEMBLY (48")
19. CRUSHER / LOADOUT MCC BUILDING
20. TRUCK SCALE / LOADOUT STRUCTURE
21. REFUSE CONVEYOR STRUCTURE (48")
22. CRUSHER BUILDING
23. UNDERGROUND RECLAIM ESCAPE TUNNEL WITH FAN
24. RECLAIM FEEDER
25. EMERGENCY RECLAIM FEEDER
26. EXTENDED RAW COAL CONVEYOR (60")
27. REFUSE PILE
28. ELECTRICAL GROUNDING FIELD
29. POND SPILLWAY STRUCTURE
30. RAW COAL CONVEYOR (60")
31. STEEL PORTAL CANOPY STRUCTURE
32. CONCRETE CONVEYOR BAY
33. ROM COAL STACKING TUBE
34. MINE MCC BUILDING / ELECTRICAL TOWER
35. BACKUP FAN
36. MAIN MINE BLOWING FAN
37. WATER TREATMENT PLANT
38. POWDER AND CAP MAGAZINES
39. CHAIN-LINK FENCE

N
R 14 E, T 16 S
200' 100' 0 50'

LEGEND:
- UNDISTURBED WITHIN THE DISTURBED AREA
- DISTURBED AREA BOUNDARY:
- NATURAL DRAINAGE:
- 6' HIGH CHAIN LINK FENCE
- TEMPORARY ROADWAYS:
- BLM R.O.W. BOUNDARY LINE:
- STRUCTURAL FILL:
- TOPSOIL BERM:
- LEASE BOUNDARY LINES:
- INCIDENTAL ROCK DISTRIBUTION:
- STREAM BUFFER ZONE SIGNS:
- SURFACE CONTOURS (5' INTERVALS):

NOTES: 1. REFER TO PLATE 5-7A&B FOR CROSS-SECTIONS.