



Energy West Mining Company
P. O. Box 310
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January 29, 2015

Electronically Submitted

Utah Coal Program
Utah Division of Oil, Gas, and Mining
1594 West North Temple, Suite 1210
P.O. Box 145801
Salt Lake City, Utah 84114-5801

C/015/0019
Received 1/30/2015
Task ID #4789

Subj: Amendment to Remove Cottonwood Waste Rock Site Volume 10 from the Cottonwood/Wilberg MRP, PacifiCorp, C/015/0019, Emery County, Utah

PacifiCorp, by and through its wholly-owned subsidiary, Energy West Mining Company (Energy West) as mine operator, hereby submits an amendment to remove the Cottonwood waste rock site from the Cottonwood/Wilberg mining and reclamation plan. The waste rock site will be added to the Trail Mountain mining and reclamation plan is a separate, but related, amendment.

As the Division is aware, PacifiCorp is in the process of selling of a portion of its mining assets. The Cottonwood waste rock site and the Trail Mountain Mine are two of the assets involved in the sale package. The Trail Mountain Mine is adjacent to unmined reserves that will be accessed through the existing Trail Mountain Mine. It is being proposed that the Cottonwood waste rock site be transferred to the Trail Mountain mining and reclamation plan so as to provide a site for the storage of coal waste materials from the mine.

In developing a straightforward process for this transfer, Energy West is constructing three amendments. The first amendment will be to Permit # C/015/0019 to remove the Cottonwood waste rock site from its MRP. The second amendment will be to Permit # C/015/0009 to add the waste rock site to its MRP. And the third amendment will be to the Legal and financial Volume to amend the all text and appendices affected by the transfer of the site from one permit to another. The three amendments are being submitted simultaneously.

With this submittal, one electronic copy of the amended sections of the Cottonwood/Wilberg MRP is being submitted for Division review. C1/C2 forms are included. Please refer to the C2 form to review the changes made to the Cottonwood/Wilber MPR. Upon approval, Energy West will provide two (2) clean copies of all amended documentation for insertion into the permit. If you have any questions concerning this action, please contact Dennis Oakley at 435-687-4825.

Sincerely,

Kenneth Fleck
Geology and Environmental Affairs Manager

Cc: file

APPLICATION FOR COAL PERMIT PROCESSING

Permit Change New Permit Renewal Exploration Bond Release Transfer

Permittee: PacifiCorp

Mine: Cottonwood/Wilberg Mine

Permit Number: C/015/0019

Title: Amendment to Remove Cottonwood Waste Rock Site Volume 10 from the Cottonwood/Wilberg MRP, Pacificorp, C/015/0019, Emery County, Utah

Description, Include reason for application and timing required to implement:

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

- Yes No 1. Change in the size of the Permit Area? Acres: 25.85 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: _____

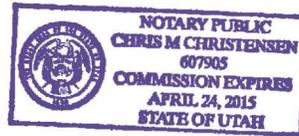
- Yes No 11. Does the application affect the surface landowner or change the post mining land use?
- Yes No 12. Does the application require or include underground design or mine sequence and timing? (Modification of R2P2)
- Yes No 13. Does the application require or include collection and reporting 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?

Please attach four (4) review copies of the application. If the mine is on or adjacent to Forest Service land please submit five (5) 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.

Kenneth Fleck Kenneth S. Fleck Manager of Environmental Affairs JAN. 29, 2015
 Print Name Sign Name, Position, Date

Subscribed and sworn to before me this 29 day of January, 2015
Chris M Christensen
 Notary Public



My commission Expires: Utah April 24, 2015 } ss:
 Attest: State of _____
 County of Emery

For Office Use Only: 	Assigned Tracking Number: 	Received by Oil, Gas & Mining
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Any other specific or special instruction required for insertion of this proposal into the Mining and Reclamation Plan.	Received by Oil, Gas & Mining
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Form DOGM - C2 (Revised March 12, 2002)

PacifiCorp

Energy West Mining Company

Cottonwood Wilberg MRP

Volume 1: Introduction

Replace pages i thru vii

Introduction

PacifiCorp owns and leases certain fee coal lands, together with assigned federal coal leases, and controls approximately 22,500 acres of contiguous minable property located in Emery County, Utah. Geography, the area is known as East Mountain, a large, relatively flat plateau, containing three minable coal seams.

Coal was mined through three separate mines: Deer Creek Mine, Cottonwood/Wilberg Mine, and the Des Bee Dove Mine. The Deer Creek Mine is the only mine that is presently in production. The Cottonwood/Wilberg Mine has been ~~nearly~~ mined out and is ~~currently~~ being used as an underground coal haulage facility reclaimed as of 2015. The mine transferred coal from the Deer Creek and Trail Mountain mines to the coal loadout facility in left fork of the Grimes Wash. At this point, coal ~~is~~ was transported, via triple trailer coal trucks, to the Hunter Power Plant. The mine was put into temporary cessation in 2001. PacifiCorp determined that the mine had no future potential for use in their long term mining plans and in 2014 began demolition activities. The Des Bee Dove Mine has been mined out, sealed, and surface facilities removed. The surface has been returned to its approximate original contour and reseeded. Phase III bond release was granted by OSM and DOGM in 2014.

Several federal coal leases are coincidental to both the Cottonwood/Wilberg and Deer Creek mines as the mines are superimposed. The description of the permit area for both mines is listed in their respective permits. Both mines are owned and operated by PacifiCorp.

Three coal seams exist in the Cottonwood/Wilberg mine area; Blind Canyon seam (upper), Cottonwood seam (middle), and Hiawatha seam (lower). The Deer Creek Mine is producing coal from the Blind Canyon Seam and will mine in the North Hiawatha seam in the future. The Cottonwood seam contains excessive in-seam temperature gradients and has been determined as unmineable. The majority of coal produced from Cottonwood Mine was from the Hiawatha seam. ~~The coal haulage system (beltline) of the Cottonwood/Wilberg Mine is located in this seam.~~

Cottonwood/Wilberg Mines

The permit boundary and approximate locations of faults that have affected the Cottonwood/Wilberg Mine plan are illustrated in Figure 1. Faults that have influenced mining are the Pleasant Valley Fault, Deer Creek Fault, and the Roan's Canyon Fault.

In the Cottonwood/Wilberg Mine, the Hiawatha seam is bounded on the north by the thinning of the seam below five feet in thickness. On the east, the seam is bounded by the Deer Creek Fault and the Pleasant Valley Fault. On the south and west, the seam is bounded by the coal outcrop and lease border, respectively.

The Blind Canyon seam within the Cottonwood/Wilberg Mine lies approximately 100 feet above the Hiawatha seam. This seam is bounded on the north by the Deer Creek Mine workings. The east, south and west is bounded by the thinning seam of less than five feet in thickness.

Since part of the Cottonwood/Wilberg Mine was overlain by areas of the Deer Creek Mine, the upper seam was mined prior to mining the lower seam. In addition, mining plans were designed with a system of barriers to protect a 345KV power line.

Wilberg Mine

The Wilberg Mine was acquired by Peabody Coal company in 1958. In March 1977, Utah Power and Light (UP&L) acquired the mine from Peabody Coal and was officially listed as the lessee on September 1, 1977. In 1982, UP&L successively bid the South Lease (U-47978) federal coal tract.

On July 1, 1985, the Wilberg Mine and the South Lease area were separated into two distinct mines; the Wilberg Mine (MSHA ID No. 42-00080) and Cottonwood Mine (MSHA ID No. 42-01944). Each mine operated independently of the other utilizing separate equipment and ventilation systems. The Wilberg portals are located on the north coal outcrop in Grimes Wash on the southern end of East Mountain. Mine personnel and coal transfer facilities are located at

Cottonwood/Wilberg Mines

the Wilberg portal.

The Cottonwood portals are located on the south coal outcrop of the Grimes Wash. These portals provided for men and equipment access, underground conveyor belt coal haulage system, and mine ventilation. Although they are separate underground operations, the two mines shared common surface facilities, thus forming the Cottonwood/Wilberg complex.

On May 6, 1996, the Cottonwood/Wilberg Mine and its attached facilities were reassigned an MSHA identification number. The new identification number that was given to the mine was the Trail Mountain identification number (MSHA ID No. 42-01211). This number was assigned to the Cottonwood/Wilberg mine since all Trail Mountain coal is transported through this mine.

Cottonwood/Wilberg Mine

The Cottonwood/Wilberg Mine surface facilities occupy approximately twenty acres of disturbed land at the confluence of the Left and Right forks of the Grimes Wash. The surface facilities include coal handling, electrical substation, equipment maintenance, material storage, parking areas and drainage and sediment control structures. Office, bathhouse and warehouse facilities are located underground. Demolition and other reclamation activities of the mine site commenced in November 2014.

Cottonwood/Wilberg, Des Bee Dove, and Trail Mountain Waste Rock Sites

Bureau of Land Management Right-of-Way UTU-37642: Located 1.5 miles south of the Cottonwood/Wilberg Mine, the original 48.62 acre site was designed as an open storage and truck loadout for the mine. The Right of Way (ROW) grant, UTU-37642 (east side of State Highway 57), was issued by the Bureau of Land Management (BLM) in 1977, but the development of a concrete storage silo for coal on site changed the need for the loadout. A modification was submitted to use this land for underground development waste storage in connection with underground development ongoing in the Cottonwood/Wilberg Mine. The ROW has been modified to accommodate coal bed methane degasification conducted by Texaco Inc.

Cottonwood/Wilberg Mines

The modification includes:

- 1) 1997 relinquishment of 1.08 acres (access to Texaco well 35-14).
- 2) 1999 relinquishment of 12.98 acres (Texaco well 34-80).

Total relinquishment of this ROW is 14.06 acres. Of the original 48.62 acre site, only 34.56 acres remain with 1.81 acres of it disturbed. Historically, the Cottonwood/Wilberg Waste Rock Site was located in the southern portion of this ROW. Phase III Bond Release was granted in July 22, 2009.

~~Bureau of Land Management Right of Way UTU 65027: Located 1.7 miles south of the Cottonwood/Wilberg Mine is BLM ROW UTU 65027 (west side of State Highway 57). This 25.85 acre site is currently used for underground waste storage in connection with underground development ongoing in the Trail Mountain Mine. This site replaced ROW UTU 37642 as the primary waste rock storage facility as the old ROW reached design capacity.~~

Further discussion of the Cottonwood/Wilberg mining operation and facilities can be found in Part 3, Operations Section, beginning on page 3-1. This application and related information are intended to address the Cottonwood/Wilberg Mine complex and its affect on the surrounding area. However, several of the environmental resource studies such as vegetation, soils, and wildlife, apply to the applicant's total contiguous area and can be better evaluated as a whole as they refer not only to the specific mine but to the adjacent areas.

Cottonwood/Wilberg Mines

Organization of the Mining Permit Application

The following volumes contain PacifiCorp's permit application for underground coal mining operations at the Cottonwood/Wilberg Coal Mine. The application is organized into a set of eleven (11) volumes as follows:

Volume 1

DOGM Permit
Introduction
Table of Contents
Part 1 - Legal, Financial, Compliance Information
 Part 1 Appendices
Part 2 - Environmental Resources

Volume 2

Part 3 - Mining Operation Plan
Part 4 - Reclamation Plan
 Part 4 Appendices

Volume 3

Maps and Drawings

Volume 4

Empty

Volume 5

Maps and Drawings

Volume 6

Maps and Drawings

Volume 7

Appendices

Volume 8

Geology Section (C/015/0017, C/015/0018, C/015/0019)

Cottonwood/Wilberg Mines

Volume 9

Hydrologic Section (C/015/0017, C/015/0018, C/015/0019)

Volume 10

This volume contained information concerning the Cottonwood Mine Waste Rock Site. (Bureau of Land Management R/W UTU 65027) This site was transferred to the Trail Mountain Mine Permit in 2015 and is no longer associated with the Cottonwood/Wilber Mine Permit.

Volume 11

Deleted and archived at DOGM in Salt Lake City

PacifiCorp

Energy West Mining Company

Cottonwood/Wilberg MRP

Volume 1: Part 1

Legal and Financial – Remove reference to Des Bee Dove Mine

Cottonwood/Wilberg Mine

**PacifiCorp
Energy West Mining Company
COTTONWOOD/WILBERG MINE
Legal and Financial Information**

This application for a mining and/or reclamation permit is submitted to the State of Utah, Department of Natural Resources, Division of Oil, Gas and Mining, in accordance with the Utah Coal Mining and Reclamation Act, Title 40, Chapter 10, U.C.A., 1953 (as amended); the applicable rules and regulations adopted thereunder; the Surface Mining Control & Reclamation Act of 1977, and applicable regulations adopted thereunder (30 CFR 770, et seq.), the Cooperative Agreement between the State of Utah and the United States Secretary of Interior, and other applicable laws and regulations.

R645-301-100 GENERAL CONTENTS

All Legal and Financial Information pertaining to the Cottonwood/Wilberg Mine is located in the Supplemental Volume entitled:

PacifiCorp Legal and Financial Volume

Cottonwood Mine C/015/19

Deer Creek Mine C/015/18

~~Des-Bee-Dove Mine C/015/017~~

Trail Mountain Mine C/015/009

PacifiCorp

Energy West Mining Company

Cottonwood/Wilberg MRP

Volume 1: Part 2

Appendix A – Replace entire Hydrologic Monitoring Program Description – pages
1 – 6.

**PACIFICORP
ENERGY WEST
HYDROLOGIC MONITORING PROGRAM
WILBERG/COTTONWOOD MINE**

I. MONITORING LOCATIONS – WILBERG/COTTONWOOD MINE

A. Surface Water Hydrology (for maps refer to Deer Creek, Wilberg/Cottonwood Mine: Volume 9 Map HM-1B)

1. Cottonwood Creek Drainage System

a. ***Cottonwood Canyon Creek*** (refer to Deer Creek and Wilberg/Cottonwood Mine: Volume 9 Map HM-1B)

(1) CCC01 - USGS Flume:
(Approximately 7800 feet downstream from the outlet culvert for the disturbed area.) 1500 feet North, 200 feet East of the Southwest corner of Section 31, Township 17 South, Range 7 East.

b. ***Grimes Wash*** (refer to Deer Creek and Wilberg/Cottonwood Mine: Volume 9 Map HM-1B)

(1) GWR01 - Right Fork:
(Approximately 1500 feet upstream of the inlet culvert for the disturbed area.) 550 feet North, 1500 feet West of the Southwest corner of Section 22, Township 17 South, Range 7 East.

(2) GWR02 - Left Fork:
(Approximately 50 feet upstream of the inlet culvert for the disturbed area.) 200 feet South, 2350 feet East of the Northwest corner of Section 27, Township 17 South, Range 7 East.

(3) GWR03 - Below the mine:
(Approximately 500 feet downstream of the outlet culvert below the disturbed area.) 1770 feet South, 1820 feet West of the Northeast corner of Section 27, Township 17 South, Range 7 East.

**PACIFICORP
ENERGY WEST
HYDROLOGIC MONITORING PROGRAM
WILBERG/COTTONWOOD MINE**

2. **Reclamation Monitoring:** Following final reclamation, backfilling and grading monitoring will be conducted at points immediately above and below the reclaimed site.

B. Groundwater Hydrology

1. Piezometric Data

The Wilber/Cottonwood Mine has been sealed since 2001. There are no ~~accessible in-mine~~ **piezometric well** sampling locations.

2. In-Mine Water Locations

The Wilber/Cottonwood Mine has been sealed since 2001. There are no accessible in-mine sampling locations.

3. Waste Rock Wells (~~refer to Deer Creek and Wilberg/Cottonwood Mine: Volume 9 Map HM-1B~~ **None)**

- a. ~~Cottonwood~~

C. UPDES Monitoring Locations

a. ***Wilberg/Cottonwood Mines***

UPDES UT0022896

001- Mine Discharge @ Cottonwood Canyon (TMA)

003- Sediment Pond @ Mine Facilities

~~005- Sediment Pond Discharge @ Waste Rock Site~~

**PACIFICORP
ENERGY WEST
HYDROLOGIC MONITORING PROGRAM
WILBERG/COTTONWOOD MINE**

II. MONITORING SCHEDULE *(see enclosed monitoring schedules for operational, baseline, and reclamation monitoring)*

A. Field Measurements

Field Measurements collected during quality sampling: Listed below are the sites which will be monitored by PacifiCorp - Energy West in accordance with the guidelines established by DOGM; i.e.

- Date and Time
- Flow
- pH
- Temperature
- Conductivity
- Dissolved oxygen (perennial streams only)

Surface Monitoring

Surface monitoring locations will be field monitored quarterly for all field parameters, except Indian Creek - monitoring to be conducted during baseflow only.

1. Cottonwood Canyon Creek

- a. Cottonwood Canyon Creek
 - (1) CCC01 - USGS Flume
- b. Grimes Wash
 - (1) GWR01
 - (2) GWR02
 - (3) GWR03

Groundwater Monitoring

There is ~~only one~~ **are no** groundwater monitoring site for the Wilberg/Cottonwood Mine.

~~1. Waste Rock Wells~~

- ~~a. Cottonwood~~

**PACIFICORP
ENERGY WEST
HYDROLOGIC MONITORING PROGRAM
WILBERG/COTTONWOOD MINE**

UPDES Monitoring

1. Wilberg/Cottonwood

UPDES sites 001, 003, and 005 will be monitored as specified in the individual permits.

Reclamation Monitoring

Surface Water Resources: (see enclosed summary of operational, baseline, and reclamation monitoring schedules)

Surface monitoring locations will be field monitored monthly for flow and all field parameters quarterly until bond release.

Ground Water Resources: (see enclosed summary of operational, baseline, and reclamation monitoring schedules **N/A**)

~~Waste Rock Well: will be field monitored for level only on a quarterly basis. Monitoring will be conducted until sealing during final reclamation.~~

UPDES: Sites will be monitored as specified in the individual permits

B. Quality Sampling (Laboratory Measurements)

1. **Surface Water Hydrology:** Water samples will be collected and analyzed quarterly (one sample at low flow and high flow) during the first or second week of the quarter. Parameters analyzed are those listed in the DOGM Guidelines for Surface Water Quality (see Table 1-Surface Water Quality Parameter List). Quarterly sampling was initiated during March 1988 and will continue throughout the year; i.e., June, September, and December. Baseline analysis was performed in 2011 and will be repeated every five years there-after.

a. **Cottonwood Creek Drainage**

(1) Cottonwood Canyon Creek

(a) CCC01 - USGS Flume

**PACIFICORP
ENERGY WEST
HYDROLOGIC MONITORING PROGRAM
WILBERG/COTTONWOOD MINE**

(2) Grimes Wash

- (a) GWR01
- (b) GWR02
- (c) GWR03

Reclamation Monitoring - Surface Water Hydrology: Water samples will be collected and analyzed quarterly (one sample at low flow and high flow) during the first or second week of the quarter. Parameters analyzed are those listed in the DOGM Guidelines for Surface Water Quality (see Table 1-Surface Water Quality Parameter List). Sampling will be conducted on a quarterly basis until bond release. Baseline analysis will be performed on the 5th and 9th years following reclamation. In no case will baseline sampling time frame exceed 5 years converting from operational to reclamation monitoring.

~~2. Groundwater Hydrology~~

- ~~a. Waste Rock Wells: One water sample will be collected and analyzed per location quarterly. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table 2-Ground Water Quality Parameter List).~~

~~Baseline analysis was performed in 2011 and will be repeated every five years thereafter.~~

~~Reclamation Monitoring - Groundwater Hydrology:~~

- ~~a. Waste Rock Wells: Waste rock wells will be sealed during final reclamation. One water sample will be collected and analyzed per location quarterly until well sealing. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table 2-Ground Water Quality Parameter List).~~
- ~~b. Post Reclamation Monitoring: PacifiCorp commits to conduct annual surveys to identify new discharge locations within and below sealed portals. If discharge occurs, one water sample will be collected and analyzed per location quarterly. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table~~

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ENERGY WEST
HYDROLOGIC MONITORING PROGRAM
WILBERG/COTTONWOOD MINE**

~~2-Ground Water Quality Parameter List). Baseline analysis will be performed on the 5th and 9th year.~~

2. UPDES Monitoring Sites

a. Wilberg/Cottonwood Mines

UPDES sites will be monitored as specified in the individual permits.

III. ANNUAL REPORTS

All data collected regarding the hydrology of East Mountain will be summarized by the applicant in an annual Hydrologic Monitoring Report. Copies of the report will be submitted to the Utah State Division of Oil, Gas and Mining. In addition, any raw data collected will be submitted to the Utah State Division of Oil, Gas and Mining on a quarterly basis.

PacifiCorp

Energy West Mining Company

Cottonwood/Wilberg MRP

Volume 1: Part 2

Appendix A – Hydrologic Monitoring Table - Replace

PACIFICORP
ENERGY WEST MINING COMPANY
HYDROLOGIC MONITORING PROGRAM
COTTONWOOD-WILBERG MINE

SURFACE HYDROLOGY - OPERATIONAL SAMPLING (Table 1)

<u>Drainage System</u>	<u>Drainage</u>	<u>Location</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
Cottonwood Creek Drainage System	Cottonwood Canyon Creek	CCC01	Flow	Flow	Field									
	Grimes Wash	GWR01	Flow	Flow	Operational									
		GWR02	Flow	Flow	Operational									
		GWR03	Flow	Flow	Operational									

GROUNDWATER HYDROLOGY - OPERATIONAL SAMPLING (Table 2)

<u>Groundwater Type</u>		<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
Springs	N/A												
In-Mine	N/A												
Wells	Cottonwood Waste Rock Well N/A			Operational			Operational			Operational			Operational

UPDES SAMPLING - (Table 1)

			<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
Mine Water Discharge	Cottonwood	TMA	Operational											
Sediment Pond Discharge	Cottonwood	2 1 Outfalls	Operational											

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HYDROLOGIC MONITORING PROGRAM
COTTONWOOD-WILBERG MINE

SURFACE HYDROLOGY - BASELINE SAMPLING (Table 1) - 2011

<u>Drainage System</u>	<u>Drainage</u>	<u>Location</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
	<i>Cottonwood Canyon Creek</i>	CCC01	Flow	Flow	Field									
<i>Cottonwood Creek Drainage System</i>	<i>Grimes Wash</i>	GWR01	Flow	Flow	Baseline									
		GWR02	Flow	Flow	Baseline									
		GWR03	Flow	Flow	Baseline									

GROUNDWATER HYDROLOGY - BASELINE SAMPLING (Table 2) - 2011

<u>Groundwater Type</u>		<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
<i>Springs</i>	N/A												
<i>In-Mine</i>	N/A												
<i>Wells</i>	<i>Cottonwood Waste Rock Well - N/A</i>			Baseline			Baseline			Baseline			Baseline

UPDES SAMPLING - (Table 1)

			<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
<i>Mine Water Discharge</i>	<i>Cottonwood</i>	TMA	Operational											
<i>Sediment Pond Discharge</i>	<i>Cottonwood</i>	2 1 Outfalls	Operational											

PACIFICORP
ENERGY WEST MINING COMPANY
HYDROLOGIC MONITORING PROGRAM
COTTONWOOD-WILBERG MINE

SURFACE HYDROLOGY - RECLAMATION SAMPLING (Table 1)

<u>Drainage System</u>	<u>Drainage</u>	<u>Location</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
Cottonwood Creek Drainage System*	Cottonwood Canyon Creek	CCC01			Field			Field			Field			Field
	Grimes Wash	GWR01			Operational			Operational			Operational			Operational
		GWR02			Operational			Operational			Operational			Operational
		GWR03			Operational			Operational			Operational			Operational

GROUNDWATER HYDROLOGY - RECLAMATION SAMPLING (Table 2)

<u>Groundwater Type</u>		<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
Springs	N/A												
In Mine	N/A												
Wells	Cottonwood Waste Rock Well N/A			Operational			Operational			Operational			Operational

Cottonwood Waste Rock Well will be sealed during Phase I reclamation. One water sample will be collected and analyzed per location quarterly until well sealing

UPDES SAMPLING - (Table 1)

	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
Mine Water Discharge**	TMA	As Needed Basis According to UPDES Permit Stipulations										
Sediment Pond Discharge	2 1 Outfall	As Needed Basis According to UPDES Permit Stipulations										

**** After Portal Sealing, PacifiCorp Will Monitor Down Dip For Development Of Groundwater Seeps/Springs Until Bond Release**

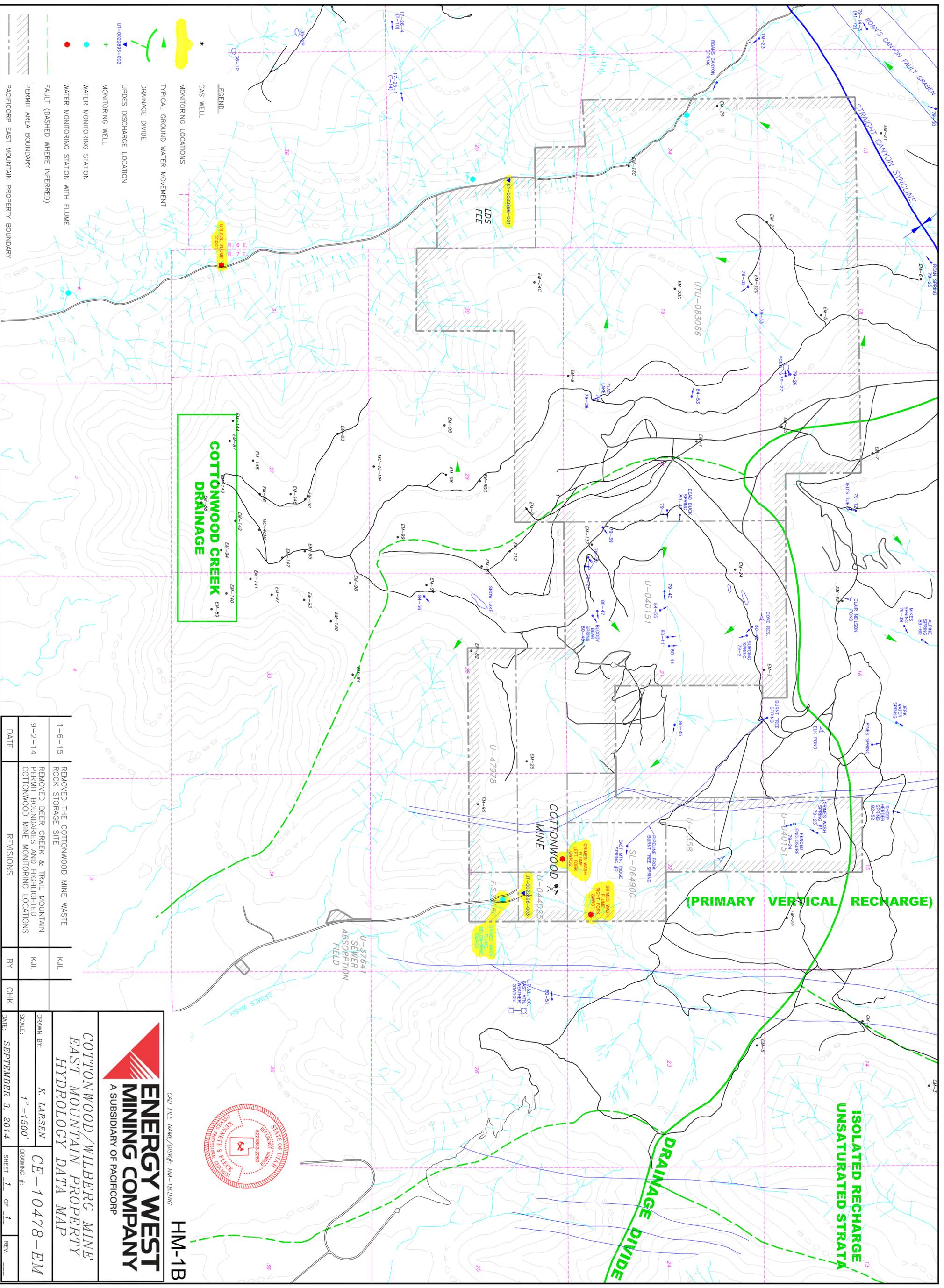
PacifiCorp

Energy West Mining Company

Cottonwood/Wilberg MRP

Volume 1: Part 2

Replace Map HM-1B – Remove Waste Rock Site and Well Location



COTTONWOOD CREEK DRAINAGE

(PRIMARY VERTICAL RECHARGE)

ISOLATED RECHARGE UNSATURATED STRATA

DRAINAGE DIVIDE



COTTONWOOD/WILBERG MINE EAST MOUNTAIN PROPERTY HYDROLOGY DATA MAP

DATE:	SEPTEMBER 3, 2014	SHEET:	1	OF:	1	REV.:		
SCALE:	1" = 1500'	DRAWING #:	CE-10478-EM					
DRAWN BY:	K. LARSEN							

DATE	REVISIONS	BY	CHK
1-6-15	REMOVED THE COTTONWOOD MINE WASTE ROCK STORAGE SITE	KJL	
9-2-14	REMOVED DEER CREEK & TRAIL MOUNTAIN PERMIT BOUNDARIES AND HIGHLIGHTED COTTONWOOD MINE MONITORING LOCATIONS	KJL	



HM-1B

CAD FILE NAME/DISK#: HM-1B.DWG

PacifiCorp

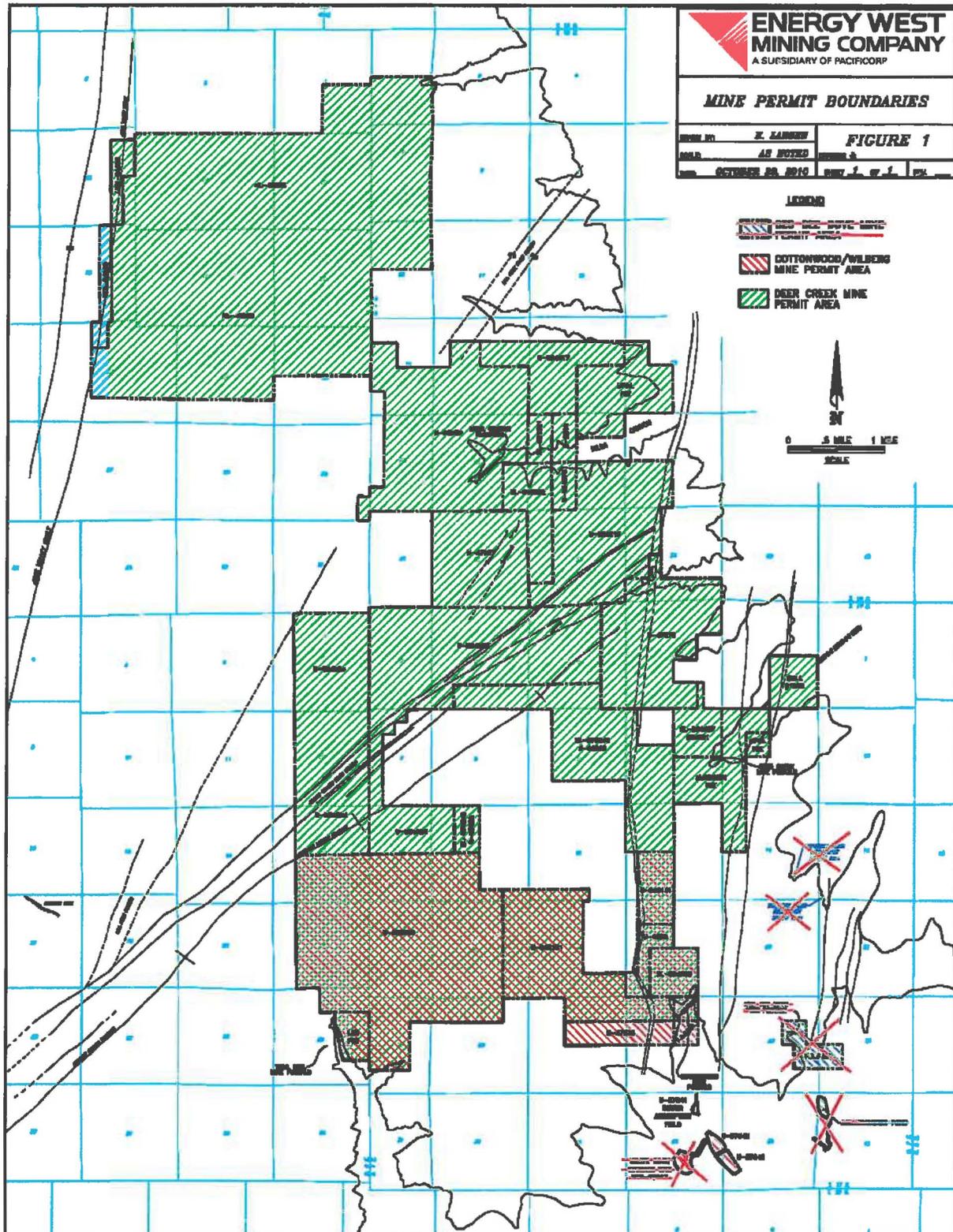
Energy West Mining Company

Cottonwood/Wilberg MRP

Volume 2: Part 3

Replace pages 2 (Figure 1), 20, 27, 37, 44, 45, and 50 (redline/strikeout text)

Cottonwood/Wilberg Mines



DAMS, EMBANKMENTS AND OTHER IMPOUNDMENTS

Sediment Ponds - Two MSHA ponds provide sediment control for the twenty acre disturbance associated with Cottonwood/Wilberg Mine; North Pond and South Pond. The South Pond includes the UPDES discharge point.

The original Cottonwood/Wilberg/Des Bee Dove Waste Rock Disposal Site (Cells 1 through 7) requires no separate sedimentation pond as it is an earthen containment structure itself. Phase I Bond Release was granted on July 22, 1999. Phase III Bond Release was granted July 22, 2009. An approved sedimentation pond was constructed at the ~~current~~ **new Cottonwood/Des Bee Dove/Trail Mountain** Waste Rock Disposal Site (operation startup 1990). The pond is covered under UPDES Permit No. UT0022896-005. **This site was transferred to the Trail Mountain Mine permit (C/015/0009) in January 2015.**

MSHA ponds are inspected monthly. All other structures are inspected quarterly by a qualified person and at least yearly by a registered professional engineer. A certified engineering report will be submitted to the regulatory authority annually. See Appendix XI for sediment pond safety factor calculations.

Construction of the ponds ~~and waste rock site~~ is according to the design discussed in Existing Structures. These designs were prepared under the direction of registered professional engineers. Basic construction of the mine site ponds includes: (1) excavation of pond area concurrently with dam construction, (2) emplacement of large boulders in dam for riprap, (3) installation of outlet works, (4) installation of 3 foot thick clay seal in each pond, and (5) establishment of vegetation to control embankment erosion. Specifics of Subchapter K compliance criteria are presented in Existing Structures.

The MSHA ponds are connected in series such that the overflow from the first pond enters the second pond. Overflow from the second pond is discharged into a 90-inch bypass culvert. The outlet works of each pond consist of an overflow riser and outlet orifice. The orifice functions to slowly drain the sedimentation ponds while the sediment is being settled out. Each pond also is equipped with a staff gauge to indicate water surface depth.

Maintenance of the dust collection system includes lubrication, bag cleaning, and motor replacement. All moving parts are lubricated to prevent excess wear and corrosion during operation. Periodically, the collection bags are mechanically cleaned of dust. The collected dust is returned to the plant product system.

Removal of dust collection systems will take place in conjunction with removal of the facility stations in which they are incorporated. Parts will be sold for scrap or salvaged.

NON-COAL AND MINE DEVELOPMENT WASTE DISPOSAL

In the north end of the upper storage yard, a trash chute and collection boxes have been provided for disposal of non-coal waste material from the mine. Material that accumulates in the collection box is loaded into trucks by front-end loader. Trash is then transported to a state and federal approved dump site. The concrete trash chute and collection box will be demolished during reclamation and used for backfill.

Used oil accumulated at the mine site is reclaimed in compliance with the Utah Oil Refinement Act and CFR Title 40, Part 266, Subpart E. Used oil is collected at the mine site by a Division approved collector/hauler and reclaimed through a Division, and EPA approved reclaimer.

Underground development waste is temporarily stored adjacent to the non-coal waste pile and then transported to an approved waste rock disposal site. Temporary storage will not exceed thirty (30) days. ~~A modification to the underground development waste disposal plan is included in Appendix VII.~~

OTHER MINE FACILITIES

Office - Bathhouse - Warehouse - The mine office at Cottonwood/Wilberg is located underground off the portal road on the same level as the Hiawatha Seam. It is part of an underground facility containing a small parts warehouse and bathhouse. The floor plan comprises 2,300 square feet, housing mine administration, first aid, safety, dust control, and clerical personnel. Included in the office is a conference room and restroom facilities. The structure is concrete block walls and

TABLE 5			
COTTONWOOD/WILBERG MINE ALTERNATIVE SEDIMENT CONTROL AREAS (ASCA)			
<u>SITE LOCATION</u>	<u>SEDIMENT CONTROL</u>	<u>ACREAGE</u>	<u>DRAWING</u>
Sewer Absorption Field	Vegetation	1.25	Map 7704-PP10
Guard Station	Silt Fence	0.18	Map 3-16: WS449D
Conveyor Bent Pad	Strawbales	0.04	Map 3-16: WS449D
Tube Conveyor Access Road	Silt Fence/Strawbales, Berm	0.24	Map 3-16: WS449D
Wilberg Fan	Sediment Trap, Berm	0.67	Map 3-16: WS449D
Waste Rock Site:UTU-65027	Silt Fence	3.28	Volume 10 Map 4-2: CM-10821-WB
Cottonwood Canyon Facilities	Surface Roughening/Deep Pocking Sediment Trap, Vegetation	1.86	Map 3-16a: CM-10892-CP
TOTAL ACREAGE		7.52 4.24	

Cottonwood Canyon Diesel and Tube Conveyor Portals

The Cottonwood Canyon diesel and tube conveyor portals were developed in 1994-1995. The portals are used for underground travel and conveyance of coal from the Trail Mountain Mine to the Cottonwood Mine surface facilities. (See Appendix III for reclamation cross-sections, soil, vegetation reports and culvert size calculations.) Reclamation of this area will use the same seed mixture listed in Part 4 of this plan.

All surface drainage will be directed and treated through a silt fence before entering an eighteen inch (18") corrugated metal pipe (cmp) that will be placed under the concrete pad to allow surface flow from the existing road ditch to continue. The conveyor pad will be constructed of dirt and gravel with a dirt berm. All surface drainage will be directed and treated through a silt fence before entering a six inch (6") corrugated metal pipe (cmp) which will direct the flow down the slope from the pad and into an existing thirty-six inch (36") undisturbed inlet.

BLM Right-of-Way UTU-37642 – This area once contained a 15.62 acre waste rock site. The site was reclaimed in the 1980's and Phase III bond release was granted in July of 2009. A 1.81 acre rock and soil storage area now only exists at this site. The area is completely enclosed by a net and barbed wire fence. Access into this site is from state highway 57.

Cottonwood/Wilberg Waste Rock Disposal Site

BLM Right-of-Way UTU-65027 (New Waste Rock Site):

~~New Waste Site (refer to Volume 10): Located 1.7 miles south of the Cottonwood/Wilberg Mine on the west side of State Highway 57 is BLM Right-of-Way UTU-65027. This 27.27 acre site was permitted to replace the "Old Waste Rock Site: UTU-37642" which reached designed capacity. The Right-of-Way grant was issued by the BLM in 1990. The Right-of-Way UTU-65027 has been modified to accommodate coal bed methane degasification conducted by Texaco Inc and to reflect as-built conditions. Listed below is a list the acreage descriptions of the~~

Cottonwood/Wilberg Mines

Right-of-Way including original grant, modifications and disturbance associated with the facility:

BLM Right of Way UTU 65027

Original Grant: 6/28/90	25.49 acres
Amendment: 8/15/90 (Staging Area)	1.78 acres
Subtotal	27.27 acres
1999 Relinquishment (Texaco Well 34 80)	
Staging Area	1.78 acres
As Built Addition (1999)	0.36 acres
TOTAL RIGHT OF WAY UTU 65027	25.85 acres
Disturbed Area (Total Project Life)	17.44 acres

During the Texaco well assessment, PacifiCorp re-surveyed the disturbed and permit boundaries associated the RAW UTU 65027. Two small areas of disturbance were located outside the original metes and bounds permit boundary description. To rectify this situation, PacifiCorp has revised the RAW description to include all areas of disturbance associated with the waste rock facility (refer to Volume 10). The 1999 relinquished area referred to as the "staging area", was previously disturbed by oil & gas drilling activities in 1956. PacifiCorp will retain access to State Highway 57 and has installed permit and disturbed boundary signs as indicated on map 4-1 (CM 10826). Texaco will re-disturb the staging area with development of well 34 80 and will assume reclamation liabilities.

This site has been transferred (January 2015) to the Trail Mountain Mine permit C/015/0009 and is specific only to this facility.

IN-SITU PROCESSING

There are no-situ processing activities or plans for such activities associated with the Cottonwood/Wilberg Mine.

OPERATION PLAN EXISTING STRUCTURES

The definition of Existing Structures, as found in the Environmental Impact Statement for the Surface Mining Control and Reclamation Act of 1977, is as follows:

Existing Structures

The types of structures which may be affected by the regulations in the preferred alternative concerning existing structures are roads and associated structures, fills, berms, benches, waste banks, discharge structures, diversions, rail loops, rail sidings, rail spurs, refuse areas, shafts, spoil pipes,

The following is a general description of these structures.

Sediment Basin Area

Sedimentation basins constructed in 1979 utilize two small basins taking advantage of the restricted width and the canyon gradient to optimize storage capacity requirements. Both basins are located between the load-out loop road, as shown on the layout maps. Physical dimensions and detail drawings are included. Design parameters are based on a 10 year/24 hour event. Basins are in series with each other allowing for a 24 hour detention time. Each basin is fitted with a steel stand pipe with a 3" siphon pipe for decanting purposes. The stand pipes are open topped and sized to accommodate a 25 year storm event. No emergency spillways, other than the stand pipes, will be required to meet the performance standards of 30 CFR Subpart "C", 77.216. Hydrological computations for the design with flow through hydrographs are included in this submittal, Appendix XIII.

Calculations for the sediment basin embankments indicate that the basins meet the safety factor requirements established by R645-301-533.100. See Appendix XI for this information.

Monitoring of the basins for structural deterioration, settling or water seepage will be visually inspected quarterly. Sediment and water levels will be recorded and cleaned as necessary to maintain the 60 percent sediment storage levels. An annual inspection report of each basin's physical condition with recorded water and sediment levels shall be submitted to the Division are required.

Wilberg Mine has been issued an UPDES permit whose identification number is UT-0022896. There are five outfalls associated with this permit. They are:

- 001 Cottonwood Mine Water Discharge in Cottonwood Canyon,
- 003 Wilberg Portal Sedimentation Pond Discharge,
- ~~005 New Waste Rock Site Sedimentation Pond Discharge.~~

Approval of the sedimentation ponds by the appropriate state and federal agencies has been given for the Wilberg portal and Waste Rock Site ponds.

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Cottonwood/Wilberg MRP

Volume 2: Part 4

Replace pages 9 and 26 (redline/strikeout text)

Approximately 13.81 acres of the old waste rock site has been reclaimed. Material to cover the waste rock was taken from the perimeter berms. Phase 1 bond release was approved on July 22, 1999. Phase III bond release was approved July 22, 2009.

~~New Waste Site: Located 1.7 miles south of the Cottonwood/Wilberg Mine on the west side of State Highway 57. This 27.27 acre site was permitted to replace the "Old Waste Rock Site: UTU-37642" which reached designed capacity. The Right-of-Way grant was issued by the Bureau of Land Management in 1990. The Right of Way UTU 65027 has been modified to accommodate coal bed methane degasification conducted by Texaco Inc and to reflect as-built conditions. Listed below is a list the acreage descriptions of the Right of Way including original grant, modifications and disturbance associated with the facility:~~

BLM Right of Way UTU-65027

Original Grant: 6/8/90	25.49 acres
Amendment: 8/15/90 (Staging Area)	1.78 acres
Subtotal	27.27 acres
1999 Relinquishment (Texaco Well 34-80)	
Staging Area	1.78 acres
As-Built Addition (1999)	0.36 acres
TOTAL RIGHT OF WAY UTU 65027	25.85 acres
Disturbed Area (Total Project Life)	17.44 acres

~~For complete reclamation details refer to Volume 10. Soil sample analyses of this site are found in Appendix D.~~

Highwall Elimination

Final reclamation of highwalls at the Cottonwood/Wilberg mines is accomplished in three phases. These phases follow strict requirements set forth by the Utah Coal Rules R645-301-100 through 800. Highwalls at the Cottonwood/Wilberg mines were inventoried by Office of Surface Mining and the Division of Oil, Gas and Mining in 1997. Eighteen (18) areas of concern were identified and are listed in Part 4 Appendix A. Eight (8) of the areas considered highwalls were constructed prior to the ruling (May 3, 1978) of the Surface Mining Control and Reclamation Act (SMCRA). Seven (7)

4. Sample size for ground cover and shrub density will be tested at a 90 percent confidence level using a one-tail "t" test with a 10 percent change in the mean.
5. Productivity measurements will be a double sampling procedure of clipped plots and ocular estimates. Rectangular plots (6.27" x 100") will be randomly located in reference areas and revegetation sites. Sampling will be at the 90% confidence level.
6. The reference areas will be checked to detect any changes from man-induced activities and to verify they are in fair or better condition.
7. Revegetation Success:
 - a. Sampling of reference sites at end of ten year responsibility period will be conducted concurrently with final reclamation sampling, using the same methodology. The range condition of all reference areas will be re-assessed in 1989. This will be repeated every five year.
 - b. Ground cover is established for two consecutive years at the end of responsibility period at 90 percent of reference site ground cover.
 - c. At least 80% of the shrubs and trees will have been in place for a least 8 growing seasons, the tree or shrub is alive and healthy.
 - d. The woody plants established on the revegetated site are equal to or greater than 90 percent of the stocking of live woody plants of the same life form of the approved reference areas with 90 percent statistical confidence.
 - e. Productivity will equal 90 percent of that of the reference areas at 90 percent statistical confidence.
 - f. A one-tail students "t" test of the sample means will be used for the statistical test.

WASTE ROCK DISPOSAL SITE AND WILBERG DRAIN FIELD

(Old Waste Rock Site: UTU-37642 – Phase III Bond Release Accepted July 22, 2009)

New Waste Rock Site: UTU-65027

~~For complete details refer to Volume 10. Bond estimation is included in Part 4: Appendix C. Soil sample analyses are found in Appendix D.~~ This site has been transferred (January 2015) to the Trail Mountain Mine permit C/015/0009 and is specific only to this facility.

Wilberg Drain Field

The drain field will be harrowed by tractor and revegetated with the same techniques and seed mixture as the waste rock site. Costs are included in reclamation costs.

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Volume 2: Part 4

Appendix C – Replace Bond Summary Page

**Cottonwood/Wilberg Mine
Bond Summary
C/015/0019**

Revised March 2012

Direct Costs

Grimes Wash Facility

Demolition	\$967,887.38
Earthwork	\$673,586.42
Revegetation	<u>\$36,172.85</u>
Subtotal	\$1,677,646.66

Overland Conveyor

Demolition	\$23,494.49
Earthwork	\$10,825.80
Revegetation	<u>\$3,061.91</u>
Subtotal	\$37,382.20

~~Cottonwood Waste Rock Site~~

Demolition	\$10,618.49
Earthwork	\$231,606.96
Rip-Rap	\$24,151.09
Revegetation	<u>\$33,342.25</u>
Subtotal	\$299,718.79

Total Direct Costs **\$1,715,028.86**

Indirect Costs

Mob/Demob	\$171,503.00	10.0%
Contingency	\$85,751.00	5.0%
Engineering Redesign	\$42,876.00	2.5%
Main Office Expense	\$116,622.00	6.8%
Project Management Fee	<u>\$42,876.00</u>	2.5%

Total Indirect Costs **\$459,628.00** **26.8%**

Total Cost (2011 Dollars) **\$2,174,656.86**

Escalation factor		0.017
Number of years		5
Escalation	\$191,238.00	

Bond Amount (2016 Dollars) **\$2,365,895**

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Cottonwood/Wilberg MRP

Volume 2: Part 4

Appendix D – Intermountain Lab Soil Analysis CTW WRS reference pages 4 of 15
thru 15 of 15 (Strikeout data)

Energy West Mining Co.
Huntington, UT

Set #0101S06587

Report Date: 05/17/01

Client Project ID: Cottonwood Mine
Date Received: 04/04/01

Lab Id	Sample Id	Hole #	Depths (Inches)	pH s.u.	Saturation %	EC mmhos/cm	Calcium meq/L	Magnesium meq/L	Sodium meq/L	SAR	Available Sodium ppm	Exchangeable Sodium meq/100g
101S06603	CW7301	CTW Mine #2 ↓	0 - 6	7.4	26.6	2.17	7.37	4.22	6.76	2.81	0.70	0.52
101S06604	CW7401		6 - 12	7.4	26.1	2.55	14.0	8.40	5.08	1.52	0.61	0.48
101S06605	CW7501		12 - 18	7.5	24.9	1.30	4.84	3.53	3.62	1.77	0.52	0.43
101S06606	CW7601	#3	0 - 6	7.3	30.0	3.28	22.8	20.1	2.13	0.46	0.41	0.35
101S06607	CW7701		6 - 12	7.4	33.5	3.33	21.2	21.8	2.50	0.54	0.60	0.52
101S06608	CW7801		12 - 18	7.2	33.0	3.54	21.3	24.6	2.78	0.58	0.54	0.45
101S06609	CW7901	#4	0 - 6	7.9	20.1	3.16	2.25	1.53	22.5	16.4	2.24	1.79
101S06610	CW8001		6 - 12	7.5	23.0	6.97	5.50	3.54	49.5	23.3	3.13	1.99
01S06611	CW8101		12 - 18	7.3	23.7	9.55	9.28	5.80	67.5	24.6	3.86	2.26
01S06612	CW8201	#5 ↑	0 - 6	7.4	25.7	2.22	4.44	2.91	10.0	5.24	0.96	0.70
01S06613	CW8301		6 - 12	7.3	25.3	2.66	6.48	4.99	11.4	4.78	1.04	0.75
01S06614	CW3101	CTW WRS	0 - 6	7.5	29.6	0.66	2.75	1.27	1.62	1.14	0.42	0.37
01S06615	CW3201	#1 ↓	6 - 12	7.5	30.6	0.62	2.43	1.01	2.72	2.08	1.49	1.41
01S06616	CW3301		0 - 6	7.5	32.8	0.78	2.89	1.15	3.92	2.75	0.77	0.64
01S06617	CW3401	#2	0 - 6	7.4	30.8	0.70	2.94	1.05	2.59	1.83	0.56	0.48

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abbreviations for extractants: PE= Saturated Paste Extract, H2SO4= water soluble, AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
 abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neut. Pot.= Neutralization Potential
 miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage
 viewed By: _____

Energy West Mining Co.
Huntington, UT

Client Project ID: Cottonwood Mine
Date Received: 04/04/01

Set #0101S06587
Report Date: 05/17/01

Lab Id	Sample Id	Hole #	Depths (Inches)	Coarse Fragments %	Sand %	Silt %	Clay %	Texture	1/3 Bar %	15 Bar %
101S06603	CW7301	CTW Mine #2	0 - 6	29.1	66.0	24.0	10.0	SANDY LOAM	15.3	4.4
101S06604	CW7401		6 - 12	34.4	62.0	25.0	13.0	SANDY LOAM	15.0	4.3
101S06605	CW7501		12 - 18	25.6	60.0	26.0	14.0	SANDY LOAM	13.8	3.9
101S06606	CW7601	#3	0 - 6	27.3	30.0	56.0	14.0	SILT LOAM	17.3	4.8
101S06607	CW7701		6 - 12	25.6	24.0	56.0	20.0	SILT LOAM	18.7	6.6
101S06608	CW7801		12 - 18	23.8	22.0	56.0	22.0	SILT LOAM	18.7	6.6
101S06609	CW7901	#4	0 - 6	25.2	58.0	28.0	14.0	SANDY LOAM	11.5	5.3
101S06610	CW8001		6 - 12	9.4	59.0	31.0	10.0	SANDY LOAM	12.0	4.7
101S06611	CW8101		12 - 18	28.7	60.0	26.0	14.0	SANDY LOAM	12.0	4.9
101S06612	CW8201	#5	0 - 6	29.5	56.0	28.0	16.0	SANDY LOAM	13.1	5.6
101S06613	CW8301		6 - 12	17.0	59.0	25.0	16.0	SANDY LOAM	12.8	5.2
101S06614	CW3101	CTW WRS #1	0 - 6	14.0	66.0	20.0	14.0	SANDY LOAM	16.8	6.7
101S06615	CW3201		6 - 12	8.8	61.0	25.0	14.0	SANDY LOAM	15.8	7.0
101S06616	CW3301		0 - 6	14.8	64.0	20.0	16.0	SANDY LOAM	15.2	7.3
101S06617	CW3401	#2	0 - 6	10.7	60.0	22.0	18.0	SANDY LOAM	16.5	7.3

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JAN 24 2002
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abbreviations for extractants: PE= Saturated Paste Extract, H2OSol= water soluble, AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
 abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neut. Pot.= Neutralization Potential
 miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage
 viewed By: _____

Energy West Mining Co.
Huntington, UT

Client Project ID: Cottonwood Mine

Set #0101S06587

Date Received: 04/04/01

Report Date: 05/17/01

Lab Id	Sample Id	Hole #	Depths (Inches)	TOC	Total Sulfur %	T.S. AB /1000t	Neutral. Pot. /1000t	T.S. ABP /1000t	Boron ppm	Nitrogen-Nitrate ppm	TKN %	Selenium ppm
101S06603	CW7301	CTW Mine #2	0 - 6	2.2	0.02	0.62	365	364	0.46	3.14	0.10	<0.02
101S06604	CW7401		6 - 12	1.5	0.02	0.62	351	351	0.47	0.44	0.07	<0.02
101S06605	CW7501		12 - 18	1.7	<0.01	0.00	350	350	0.41	1.30	0.07	<0.02
101S06606	CW7601	#3	0 - 6	2.9	0.12	3.75	206	202	0.64	3.56	0.11	<0.02
101S06607	CW7701		6 - 12	2.4	0.10	3.12	206	203	0.68	5.08	0.09	<0.02
101S06608	CW7801		12 - 18	2.0	0.11	3.44	208	205	0.64	6.08	0.11	<0.02
101S06609	CW7901	#4	0 - 6	2.2	0.03	0.94	315	314	0.60	1.16	0.09	<0.02
101S06610	CW8001		6 - 12	1.5	0.03	0.94	297	297	0.52	1.64	0.18	<0.02
101S06611	CW8101		12 - 18	1.4	0.02	0.62	303	303	0.44	0.54	0.08	<0.02
101S06612	CW8201	#5	0 - 6	1.6	0.01	0.31	306	305	0.59	1.22	0.08	<0.02
01S06613	CW8301		6 - 12	1.4	<0.01	0.00	318	318	0.52	1.22	0.07	<0.02
01S06614	CW3101	CTW/WRS	0 - 6	1.4	<0.01	0.00	352	352	0.60	9.72	0.10	<0.02
01S06615	CW3201	#1	6 - 12	1.4	0.02	0.02	369	368	0.39	5.94	0.11	<0.02
01S06616	CW3301	12-18	0 - 6	1.5	0.01	0.31	334	334	0.41	8.82	0.10	<0.02
01S06617	CW3401	#2	0 - 6	1.4	<0.01	0.00	376	376	0.49	8.76	0.11	<0.02

INCORPORATED

JAN 24 2002

DIV OF OIL GAS & MINING

Abbreviations for extractants: PE= Saturated Paste Extract, H2Osol= water soluble, AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate

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miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed By: _____

Energy West Mining Co.
Huntington, UT

Client Project ID: Cottonwood Mine
Date Received: 04/04/01

Set #0101S06587
Report Date: 05/17/01

Lab Id	Sample Id	Hole #	Depths (Inches)	pH s.u.	Saturation %	EC mmhos/cm	Calcium meq/L	Magnesium meq/L	Sodium meq/L	SAR	Available Sodium ppm	Exchangeable Sodium meq/100g
101S06618	CW3501	#2	0-6	7.0	34.6	2.53	21.9	9.00	2.93	0.75	0.54	0.44
101S06619	CW3601		12-18	7.3	32.2	2.01	14.7	5.65	4.05	1.27	0.55	0.42
101S06620	CW3701	#3	0-6	7.2	40.5	0.51	3.10	0.90	0.58	0.41	0.40	0.38
101S06621	CW3801		6-12	7.2	42.3	0.48	2.83	1.01	0.84	0.60	0.29	0.25
101S06622	CW3901		12-18	7.4	39.8	0.41	2.57	1.10	0.61	0.45	0.31	0.29
101S06623	CW4001	#4	0-6	7.6	41.5	7.59	18.4	7.38	56.2	15.6	5.95	3.62
101S06624	CW4101		6-12	7.6	37.7	7.59	16.7	7.41	52.8	15.2	5.16	3.17
101S06625	CW4201		12-18	7.7	37.6	10.3	15.8	9.22	61.0	22.9	7.64	4.59
101S06626	CW4301	#5	0-6	7.2	33.5	2.70	22.0	2.31	3.40	0.97	0.50	0.39
101S06627	CW4401		6-12	7.2	34.4	2.46	21.3	4.05	1.26	0.35	0.39	0.35
101S06628	CW4501		12-18	7.2	34.5	2.66	21.8	8.83	1.27	0.33	0.44	0.40
101S06629	CW4601	#6	0-6	7.3	44.4	2.92	20.9	8.17	4.96	1.30	0.86	0.64
101S06630	CW4701		6-12	7.6	42.0	4.36	18.9	20.5	11.7	2.63	1.49	1.00
101S06631	CW4801		12-18	7.6	44.8	6.92	17.1	54.1	22.0	3.68	2.34	1.35
101S06632	CW4901	#7	6-12	7.8	50.6	7.25	17.7	8.42	49.6	13.7	5.71	3.20
101S06633	CW3001		6-12	8.1	48.8	16.0	15.3	20.5	141	33.3	7.80	0.93

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Abbreviations for extractants: PE= Saturated Paste Extract, H2Osol= water soluble, AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate

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miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed By: _____

Energy West Mining Co.
Huntington, UT

Client Project ID: Cottonwood Mine
Date Received: 04/04/01

Set #0101S06587
Report Date: 05/17/01

Lab Id	Sample Id	Hole #	Depth (Inches)	Coarse Fragments %	Sand %	Silt %	Clay %	Texture	1/3 Bar %	15 Bar %
101S06618	CW3501	#2	6-12	9.6	62.0	20.0	18.0	SANDY LOAM	17.2	7.7
101S06619	CW3601		12-18	11.0	60.0	23.0	17.0	SANDY LOAM	15.5	7.4
101S06620	CW3701	#3	0-6	14.9	56.0	26.0	18.0	SANDY LOAM	20.7	9.2
101S06621	CW3801		6-12	6.3	47.0	35.0	18.0	LOAM	24.6	10.5
01S06622	CW3901		12-18	5.2	44.0	35.0	21.0	LOAM	25.2	10.3
01S06623	CW4001	#4	0-6	0.0	15.0	57.0	28.0	SILTY CLAY LOAM	20.0	15.2
01S06624	CW4101		6-12	18.7	10.0	62.0	28.0	SILTY CLAY LOAM	19.9	14.7
01S06625	CW4201		12-18	31.9	13.0	60.0	27.0	SILTY CLAY LOAM	19.8	17.0
01S06626	CW4301	#5	0-6	14.2	34.0	42.0	24.0	LOAM	16.7	8.2
01S06627	CW4401		6-12	19.8	34.0	42.0	24.0	LOAM	17.1	9.5
01S06628	CW4501		12-18	25.1	34.0	42.0	24.0	LOAM	16.8	8.8
01S06629	CW4601	#6	0-6	10.0	10.0	58.0	32.0	SILTY CLAY LOAM	17.5	13.7
01S06630	CW4701		6-12	21.0	13.0	57.0	30.0	SILTY CLAY LOAM	17.8	12.5
01S06631	CW4801		12-18	25.7	12.0	60.0	28.0	SILTY CLAY LOAM	18.6	13.8
01S06632	CW4901	#7	6-12	19.0	18.0	49.0	33.0	SILTY CLAY LOAM	21.9	17.6
01S06633	CW5001		6-12	14.2	18.0	48.0	34.0	SILTY CLAY LOAM	20.8	16.8

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JAN 24 2002

DIV OF OIL GAS & MINING

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Reviewed By: _____

Energy West Mining Co.
Huntington, UT

Client Project ID: Cottonwood Mine

Set #0101S06587

Date Received: 04/04/01

Report Date: 05/17/01

Lab Id	Sample Id	Hole #	Depths (Inches)	TOC	Total Sulfur %	T.S. AB /1000t	Neutral. Pot. /1000t	T.S. ABP /1000t	Boron ppm	Nitrogen-Nitrate ppm	TKN %	Selenium ppm
101S06618	CW3501	CTW DRS # 2	16 - 12	1.8	<0.01	0.00	332	332	0.58	10.9	0.11	<0.02
101S06619	CW3601	# 2	12 - 18	1.7	0.02	0.62	326	326	0.57	9.56	0.12	<0.02
101S06620	CW3701	# 3	0 - 6	1.6	<0.01	0.00	215	215	0.62	7.30	0.13	<0.02
101S06621	CW3801		6 - 12	1.4	0.01	0.31	260	259	0.43	0.90	0.13	<0.02
101S06622	CW3901		12 - 18	1.0	<0.01	0.00	265	265	0.33	1.08	0.10	<0.02
101S06623	CW4001		0 - 6	0.8	0.41	12.8	108	95.4	0.72	4.50	0.09	0.02
101S06624	CW4101	# 4	6 - 12	0.9	0.62	19.4	104	84.8	0.67	5.74	0.09	0.02
101S06625	CW4201		12 - 18	0.8	0.40	12.5	110	97.2	0.68	10.6	0.09	0.10
101S06626	CW4301		0 - 6	0.4	0.11	3.44	154	150	0.46	1.66	0.06	<0.02
101S06627	CW4401	# 5	6 - 12	0.4	0.29	9.06	170	161	0.62	0.90	0.05	<0.02
101S06628	CW4501		12 - 18	0.5	0.24	7.50	182	175	0.73	0.68	0.06	<0.02
101S06629	CW4601		0 - 6	0.6	0.68	21.2	96.0	74.8	1.60	3.68	0.06	<0.02
101S06630	CW4701	# 6	6 - 12	0.6	0.83	25.9	97.3	71.4	1.79	0.52	0.05	0.02
101S06631	CW4801		12 - 18	0.6	0.64	20.0	105	84.8	1.27	1.06	0.06	<0.02
101S06632	CW4901	# 7	6 - 12	0.6	1.24	38.7	106	67.6	1.36	9.32	0.06	0.02
101S06633	CW5001		6 - 12	0.6	1.48	46.2	99.6	53.4	1.26	3.28	0.05	0.30

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 Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Energy West Mining Co.
Huntington, UT

Set #0101S06587

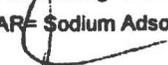
Report Date: 05/17/01

Client Project ID: Cottonwood Mine

Date Received: 04/04/01

Lab Id	Sample Id	Hok #	Depths (Inches)	pH s.u.	Saturation %	EC mmhos/cm	Calcium meq/L	Magnesium meq/L	Sodium meq/L	SAR	Available Sodium ppm	Exchangeable Sodium meq/100g
101S06634	CW5101	WT	12-18	8.2	48.7	17.9	15.1	24.9	166	37.0	21.5	13.5
		CTW WRS										

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 miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage
 viewed By: 

Energy West Mining Co.
Huntington, UT

Client Project ID: Cottonwood Mine

Date Received: 04/04/01

Lab Id	Sample Id	Hole #	Depths (Inches)	Coarse Fragments %	Sand %	Silt %	Clay %	Texture	1/3 Bar %	15 Bar %
101S06634	CW5101	#7	12 - 18	6.7	16.0	50.0	34.0	SILTY CLAY LOAM	19.8	15.6
<i>CTW WRS</i>										

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abbreviations for extractants: PE= Saturated Paste Extract, H2Osol= water soluble, AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
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viewed By:

Energy West Mining Co.
Huntington, UT

Client Project ID: Cottonwood Mine
Date Received: 04/04/01

Set #0101S06587
Report Date: 05/17/01

Lab Id	Sample Id	Hole #	Depths (Inches)	TOC	Total Sulfur %	T.S. AB μ /1000t	Neutral. Pot. μ /1000t	T.S. ABP μ /1000t	Boron ppm	Nitrogen-Nitrate ppm	TKN %	Selenium ppm
101S06634	CW5101	#7	12-18	0.6	0.97	30.3	102	72.0	1.05	2.34	0.12	0.40

~~CTW WRS~~

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DIV OF OIL GAS & MINING

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Energy West Mining Co.
Huntington, UT

Set #0101S06587

Report Date: 05/17/01

Client Project ID: Cottonwood Mine

Date Received: 04/04/01

Lab Id	Sample Id	Hole #	Depths (Inches)	pH s.u.	Saturation %	EC mmhos/cm	Calcium meq/L	Magnesium meq/L	Sodium meq/L	SAR	Available Sodium ppm	Exchangeable Sodium meq/100g
101S06596	CW9301	# 3	12 - 18	7.2	31.2	2.54	20.9	11.2	1.84	0.46	0.36	0.30
101S06596D	CW9301	CTW Mine	12 - 18	7.2	31.4	2.52	20.6	11.5	1.81	0.45	0.43	0.37
101S06612	CW8201	# 5	0 - 6	7.4	25.7	2.22	4.44	2.91	10.0	5.24	0.96	0.70
101S06612D	CW8201	CTW mine	0 - 6	7.4	25.9	2.11	4.27	2.89	9.80	5.18	0.94	0.69
101S06624	CW4101	# 4	6 - 12	7.6	37.7	7.59	16.7	7.41	52.8	15.2	5.16	3.17
101S06624D	CW4101	CTW WRS	6 - 12	7.6	37.2	8.11	19.3	8.45	59.0	15.8	5.15	2.95
101S06626	CW4301	# 5	0 - 6	7.2	33.5	2.70	22.0	2.31	3.40	0.97	0.50	0.39
101S06626D	CW4301	CTW WRS	0 - 6	7.2	33.8	2.55	23.3	2.34	2.32	0.65	0.51	0.43
101S06629	CW4601	# 6	0 - 6	7.3	44.4	2.92	20.9	8.17	4.96	1.30	0.86	0.64
101S06629D	CW4601	CTW WRS	0 - 6	7.3	44.1	3.06	22.1	8.52	5.09	1.30	0.83	0.61

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 DIV OF OIL GAS & MINING

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Reviewed By: _____

Energy West Mining Co.
Huntington, UT

Client Project ID: Cottonwood Mine

Set #0101S06587

Date Received: 04/04/01

Report Date: 05/17/01

Lab Id	Sample Id	Hole #	Depths (Inches)	Coarse Fragments %	Sand %	Silt %	Clay %	Texture	1/3 Bar %	15 Bar %
101S06596	CW9301	# 8	12 - 18	16.0	40.0	42.0	18.0	LOAM	16.5	8.3
101S06596D	CW9301	CTW mine	12 - 18	0.0	41.0	41.0	18.0	LOAM	16.8	8.3
101S06612	CW8201	# 5	0 - 6	29.5	56.0	28.0	16.0	SANDY LOAM	13.1	5.6
101S06612D	CW8201	CTW mine	0 - 6	0.0	56.0	28.0	16.0	SANDY LOAM	13.1	5.6
101S06624	CW4101	# 4	6 - 12	18.7	10.0	62.0	28.0	SILTY CLAY LOAM	19.9	14.7
101S06624D	CW4101	CTW WRS	6 - 12	0.0	11.0	61.0	28.0	SILTY CLAY LOAM	19.6	15.6
101S06626	CW4301	# 5	0 - 6	14.2	34.0	42.0	24.0	LOAM	16.7	8.2
101S06626D	CW4301	CTW WRS	0 - 6	0.0	34.0	42.0	24.0	LOAM	16.6	8.5
101S06629	CW4601	# 6	0 - 6	10.0	10.0	58.0	32.0	SILTY CLAY LOAM	17.5	13.7
101S06629D	CW4601	CTW WRS	0 - 6	0.0	13.0	55.0	32.0	SILTY CLAY LOAM	17.7	13.6

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Huntington, UT

Client Project ID: Cottonwood Mine

Set #0101S06587

Date Received: 04/04/01

Report Date: 05/17/01

Lab Id	Sample Id	Hole #	Depths (Inches)	TOC	Total Sulfur %	T.S. AB μ 1000t	Neutral. Pot. μ 1000t	T.S. ABP μ 1000t	Boron ppm	Nitrogen-Nitrate ppm	TKN %	Selenium ppm
101S06596	CW9301	# 8	12 - 18	5.8	0.04	1.25	377	376	0.96	5.64	0.17	<0.02
101S06596D	CW9301	CW mine	12 - 18	5.8	0.05	1.56	376	374	1.20	5.50	0.17	<0.02
101S06612	CW8201	# 5	0 - 6	1.6	0.01	0.31	306	305	0.59	1.22	0.08	<0.02
101S06612D	CW8201	CW mine	0 - 6	1.5	0.03	0.94	304	303	0.61	1.40	0.09	<0.02
101S06624	CW4101	# 4	6 - 12	0.9	0.62	19.4	104	84.8	0.67	5.74	0.09	0.02
101S06624D	CW4101	CW WRS	6 - 12	0.8	0.64	20.0	104	84.1	0.61	6.22	0.09	0.02
101S06626	CW4301	# 5	0 - 6	0.4	0.11	3.44	154	150	0.46	1.66	0.06	<0.02
101S06626D	CW4301	CW WRS	0 - 6	0.5	0.09	2.81	154	151	0.44	2.22	0.06	<0.02
101S06629	CW4601	# 6	0 - 6	0.6	0.68	21.2	96.0	74.8	1.60	3.68	0.06	<0.02
101S06629D	CW4601	CW WRS	0 - 6	0.6	0.67	20.9	96.0	75.0	1.62	3.60	0.06	<0.02

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 JAN 24 2002
 DIV OF OIL GAS & MINING

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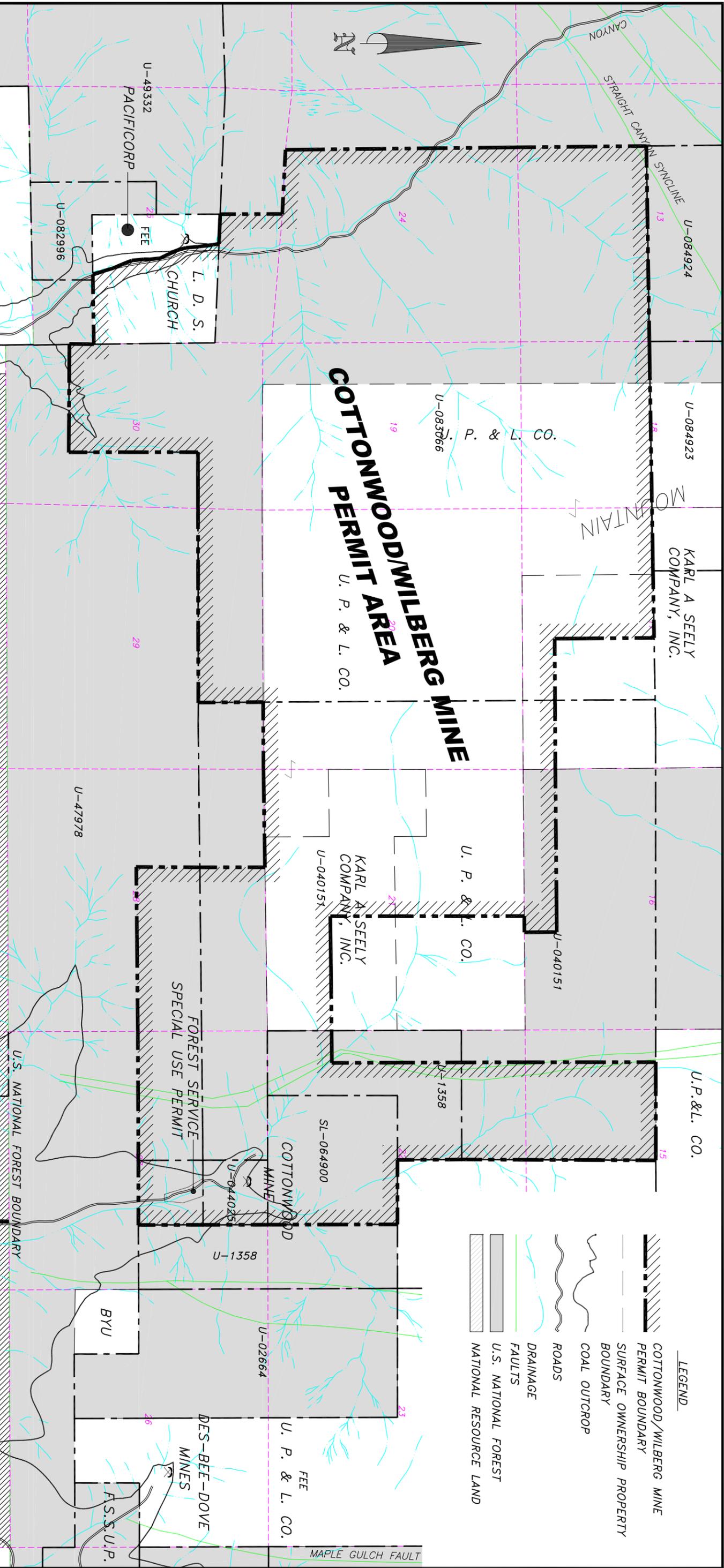
PacifiCorp

Energy West Mining Company

Cottonwood/Wilberg MRP

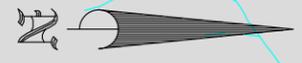
Volume 3: Maps

Replace maps CM-10519-WB, CM-10520-WB, and CM-10370-WB



LEGEND

- COTTONWOOD/WILBERG MINE PERMIT BOUNDARY
- SURFACE OWNERSHIP PROPERTY BOUNDARY
- COAL OUTCROP
- ROADS
- DRAINAGE
- FAULTS
- U.S. NATIONAL FOREST
- NATIONAL RESOURCE LAND



1-2

CAD FILE NAME/DISK#: USERS\KJL\GM\CM-10520-WB.DWG

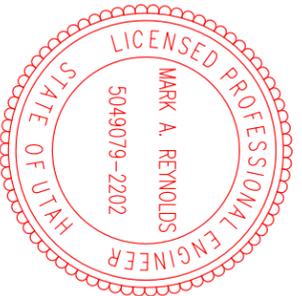


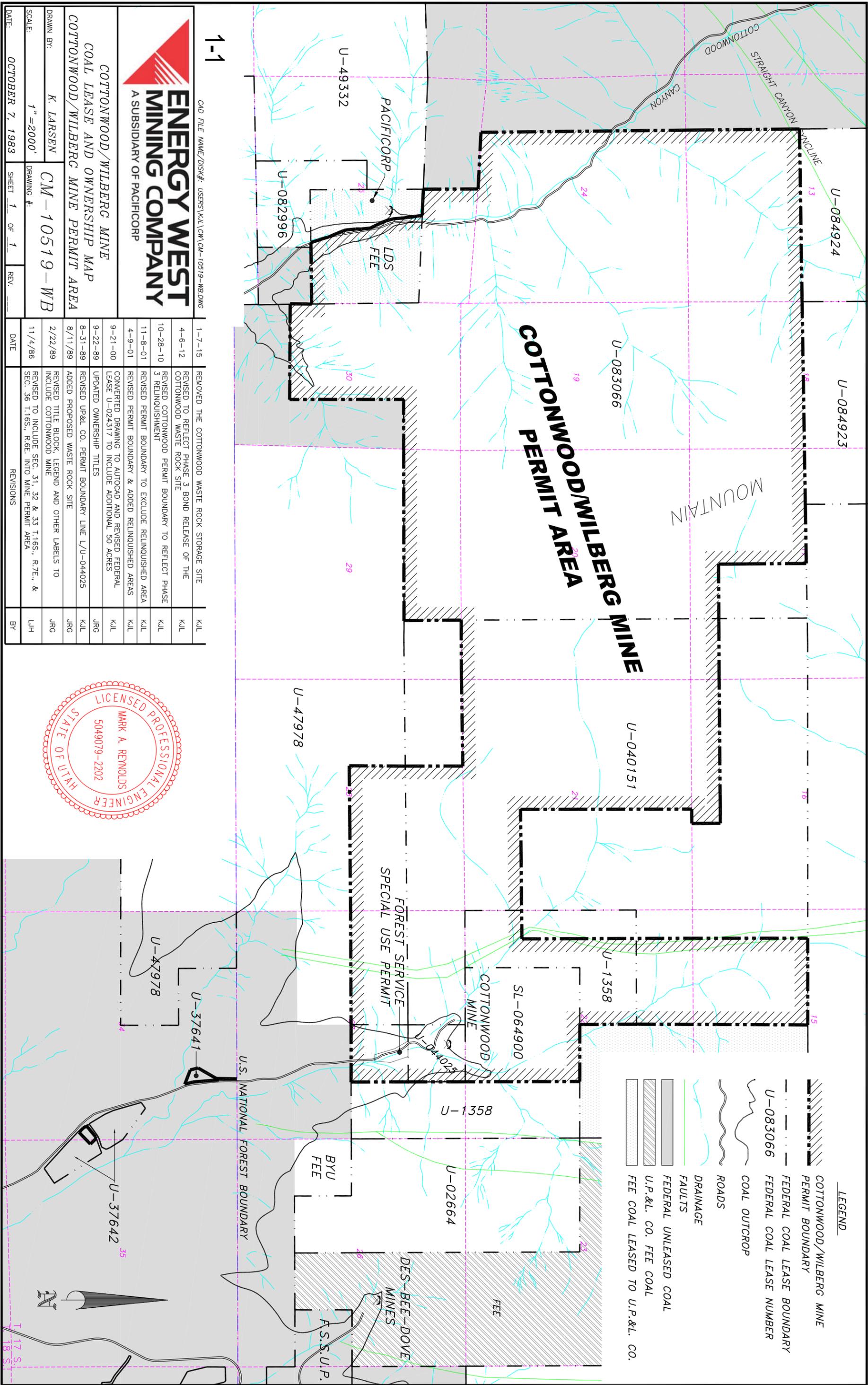
COTTONWOOD/WILBERG MINE
SURFACE OWNERSHIP MAP
COTTONWOOD/WILBERG COAL MINE

DRAWN BY: L. DRAPER/KJL
DRAWING #: CM-10520-WB

SCALE: 1" = 2000'
DATE: SEPTEMBER 21, 2000

NO.	DATE	REVISIONS	BY
1-7-15		REMOVED THE COTTONWOOD WASTE ROCK STORAGE SITE	KJL
4-6-12		REVISED TO REFLECT PHASE 3 BOND RELEASE OF THE COTTONWOOD WASTE ROCK SITE	KJL
10-28-10		REVISED COTTONWOOD PERMIT BOUNDARY TO REFLECT PHASE 3 RELINQUISHMENT	KJL
11-8-01		REVISED PERMIT BOUNDARY TO EXCLUDE RELINQUISHED AREAS AND UPDATED SURFACE OWNERSHIP	KJL
4-9-01		REVISED PERMIT BOUNDARY & ADDED RELINQUISHED AREAS	KJL
9-21-00		CONVERTED DRAWING TO AUTOCAD AND REVISED FEDERAL LEASE U-024317 TO INCLUDE ADDITIONAL 50 ACRES	KJL
8-31-89		REVISED UP&L CO. PERMIT BOUNDARY LINE	KJL
8/11/89		ADDED PROPOSED WASTE ROCK STORAGE SITE	JRG
6-7-89		REVISED TO REFLECT SURFACE OWNERSHIP	KJL
2/22/89		REVISED LABELING TO INCLUDE COTTONWOOD MINE	JRG
12-16-88		REVISED SECTION 17 TO REFLECT SURFACE OWNERSHIP AS OF 10/19/88	KJL





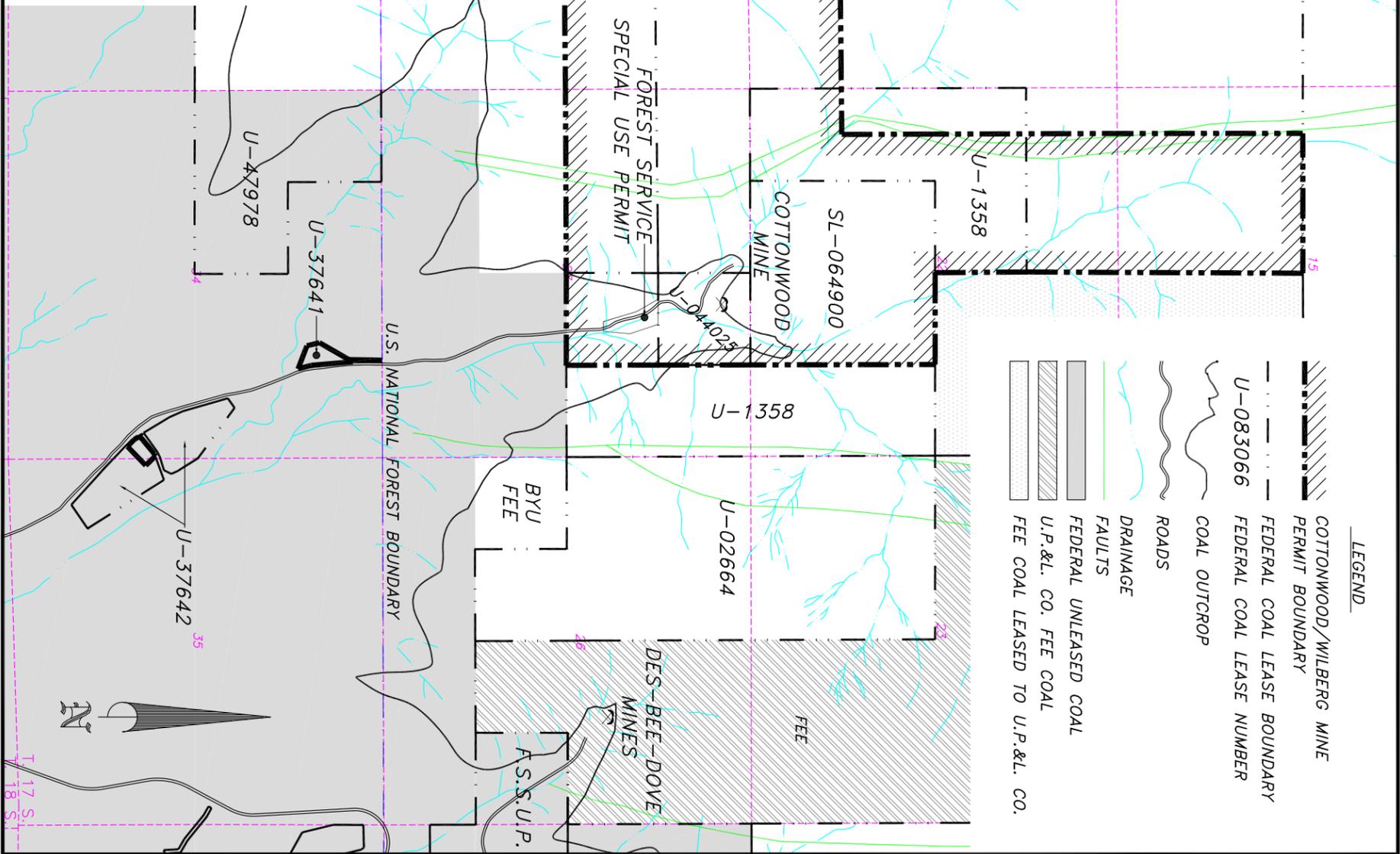
LEGEND

- COTTONWOOD/WILBERG MINE PERMIT BOUNDARY
- FEDERAL COAL LEASE BOUNDARY
- U-083066 FEDERAL COAL LEASE NUMBER
- COAL OUTCROP
- ROADS
- DRAINAGE
- FAULTS
- FEDERAL UNLEASED COAL
- U.P.&L. CO. FEE COAL
- FEE COAL LEASED TO U.P.&L. CO.

1-1
 CAD FILE NAME/DISK#: USERS\KJL\GM\CM-10519-WB.DWG
ENERGY WEST MINING COMPANY
 A SUBSIDIARY OF PACIFICORP

COTTONWOOD/WILBERG MINE COAL LEASE AND OWNERSHIP MAP COTTONWOOD/WILBERG MINE PERMIT AREA	
DRAWN BY: K. LARSEN	DRAWING #: CM-10519-WB
SCALE: 1"=2000'	DATE: OCTOBER 7, 1983
SHEET 1 OF 1	REV. _____

NO.	DATE	REVISIONS	BY
1-7-15		REMOVED THE COTTONWOOD WASTE ROCK STORAGE SITE	KJL
4-6-12		REVISED TO REFLECT PHASE 3 BOND RELEASE OF THE COTTONWOOD WASTE ROCK SITE	KJL
10-28-10		REVISED COTTONWOOD PERMIT BOUNDARY TO REFLECT PHASE 3 RELINQUISHMENT	KJL
11-8-01		REVISED PERMIT BOUNDARY TO EXCLUDE RELINQUISHED AREA	KJL
4-9-01		REVISED PERMIT BOUNDARY & ADDED RELINQUISHED AREAS	KJL
9-21-00		CONVERTED DRAWING TO AUTOCAD AND REVISED FEDERAL LEASE U-024317 TO INCLUDE ADDITIONAL 50 ACRES	KJL
9-22-89		UPDATED OWNERSHIP TITLES	JRG
8-31-89		REVISED UP&L CO. PERMIT BOUNDARY LINE L/U-044025	KJL
8/11/89		ADDED PROPOSED WASTE ROCK SITE	JRG
2/22/89		REVISED TITLE BLOCK, LEGEND AND OTHER LABELS TO INCLUDE COTTONWOOD MINE	JRG
11/4/86		REVISED TO INCLUDE SEC. 31, 32 & 33 T.16S., R.7E., & SEC. 36 T.16S., R.6E. INTO MINE PERMIT AREA	LJH



T 17 S
 R 18 S



COTTONWOOD/WILBERG COAL MINE PERMIT AREA MAP

DRAWN BY: **K. LARSEN**
SCALE: **1" = 2000'**
DATE: **NOVEMBER 28, 2000**

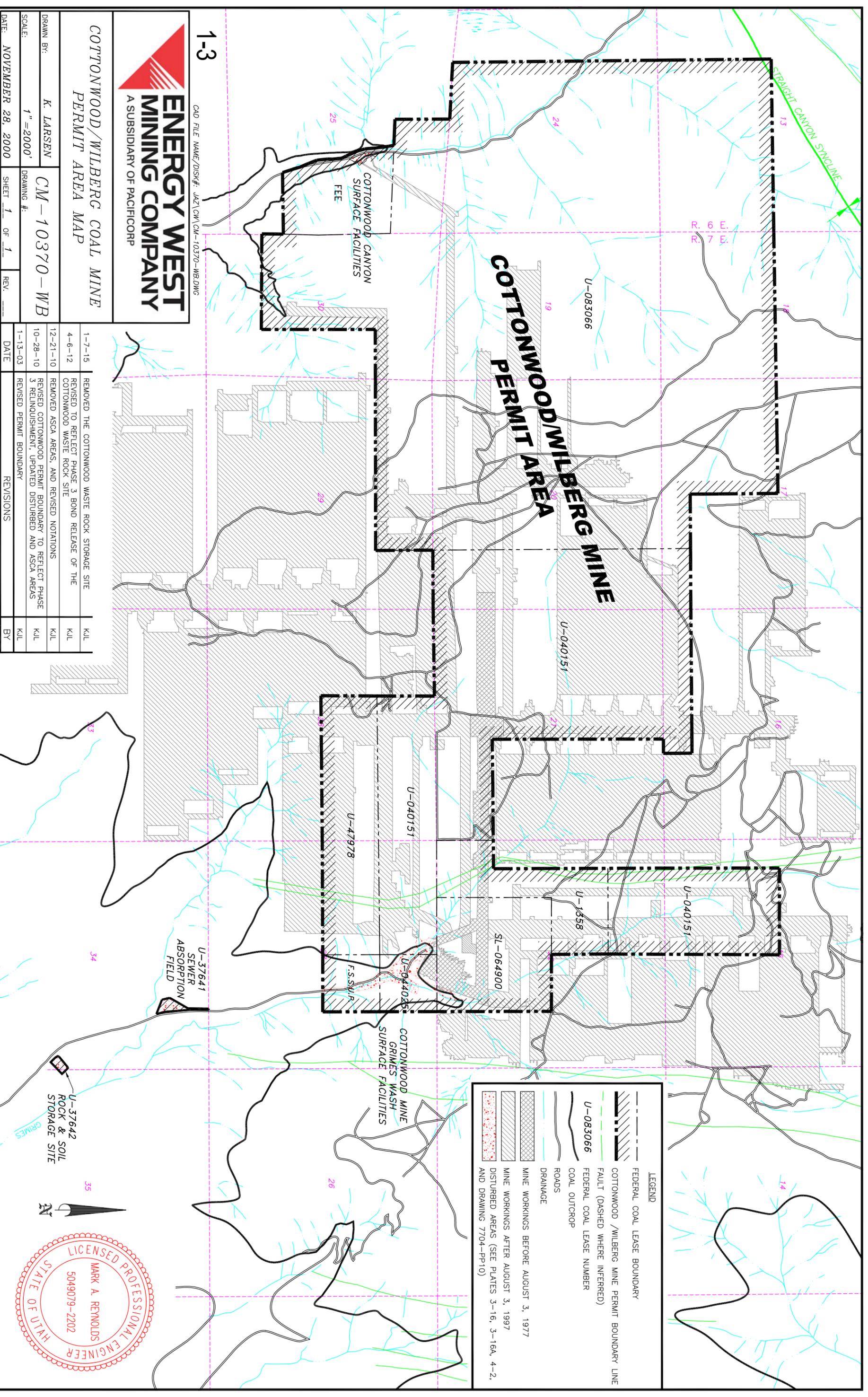
DRAWING #: **CM-10370-WB**

1-3
CAD FILE NAME/DISK#: JAZZ\ON\CM-10370-WB.DWG

DATE	REVISIONS	BY
1-7-15	REMOVED THE COTTONWOOD WASTE ROCK STORAGE SITE	KJL
4-6-12	REVISED TO REFLECT PHASE 3 BOND RELEASE OF THE COTTONWOOD WASTE ROCK SITE	KJL
12-21-10	REMOVED ASCA AREAS, AND REVISED NOTATIONS	KJL
10-28-10	REVISED COTTONWOOD PERMIT BOUNDARY TO REFLECT PHASE 3 RELINQUISHMENT, UPDATED DISTURBED AND ASCA AREAS	KJL
1-13-03	REVISED PERMIT BOUNDARY	KJL

LEGEND

- FEDERAL COAL LEASE BOUNDARY
- COTTONWOOD /WILBERG MINE PERMIT BOUNDARY LINE
- - - FAULT (DASHED WHERE INFERRED)
- U-083066 FEDERAL COAL LEASE NUMBER
- COAL OUTCROP
- ROADS
- DRAINAGE
- MINE WORKINGS BEFORE AUGUST 3, 1977
- MINE WORKINGS AFTER AUGUST 3, 1997
- DISTURBED AREAS (SEE PLATES 3-16, 3-16A, 4-2, AND DRAWING 7704-PP10)



PacifiCorp

Energy West Mining Company

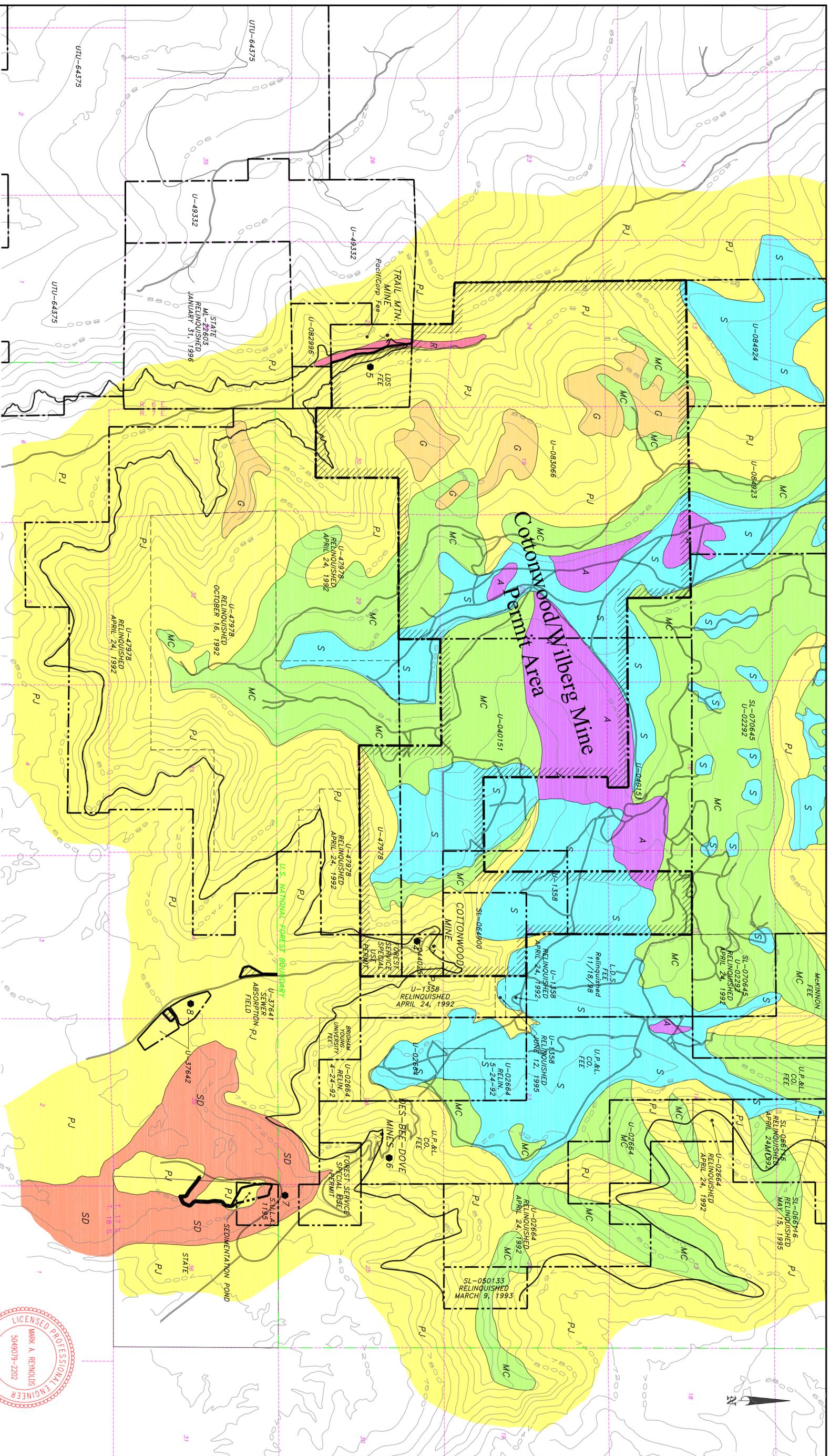
Cottonwood/Wilberg MRP

Volume 5: Maps

Replace maps: CM-10489-WB, CM-10829-WB, CM-10497-WB, CM-10542-WB,
CM-10597-WB, CM-10907-WB, CM-10807-WB

Remove map: CM-10587-WB

Add: Reference sheet for CM-10587-WB (Plate 2-19A)



- VEGETATION LEGEND**
- R RIPARIAN
 - SD SALT DESERT SHRUB
 - G GRASS
 - S SAGEBRUSH
 - A ASPEN
 - MC MIXED CONIFER
 - PJ PINYON JUNIPER

LEGEND

———— COTTONWOOD/WILBERG MINE PERMIT BOUNDARY

- 5 REFERENCE SITE AREAS
- 1-DEER CREEK - RIPARIAN
 - 2-DEER CREEK - PINYON JUNIPER
 - 3-DEER CREEK - MIXED CONIFER
 - 4-WILBERG - PINYON JUNIPER
 - 5-COTTONWOOD - PINYON JUNIPER
 - 6-DES-BEE-DOVE - PINYON JUNIPER
 - 7-DES-BEE-DOVE - SALT DESERT SHRUB
 - 8-WILBERG - PINYON JUNIPER

DATE	REVISIONS	BY	CHK.
1-14-15	REMOVED THE COTTONWOOD WASTE ROCK STORAGE SITE		KILL
4-6-12	REVISED TO REFLECT PHASE 3 BOND RELEASE OF THE COTTONWOOD WASTE ROCK SITE		KILL
6-22-05	REVISED PERMIT BOUNDARY AND LEGENDS		KILL
1-13-03	REVISED PERMIT BOUNDARY & CONVERTED TO AUTOCAD		KILL

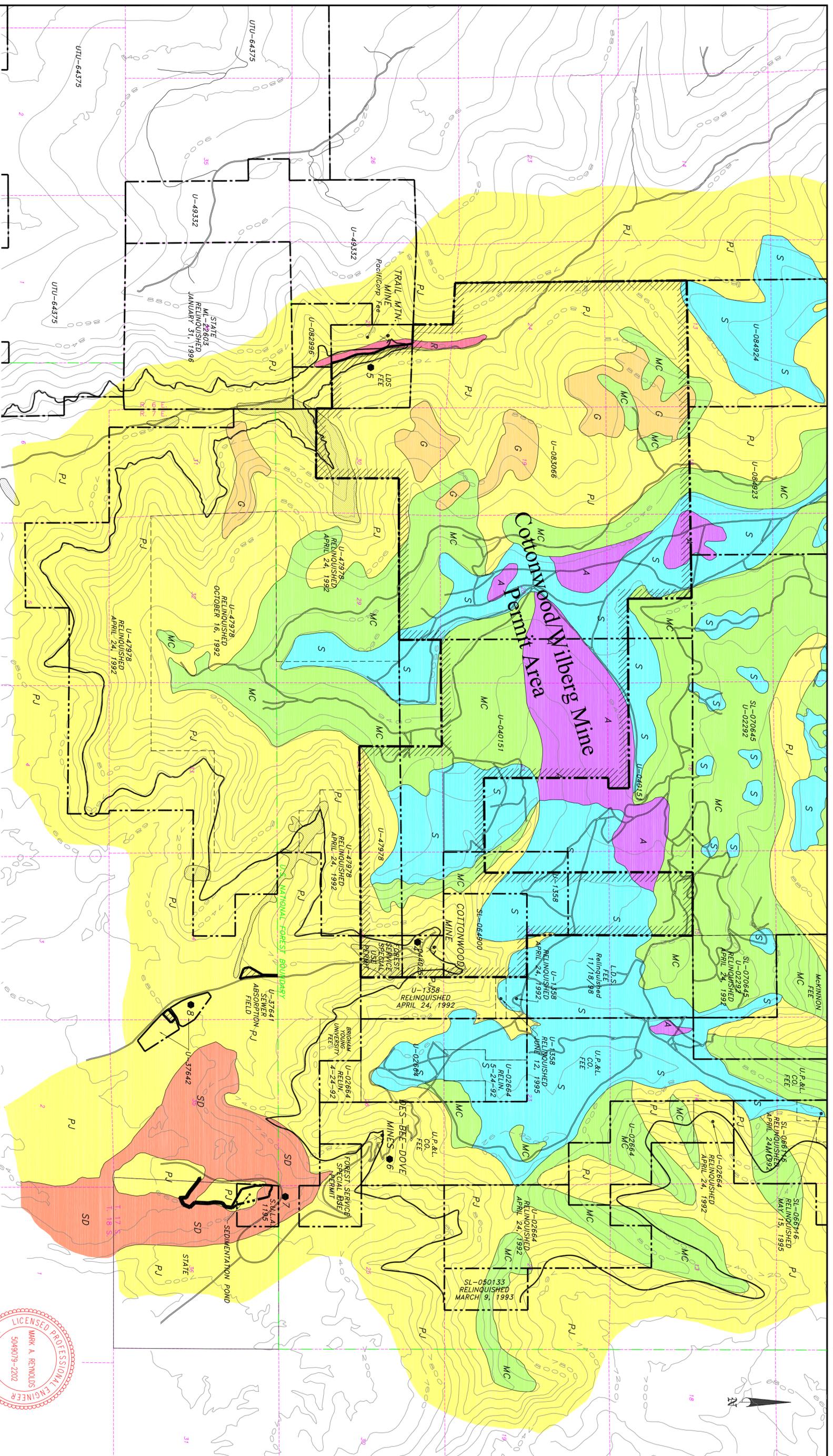
ENERGY WEST MINING COMPANY
A SUBSIDIARY OF PACIFICORP

VEGETATION MAP
OF THE
COTTONWOOD/WILBERG MINE PERMIT AREA

DRAWN BY: K. LARSEN
SCALE: 1" = 2000'
DRAWING #: CE-10489-WB



DATE	REVISIONS	BY	CHK.
1-14-15	REMOVED THE COTTONWOOD WASTE ROCK STORAGE SITE		KILL
4-6-12	REVISED TO REFLECT PHASE 3 BOND RELEASE OF THE COTTONWOOD WASTE ROCK SITE		KILL
6-22-05	REVISED PERMIT BOUNDARY AND LEGENDS		KILL
1-13-03	REVISED PERMIT BOUNDARY & CONVERTED TO AUTOCAD		KILL



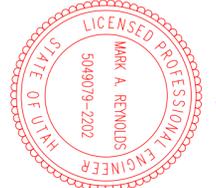
- VEGETATION LEGEND**
- R RIPARIAN
 - SD SALT DESERT SHRUB
 - G GRASS
 - S SAGEBRUSH
 - A ASPEN
 - MC MIXED CONIFER
 - PU PINYON JUNIPER

- LEGEND**
- COTTONWOOD/WILBERG MINE PERMIT BOUNDARY
 - HEDYSARUM OCCIDENTALE VAR. CANONE

- REFERENCE SITE AREAS**
- 1-DEER CREEK - RIPARIAN JUNIPER
 - 2-DEER CREEK - MIXED CONIFER
 - 3-COTTONWOOD - PINYON JUNIPER
 - 4-WILBERG - PINYON JUNIPER
 - 5-DEER CREEK - RIPARIAN JUNIPER
 - 6-DEER CREEK - MIXED CONIFER
 - 7-DIS-DEE-DOVE - SALT DESERT SHRUB
 - 8-WILBERG/DIS-DEE-DOVE WASTE ROCK PINYON JUNIPER

DATE	REVISIONS	BY	CHK.
1-14-15	REMOVED THE COTTONWOOD WASTE ROCK STORAGE SITE		KILL
4-10-12	REVISED TO REFLECT PHASE 3 BOND RELEASE OF THE COTTONWOOD WASTE ROCK SITE		KILL
6-22-05	REVISED PERMIT BOUNDARY AND LEGENDS		KILL
1-14-03	REVISED PERMIT BOUNDARY & CONVERTED TO AUTOCAD		KILL


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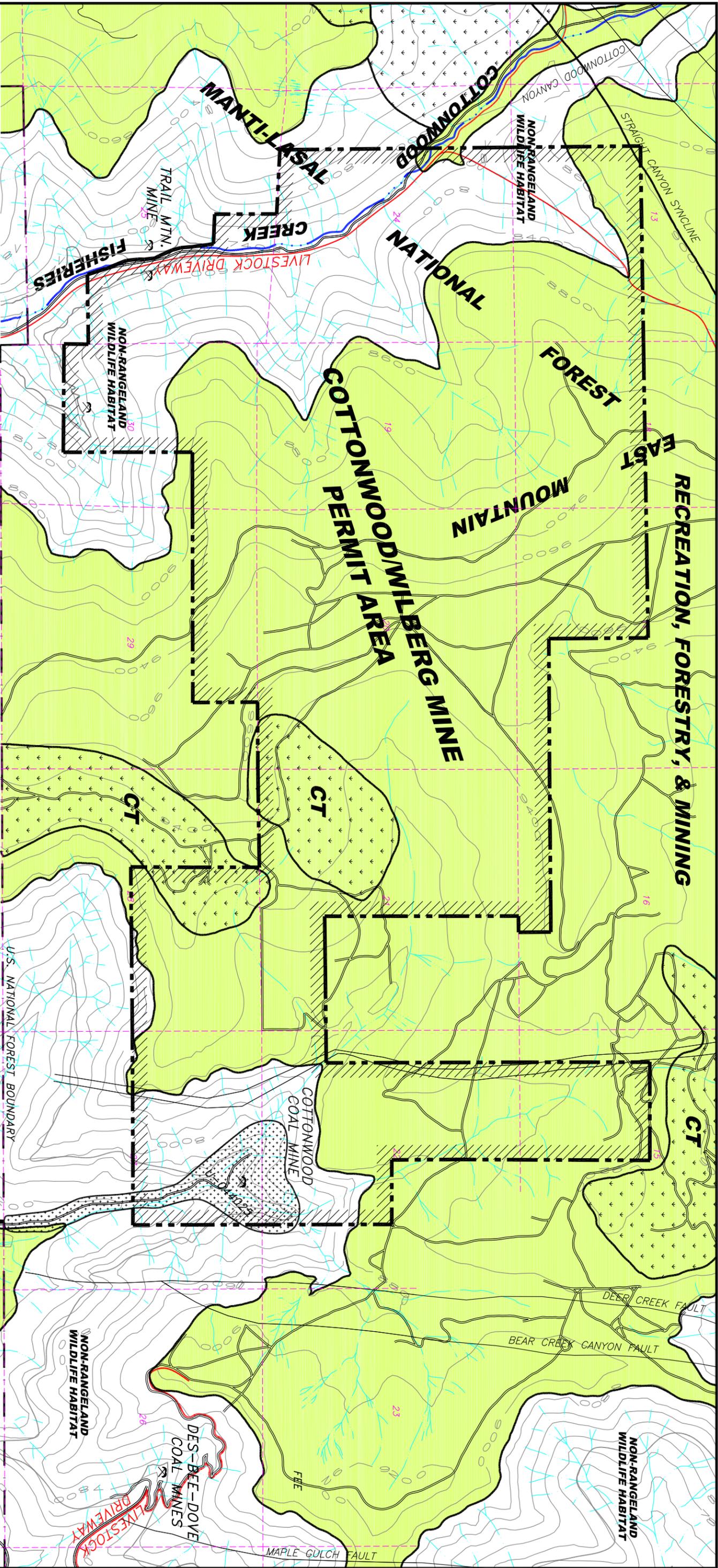


2-15A

COTTONWOOD/WILBERG MINE
VEGETATION MAP SHOWING THE LOCATION OF
HEDYSARUM OCCIDENTALE VAR. CANONE

DRAWN BY: **K. LARSEN**
 SCALE: **1" = 2000'**
 DATE: **APRIL 10, 2012**

DRAWING #: **CE-10829-WB**
 SHEET **1** OF **1**



2-19

CAD FILE NAME/DISK#: CM-10597-WB



COTTONWOOD/WILBERG MINE
LAND USE MAP

DRAWN BY: K. LARSEN
CM-10597-WB

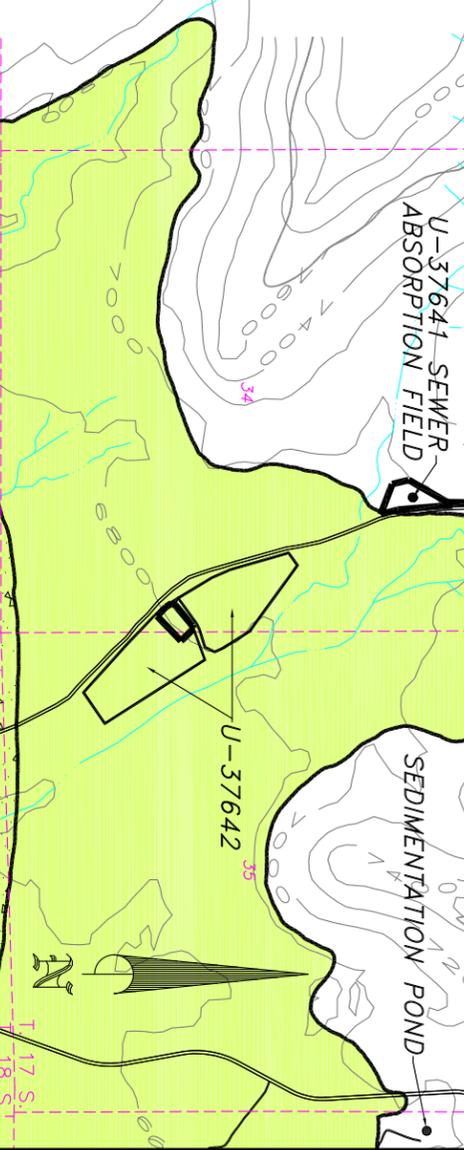
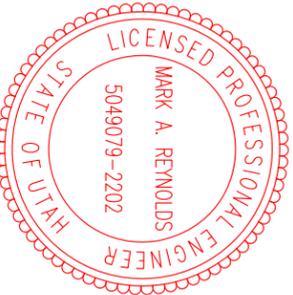
SCALE: 1"=2000'
DRAWING #:

DATE: APRIL 10, 2012 SHEET 1 OF 1 REV. _____

LEGEND

	COTTONWOOD MINE PERMIT BOUNDARY LINE
	GRAZING
	COMMERCIAL TIMBER
	MINE PORTALS (EXISTING, SEALED & RECLAIMED)
	FISHERIES
	LIVESTOCK DRIVEWAY
	LEASABLE MINERAL DEVELOPMENT

1-14-15	REMOVED THE COTTONWOOD WASTE ROCK STORAGE SITE	K/L
4-10-12	REVISED TO REFLECT PHASE 3 BOND RELEASE OF THE COTTONWOOD WASTE ROCK SITE	K/L
6-27-05	REVISED PERMIT BOUNDARY	K/L
1-15-03	REVISED PERMIT BOUNDARY	K/L
2-4-98	CONVERTED TO AUTOCAD AND UPDATED PERMIT BOUNDARIES	K/L
8-18-90	ADDED WASTE ROCK SITE PERMIT #UTU-065027	J/G



T 17 S
R 18 E

Cottonwood/Wilberg Mine

C/015/0019

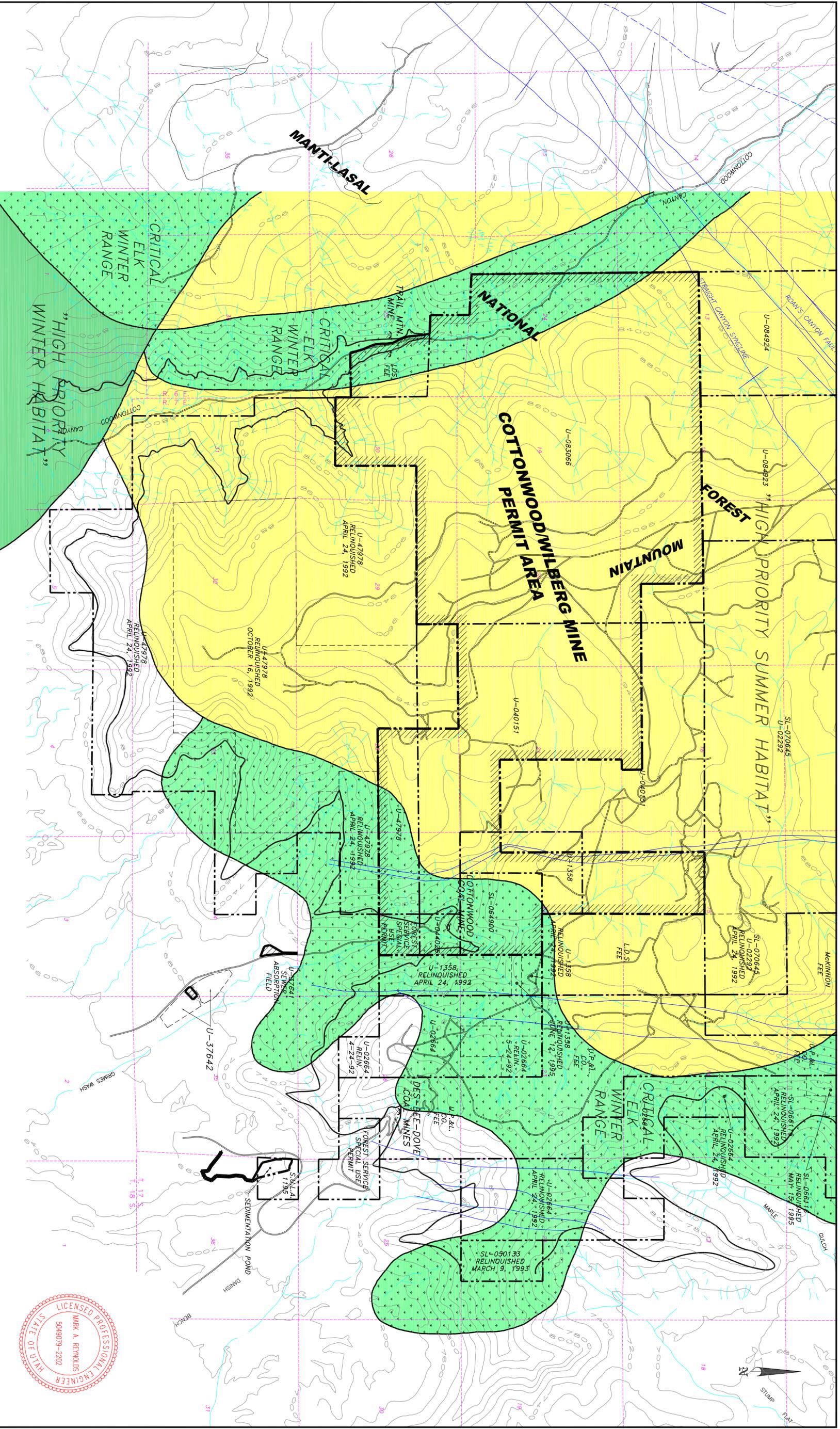
Plate 2-19A

Raptor Nesting Location Map

And Habitat Map

Refer to Private and Confidential Volume

Cottonwood Tab



LEGEND

	COTTONWOOD/WILBERG MINE PERMIT BOUNDARY
	ROADS
	DRAINAGE
	CRITICAL/HIGH PRIORITY ELK WINTER RANGE
	HIGH PRIORITY ELK WINTER RANGE
	HIGH PRIORITY ELK SUMMER RANGE

DATE	REVISIONS	BY	K/L
1-14-15	REMOVED THE COTTONWOOD WASTE ROCK STORAGE SITE		K/L
4-10-12	REVISED TO REFLECT PHASE 3 BOND RELEASE OF THE COTTONWOOD WASTE ROCK SITE		K/L
6-29-05	REVISED PERMIT BOUNDARY		K/L
1-17-03	REVISED PERMIT BOUNDARY & CONVERTED TO AUTOCAD		K/L

2-20A

CAD FILE NAME/DISK#: CM10907WB



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**COTTONWOOD/WILBERG MINE
ELK HABITAT**

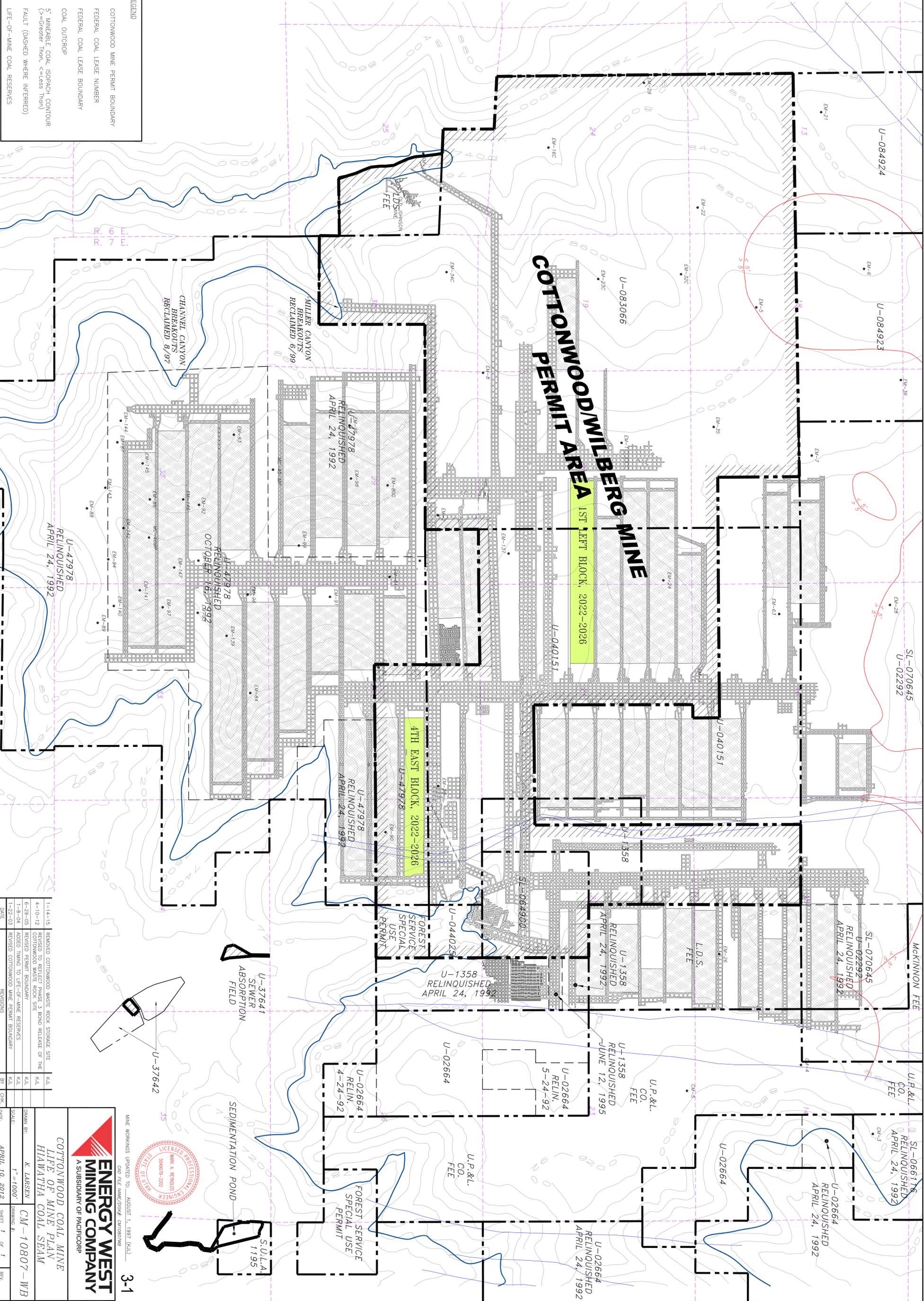
DRAWN BY: K. LARSEN	DRAWING #: CM-10907-WB
SCALE: 1" = 2000'	SHEET 1 OF 1
DATE: APRIL 10, 2012	REV. _____





LEGEND

	COTTONWOOD MINE PERMIT BOUNDARY
	FEDERAL COAL LEASE NUMBER
	FEDERAL COAL LEASE BOUNDARY
	COAL OUTCROP
	5' MINEABLE COAL ISOPACH CONTOUR (>=Greater Than, <=Less Than)
	FAULT (DASHED WHERE INFERRED)
	LIFE-OF-MINE COAL RESERVES



DATE	REVISIONS
1-14-15	REMOVED COTTONWOOD WASTE ROCK STORAGE SITE
4-10-12	REVISED TO REFLECT PHASE 3 BOND RELEASE OF THE COTTONWOOD WASTE ROCK SITE
6-29-05	REVISED PERMIT BOUNDARY
1-8-04	ADDED TITING TO LIFE-OF-MINE RESERVES
1-22-03	REVISED COTTONWOOD MINE PERMIT BOUNDARY

ENERGY WEST MINING COMPANY
A SUBSIDIARY OF PACIFICORP

COTTONWOOD COAL MINE
LIFE OF MINE PLAN
HIAWATHA COAL SEAM

DRAWN BY: K. LARSEN
SCALE: 1" = 1000'
SHEET 1 OF 1

DATE: APRIL 10, 2012



3-1

MINE WORKINGS UPDATED TO: AUGUST 1, 1997 (K.L.)
CAD FILE NAME: COWM024A.CAD(02/07/98)

PacifiCorp

Energy West Mining Company

Cottonwood/Wilberg MRP

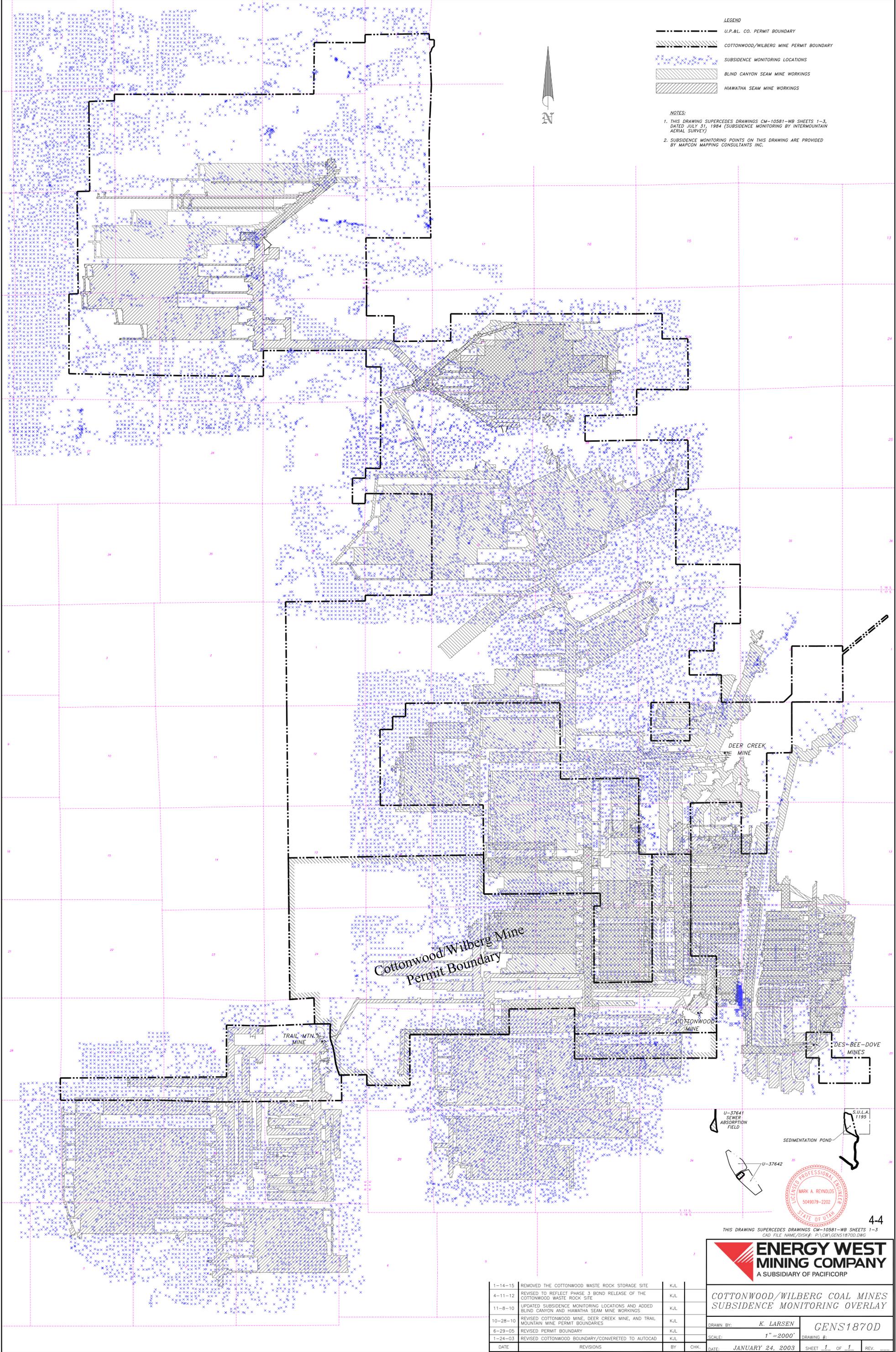
Volume 6: Maps

GENS1870D

CM-10742-WB

- LEGEND**
- U.P.&L. CO. PERMIT BOUNDARY
 - COTTONWOOD/WILBERG MINE PERMIT BOUNDARY
 - SUBSIDENCE MONITORING LOCATIONS
 - ▨ BLIND CANYON SEAM MINE WORKINGS
 - ▨ HIAWATHA SEAM MINE WORKINGS

- NOTES:**
1. THIS DRAWING SUPERCEDES DRAWINGS CM-10581-WB SHEETS 1-3, DATED JULY 31, 1984 (SUBSIDENCE MONITORING BY INTERMOUNTAIN AERIAL SURVEY)
 2. SUBSIDENCE MONITORING POINTS ON THIS DRAWING ARE PROVIDED BY MAPCON MAPPING CONSULTANTS INC.



Cottonwood/Wilberg Mine
Permit Boundary

TRAIL MTN. MINE

COTTONWOOD MINE

DEER CREEK MINE

DES-BEE-DOVE MINES

U-37641
SEWER
ABSORPTION
FIELD

SEDIMENTATION POND



4-4

THIS DRAWING SUPERCEDES DRAWINGS CM-10581-WB SHEETS 1-3
CAD FILE NAME/DISK#: P:\CW\GENS1870D.DWG



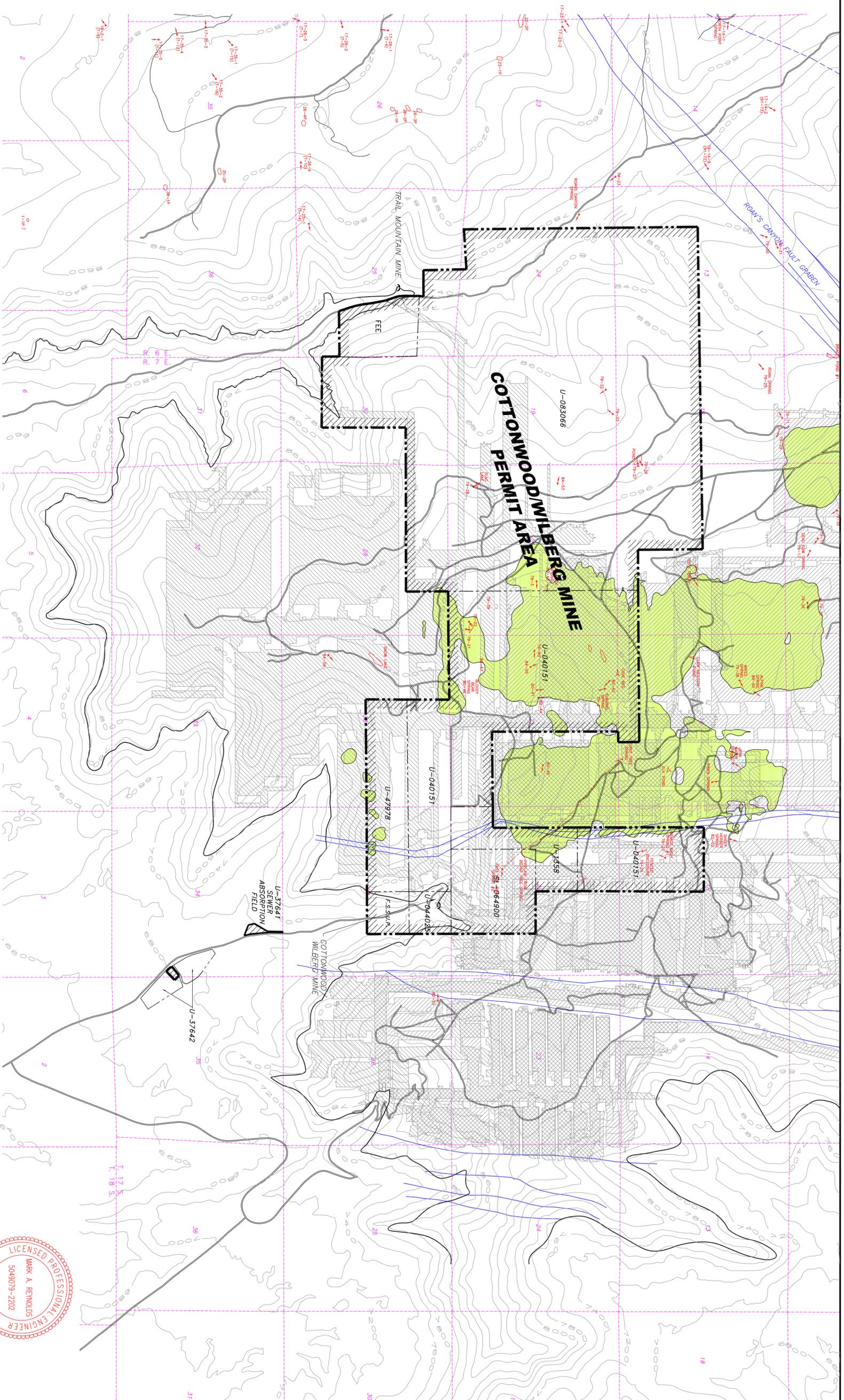
DATE	REVISIONS	BY	CHK.
1-14-15	REMOVED THE COTTONWOOD WASTE ROCK STORAGE SITE	KJL	
4-11-12	REVISED TO REFLECT PHASE 3 BOND RELEASE OF THE COTTONWOOD WASTE ROCK SITE	KJL	
11-8-10	UPDATED SUBSIDENCE MONITORING LOCATIONS AND ADDED BLIND CANYON AND HIAWATHA SEAM MINE WORKINGS	KJL	
10-28-10	REVISED COTTONWOOD MINE, DEER CREEK MINE, AND TRAIL MOUNTAIN MINE PERMIT BOUNDARIES	KJL	
6-29-05	REVISED PERMIT BOUNDARY	KJL	
1-24-03	REVISED COTTONWOOD BOUNDARY/CONVERTED TO AUTOCAD	KJL	

COTTONWOOD/WILBERG COAL MINES
SUBSIDENCE MONITORING OVERLAY

DRAWN BY: K. LARSEN GENS1870D

SCALE: 1" = 2000' DRAWING #:

DATE: JANUARY 24, 2003 SHEET 1 OF 1 REV. ---



LEGEND

	PACIFICORP EAST MOUNTAIN PROPERTY BOUNDARY
	COTTONWOOD/WILBERG MINE PERMIT BOUNDARY
	FAULT (DASHED WHERE INFERRED)
	SPRING & I.D. NUMBER
	BLIND CANYON COAL SEAM
	HIMAWATHA COAL SEAM
	SUBSIDENCE AREAS (GREATER THAN 2 FEET)

NOTE:
FOR FURTHER DETAILS OF THE DEER CREEK MINE FOR SUBSIDENCE, REVIEW THE ANNUAL SUBSIDENCE REPORT.

DATE	REVISIONS	BY	CHK.
1-14-15	REMOVED THE COTTONWOOD WASTE ROCK STORAGE SITE		KILL
4-10-12	REVISED TO REFLECT PHASE 3 BOND RELEASE OF THE COTTONWOOD WASTE ROCK SITE		KILL
10-28-10	REVISED COTTONWOOD PERMIT BOUNDARY TO REFLECT PHASE 3 RELINQUISHMENT		KILL
6-29-05	REVISED PERMIT BOUNDARY & UPDATED SUBSIDENCE ZONES		KILL



ENERGY WEST MINING COMPANY
A SUBSIDIARY OF PACIFICORP

4-5

CAD FILE NAME/DISK#: P:\CM\CM10742WB.DWG

**COTTONWOOD/WILBERG COAL MINE
EAST MOUNTAIN SPRING
& SUBSIDENCE LOCATION MAP**

DRAWN BY: **K. LARSEN**
SCALE: **1" = 2000'**

CHECKED BY: **CM-10742-WB**
DRAWING #:

DATE: **APRIL 10, 2012** SHEET **1** OF **1** REV. **---**

PacifiCorp

Energy West Mining Company

Cottonwood/Wilberg MRP

Volume 9, Appendix A-1

Replace Cottonwood/Wilberg Monitoring program, Table, and Monitoring Location Map.

PACIFICORP
ENERGY WEST
HYDROLOGIC MONITORING PROGRAM
WILBERG/COTTONWOOD MINE

I. MONITORING LOCATIONS – WILBERG/COTTONWOOD MINE

A. Surface Water Hydrology (for maps refer to Deer Creek, Wilberg/Cottonwood Mine: Volume 9 Map HM-1B)

1. Cottonwood Creek Drainage System

a. ***Cottonwood Canyon Creek*** (refer to Deer Creek and Wilberg/Cottonwood Mine: Volume 9 Map HM-1B)

(1) CCC01 - USGS Flume:
(Approximately 7800 feet downstream from the outlet culvert for the disturbed area.) 1500 feet North, 200 feet East of the Southwest corner of Section 31, Township 17 South, Range 7 East.

b. ***Grimes Wash*** (refer to Deer Creek and Wilberg/Cottonwood Mine: Volume 9 Map HM-1B)

(1) GWR01 - Right Fork:
(Approximately 1500 feet upstream of the inlet culvert for the disturbed area.) 550 feet North, 1500 feet West of the Southwest corner of Section 22, Township 17 South, Range 7 East.

(2) GWR02 - Left Fork:
(Approximately 50 feet upstream of the inlet culvert for the disturbed area.) 200 feet South, 2350 feet East of the Northwest corner of Section 27, Township 17 South, Range 7 East.

(3) GWR03 - Below the mine:
(Approximately 500 feet downstream of the outlet culvert below the disturbed area.) 1770 feet South, 1820 feet West of the Northeast corner of Section 27, Township 17 South, Range 7 East.

**PACIFICORP
ENERGY WEST
HYDROLOGIC MONITORING PROGRAM
WILBERG/COTTONWOOD MINE**

2. **Reclamation Monitoring:** Following final reclamation, backfilling and grading monitoring will be conducted at points immediately above and below the reclaimed site.

B. Groundwater Hydrology

1. Piezometric Data

The Wilber/Cottonwood Mine has been sealed since 2001. There are no accessible in-mine **piezometric well** sampling locations.

2. In-Mine Water Locations

The Wilber/Cottonwood Mine has been sealed since 2001. There are no accessible in-mine sampling locations.

3. Waste Rock Wells (~~refer to Deer Creek and Wilberg/Cottonwood Mine: Volume 9 Map HM-1B~~ **None**)

- a. ~~Cottonwood~~

C. UPDES Monitoring Locations

a. ***Wilberg/Cottonwood Mines***

UPDES UT0022896

001- Mine Discharge @ Cottonwood Canyon (TMA)

003- Sediment Pond @ Mine Facilities

~~005- Sediment Pond Discharge @ Waste Rock Site~~

**PACIFICORP
ENERGY WEST
HYDROLOGIC MONITORING PROGRAM
WILBERG/COTTONWOOD MINE**

II. MONITORING SCHEDULE (see enclosed monitoring schedules for operational, baseline, and reclamation monitoring)

A. Field Measurements

Field Measurements collected during quality sampling: Listed below are the sites which will be monitored by PacifiCorp - Energy West in accordance with the guidelines established by DOGM; i.e.

- Date and Time
- Flow
- pH
- Temperature
- Conductivity
- Dissolved oxygen (perennial streams only)

Surface Monitoring

Surface monitoring locations will be field monitored quarterly for all field parameters, except Indian Creek - monitoring to be conducted during baseflow only.

1. Cottonwood Canyon Creek

- a. Cottonwood Canyon Creek
 - (1) CCC01 - USGS Flume
- b. Grimes Wash
 - (1) GWR01
 - (2) GWR02
 - (3) GWR03

Groundwater Monitoring

There is ~~only one~~ **are no** groundwater monitoring site for the Wilberg/Cottonwood Mine.

~~1. Waste Rock Wells~~

- ~~a. Cottonwood~~

**PACIFICORP
ENERGY WEST
HYDROLOGIC MONITORING PROGRAM
WILBERG/COTTONWOOD MINE**

UPDES Monitoring

1. Wilberg/Cottonwood

UPDES sites 001, 003, and ~~005~~ will be monitored as specified in the individual permits.

Reclamation Monitoring

Surface Water Resources: (see enclosed summary of operational, baseline, and reclamation monitoring schedules)

Surface monitoring locations will be field monitored monthly for flow and all field parameters quarterly until bond release.

Ground Water Resources: (see ~~enclosed summary of operational, baseline, and reclamation monitoring schedules~~ **N/A**)

~~Waste Rock Well: will be field monitored for level only on a quarterly basis. Monitoring will be conducted until sealing during final reclamation.~~

UPDES: Sites will be monitored as specified in the individual permits

B. Quality Sampling (Laboratory Measurements)

1. **Surface Water Hydrology:** Water samples will be collected and analyzed quarterly (one sample at low flow and high flow) during the first or second week of the quarter. Parameters analyzed are those listed in the DOGM Guidelines for Surface Water Quality (see Table 1-Surface Water Quality Parameter List). Quarterly sampling was initiated during March 1988 and will continue throughout the year; i.e., June, September, and December. Baseline analysis was performed in 2011 and will be repeated every five years there-after.

a. **Cottonwood Creek Drainage**

(1) Cottonwood Canyon Creek

(a) CCC01 - USGS Flume

**PACIFICORP
ENERGY WEST
HYDROLOGIC MONITORING PROGRAM
WILBERG/COTTONWOOD MINE**

(2) Grimes Wash

- (a) GWR01
- (b) GWR02
- (c) GWR03

Reclamation Monitoring - Surface Water Hydrology: Water samples will be collected and analyzed quarterly (one sample at low flow and high flow) during the first or second week of the quarter. Parameters analyzed are those listed in the DOGM Guidelines for Surface Water Quality (see Table 1-Surface Water Quality Parameter List). Sampling will be conducted on a quarterly basis until bond release. Baseline analysis will be performed on the 5th and 9th years following reclamation. In no case will baseline sampling time frame exceed 5 years converting from operational to reclamation monitoring.

~~2. Groundwater Hydrology~~

- ~~a. Waste Rock Wells: One water sample will be collected and analyzed per location quarterly. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table 2-Ground Water Quality Parameter List).~~

~~Baseline analysis was performed in 2011 and will be repeated every five years thereafter.~~

~~Reclamation Monitoring - Groundwater Hydrology:~~

- ~~a. Waste Rock Wells: Waste rock wells will be sealed during final reclamation. One water sample will be collected and analyzed per location quarterly until well sealing. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table 2-Ground Water Quality Parameter List).~~
- ~~b. Post Reclamation Monitoring: PacifiCorp commits to conduct annual surveys to identify new discharge locations within and below sealed portals. If discharge occurs, one water sample will be collected and analyzed per location quarterly. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table~~

PACIFICORP
ENERGY WEST
HYDROLOGIC MONITORING PROGRAM
WILBERG/COTTONWOOD MINE

~~2-Ground-Water-Quality-Parameter-List). Baseline analysis will be performed on the 5th and 9th year.~~

2. UPDES Monitoring Sites

a. Wilberg/Cottonwood Mines

UPDES sites will be monitored as specified in the individual permits.

III. ANNUAL REPORTS

All data collected regarding the hydrology of East Mountain will be summarized by the applicant in an annual Hydrologic Monitoring Report. Copies of the report will be submitted to the Utah State Division of Oil, Gas and Mining. In addition, any raw data collected will be submitted to the Utah State Division of Oil, Gas and Mining on a quarterly basis.

PACIFICORP
ENERGY WEST MINING COMPANY
HYDROLOGIC MONITORING PROGRAM
COTTONWOOD-WILBERG MINE

SURFACE HYDROLOGY - OPERATIONAL SAMPLING (Table 1)

<u>Drainage System</u>	<u>Drainage</u>	<u>Location</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
<i>Cottonwood Creek Drainage System</i>	<i>Cottonwood Canyon Creek</i>	CCC01	Flow	Flow	Field									
	<i>Grimes Wash</i>	GWR01	Flow	Flow	Operational									
		GWR02	Flow	Flow	Operational									
		GWR03	Flow	Flow	Operational									

GROUNDWATER HYDROLOGY - OPERATIONAL SAMPLING (Table 2)

<u>Groundwater Type</u>		<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
<i>Springs</i>	N/A												
<i>In-Mine</i>	N/A												
<i>Wells</i>	<i>Cottonwood Waste Rock Well</i> N/A			Operational			Operational			Operational			Operational

UPDES SAMPLING - (Table 1)

			<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
<i>Mine Water Discharge</i>	<i>Cottonwood</i>	TMA	Operational											
<i>Sediment Pond Discharge</i>	<i>Cottonwood</i>	2 1 Outfalls	Operational											

PACIFICORP
ENERGY WEST MINING COMPANY
HYDROLOGIC MONITORING PROGRAM
COTTONWOOD-WILBERG MINE

SURFACE HYDROLOGY - BASELINE SAMPLING (Table 1) - 2011

<u>Drainage System</u>	<u>Drainage</u>	<u>Location</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
	<i>Cottonwood Canyon Creek</i>	CCC01	Flow	Flow	Field									
<i>Cottonwood Creek Drainage System</i>	<i>Grimes Wash</i>	GWR01	Flow	Flow	Baseline									
		GWR02	Flow	Flow	Baseline									
		GWR03	Flow	Flow	Baseline									

GROUNDWATER HYDROLOGY - BASELINE SAMPLING (Table 2) - 2011

<u>Groundwater Type</u>		<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
<i>Springs</i>	N/A												
<i>In-Mine Wells</i>	<i>Cottonwood Waste Rock Well - N/A</i>			Baseline			Baseline			Baseline			Baseline

UPDES SAMPLING - (Table 1)

			<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
<i>Mine Water Discharge</i>	<i>Cottonwood</i>	TMA	Operational											
<i>Sediment Pond Discharge</i>	<i>Cottonwood</i>	21 Outfalls	Operational											

**PACIFICORP
ENERGY WEST MINING COMPANY
HYDROLOGIC MONITORING PROGRAM
COTTONWOOD-WILBERG MINE**

SURFACE HYDROLOGY - RECLAMATION SAMPLING (Table 1)

<u>Drainage System</u>	<u>Drainage</u>	<u>Location</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
Cottonwood Creek Drainage System*	Cottonwood Canyon	CCC01			Field			Field			Field			Field
	Grimes	GWR01			Operational			Operational			Operational			Operational
	Wash	GWR02			Operational			Operational			Operational			Operational
		GWR03			Operational			Operational			Operational			Operational

GROUNDWATER HYDROLOGY - RECLAMATION SAMPLING (Table 2)

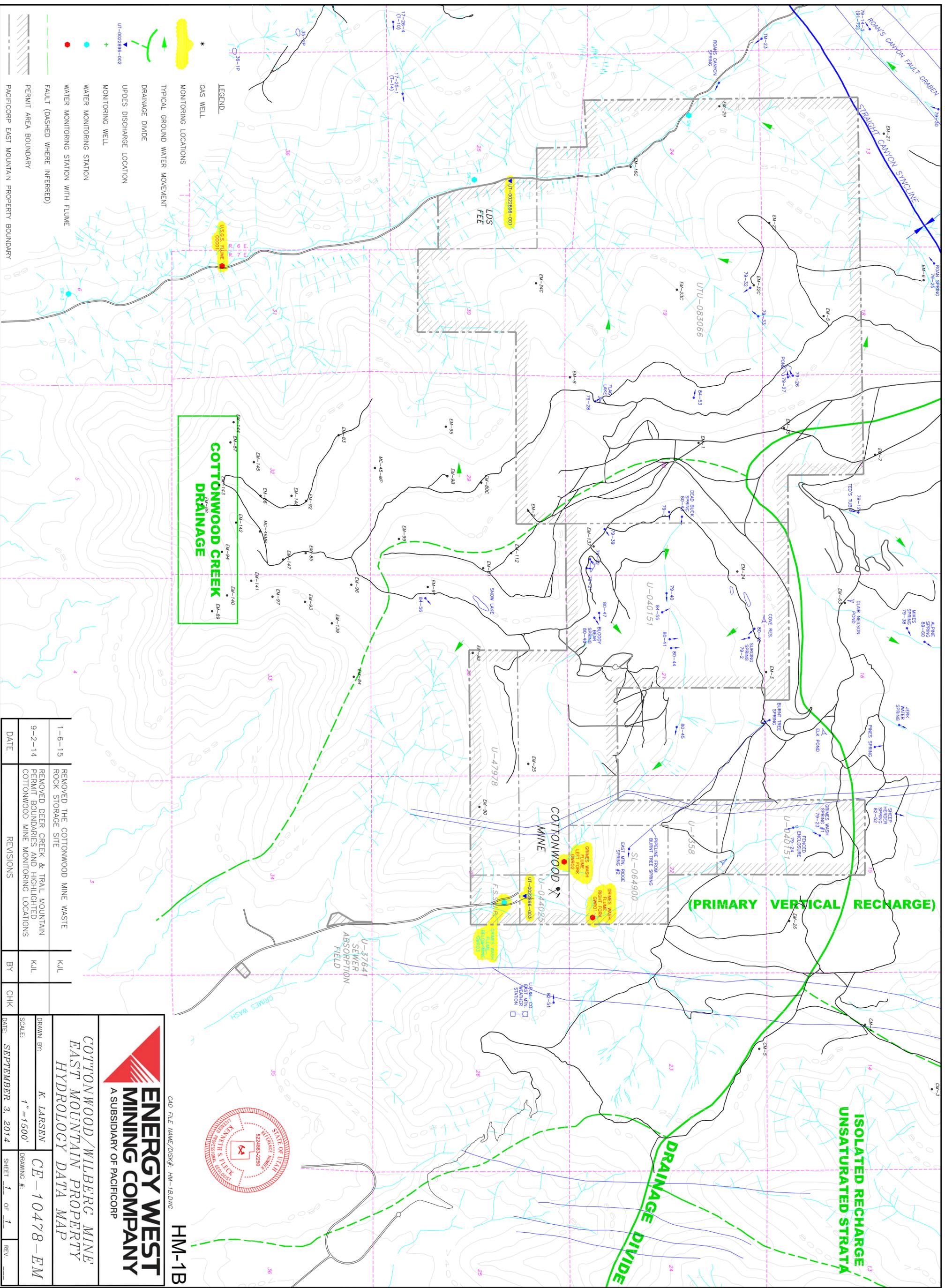
<u>Groundwater Type</u>		<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
Springs	N/A												
In Mine	N/A												
Wells	Cottonwood Waste Rock Well N/A			Operational			Operational			Operational			Operational

Cottonwood Waste Rock Well will be sealed during Phase I reclamation. One water sample will be collected and analyzed per location quarterly until well sealing

UPDES SAMPLING - (Table 1)

		<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
Mine Water Discharge**	TMA	As Needed Basis According to UPDES Permit Stipulations											
Sediment Pond Discharge	2 1 Outfall	As Needed Basis According to UPDES Permit Stipulations											

**** After Portal Sealing, PacifiCorp Will Monitor Down Dip For Development Of Groundwater Seeps/Springs Until Bond Release**



COTTONWOOD CREEK DRAINAGE

(PRIMARY VERTICAL RECHARGE)

ISOLATED RECHARGE UNSATURATED STRATA

DRAINAGE DIVIDE



COTTONWOOD/WILBERG MINE EAST MOUNTAIN PROPERTY HYDROLOGY DATA MAP

DATE:	SEPTEMBER 3, 2014	SHEET:	1	OF:	1	REV.:													
SCALE:	1" = 1500'	DRAWING #:	CE-10478-EM																
BY:	KIL	CHK:																	
REVISIONS:	<table border="1"> <tr> <th>DATE</th> <th>REVISIONS</th> <th>BY</th> <th>CHK</th> </tr> <tr> <td>1-6-15</td> <td>REMOVED THE COTTONWOOD MINE WASTE ROCK STORAGE SITE</td> <td>KIL</td> <td></td> </tr> <tr> <td>9-2-14</td> <td>REMOVED DEER CREEK & TRAIL MOUNTAIN PERMIT BOUNDARIES AND HIGHLIGHTED COTTONWOOD MINE MONITORING LOCATIONS</td> <td>KIL</td> <td></td> </tr> </table>							DATE	REVISIONS	BY	CHK	1-6-15	REMOVED THE COTTONWOOD MINE WASTE ROCK STORAGE SITE	KIL		9-2-14	REMOVED DEER CREEK & TRAIL MOUNTAIN PERMIT BOUNDARIES AND HIGHLIGHTED COTTONWOOD MINE MONITORING LOCATIONS	KIL	
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HM-1B

CAD FILE NAME/DISK#: HM-1B.DWG

ENERGY WEST MINING COMPANY
A SUBSIDIARY OF PACIFICCORP

COTTONWOOD/WILBERG MINE EAST MOUNTAIN PROPERTY HYDROLOGY DATA MAP

DRAWN BY: K. LARSEN
DATE: SEPTEMBER 3, 2014