



23 December 2013

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DIV. OF OIL, GAS & MINING

Mr. Daron R. Haddock, Coal Program Manager  
Utah Division of Oil, Gas & Mining  
1594 West Temple, Suite 1210  
Salt Lake City, Utah 84114-5801

Re: Clean Submittal of Phase I & II Bond Release of the Tank Seam Road, Upper Storage Pad and Portal Pad Access Area, C/015/0025, Task ID #4402

Dear Mr. Haddock:

Attached are the C1, C2 forms, and two (2) clean copies prepared for incorporation into the current Castle Valley Mining, LLC, Mining and Reclamation Plan (MRP) as required in a letter dated 25 November 2013 from the Division of Oil, Gas & Mining (DOGGM).

Remove the Public Notice and Letters of Notification from the redline/strikeout submittal and place them into the current Castle Valley Mining, LLC, MRP. The reason for this request is because these items have not changed since that submittal.

Sincerely,

Tony Welch  
Resident Agent

A handwritten signature in black ink that reads "Tony Welch". The signature is written in a cursive style with a large, sweeping "T" and "W".

P.O. Box 475 • Huntington, UT 84528  
Phone (435) 687-5454 • Fax (435) 687-5037

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### APPLICATION FOR COAL PERMIT PROCESSING

Permit Change  New Permit  Renewal  Exploration  Bond Release  Transfer

Permittee: Castle Valley Mining, LLC

Mine: \_\_\_\_\_

Permit Number: **ACT 015/0025**

Title: Phases I and II Bond Release

Description, Include reason for application and timing required to implement:  
Bond Release on reclaimed areas TS- 8, 10 11 and portions of 7

**Instructions:** If you answer yes to any of the first eight questions, this application may require Public Notice publication.

- Yes  No 1. Change in the size of the Permit Area? Acres: \_\_\_\_\_ Disturbed Area: \_\_\_\_\_  increase  decrease.
- Yes  No 2. Is the application submitted as a result of a Division Order? DO# \_\_\_\_\_
- Yes  No 3. Does the application include operations outside a previously identified Cumulative Hydrologic Impact Area?
- Yes  No 4. Does the application include operations in hydrologic basins other than as currently approved?
- Yes  No 5. Does the application result from cancellation, reduction or increase of insurance or reclamation bond?
- Yes  No 6. Does the application require or include public notice publication?
- Yes  No 7. Does the application require or include ownership, control, right-of-entry, or compliance information?
- Yes  No 8. Is proposed activity within 100 feet of a public road or cemetery or 300 feet of an occupied dwelling?
- Yes  No 9. Is the application submitted as a result of a Violation? NOV # \_\_\_\_\_
- Yes  No 10. Is the application submitted as a result of other laws or regulations or policies?

*Explain:* \_\_\_\_\_

- Yes  No 11. Does the application affect the surface landowner or change the post mining land use?
- Yes  No 12. Does the application require or include underground design or mine sequence and timing? (Modification of R2P2)
- Yes  No 13. Does the application require or include collection and reporting of any baseline information?
- Yes  No 14. Could the application have any effect on wildlife or vegetation outside the current disturbed area?
- Yes  No 15. Does the application require or include soil removal, storage or placement?
- Yes  No 16. Does the application require or include vegetation monitoring, removal or revegetation activities?
- Yes  No 17. Does the application require or include construction, modification, or removal of surface facilities?
- Yes  No 18. Does the application require or include water monitoring, sediment or drainage control measures?
- Yes  No 19. Does the application require or include certified designs, maps or calculation?
- Yes  No 20. Does the application require or include subsidence control or monitoring?
- Yes  No 21. Have reclamation costs for bonding been provided?
- Yes  No 22. Does the application involve a perennial stream, a stream buffer zone or discharges to a stream?
- Yes  No 23. Does the application affect permits issued by other agencies or permits issued to other entities?
- Yes  No 24. Does the application include confidential information and is it clearly marked and separated in the plan?

Please attach three (3) review copies of the application. If the mine is on or adjacent to Forest Service land please submit four (4) copies, thank you. (These numbers include a copy for the Price Field Office)

I hereby certify that I am a responsible official of the applicant and that the information contained in this application is true and correct to the best of my information and belief in all respects with the laws of Utah in reference to commitments, undertakings, and obligations, herein.

JAREN JORBEUSEN ENGINEER TECH 12/30/13 JAREN JORBEUSEN  
Print Name Position Date Signature (Right-click above choose certify then have notary sign below)

Subscribed and sworn to before me this 30 day of December, 2013

Notary Public: Brookelle Langi, state of Utah.

My commission Expires: February 4, 2017  
Commission Number: 1663336

Address: 51 N Main  
City: Huntington State: UT Zip: 84628



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Assigned Tracking Number:

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# APPLICATION FOR COAL PERMIT PROCESSING

## Detailed Schedule Of Changes to the Mining And Reclamation Plan

Permittee: Castle Valley Mining, LLC

Mine: \_\_\_\_\_

Title: Phases I and II Bond Release

Permit Number: \_\_\_\_\_

ACT 015/0025

Provide a detailed listing of all changes to the Mining and Reclamation Plan, which is required as a result of this proposed permit application. Individually list all maps and drawings that are added, replaced, or removed from the plan. Include changes to the table of contents, section of the plan, or other information as needed to specifically locate, identify and revise the existing Mining and Reclamation Plan. Include page, section and drawing number as part of the description.

### DESCRIPTION OF MAP, TEXT, OR MATERIAL TO BE CHANGED

			DESCRIPTION OF MAP, TEXT, OR MATERIAL TO BE CHANGED
<input type="checkbox"/> Add	<input checked="" type="checkbox"/> Replace	<input type="checkbox"/> Remove	Clean Chapter 1, Page 1-12
<input type="checkbox"/> Add	<input checked="" type="checkbox"/> Replace	<input type="checkbox"/> Remove	Clean Chapter 2, Pages 2-4, 2-13, 2-19, 2-26, 2-34, 2-35, 2-39, and 2-40
<input type="checkbox"/> Add	<input checked="" type="checkbox"/> Replace	<input type="checkbox"/> Remove	Clean Chapter 5, Pages 5-11, 5-21, 5-24, 5-43, 5-44, 5F-2, 5F-4, 5F-8, 5I-61, and
<input type="checkbox"/> Add	<input checked="" type="checkbox"/> Replace	<input type="checkbox"/> Remove	5I-77
<input checked="" type="checkbox"/> Add	<input type="checkbox"/> Replace	<input type="checkbox"/> Remove	Chapter 5, Appendix R - Cross-Sections Tank Seam Access Road
<input type="checkbox"/> Add	<input checked="" type="checkbox"/> Replace	<input type="checkbox"/> Remove	Clean Chapter 7, Pages 7-113, 7-114, 7-115, 7-117, 7-119, 7-120, 7-121, 7-133,
<input type="checkbox"/> Add	<input checked="" type="checkbox"/> Replace	<input type="checkbox"/> Remove	7-134, 7-139, 7G-49, 7G-51, 7G-54, 7G-55, 7G-56, 7G-57, 7G-70, 7G-71, 7G-72, 7G-73,
<input type="checkbox"/> Add	<input checked="" type="checkbox"/> Replace	<input type="checkbox"/> Remove	7G-74, 7G-97, 7G-102, 7G-105, 7G-108, 7G-109, 7G-111, 7G-112, 7G-138, 7G-142, 7G-143,
<input type="checkbox"/> Add	<input checked="" type="checkbox"/> Replace	<input type="checkbox"/> Remove	7G-144, 7G-145, 7G-146, 7G-147, 7G-148, 7G-149, 7G-171, 7G-172, 7G-173, 7G-174, 7G-175,
<input type="checkbox"/> Add	<input checked="" type="checkbox"/> Replace	<input type="checkbox"/> Remove	7G-176, 7G-177, 7G-178, and 7H-53
<input type="checkbox"/> Add	<input checked="" type="checkbox"/> Replace	<input type="checkbox"/> Remove	Clean Chapter 8, TABLE 8-1, Page 8-2
<input type="checkbox"/> Add	<input checked="" type="checkbox"/> Replace	<input type="checkbox"/> Remove	Clean Chapter 8, Appendix A, DOGM Reclamation Calculations
<input type="checkbox"/> Add	<input checked="" type="checkbox"/> Replace	<input type="checkbox"/> Remove	Clean Chapter 2, Page 3-iv
<input checked="" type="checkbox"/> Add	<input type="checkbox"/> Replace	<input type="checkbox"/> Remove	Chapter 3, Appendix M - Castle Valley Mine (Rhino Energy) Vegetation Sampling
<input type="checkbox"/> Add	<input checked="" type="checkbox"/> Replace	<input type="checkbox"/> Remove	Map 2-1A - SOILS MAP
<input type="checkbox"/> Add	<input checked="" type="checkbox"/> Replace	<input type="checkbox"/> Remove	Map 2-3C - RECLAMATION AREA
<input type="checkbox"/> Add	<input checked="" type="checkbox"/> Replace	<input type="checkbox"/> Remove	Map 2-3E - RECLAMATION AREA
<input type="checkbox"/> Add	<input checked="" type="checkbox"/> Replace	<input type="checkbox"/> Remove	Map 5-2C - SURFACE FACILITIES
<input type="checkbox"/> Add	<input checked="" type="checkbox"/> Replace	<input type="checkbox"/> Remove	Map 5-6C - POST-MINING TOPOGRAPHY
<input type="checkbox"/> Add	<input checked="" type="checkbox"/> Replace	<input type="checkbox"/> Remove	Map 5-6E - POST MINING TOPOGRAPHY
<input type="checkbox"/> Add	<input checked="" type="checkbox"/> Replace	<input type="checkbox"/> Remove	Map 7-1C - HYDROLOGY MAP
<input type="checkbox"/> Add	<input checked="" type="checkbox"/> Replace	<input type="checkbox"/> Remove	Map 7-5 - WATERSHED MAP
<input type="checkbox"/> Add	<input type="checkbox"/> Replace	<input type="checkbox"/> Remove	_____
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**Any other specific or special instruction required for insertion of this proposal into the Mining and Reclamation Plan.**

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PHASE I  
BOND RELEASE

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**CHAPTER 1**  
**R645-301-100 GENERAL CONTENTS**

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**Table 1-4 Surface Disturbance Summary Error! Bookmark not defined**

<b>DESCRIPTION</b>	<b>Total acres</b>	<b>Pre-1977 acres</b>	<b>New acres</b>	<b>Reclaimed acres</b>
Ball Park Topsoil Pile	1.27	-0-	1.27	
Lower Haul Road	1.60	1.60	-0-	
Sed Pond B & Scale Office Pad	2.60	1.23	1.37	
Sed Pond A	0.75	-0-	0.75	
Maine Pad Area	12.32	8.89	3.43	
Portal Access Pad	3.25	0.02	3.23	
Blind Canyon Seam Portal Area	1.81	0.51	1.30	1.18
Upper Storage Pad	0.87	-0-	0.87	0.87
Shower House Pad	1.83	-0-	1.83	
Tank Seam Access Road	2.91	-0-	2.91	2.91
Tank Seam Portal Pad	0.66	-0-	0.66	0.66
No. 3 Mine Access Road	3.26	-0-	3.26	
Conveyor belt Access/Topsoil Stockpile	1.50	-0-	1.50	
Upper Conveyor belt Access Road No. 2	0.96	-0-	0.96	
WHR Blind Canyon Seam Portal Area	1.58	-0-	1.58	
1 No. 4 Mine Access Road	0.89	-0-	0.89	
2WHR Tank Seam Portal Pad Area	2.22	-0-	2.22	
<b>TOTAL</b>	<b>40.28</b>	<b>12.25</b>	<b>28.03</b>	<b>5.62</b>

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CHAPTER 2  
R645-301-200 SOILS

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Table 2-3 Available Substitute Topsoil Material

Location	Drill Hole	Drill Depth (in)	Area (acres)	Volume Available (cu. yd)	Minimum Cut Depth (in)
TS-3	SEDB-1	24	.09	296	13
TS-3	SEDB-2	48	.09	602	13
TS-3	SHP-1	60	1.34	10,797	13
TS-3	SHP-2	60	.81	6,533	13
<b>TS-3 Totals</b>			<b>2.33</b>	<b>18,228</b>	
TS-4	SEDA-1	24	.24	777	2.5
TS-4	SEDA-2	24	.20	641	2.5
<b>TS-4 Totals</b>			<b>.44</b>	<b>1,418</b>	
TS-5	SP-1	18	.69	1,680	18
TS-5	SP-2	24	.36	1,150	24
TS-5	CSP-1	96	.95	12,190	30
TS-5	CSP-2	84	1.32	14,863	27
TS-5	CSP-3	72	.25	1,931	27
TS-5	CSP-4	60	1.67	13,469	27
TS-5	CSP-5	72	3.03	29,325	27
<b>TS-5 Totals</b>			<b>8.28</b>	<b>74,608</b>	
TS-6	PAR-1	84	2.62	29,589	12
TS-7	LHP-1	96		10067	12
TS-8	USP-1	120		0	12
TS-9	REF-1	36	.26	1,253	18
TS-9	REF-2	36	.71	3,413	18
TS-9	REF-3	36	.23	1,122	18
<b>TS-9 Totals</b>			<b>1.20</b>	<b>5,788</b>	

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The following table summarizes the volumes of topsoil being stored.

Table 2-5 Topsoil Summary Table

<u>Description</u>	<u>cu yd</u>
Main Topsoil Pile	1,480
Tank Seam Road Topsoil Storage Areas	<del>1,000</del>
Wild Horse Ridge Topsoil Pile	12,254
Wild Horse Ridge Tank Seam Topsoil Pile	<u>1,400</u>
Subtotal	15,134
On-site Material (Substitute Topsoil)	<u>43,323*</u>
Total	58,457

NOTES:

1. \* This information from Table 2-8
2. Additional On-site Material (Substitute Topsoil) figures can be found in the different sections of R645-301-242 Soil Redistribution.

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### **Tank Seam Access Road and Portal Pad Topsoil Pile**

A survey of topsoil material was performed in the area of the Tank Seam access road and portal pad area in 1992. Four sites were sampled and the soil was analyzed. These sites are designated on Plate 2-3E as TSA-1, TSA-2, TSA-3 and TSA-4 (See Appendix 2-A for test results). Results indicated highest organic matter accumulations in the top 0-6 inches. Test results also indicate that the material tested is suitable for final reclamation material at all depths. See discussion in Appendix 2-D. Soil depths were determined by the visible presence of organic matter and a distinct soil color change. The observations indicated a varying soil depth of 0 to 8 inches, the lesser depths being in the steep rocky areas. During construction, topsoil was stripped at depths varying from 0 to 8 inches by visually observing the depth at which organic material is found in the soil. The volume of topsoil which was recovered and placed in the designated storage area is 1,000 cubic yards.

This topsoil pile was utilized in the reclamation of the Tank Seam Access Road and Portal Pad.

### **Wild Horse Ridge Topsoil Stockpile**

A survey of topsoil material was performed in the area of the shower house pad and Sediment Pond "C". Three sites were sampled and the soil was analyzed. These sites are

**Table 2-7 Reclamation Area Summary**

MARK	DESCRIPTION	Total ac. <sup>1,2,3</sup>	Re-contour acrea <sup>1&amp;2</sup>	Pre-1977 acrea <sup>2</sup>	New acres <sup>1</sup>	Reclaimed Acres
TS-1	Ball Park Topsoil Pile	1.27	0.0	-0-	1.27	
TS-2	Lower Haul Road	1.6	0.0	1.6	-0-	
TS-3	Sed Pond B & Scale Office Pad	2.60	1.41	1.23	1.37	
TS-4	Sed Pond A	0.75	0.75	-0-	0.75	
TS-5	Main Pad Area	12.32	*.41	8.89	3.43	
TS-6	Portal Access Road	3.25	3.25	0.02	3.23	
TS-7	Blind Canyon Seam Portal Area	1.81	1.981	0.51	1.30	1.18
TS-8	Upper Storage Pad	0.87	0.83	-0-	0.87	0.87
TS-9	Shower House Pad	1.83	1.83	-0-	1.83	
TS-10	Tank Seam Access Road	2.91	2.91	-0-	2.91	2.91
TS-11	Tank Seam Portal Pad	0.66	0.59	-0-	0.66	0.66
TS-12	Wild Horse Ridge Access Road	3.26	0.22	-0-	3.26	
TS-13	Conveyor belt Access/Topsoil	1.50	1.14	-0-	1.50	
TS-14	Upper Conveyor belt Access Road	0.96	0.66	-0-	0.96	
TS-15	WHR Blind Canyon Seam Portal Area	1.58	1.58	-0-	1.58	
TS-16	WHR TS Lower Portal Access Road	0.89	0.0	-0-	0.89	
TS-17	WHR TS Upper Access Road and Pad	2.22	1.74	-0-	2.22	
	TOTAL	40.28	28.13	12.25	28.03	5.62

Notes:

1. See Plates 2-3.
2. See Plates 5-2.
3. The total acres represent acreage which will be reclaimed. Some of the acres will not require re-contouring or regrading during reclamation. The "Re-contour acres" represent the total acres which will require regrading. The "Total acres" shown will be reclaimed in accordance with the reclamation plan.

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The proposed substitute topsoil material will be re-tested in the final five years of operations according to Table 5O-1 and will include Total Petroleum Hydrocarbons by EPA Methods 8015 and 418.1. The location of these samples will correlate with the areas generating the most substitute topsoil material as described in Appendix 5-I. Following regrading, soils remaining on the surface as substitute topsoil material will be sampled for pH, EC, and Total Hydrocarbons by EPA method 8015 for diesel fuel and 418.8 for waste oil.

Table 2-8 Substitute Topsoil Summary

Location	Topsoil Amounts Required			Substitute Topsoil Generated from Cuts (cu. yd.)			
	Area (acres)	Depth (in.)	Volume (cu. yd.)	Topsoil Stockpile	Sub. Topsoil Generated	Sub. Topsoil Not Regraded	Total Topsoil
TS-3	1.41	12	<b>2,275</b>	0	2,080	2,563	<b>4,643</b>
TS-4	.75	10	<b>1,008</b>	0	1,008	0	<b>1,008</b>
TS-5	9.41	12	<b>15,181</b>	0	20,814	4,537	<b>25,351</b>
TS-6	3.25	12	<b>5,243</b>	0	7,111	0	<b>7,111</b>
TS-7	0.52	12	839	0	867	0	<b>867</b>
TS-8	0	12		0	0	0	<b>0</b>
TS-9	1.83	12	<b>2,952</b>	1,200	3,761	0	<b>4,961</b>
<b>Total</b>			<b>33,032</b>				<b>43,323</b>

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TS-6 Portal Access Road. This area was disturbed prior to initiation of Mining by Co-Op Mining Co. and did not have topsoil recovered for reclamation purposes. This area has received special attention in the past and is discussed in Appendix 2-C. This area will be treated the same as area TS-2. 29,589 cu. yd. of substitute topsoil material is available in the recovered area. 7,111 cu. yd. of material will be used giving a minimum depth of 12 inches of substitute topsoil material over the entire area. 2,553 cu. yd. of fill material will be generated in this area for use in TS-7 and TS-8.

TS-7 Portal Pad Area. Most of this area is within the pre-1977 disturbed area and did not have topsoil recovered for reclamation purposes. Downcast material will be recovered for reclamation. 22,329 cu. yd. of substitute topsoil material is available in the recovered area. 4,170 cu. yd. of this material will be used giving a minimum depth of 12 inches of substitute topsoil material over the entire area. 11,582 cu. yd. of fill material will come from TS-5 and TS-6. All but approximately 0.52 acres have been reclaimed.

TS-8 Upper Storage Pad. This area has been reclaimed

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.TS-9 Shower House Pad. This area will have topsoil recovered for reclamation purposes. Sources for contamination are minimal. Following recontouring at the time of final reclamation, the topsoil material recovered prior to construction will be spread over the surface to attain an approx depth of 7 inches. Additional in place material has been tested and is available in the recovered area for substitute topsoil. At least 2,952 cu. yd. of this material will be placed below the 7 inches of topsoil, giving a minimum depth of 12 inches of topsoil or substitute topsoil material over the entire area.

TS-10 Tank Seam Access Road. This area has been reclaimed.

TS-11 Tank Seam Portal Pad. This area has been reclaimed.

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# CHAPTER 5

## R645-301-500 ENGINEERING

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5R-1

## **R645-301-527 Transportation Facilities**

There are nine primary roads in the permit area: Bear Canyon Haul Road, Shower House Road, road to Sediment Pond A, Tipple Access Road, Shop Road, No. 3 Mine Access Road, No. 4 Mine Access Road, and the No.1 and No.2 Conveyor Access Roads. All roads are shown on Plates 5-2. Road profiles and typical cross sections are shown on Plates 5-4. A description of all roads is included in Appendix 5-F, along with maintenance procedures. Construction of the Tank Seam Access Road is discussed in Appendix 5-G. Construction of the Wild Horse Ridge road is discussed in Appendix 5-J. Construction of the Wild Horse Ridge Tank Seam Road is discussed in Appendix 5-K. Construction of the Mohrland Road is discussed in Appendix 5-L. Construction of the No. 4 Mine Access Road is discussed in Appendix 5-K.

The mine area is approached on the Bear Canyon Haul Road. The #1 mine portal is reached on the Portal Access Road. The Wild Horse Ridge area is accessed on the No. 3 Mine Access Road. The WHR Tank Seam is accessed on the No. 4 Mine Access Road. Six other primary roads provide access; to the Sediment Pond A, the coal preparation facility (tipple), the shop, the Wild Horse Ridge conveyor belts, and to the Shower House.

The Bear Canyon Haul Road, No. 3 Mine Access Road, and part of the No. 4 Mine Access Road are also used by customers of Sportsman's Hunting to access a hunting cabin, which exists in the right fork of Bear Canyon. This non-mining recreational use of the road occurs primarily from May until November, typically 2-3 times per week. A lease agreement

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Coal will be transferred from the Tank Seam to the Blind Canyon Seam of the Bear Canyon No. 1 Mine through a 7 ft diameter borehole, which has been bored from the surface adjacent to the portal. The conveyor from the portal and the drop tube structure will be enclosed. Air cannons will be placed on the outside of the drop tube to prevent the wedging of coal in the tube. A 7 ft diameter borehole will be used in Wild Horse Ridge to transfer coal from the Tank Seam (#4 Mine) to the Blind Canyon Seam (#3 Mine). This borehole, was constructed underground.

Coal from the #3 mine will be transferred from the portal area to the tippie using an overland conveyor. This conveyor is shown on Plates 5-2C, 5-2F and 5-2G. The conveyor will either be suspended in the air from cables or set on stands on the ground. Because the Wild Horse Ridge area is an important migratory path for the deer and elk, restriction of this migration by the conveyor in areas where it sets on the ground is a concern. To mitigate this potential problem, the stands will be constructed to suspend the bottom of the conveyor belt a minimum of 36" above the ground. A typical cross-section of the conveyor is shown in Appendix 7-K, Figure 1. All moving parts are contained within the spill pan, so there will be no danger to wildlife passing under the conveyor.

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## **Tank Seam Access Road Reclamation**

The Tank Seam Portal Pad (TS-11), Tank Seam Access Road (TS-10), Upper Storage Pad (TS-8) and 1.29 acres of the Blind Canyon Seam Portal Area (TS-7) have been reclaimed.

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## GENERAL COMMENTS

### **Construction**

All roads shall be constructed and maintained in such a manner that the approved design standards are met throughout the life of the entire transportation facility. This shall include maintenance of the surface, shoulders, parking, side areas, and erosion control structures for safe and efficient utilization of the road. Road are shown on Plates 5-2. Cross sections and profiles are found on Plates 5-4.

The horizontal alignment of each road is consistent with the existing topography and with the volume, speed, and weight of anticipated traffic. The highly traveled Primary Haul Road is surfaced with 4 in. min of durable road base material. The high percentage of coarse granular material in the native soil provides for adequate surfacing of the remaining roads. Additional road base may be added to all roads as required. Damage to the roads from use or weather events shall be promptly repaired.

Ditches and culverts have been designed and installed to control and safely pass or contain runoff from a 10-yr, 24-hr precipitation event. Ditches are rip-rapped as required. Culverts are fitted with trash racks to prevent plugging and buried adequately to prevent crushing. Rock or concrete headwalls are provided at inlets to all culverts, and

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## Reclamation

All roads shall be removed upon completion of the mining operation except those approved as part of the post-mining land use. The timing and procedure of removal and reclamation is discussed in detail under the Backfilling and Grading Plan in R645-301-553 See R645-301-540, and Chapters 7, 2 and 3 for full reclamation procedures.

During reclamation road surfacing material will be removed and salvaged or buried as fill material in the reclamation of highwalls, see Appendix 5-I. Reclamation will then be accomplished by ripping up the remaining base, and ensuring that suitable plant growth material is in place prior to planting the area with the approved seed mix. During this time, all culverts shall be removed and either salvaged or disposed of in an approved landfill, and the natural drainage patterns shall be restored.

## PRIMARY ROADS

There are 9 Primary roads within the Permit Area. Each road is described below. Construction of the Tank Seam Access road is described in Appendix 5-G. Construction of the Wild Horse Ridge Access road and Conveyor Access roads are described in Appendix 5-J. Construction of the No. 4 Mine Access Road is described in Appendix 5-K.

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### **Tank Seam Access Road**

This road has been reclaimed.

### **Wild Horse Ridge Access Road**

This road is approximately 4,850 ft long, and provides access to the Bear Canyon #3 Mine, located in the Blind Canyon Seam in Wild Horse Ridge. The road has an overall grade of 10.5 percent, and does not exceed 18 percent at any point. This road existed prior to mining and will remain in place to meet the post-mining land use. Construction of this road is discussed in Appendix 5-J.

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**TS-7 Blind Seam Portal Pad**

TS-7 will be reclaimed as shown on the following cross-sections in order to match the contours shown on plate 5-6C. 11,582 cu. yd. of material from either TS-5 or TS-6 will be used here for the reclamation. Three highwalls are located in this section and all of them will be completely covered with fill material. The highwall shown on section 3+00 is the belt entry and passes under the road before it enters the coal seam. Table 5I-6 show a summary of the cut and fill volumes. 678 cu. yd. of material generated during the load-out expansion is being stored in this area. This is not included in table 5I-6.

**Table 5I-6 - Area TS-7 Cut & Fill Summary**

Section	Fill (-) Volumes (cu. yd.)	Cut (+) Volumes (cu. yd.)			Volume Cumulative (cu. yd.)
	Total Fill Volume	Substitute Topsoil	Regular Soil	Total Cut Volume	
0+00	0	0	0	0	0
1+00	0	0	0	0	0
2+00	0	0	0	0	0
3+00	0	0		0	0
3+50	1,355	137		137	1,218
4+00	1,996	45		45	3,169
5+00	1,703	685		685	4,187
6+00	0	0		0	0
7+00	0	0		0	0
7+50	0	0		0	0
8+00	0	0	0	0	<b>INCORPORATED</b>
<b>Totals</b>	<b>5,054</b>	867	0	<b>867</b>	<b>JAN 13 2014</b>

## TS-8 Upper Storage Pad

This area has been reclaimed.

Table 5I-7 - Area TS-8 Cut & Fill Summary

Section	Fill (-) Volumes (cu. yd.)	Cut (+) Volumes (cu. yd.)			Volume Cumulative (cu. yd.)
	Total Fill Volume	Substitute Topsoil	Regular Soil	Total Cut Volume	
0+00	0	0	0	0	0
1+00	0	0	0	0	0
2+00	0	0	0	0	0
<b>Totals</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	

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APPENDIX R  
CROSS – SECTIONS  
TANK SEAM ACCESS ROAD, UPPERSTORAGE PAD  
AND MINE #1

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PLACE AUTOCAD CROSS – SECTIONS HERE

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# CHPATER 7

## R645-301-700 HYDROLOGY

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Table 7-24 Summary of Division Ditch Calculations

Ditch	Bottom Width (Ft)	Top Width (Ft)	Depth (Ft)	Type Side Slope H:V	Measured Slope %	Contributing Watershed	REQ'D Av. Rip-Rap Size (In.)
D-1D						RECLAIMED	‡
D-2D	0	1.33	0.67	1:1	6 Min 20 Max	AD-3A, AD-5	Bedrock
D-3D	0	2	1	1:1	2 Min 6 Av. 18 Max	AD-3A, AD-5, AD-7	Soil Soil Grouted
D-4D	0	2	1	1:1	2 Min 6 Av. 17 Max	AD-14	Soil Soil D <sub>50</sub> 6"
D-5D	0	1.33	0.67	1:1	4 Min 10 Max	AD-9	Soil
D-6D	0	3	1.5	1:1	2 Min 4 Max	AD-3A, AD-5 AD-7, AD-9, AD-10 AD-12, AD-14	Soil
D-7D	2	3.5	0.75	1.5:1	2 Min 6 Av. 55 Max	AD-1A, AD-1B, AD-2A AD-2B, AD-2C, AD-3B AD-4, AD-6, AD-8	Soil Soil D <sub>50</sub> 6"
8D	0	2	1	1:1	2 Min 7 Max	AD-13	Soil
D-8D Water Bar	0	14	0.33	6:1	3 Av.	AD-13	Soil
D-9D	0	2	1	1:1	4 Min 10	AD-15	Soil
D-10D	1	3.33	0.67	1.5:1	7 Min 50	AD-6, AD-3B, (part) AD-2B, AD-2C	D <sub>50</sub> 4" Bedrock
D-11D	0	1	0.5	1:1	41 Min Near Vert.	Tipple Wash Hose	Grouted Rip-Rap
D-12D	0	1	0.5	1:1	81 Av.	Tipple Wash Hose	Soil
D-13D Water Shed	0	6	0.5	10:1 2:1	0.5 Av.	AD-6 Partial	Soil
D-14D	0	1.33	0.67	1.5:1	0.06 Av.	AU-4A	Soil
D-15D	0	2.00	1.00	1:1	0.05 Av.	AD-16	Soil
D-16D	0	1.50	1.75	1:1	0.05 Av.	AD-18	Soil
D-17D	0	.96	1	1:1	0.08 Av.	AU-23, AD-20	Soil

Notes: 1. Dimensions given indicate minimum requirements. Actual dimensions may vary.  
Minimum required cross-sections will be maintained.

2. The use of line drainage ditches is required when flow velocities exceed approximately 5 feet per second. Rip-rap may be installed where not required.

Table 7-24 Summary of Division Ditch Calculations (Cont)

Ditch	Bottom Width (Ft)	Top Width (Ft)	Depth (Ft)	Type Side Slope H:V	Measured Slope %	Contributing Watershed	REQ'D Av. Rip-Rap Size (In.)
D-1U						RECLAIMED	
D-2U	10 MIN	10 MIN	1 MIN	1:1	7 Min 10 Max	AU-6, AU-11, AD-3A, AD-3B, AD-6	Soil
D-3U	10 MIN	10 MIN	1 MIN	1:1	4 Min 18 Max	AU-8, AU*6, AU-11, AD-3A, AD-3B, AD-6	Soil
D-4U	10 MIN	10 MIN	1 MIN	1:1	1 Min 10 Av. 18 Max	AU-10, AU-8, AU-6, AU-11, AD-3 <sup>a</sup> , AD-3B, AD-6	Soil Soil D <sub>50</sub> 6"
D-5U	0	1	0.5	1:1	4 Min 13 Max	AU-15	Soil
D-6U	0	1.33	0.67	1:1	3 Min 16 Max	AU-14	Soil
D-7U	0	1.33	0.67	1:1	1 Min 16 Max	AU-12	Soil
D-8U	2	4	0.67	1:1	2 Min 31 Max	AU-1, AU-1 <sup>a</sup> , AU-1B, AU-1C, AU-2, AU-2 <sup>a</sup> , AU-2B	Soil
D-9U	3	5	1	1:1	1 Min 6 Max	AU-16	Soil D <sub>50</sub> 4"
D-10U	3	4	0.5	1:1	3 Min 10 Max	AU-17	Soil
D-11U	0	2	1	1:1	3 Min 8 Max	Misc. road damage	Soil
D-12U	0	3	1	1.5:1	3 Min 9 Max	AU-18	Soil D <sub>50</sub> 4"
D-13U	0	2	1	1:1	2 Min 23 Max	Misc. road damage	Soil
D-14U	4	5.5	0.5	1.5:1	6 Min 66 Max	Sed Pond A Outlet	D <sub>50</sub> 4" D <sub>50</sub> 10"
D-15U						RECLAIMED	
D-16U						RECLAIMED	

Table 7-24 Summary of Division Ditch Calculations (Cont)

Ditch	Bottom Width (Ft)	Top Width (Ft)	Depth (Ft)	Type Side Slope H:V	Measured Slope %	Contributing Watershed	REQ'D Av. Rip-Rap Size (In.)
D-17U						RECLAIMED	
D-18D						RECLAIMED	
D-19U						RECLAIMED	
D-20U	0	1.33	0.67	1:1	16 Av.	AU-42	Soil
D-21U	0	2	1.0	1:1	13 Av.	AU-43	D <sub>50</sub> =3"
D-22U	0	3	1.0	1.5:1	11 Av.	AU-19, AU-25	D <sub>50</sub> =6"
D-23U	0	1.16	0.58	1:1	19 Av.	AU-36	Soil
D-24U	0	1.16	0.58	1:1	14 Av.	AU-35	Soil
D-25U	0	1	0.5	1:1	16 Av.	AD-17	Soil
D-26U	0	1	0.5	1:1	24 Av.	AU-32	Soil
D-27U	0.50	2	0.5	1.5:1	13 Min, 30 Max	AU-31	Soil
D-28U	0	1	0.5	1:1	14 Av.	AU-33	Soil
D-29U	0	1.33	0.67	1:1	8 Av.	AU-34	Soil
D-30U	0	1.16	0.58	1:1	13 Av.	AU-25	Soil
D-31U	0	3	1.0	1.5:1	12 Av.	AU-20, AU-26	Bedrock
D-32U	0	1	0.5	1:1	17 Av.	AU-30	Soil
D-33U	0	1.16	0.58	1:1	18 Av.	AU-29	Soil
D-34U	1	2.74	0.58	1.5:1	11 Av.	AU-24	Soil
D-35U	0	2.0	1.0	1:1	10 Av.	AU-29	Soil
D-36	0	1.0	0.5	1:1	8 Av.	AU-27	Soil
D-37	0	1.4	0.7	1:1	8 Av.	AU-26, AU-21	Soil
D-38	0	1.33	0.67	1:1	12 Min, 20 Max	AU-21	D <sub>50</sub> =3"
D-39	0	1.0	0.5	1:1	10 Av.	AU-28	Soil

## CULVERT CHARACTERISTICS

Culvert	Dia. (in.)	Type	Contributing Watersheds	Peak Q(cfs)	Slope (ft/ft)	Outlet Condition
C-1U			RECLAIMED			
C-2U			ABANDONED IN PLACE			
C-3U			ABANDONED IN PLACE			
C-4U			ABANDONED IN PLACE			
C-5U	12	CMP	AU-8,AU-9, AU-15	1.45	0.05	Soil
C-6U	12	CMP	AU-6, AU-7, AU-11 AU-13, AU-14	2.65	0.05	4" rip rap
C-7U	12	CMP	AU-12	0.34	0.05	6" rip rap
C-8U	18	Flexible CMP,RCP	AU-3, AU-3A, AU-4, AU-4A,AU-5	4.45	0.13	12" rip rap
C-9U	60	stl pipe	Bear Creek	108.18	0.06	48" rip rap
C-10U	60	RCP	Bear Creek	108.18	0.06	48" rip rap
C-11U	18	CMP	AU-16	4.92	0.10	6" rip rap
C-12U	24	CMP	AU-17	3.29	0.04	6" rip rap
C-13U C-13aU	15	CMP	misc. road drainage	1.00	0.06	Soil
C-14U	60	CMP	Bear Creek	108.18	0.06	48" rip rap
C-15U	18	CMP Flexible	AU-1B, AU-12 AU-2A, AU-2B	1.46	0.05 0.78	27" rip rap
C-16U			RECLAIMED			
C-17U			RECLAIMED			
C-18U			RECLAIMED			
C-19U			RECLAIMED			
C-20U			RECLAIMED			

Table 7-25 Culvert Characteristics (Cont)

Culvert	Diameter (in.)	Type	Contributing Watersheds	Slope (ft/ft)	Outlet Condition
C-1D			RECLAIMED		
C-2D	15	CMP, RCP flexible	AD-2B, AD-2C, AD-3B, AD-4, AD-6	4.0	10" rip-rap
C-3D			RECLAIMED		
C-4D	21	CMP	AD-3A, AD-5, AD-7, AD-14, C-10D	0.18	9" rip-rap
C-5D	18	CMP	AD-9, AD-3A, AD-5 AD-7	0.07	3" rip rap
C-6D	12	CMP	AD-10	0.48	9" rip-rap
C-7D	18	CMP	Abandoned In Place		
C-8D			REPLACED WITH C-5D		
C-9D	18	CMP	See C-8D	0.05	3" rip-rap
C-10D	18	CMP	Tipple Wash Hose	0.03	Soil
C-11D			RECLAIMED		
C-12D	8	CMP	AD-18	0.05	Soil
C-13D	12	CMP	AU-23, AD-20	0.07	Soil

## **Diversion Structures Modifications**

### **Culvert C-8U Extension, 1989**

In order to reduce migration of coal fines into undisturbed drainage, culvert C-8U which passes under the storage pad, was extended uphill approximately 60 ft during the summer of 1989. A berm will be built to meet the required headwater and to prevent runoff to the south from entering the drainage. The headwall will be riprapped and the existing trash rack will be resecured to the culvert as presently installed. Extending the culvert will increase the distance between the coal storage and the inlet to the culvert.

A small sediment basin will be constructed and maintained at the inlet of culvert C-8U in the Spring of 1992, and cleaned as needed to reduce potential impacts of suspended solids to surface waters.

### **Culvert Outlet C-1U 1991**

This was reclaimed.

**Ditches D-2U, D-3U AND D-4U 2008**

As reclamation is on in the area and the work is progressing down from the top. The drainage for TS-6 (Primary Portal Access Road) has been modified. Hiawatha Coal will temporarily show culverts C-2U, C-3U and C-4U as abandoned in place until the culverts are removed as reclamation activities progress through that area. As reclamation progresses, the flow to ditches D-2U, D-3U and D-4U will change as hydrologic structures are removed up stream. There will be no change to the outflow of D-4U which currently discharges into Bear Creek. Hiawatha Coal intends to utilize the existing roadway as the channel, which will add extensive width to the existing ditches. This will allow for the increased peak flows through the ditches. As these ditches are all considered undisturbed and the roadway drainage is also considered undisturbed, this should not have any adverse affects to the Bear Creek Drainage. See Appendix 7G for Flow Characteristics.

**Tank Seam Portal Pad & Access Road**

THIS AREA HAS BEEN RECLAIMED.

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### Wild Horse Ridge Access

The portal pad for the Bear Canyon No. 3 Mine will drain into Sediment Pond "D". For the remaining disturbed areas associated with the Wild Horse Ridge access road and conveyor belt, runoff will be controlled using alternate (ASCA) treatments. See Plates 7-1F and 7-1G for division structures and ASCA areas (BTCA Area "V", "W", "X" and "Y").

Runoff control for these ASCA areas are described in Appendix 7-K, and will consist of silt fences, erosion control matting and/or catch basins as described in Appendix 7-K and shown on Plates 7-1F and 7-1G. ASCA areas under the conveyor belt will be protected by a pan structure on the conveyor belt is described in Appendix 7-K.

Designs for the ditches and culverts associated with this area are included in Appendix 7-G and summarized in Tables 7-24 and 7-28.

The reclaimed channel designs for the Wild Horse Ridge Area are described in Appendix 7-H and Section 7.3.

Table 7-26 Characteristics of Proposed Reclaimed Channels

Channel	Bottom Width (ft)	Side Slopes	Depth (ft)	Lining
RC-1 <sup>1</sup>				
RC-2	3	2:1	1.5	D50 = 9"
RC-3	3	2:1	1.5	D50 = 9"
RC-4	4	2:1	1.5	D50 = 6"
RC-5	1.5	2:1	1.5	D50 = 6"
RC-6	2	2:1	1.5	D50 = 6"
RC-7	6	2:1	4	D50 = 24"
RC-8	8	2:1	2.5	D50 = 24"
RC-9	7	2:1	3	D50 = 24"
RC-10	6	1.5:1	6	D50 = 24"
RC-11	2	2:1	1.5	D50 = 6"
RC-12	1	2:1	2	D50 = 6"
RC-TS1	10'-12' Avg.	1:1 Typ	8'-9' Avg.	12"-72" Rock
RC-TS2	12' Avg.	1.5:1 Typ	4' Avg.	Bedrock 12"-72" Rock
RC-TS3	6' Avg.	1.5:1 Typ	4' Avg.	12"-60" Rock
RC-TS4	15' Avg.	1:1 Typ	4' Avg.	8"-36" Rock
RC-TS5	4'-6' Avg.	1.5:1 Typ	2'-6' Avg.	18"-48" Rock
RC-TS6	20' Avg.	1:1 Typ	2'-5' Avg.	Bedrock 18"-48" Rock

Note: 1. Have been reclaimed

## CULVERT CHARACTERISTICS

Culvert	Dia (in.)	Type	Contributing Watersheds	Peak Q(cfs)	Slope (ft/ft)	Outlet Condition
C-1U			RECLAIMED			
C-2U			ABANDONED IN PLACE			
C-3U			ABANDONED IN PLACE			
C-4U			ABANDONED IN PLACE			
C-5U	12	CMP	AU-8, AU-9, AU-15	1.45	0.05	Soil
C-6U	12	CMP	AU-6, AU-7, AU-11 AU-13, AU-14	2.65	0.05	4" rip-rap
C-7U	12	CMP	AU-12	0.34	0.05	6" rip-rap
C-8U	18	Flexible CMP, RCP	AU-3, AU-3A AU-4, AU-4A, AU-5	4.45	0.13	12" rip-rap
C-9U	60	stl pipe	Bear Creek	108.18	0.06	48" rip-rap
C-10U	60	RCP	Bear Creek	108.18	0.06	48" rip-rap
C-11U	18	CMP	AU-16	4.92	0.10	6" rip-rap
C-12U	24	CMP	AU-17	3.29	0.04	6" rip-rap
C-13U C-13aU	15	CMP	misc. road drainage	1.00	0.06	Soil
C-14U	60	CMP	Bear Creek	108.18	0.06	48" rip-rap
C-15U	18	CMP flexible	AU-1B, AU-2 AU-2A, AU-2B	1.46	0.05 0.78	27" rip-rap
C-16U			RECLAIMED			
C-17U			RECLAIMED			
C-18U			RECLAIMED			
C-19U			RECLAIMED			
C-20U			RECLAIMED			

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**CULVERT CHARACTERISTICS (con't)**

<b>Culvert</b>	<b>Dia (in.)</b>	<b>Type</b>	<b>Contributing Watersheds</b>	<b>Peak Q(cfs)</b>	<b>Slope (ft/ft)</b>	<b>Outlet Condition</b>
C-1D			RECLAIMED			
C-2D	15	CMP, RCP, flexible	AD-2B, AD-2C, AD-3B, AD-4, AD-6	1.47	0.40	10" rip-rap
C-3D			RECLAIMED			
C-4D	21	CMP	AD-3A, AD-5 AD-7, AD14, C-10D	2.66	0.18	9" rip-rap
C-5D	18	CMP	AD-3A, AD-5, AD-7, AD-9	2.59	0.07	3" rip-rap
C-6D	12	CMP	AD-10	0.62	0.48	9" rip-rap
C-7D	18	CMP	Abandoned In Place			
C-8D			Replaced with C-5D			
C-9D	18	CMP	See C-8D	2.36	0.05	3" rip-rap
C-10D	18	CMP	TIPPLE WASH HOSE	0.25	0.03	soil
C-11D			RECLAIMED			
C-12D	8	CMP	AD-18	0.55	0.05	soil

WORKSHEET

WORKSHEET for CIRCULAR CHANNEL

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Project Description

**RECLAIMED**

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Worksheet

C-1U

7G-54

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WORKSHEET

WORKSHEET for CIRCULAR CHANNEL

**RECLAIMED**

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Project Description	
Worksheet	C-2U

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7G-55

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WORKSHEET  
WORKSHEET for CIRCULAR CHANNEL

**RECLAIMED**

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Project Description

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Worksheet C-3U

7G-56

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WORKSHEET

WORKSHEET for CIRCULAR CHANNEL

**RECLAIMED**

Project Description	
Worksheet	C-4U

7G-57

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WORKSHEET

WORKSHEET for CIRCULAR CHANNEL

**RECLAIMED**

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Project Description

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Worksheet            C-16U

7G-70

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WORKSHEET

WORKSHEET for CIRCULAR CHANNEL

**RECLAIMED**

Project Description	
Worksheet	C-17U

7G-71

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WORKSHEET

WORKSHEET for CIRCULAR CHANNEL

**RECLAIMED**

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Project Description

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Worksheet C-18U

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WORKSHEET

WORKSHEET for CIRCULAR CHANNEL

**RECLAIMED**

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Project Description

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Worksheet

C-19U

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WORKSHEET

WORKSHEET for CIRCULAR CHANNEL

**RECLAIMED**

Project Description	
Worksheet	C-20U

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WORKSHEET

WORKSHEET for CIRCULAR CHANNEL

**RECLAIMED**

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Project Description	
Worksheet	C-3D

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WORKSHEET  
WORKSHEET for CIRCULAR CHANNEL

Culvert C-8D

Replaced with culvert C-5D

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WORKSHEET

WORKSHEET for CIRCULAR CHANNEL

**RECLAIMED**

Project Description	
Worksheet	C-11D

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### DITCH CHARACTERISTICS

DITCH	CHANNEL SLOPE %	CONTRIBUTING WATERSHED	PEAK Q(cfs)	BANK AND BOTTOM DESC.	MANNING'S $\eta^{(a)}$
D-1D		RECLAIMED			
D-2D	6 Min, 20 Max	AD-3A, AD-5	0.53	Rocky Soil, Bedrock	0.03
D-3D		Replaced with C-5D			
D-4D	2 Min, 7 Av 17 Max	AD-14	0.05	Soil	0.03
D-5D		Replaced with C-5D			
D-6D	2 Min, 4 Max	AD-3A, AD-5, AD-7 AD-9, AD-10, AD-12 AD-14	3.63	Rocky Soil	0.03
D-7D	2 Min, 6 Av 55 Max	AD-1A, AD-1B, AD-2A AD-2B, AD-2C, AD-3B AD-4, AD-6, AD-8	4.90	Soil D <sub>50</sub> ≈3"	0.03 0.033
D-8D	2 Min, 7 Max	AD-13	1.23	Soil	0.03
D-8D Water Bar	3 Av.	AD-13	1.23	Soil	0.013
D-9D	4 Min, 10 Max	AD-15	1.20	Soil	0.03
D-10D	7 Min, 50 Max	AD-6, AD-3B, AD-2C	1.03	D <sub>50</sub> ≈4"	0.033
D-11D	41 Min Near Vertical Max	TIPPLE WASH HOSE	0.25	Grouted rip-rap	0.035
D-12D	81 Av.	TIPPLE WASH HOSE	0.25	Grouted	0.03
D-13D Water Bar	0.5 Av.	AD-6 Partial	0.23	Soil	0.03
D-14D		RELAIMED			
D-15D	0.05 Av.	AD-16	1.24	Soil	0.03
D-16D	0.05 Av.	AD-18	0.55	Soil	0.03
D-17D	0.08	AU-23,AD-20	0.99		

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**DITCH CHARACTERISTICS (cont)**

DITCH	CHANNEL SLOPE %	CONTRIBUTING WATERSHED	PEAK Q (cfs)	BANK AND BOTTOM DESC.	MANNING'S $\eta^{(a)}$
D-1U		RECLAIMED			
D-2U	7 Min, 10 Max	AU-6, AU-11AD-3A,AD-3B, AD-3B, AD-6	1.64	Rocky Soil	0.03
D-3U	4 Min, 18 Max	AU-8, AU-6,AU-11,AD-3A,AD-3B, AD-6	4.08	Rocky Soil	0.03
D-4U	1 Min, 10 Av, 18 Max	AU-10, AU-8, AU-6, AU-11, AD-3A, AD-9B, AD-6	8.73	D <sub>50</sub> 6"	0.03
D-5U	4 Min, 13 Max	AU-15	0.13	Rocky Soil	0.03
D-6U	3 Min, 6 Max	AU-14	0.35	Rocky Soil	0.03
D-7U	1 Min, 16 Max	AU-12	0.34	Rocky Soil	0.03
D-8U	2 Min, 6 Av 31 Max	AU-1, AU-1A, AU-1B AU-1C, AU-2 AU-2A, AU-2B	4.75	Soil D <sub>50</sub> 6"	0.033
D-9U	1 Min, 6 Max	AU-16	4.92	D <sub>50</sub> 4"	0.03
D-10U	3 Min, 10 Max	AU-17	3.29	D <sub>50</sub> 4"	0.03
D-11U	3 Min, 8 Max	misc. road drainage	1.0 <sup>(b)</sup>	Soil	0.03
D-12U	3 Min 9 Max	AU-18	4.0	Soil D <sub>50</sub> 4"	0.03
D-13U	2 Min, 6 Av, 23 Max	misc. road drainage	1.0 <sup>(b)</sup>	Soil	0.03
D-14U	6 Min, 66 Max	Outlet of Sed Pond A	8.9	D <sub>50</sub> 4" D <sub>Max</sub> 10"	0.03
D-15U	5 Min, 11 Av, 16 Max	AU-3	0.52	soil	0.03
D-16U		RECLAIMED			
D-17U		RECLAIMED			
D-18U		RECLAIMED			
D-19U		RECLAIMED			
D-20U	16 Av	AU-42	0.67	soil	0.03
D-21U	13 Av	AU-43	1.75	D <sub>50</sub> 6"	0.03
D-22U	11 Av	AU-19, AU-25	4.33	D <sub>50</sub> =6"	0.03

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**Worksheet**

**Worksheet for Trapezoidal Channel**

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---

Project Description	
Worksheet	DITCH D-1D (Max Slope)

---

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**Worksheet**

**Worksheet for Trapezoidal Channel**

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---

Project Description	
Worksheet	DITCH D-1D (Max Slope)

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**Worksheet**

**Worksheet for Trapezoidal Channel**

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---

Project Description	
Worksheet	D-14D

---

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**Worksheet**

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---

Project Description	
Worksheet	D-1U

---

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**Project Description**

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Worksheet	D-1U (Max Slope)
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## Worksheet

### Worksheet for Trapezoidal Channel

---

#### Project Description

---

Worksheet	D-2U
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

#### Input Data

Mannings Coefficient	0.035	
Slope	0.0700	ft/ft
	00	
Left Side Slope	1.00	V : H
Right Side Slope	1.00	V : H
Bottom Width	10.00	Ft
Discharge	0.48	cfs

---

#### Results

---

Depth	0.08	ft
Flow Area	0.8	ft <sup>2</sup>
Wetted Perimeter	10.22	ft
Top Width	10.16	ft
Critical Depth	0.09	ft
Critical Slope	0.039795	ft/ft
Velocity	2.05	ft/s
Velocity Head	0.07	ft
Specific Energy	0.14	ft
Froude Number	1.29	
Flow Type	Supercritical	

Use Minimum Depth = 1.00 ft Velocity < 5 fps
---

Minimum Freeboard = 0.92 ft No riprap required
---

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## Worksheet

### Worksheet for Trapezoidal Channel

---

#### Project Description

---

Worksheet	D-2U (Max Slope)
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

---

#### Input Data

---

Mannings Coefficient	0.035
Slope	0.100 ft/ft 000
Left Side Slope	1.00 V : H
Right Side Slope	1.00 V : H
Bottom Width	10.00 ft
Discharge	1.64 cfs

---

#### Results

---

Depth	0.07 ft
Flow Area	0.7 ft <sup>2</sup>
Wetted Perimeter	10.20 ft
Top Width	10.14 ft
Critical Depth	0.09 ft
Critical Slope	0.039797 ft/ft
Velocity	2.29 ft/s
Velocity Head	0.08 ft
Specific Energy	0.15 ft
Froude Number	1.52
Flow Type	Supercritical

7G-145

05/2013

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## Worksheet

### Worksheet for Trapezoidal Channel

Project Description	
Worksheet	D-3U Ave
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Mannings Coefficient	0.035
Slope	0.040 ft/ft
Left Side Slope	1.00 V : H
Right Side Slope	1.00 V : H
Bottom Width	10.00 ft
Discharge	4.08 cfs

Results	
Depth	0.16 ft
Flow Area	1.6 ft <sup>2</sup>
Wetted Perimeter	10.46 ft
Top Width	10.32 ft
Critical Depth	0.17 ft
Critical Slope	0.032874 ft/ft
Velocity	1.10 ft/s
Velocity Head	0.06 ft
Specific Energy	0.26 ft
Froude Number	
Flow Type	Supercritical

Use Minimum Depth = 1.00 ft  
Velocity < 5 fps

Minimum Freeboard = 0.84 ft  
No riprap required

7G-146

05/2013

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## Worksheet

### Worksheet for Trapezoidal Channel

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#### Project Description

---

Worksheet	D-3U (Max Slope)
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

---

#### Input Data

---

Mannings Coefficient	0.035
Slope	ft/ft
Left Side Slope	1.00 V : H
Right Side Slope	1.00 V : H
Bottom Width	10.00 ft
Discharge	4.08 cfs

---

#### Results

---

Depth	0.10 ft
Flow Area	1.0 ft <sup>2</sup>
Wetted Perimeter	10.29 ft
Top Width	10.21 ft
Critical Depth	0.17 ft
Critical Slope	0.032876 ft/ft
Velocity	3.91 ft/s
Velocity Head	0.24 ft
Specific Energy	0.34 ft
Froude Number	2.16
Flow Type	Supercritical

7G-147

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## Worksheet

### Worksheet for Trapezoidal Channel

Project Description	
Worksheet	D-4U
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Mannings Coefficient	0.035
Slope	0.100 ft/ft
Left Side Slope	1.00 V : H
Right Side Slope	1.00 V : H
Bottom Width	10.00 ft
Discharge	8.73 cfs

Results	
Depth	0.19 ft
Flow Area	2.0 ft <sup>2</sup>
Wetted Perimeter	10.55 ft
Top Width	10.39 ft
Critical Depth	0.28 ft
Critical Slope	0.028208 ft/ft
Velocity	4.40 ft/s
Velocity Head	0.30 ft
Specific Energy	0.50 ft
Froude Number	1.76
Flow Type	Supercritical

7G-148

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## Worksheet

### Worksheet for Trapezoidal Channel

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#### Project Description

Worksheet	D-4U (Max Slope)
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

---

#### Input Data

Mannings Coefficient	0.035
Slope	000 ft/ft
Left Side Slope	1.00 V : H
Right Side Slope	1.00 V : H
Bottom Width	10.00 ft
Discharge	8.73 cfs

---

#### Results

Depth	0.16 ft
Flow Area	1.7 ft <sup>2</sup>
Wetted Perimeter	10.46 ft
Top Width	10.33 ft
Critical Depth	0.28 ft
Critical Slope	0.028280 ft/ft
Velocity	5.27 ft/s
Velocity Head	0.43 ft
Specific Energy	0.59 ft
Froude Number	2.32
Flow Type	Supercritical

7G-149

05/2013  
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**Worksheet**

**Worksheet for Trapezoidal Channel**

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Project Description	
Worksheet	D-15U

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**Worksheet for Trapezoidal Channel**

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Project Description	
Worksheet	D-15 U (Max Slope)

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**Worksheet for Trapezoidal Channel**

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Project Description	
Worksheet	D-16U

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Project Description

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Worksheet

D-17U

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7G-174

05/2013

**Worksheet**

**Worksheet for Trapezoidal Channel**

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Project Description

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Worksheet

D-18U

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7G-175

05/2013

**Worksheet**

**Worksheet for Trapezoidal Channel**

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Project Description	
Worksheet	D-18U (Avg Slope)

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**Worksheet**

**Worksheet for Trapezoidal Channel**

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Project Description	
Worksheet	D-18U (Max Slope)

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**Worksheet**

**Worksheet for Trapezoidal Channel**

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Project Description	
Worksheet	D-19U

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Construction of the Tank Seam Access Road will require the disturbance of six channels, shown on Plate 7-7 as RC-TS1 through RC-TS6. All six channels exist as naturally eroding channels. Due to the steep maximum slopes, as shown on page 7H-16, riprap designs will not be proposed for these channels. This sections characterizes and documents the premining channels which exist prior to disturbance. Reclamation will consist of restoring these channels to this configuration and mimicking the premining conditions, in order to obtain a naturally stable drainage and restore the approximate original configuration to the channels. These channels have all been reclaimed and are currently in Phase I Bond Release.

Disturbance of the channels will consist primarily of placing fill in the channels to provide access across the channels for the road. This will allow the channels to essential remain intact beneath the fill. Upon reclamation, the fill material will be excavated from the channels and fill areas, and the channels will be restored, with many of the large boulders shown in the photographs of each channel remaining in place for the post-mining channel. Profiles of the pre-mining, and subsequently the proposed post-mining, channels are shown on Plate 7-8C. A description of each channel follows. As the channels are reclaimed, the reclaimed channel will be blended in with the natural channels above and below the reclaimed channel by attempting to duplicate the appearance of the natural channels as they appear in the following photographs.

**CHAPTER 8**  
**R645-301-800 BOND**

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Bonding Calculations  
 Castle Valley Mining, LLC

Bond Summary

Direct Costs

Subtotal Demolition and Removal	\$375,843.00	
Subtotal Backfilling and Grading	\$715,605.00	
Subtotal Revegetation	\$374,408.00	
Direct Costs	<u>\$1,465,856.00</u>	

Indirect Costs

Mob/Demob	\$146,585.60	10.0%
Contingency	\$73,292.80	5.0%
Engineering Redesign	\$36,646.40	2.5%
Main Office Expense	\$99,678.21	6.8%
Project Mainagement Fee	\$36,646.40	2.5%
Subtotal Indirect Costs	<u>\$392,849.41</u>	26.8%

Total Cost \$1,858,705.41

Escalation factor 0.015  
 Number of years 5  
 Escalation \$143,648.00

Reclamation Cost \$2,002,353.41

Bond Amount (rounded to nearest \$1,000)  
 2018 dollars \$2,002,000.00

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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
	Scale House 01																			19033
	Scalehouse Pavement 02																			9831
	Shower House 03																			17169
	Shop 04																			17466
	W/er/ew Shop 05																			4730
	W/IR Shop 06																			3827
	Truck 07																			20899
	Station 08																			15050
	Coal Storage Bin 09																			8921
	Coal Storage Bin 10																			8921
	Coal Storage Bin 11																			8921
	Coal Storage Bin 12																			8921
	Ditch D 13																			12086
	Lump Coal Storage Pad 14																			302
	Equipment Wash Pad 15																			2792
	Transformer Pad Strip 16																			67
	Water Tanks 17																			1795
	Fuel Tanks 18																			2796
	Fuel Lines 19																			3260
	Fans 20																			4364
	Generator 21																			90590
	Water Pump 22																			0
	Sheds 23																			330
	Coal 24																			11103
	Waterman Tank 25																			0
	Coal and Powder Mgt 26																			139
	Conveyor Tunnel 27																			7811
	Plan Well 28																			5000
	Steel Pallets 29																			62400
	Power Lines and Poles 30																			5683
	Portable AMOZA No 31																			20900
	Concrt Removal No 32																			817
	Portable No 33																			19609
	Water Removal Well No 34																			3338
	Smelter Subst No 35																			3338
	<b>Total</b>																			<b>375843</b>

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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
	Scale House 01																			
	Structure's Demolition Cost	Mixed Materials Bld. Labor	02 41 16 13 0100	0.25 /CF	CF	34	83	16								FT		4552 /CF	13064	
	Structure's Vol. Demolished																	502 /CY		
	Structure's Weight (exclude steel)																	678 /TON		
	Truck's Capacity												1.35							
	Truck's Capacity																			
	Transportation Cost Non-Steel Truck																			
	Transportation Cost Non-Steel Truck																			
	Disposal Cost Non-Steel																			
	Steel's Weight																			
	Steel's Capacity																			
	Transportation Cost Steel Truck Drive																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			
	Equipment's Disposal Cost																			
	Equipment's Disposal Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	Concrete/Demo1	9.82 /CY	CY	234	2	0.67								FT	1.3	12 /CY	118	
	Concrete's Vol. Demolished																	16 /CY		
	Loading Cost	Front end loader 3 CY	31 23 16 42 1300	1.64 /CY															16 /CY	26
	Transportation Cost	12 CY 116 Ton Dump Truck 1/2 mi. and less	31 23 23 20 1020	6.48 /CY															16 /CY	88
	Disposal Cost	Disposal on site	02 41 16 17 4200	8.61 /CF															16 /CY	138
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	Concrete/Demo1	9.82 /CY	CY	234	4	0.67								FT		23 /CY	226	
	Concrete's Vol. Demolished																	30 /CY		
	Loading Cost	Front end loader 3 CY	31 23 16 42 1300	1.64 /CY															30 /CY	49
	Transportation Cost	12 CY 116 Ton Dump Truck 1/2 mi. and less	31 23 23 20 1020	6.48 /CY															30 /CY	164
	Disposal Cost	Disposal on site	02 41 16 17 4200	8.61 /CF															30 /CY	256
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	Concrete/Demo1	9.82 /CY	CY	83	34	0.33								FT		34 /CY	334	
	Concrete's Vol. Demolished																	44 /CY		
	Loading Cost	Front end loader 3 CY	31 23 16 42 1300	1.64 /CY															44 /CY	72
	Transportation Cost	12 CY 116 Ton Dump Truck 1/2 mi. and less	31 23 23 20 1020	6.48 /CY															44 /CY	241
	Disposal Cost	Disposal on site	02 41 16 17 4200	8.61 /CF															44 /CY	379
	Subtotal																			
	Total																			1983

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Ref	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Densiv	Time	Number	Unit	Swall Factor	Quantity	Unit	Cost	
	Shop 04																				
	Structure's Demolition Cost	Steel Blt. Ledge	02 41 16 13 0020	0.29	CF	40	93	14								FT		52080	CF	15103	
	Structure's Vol. Demolished																				
	Truck's Weight (exclude steel)																				
	Truck's Capacity																				
	Trailer																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Truck																				
	Truck's Weight																				
	Truck's Capacity																				
	Trailer																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Truck Drive																				
	Disposal Cost Steel																				
	Subtotal																				15103
	Equipment's Disposal Cost																				
	Demolition Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost	Concrete Demol		9.82	CY	187.5	4	0.67								FT	1.3	20	CY	196	
	Concrete's Vol. Demolished																				
	Loading Cost	Front end loader 3 CY	31 23 16 42 1300	1.64	CY																43
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. and less	31 23 23 20 1050	5.48	CY																142
	Disposal Costs	Disposal on site	02 41 16 17 4200	8.61	CF																224
	Subtotal																				605
	Concrete Demolition																				
	Demolition Cost	Concrete Demol		9.82	CY	266	2	0.67								FT	1.3	13	CY	120	
	Concrete's Vol. Demolished																				
	Loading Cost	Front end loader 3 CY	31 23 16 42 1300	1.64	CY																28
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. and less	31 23 23 20 1050	5.48	CY																93
	Disposal Costs	Disposal on site	02 41 16 17 4200	8.61	CF																146
	Subtotal																				365
	Concrete Demolition																				
	Demolition Cost	Concrete Demol		9.82	CY	40	93	0.33								FT	1.3	45	CY	447	
	Concrete's Vol. Demolished																				
	Loading Cost	Front end loader 3 CY	31 23 16 42 1300	1.64	CY																96
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. and less	31 23 23 20 1050	5.48	CY																501
	Disposal Costs	Disposal on site	02 41 16 17 4200	8.61	CF																501
	Subtotal																				1045
	Total																				17466

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R#	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swall Factor	Quantity	Unit	Cost	
	Mechan. Strip 05																				
	Structure's Demolition Cost	Steel Bid Length	02 41 16 13 0020	0.29	CF	30	45	10								FT		13500	CF	3915	
	Structure's Vol. Demolished																				
	Rubble's Weight (excludes liquid)																				
	Truck's Capacity																				
	Hauling																				
	Transportation Cost Non-Steel Truck																				
	Transportation Cost Non-Steel Drive																				
	Structure's Non-Steel																				
	Structure's Work																				
	Truck's Capacity																				
	Hauling																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Truck Drive																				
	Disposal Cost Steel																				
	Subtotal																				3915
	Equipment's Disposal Cost																				
	Demolition Cost																				
	Equipment's Vol. Demolished																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost	Concrete demolition	ConcreteDemo1	9.82	CY	135	1	0.67								FT	1.3	3	CY	20	
	Concrete's Vol. Demolished																				
	Loading Cost	Front end loader 3 CY	31 23 16 42 1300	1.64	CY																
	Transportation Cost	12 CY 116 Ton Dump Truck 1/2 mi. and less	31 23 23 20 1020	5.48	CY																
	Disposal Costs	Disposal on site	02 41 16 17 4200	8.61	CF																
	Subtotal																				92
	Concrete Demolition																				
	Demolition Cost	Concrete demolition	ConcreteDemo1	9.82	CY	150	2	0.67													
	Concrete's Vol. Demolished																				
	Loading Cost	Front end loader 3 CY	31 23 16 42 1300	1.64	CY																
	Transportation Cost	12 CY 116 Ton Dump Truck 1/2 mi. and less	31 23 23 20 1020	5.48	CY																
	Disposal Costs	Disposal on site	02 41 16 17 4200	8.61	CF																
	Subtotal																				69
	Concrete Demolition																				
	Demolition Cost	Concrete demolition	ConcreteDemo1	9.82	CY	30	45	0.33													
	Concrete's Vol. Demolished																				
	Loading Cost	Front end loader 3 CY	31 23 16 42 1300	1.64	CY																
	Transportation Cost	12 CY 116 Ton Dump Truck 1/2 mi. and less	31 23 23 20 1020	5.48	CY																
	Disposal Costs	Disposal on site	02 41 16 17 4200	8.61	CF																
	Subtotal																				167
	Concrete Demolition																				
	Demolition Cost	Concrete demolition	ConcreteDemo1	9.82	CY																
	Concrete's Vol. Demolished																				
	Loading Cost	Front end loader 3 CY	31 23 16 42 1300	1.64	CY																
	Transportation Cost	12 CY 116 Ton Dump Truck 1/2 mi. and less	31 23 23 20 1020	5.48	CY																
	Disposal Costs	Disposal on site	02 41 16 17 4200	8.61	CF																
	Subtotal																				36
	Concrete Demolition																				
	Demolition Cost	Concrete demolition	ConcreteDemo1	9.82	CY																
	Concrete's Vol. Demolished																				
	Loading Cost	Front end loader 3 CY	31 23 16 42 1300	1.64	CY																
	Transportation Cost	12 CY 116 Ton Dump Truck 1/2 mi. and less	31 23 23 20 1020	5.48	CY																
	Disposal Costs	Disposal on site	02 41 16 17 4200	8.61	CF																
	Subtotal																				121
	Concrete Demolition																				
	Demolition Cost	Concrete demolition	ConcreteDemo1	9.82	CY																
	Concrete's Vol. Demolished																				
	Loading Cost	Front end loader 3 CY	31 23 16 42 1300	1.64	CY																
	Transportation Cost	12 CY 116 Ton Dump Truck 1/2 mi. and less	31 23 23 20 1020	5.48	CY																
	Disposal Costs	Disposal on site	02 41 16 17 4200	8.61	CF																
	Subtotal																				180
	<b>Total</b>																				4720

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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	
	WHR Shop 06																				
	Structure's Demolition Cost	Steel Bid Large	02 41 16 13 0020	0.28	CF	20	40	14								FT		11200	CF	3248	
	Structure's Vol. Demolished																				
	Multiple's Weight (excludes steel)																				
	Truck's Capacity																				
	Truck's Capacity																				
	Transportation Cost (Non Steel Truck)																				
	Transportation Cost (Non Steel Truck)																				
	Disposal Cost (Non Steel)																				
	Steel's Capacity																				
	Steel's Capacity																				
	Transportation Cost (Steel Truck Other)																				
	Transportation Cost (Steel Truck Other)																				
	Disposal Cost (Steel)																				
	Subtotal																				19248
	Equipment & Disposal Cost																				
	Demolition Cost																				
	Equipment & Vol. Demolished																				
	Loading Costs																				
	Demolition Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost	Concrete Demolition	Concrete/Demo1	9.82	CY	120	1	0.67								FT					20
	Concrete's Vol. Demolished																				
	Loading Cost	Front end loader 3 CY	31 23 16 42 1300	1.64	CY																7
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. ind. way	31 23 23 20 1020	5.48	CY																22
	Disposal Cost	Disposal on site	02 41 16 17 4200	8.61	CF																34
	Subtotal																				82
	Concrete Demolition																				
	Demolition Cost	Concrete Demolition	Concrete/Demo1	9.82	CY	120	2	0.67								FT					59
	Concrete's Vol. Demolished																				
	Loading Cost	Front end loader 3 CY	31 23 16 42 1300	1.64	CY																13
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. ind. way	31 23 23 20 1020	5.48	CY																44
	Disposal Cost	Disposal on site	02 41 16 17 4200	8.61	CF																60
	Subtotal																				156
	Concrete Demolition																				
	Demolition Cost	Concrete Demolition	Concrete/Demo1	9.82	CY	20	40	0.33								FT					98
	Concrete's Vol. Demolished																				
	Loading Cost	Front end loader 3 CY	31 23 16 42 1300	1.64	CY																21
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. ind. way	31 23 23 20 1020	5.48	CY																13
	Disposal Cost	Disposal on site	02 41 16 17 4200	8.61	CF																112
	Subtotal																				327
	Total																				

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Ref	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Sweat Factor	Quantity	Unit	Cost	
	Substation 08 Structure & Demolition Cost																				
		Torch Cutting Steel 1" plate	02 41 19 27 0070	1.17 /LF	LF	28.6												27	LF	32	
		Torch Cutting Steel 1" bar	02 41 19 27 0040	1.35 /EA	EA													0.8	DAY	1	
		Truck Moving Crane 25 ton	01 54 33 60 2500	650 /day	day													6.2	HR	3606	
		Eg. Op. Crane or Shovel (EGB)		\$48.80 /HR	HR													1.5	DAY	73	
		Truck dump 16 ton per pass	01 54 33 28 5360	375 /day	day													12.4	HR	4050	
		Truck driver /operator		\$36.00 /HR	HR													12.4	HR	451	
		SLAB		\$35.45 /HR	HR																
	Slab's Weight																				
	Truck's Capacity																				
	Hourly																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Truck Drive																				
	Disposal Cost Steel																				
	Subtotal																				8456
	Equipment's Disposal Cost																				
	Disposal Cost																				
	Equipment's Vol. Demolished																				
	Concrete Costs																				
	Disposal Costs																				
	Subtotal																				857
	Transporters																				
	Equipment's Disposal Cost																				
	Disposal Cost																				
	Equipment's Vol. Demolished																				
	Logistic Costs																				
	Transport Costs																				
	Disposal Costs																				
	Subtotal																				5476
	Concrete Demolition																				
	Disposal Cost																				
	Concrete's Vol. Demolished																				
	Logistic Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				178
	Concrete Demolition																				
	Disposal Cost																				
	Concrete's Vol. Demolished																				
	Logistic Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				28
	Concrete Demolition																				
	Disposal Cost																				
	Concrete's Vol. Demolished																				
	Logistic Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				93
	Concrete Demolition																				
	Disposal Cost																				
	Concrete's Vol. Demolished																				
	Logistic Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				146
	Concrete Demolition																				
	Disposal Cost																				
	Concrete's Vol. Demolished																				
	Logistic Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				395
	Concrete Demolition																				
	Disposal Cost																				
	Concrete's Vol. Demolished																				
	Logistic Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				10
	Concrete Demolition																				
	Disposal Cost																				
	Concrete's Vol. Demolished																				
	Logistic Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				2
	Concrete Demolition																				
	Disposal Cost																				
	Concrete's Vol. Demolished																				
	Logistic Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				6
	Total																				15000

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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 09																				
	Structure's Demolition Cost																				
		Trench Cutting Steel 1" x 1/4"	02-41-19-27-0070	1.17 LF	LF	163.3												163.3	LF	191	
		Trench Cutting Steel 1" x 1/4"	02-41-19-27-0070	1.35 EA	EA													0.7	DAY	1	
		Truck Mounted Crane 25 ton	01-54-33-60-2500	630 Day	Day													5.3	DAY	3330	
		Eq. Op. Crane or Shovel (Eight)		\$44,800 HR	HR													1.3	DAY	63	
		Truck Dump 16 ton parked	01-54-33-70-5300	325 Day	Day													10.6	HR	3445	
		Truck Dump 16 ton parked		\$38,600 HR	HR													10.6	HR	3445	
		CLAB		\$35,450 HR	HR													10.6	HR	356	
	Steel's Weight																				
	Truck's Capacity																				
	Headline																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Truck Drive																				
	Disposal Cost Steel																				
	Subtotal																				7427
	Equipment's Disposal Cost																				
	Demolition Cost																				
	Equipment's Vol. Demolished																				
	Trucking Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost	Concrete demolition	Concrete/Demo1	9.62 CY	CY	60	1	6													126
	Concrete's Vol. Demolished																				
	Loading Cost	Front end loader 3 CY	31-23-16-42-1300	1.64 CY	CY																26
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. and less	31-23-23-20-1070	5.48 CY	CY																52
	Disposal Costs	Disposal on site	02-41-16-17-1200	8.61 CCF	CCF																146
	Subtotal																				305
	Concrete Demolition																				
	Demolition Cost	Concrete demolition	Concrete/Demo1	9.62 CY	CY	3	3	1													10
	Concrete's Vol. Demolished																				
	Loading Cost	Front end loader 3 CY	31-23-16-42-1300	1.64 CY	CY																2
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. and less	31-23-23-20-1070	5.48 CY	CY																6
	Disposal Costs	Disposal on site	02-41-16-17-1200	8.61 CCF	CCF																9
	Subtotal																				26
	Concrete Demolition																				
	Demolition Cost	Concrete demolition	Concrete/Demo1	9.62 CY	CY	30	30	0.67													216
	Concrete's Vol. Demolished																				
	Loading Cost	Front end loader 3 CY	31-23-16-42-1300	1.64 CY	CY																48
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. and less	31-23-23-20-1070	5.48 CY	CY																150
	Disposal Costs	Disposal on site	02-41-16-17-1200	8.61 CCF	CCF																250
	Subtotal																				624
	Total																				8521

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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	
	Lump Cost 10																				
	Structure's Demolition Cost																				
		Torch Cutting Steel 1" plate	07 41 10 27 0020	1.17 LF	LF													225	LF		262
		Torch Cutting Steel 1" bar	07 41 10 27 0040	1.35 LF	LF													0.55	DAY		1
		Truck Mounted Crane 25 ton	01 54 33 60 2500	360 Day	DAY													4.4	HR		1564
		Eq. Op. Crane or Shovel (Eqhv)		\$46.80 HR	HR													0.95	DAY		54
		Truck Dump 16 ton standard	01 54 33 20 5300	235 Day	DAY													4.4	HR		2900
		Truck Wheel Heavy		\$36.60 HR	HR													8.8	HR		322
		CLAB		\$55.45 HR	HR																
	Steel's Weight																				
	Truck's Capacity																				
	Hourly																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Truck Drive																				
	Disposal Cost Steel																				
	Subtotal																				5084
	Equipment's Disposal Cost																				
	Demolition Cost																				
	Equipment's Vol Demolished																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost	Concrete Demolition	ConcreteDemo1	9.92 CY	CY	102	2	1													70
	Loading Cost	Front and loader 3 CY	31 23 16 42 1300	1.64 CY	CY													1.3	FT		16
	Transportation Cost	12 CY 16 Ton Dump Truck 179 mi. msl	31 23 23 20 1050	5.48 CY	CY																55
	Disposal Costs	Disposal on site	02 41 16 17 4200	8.61 CF	CF																86
	Subtotal																				238
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Total																				5322

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swill Factor	Quantity	Unit	Cost	
	Coal Recovery Bin 11																				
	Structure's Demolition Cost																				
	Structure's Vol. Demolished																				
	Rubble's Weight (Available Weight)																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Non-Steel Truck																				
	Transportation Cost Non-Steel Truck																				
	Structure's Cost Non-Steel																				
	Structure's Weight																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Truck Drive																				
	Disposal Cost Steel																				
	Subtotal																				
	Equipment's Disposal Cost																				
	Demolition Cost																				
	Equipment's Vol. Demolished																				
	Weighting Cost																				
	Transportation Cost																				
	Disposal Cost																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost	Concrete Demol		9.82	CY	12	2.5	1							4	FT					39
	Concrete's Vol. Demolished																				
	Weighting Cost																				
	Transportation Cost	Front end loader 3 CY		1.64	CY																8
	Disposal Cost	12 CY 116 Ton Dump Truck 1/2 mi. ind. h		5.48	CY																27
	Subtotal	Disposal on job		8.61	CF																43
	Concrete Demolition																				
	Demolition Cost	Concrete Demol		9.82	CY	12	12	0.33													
	Concrete's Vol. Demolished																				
	Weighting Cost																				
	Transportation Cost	Front end loader 3 CY		1.64	CY																5
	Disposal Cost	12 CY 116 Ton Dump Truck 1/2 mi. ind. h		5.48	CY																16
	Subtotal	Disposal on job		8.61	CF																26
	Concrete Demolition																				
	Demolition Cost	Concrete Demol		9.82	CY																
	Concrete's Vol. Demolished																				
	Weighting Cost																				
	Transportation Cost	Front end loader 3 CY		1.64	CY																5
	Disposal Cost	12 CY 116 Ton Dump Truck 1/2 mi. ind. h		5.48	CY																16
	Subtotal	Disposal on job		8.61	CF																26
	Concrete Demolition																				
	Demolition Cost	Concrete Demol		9.82	CY																
	Concrete's Vol. Demolished																				
	Weighting Cost																				
	Transportation Cost	Front end loader 3 CY		1.64	CY																5
	Disposal Cost	12 CY 116 Ton Dump Truck 1/2 mi. ind. h		5.48	CY																16
	Subtotal	Disposal on job		8.61	CF																26
	<b>Total</b>																				<b>184</b>

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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	
	WHR Shute Bin 12 Structure's Demolition Cost																				
		Torch Cutters Sheet 1" plate	02 41 19 27 0070	1.17 LF	LF													458 LF		536	
		Torch Cutters Sheet 1" bar	02 41 19 27 0040	1.35 EA	EA	458												0.85 DAY		1	
		Truck Mounted Crane 25 ton	01 54 33 60 7500	630 /day	DAY													6.8 DAY		4781	
		Eq. Dp. Crew of Shovel (Eight)		\$48 800 HR	HR													2 DAY		420	
		Truck Dump 16 ton enclosed	01 54 33 20 5300	323 /hr	HR													13.6 HR		4420	
		Trk. Dmtr. Baby		\$26 800 HR	HR													2 HR		460	
		CL 14B		\$35 25 HR	HR																
	Steel's Waste																				
	Truck's Capacity																				
	Headline																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Truck Drive																				
	Subtotal																				9872
	Equipment's Disposal Cost																				
	Demolition Cost																				
	Equipment's Vol Demolished																				
	Loading Costs																				
	Demolition Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost	Concrete demolition	Concrete/Item 1	9.82 /CY	CY	120	6	0.67													177
	Equipment's Vol Demolished																				
	Loading Cost	Front and loader 3 CY	31 23 16 42 1300	1.64 /CY	CY													1.3			36
	Transportation Cost	12 CY (18 Ton) Dump Truck 1/2 mi. incl. h	31 23 23 20 1070	5.48 /CY	CY																176
	Disposal Costs	Disposal on site	02 41 16 17 4200	8.61 /CF	CF																128
	Subtotal																				392
	Concrete Demolition																				
	Demolition Cost	Concrete demolition	Concrete/Item 1	9.82 /CY	CY	3	3	1													10
	Equipment's Vol Demolished																				
	Loading Cost	Front and loader 3 CY	31 23 16 42 1300	1.64 /CY	CY																2
	Transportation Cost	12 CY (18 Ton) Dump Truck 1/2 mi. incl. h	31 23 23 20 1070	5.48 /CY	CY																5
	Disposal Costs	Disposal on site	02 41 16 17 4200	8.61 /CF	CF																9
	Subtotal																				26
	Concrete Demolition																				
	Demolition Cost	Concrete demolition	Concrete/Item 1	9.82 /CY	CY	60	50	0.5													540
	Equipment's Vol Demolished																				
	Loading Cost	Concrete's Vol Demolished	31 23 16 42 1300	1.64 /CY	CY																120
	Transportation Cost	12 CY (18 Ton) Dump Truck 1/2 mi. incl. h	31 23 23 20 1070	5.48 /CY	CY																400
	Disposal Costs	Disposal on site	02 41 16 17 4200	8.61 /CF	CF																629
	Subtotal																				12006
	Total																				

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Line	Swell Factor	Quantity	Unit	Cost	
	Class D 80 13																				
	Structure's Demolition Cost																				
	Structure's Vol Demolished																				
	Rubble's Weight (excludes steel)																				
	Truck's Capacity																				
	Truck's Capacity																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel																				
	Steel's Weight																				
	Truck's Capacity																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Truck Drive																				
	Disposal Cost Steel																				
	Subtotal																				
	Equipment's Disposal Cost																				
	Demolition Cost																				
	Equipment's Vol Demolished																				
	Equipment's Vol Demolished																				
	Leasing Cost																				
	Leasing Cost																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost	Concrete demolition	ConcreteDemol	9.97	CV	35	12	0.67													
	Concrete's Vol Demolished																				
	Leasing Cost	Front end loader 3 CV		1.64	CV																
	Leasing Cost	12 CV 116 Terri Dump Truck 1/2 mi. rd.		31.23	CV																
	Transportation Cost			5.46	CV																
	Disposal Costs	Disposal on site		8.61	CV																
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol Demolished																				
	Leasing Cost																				
	Leasing Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Total																				302

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Ref	Description	Materials	Meats Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	Lump Coal Storage Pad 14																				
	Structure's Demolition Cost																				
	Structure's Vol. Demolished																				
	Rubble's Weight (exclusive steel)																				
	Truck's Capacity																				
	Landfill																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel																				
	Steel's Weight																				
	Truck's Capacity																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Truck Drive																				
	Disposal Cost Steel																				
	Rubble																				
	Equipment & Disposal Cost																				
	Disposal Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost	Concrete demolition	Concrete/Demo 1	9.82	CY	118	4	1								FT	1.3	17	CY	167	
	Concrete's Vol. Demolished																				
	Loading Cost	Front end loader 3 CY	31 23 16 42 1300	1.64	CY																
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rd. wd	31 23 23 20 1020	5.48	CY																
	Disposal Costs	12 CY (16 Ton) Dump Truck 1/2 mi. rd. wd	31 23 23 20 1020	6.48	CY																
	Subtotal	Disposal on site	02 41 16 17 4300	8.61	CF															519	
	Concrete Demolition																				
	Demolition Cost	Concrete demolition	Concrete/Demo 1	9.82	CY	38	80	0.67								FT	1.3	75	CY	737	
	Concrete's Vol. Demolished																				
	Loading Cost	Front end loader 3 CY	31 23 16 42 1300	1.64	CY																
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rd. wd	31 23 23 20 1020	6.48	CY																
	Disposal Costs	Disposal on site	02 41 16 17 4300	8.61	CF																
	Subtotal																			2278	
	Concrete Demolition																				
	Demolition Cost	Concrete demolition	Concrete/Demo 1	9.82	CY																
	Concrete's Vol. Demolished																				
	Loading Cost	Front end loader 3 CY	31 23 16 42 1300	1.64	CY																
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rd. wd	31 23 23 20 1020	6.48	CY																
	Disposal Costs	Disposal on site	02 41 16 17 4300	8.61	CF																
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost	Concrete demolition	Concrete/Demo 1	9.82	CY																
	Concrete's Vol. Demolished																				
	Loading Cost	Front end loader 3 CY	31 23 16 42 1300	1.64	CY																
	Transportation Cost	12 CY (16 Ton) Dump Truck 1/2 mi. rd. wd	31 23 23 20 1020	6.48	CY																
	Disposal Costs	Disposal on site	02 41 16 17 4300	8.61	CF																
	Subtotal																				
	Total																				2792

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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 Tanks 17																				
	Structure's Demolition Cost	Steel Bld. Large	02 11 16 13 0012	0.29 /CF	CF	10	10			14					3	FT		4818	CF	1339	
	Structure's Demolition Cost	Steel Bld. Large	02 41 16 13 0012	0.29 /CF	CF	20	20			10					1	FT		1571	CF	456	
	Structure's Vol. Demolished																				
	Rubble's Wash (excludes steel)																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Non-Steel Truck																				
	Transportation Cost Non-Steel Drive																				
	Storage Cost Main Street																				
	Storage Cost																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Truck Drive																				
	Disposal Cost Steel																				
	Subtotal																				1795
	Equipment's Disposal Cost																				
	Demolition Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transport Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Total																				1795

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Ref	Description	Materials	Meters Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Directly	Time	Number	Unit	Swall Factor	Quantity	Unit	Cost	
	Fuel Lines 19																				
	Structure's Demolition Cost																				
	Structure's Vol. Demolished																				
	Rubble's Washed (excludes steel)																				
	Truck's Capacity																				
	Half/ste																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel																				
	Steel's Weight																				
	Steel's Capacity																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Truck Drive																				
	Disposal Cost Steel																				
	Subtotal																				3260
	Equipment's Disposal Cost																				
	Demolition Cost																				
	Equipment's Vol. Demolished																				
	Leasing Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Leasing Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Leasing Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Total																				3260

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Ref	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swall Factor	Quantity	Unit	Cost
	Concrete 21																			
	Structure's Demolition Cost	Steel Bid Large	02 41 16 13 0012	0.25 KCF	KCF	6730	5	5										155750	CF	45168
	Structure's Demolition Cost	Steel Bid Large	02 41 16 13 0012	0.29 KCF	KCF	60	8	8										149760	CF	43430
	Structure's Vnl Demolished																			
	Rubble's Weight (outside shell)																			
	Truck's Capacity																			
	Hardware																			
	Transportation Cost Non-Steel Truck																			
	Transportation Cost Non-Steel Truck																			
	Transportation Cost Non-Steel Drive																			
	Transportation Cost Non-Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Hardware																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			88598
	Equipment's Disposal Cost																			
	Demolition Cost																			
	Concrete's Vnl Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Cost																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete demolition	Concrete/Demo 1	9.82 CY	CY	3	3	1							188	FT	1.3	63	CY	619
	Loading Cost	Flora and Louisa 3 CY	31 23 16 42 1300	1.64 CY	CY															134
	Transportation Cost	12 CY (10 Top) Dump Truck 1/2 mi. and up	31 23 23 30 1050	5.48 CY	CY															419
	Disposal Cost	Disposal on site	02 41 16 17 2200	8.61 CCF	CCF															706
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete's Vnl Demolished																		
	Loading Cost																			
	Transportation Cost																			
	Disposal Cost																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost	Concrete's Vnl Demolished																		
	Loading Cost																			
	Transportation Cost																			
	Disposal Cost																			
	Subtotal																			
	Total																			

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Ref.	Description	Materials	Notes Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	Septic Tanks 73																				
	Structure's Demolition Cost																				
	Structure's Vol. Demolished																				
	Structure's Weight (excludes steel)																				
	Truck's Capacity																				
	Multiple																				
	Transportation Cost Non-Steel Truck																				
	Transportation Cost Non-Steel Drive																				
	Disposal Cost Non-Steel																				
	Steel's Weight																				
	Steel's Capacity																				
	Multiple																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Truck Drive																				
	Disposal Cost Steel																				
	Subtotal																				
	Excavation of Septic Tanks																				
	Excavation		31 23 16 42 0260	1.54	10	10	10	3								4	4	41	CV	68	
	Backfill		31 23 16 13 3080	1.75	10	10	10	3								4	4	41	CV	77	
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost		Concrete/Demo1	9.82	1.5											4	4	6	CV	59	
	Concrete's Vol. Demolished																				
	Loading Cost		31 23 16 42 1300	1.64	1.3																
	Transportation Cost		31 23 23 20 1070	5.48	8																
	Disposal Cost		02 41 16 17 4200	8.61	8																
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Cost																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Cost																				
	Subtotal																				
	Total																				330

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Ref	Description	Materials	News Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	Cup and Prowden Aug 36																				
	Structure's Demolition Cost	Steel Bld. L eng	02 11 16 13 0012	0.29 /CF	CF	5	6	8								2 FT		480 CF		139	
	Structure's Vol. Demolished																				
	Structure's Weight (excludes steel)																				
	Truck's Capacity																				
	Truck's Capacity																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Truck																				
	Disposal Cost Non Steel																				
	Steel's Weight																				
	Truck's Capacity																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Truck Drive																				
	Disposal Cost Steel																				139
	Subtotal																				
	Equipment's Disposal Cost																				
	Demolition Cost																				
	Equipment's Vol. Demolished																				
	Leasing Costs																				
	Transport Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Leasing Costs																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Leasing Costs																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Total																				139

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Ref	Description	Materials	Mans Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Densiv	Time	Number	Unit	Swall Factor	Quantity	Unit	Cost	
	Plan Well 28																				
	Structure's Demolition Cost	Plan Well	AM-3	5000	EA										1	EA		1	EA	5000	
	Structure's Vol. Demolished																				
	Rubble's Weight (exclude steel)																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Non-Steel Truck																				
	Transportation Cost Non-Steel Truck Drive																				
	Disposal Cost Steel																				
	Subtotal																				5000
	Equipment's Disposal Cost																				
	Demolition Cost																				
	Equipment's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	<b>Total</b>																				5000

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Ref	Description	Materials	Main's Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swal Factor	Quantity	Unit	Cost
	Steel Purlins 20			5000	EA.															
	Shovel's Demolition Cost		AM 1																	
	Shovel's Fuel (Diesel) (See)																			
	Truck's Capacity																			
	Truck's Capacity																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Shovel's Fuel (Diesel)																			
	Truck's Capacity																			
	Truck's Capacity																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Shovel's Fuel (Diesel)																			
	Equipment's Disposal Cost																			
	Disposal Cost																			
	Equipment's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Equipment's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Equipment's Vol. Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			

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Ref.	Description	Materials	Meas. Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	Power Lines and Poles 30																				
	Structure's Demolition Cost																				
	Structure's Vol. Demolished																				
	Rubble's Weight (exclude above)																				
	Truck's Capacity																				
	Hydrazine																				
	Transportation Cost Non-Steel Truck																				
	Transportation Cost Non-Steel Drive																				
	Shovel's Cost Non-Steel																				
	Shovel's Capacity																				
	Hydrazine																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Truck Drive																				
	Subtotal																				
	Equipment's Disposal Cost	Wire Removal	Old Marine 1	11.3 C/F	C/F	8700										FT				963	
	Demolition Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transport Costs																				
	Disposal Costs																				
	Subtotal																				
	Equipment's Disposal Cost	Powertools	Hawthra	100 EA	EA											50 EA					5000
	Demolition Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transport Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Equipment's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Total																				5983

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Ref	Description	Material	Material Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swail Factor	Quantity	Unit	Cost	
	Portals AM02A No. 31																				
	Structure's Demolition Cost																				
	Structure's Vol. Demolished																				
	Rubble's Weight (excludes steel)																				
	Truck's Capacity																				
	Headlight																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Truck																				
	Disposal Cost Non Steel																				
	Steel's Weight																				
	Steel's Capacity																				
	Headlight																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Truck Drive																				
	Disposal Cost Steel																				
	Subtotal																				20800
	Equipment's Disposal Cost																				
	Demolition Cost																				
	Equipment's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Total																				20800

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Ref	Description	Mainline	Means Reference Number	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	Crew Removal No 32																			
	Structure's Demolition Cost																			
	Structure's Vol Demolished																			
	Rubble's Weight (excludes steel)																			
	Truck's Capacity																			
	Hourly Rate																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Hourly Rate																			
	Truck's Capacity																			
	Hourly Rate																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Truck Drive																			
	Disposal Cost Steel																			
	Subtotal																			0
	Equipment's Disposal Cost																			
	Demolition Cost																			
	Equipment's Vol Demolished																			
	Loading Costs																			
	Transport Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost		Concrete Demo 1	9.82 CY						27.15					CY	1.3	27.15	CY	267	
	Concrete's Vol Demolished																			
	Loading Cost		31 23 18 42 1300	1.64 CY																
	Transportation Cost		12 CY 118 Tons Dump Truck 1/2 mi rd	5.48 CY																
	Disposal Costs		09 41 16 17 4700	8.61 CFB																
	Subtotal																			307
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol Demolished																			
	Loading Costs																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Demolition Cost																			
	Concrete's Vol Demolished																			
	Loading Cost																			
	Transportation Cost																			
	Disposal Costs																			
	Subtotal																			
	Total																			817

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Ref.	Description	Materials	Hours Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swarf Factor	Quantity	Unit	Cost	
	Hillier Retained Wall No. 34																				
	Structure's Demolition Cost																				
	Structure's Vol. Demolished																				
	Rubble's Weight (exclude steel)																				
	Truck's Capacity																				
	Weight																				
	Transportation Cost Near Steel Truck																				
	Transportation Cost Near Steel Drive																				
	Disposal Cost Non Steel																				
	Sheet's Weight																				
	Sheet's Capacity																				
	Transportation Cost Steel Truck																				
	Transportation Cost Sheet Truck Drive																				
	Disposal Cost Steel																				
	Subtotal																				
	Crane	Truck Mounted Crane 25 ton	01 54 33 60 2500	630 /day											2	1 days		2	days	1260	
	Truck	Truck dump 16 ton payload	01 54 33 70 5300	375 /day											2	2 days		4	days	1000	
	Crane Operator	Eq. Op. Crane or Shovel (Hohe)	Eq. Op.	\$48.60 /HR											2	1 days		2	days	96	
	Truck Driver	Truck Driver Henry	Eq. Op.	\$36.00 /HR											2	2 days		4	days	144	
	Labors	CLAB	Eq. Op.	\$35.45 /HR											16	2 hrs		32	hrs	1134	
	Subtotal																				3898
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Total																				3898

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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	
	Sampling Station No. 35																				
	Structure's Demolition Cost																				
	Structure's Vol. Demolished																				
	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 Truck Drive																				
	Disposal Cost Steel																				
	Subtotal																				313
	Equipment's Disposal Cost																				
	Demolition Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transport Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Demolition Cost																				
	Concrete's Vol. Demolished																				
	Loading Cost																				
	Transportation Cost																				
	Disposal Costs																				
	Subtotal																				
	Total																				319

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	Equipment Cost	Hourly Operating Costs	Equipment Overhead	Operator's Hourly Wage Rate	Hourly Cost	Number of Men or Eq.	Total Eq. & Lab. Costs	Units	Quantity	Units	Production Rate	Units	Equip. + Labor Time/Drs.	Units	Cost
Bear Canyon Mine															
Grading RECLAIMED															
Tank Seam No 01 YS-10 & TS-11															
Tank Seam Access Road and Portal Pad Area															
Direct Cut and Fill															
CAT 345BL II (10-24)(2nd2006) 2005															
Load and Haul															
CAT 345BL II (10-24)(2nd2006) 2005															
6X4 50,000lbs 10-12 CY (20-15) (2nd2006)															
Place Hauled Material															
CAT 345BL II (10-24)(2nd2006) 2005															
Volume															
Total															0

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	Equipment Cost	Hourly Operating Costs	Equipment Overhead	Operator's Hourly Wage Rate	Hourly Cost	Number of Men or Eq.	Total Eq. & Lab. Costs	Units	Quantity	Units	Production Rate	Units	Equip. + Labor Time/Dis	Units	Cost
Bear Canyon Mine Grading RECLAIMED Upper Storage Pad No 02 TS-8															
Direct Cut and Fill CAT 345BL II (10-24)(2nd2006) 2005															
Place Hauled Material From TS-5 and TS-6															
<b>Volume Total</b>															<b>0</b>

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	Equipment Cost	Hourly Operating Costs	Equipment Overhead	Operators Hourly Wage Rate	Hourly Cost	Number of Men or Eq.	Total Eq & Lab Costs	Units	Quantity	Units	Production Rate	Units	Equip. + Labor Time/Disc	Units	Cost
Bear Canyon Mine Grading															
Portals Paid Areas No 03 TS-7															
Direct Cut and Fill															
CAT 345BL II (10-24X2nd2000) 2005	13900	109.55	0.1	47.50	254.88	1	254.88 \$/HR		5578 CY	478 CY/HR		11.7 HR		2382	
Place Hauled Material From TS-5															
CAT 345BL II (10-24X2nd2006) 2005	13900	109.55	0.1	47.50	254.88	1	254.88 \$/HR		7405 CY	478 CY/HR		15.5 HR		3951	
<b>Volume Total</b>									12983						6933

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	Equipment Cost	Hourly Operating Costs	Equipment Overhead	Operator's Hourly Wage Rate	Hourly Cost	Number of Men or Eq.	Total Eq. & Lab. Costs	Units	Quantity	Units	Production Rate	Units	Equip. + Labor Time/Dis.	Units	Cost
Bear Canyon Mine Grading															
Portal Access Road No. 04															
Direct Cut and Fill															
CAT 345BL II (10-24)(2nd2006) 2005	13900	109.55	0.1	47.50	254.88	1	254.88 \$/HR		5573 CY	476 CY/HR		11.7 HR		2982	
Load and Haul															
CAT 345BL II (10-24)(2nd2006) 2005	13900	109.55	0.1	47.50	254.88	1	254.88 \$/HR		2553 CY	476 CY/HR		5.3 HR		1351	
6X4 50,000lbs 10-12 CY (20-15) (2nd2006)	2950	62.05	0.1	36.60	123.29	4	493.16 \$/HR					5.3 HR		2614	
Place Hauled Material															
CAT 345BL II (10-24)(2nd2006) 2005	13900	109.55	0.1	47.50	254.88	1	254.88 \$/HR		2553 CY	476 CY/HR		5.3 HR		1351	
Volume Total									8126						8298

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	Equipment Cost	Hourly Operating Costs	Equipment Overhead	Operator's Hourly Wage Rate	Hourly Cost	Number of Men or Eq.	Total Eq. & Lab. Costs	Units	Quantity	Units	Production Rate	Units	Equip. + Labor Time/Dis.	Units	Cost
Bear Canyon Mine Grading															
Coal Storage Pad No. 5															
Load and Haul Soil to other sites															
980H Series II EROPS (9-34) (2nd2006)	16200	115.7	0.1	47.5	276.02	1	276.02 \$/HR		15428 CY		577 CY/HR		26.7 HR		7370
6X4 50,000lbs 10-12 CY (20-15) (2nd2006)	2950	62.05	0.1	36.60	123.29	14	1726.06 \$/HR						26.7 HR		46086
Place Hauled Material															
CAT 345BL II (10-24) (2nd2006) 2005	13900	109.55	0.1	47.50	254.88	1	254.88 \$/HR		15428 CY		478 CY/HR		32.3 HR		8233
Move material on site Place Hauled Material															
D9R Semi-U EROPS (9-50) (2H2006)	20300	134.95	0.1	47.50	322.82	1	322.82 \$/HR		25157 CY		500 CY/HR		50.3 HR		16238
Volume									40585						
Total															77927

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	Equipment Cost	Hourly Operating Costs	Equipment Overhead	Operator's Hourly Wage Rate	Hourly Cost	Number of Men or Eq.	Total Eq. & Lab. Costs	Units	Quantity	Units	Production Rate	Units	Equip. + Labor Time/Dis.	Units	Cost
Bear Canyon Mine															
Grading															
Scale House No 6	203000	134.95	0.1	47.50	322.82	1	322.82 \$/HR		1454 CY		500 CY/HR		2.9 HR		936
D9R Semi-U EROPS (9-50) (2H2006)									1454						
<b>Volume Total</b>															<b>936</b>

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	Equipment Cost	Hourly Operating Costs	Equipment Overhead	Operator's Hourly Wage Rate	Hourly Cost	Number of Men or Eq.	Total Eq. & Lab. Costs	Units	Quantity	Units	Production Rate	Units	Equip. + Labor Time/Dis.	Units	Cost
Bear Canyon Mine Grading															
Sediment Ponds No.7															
D9R Semi-U EROPS "A"	20300	134.95	0.1	47.50	322.82	1	322.82 \$/HR		3460 CY		500 CY/HR		6.9 HR		2227
D9R Semi-U EROPS "B"	20300	134.95	0.1	47.50	322.82	1	322.82 \$/HR		0 CY		500 CY/HR		0 HR		0
D9R Semi-U EROPS "C"	20300	134.95	0.1	47.50	322.82	1	322.82 \$/HR		0 CY		500 CY/HR		0 HR		0
Volume Total									3460						2227

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	Equipment Cost	Hourly Operating Costs	Equipment Overhead	Operator's Hourly Wage Rate	Hourly Cost	Number of Men or Eq.	Total Eq. & Lab. Costs	Units	Quantity	Units	Production Rate	Units	Equip. + Labor Time/Dls.	Units	Cost
Bear Canyon Mine Grading															
Shower House No.08															
D9R Semi-U EROPS (9-50) (2H2006)	20300	134.95	0.1	47.50	322.82	1	322.82 \$/HR		5851	500	500 CY	11.7	11.7 CY		3777
Volume									5851						
Total															3777

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	Equipment Cost	Hourly Operating Costs	Equipment Overhead	Operators Hourly Wage Rate	Hourly Cost	Number of Men or Eq.	Total Eq. & Lab. Costs	Units	Quantity	Units	Production Rate	Units	Equip. + Labor Time/Dis.	Units	Cost
Bear Canyon Mine Grading															
Wild Horse Ridge No. 09															
WHR Portal Area															
Rough Backfilling and Grading															
D9R Semi-U EROPS (9-50) (2H2006)	20300	134.95	0.1	47.50	322.82	1	322.82 \$/HR		10288 CY	500 CY/HR		20.6 HR		6650	
Haul and Place Topsoil															
980H Series II EROPS (9-34) (2nd2006)	16200	115.7	0.1	47.50	276.02	1	276.02 \$/HR		4860 CY	577 CY/HR		8.4 HR		2319	
6X4 50,000lbs 10-12 CY (20-15) (2nd2006)	2950	62.05	0.1	36.60	123.29	17	2095.93 \$/HR		4860 CY	500 CY/HR		8.4 HR		17606	
D9R Semi-U EROPS (9-50) (2H2006)	20300	134.95	0.1	47.50	322.82	1	322.82 \$/HR		4860 CY	500 CY/HR		9.7 HR		3131	
Subtotal														29706	
WHR Upper Access Road															
Cut and Fill Material															
CAT 345BL II (10-24) (2nd2006) 2005	13900	109.54	0.1	47.50	254.87	1	254.87 \$/HR		1912 CY	478 CY/HR		4 HR		1019	
Haul and Place Topsoil															
CAT 345BL II (10-24) (2nd2006) 2005	13900	109.54	0.1	47.50	254.87	1	254.87 \$/HR		2171 CY	478 CY/HR		4.5 HR		1147	
6X4 50,000lbs 10-12 CY (20-15) (2nd2006)	2950	62.05	0.1	36.60	123.29	3	369.87 \$/HR		2171 CY	478 CY/HR		4.5 HR		1664	
CAT 345BL II (10-24) (2nd2006) 2005	13900	109.54	0.1	47.50	254.87	1	254.87 \$/HR		2171 CY	478 CY/HR		4.5 HR		1147	
Subtotal														3977	
WHR Lower Access Road															
Load and Haul Material with															
CAT 345BL II (10-24) (2nd2006) 2005	13900	109.54	0.1	47.50	254.87	1	254.87 \$/HR		1473.5 CY	478 CY/HR		3.1 HR		790	
D9R Semi-U EROPS (9-50) (2H2006)	20300	134.95	0.1	47.50	322.82	1	322.82 \$/HR		1473.5 CY	500 CY/HR		2.9 HR		936	
Subtotal														1726	
Volume Total									20704.5						36409

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	Equipment Cost	Hourly Operating Costs	Equipment Overhead	Operator's Hourly Wage Rate	Hourly Cost	Number of Men or Eq.	Total Eq. & Lab. Costs	Units	Quantity	Units	Production Rate	Units	Equip. + Labor Time/Dls.	Units	Cost
Bear Canyon Mine															
Grading															
Borehole No 10															
Load and Haul Material															
980H Series II EROPS (9-34) (2nd/2006)	16200	115.70	0.1	47.50	276.02	1	276.02 \$/HR		10560 CY	498	498	21.2 HR		5852	
6X4 50,000lbs 10-12 CY (20-15) (2nd/2006)	2950	62.05	0.1	36.60	123.29	13	1602.77 \$/HR		10560 CY	478	478	21.2 HR		33979	
CAT 345BL II (10-24) (2nd/2006) 2005	13900	109.55	0.1	47.50	254.88	1	254.88 \$/HR		10560 CY			22.1 HR		5633	
Volume									10560						
<b>Total</b>															<b>45464</b>

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	Equipment Cost	Hourly Operating Costs	Equipment Overhead	Operator's Hourly Wage Rate	Hourly Cost	Number of Men or Eq.	Total Eq. & Lab Costs	Units	Quantity	Units	Production Rate	Units	Equip. + Labor Time/Drs	Units	Cost
Bear Canyon Mine Grading Support No. 11															
Foreman Average Outside					37.45	1	37.45 \$/HR						245.5 HR		9194
5,000 gal H2O Truck Diesel (20-17) (2nd/2006)	9800	57.7	0.1	45.85	127.37	1	127.37 \$/HR						26 HR		3312
Pickup Truck Crew 4x4 1 ton (20-17) (2nd/2006)	660	15.2	0.1	0	20.85	1	20.85 \$/HR						245.5 HR		5119
<b>Total</b>															<b>17625</b>

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	Equipment Cost	Hourly Operating Costs	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/Dls.	Units	Cost
Bear Canyon Mine Grading															
Riprap No.12					75.75										
Place rip-rap, 18" min. thickness mat only									6612						516009
31 37 13, 10 0200															
<b>Total</b>															<b>516009</b>

AREA	TOTAL LENGTH	RECLAIMED & COMP LENGTH	TOTAL RIPRAP (SY)	RECLAIMED RIPRAP (SY)
RC-1	320	320	100	125
RC-2	640	190	30	80
RC-3	1030	140	14	59
				<u>264</u>

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Ref	Description	Material	Material Reference Number	Unit Cost	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Man Mine Site 01																		
	Dirt Spreading	Trucks, Spreader (excav. & labor) 18.46	Remo004	24.09 MSF					13.4						AC		584 MSF		14209
	Spill Material	Beer Canyon Man Mine Shovel	Beer Canyon 001	100 \$AC					13.4						AC		13 AC		2518
	Spill Material	Beer Canyon Man Mine Forks	Beer Canyon 002	178 \$AC					13.4						AC		13 AC		2414
	Spill Material	Beer Canyon Man Mine Gravel	Beer Canyon 003	186 \$AC					13.4						AC		13 AC		2414
	Dirt Spreading	Trucks, Spreader (excav. & labor) 18.46	Remo004	24.09 MSF					13.4						AC		584 MSF		14209
	Spill Material	Beer Canyon Man Mine Shovel	Beer Canyon 001	100 \$AC					13.4						AC		13 AC		2518
	Spill Material	Beer Canyon Man Mine Forks	Beer Canyon 002	178 \$AC					13.4						AC		13 AC		2414
	Spill Material	Beer Canyon Man Mine Gravel	Beer Canyon 003	186 \$AC					13.4						AC		13 AC		2414
	Manch	Hay 1' material only 0.91 0.9000750	Remo001	41.19 MSF					13.4						AC		584 MSF		14209
	Stock Labor	Rate food seedlings, 11" to 18" med. soil	33 01 43 10 01 10	0.79 EA					13.4					500	AC		6700 EA		5235
	Stock Material	Beer Canyon Man Turbidity	Beer Canyon 004	4.94 \$AC					13.4					500	AC		6700 EA		3122
	Subtotal	300 HP Ditch w/ Ripper	31 23 18 33 2830	9.46 CY					13.4					21014	CY				9612
	Hydroexcavation																		13668
	Hydroexcavation	Hydroexcavation	Remo002	24.93 MSF					3.71						AC		164 MSF		4072
	Spill Material	Beer Canyon Man Mine Shovel	Beer Canyon 001	100 \$AC					3.71						AC		4 AC		781
	Spill Material	Beer Canyon Man Mine Forks	Beer Canyon 002	178 \$AC					3.71						AC		4 AC		781
	Spill Material	Beer Canyon Man Mine Gravel	Beer Canyon 003	186 \$AC					3.71						AC		4 AC		781
	Manch	Hay 1' material only 0.91 0.9000750	Remo001	41.19 MSF					3.71						AC		164 MSF		3951
	Stock Labor	Rate food seedlings, 11" to 18" med. soil	33 01 43 10 01 10	0.79 EA					3.71					500	AC		1851 EA		6755
	Stock Material	Beer Canyon Man Turbidity	Beer Canyon 004	4.94 \$AC					3.71					500	AC		1851 EA		1470
	Excavation	Excavation Back Bank 2 CY (N22th 1)	31 23 18 33 0780	1.54 CY					3.71					1702	CY				1674
	Reclaim Plantation Area																		29254
	Plant Stock	Beer Canyon Man Mine Grass	Beer Canyon 003	100 \$AC					1						AC		1 AC		165
	Subtotal	Beer food seedlings, 11" to 18" med. soil	33 01 43 10 01 10	0.79 EA					1					1000	EA		1000 EA		780
	Manch																		883
	Subtotal	Reclamation dirt, weedbed	31 26 13 10 0120	7.57					3.6						AC		12284 SY		80048
	Total																		293185
	Revised																		14285
	Subtotal	Assuming 25% reworking																	252470
	Total																		263470

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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	
	Wild Horse Ridge 02																				
	Revegetation																				
	Drill Seeding																				
	Drill Seeding																				
	Mulch																				
	Stock																				
	Replanting																				
	Subtotal																				
	Hydroseeding																				
	Hydroseeding	Hydro Spreader (equip. & labor) B-61	Reveg005	24.09/MSF	MSF																
	Hydroseeding	Bear Canyon Main Mine Grass	Bear Canyon 005	196 \$/AC	AC																3927
	Hydroseeding	Bear Canyon Main Mine Grass	Bear Canyon 006	235 \$/AC	AC																784
	Hydroseeding	Bear Canyon Main Mine Grass	Bear Canyon 007	188 \$/AC	AC																940
	Mulch	Hydro Spreader (equip. & labor) B-61	Reveg005	24.09/MSF	MSF																752
	Mulch	Hay 1, material only, 029105.000250	Reveg001	41.19/MSF	MSF																3927
	Stock	Bear Canyon Main Transplants	Bear Canyon 004	4.66 \$/AC	AC																8714
	Stock (labor cost = material cost)	Bare root seedlings, 11" to 18" med. soil	32 53 43 10 0140	0.78 Ea	EA																1459
	Packing 340 CY/AC	Erosion Bulk Bank 2 CY (322BL)	31 23 16 32 0260	1.54 /CY	CY																1559
	Subtotal																				29176
	Hard Seed	Hand Spread Seed (CLAB)	32 52 18 14 0400	54.11/MSF	MSF																3768
	Seed	Bear Canyon Main Mine Grass	Bear Canyon 005	196 \$/AC	AC																392
	Seed	Bear Canyon Main Mine Grass	Bear Canyon 006	235 \$/AC	AC																470
	Seed	Bear Canyon Main Mine Grass	Bear Canyon 007	188 \$/AC	AC																376
	Stock	Bear Canyon Main Transplants	Bear Canyon 004	4.66/MSF	MSF																3728
	Stock (labor cost = material cost)	Bare root seedlings, 11" to 18" med. Soil	23 93 43 10 0140	0.78 Ea	Ea																624
	Mulch	Revegetation mulf, webbed	31 25 13 10 0120	7 \$Y	SY																54208
	Subtotal																				63588
	Total Vegetation																				92762
	Revised																				
	Assume 25% reseeding																				
	Subtotal																				4500
	Subtotal																				4500
	Subtotal																				121838

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# PHASE II

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**CHAPTER 3**  
**R645-301-300 BIOLOGY**

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## TABLE OF CONTENTS (Continued)

### CHAPTER 3 BIOLOGY

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**APPENDIX M**  
**CASTLE VALLEY (RHINO ENERGY) VEGETATION**  
**SAMPLING REPORT**  
**TAK SEAM ACCESS ROAD RECLAMATION**

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**Castle Valley Mine (Rhino Energy) Vegetation Sampling  
Report  
Tank Seam Access Road Reclamation**

**2012  
Emery County, Utah**

CONDUCTED AUGUST 24<sup>TH</sup> & SEPTEMBER 5<sup>TH</sup> 2012

---

**EIS Environmental & Engineering Consulting**  
31 North Main Street \* Helper, Utah 84526  
Office – (435) 472-3814 \* Toll free – (800) 641-2927 \* Fax – (435) 472-8780  
eisec@preciscom.net

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## **Introduction**

The Tank Seam Access Road Reclamation Area has been reclaimed since 2005. Rhino Energy contracted with EIS Environmental to survey the area for the condition, performance and overall statistical output of the area. This area is located in Bear Canyon, a branch of Huntington Canyon, located west of the town of Huntington, Utah. The reclaimed area is on an east facing slope surrounded by pinion-juniper plant communities. The reference area is located adjacent to the disturbance and was also surveyed.

## **Methods**

Random placement of 100 foot transects were placed in the reclamation and reference areas on August 24<sup>th</sup> and September 5<sup>th</sup> 2012. Points were read every five feet for a total of 20 points per transect. Vegetation (species), rock, litter (organic material), and soil was recorded at each point. A total of 48 transects were used on the reclamation area and 20 transects on the reference site.

## **Results**

A total of 48 transects were run over an estimated 4.96 acres. The results were gathered and tabulated in Table 1. The reference area of one acre was surveyed with 20 transects and the data gathered in Table 2. Standard deviations were calculated for both the reclamation and reference areas data in Table 3. Reference areas standard deviations are calculated in Table 4. Individual species occurrences for the reclamation area are referenced in Table 4. Reference area occurrences are shown in Table 5.

## **Conclusion**

Grasses dominated the vegetation in the reclamation area as well as the reference area. Grasses accounted for 64.4% of the total vegetation present. Forbs consisted of 31.5% and shrubs made up the difference at 4.1%. The total cover of vegetation in this area was at 15.8% with the rest made up from rock, soil and litter.

The reference areas vegetation was composed of 98% grasses (Salina Wildrye), 2% shrubs (Curl-leaf Mahogany), and no forbs were recorded by transects. The percent of coverage by vegetation was 12.8% with the remaining percentage made up of soil, rock, and litter.

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**Table 1 Data From Reclamation Transects (Percent Cover)**

<b>Road Transects:</b>		
<b>Grasses:</b>	<b>%</b>	<b># of Occurances</b>
Bluebunch Wheatgrass	2.40%	23
Crested Wheatgrass	0.21%	2
Great Basin Wildrye	3.02%	29
Indian Ricegrass	0.52%	5
Intermediate Wheatgrass	0.10%	1
Salina Wildrye	2.19%	21
Saltgrass	1.35%	13
Western Wheatgrass	0.42%	4
<b>Total Grasses:</b>	<b>10.21%</b>	<b>98</b>
<b>Forbs:</b>		
Canadian Thistle	0.10%	1
Englemanns Aster	0.31%	3
Halogeton	0.21%	2
Palmers Penstemon	1.25%	12
Rubber Rabbitbrush	1.88%	18
Yarrow	0.94%	9
Yellow Rabbitbrush	0.31%	3
<b>Total Forbs:</b>	<b>5.00%</b>	<b>48</b>
<b>Shrubs:</b>		
Curl-leaf Mohagony	0.10%	1
Slender Buchwheat	0.21%	2
Wyoming Sagebrush	0.31%	3
<b>Total Shrubs:</b>	<b>0.63%</b>	<b>6</b>
<b>Soils:</b>	<b>37.08%</b>	<b>356</b>
<b>Rock:</b>	<b>30.42%</b>	<b>292</b>
<b>Litter:</b>	<b>16.67%</b>	<b>160</b>

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**Table 2 Data from Reference Site (Percent Cover)**

<b>Reference Site:</b>		
<b>Grasses:</b>	Total %:	# of Occurances
Salina Wildrye	<b>12.50%</b>	<b>50</b>
<b>Shrubs:</b>		
Curl-leaf Mohagony	<b>0.25%</b>	<b>1</b>
<b>Soils:</b>	<b>41.50%</b>	<b>166</b>
<b>Rock:</b>	<b>21.25%</b>	<b>85</b>
<b>Litter:</b>	<b>24.50%</b>	<b>98</b>

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**Table 3 Road Reclamation Site Standard Deviations**

**Total Cover**

<b>Reclamation Area Sample Size</b>	<b>Mean % Cover</b>	<b>Standard Deviation</b>	
Living Vegetation Sampled	15.83	17.52	48
Rock	30.42	22.08	48
Litter	16.67	17.89	48
Soil	37.08	23.18	48

**Composition**

Shrubs/Trees	3.95	9.35	48
Forbes	31.58	22.31	48
Grasses	64.67	22.94	48

**Table 4 Reference Area Standard Deviations**

<b>Reference Area</b>	<b>Mean % Cover</b>	<b>Standard Deviation</b>	<b>Sample Size</b>
Living Vegetation Sampled	12.75	6.67	20
Rock	21.25	8.18	20
Litter	24.5	8.60	20
Soil	41.5	9.85	20

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**Table 5 Road Reclamation Site Individual Species Occurrences**

Species	% Cover	Standard Deviation	Average/Transect
<b>Grasses</b>			
Bluebunch Wheatgrass	2.4	7.35	0.48
Crested Wheatgrass	0.21	2.20	0.10
Great Basin Wildrye	3.02	8.21	0.60
Indian Ricegrass	0.52	3.45	0.10
Intermediate Wheatgrass	0.10	1.52	0.02
Salina Wildrye	2.19	7.03	0.44
Saltgrass	1.35	5.54	0.27
Western Wheatgrass	0.42	3.10	0.08
<b>Forbs:</b>			
Canadian Thistle	0.10	1.52	0.02
Englemanns Aster	0.31	2.67	0.06
Halogeton	0.20	2.14	0.04
Palmers Penstemon	1.25	5.33	0.25
Rubber Rabbitbrush	1.88	6.52	0.38
Yarrow	0.94	4.63	0.19
Yellow Rabbitbrush	0.31	2.67	0.06
<b>Shrubs:</b>			
Curl-leaf Mohagony	0.10	1.52	0.02
Slender Buckwheat	0.21	2.20	0.04
Wyoming Sagebrush	0.31	2.67	0.06

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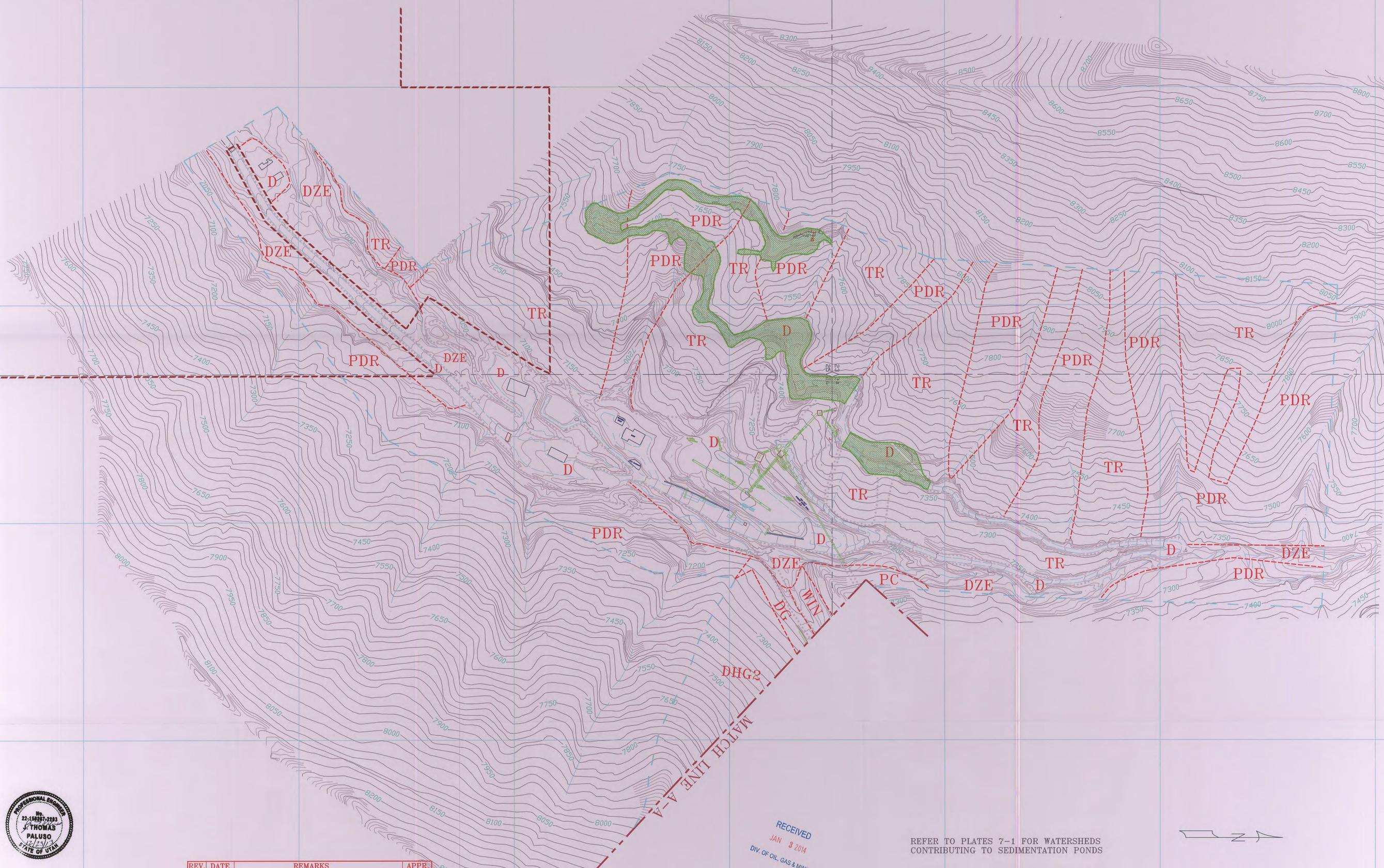
**Table 6 Reference Area Site Individual Species Occurrences**

Species	% Cover	Standard Deviation	Average/Transect
<b>Grasses:</b>			
Salina Wildrye	12.5	6.61	2.5
<b>Shrubs:</b>			
Curl-leaf Mohagony	0.25	1.00	0.02

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N 389,000 N 390,000 N 391,000 N 392,000 N 393,000 N 394,000 N 395,000

E 2,113,000  
E 2,114,000  
E 2,115,000  
E 2,116,000  
E 2,117,000



**CASTLE VALLEY MINING, LLC**  
HUNTINGTON, UTAH

**SOILS MAP**

SCALE: 1" = 200'  
DRAWN BY: C. Reynolds  
DATE: 8/25/92

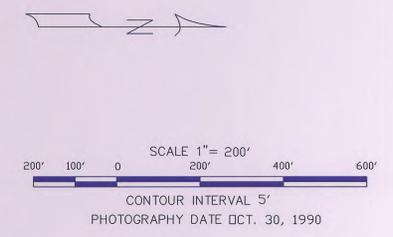
**PLATE 2-1A**

REV.	DATE	REMARKS	APPR.
1	5-30-95	Tipple Structure Expansion/Rock Crusher Conveyor/Water Tank (95D)	9-12-95
2	9-13-95	Ditch D-10D Route Modified (95J)	9-18-95
3	12-02-95	Disturbed Boundary Modified/Coal Recovery Bin Removed (95N)	12-18-95
4	6-06-95	Dist. Boundary Mod. for BTCA Area "V" (95I)	1-08-96
5	2-23-96	Plate Updated for Tank Seam/Bathhouse As-built (96A)	7-05-96
6	7-22-96	D-8D Water Bar Concrete Crossing Added (96C)	9-04-96
7	3-18-98	Lower Culvert C-2D Removed	4-15-98
8	6-25-01	Wild Horse Ridge Disturbance Area Added (SR98-1)	7-03-01
9	8-01-02	Changed from plate 8-1 to 2-1A	12-08-05
10	1-16-07	Loadout Expansion	8-07-07
11	9-09-13	Reclaimed Area	11-25-13

LEGEND			
RECLAIMED		SECTION LINE	
DISTURBED AREA		CONTOUR LINE	
SOIL BOUNDARY		PODO-DATINO-ROCK	<b>PDR</b>
DATINO-SHEEPCAN-WINETTI	<b>DZE</b>	TRAVESSILLA	<b>TR</b>
		PERMIT BOUNDARY	
		SURVEY BOUNDARY	

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REFER TO PLATES 7-1 FOR WATERSHEDS CONTRIBUTING TO SEDIMENTATION PONDS  
SEE PLATES 2-4 FOR SURFACE FACILITIES



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CASTLE VALLEY MINING, LLC  
HUNTINGTON, UTAH

**RECLAMATION AREA**

SCALE: 1" = 50'  
DRAWN BY: C. REYNOLDS  
DATE: 5/13/91  
PLATE 2-3C

REV.	DATE	REMARKS	APPR.
1	10/22/93	Tank Seam Road, TS-10 Added (93B)	7/22/94
2	8/01/94	Lamphouses Removed/Portal Pad Recontoured	8/17/94
3	5/30/95	Tipple Structure Expansion/Rock Crusher Conveyor (95C)	9/12/95
4	9/13/95	Ditch D-10D Route Modification (95K)	9/18/95
5	12/02/95	Dist. Boundary Modified/Cool Recovery Bin Removed (95N)	12/18/95
6	2/23/96	Plate Updated With Tank Seam As-Built	7/05/96
7	5/31/98	Wild Horse Ridge Disturbance Added	6/25/01
8	10/13/01	Added TS-4, TS-5 boundary and cross-sections, moved road (01A) Corrected Disturbed Boundary and Reclamation Boundary	11/13/01
9	8/01/02	Changed name from 8-5C to 2-3C	12/8/05
10	1/16/07	Loadout Expansion	8/07/07
11	9/09/13	Reclaimed Area	11/25/13

SCALE 1" = 50'  
CONTOUR INTERVAL 2'  
PHOTOGRAPHY DATE NOV. 11, 1990



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**LEGEND**

Cross-Sections (Appendix 3L)	CONTOUR LINE	RECLAMATION AREA
DISTURBED AREA	TOPSOIL SAMPLE LOCATIONS	CROSS SECTION
AREA NOT REQUIRING RECONTOURING OR TOPSOIL WITHIN THE DISTURBED AREA		

NOTE: WHERE DISTURBED AND RECLAMATION BOUNDARIES COINCIDE, ONLY THE RECLAMATION BOUNDARY IS SHOWN.

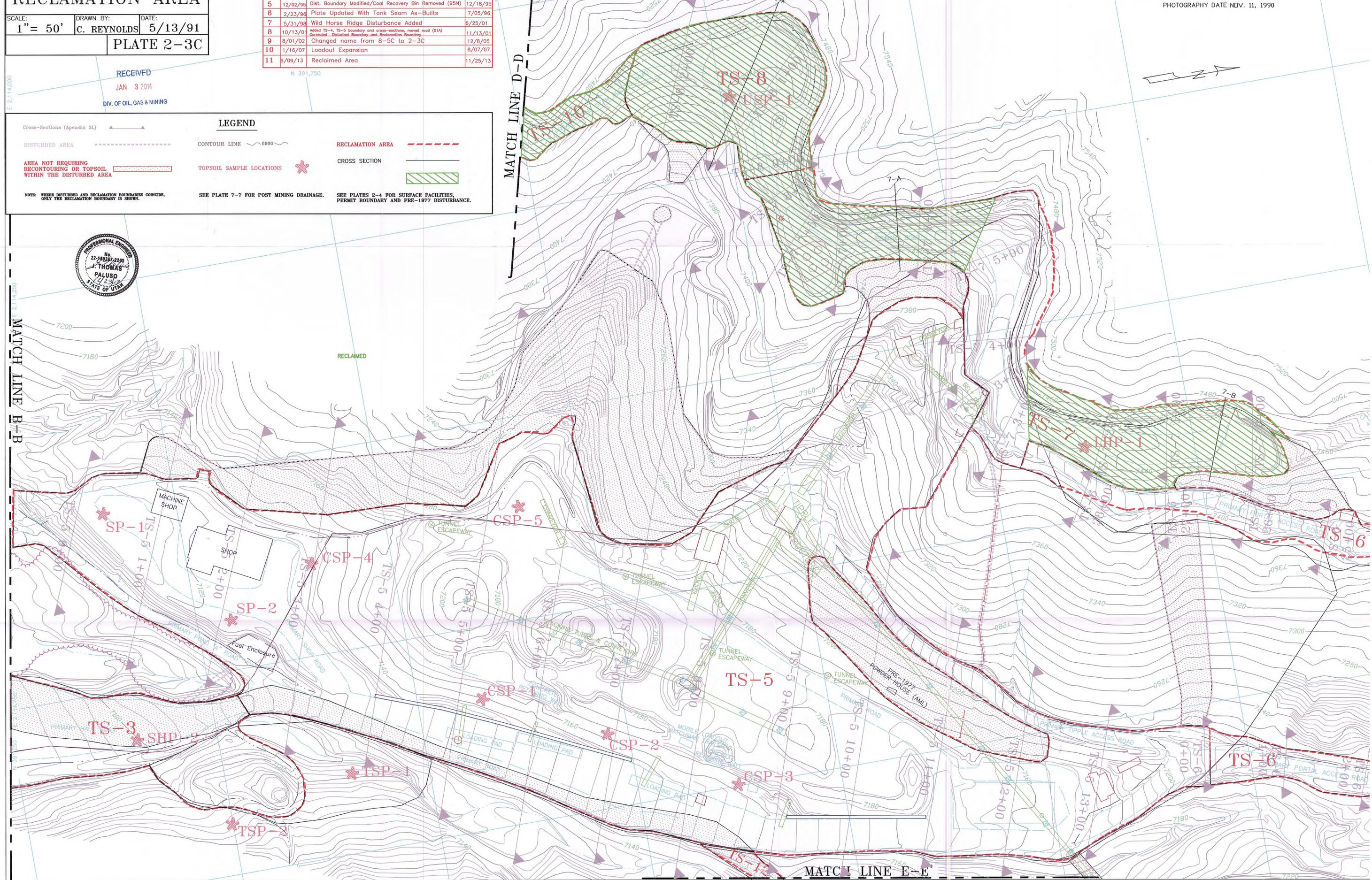
SEE PLATE 7-7 FOR POST MINING DRAINAGE.

SEE PLATES 2-4 FOR SURFACE FACILITIES, PERMIT BOUNDARY AND PRE-1977 DISTURBANCE.

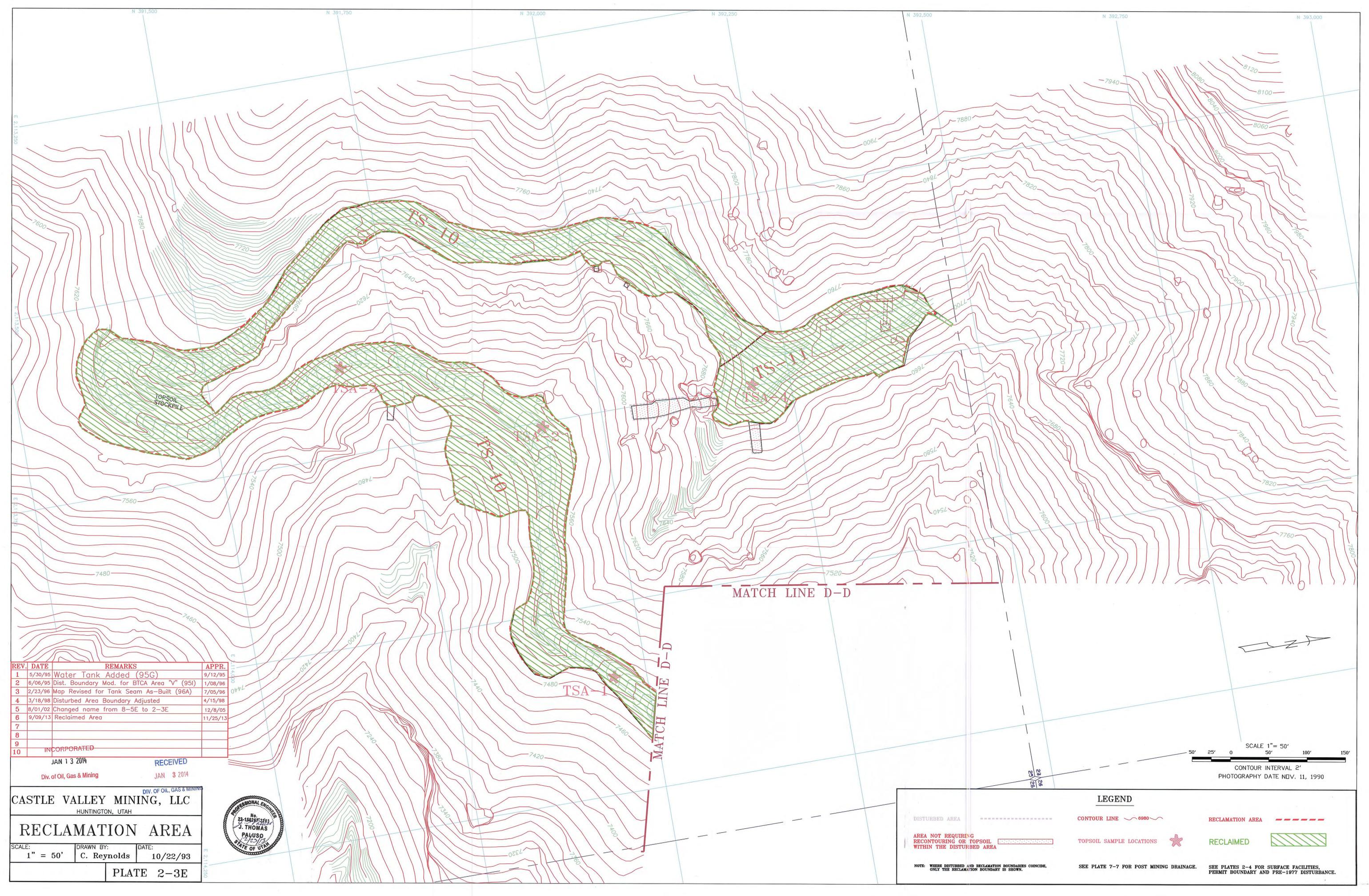


MATCH LINE B-B

MATCH LINE D-D



MATCH LINE E-E



REV.	DATE	REMARKS	APPR.
1	5/30/95	Water Tank Added (95G)	9/12/95
2	6/06/95	Dist. Boundary Mod. for BTCA Area "v" (95)	1/08/96
3	2/23/96	Map Revised for Tank Seam As-Built (96A)	7/05/96
4	3/18/98	Disturbed Area Boundary Adjusted	4/15/98
5	8/01/02	Changed name from 8-5E to 2-3E	12/8/05
6	9/09/13	Reclaimed Area	11/25/13
7			
8			
9			
10		INCORPORATED	

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 HUNTINGTON, UTAH

**RECLAMATION AREA**

SCALE: 1" = 50' DRAWN BY: C. Reynolds DATE: 10/22/93

PLATE 2-3E



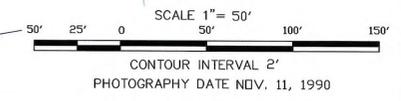
**LEGEND**

- DISTURBED AREA: Dotted line
- CONTOUR LINE: Solid line with elevation (e.g., 6980)
- RECLAMATION AREA: Dashed line
- AREA NOT REQUIRING RECONTOURING OR TOPSOIL WITHIN THE DISTURBED AREA: Stippled area
- TOPSOIL SAMPLE LOCATIONS: Star symbol
- RECLAIMED: Green hatched area

NOTE: WHERE DISTURBED AND RECLAMATION BOUNDARIES COINCIDE, ONLY THE RECLAMATION BOUNDARY IS SHOWN.

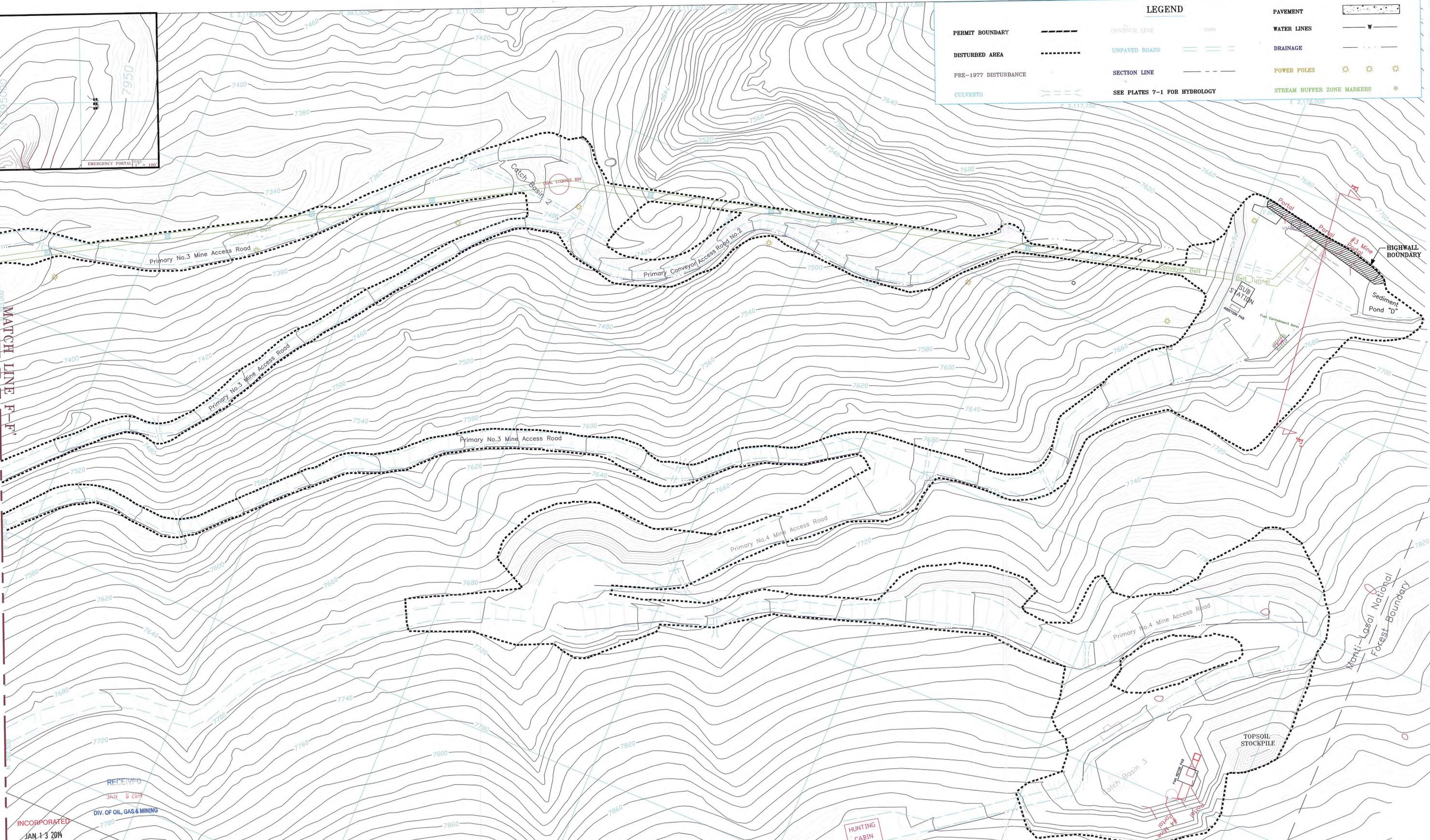
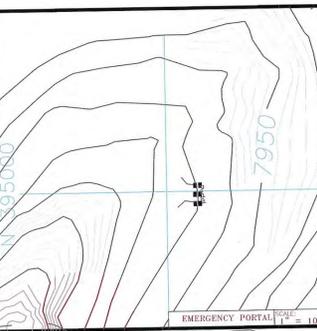
SEE PLATE 7-7 FOR POST MINING DRAINAGE.

SEE PLATES 2-4 FOR SURFACE FACILITIES, PERMIT BOUNDARY AND PRE-1977 DISTURBANCE.



**LEGEND**

PERMIT BOUNDARY	---	CONTOUR LINE	---	PAVEMENT	---
DISTURBED AREA	---	UNPAVED ROADS	---	WATER LINES	---
PRE-1977 DISTURBANCE	---	SECTION LINE	---	DRAINAGE	---
CULVERTS	---	SEE PLATES 7-1 FOR HYDROLOGY	---	POWER POLES	---
				STREAM BUFFER ZONE MARKERS	---



MATCH LINE F-F'

HIGHWALL BOUNDARY

Monticello National Forest Boundary

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**CO-OP MINING CO.**  
HUNTINGTON, UTAH

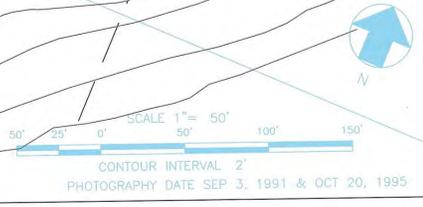
**SURFACE FACILITIES**

SCALE: 1" = 50'  
DRAWN BY: C. Reynolds  
DATE: 6/25/01

BEAR CANYON PLATE 5-2G



REV.	DATE	REMARKS	APPR.
1	6/25/01	WHR surface facilities added (SR98-1)	7/03/01
2	10/23/01	WHR Tower Location Corrected (AM01c)	11/05/01
3	6/03/02	WHR tank seam pad and access road added (AM02B)	9/20/02
4	1/13/03	Extended TS Pad	6/3/03
5	8/01/02	Changed name from 2-4G to 5-2G	12/8/05
6	9/18/05	Added 4 Mine Emergency Escape Portal	2/13/05
7	5/09/06	WHR Tanks Seam As-Built	
8	5/16/07	Added #4 Mine Aux Substation	8/22/07
9	12/7/13	Added Concrete Fan Pad and Substation Capacitor Bank	
10			



Section 24  
T16S, R12E, S10N

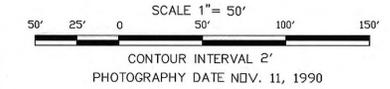
**CASTLE VALLEY MINING, LLC**  
 HUNTINGTON, UTAH

**POST-MINING TOPOGRAPHY**

SCALE: 1" = 50'  
 DRAWN BY: C. Reynolds  
 DATE: 5/22/91

PLATE 5-6C

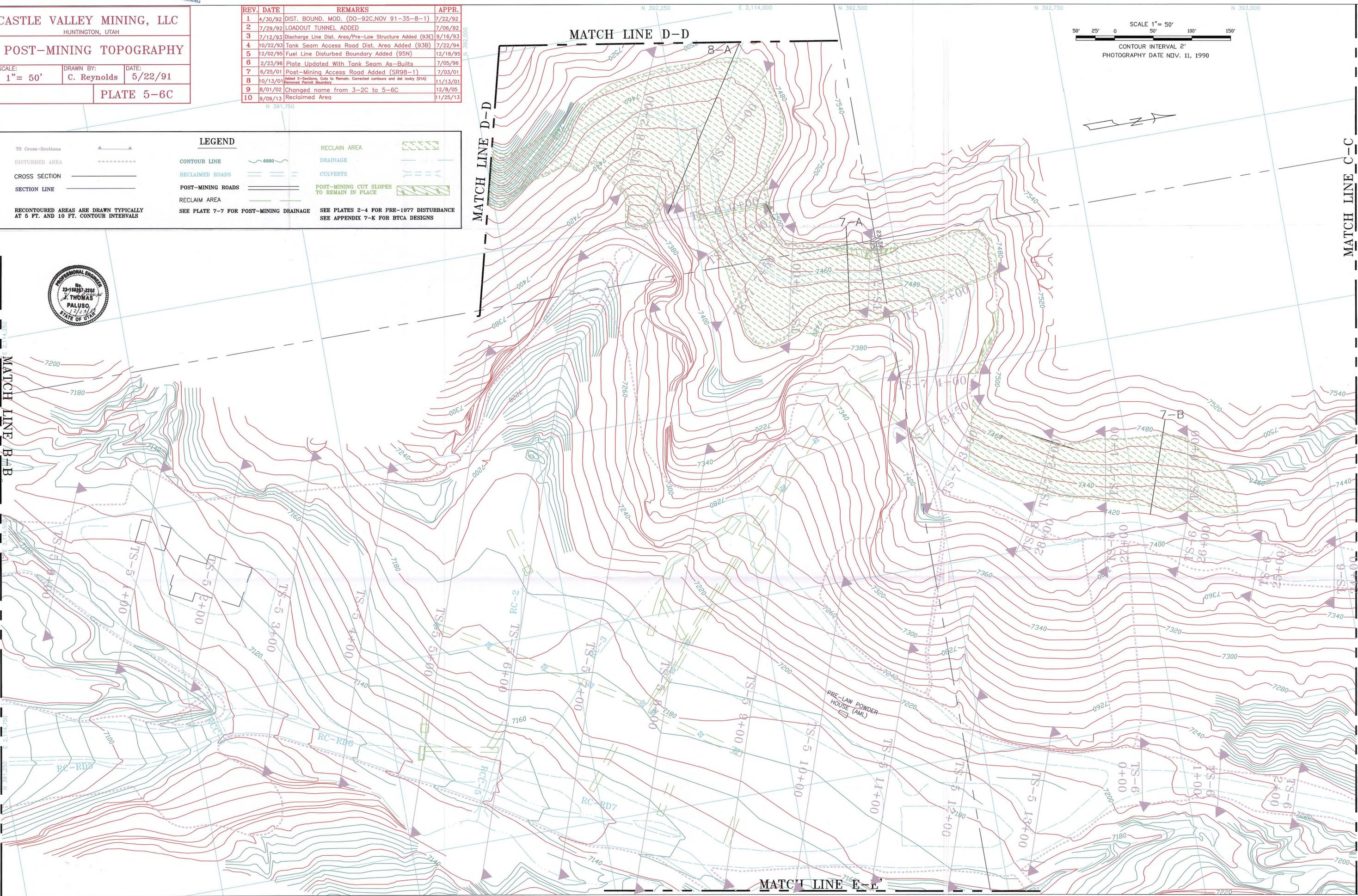
REV.	DATE	REMARKS	APPR.
1	4/30/92	DIST. BOUND. MOD. (DO-92C, NOV 91-35-8-1)	7/22/92
2	7/29/92	LOADOUT TUNNEL ADDED	7/06/93
3	7/12/93	Discharge Line Dist. Area/Pre-Low Structure Added (93E)	9/16/93
4	10/22/93	Tank Seam Access Road Dist. Area Added (93B)	7/22/94
5	12/02/95	Fuel Line Disturbed Boundary Added (95N)	12/18/95
6	2/23/96	Plate Updated With Tank Seam As-Built	7/05/96
7	6/25/01	Post-Mining Access Road Added (SR98-1)	7/03/01
8	10/13/01	Added X-Sections, Cuts to Remain, Corrected contours and dat. undry (01A) Removed Permit Boundary	11/13/01
9	8/01/02	Changed name from 3-2C to 5-6C	12/8/05
10	9/09/13	Reclaimed Area	11/25/13

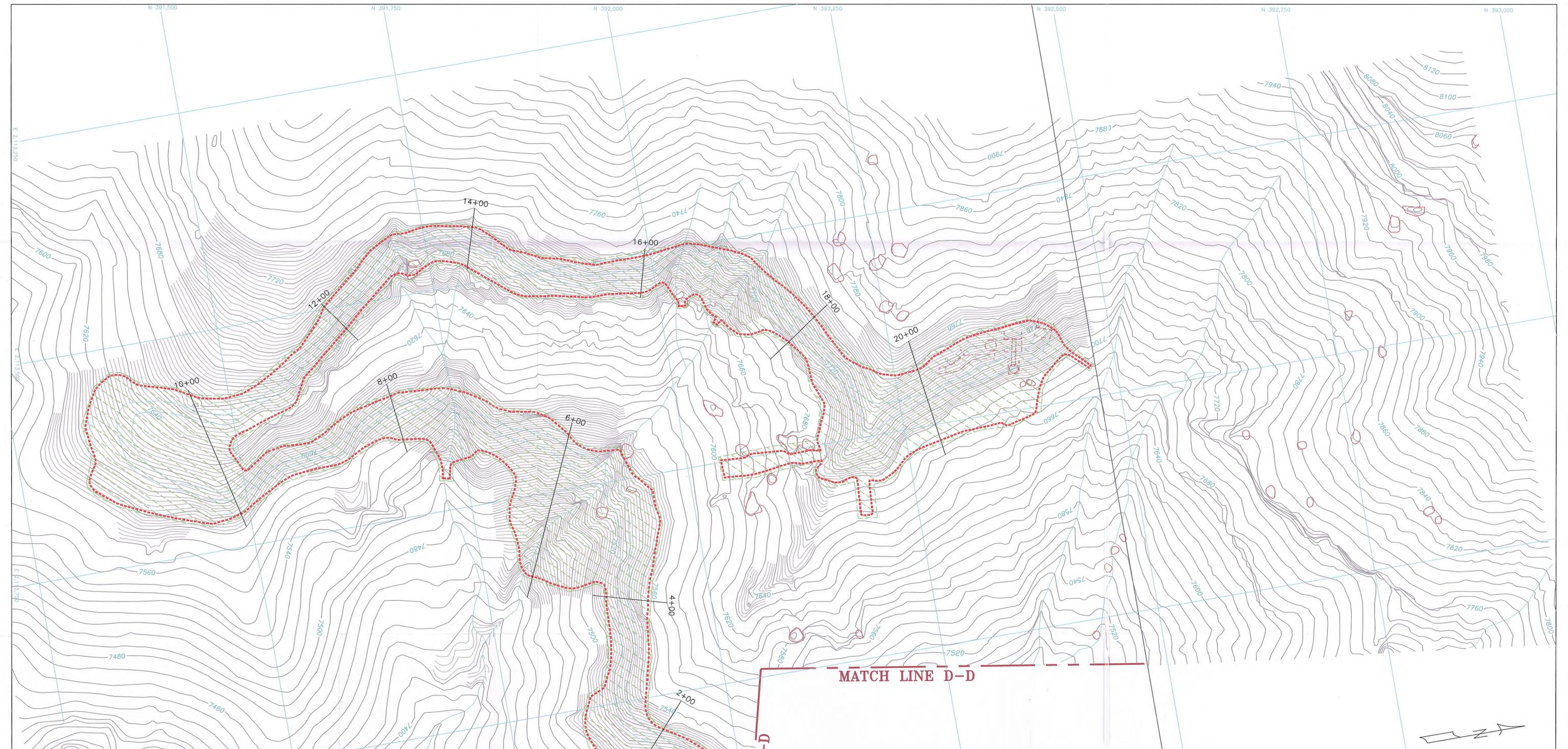


**LEGEND**

- TS Cross-Sections
- DISTURBED AREA
- CROSS SECTION
- SECTION LINE
- RECLAIMED ROADS
- POST-MINING ROADS
- RECLAIM AREA
- CONTOUR LINE
- RECLAIMED ROADS
- POST-MINING ROADS
- RECLAIM AREA
- RECLAIM AREA
- DRAINAGE
- CULVERTS
- POST-MINING CUT SLOPES TO REMAIN IN PLACE

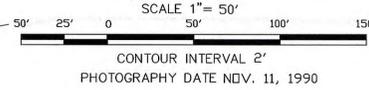
SEE PLATES 2-4 FOR PRE-1977 DISTURBANCE  
 SEE APPENDIX 7-K FOR BTCA DESIGNS





MATCH LINE D-D

MATCH LINE D-D



REV.	DATE	REMARKS	APPR.
1	6/06/95	Dist. Boundary Mod. For BTCA Area "V" (95I)	1/08/96
2	2/23/96	Updated For Tank Seam As-Built (96A)	7/05/96
3	3/18/98	Disturbed Area Boundary Adjusted	4/15/98
4	8/01/02	Changed name from 3-2E to 5-6E	12/8/05
5	9/09/13	Reclaimed Area	11/25/13
6			
7			
8			
9			
10			

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**POST-MINING TOPOGRAPHY**

SCALE: 1" = 50'  
DRAWN BY: C. Reynolds  
DATE: 10/22/93

PLATE 5-6E



**LEGEND**

CROSS SECTION	—	CONTOUR LINE	~ 8980 ~	PERMIT BOUNDARY	---
DISTURBED AREA	---	RECLAIMED ROADS	==	DRAINAGE	---
RECLAIMED	▨				
SECTION LINE	---				

RECONTOURED AREAS ARE DRAWN TYPICALLY AT 5 FT. AND 10 FT. CONTOUR INTERVALS

SEE PLATE 7-7 FOR POST-MINING DRAINAGE SEE PLATES 2-4 FOR PRE-1977 DISTURBANCE

NOTE: ALL DISTURBED AREAS SHOWN ON THIS MAP DESIGNATED AS BTCA "1".

CASTEL VALLEY MINING, LLC  
 HUNTINGTON, UTAH

**HYDROLOGY MAP**

SCALE: 1" = 50'  
 DRAWN BY: C. Reynolds  
 DATE: 7/17/91

PLATE 7-1C

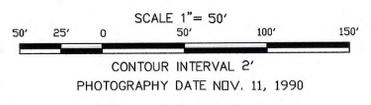
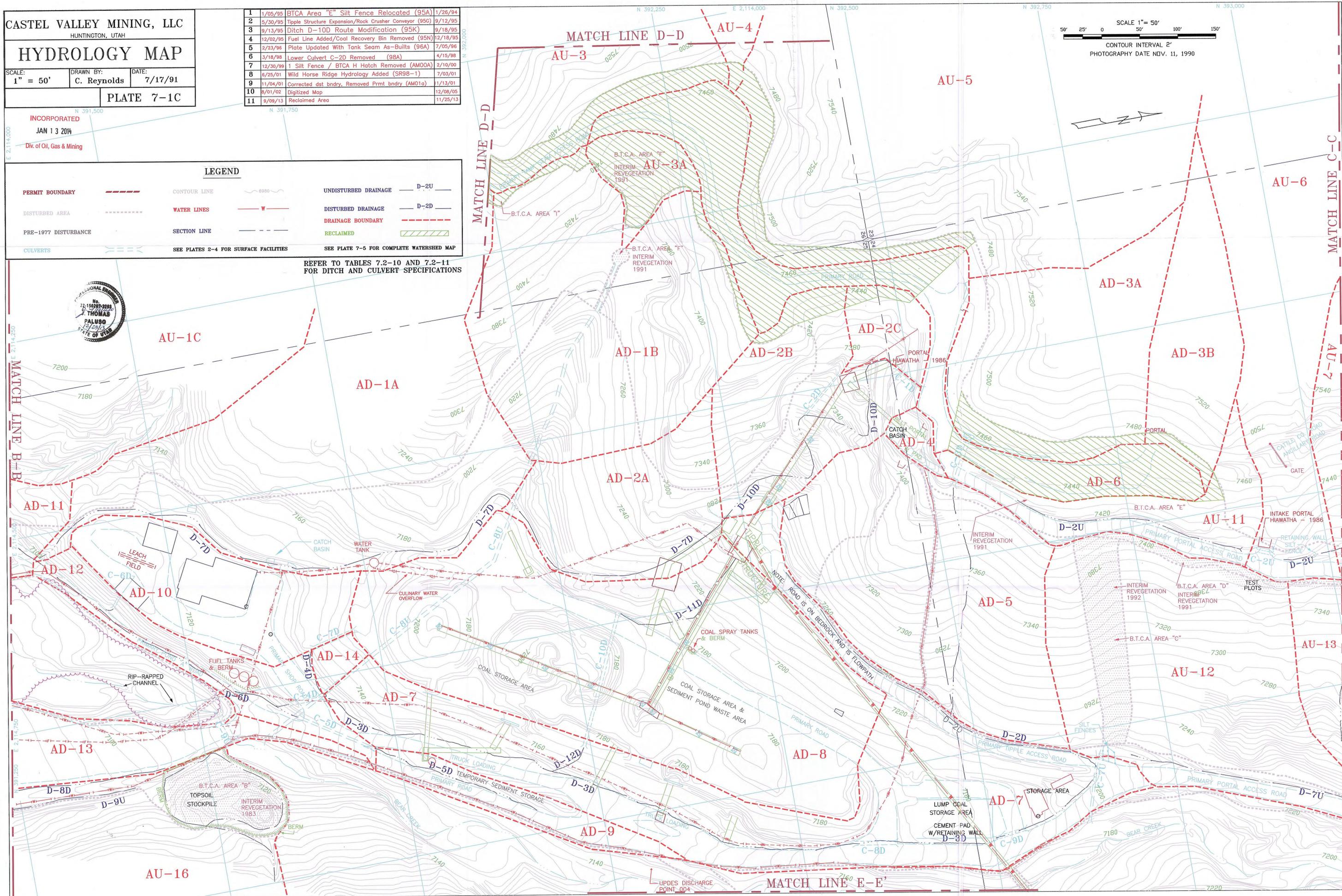
1	1/05/95	BTCA Area "E" Silt Fence Relocated (95A)	1/26/94
2	5/30/95	Tipple Structure Expansion/Rock Crusher Conveyor (95G)	9/12/95
3	9/13/95	Ditch D-10D Route Modification (95K)	9/18/95
4	12/02/95	Fuel Line Added/Coal Recovery Bin Removed (95N)	12/18/95
5	2/23/96	Plate Updated With Tank Seam As-Built (96A)	7/05/96
6	3/18/98	Lower Culvert C-2D Removed (98A)	4/15/98
7	12/30/99	1 Silt Fence / BTCA H Hatch Removed (AM00A)	2/10/00
8	6/25/01	Wild Horse Ridge Hydrology Added (SR98-1)	7/03/01
9	11/04/01	Corrected dst bndry, Removed Prmt bndry (AM01a)	11/13/01
10	8/01/02	Digitized Map	12/08/05
11	9/09/13	Reclaimed Area	11/25/13

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**LEGEND**

PERMIT BOUNDARY	--- (Red Dashed)	CONTOUR LINE	--- (Blue)	UNDISTURBED DRAINAGE	--- (Blue)
DISTURBED AREA	--- (Red Dotted)	WATER LINES	--- (Red)	DISTURBED DRAINAGE	--- (Blue)
PRE-1977 DISTURBANCE	--- (Red Dotted)	SECTION LINE	--- (Black)	DRAINAGE BOUNDARY	--- (Red Dashed)
CULVERTS	--- (Blue)	SEE PLATES 2-4 FOR SURFACE FACILITIES		RECLAIMED	--- (Green Hatched)

REFER TO TABLES 7.2-10 AND 7.2-11 FOR DITCH AND CULVERT SPECIFICATIONS



AU-16

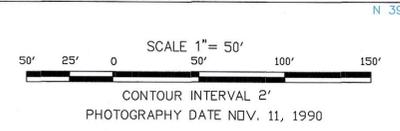
MATCH LINE E-E



**SURFACE FACILITIES**

SCALE: 1" = 50'  
DRAWN BY: C. Reynolds  
DATE: 8/26/91  
PLATE 5-2C

REV.	DATE	REMARKS	APPR.
1	2/23/96	Plate Updated With Tank Seam As-Built (96A)	7/05/96
2	6/23/97	Scalehouse Pavement Added (97B)	11/03/97
3	3/18/98	Lower Culvert C-2D Removed (98A)	4/15/98
4	6/18/98	Corrections For Midterm Review 1998 (98MT)	12/03/98
5	6/25/01	WHR surface facilities added (SR98-1)	7/03/01
6	11/04/01	Corrected dst bndry, removed permit bndry (AM01a)	11/13/01
7	7/08/02	Added Fan, Moved Powder House/Water Tank (AM02H)	8/14/02
8	5/10/02	Added fule containment Enclosure (AM02E)	8/15/02
9	8/01/02	Changed name from 2-4C to 5-2C	12/8/05
10	1/16/07	Loadout Expansion	8/07/07
11	9/09/13	Reclaimed Area	11/25/13



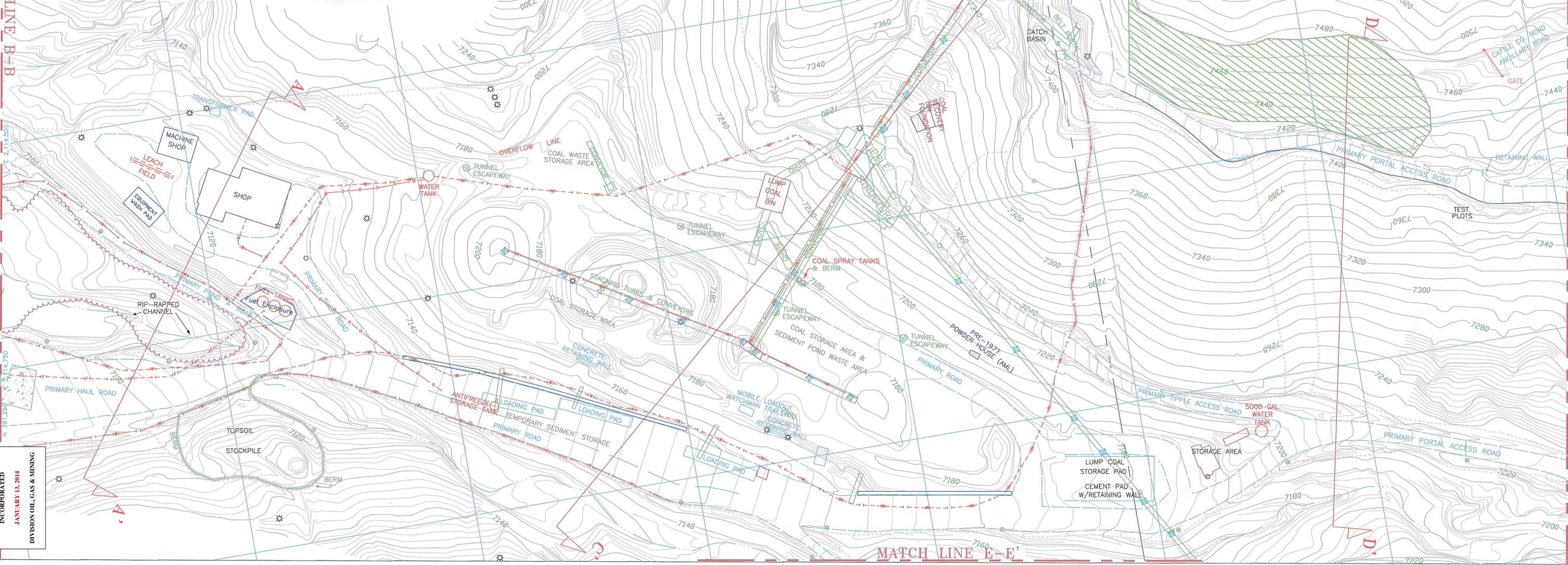
CROSS-SECTIONS LOCATED ON PLATE 3-1.

**LEGEND**

PERMIT BOUNDARY	-----	CONTOUR LINE	~ 6980 ~	WATER LINES	— W —
DISTURBED AREA	-----	UNPAVED ROADS	== == ==	RECLAIMED	▨
PRE-1977 DISTURBANCE	-----	SECTION LINE	— — — —	POWER POLES	* * *
		SEE PLATES 7-1 FOR HYDROLOGY		STREAM BUFFER ZONE MARKERS	⊙

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MATCH LINE C-C

MATCH LINE D-D

MATCH LINE E-E