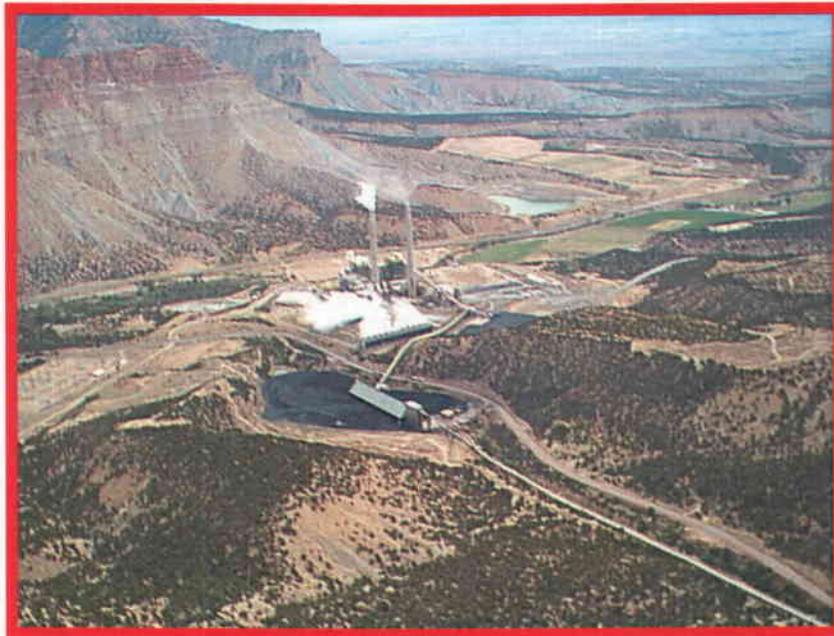


# PACIFICORP

## ENERGY WEST MINING COMPANY

- COTTONWOOD/WILBERG MINE - C/015/0019
- DEER CREEK MINE - C/015/0018
- DES BEE DOVE MINE - C/015/0017
- TRAIL MOUNTAIN MINE - C/015/0009



### 2008 ANNUAL REPORT FOR DIVISION OF OIL, GAS, AND MINING



File in:

Confidential

Shelf

Expandable

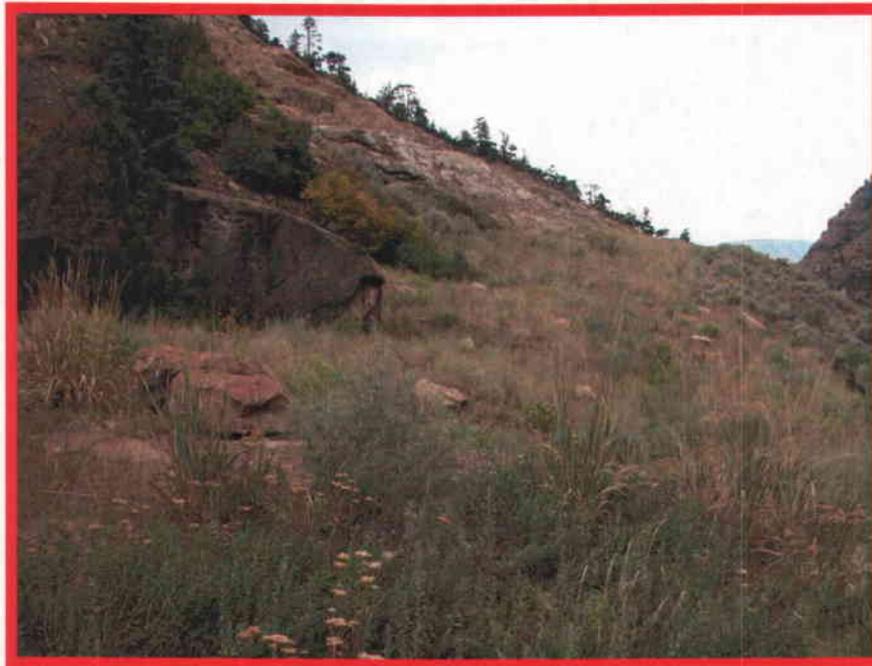
Refer to Record No 0015 Date 05152009

In CI 0150018, 2007, Incoming

For additional information Confidential CD



PACIFICORP  
ENERGY WEST MINING COMPANY  
COTTONWOOD/WILBERG MINE  
DIVISION OF OIL, GAS, AND MINING PERMIT NUMBER:  
C/015/0019  
2008 ANNUAL REPORT



File in:

- Confidential
- Shelf
- Expandable

Refer to Record No. 0015 Date 05/5/2009

In C/015/0018, 2007, Wyoming

For additional information Confidential CD

0015



**COPY**

*C/015/009 Incoming*  
*C/015/017*  
*C/015/018*  
*C/015/019*  
Energy West Mining Company  
P. O. Box 310  
15 No Main Street  
Huntington, Utah 84528

May 15, 2009

#3295

Utah Coal Regulatory Program  
Division of Oil, Gas and Mining  
1594 West North Temple, Suite 121 0  
Box 145801  
Salt Lake City, Utah 84114-5801

**RECEIVED**

*OK*

**MAY 20 2009**

**DIV. OF OIL, GAS & MINING**

**Re: Submittal of Annual and Subsidence Reports for 2008, PacifiCorp, Trail Mountain Mine, C/015/009, Cottonwood Mine, C/015/019, Deer Creek Mine, C/015/018, Des-Bee-Dove, C/015/017, Emery County, Utah.**

PacifiCorp, by and through its wholly-owned subsidiary, Energy West Mining Company as mine operator, herewith makes a partial submittal of the Annual and Subsidence Reports for 2008.

Energy West requested an extension for the submittal of the Hydrologic report. Approval of this extension request was granted on May 11, 2009 for an additional 30 days. This report will be sent as an electronic file on CD.

Additionally, there are two (3) CD's being submitted. The first CD contains the Annual Report forms information, and data that is not confidential. The second CD contains confidential raptor data. The CD is marked as "CONFIDENTIAL". The third CD contains the Subsidence Report.

Please find enclosed two (2) CD copies of the submitted reports. If there are any questions or concerns please call Dennis Oakley at 687-4825.

Sincerely,

*Ken Fleck*  
Ken Fleck  
Geology and Environmental Affairs Manager

cc: (File)

Cover5\_2008.doc

File in:  
*C/015/0018.2009. Incoming*  
Refer to:  
 Confidential CD  
 Shelf  
 Expandable  
Date *05/15/09* For additional information

This Annual Report shows information the Division has for your mine. Please review the information to see if it is current. If the information needs to be updated please do so in this document. At the end of each section the operator is asked to verify if the information is correct. Please answer these questions and make all comments on this document. Submit the completed document and any additional information identified in the Appendicies to the Division by April 30, 2009. During a complete inspection an inspector will check and verify the information. To enter text, click in the cell and type your response. You can use the tab key to move from one field to the next. To enter an X in a box, click next to the box, right click, and select properties, then the checked circle, then hit enter, or hit the unchecked circle if the X is to be removed.

**GENERAL INFORMATION**

Permittee Name	PacifiCorp
Mine Name	Cottonwood/Wilberg Mine
Operator Name (If other then permittee)	Energy West Mining Company
Permit Expiration Date	July 6, 2009
Permit Number	C/015/0019
Authorized Representative Title	Geological and Environmental Affairs Manager
Phone Number	(435) 687-4712
Fax Number	(435) 687-2695
E-mail Address	ken.fleck@pacificorp.com
Mailing Address	P.O. Box 310 Huntington, Utah 84528
Designated Representative	Ken Fleck
Resident Agent	Ken Fleck
Resident Agent Mailing Address	Same as above
Number of Binders Submitted	2

**IDENTIFICATION OF OTHER PERMITS**

Identify other permits that are required in conjunction with mining and reclamation activities.

Permit Type	ID Number	Description	Expiration Date
MSHA Mine ID(s)	42-01221	Cottonwood/Wilberg Mine	None
MSHA Impoundment(s)	1211-UT-09-02052-02	North Sediment Pond	None
	1211-UT-09-02052-02	South Sediment Pond	None
NPDES/UPDES Permit(s)	UT0022896	Sites 001, 003, 004, and 005 consisting of mine discharge and sediment ponds.	
PSD Permit(s) (Air)	DAQE-694-95	Issued 8/9/95, includes Trail Mtn Mine	None
	DAQE-835-91	Issued 12/16/91, includes WRS	None
<b>Other</b>			

Operator, please update any incorrect information.

**CERTIFIED REPORTS**

List the certified inspection reports as required by the rules and under the approved plan that must be periodically submitted to the Division. Specify whether the information is included as Appendix A to this report or currently on file with the Division.

Certified Reports:	Required		Included Included	or	DOGM file location Vol, Chapter, Page
	Yes	No			
Excess Spoil Piles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Refuse Piles	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Impoundments	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<b>Other</b>					
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

**Operator Comments:**  
DOGM receives these reports quarterly. Refer to Appendix A.

**Inspector:**  
Has the operator complied with this section? Yes  No   
**Inspector Comments:**

**COMMITMENTS AND CONDITIONS**

The Permittee is responsible for ensuring annual technical commitments in the MRP and conditions accepted with the permit are completed throughout the year. The Division has identified these commitments below and has provided space for you to report what you have done during the past year for each commitment. If the particular section is blank, no commitment has been identified and no response is required for this report. If additional written response is required, it should be filed under Appendix B to this report.

Admin R645-301-100
Soils R645-301-200
Biology R645-301-300
Landuse, Cultural Resources, Air Quality R645-301- 400
Engineering R645-301-500
Geology R645-301-600

Hydrology R645-301-700

Bonding & Insurance R645-301-800

**Other Commitments**

\*Reminder: If equipment has been abandoned during 2008, an amendment must be submitted that includes a map showing its location, a description of what was abandoned, whether there were any hazardous or toxic materials and any revision to the PHC as necessary.

**REPORTING OF OTHER TECHNICAL DATA**

List other technical data and information as required under the approved plan, which must be periodically submitted to the Division. Specify whether the information is included as Appendix B to this report or currently on file with the Division.

**Operator Comments:**

The annual vegetation monitoring report is included in Appendix B.

**Inspector:**

Has the operator complied with this section? Yes  No

**Inspector Comments:**

**LEGAL, FINANCIAL, COMPLIANCE AND RELATED INFORMATION**

Change in administration or corporate structure can often bring about necessary changes to information found in the mining and reclamation plan. The Division is Requesting that each permittee review and update the legal, financial, compliance and related information in the plan as part of the annual report. Please provide the Department of Commerce, Annual Report of Officers, or other equivalent information as necessary to ensure that the information provided in the plan is current. Provide any other change as necessary regarding land ownership, lease acquisitions, legal results from appeals of violations, or other changes as necessary to update information required in the mining and reclamation plan. Include certified financial statements, audits or worksheets, which may be required to meet bonding requirements. Specify whether the information is currently on file with the Division or included as Appendix C to the report.

**Legal / Financial Update**      **Required**      **Included**      **or**      **DOGM File location**  
    Yes   No      Included      Vol, Chapter, Page

Department of Commerce, Annual Report Officers	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<b>Other</b>				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

**Operator Comments:**

Officer and director list was updated in September 2008. See Legal and Financial Volume, Appendix A

**Inspector:**

Has the operator complied with this section? Yes  No

**Inspector Comments:**

**MAPS**

Copies of mine maps, current and up-to-date through at least December 31, 2008, are to be provided to the Division as Appendix D to this report in accordance with the requirements of R 645-301-525.240. The map copies shall be made in accordance with 30 CFR 75.1200 as required by MSHA. Mine maps are not considered confidential. (Please provide a CD.)

Confidential information is limited to:

R645-300-124.310. Information that pertains only to the analysis of the chemical and physical properties of the coal to be mined, except information on components of such coal which are potentially toxic in the environment.

R645-300-124.330. Information on the nature and location of archeological resources on public land and Indian land as required under the Archeological Resources Protection Act of 1979 (P. L. 96-95, 93 Stat. 721, 16 U.S.C. 470).

R645-301-322, Fish and Wildlife Information; R645-301-322.100, the scope and level of detail for such information will be determined by the Division in consultation with state and federal agencies with responsibilities for fish and wildlife and will be sufficient to design the protection and enhancement plan required under R645-301-333 and R645-301-322.230, other species or habitats identified through agency consultation as requiring special protection under state or federal law; R645-301-333.300, Include protective measures that will be used during the active mining phase of operation.

The Division will provide procedures, including notice and opportunity to be heard for persons both seeking and opposing disclosure.

<b>Map Number(s)</b>	<b>Map Title/ Description</b>	<b>Confidential</b>	
		<b>Yes</b>	<b>No</b>
Annual subsidence map	See separate Subsidence Report with this submittal		
Mine map	See separate Subsidence Report with this submittal		
Other maps			
	Raptor Nest Location Map (Refer to Confidential folder)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>

**Operator Comments:**

**Inspector:**

Has the operator complied with this section? Yes  No

**Inspector Comments:**

**OTHER INFORMATION**

Please provide any comments of further information to be included as part of the Annual Report. Any other attachments are to be provided as Appendix E to this report. If information is submitted as a group rather than by individual mine, please identify each of the mine's data in the list below.

**Additional attachment to this report?** Yes  No

Annual Raptor Survey Report (confidential folder submitted separately).

Subsidence Report (Reported for Cottonwood/Wilberg, Des Bee Dove, Deer Creek, and Trail Mountain mines)

Hydrology Report (Reported for Cottonwood/Wilberg, Des Bee Dove, Deer Creek, and Trail Mountain mines).

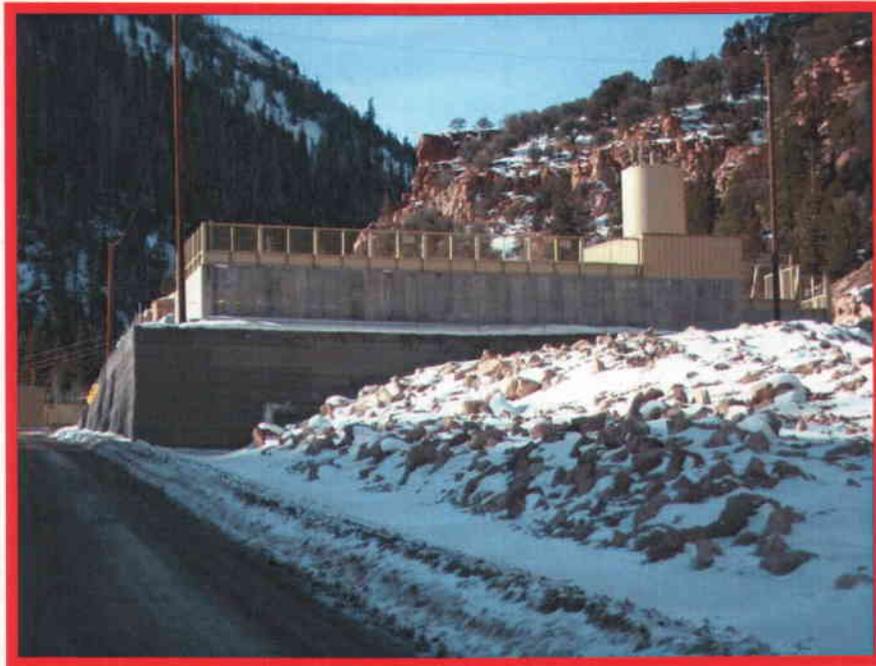
**Operator Comments:**

**Inspector:**

Has the operator complied with this section? Yes  No

**Inspector Comments:**

**PACIFICORP  
ENERGY WEST MINING COMPANY  
DEER CREEK MINE  
DIVISION OF OIL, GAS, AND MINING PERMIT NUMBER:  
C/015/0018  
2008 ANNUAL REPORT**



This Annual Report shows information the Division has for your mine. Please review the information to see if it is current. If the information needs to be updated please do so in this document. At the end of each section the operator is asked to verify if the information is correct. Please answer these questions and make all comments on this document. Submit the completed document and any additional information identified in the Appendicies to the Division by April 30, 2009. During a complete inspection an inspector will check and verify the information. To enter text, click in the cell and type your response. You can use the tab key to move from one field to the next. To enter an X in a box, click next to the box, right click, and select properties, then the checked circle, then hit enter, or hit the unchecked circle if the X is to be removed.

### GENERAL INFORMATION

Permittee Name	PacifiCorp
Mine Name	Deer Creek Mine
Operator Name (If other than permittee)	
Permit Expiration Date	February 7, 2011
Permit Number	C/015/0018
Authorized Representative Title	Geological and Environmental Affairs Manager
Phone Number	(435) 687-4712
Fax Number	(435) 687-2695
E-mail Address	Ken.fleck@pacificorp.com
Mailing Address	P.O. Box 310 Huntington, Utah 84528
Designated Representative	Ken Fleck
Resident Agent	Ken Fleck
Resident Agent Mailing Address	Same as above
Number of Binders Submitted	2

Operator, please update any incorrect information.

### IDENTIFICATION OF OTHER PERMITS

Identify other permits that are required in conjunction with mining and reclamation activities.

Permit Type	ID Number	Description	Expiration Date
MSHA Mine ID(s)	42-00121	Deer Creek Mine	None
MSHA Impoundment(s)			
NPDES/UPDES Permit(s)	UT0023604	Outfalls 001 and 002, consisting of mine and sediment pond discharges	11/30/2012
PSD Permit(s) (Air)	DAQE-AN239003-02	Issued 6/14/02 Deer Creek Mine Tipple	None
	DAQE-694-91	Issued 12/5/91, Waste Rock Site	None
<b>Other</b>			

Operator, please update any incorrect information.

**CERTIFIED REPORTS**

List the certified inspection reports as required by the rules and under the approved plan that must be periodically submitted to the Division. Specify whether the information is included as Appendix A to this report or currently on file with the Division.

Certified Reports:	Required		Included Included	or	DOGM file location Vol, Chapter, Page
	Yes	No			
Excess Spoil Piles	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Refuse Piles	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Impoundments	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<b>Other</b>					
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

**Operator Comments:**

DOGM receives these reports quarterly. Fourth quarter report for Refuse and Impoundment has been amended. Refer to Appendix A.

**Inspector:**

Has the operator complied with this section? Yes  No

**Inspector Comments:**

**COMMITMENTS AND CONDITIONS**

The Permittee is responsible for ensuring annual technical commitments in the MRP and conditions accepted with the permit are completed throughout the year. The Division has identified these commitments below and has provided space for you to report what you have done during the past year for each commitment. If the particular section is blank, no commitment has been identified and no response is required for this report. If additional written response is required, it should be filed under Appendix B to this report.

Admin R645-301-100

**Title: TRAILHEAD CONSTRUCTION****Objective:** Construct a new trailhead and parking pad at the east end of the facilities site.**Frequency:** Once.**Status:** Pending Rilda portal construction in 2005.**Reports:** Annual report.**Citation:** MRP, Sec. 526.116.2, p. 34.**Operator:** Has this commitment been acted on this year?Yes  No  Not required this year.  If yes, comment;**Operator Comments:****Trail was completed during the 3<sup>rd</sup> quarter of 2008.****Inspector:**Has the operator complied with this commitment? Yes  No **Inspector Comments:**

Soils R645-301-200

**Title: REVEGETATION****Objective:** Revegetate previously disturbed areas to nondisturbed standards.**Frequency:** Annual.**Status:** Pending Rilda portal construction in 2005 and reclamation.**Reports:** Annual report.**Citation:** MRP, Sec. 330, p. 16, #1 of list.**Operator:** Has this commitment been acted on this year?Yes  No  Not required this year.  If yes, comment;**Operator Comments:****Sediment pond construction was completed the first part of the 4<sup>th</sup> quarter; which complete the Stage 1 construction activities at the Rilda facility. The completion of construction included seeding previously disturbed areas. At reclamation, all previously disturbed areas will be revegetated to non-disturbed standards.****Inspector:**Has the operator complied with this commitment? Yes  No **Inspector Comments:**

**Title: RILDA SOIL SALVAGE PLAN**

**Objective:** The Permittee will have a qualified person (familiar with the soil survey and salvage plan) on site to monitor the soil salvage operations (Section R645-301-231.100).

**Frequency:** During any construction.

**Status:** Ongoing.

**Reports:** As-built volumes of salvaged soil.

**Citation:** Vol. 11. Section R645-301-231.100.

**Operator:** Has this commitment been acted on this year?

Yes  No  Not required this year.  If yes, comment;

**Operator Comments:**

**Inspector:**

Has the operator complied with this commitment? Yes  No

**Inspector Comments:**

**Title: RILDA TOPSOIL PILE CONSTRUCTION**

**Objective:** After construction, the stockpile will be surveyed and the volume of topsoil stockpiled will be documented.

**Frequency:** After construction.

**Status:** Ongoing.

**Reports:** As-built of topsoil stockpile.

**Citation:** Vol. 11. R645-301-232.

**Operator:** Has this commitment been acted on this year?

Yes  No  Not required this year.  If yes, comment;

**Operator Comments:**

As-built volumes have been reported to the Division (Priscilla Burton). Volume 11 is currently being amended to reflect as-built condition of the Rilda Canyon facility. Volumes reported are as follows: Topsoil – 2,148 cy, Substitute Topsoil – 2,137 cy.

**Inspector:**

Has the operator complied with this commitment? Yes  No

**Inspector Comments:**

**Title: SUBSOIL TESTING**

**Objective:** Regraded subsoil will be sampled on 500 ft intervals to a depth of four ft (three or four samples for the 2,000 linear ft in the facilities area). The samples will be analyzed on site for pH and EC. Problem areas will be further sampled and sent to a laboratory for analysis.

**Frequency:** Final regrading.

**Status:** Ongoing .

**Reports:** Laboratory analysis to be provided to the Division.

**Citation:** Vol. 11. Section R645-301-231.300.

**Operator:** Has this commitment been acted on this year?

Yes  No  Not required this year.  If yes, comment;

**Operator Comments:**

**Inspector:**

Has the operator complied with this commitment? Yes  No

**Inspector Comments:**

**Title: TOPSOIL HANDLING TESTING PLAN**

**Objective:** Three composite samples will be taken from the facilities area and sediment pond. Samples will be analyzed for parameters to be compared with baseline information and to determine the need for amendments, including fertilizer

**Frequency:** Final Reclamation

**Status:** Ongoing.

**Reports:** Annual.

**Citation:** Vol. 11. Section R645-301-242.

**Operator:** Has this commitment been acted on this year?

Yes  No  Not required this year.  If yes, comment;

**Operator Comments:**

**Inspector:**

Has the operator complied with this commitment? Yes  No

**Inspector Comments:**

**Title: BULK DENSITY TESTING**

**Objective:** The experimental practice will provide an indication of the degree of compaction related to the loading of the in place soil through measurements of the bulk density of the in-place soil before and after burial. Bulk density of the Rominger Mine soils will occur to a depth of 6 ft. (or lithic contact) prior to and after disturbance.

**Frequency:** Prior to subsoil pile construction and again during reclamation, using a split spoon.

**Status:** once before construction and once again during reclamation

**Reports:** Analysis to be provided to the Division. A [bulk] change greater than 10% from an undisturbed state will require that the Permittee increase the gouging depth by one foot.

**Citation:** Vol. 11. Chapter 2 R645-301-242 and R645-302-216 and Experimental Practice pgs.36 and 40.

**Operator:** Has this commitment been acted on this year?

Yes  No  Not required this year.  If yes, comment;

**Operator Comments:**

**Bulk density testing was completed at the topsoil storage site prior to placement of topsoil. Current plans have temporarily postponed the storage of soil at the Rominger Mine site. If storage is planned in the future, bulk density testing will be completed at that time.**

**Inspector:**

Has the operator complied with this commitment? Yes  No

**Inspector Comments:****Title: POLYACRYLAMIDE APPLICATION**

**Objective:** Reduce erosion from 1.6 acres undisturbed soil on 60 degree slopes buried by subsoil and unearthed at reclamation. Fill removal will be done by small earth moving equipment and/or by hand labor to minimize disturbance of the topsoil. The soil will be re-exposed in 5-10 foot horizontal zones that can and worked by hand from the adjacent pad fill level. (After the pad fill has been removed, the backfilled culvert will serve as the primary access way for machinery and materials associated with the remaining reclamation efforts.) Slopes steeper than 50% will be treated with an anionic polyacrylamide (PAM) during seeding to increase cohesion and infiltration of water without disrupting soil structure. Bareroot or containerized plant stock will be pre-treated with PAM and used as enhancement plantings on the re-exposed, steep slopes.

**Frequency:** Final Reclamation

**Status:** during reclamation

**Reports:** During reclamation.

**Citation:** Vol. 11. Chapter 2 Section R645-302-216 and Experimental Practice Plan pg.40.

**Operator:** Has this commitment been acted on this year?

Yes  No  Not required this year.  If yes, comment;

**Operator Comments:****Inspector:**

Has the operator complied with this commitment? Yes  No

**Inspector Comments:**

**Title: WASTE ROCK SITE SAMPLING**

**Objective:** Monitor chemical quality of waste at waste rock site

**Frequency:** Grab samples upon completion of each two foot lifts. Parameters as described.

**Status:** Ongoing during mining.

**Reports:** Annual Report

**Citation:** MRP Volume 10, Chap. VII, p. 7-4 to 7-5.

**Operator:** Has this commitment been acted on this year?

Yes  No  Not required this year.  If yes, comment.

**Operator Comments:**

**Inspector:**

Has the operator complied with this commitment? Yes  No

**Inspector Comments:**

**Title: WASTE ROCK SITE RECLAMATION SAMPLING**

**Objective:** Monitor chemical quality of upper four feet of final waste reclaimed surface at waste rock site

**Frequency:** Grab samples within four feet of final elevation at a rate of two samples per acre per lift. Parameters as described.

**Status:** Final reclamation of waste rock cell

**Reports:** Annual Report

**Citation:** MRP Volume 10, Chap. VII, p. 7-5

**Operator:** Has this commitment been acted on this year?

Yes  No  Not required this year.  If yes, comment.

**Operator Comments:**

**Inspector:**

Has the operator complied with this commitment? Yes  No

**Inspector Comments:**

**Title: DEMONSTRATION OF SELECTED OVERBURDEN AS BEST AVAILABLE MATERIAL IN THE PERMIT AREA FOR USE AS SUBSTITUTE TOPSOIL**

**Objective:** Monitor chemical quality of identified substitute topsoil to show reduction in sodicity

**Frequency:** Sampling as described

**Status:** Prior to permit renewal

**Reports:** Annual Report

**Citation:** MRP Vol. 2, Part4, Section R645-301-233, pg. 2-3

**Operator:** Has this commitment been acted on this year?

Yes  No  Not required this year.  If yes, comment.

**Operator Comments:**

**Inspector:**

Has the operator complied with this commitment? Yes  No

**Inspector Comments:**

Biology R645-301-300

**Title: WILDLIFE**

**Objective:** Adhere to wildlife exclusionary periods.

**Frequency:** Annual

**Status:** Ongoing during Rilda portal construction in 2005 and reclamation.

**Reports:** Annual Report.

**Citation:** MRP, Sec. 322, p. 10; Sec. 330, p.16, #14 in list; Sec. 342, p. 32, #7 in list.

**Operator:** Has this commitment been acted on this year?

Yes  No  Not required this year.  If yes, comment.

**Operator Comments:**

**No activity in the left fork except for one access for emergency response to roof fall near the portal. Occurred in January 2008.**

**Inspector:**

Has the operator complied with this commitment? Yes  No

**Inspector Comments:**

**Title MACROINVERTEBRATES "AQUATIC".****Objective:** Monitor macroinvertebrates in Rilda Creek.**Frequency:** Spring/fall two years prior to and spring/fall one year immediately following start of construction. Spring every three years during operations and reclamation.**Status:** On going. Spring/fall 2006 is the anticipated date for the year following construction. Spring 2009 is the anticipated date for the first of the three-year monitoring surveys.**Reports:** Division Annual Report.**Citation:** MRP, Sec. 330, p. 26.**Operator:** Has this commitment been acted on this year?Yes  No  Not required this year.  If yes, comment;**Operator Comments:****DWR monitored in spring (June 23, 2008) and private consultant in the fall (October 8, 2008).****Construction of the facilities was completed in the 4<sup>th</sup> quarter of 2008; therefore, the first of the three year monitoring surveys will begin in the fall of 2011.****Inspector:**Has the operator complied with this commitment? Yes  No **Inspector Comments:****Title: FISH "AQUATIC".****Objective:** DWR will monitor fish in Rilda Creek as part of annual surveys.**Frequency:** Spring/fall two years prior to and spring/fall one year immediately following start of construction. Spring every three years during operations and reclamation.**Status:** On going. Spring/fall 2006 is the anticipated date for the year following construction. Spring 2009 is the anticipated date for the first of the three-year monitoring surveys.**Reports:** Division Annual Report.**Citation:** MRP, Sec. 330, p. 26.**Operator:** Has this commitment been acted on this year?Yes  No  Not required this year.  If yes, comment;**Operator Comments:****See above Operator Comment.****Inspector:**Has the operator complied with this commitment? Yes  No **Inspector Comments:**

**Title: RAPTORS.****Objective:** Over-flight surveys.**Frequency:** Yearly.**Status:** On going for life of mine.**Reports:** Upon request.**Citation:** MRP, Sec. 322, Subsec. Terrestrial Species.**Operator:** Has this commitment been acted on this year?Yes  No  Not required this year.  If yes, comment;**Operator Comments:****Raptor survey report included in confidential file.****Inspector:**Has the operator complied with this commitment? Yes  No **Inspector Comments:****Title: BATS.****Objective:** Install a "stay-out" sign near a large cavern.**Frequency:** Once.**Status:** Prior to Rilda portal construction in 2005.**Reports:** Not required.**Citation:** MRP, Sec. 330, p. 16, #15 in list.**Operator:** Has this commitment been acted on this year?Yes  No  Not required this year.  If yes, comment;**Operator Comments:****No subsoil has been stored at the Rominger Mine to date.****Inspector:**Has the operator complied with this commitment? Yes  No **Inspector Comments:**

**Title: RILDA CREEK.****Objective:** Enhance riparian corridor along the Rilda Creek.**Frequency:** As necessary.**Status:** Initiate 180 days after Rilda portal construction begins in 2005.**Reports:** Not required.**Citation:** MRP, Sec. 330, Tab. 300-5.**Operator:** Has this commitment been acted on this year?Yes  No  Not required this year.  If yes, comment;**Operator Comments:**

**Disturbed road embankments along EC#306 were roughed, reseeded, and hydromulched/tackified in November/December 2008. This erosion control work along with paving the Rilda road has satisfied the concerns of the Forest Services and DWR for riparian enhancement.**

**Inspector:**Has the operator complied with this commitment? Yes  No **Inspector Comments:****Title: RAT MIDDEN.****Objective:** Install a fence around a rat midden in Rilda Canyon.**Frequency:** Once with annual repairs.**Status:** Prior to Rilda portal construction in 2005.**Reports:** Annual Report.**Citation:** MRP, Sec. 322.**Operator:** Has this commitment been acted on this year?Yes  No  Not required this year.  If yes, comment;**Operator Comments:****Inspector:**Has the operator complied with this commitment? Yes  No **Inspector Comments:**

**Title: MITIGATION.****Objective:** Several projects to enhance and mitigate potential impacts associated with Rilda portal facilities.**Frequency:** Annual.**Status:** Pending approval or Rilda portal construction in 2005.**Reports:** Annual Report.**Citation:** MRP, Sec. 330, Tab. 300-5.**Operator:** Has this commitment been acted on this year?Yes  No  Not required this year.  If yes, comment;**Operator Comments:**

Energy West has completed the buried coal removal at Leroy Mine, reclaimed access road to Leroy Mine portal bench, PacifiCorp maintains ownership and control of East Mountain property for habitat protection, riparian enhancement along Rilda Creek, continues to monitor for noxious weeds and provides information in company news letter. Amending Volume 11 to remove a portion of the mitigation projects (see 2007 annual report).

Proposed deletions of projects include aspen regeneration on East Mountain, Raptor database development, and mitigation database development.

**Inspector:**Has the operator complied with this commitment? Yes  No **Inspector Comments:**

Landuse, Cultural Resources, Air Quality R645-301- 400

Engineering R645-301-500

**Title: SPECIAL MONITORING - CASTLEGATE CLIFF ESCARPMENT****Objective:** Monitor Cliff Escarpments**Frequency:** Daily measuring during mining.**Status:** Ongoing.**Reports:** Annual.**Citation:** Volume 11 p 28.**Operator:** Has this commitment been acted on this year?Yes  No  Not required this year.  If yes, comment;**Operator Comments:****No longer mining in this area.****Inspector:**Has the operator complied with this commitment? Yes  No **Inspector Comments:**

Geology R645-301-600

Hydrology R645-301-700

Bonding &amp; Insurance R645-301-800

<b>Other Commitments</b>	

\*Reminder: If equipment has been abandoned during 2008, an amendment must be submitted that includes a map showing its location, a description of what was abandoned, whether there were any hazardous or toxic materials and any revision to the PHC as necessary.

**REPORTING OF OTHER TECHNICAL DATA**

List other technical data and information as required under the approved plan, which must be periodically submitted to the Division. Specify whether the information is included as Appendix B to this report or currently on file with the Division.

**Operator Comments:**

The annual vegetation monitoring report is included in Appendix B.

**Inspector:**

Has the operator complied with this section? Yes  No

**Inspector Comments:**

**LEGAL, FINANCIAL, COMPLIANCE AND RELATED INFORMATION**

Change in administration or corporate structure can often bring about necessary changes to information found in the mining and reclamation plan. The Division is Requesting that each Permittee review and update the legal, financial, compliance and related information in the plan as part of the annual report. Please provide the Department of Commerce, Annual Report of Officers, or other equivalent information as necessary to ensure that the information provided in the plan is current. Provide any other change as necessary regarding land ownership, lease acquisitions, legal results from appeals of violations, or other changes as necessary to update information required in the mining and reclamation plan. Include certified financial statements, audits or worksheets, which may be required to meet bonding requirements. Specify whether the information is currently on file with the Division or included as Appendix C to the report.

**Legal / Financial Update**      **Required**      **Included**      **or**      **DOGM File location**  
    Yes    No      Included      Vol, Chapter, Page

Department of Commerce, Annual Report Officers	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<b>Other</b>				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

**Operator Comments:**

Officer and director list was updated in September 2008. See Legal and Financial Volume, Appendix A

**Inspector:**

Has the operator complied with this section? Yes  No

**Inspector Comments:**

**MAPS**

Copies of mine maps, current and up-to-date through at least December 31, 2008, are to be provided to the Division as Appendix D to this report in accordance with the requirements of R 645-301-525.240. The map copies shall be made in accordance with 30 CFR 75.1200 as required by MSHA. Mine maps are not considered confidential. (Please provide a CD.)

Confidential information is limited to:

R645-300-124.310. Information that pertains only to the analysis of the chemical and physical properties of the coal to be mined, except information on components of such coal which are potentially toxic in the environment.

R645-300-124.330. Information on the nature and location of archeological resources on public land and Indian land as required under the Archeological Resources Protection Act of 1979 (P. L. 96-95, 93 Stat. 721, 16 U.S.C. 470).

R645-301-322, Fish and Wildlife Information; R645-301-322.100, the scope and level of detail for such information will be determined by the Division in consultation with state and federal agencies with responsibilities for fish and wildlife and will be sufficient to design the protection and enhancement plan required under R645-301-333 and R645-301-322.230, other species or habitats identified through agency consultation as requiring special protection under state or federal law; R645-301-333.300, Include protective measures that will be used during the active mining phase of operation.

The Division will provide procedures, including notice and opportunity to be heard for persons both seeking and opposing disclosure.

**Map Number(s)                      Map Title/ Description**

Annual subsidence map	See separate Subsidence Report with this submittal		
Mine map	Production Map – Hiawatha Seam, Production Map - Blind Canyon Seam (Refer to Appendix D)		
Other maps		<b>Confidential</b>	
		Yes	No
	Raptor Nest Location Map (Refer to Confidential folder)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>

**Operator Comments:**

**Inspector:**

Has the operator complied with this section? Yes  No

**Inspector Comments:**



**PACIFICORP**  
**ENERGY WEST MINING COMPANY**  
**DES BEE DOVE MINE**  
**DIVISION OF OIL, GAS, AND MINING PERMIT NUMBER:**  
**C/015/0018**  
**2008 ANNUAL REPORT**



This Annual Report shows information the Division has for your mine. Please review the information to see if it is current. If the information needs to be updated please do so in this document. At the end of each section the operator is asked to verify if the information is correct. Please answer these questions and make all comments on this document. Submit the completed document and any additional information identified in the Appendicies to the Division by April 30, 2009. During a complete inspection an inspector will check and verify the information. To enter text, click in the cell and type your response. You can use the tab key to move from one field to the next. To enter an X in a box, click next to the box, right click, and select properties, then the checked circle, then hit enter, or hit the unchecked circle if the X is to be removed.

**GENERAL INFORMATION**

Permittee Name	PacifiCorp
Mine Name	Des Bee Dove Mines
Operator Name	
(If other then permittee)	Energy West Mining Company
Permit Expiration Date	August 30, 2010
Permit Number	C/015/0017
Authorized Representative Title	Geological and Environmental Affairs Manager
Phone Number	(435) 687-4712
Fax Number	(435) 687-2695
E-mail Address	Ken.fleck@pacificorp.com
Mailing Address	P.O. Box 310 Huntington, Utah 84528
Designated Representative	Ken Fleck
Resident Agent	Ken Fleck
Resident Agent Mailing Address	Same as above
Number of Binders Submitted	2

**IDENTIFICATION OF OTHER PERMITS**

Identify other permits that are required in conjunction with mining and reclamation activities.

Permit Type	ID Number	Description	Expiration Date
MSHA Mine ID(s)	N/A	Record abandoned by MSHA March 27, 1987	
MSHA Impoundment(s)	None		
NPDES/UPDES Permit(s)	UTG040022	Site 001, Sediment Pond site reclaimed January 31, 2006.	April 30, 2013
PSD Permit(s) (Air)	None		
<b>Other</b>			

Operator, please update any incorrect information.

**CERTIFIED REPORTS**

List the certified inspection reports as required by the rules and under the approved plan that must be periodically submitted to the Division. Specify whether the information is included as Appendix A to this report or currently on file with the Division.

Certified Reports:	Required		Included Included	or	DOGM file location Vol, Chapter, Page
	Yes	No			
Excess Spoil Piles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Refuse Piles	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Impoundments	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
<b>Other</b>					
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

**Operator Comments:**

DOGM receives these reports quarterly. Refer to Appendix A. Trail Mountain refuse pile report is included with the Cottonwood/Wilberg/Des Bee Dove/Trail Mountain report.

**Inspector:**

Has the operator complied with this section? Yes  No

**Inspector Comments:**

**COMMITMENTS AND CONDITIONS**

The Permittee is responsible for ensuring annual technical commitments in the MRP and conditions accepted with the permit are completed throughout the year. The Division has identified these commitments below and has provided space for you to report what you have done during the past year for each commitment. If the particular section is blank, no commitment has been identified and no response is required for this report. If additional written response is required, it should be filed under Appendix B to this report.

Admin R645-301-100
Soils R645-301-200
Biology R645-301-300
Landuse, Cultural Resources, Air Quality R645-301- 400
Engineering R645-301-500

Geology R645-301-600

Hydrology R645-301-700

Bonding & Insurance R645-301-800

**Other Commitments**


\*Reminder: If equipment has been abandoned during 2008, an amendment must be submitted that includes a map showing its location, a description of what was abandoned, whether there were any hazardous or toxic materials and any revision to the PHC as necessary.

**REPORTING OF OTHER TECHNICAL DATA**

List other technical data and information as required under the approved plan, which must be periodically submitted to the Division. Specify whether the information is included as Appendix B to this report or currently on file with the Division.

**Operator Comments:**

The annual vegetation monitoring report is included in Appendix B.

**Inspector:**

Has the operator complied with this section? Yes  No

**Inspector Comments:**

**LEGAL, FINANCIAL, COMPLIANCE AND RELATED INFORMATION**

Change in administration or corporate structure can often bring about necessary changes to information found in the mining and reclamation plan. The Division is Requesting that each permittee review and update the legal, financial, compliance and related information in the plan as part of the annual report. Please provide the Department of Commerce, Annual Report of Officers, or other equivalent information as necessary to ensure that the information provided in the plan is current. Provide any other change as necessary regarding land ownership, lease acquisitions, legal results from appeals of violations, or other changes as necessary to update information required in the mining and reclamation plan. Include certified financial statements, audits or worksheets, which may be required to meet bonding requirements. Specify whether the information is currently on file with the Division or included as Appendix C to the report.

<b>Legal / Financial Update</b>	<b>Required</b>		<b>Included</b>	<b>or</b>	<b>DOGM File location</b>
	<b>Yes</b>	<b>No</b>			

Department of Commerce, Annual Report Officers	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<b>Other</b>				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	



**Operator Comments:**

**Inspector:**

Has the operator complied with this section? Yes  No

**Inspector Comments:**

**OTHER INFORMATION**

Please provide any comments of further information to be included as part of the Annual Report. Any other attachments are to be provided as Appendix E to this report. If information is submitted as a group rather than by individual mine, please identify each of the mine's data in the list below.

**Additional attachment to this report?** Yes  No

- Annual Raptor Survey Report (confidential folder submitted separately).
- Subsidence Report (Reported for Cottonwood/Wilberg, Des Bee Dove, Deer Creek, and Trail Mountain mines)
- Hydrology Report (Reported for Cottonwood/Wilberg, Des Bee Dove, Deer Creek, and Trail Mountain mines).
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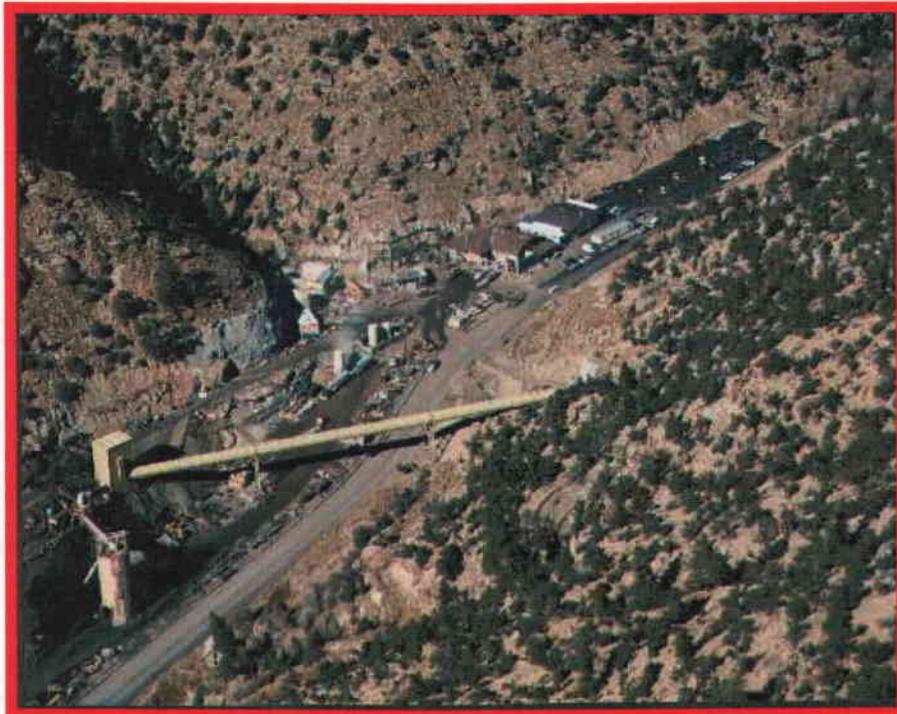
**Operator Comments:**

**Inspector:**

Has the operator complied with this section? Yes  No

**Inspector Comments:**

**PACIFICORP**  
**ENERGY WEST MINING COMPANY**  
**TRAIL MOUNTAIN MINE**  
**DIVISION OF OIL, GAS, AND MINING PERMIT NUMBER:**  
**C/015/0009**  
**2008 ANNUAL REPORT**



This Annual Report shows information the Division has for your mine. Please review the information to see if it is current. If the information needs to be updated please do so in this document. At the end of each section the operator is asked to verify if the information is correct. Please answer these questions and make all comments on this document. Submit the completed document and any additional information identified in the Appendicies to the Division by April 30, 2009. During a complete inspection an inspector will check and verify the information. To enter text, click in the cell and type your response. You can use the tab key to move from one field to the next. To enter an X in a box, click next to the box, right click, and select properties, then the checked circle, then hit enter, or hit the unchecked circle if the X is to be removed.

**GENERAL INFORMATION**

Permittee Name	PacifiCorp
Mine Name	Trail Mountain Mine
Operator Name	
(If other then permittee)	Energy West Mining Company
Permit Expiration Date	February 21, 2010
Permit Number	C/015/0009
Authorized Representative Title	Geological and Environmental Affairs Manager
Phone Number	(435) 687-4712
Fax Number	(435) 687-2695
E-mail Address	Ken.fleck@pacificorp.com
Mailing Address	P.O. Box 310 Huntington, Utah 84528
Designated Representative	Ken Fleck
Resident Agent	Ken Fleck
Resident Agent Mailing Address	Same as above
Number of Binders Submitted	2

**IDENTIFICATION OF OTHER PERMITS**

Identify other permits that are required in conjunction with mining and reclamation activities.

Permit Type	ID Number	Description	Expiration Date
MSHA Mine ID(s)	42-01211	Trail Mountain Mine	None
MSHA Impoundment(s)	None		
NPDES/UPDES Permit(s)	UT0023728	Site 001, Sediment Pond	December 31, 2012
		Site 002, Mine Discharge	
PSD Permit(s) (Air)	DAQE-694-95	Issued 8/9/95, includes Cottonwood/Wilberg Mine.	None
<b>Other</b>			

Operator, please update any incorrect information.

**CERTIFIED REPORTS**

List the certified inspection reports as required by the rules and under the approved plan that must be periodically submitted to the Division. Specify whether the information is included as Appendix A to this report or currently on file with the Division.

Certified Reports:	Required		Included Included	or	DOGM file location Vol, Chapter, Page
	Yes	No			
Excess Spoil Piles	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Refuse Piles	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Impoundments	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
<b>Other</b>					
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

**Operator Comments:**

DOGM receives these reports quarterly. Refer to Appendix A. Trail Mountain refuse pile report is included with the Cottonwood/Wilberg/Des Bee Dove/Trail Mountain report.

**Inspector:**

Has the operator complied with this section? Yes  No

**Inspector Comments:**

**COMMITMENTS AND CONDITIONS**

The Permittee is responsible for ensuring annual technical commitments in the MRP and conditions accepted with the permit are completed throughout the year. The Division has identified these commitments below and has provided space for you to report what you have done during the past year for each commitment. If the particular section is blank, no commitment has been identified and no response is required for this report. If additional written response is required, it should be filed under Appendix B to this report.

Admin R645-301-100
Soils R645-301-200
Biology R645-301-300
Landuse, Cultural Resources, Air Quality R645-301- 400
Engineering R645-301-500

Geology R645-301-600

Hydrology R645-301-700

Bonding & Insurance R645-301-800

**Other Commitments**


\*Reminder: If equipment has been abandoned during 2008, an amendment must be submitted that includes a map showing its location, a description of what was abandoned, whether there were any hazardous or toxic materials and any revision to the PHC as necessary.

**REPORTING OF OTHER TECHNICAL DATA**

List other technical data and information as required under the approved plan, which must be periodically submitted to the Division. Specify whether the information is included as Appendix B to this report or currently on file with the Division.

**Operator Comments:**

The annual vegetation monitoring report is included in Appendix B.

**Inspector:**

Has the operator complied with this section? Yes  No

**Inspector Comments:**

**LEGAL, FINANCIAL, COMPLIANCE AND RELATED INFORMATION**

Change in administration or corporate structure can often bring about necessary changes to information found in the mining and reclamation plan. The Division is Requesting that each permittee review and update the legal, financial, compliance and related information in the plan as part of the annual report. Please provide the Department of Commerce, Annual Report of Officers, or other equivalent information as necessary to ensure that the information provided in the plan is current. Provide any other change as necessary regarding land ownership, lease acquisitions, legal results from appeals of violations, or other changes as necessary to update information required in the mining and reclamation plan. Include certified financial statements, audits or worksheets, which may be required to meet bonding requirements. Specify whether the information is currently on file with the Division or included as Appendix C to the report.

<b>Legal / Financial Update</b>	<b>Required</b>	<b>Included</b>	<b>or</b>	<b>DOGM File location</b>
	Yes No	Included		

Department of Commerce, Annual Report Officers	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<b>Other</b>				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	



**Operator Comments:**

**Inspector:**

Has the operator complied with this section? Yes  No

**Inspector Comments:**

**OTHER INFORMATION**

Please provide any comments of further information to be included as part of the Annual Report. Any other attachments are to be provided as Appendix E to this report. If information is submitted as a group rather than by individual mine, please identify each of the mine's data in the list below.

**Additional attachment to this report?** Yes  No

Annual Raptor Survey Report (confidential folder submitted separately).

Subsidence Report (Reported for Cottonwood/Wilberg, Des Bee Dove, Deer Creek, and Trail Mountain mines)

Hydrology Report (Reported for Cottonwood/Wilberg, Des Bee Dove, Deer Creek, and Trail Mountain mines).

**Operator Comments:**

**Inspector:**

Has the operator complied with this section? Yes  No

**Inspector Comments:**

## **APPENDIX A**

### **Certified Reports**

Excess Spoil Piles  
Refuse Piles  
Impoundments

As required under R645-301-514

### **CONTENTS**

#### **Quarterly Reports for:**

Deer Creek Waste Rock Site  
Deer Creek Sediment Pond  
Cottonwood/Trail Mountain Waste Rock Site  
Cottonwood Sediment Pond  
Trail Mountain Sediment Pond

**PACIFICORP  
ENERGY WEST MINING COMPANY  
DEER CREEK MINE  
DIVISION OF OIL, GAS, AND MINING PERMIT NUMBER:  
C/015/0018  
QUARTERLY REFUSE PILE REPORTS**

**CONTENTS:  
ACTIVE WASTE ROCK DISPOSAL SITE  
ELK CANYON/ORIGINAL WASTE ROCK DISPOSAL SITE**

INSPECTION AND CERTIFIED REPORT ON EXCESS SPOIL PILE OR REFUSE PILE		Page 1 of 2	
Permit Number	ACT/015/018	Report Date	March 28, 2008
Mine Name	Deer Creek		
Company Name	Energy West Mining Company		
Excess Spoil Pile or Refuse Pile Identification	File Name	Waste Rock Disposal Site	
	File Number		
	MSHA ID Number	1211-UT-09-00121-02	
Inspection Date	March 18, 2008		
Inspected By	John Christensen/Rick Cullum		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)		2008 First Quarter Inspection	
		Attachments to Report? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	
<b>Field Evaluation</b>			
<p>1.Foundation preparation, including the removal of all organic material and topsoil.</p> <p>All construction was done according to the permitted, professional engineered design specifications.</p>			
<p>2.Placement of underdrains and protective filter systems.</p> <p>An underdrain was installed when the site was constructed in 1989. The drain had a small amount of flow coming through it at the time of the inspection.</p>			
<p>3.Installation of final surface drainage systems.</p> <p>All interim slopes are maintained at their proper grade. The final slopes are surveyed to assure they are correct. Also the two final designed rip-rap ditches were installed as per the permitted plan and are extended as more lifts are added.</p>			
<p>4.Placement and compaction of fill materials.</p> <p>The lower site (area 2) was leveled in January 2008. Trash and extraneous material were removed. Lift was sampled as required.</p>			

See No. 3.

The sub-soil berm surrounding the site was seeded shortly after construction.

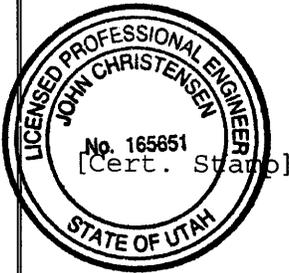
6. Appearances of instability, structural weakness, and other hazardous conditions.

No weakness or instabilities are evident at this time.

Other Comments. Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

The total storage capacity of the Area No. 1 cell is 460,000 cubic yards. The elevation of the current lift varies with the required drainage slope. The surveyed elevation at the center of the active lift in cell 1 is 6357.62 ft and cell 2 is 6332.01 The final design elevation will be 6,369 ft. The volume remaining in cell 1 is approximately 9% capacity. The Lower Cell 2 was at approximately 2% capacity. As of March 1, 2008, 4,130 cubic yards of material was hauled in 2008.

Certification Statement



I hereby certify that, I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

By: John Christensen, Sr. Construction Engineer (Full Name and Title)

Signature: [Handwritten Signature] Date: 4/23/08

P.E. Number & State: 165651, Utah

INSPECTION AND CERTIFIED REPORT ON EXCESS SPOIL PILE OR REFUSE PILE		Page 1 of 2	
Permit Number	ACT/015/018	Report Date	March 28, 2008
Mine Name	Deer Creek		
Company Name	Energy West Mining Company		
Excess Spoil Pile or Refuse Pile Identification	Pile Name	ELK CANYON/ORIGINAL SITE	
	Pile Number		
	MSHA ID Number	1211-UT-09-00121-01	
Inspection Date	March 18, 2008		
Inspected By	John Christensen/Rick Cullum		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)		2008 1st Quarter Inspection	
		Attachments to Report?   XNo    Yes	
<b>Field Evaluation</b>			
Foundation preparation, including the removal of all organic material and topsoil.			
The construction of both sites have been complete for some time in excess of 18 years. The foundations appear to be stable.			
Placement of underdrains and protective filter systems.			
None			
Installation of final surface drainage systems.			
The slopes of both sites have no rills, gullies or sloughage present.			
Placement and compaction of fill materials.			
No fill material is being placed at either site, since both are at their designed capacity. The Elk Canyon site contains approximately 24,000 cubic original site 90,000 cubic yards of fill material.			

Final grading and revegetation of .11.

The sites are at capacity. The final grades are established and are revegetated.

Appearances of instability, structural weakness, and other hazardous conditions.

None were observed.

Other Comments. Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

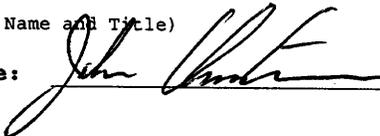
There was minimal coal stored at the Elk Canyon pad at the time of inspection. Snow covered the site at the time of the inspection.

**Certification Statement** I hereby certify that; I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

By: John Christensen, Sr. Construction Engineer

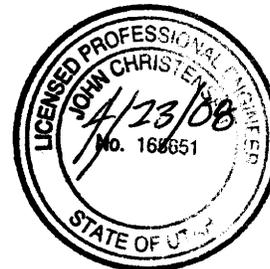
(Full Name and Title)

Signature: \_\_\_\_\_



Date: \_\_\_\_\_

P.E. Number & State: 165651, Utah



**PACIFICORP  
ENERGY WEST MINING COMPANY  
DEER CREEK MINE  
DIVISION OF OIL, GAS, AND MINING PERMIT NUMBER:  
C/015/0018  
QUARTERLY REFUSE PILE REPORTS**

**2<sup>ND</sup> QUARTER REPORT**

INSPECTION AND CERTIFIED REPORT ON EXCESS SPOIL PILE OR REFUSE PILE		Page 1 of 2	
Permit Number	ACT/015/018	Report Date	June 27, 2008
Mine Name	Deer Creek		
Company Name	Energy West Mining Company		
Excess Spoil Pile or Refuse Pile Identification	File Name	Waste Rock Disposal Site	
	File Number		
	MSHA ID Number	1211-UT-09-00121-02	
Inspection Date	June 24, 2008		
Inspected By	John Christensen/Rick Cullum		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)		2008 Second Quarter Inspection	
		Attachments to Report? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	
<b>Field Evaluation</b>			
<p>1.Foundation preparation, including the removal of all organic material and topsoil.</p> <p>All construction was done according to the permitted, professional engineered design specifications.</p>			
<p>2.Placement of underdrains and protective filter systems.</p> <p>An underdrain was installed when the site was constructed in 1989. The drain had a small amount of flow coming through it at the time of the inspection.</p>			
<p>3.Installation of final surface drainage systems.</p> <p>All interim slopes are maintained at their proper grade. The final slopes are surveyed to assure they are correct. Also the two final designed rip-rap ditches were installed as per the permitted plan and are extended as more lifts are added.</p>			
<p>4.Placement and compaction of fill materials.</p> <p>The Upper site (area 1) was leveled in June 2008. Trash and extraneous material were removed. Lift was sampled as required.</p>			

5.F. grading and revegetation of fill.

See No. 3.

The sub-soil berm surrounding the site was seeded shortly after construction.

6. Appearances of instability, structural weakness, and other hazardous conditions.

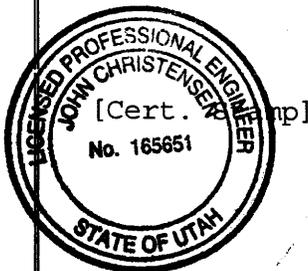
No weakness or instabilities are evident at this time.

Other Comments. Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

The total storage capacity of the Area No. 1 cell is 460,000 cubic yards. The elevation of the current lift varies with the required drainage slope. The surveyed elevation at the center of the active lift in cell 1 is 6360.27ft and cell 2 is 6330.89 The final design elevation will be 6,369 ft. The volume remaining in cell 1 is approximately 9% capacity. The Lower Cell 2 was at approximately 20% capacity. As of June 1, 2008, 6,845.46 cubic yards of material was hauled in 2008.

**Certification  
Statement**

I hereby certify that; I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.



By: John Christensen, Sr. Construction Engineer  
(Full Name and Title)

Signature: *John Christensen*

Date: 8/13/08

P.E. Number & State: 165651, Utah

<b>Permit Number</b>	ACT/015/018	<b>Report Date</b>	June 26, 2008
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<b>Mine Name</b>	Deer Creek
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<b>Company Name</b>	Energy West Mining Company
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<b>Excess Spoil Pile or Refuse Pile Identification</b>	<b>File Name</b>	ELK CANYON/ORIGINAL SITE
	<b>File Number</b>	
	<b>MSHA ID Number</b>	1211-UT-09-00121-01

<b>Inspection Date</b>	June 18, 2008
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<b>Inspected By</b>	John Christensen/Rick Cullum
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<b>Reason for Inspection</b> <small>(Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)</small>	2008 2nd Quarter Inspection
	<b>Attachments to Report?</b> <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes

<b>Field Evaluation</b>
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Foundation preparation, including the removal of all organic material and topsoil.

The construction of both sites have been complete for some time in excess of 18 years. The foundations appear to be stable.

Placement of underdrains and protective filter systems.

None

Installation of final surface drainage systems.

The slopes of both sites have no rills, gullies or sloughage present.

Placement and compaction of fill materials.

No fill material is being placed at either site, since both are at their designed capacity. The Elk Canyon site contains approximately 24,000 cubic original site 90,000 cubic yards of fill material.

Final grading and revegetation of fill.

The sites are at capacity. The final grades are established and are revegetated.

Appearances of instability, structural weakness, and other hazardous conditions.

None were observed.

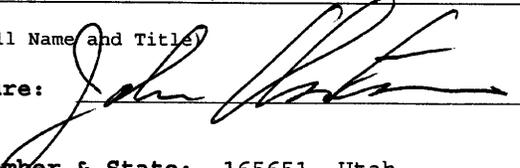
Other Comments. Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

There was minimal coal stored at the Elk Canyon pad at the time of inspection.

**Certification Statement** I hereby certify that; I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

By: John Christensen, Sr. Construction Engineer

(Full Name and Title)

Signature: 

Date: 8/12/88



P.E. Number & State: 165651, Utah

**PACIFICORP  
ENERGY WEST MINING COMPANY  
DEER CREEK MINE  
DIVISION OF OIL, GAS, AND MINING PERMIT NUMBER:  
C/015/0018  
QUARTERLY REFUSE PILE REPORTS**

**3<sup>RD</sup> QUARTER REPORT**

INSPECTION AND CERTIFIED REPORT ON EXCESS SPOIL PILE OR REFUSE PILE		Page 1 of 2	
Permit Number	ACT/015/018	Report Date	Sept. 30, 2008
Mine Name	Deer Creek		
Company Name	Energy West Mining Company		
Excess Spoil Pile or Refuse Pile Identification	Pile Name	Waste Rock Disposal Site	
	Pile Number		
	MSHA ID Number	1211-UT-09-00121-02	
Inspection Date	Sept 26, 2008		
Inspected By	John Christensen/Rick Cullum		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)		2008 Third Quarter Inspection	
		Attachments to Report? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	
<b>Field Evaluation</b>			
<p style="text-align: center;">1.Foundation preparation, including the removal of all organic material and topsoil.</p> <p>All construction was done according to the permitted, professional engineered design specifications.</p>			
<p style="text-align: center;">2.Placement of underdrains and protective filter systems.</p> <p>An underdrain was installed when the site was constructed in 1989. The drain had a small amount of flow coming through it at the time of the inspection.</p>			
<p style="text-align: center;">3.Installation of final surface drainage systems.</p> <p>All interim slopes are maintained at their proper grade. The final slopes are surveyed to assure they are correct. Also the two final designed rip-rap ditches were installed as per the permitted plan and are extended as more lifts are added.</p>			
<p style="text-align: center;">4.Placement and compaction of fill materials.</p> <p>The Upper site (area 1) was leveled in June 2008. Trash and extraneous material were removed. Lift was sampled as required.</p>			

5. Final grading and revegetation of fill.

See No. 3.

The sub-soil berm surrounding the site was seeded shortly after construction.

6. Appearances of instability, structural weakness, and other hazardous conditions.

No weakness or instabilities are evident at this time.

Other Comments. Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

The total storage capacity of the Area No. 1 cell is 460,000 cubic yards. The elevation of the current lift varies with the required drainage slope. The surveyed elevation at the center of the active lift in cell 1 is 6359.74ft and cell 2 is 6334.80 The final design elevation will be 6,369 ft. The volume remaining in cell 1 is approximately 9% capacity. The Lower Cell 2 was at approximately 20% capacity. As of Sept. 1, 2008, 8,638.92 cubic yards of material was hauled in 2008. Containment cells were constructed on the upper and lower levels to place sediment from the Deer Creek pond cleaning operation.

**Certification  
Statement**



I hereby certify that; I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

By: John Christensen, Sr. Construction Engineer  
(Full Name and Title)

Signature: \_\_\_\_\_

Date: 10/28/08

P.E. Number & State: 165651, Utah

<b>Permit Number</b>	ACT/015/018	<b>Report Date</b>	Sept. 30, 2008
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<b>Mine Name</b>	Deer Creek
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<b>Company Name</b>	Energy West Mining Company
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<b>Excess Spoil Pile or Refuse Pile Identification</b>	<b>File Name</b>	ELK CANYON/ORIGINAL SITE
	<b>File Number</b>	
	<b>MSHA ID Number</b>	1211-UT-09-00121-01

<b>Inspection Date</b>	Sept. 26, 2008
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<b>Inspected By</b>	John Christensen/Rick Cullum
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<b>Reason for Inspection</b> <small>(Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)</small>	2008 3rd Quarter Inspection
	<b>Attachments to Report?</b> <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes

**Field Evaluation**

Foundation preparation, including the removal of all organic material and topsoil.

The construction of both sites have been complete for some time in excess of 18 years. The foundations appear to be stable.

Placement of underdrains and protective filter systems.

None

Installation of final surface drainage systems.

The slopes of both sites have no rills, gullies or sloughage present.

Placement and compaction of fill materials.

No fill material is being placed at either site, since both are at their designed capacity. The Elk Canyon site contains approximately 24,000 cubic original site 90,000 cubic yards of fill material.

Final grading and revegetation of fill.

The sites are at capacity. The final grades are established and are revegetated.

Appearances of instability, structural weakness, and other hazardous conditions.

None were observed.

Other Comments. Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

There was minimal coal stored at the Elk Canyon pad at the time of inspection.

**Certification Statement** I hereby certify that; I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

By: John Christensen, Sr. Construction Engineer

(Full Name and Title)

Signature: 

Date: 10/28/08

P.E. Number & State: 165651, Utah

**PACIFICORP  
ENERGY WEST MINING COMPANY  
DEER CREEK MINE  
DIVISION OF OIL, GAS, AND MINING PERMIT NUMBER:  
C/015/0018  
QUARTERLY REFUSE PILE REPORTS**

**4<sup>TH</sup> QUARTER REPORT**

INSPECTION AND CERTIFIED REPORT ON EXCESS SPOIL PILE OR REFUSE PILE		Page 1 of 2	
Permit Number	ACT/015/018	Report Date	orig. report 12/31/08 Revised 4/9/09
Mine Name	Deer Creek		
Company Name	Energy West Mining Company		
Excess Spoil Pile or Refuse Pile Identification	Pile Name	Waste Rock Disposal Site	
	Pile Number		
	MSHA ID Number	1211-UT-09-00121-02	
Inspection Date	DEC. 30, 2008		
Inspected By	John Christensen/Rick Cullum		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)		2008 Fourth Quarter Inspection	
		Attachments to Report? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	
<b>Field Evaluation</b>			
<p>1.Foundation preparation, including the removal of all organic material and topsoil.</p> <p>All construction was done according to the permitted, professional engineered design specifications.</p>			
<p>2.Placement of underdrains and protective filter systems.</p> <p>An underdrain was installed when the site was constructed in 1989. The drain had a small amount of flow coming through it at the time of the inspection.</p>			
<p>3.Installation of final surface drainage systems.</p> <p>All interim slopes are maintained at their proper grade. The final slopes are surveyed to assure they are correct. Also the two final designed rip-rap ditches were installed as per the permitted plan and are extended as more lifts are added.</p>			
<p>4.Placement and compaction of fill materials.</p> <p>The Upper site (Cell 1) was leveled in June 2008. Trash and extraneous material were removed. Lift was sampled as required.</p>			
<p>5.Final grading and revegetation of fill.</p> <p>See No. 3.</p> <p>The sub-soil berm surrounding the site was seeded shortly after construction. The total capacity of Phase I is 468,215 yd<sup>3</sup>, this includes both cells 1 and 2.</p>			

6. Appearances of instability, structural weakness, and other hazardous conditions.  
No weakness or instabilities are evident at this time.

Other Comments.

Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

CELL	ELEVATION *	DESIGN ELEV.	CAPACITY**
1 (Upper, northern)	6360.6	6369.2	79.5%
2 (Lower, southern)	6334.6	6369.2	36.9%

\*The elevations are taken on top of the last compacted lift. The elevation of the dumped piles will not be surveyed until the active lift is compacted and leveled. The survey location is approximately the center of each cell.

\*\* The capacity is based on the last survey elevation compared to available height of waste rock in each cell. To figure the available height an approximate elevation of the original ground was determined based on pre-construction ground contours. The capacity will be updated when a new elevation is survey. The capacity is not based on material hauled to site, as described below.

The reason for slight decreased in elevation noted in the previous reports was some material had been removed off the top of the center of the cell and used for separation berms to contain the Deer Creek Mine sediment pond cleanings.

As of Dec. 31, 2008 there was 11,667 yd<sup>3</sup> of material hauled YTD. This estimate is based on invoices from the trucking company of truckloads hauled to the site. Each truckload is assumed to be full at 15 tons and a density of 88 pcf. This estimate could lag actual haul dates by 1 to 3 months, depending of invoicing and accounting.

Certification  
Statement



I hereby certify that; I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

By: John Christensen, Sr. Construction Engineer  
(Full Name and Title)

Signature: *John Christensen* Date: 4/9/09

P.E. Number & State: 165651, Utah

INSPECTION AND CERTIFIED REPORT ON EXCESS SPOIL PILE OR REFUSE PILE		Page 1 of 2	
Permit Number	ACT/015/018	Report Date	DEC. 29, 2008
Mine Name	Deer Creek		
Company Name	Energy West Mining Company		
Excess Spoil Pile or Refuse Pile Identification	File Name	ELK CANYON/ORIGINAL SITE	
	File Number		
	MSHA ID Number	1211-UT-09-00121-01	
Inspection Date	DEC. 8, 2008		
Inspected By	John Christensen/Rick Cullum		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)		2008 4th Quarter Inspection	
		Attachments to Report?   XNo   Yes	
<b>Field Evaluation</b>			
Foundation preparation, including the removal of all organic material and topsoil.			
The construction of both sites have been complete for some time in excess of 18 years. The foundations appear to be stable.			
Placement of underdrains and protective filter systems.			
None			
Installation of final surface drainage systems.			
The slopes of both sites have no rills, gullies or sloughage present.			
Placement and compaction of fill materials.			
No fill material is being placed at either site, since both are at their designed capacity. The Elk Canyon site contains approximately 24,000 cubic original site 90,000 cubic yards of fill material.			

Final grading and revegetation of fill.

The sites are at capacity. The final grades are established and are revegetated.

Appearances of instability, structural weakness, and other hazardous conditions.

None were observed.

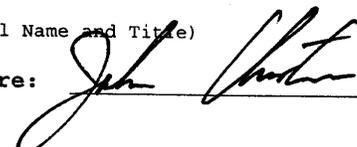
Other Comments. Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

There was minimal coal stored at the Elk Canyon pad at the time of inspection. Snow covered the site at the time of inspection.

**Certification Statement** I hereby certify that; I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

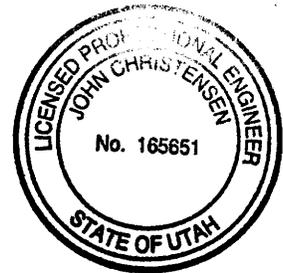
By: John Christensen, Sr. Construction Engineer

(Full Name and Title)

Signature: 

Date: 1/13/09

P.E. Number & State: 165651, Utah



**PACIFICORP  
ENERGY WEST MINING COMPANY  
DEER CREEK MINE  
DIVISION OF OIL, GAS, AND MINING PERMIT NUMBER:  
C/015/0018  
QUARTERLY POND INSPECTION REPORTS**

**PACIFICORP  
ENERGY WEST MINING COMPANY  
DEER CREEK MINE  
DIVISION OF OIL, GAS, AND MINING PERMIT NUMBER:  
C/015/0018  
QUARTERLY POND INSPECTION REPORTS**

**1<sup>ST</sup> QUARTER REPORT**

<b>IMPOUNDMENT INSPECTION AND CERTIFIED REPORT</b>		<b>Page 1 of 2</b>										
<b>Permit Number</b>	ACT/015/018	<b>Report Date</b>	March 28, 2008									
<b>Mine Name</b>	Deer Creek Mine											
<b>Company Name</b>	Energy West Mining											
<b>Impoundment Identification</b>	<b>Impoundment Name</b>	<b>Mine Site Pond:</b>	<b>Waste Rock Pond:</b>									
	<b>Impoundment Number</b>											
	<b>UPDES Permit Number</b>	UT-0023604-001										
	<b>MSHA ID Number</b>	N/A	N/A									
3												
<b>Inspection Date</b>	3/17/08	<b>Waste Rock Pond</b> 3/18/08										
<b>Inspected By</b>	Rick Cullum / John Christensen											
<b>Reason for Inspection</b> (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)		1st Quarter 2008 Inspection										
<p>1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 30%;"></td> <td style="text-align: center;"><u>Mine Site Pond</u></td> <td style="text-align: center;"><u>Waste Rock Pond</u></td> </tr> <tr> <td><b>Conditions, Comments</b></td> <td></td> <td></td> </tr> <tr> <td><b>Etc.</b></td> <td style="text-align: center;">No hazards observed.</td> <td style="text-align: center;">No hazards observed.</td> </tr> </table>					<u>Mine Site Pond</u>	<u>Waste Rock Pond</u>	<b>Conditions, Comments</b>			<b>Etc.</b>	No hazards observed.	No hazards observed.
	<u>Mine Site Pond</u>	<u>Waste Rock Pond</u>										
<b>Conditions, Comments</b>												
<b>Etc.</b>	No hazards observed.	No hazards observed.										
<b>Required for an impoundment which functions as a SEDIMENTATION POND.</b>	Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.											
		<u>Mine Site Pond:</u>	<u>Waste Rock Pond:</u>									
	<b>60% Design Storage Capacity</b> 1.87 A.F. at 7213.1 ft.	<b>60% Design Storage Capacity</b> .59 A.F. at 6312.7 ft.										
	<b>100% Sediment Capacity</b> 3.12 A.F. at 7216.0 ft.	<b>100% Sediment Capacity</b> .98 A.F. at 6313.45 ft.										
	Principle and emergency spillway elevations.											
		<u>Mine Site Pond</u>	<u>Waste Rock Pond</u>									
	<b>Principle Spillway Elevation (F.A.S.L.):</b>	7218.64	6318.0									
	<b>Emergency Spillway Elevation</b>	7232.03	6318.0									

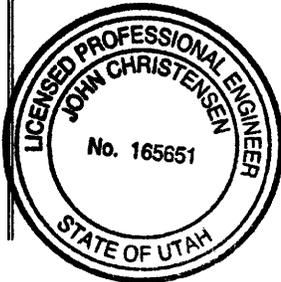
**Field Information.** Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on outslopes of embankments, etc.

	<u>Mine Site Pond</u>	<u>Waste Rock Pond</u>
Water Elevation	7227.62	None
Discharging	Yes	Never
Inlet, Outlet, Spillway Conditions	Good	Good
Out slope Conditions	No Change	No Change

\*See "Hydrologic Monitoring Data" report submitted quarterly to DOGM for monitoring information.

	<u>Mine Site Pond</u>	<u>Waste Rock Pond</u>
Sediment Volume	1.25 A.F. @ 7211.6	None
Remaining Sediment Storage Capacity	.62 A.F.	0.59 A.F.
Water impounded	8.25 A.F.	NONE
Changes, Comments, etc.	The pond was cleaned in the second quarter of 2007. The pond was frozen at time of the inspection.	No change from last inspection.

**Qualification Statement**



I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature: John Christensen Date: 4/23/08  
 Signature: Richard Cullum Date: 4/24/08

**PACIFICORP  
ENERGY WEST MINING COMPANY  
DEER CREEK MINE  
DIVISION OF OIL, GAS, AND MINING PERMIT NUMBER:  
C/015/0018  
QUARTERLY POND INSPECTION REPORTS**

**2<sup>ND</sup> QUARTER REPORT**

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT		Page 1 of 2	
Permit Number	ACT/015/018	Report Date	June 27, 2008
Mine Name	Deer Creek Mine		
Company Name	Energy West Mining		
Impoundment Identification	Impoundment Name	Mine Site Pond:	Waste Rock Pond:
	Impoundment Number		
	UPDES Permit Number	UT-0023604-001	
	MSHA ID Number	N/A	N/A
3			
Inspection Date	6/25/08	Waste Rock Pond	6/25/08
Inspected By	Rick Cullum / John Christensen		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	2nd Quarter 2008 Inspection		
1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.			
	<u>Mine Site Pond</u>	<u>Waste Rock Pond</u>	
Conditions, Comments Etc.	No hazards observed.	No hazards observed.	
Required for an impoundment which functions as a SEDIMENTATION POND.	Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.		
		<u>Mine Site Pond:</u>	<u>Waste Rock Pond:</u>
	60% Design Storage Capacity	1.87 A.F. at 7213.1 ft.	.59 A.F. at 6312.7 ft.
	100% Sediment Capacity	3.12 A.F. at 7216.0 ft.	.98 A.F. at 6313.45 ft.
	Principle and emergency spillway elevations.		
		<u>Mine Site Pond</u>	<u>Waste Rock Pond</u>
	Principle Spillway Elevation (F.A.S.L.):	7218.64	6318.0
	Emergency Spillway Elevation	7232.03	6318.0

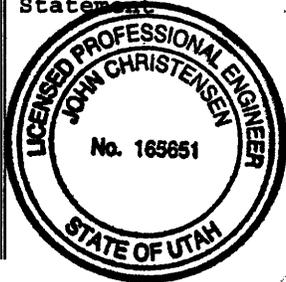
**Field Information.** Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on out slopes of embankments, etc.

	<u>Mine Site Pond</u>	<u>Waste Rock Pond</u>
Water Elevation	7220.15	eNone
Discharging	Yes	Never
Inlet, Outlet, Spillway Conditions	Good	Good
Out slope Conditions	No Change	No Change

\*See "Hydrologic Monitoring Data" report submitted quarterly to DOGM for monitoring information.

	<u>Mine Site Pond</u>	<u>Waste Rock Pond</u>
Sediment Volume	2.76 A.F. @ 7216.98	None
Remaining Sediment Storage Capacity	.36 A.F.	0.59 A.F.
Water impounded	5.4 A.F.	
Changes, Comments, etc.	NONE The pond was cleaned in June of 2008. The pond will be finished being cleaned in the 3 <sup>rd</sup> quarter 2008.	No change from last inspection.

**Qualification Statement**



I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness of other hazardous conditions of the structure affecting stability.

Signature: \_\_\_\_\_

Date: 8/12/08

Signature: Richard Cullen

Date: 8/12/08

**PACIFICORP  
ENERGY WEST MINING COMPANY  
DEER CREEK MINE  
DIVISION OF OIL, GAS, AND MINING PERMIT NUMBER:  
C/015/0018  
QUARTERLY POND INSPECTION REPORTS**

**3<sup>RD</sup> QUARTER REPORT**

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT		Page 1 of 2	
Permit Number	ACT/015/018	Report Date	Sept. 30, 2008
Mine Name	Deer Creek Mine		
Company Name	Energy West Mining		
Impoundment Identification	Impoundment Name	Mine Site Pond:	Waste Rock Pond:
	Impoundment Number		
	UPDES Permit Number	UT-0023604-001	
	MSHA ID Number	N/A	N/A
3			
Inspection Date	9/21/08	Waste Rock Pond 9/21/08	
Inspected By	Rick Cullum / John Christensen		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	3rd Quarter 2008 Inspection		
1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.			
	<u>Mine Site Pond</u>	<u>Waste Rock Pond</u>	
Conditions, Comments Etc.	No hazards observed.	No hazards observed.	
Required for an impoundment which functions as a SEDIMENTATION POND.	Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.		
		<u>Mine Site Pond:</u>	<u>Waste Rock Pond:</u>
	60% Design Storage Capacity	1.87 A.F. at 7213.1 ft.	.59 A.F. at 6312.7 ft.
	100% Sediment Capacity	3.12 A.F. at 7216.0 ft.	.98 A.F. at 6313.45 ft.
	Principle and emergency spillway elevations.		
		<u>Mine Site Pond</u>	<u>Waste Rock Pond</u>
	Principle Spillway Elevation (F.A.S.L.):	7218.64	6318.0
	Emergency Spillway Elevation	7232.03	6318.0

**Field Information.** Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on outslopes of embankments, etc.

	<u>Mine Site Pond</u>	<u>Waste Rock Pond</u>
Water Elevation	7220.15	eNone
Discharging	Yes	Never
Inlet, Outlet, Spillway Conditions	Good	Good
Out slope Conditions	No Change	No Change

\*See "Hydrologic Monitoring Data" report submitted quarterly to DOGM for monitoring information.

	<u>Mine Site Pond</u>	<u>Waste Rock Pond</u>
Sediment Volume	2.76 A.F. @ 7216.98	None
Remaining Sediment Storage Capacity	.36 A.F.	0.59 A.F.
Water impounded	5.4 A.F.	
Changes, Comments, etc.	NONE The pond was cleaned in June of 2008. The pond cleaning started in 1 <sup>st</sup> week of Oct. '08.	No change from last

**Qualification Statement**



I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature: [Signature]  
 Signature: Richard Cullum

Date: 10/28/08  
 Date: 11/3/08

**PACIFICORP  
ENERGY WEST MINING COMPANY  
DEER CREEK MINE  
DIVISION OF OIL, GAS, AND MINING PERMIT NUMBER:  
C/015/0018  
QUARTERLY POND INSPECTION REPORTS**

**4<sup>TH</sup> QUARTER REPORT**

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT		Page 1 of 2							
Permit Number	ACT/015/018	Report Date	DEC. 31, 2008						
Mine Name	Deer Creek Mine								
Company Name	Energy West Mining								
Impoundment Identification	Impoundment Name	Mine Site Pond:	Waste Rock Pond:						
	Impoundment Number								
	UPDES Permit Number	UT-0023604-001							
	MSHA ID Number	N/A	N/A						
3									
Inspection Date	12/30/08	Waste Rock Pond 12/30/08							
Inspected By	Rick Cullum / John Christensen								
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	4TH Quarter 2008 Inspection								
<p>1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.</p> <table border="0" style="width: 100%;"> <thead> <tr> <th style="width: 30%;"></th> <th style="width: 35%; text-align: center;"><u>Mine Site Pond</u></th> <th style="width: 35%; text-align: center;"><u>Waste Rock Pond</u></th> </tr> </thead> <tbody> <tr> <td>Conditions, Comments Etc.</td> <td style="text-align: center;">No hazards observed.</td> <td style="text-align: center;">No hazards observed.</td> </tr> </tbody> </table>					<u>Mine Site Pond</u>	<u>Waste Rock Pond</u>	Conditions, Comments Etc.	No hazards observed.	No hazards observed.
	<u>Mine Site Pond</u>	<u>Waste Rock Pond</u>							
Conditions, Comments Etc.	No hazards observed.	No hazards observed.							
Required for an impoundment which functions as a SEDIMENTATION POND.	Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.								
		<u>Mine Site Pond:</u>	<u>Waste Rock Pond:</u>						
	60% Design Storage Capacity	1.87 A.F. at 7213.1 ft.	.59 A.F. at 6312.7 ft.						
	100% Sediment Capacity	3.12 A.F. at 7216.0 ft.	.98 A.F. at 6313.45 ft.						
	Principle and emergency spillway elevations.								
		<u>Mine Site Pond</u>	<u>Waste Rock Pond</u>						
	Principle Spillway Elevation (F.A.S.L.):	7218.64	6318.0						
	Emergency Spillway Elevation	7232.03	6318.0						
<p><b>Field Information.</b> Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities</p>									

**IMPOUNDMENT INSPECTION AND CERTIFIED REPORT**

associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on out slopes of embankments, etc.

	<u>Mine Site Pond</u>	<u>Waste Rock Pond</u>
Water Elevation	7222.69 (top of ice)	None
Discharging	Yes	Never
Inlet, Outlet, Spillway Conditions	Good	Good
Out slope Conditions	No Change	No Change

\*See "Hydrologic Monitoring Data" report submitted quarterly to DOGM for monitoring information.

	<u>Mine Site Pond</u>	<u>Waste Rock Pond</u>
Sediment Volume	See note	None
Remaining Sediment Storage Capacity	See Note	0.59 A.F.
Water impounded	See Note.	

**Changes, Comments, etc.**

The Deer Creek Pond was cleaned in the early 4<sup>th</sup> Qtr. 2008. When the cleaning was finished the pond was relatively dry. By the time it had enough water in it to float, it had crusted with ice. The pond will be surveyed as early as possible in 2009.

**Qualification Statement**



I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: 1/13/09

Date: 1/14/09

**PACIFICORP  
ENERGY WEST MINING COMPANY  
COTTONWOOD/WILBERG MINE  
DIVISION OF OIL, GAS, AND MINING PERMIT NUMBER:  
C/015/0019  
QUARTERLY REFUSE PILE REPORTS**

**CONTENTS:  
ACTIVE CTW/WIL/DBD/TRIAL MTN WASTE ROCK DISPOSAL SITE  
ORIGINAL CTW/WIL/DBD WASTE ROCK DISPOSAL SITE**

**PACIFICORP  
ENERGY WEST MINING COMPANY  
COTTONWOOD/WILBERG MINE  
DIVISION OF OIL, GAS, AND MINING PERMIT NUMBER:  
C/015/0019  
QUARTERLY REFUSE PILE REPORTS**

**1<sup>ST</sup> QUARTER REPORT**

INSPECTION AND CERTIFIED REPORT ON EXCESS SPOIL PILE OR REFUSE PILE		Page 1 of 2	
Permit Number	ACT/015/017/ACT/015/019	Report Date	March 31, 2008
Mine Name	Cottonwood/Wilberg/Des-Bee-Dove/Trail Mountain		
Company Name	Energy West Mining Company		
Excess Spoil Pile or Refuse Pile Identification	File Name	Cottonwood Waste Rock Site	
	File Number		
	MSHA ID Number	1211-UT-09-01211-03	
Inspection Date	March 28, 2008		
Inspected By	John Christensen/Rick Cullum		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)		2008 1st Quarter Inspection	
		Attachments to Report? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	
<b>Field Evaluation</b>			
Foundation preparation, including the removal of all organic material and topsoil.			
Foundation was prepared according to the approved plan.			
Placement of underdrains and protective filter systems.			
Not applicable.			
Installation of final surface drainage systems.			
The out slopes of the containment berms are at their final configuration and have been revegetated. The inlet ditch to the pond has been lined with rip rap and is extended as the pile changes elevation.			
Placement and compaction of fill materials.			
The Trail Mountain Mine has ceased production. Mine refuse will no longer be haul to this site. The site will remain active to accommodate future pond cleanings at Trail Mountain and Cottonwood Mines.			
Final grading and revegetation of fill.			
The outslopes of each containment/lift berm have had final grading and vegetation completed.			

Appearances of instability, structural weakness, and other hazardous conditions.

None seen.

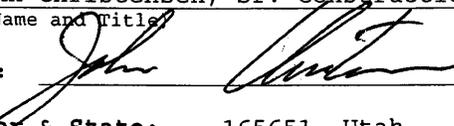
Other Comments. Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

The total storage capacity of the site is a 784,000 cubic yards. The elevation of the current lift varies with the required drainage slope. The surveyed elevation at the center of the active lift is 6,803.31 ft. The final design elevation will be 6,850 ft. The entire site is approximately 36% capacity. The useable area of the present lift is approximately 97%. Snow covered the site at the time of the inspection.

Certification  
Statement

I hereby certify that; I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

By: John Christensen, Sr. Construction Engineer  
(Full Name and Title)

Signature: 

Date: 4/23/08

P.E. Number & State: 165651, Utah



INSPECTION AND CERTIFIED REPORT ON EXCESS SPOIL PILE OR REFUSE PILE		Page 1 of 2	
Permit Number	ACT/015/0017/ACT/015/019	Report Date	March 31, 2008
Mine Name	Cottonwood/Wilberg/Des-Bee-Dove		
Company Name	Energy West Mining Company		
Excess Spoil Pile or Refuse Pile Identification	Pile Name	Old Waste Rock Site	
	Pile Number		
	MSHA ID Number		
Inspection Date	March 28, 2008		
Inspected By	John Christensen/Rick Cullum		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)		2008 First Quarter Inspection	
		Attachments to Report? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	
<b>Field Evaluation</b>			
Foundation preparation, including the removal of all organic material and topsoil.			
Constructed according to plan.			
Placement of underdrains and protective filter systems.			
Not applicable.			
Installation of final surface drainage systems.			
All surfaces are at their final configuration and drainage established.			
Placement and compaction of fill materials.			
This site is complete and at capacity.			

Final grading and revegetation of 11.

Site is complete and vegetation has been established.

Appearances of instability, structural weakness, and other hazardous conditions.

None observed.

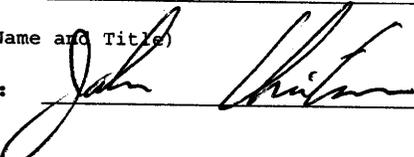
Other Comments. Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

There haven't been any changes at the site since the last inspection, except for the snow covering the area.

**Certification Statement** I hereby certify that; I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

By: John Christensen, Sr. Construction Engineer

(Full Name and Title)

Signature: 

Date: 4/23/08

P.E. Number & State: 165651, Utah



**PACIFICORP  
ENERGY WEST MINING COMPANY  
COTTONWOOD/WILBERG MINE  
DIVISION OF OIL, GAS, AND MINING PERMIT NUMBER:  
C/015/0019  
QUARTERLY REFUSE PILE REPORTS**

**2<sup>ND</sup> QUARTER REPORT**

INSPECTION AND CERTIFIED REPORT ON EXCESS SPOIL PILE OR REFUSE PILE		Page 1 of 2	
Permit Number	ACT/015/017/ACT/015/019	Report Date	June 25, 2008
Mine Name	Cottonwood/Wilberg/Des-Bee-Dove/Trail Mountain		
Company Name	Energy West Mining Company		
Excess Spoil Pile or Refuse Pile Identification	Pile Name	Cottonwood Waste Rock Site	
	Pile Number		
	MSHA ID Number	1211-UT-09-01211-03	
Inspection Date	June 3, 2008		
Inspected By	John Christensen/Rick Cullum		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)		2008 2nd Quarter Inspection	
		Attachments to Report? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	
<b>Field Evaluation</b>			
Foundation preparation, including the removal of all organic material and topsoil.			
Foundation was prepared according to the approved plan.			
Placement of underdrains and protective filter systems.			
Not applicable.			
Installation of final surface drainage systems.			
The out slopes of the containment berms are at their final configuration and have been revegetated. The inlet ditch to the pond has been lined with rip rap and is extended as the pile changes elevation.			
Placement and compaction of fill materials.			
The Trail Mountain Mine has ceased production. Mine refuse will no longer be haul to this site. The site will remain active to accommodate future pond cleanings at Trail Mountain and Cottonwood Mines.			
Final grading and revegetation of fill.			
The outslopes of each containment/lift berm have had final grading and vegetation completed.			

Appearances of instability, structural weakness, and other hazardous conditions.

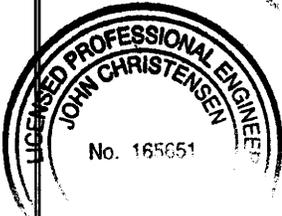
None seen.

Other Comments. Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

The total storage capacity of the site is a 784,000 cubic yards. The elevation of the current lift varies with the required drainage slope. The surveyed elevation at the center of the active lift is 6,803.31 ft. The final design elevation will be 6,850 ft. The entire site is approximately 36% capacity. The useable area of the present lift is approximately 97%.

Certification  
Statement

I hereby certify that; I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.



By: John Christensen, Sr. Construction Engineer  
(Full Name and Title)

Signature: *John Christensen*

Date: 8/2/08

P.E. Number & State: 165651, Utah

INSPECTION AND CERTIFIED REPORT ON EXCESS SPOIL PILE OR REFUSE PILE		Page 1 of 2	
Permit Number	ACT/015/0017/ACT/015/019	Report Date	June 25, 2008
Mine Name	Cottonwood/Wilberg/Des-Bee-Dove		
Company Name	Energy West Mining Company		
Excess Spoil Pile or Refuse Pile Identification	File Name	Old Waste Rock Site	
	File Number		
	MSHA ID Number		
Inspection Date	June 3, 2008		
Inspected By	John Christensen/Rick Cullum		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)		2008 Second Quarter Inspection	
		Attachments to Report? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	
<b>Field Evaluation</b>			
Foundation preparation, including the removal of all organic material and topsoil.			
Constructed according to plan.			
Placement of underdrains and protective filter systems.			
Not applicable..			
Installation of final surface drainage systems.			
All surfaces are at their final configuration and drainage established.			
Placement and compaction of fill materials.			
This site is complete and at capacity.			

Final grading and revegetation of fill.

Site is complete and vegetation has been established.

Appearances of instability, structural weakness, and other hazardous conditions.

None observed.

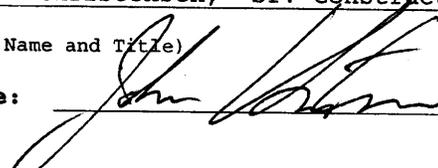
Other Comments. Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

There haven't been any changes at the site since the last inspection.

**Certification Statement** I hereby certify that; I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

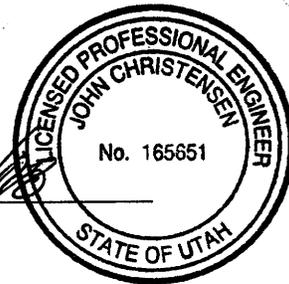
By: John Christensen, Sr. Construction Engineer

(Full Name and Title)

Signature: 

Date: 7/2/88

P.E. Number & State: 165651, Utah



**PACIFICORP  
ENERGY WEST MINING COMPANY  
COTTONWOOD/WILBERG MINE  
DIVISION OF OIL, GAS, AND MINING PERMIT NUMBER:  
C/015/0019  
QUARTERLY REFUSE PILE REPORTS**

**3<sup>RD</sup> QUARTER REPORT**

INSPECTION AND CERTIFIED REPORT ON EXCESS SPOIL PILE OR REFUSE PILE		Page 1 of 2	
Permit Number	ACT/015/017/ACT/015/019	Report Date	Sept, 30, 2008
Mine Name	Cottonwood/Wilberg/Des-Bee-Dove/Trail Mountain		
Company Name	Energy West Mining Company		
Excess Spoil Pile or Refuse Pile Identification	File Name	Cottonwood Waste Rock Site	
	File Number		
	MSHA ID Number	1211-UT-09-01211-03	
Inspection Date	Sept 29, 2008		
Inspected By	John Christensen/Rick Cullum		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)		2008 3rd Quarter Inspection	
		Attachments to Report?    x No    Yes	
<b>Field Evaluation</b>			
<p>Foundation preparation, including the removal of all organic material and topsoil.</p> <p>Foundation was prepared according to the approved plan.</p>			
<p>Placement of underdrains and protective filter systems.</p> <p>Not applicable.</p>			
<p>Installation of final surface drainage systems.</p> <p>The out slopes of the containment berms are at their final configuration and have been revegetated. The inlet ditch to the pond has been lined with rip rap and is extended as the pile changes elevation.</p>			
<p>Placement and compaction of fill materials.</p> <p>The Trail Mountain Mine has ceased production. Mine refuse will no longer be haul to this site. The site will remain active to accommodate future pond cleanings at Trail Mountain and Cottonwood Mines.</p>			
<p>Final grading and revegetation of fill.</p> <p>The outslopes of each containment/lift berm have had final grading and vegetation completed.</p>			

Appearances of instability, structural weakness, and other hazardous conditions.

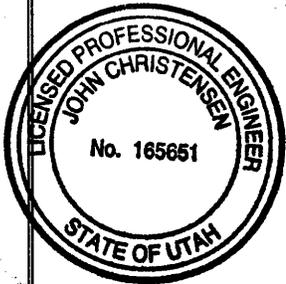
None seen.

Other Comments. Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

The total storage capacity of the site is a 784,000 cubic yards. The elevation of the current lift varies with the required drainage slope. The surveyed elevation at the center of the active lift is 6,803.31 ft. The final design elevation will be 6,850 ft. The entire site is approximately 36% capacity. The useable area of the present lift is approximately 97%.

Certification  
Statement

I hereby certify that; I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.



By: John Christensen, Sr. Construction Engineer  
(Full Name and Title)

Signature: *John Christensen*

Date: 10/28/08

P.E. Number & State: 165651, Utah

INSPECTION AND CERTIFIED REPORT ON EXCESS SPOIL PILE OR REFUSE PILE		Page 1 of 2	
Permit Number	ACT/015/0017/ACT/015/019	Report Date	Sept. 30, 2008
Mine Name	Cottonwood/Wilberg/Des-Bee-Dove		
Company Name	Energy West Mining Company		
Excess Spoil Pile or Refuse Pile Identification	Pile Name	Old Waste Rock Site	
	Pile Number		
	MSHA ID Number		
Inspection Date	Sept. 29, 2008		
Inspected By	John Christensen/Rick Cullum		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)		2008 Third Quarter Inspection	
		Attachments to Report? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	
<b>Field Evaluation</b>			
Foundation preparation, including the removal of all organic material and topsoil.			
Constructed according to plan.			
Placement of underdrains and protective filter systems.			
Not applicable.			
Installation of final surface drainage systems.			
All surfaces are at their final configuration and drainage established.			
Placement and compaction of fill materials.			
This site is complete and at capacity.			

Final grading and revegetation of fill.

Site is complete and vegetation has been established.

Appearances of instability, structural weakness, and other hazardous conditions.

None observed.

Other Comments. Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

There haven't been any changes at the site since the last inspection.

**Certification Statement** I hereby certify that; I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

By: John Christensen, Sr. Construction Engineer

(Full Name and Title)

Signature: John Christensen

Date: 10/28/08

P.E. Number & State: 165651, Utah



**PACIFICORP  
ENERGY WEST MINING COMPANY  
COTTONWOOD/WILBERG MINE  
DIVISION OF OIL, GAS, AND MINING PERMIT NUMBER:  
C/015/0019  
QUARTERLY REFUSE PILE REPORTS**

**4<sup>TH</sup> QUARTER REPORT**

INSPECTION AND CERTIFIED REPORT ON EXCESS SPOIL PILE OR REFUSE PILE		Page 1 of 2	
Permit Number	ACT/015/017/ACT/015/019	Report Date	DEC. 29, 2008
Mine Name	Cottonwood/Wilberg/Des-Bee-Dove/Trail Mountain		
Company Name	Energy West Mining Company		
Excess Spoil Pile or Refuse Pile Identification	File Name	Cottonwood Waste Rock Site	
	File Number		
	MSHA ID Number	1211-UT-09-01211-03	
Inspection Date	DEC. 8, 2008		
Inspected By	John Christensen/Rick Cullum		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	2008 4TH Quarter Inspection		
	Attachments to Report?    x No    Yes		
<b>Field Evaluation</b>			
Foundation preparation, including the removal of all organic material and topsoil.			
Foundation was prepared according to the approved plan.			
Placement of underdrains and protective filter systems.			
Not applicable.			
Installation of final surface drainage systems.			
The out slopes of the containment berms are at their final configuration and have been revegetated. The inlet ditch to the pond has been lined with rip rap and is extended as the pile changes elevation.			
Placement and compaction of fill materials.			
The Trail Mountain Mine has ceased production. Mine refuse will no longer be haul to this site. The site will remain active to accommodate future pond cleanings at Trail Mountain and Cottonwood Mines.			
Final grading and revegetation of fill.			
The outslopes of each containment/lift berm have had final grading and vegetation completed.			

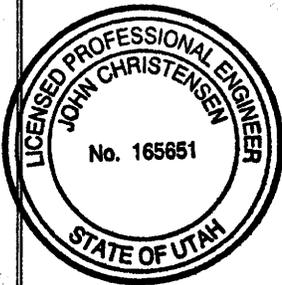
Appearances of instability, structural weakness, and other hazardous conditions.

None seen.

Other Comments. Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

The total storage capacity of the site is a 784,000 cubic yards. The elevation of the current lift varies with the required drainage slope. The surveyed elevation at the center of the active lift is 6,803.31 ft. The final design elevation will be 6,850 ft. The entire site is approximately 36% capacity. The useable area of the present lift is approximately 97%. Snow covered the site during the inspection.

Certification  
Statement



I hereby certify that; I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

By: John Christensen, Sr. Construction Engineer  
(Full Name and Title)

Signature: *John Christensen*

Date: 1/13/09

P.E. Number & State: 165651, Utah

INSPECTION AND CERTIFIED REPORT ON EXCESS SPOIL PILE OR REFUSE PILE		Page 1 of 2	
Permit Number	ACT/015/0017/ACT/015/019	Report Date	DEC. 29, 2008
Mine Name	Cottonwood/Wilberg/Des-Bee-Dove		
Company Name	Energy West Mining Company		
Excess Spoil Pile or Refuse Pile Identification	Pile Name	Old Waste Rock Site	
	Pile Number		
	MSHA ID Number		
Inspection Date	DEC. 8, 2008		
Inspected By	John Christensen/Rick Cullum		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)		2008 Fourth Quarter Inspection	
		Attachments to Report? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	
<b>Field Evaluation</b>			
Foundation preparation, including the removal of all organic material and topsoil.			
Constructed according to plan.			
Placement of underdrains and protective filter systems.			
Not applicable.			
Installation of final surface drainage systems.			
All surfaces are at their final configuration and drainage established.			
Placement and compaction of fill materials.			
This site is complete and at capacity.			

Final grading and revegetation of fill.

Site is complete and vegetation has been established.

Appearances of instability, structural weakness, and other hazardous conditions.

None observed.

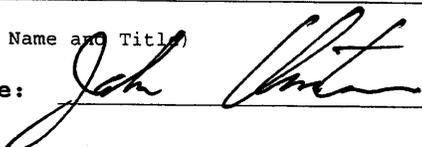
Other Comments. Describe any changes in the geometry of the Excess Spoil/Refuse Pile structure, instrumentation, average and maximum lifts of materials placed in the pile, elevations of active benches, total and remaining storage capacity of the structure, evidence of fires in the pile and abatement of such fires, volumes of materials placed in the structure during the year, and any other aspect of the structure affecting its stability or function which has occurred during the reporting period.

There haven't been any changes at the site since the last inspection. Snow covered the site at the time of inspection.

**Certification Statement** I hereby certify that; I am experienced in the construction of earth and rock fills; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of earth and rock fills in accordance with the certified and approved designs for this structure; that the fill structure has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

By: John Christensen, Sr. Construction Engineer

(Full Name and Title)

Signature: 

Date: 1/13/09

P.E. Number & State: 165651, Utah



IMPOUNDMENT INSPECTION AND CERTIFIED REPORT		Page 1 of 2	
Permit Number	ACT/015/019	Report Date	March 31, 2008
Mine Name	Cottonwood/Wilberg		
Company Name	PacifiCorp		
Impoundment Name...	North Pond	South Pond	Waste Rock Pond
Impoundment Number.			
UPDES Permit Number			
MSHA ID NUMBER.....		UT 0022896-003A	UT 0022896-005
	1211-UT-09-02052-02	1211-UT-09-02052-03	

### IMPOUNDMENT INSPECTION

Inspection Date	March 28, 2008
Inspected By	Rick Cullum/ John Christensen
	1st Quarter Inspection 2008

1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.

North Pond: No instabilities or weaknesses observed.

South Pond: No instabilities or weaknesses observed.

Waste Rock Site Pond: No instabilities observed.

Required for an impoundment which functions as a SEDIMENTATION POND.

Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.

	<u>North Pond</u>	<u>South Pond</u>	<u>Waste Rock</u>
<u>Pond</u>			
60% Design Storage Capacity	.34 A.F. at 7351.0 ft.	.19 A.F. at 7322.3 ft.	1.45 A.F. at 6761.5 ft.
100% Sediment Capacity	.56 A.F. at 7354.83 ft.	.32 A.F. at 7325.33 ft.	2.42 A.F. at 6765.3 ft.

Principle and emergency spillway elevations.

	<u>North Pond</u>	<u>South Pond</u>	<u>Waste Rock Pond</u>
Principal Spillway Elevation	7354.83	7325.33	6766.3
Emergency Spillway	7363.33	7334.2	6770.0

Elevation

**Field Information.** Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on outslopes of embankments, etc.

	<u>North Pond</u>	<u>South Pond</u>	<u>Waste Rock Pond</u>
Water Elevation	DRY	DRY	6761.52
Discharging	NO	NO	No
Inlet/Outlet Condition	Good	Good	Good
Slope conditions	Good	Good	Good

\*See "Hydrologic Monitoring Data" report submitted to DOGM quarterly for monitoring information.

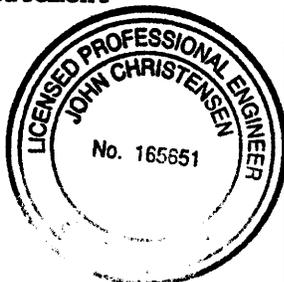
**Field Evaluation.** Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

	<u>North Pond</u>	<u>South Pond</u>	<u>Waste Rock Pond</u>
Sediment Volume	0.10 AF	0.00 AF	1.19 AF
Remaining Sediment Storage Capacity	0.24 AF	0.19 AF	.26 AF
Water Impounded	0.0 AF	0.0 AF	0.13 AF

Changes, Comments,

THE COTTONWOOD MINE WAS IDLED IN 2001, SO THE ONLY WATER THAT REPORTS TO THE PONDS are RUN-OFF DURING A STORM EVENT.

**Qualification Statement**



I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature: John Christensen  
 Signature: Richard Cullum

Date: 4/23/08  
 Date: 4/24/08

<b>IMPOUNDMENT INSPECTION AND CERTIFIED REPORT</b>		<b>Page 1 of 2</b>	
<b>Permit Number</b>	ACT/015/019	<b>Report Date</b>	June 25, 2008
<b>Mine Name</b>	Cottonwood/Wilberg		
<b>Company Name</b>	PacifiCorp		
<b>Impoundment Name...</b>	<b>North Pond</b>	<b>South Pond</b>	<b>Waste Rock Pond</b>
<b>Impoundment Number.</b>			
<b>UPDES Permit Number</b>			
<b>MSHA ID NUMBER.....</b>		UT 0022896-003A	UT 0022896-005
	1211-UT-09-02052-02	1211-UT-09-02052-03	

<b>IMPOUNDMENT INSPECTION</b>	
<b>Inspection Date</b>	June 3, 2008
<b>Inspected By</b>	Rick Cullum/ John Christensen
	2nd Quarter Inspection 2008

1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.

**North Pond:** No instabilities or weaknesses observed.

**South Pond:** No instabilities or weaknesses observed.

**Waste Rock Site Pond:** No instabilities observed.

Required for an impoundment which functions as a <b>SEDIMENTATION POND.</b>	Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.			
		<u>North Pond</u>	<u>South Pond</u>	<u>Waste Rock</u>
	<b>Pond</b>			
	<b>60% Design Storage Capacity</b>	.34 A.F. at 7351.0 ft.	.19 A.F. at 7322.3 ft.	1.45 A.F. at 6761.5 ft.
	<b>100% Sediment Capacity</b>	.56 A.F. at 7354.83 ft.	.32 A.F. at 7325.33 ft.	2.42 A.F. at 6765.3 ft.
	Principle and emergency spillway elevations.			
		<u>North Pond</u>	<u>South Pond</u>	<u>Waste Rock Pond</u>
	<b>Principal Spillway Elevation</b>	7354.83	7325.33	6766.3
	<b>Emergency Spillway Elevation</b>	7363.33	7334.2	6770.0

**Field Information.** Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on outslopes of embankments, etc.

	<u>North Pond</u>	<u>South Pond</u>	<u>Waste Rock Pond</u>
Water Elevation	DRY	DRY	DRY
Discharging	NO	NO	NO
Inlet/Outlet Condition	Good	Good	Good
Slope conditions	Good	Good	Good

\*See "Hydrologic Monitoring Data" report submitted to DOGM quarterly for monitoring information.

**Field Evaluation.** Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

	<u>North Pond</u>	<u>South Pond</u>	<u>Waste Rock Pond</u>
Sediment Volume	0.10 AF	0.00 AF	1.19 AF
Remaining Sediment Storage Capacity	0.24 AF	0.19 AF	.26 AF
Water Impounded	0.0 AF	0.0 AF	0.0 AF

Changes, Comments,

THE COTTONWOOD MINE WAS IDLED IN 2001, SO THE ONLY WATER THAT REPORTS TO THE PONDS are RUN-OFF DURING A STORM EVENT.

**Qualification Statement**



I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature: [Signature]  
 Signature: [Signature]

Date: 8/12/08  
 Date: 8/12/08

<b>IMPOUNDMENT INSPECTION AND CERTIFIED REPORT</b>			<b>Page 1 of 2</b>
<b>Permit Number</b>	ACT/015/019	<b>Report Date</b>	Sept.30, 2008
<b>Mine Name</b>	Cottonwood/Wilberg		
<b>Company Name</b>	PacifiCorp		
<b>Impoundment Name...</b>	<b>North Pond</b>	<b>South Pond</b>	<b>Waste Rock Pond</b>
<b>Impoundment Number.</b>			
<b>UPDES Permit Number</b>			
<b>MSHA ID NUMBER.....</b>		UT 0022896-003A	UT 0022896-005
	1211-UT-09-02052-02	1211-UT-09-02052-03	

**IMPOUNDMENT INSPECTION**

<b>Inspection Date</b>	Sept. 29, 2008
<b>Inspected By</b>	Rick Cullum/ John Christensen
	3rd Quarter Inspection 2008

1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.
- North Pond:** No instabilities or weaknesses observed.
- South Pond:** No instabilities or weaknesses observed.
- Waste Rock Site Pond:** No instabilities observed.

Required for an impoundment which functions as a <b>SEDIMENTATION POND.</b>	Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.														
	<table border="1"> <thead> <tr> <th><u>Pond</u></th> <th><u>North Pond</u></th> <th><u>South Pond</u></th> <th><u>Waste Rock</u></th> </tr> </thead> <tbody> <tr> <td>60% Design Storage Capacity</td> <td>.34 A.F. at 7351.0 ft.</td> <td>.19 A.F. at 7322.3 ft.</td> <td>1.45 A.F. at 6761.5 ft.</td> </tr> <tr> <td>100% Sediment Capacity</td> <td>.56 A.F. at 7354.83 ft.</td> <td>.32 A.F. at 7325.33 ft.</td> <td>2.42 A.F. at 6765.3 ft.</td> </tr> </tbody> </table>	<u>Pond</u>	<u>North Pond</u>	<u>South Pond</u>	<u>Waste Rock</u>	60% Design Storage Capacity	.34 A.F. at 7351.0 ft.	.19 A.F. at 7322.3 ft.	1.45 A.F. at 6761.5 ft.	100% Sediment Capacity	.56 A.F. at 7354.83 ft.	.32 A.F. at 7325.33 ft.	2.42 A.F. at 6765.3 ft.		
<u>Pond</u>	<u>North Pond</u>	<u>South Pond</u>	<u>Waste Rock</u>												
60% Design Storage Capacity	.34 A.F. at 7351.0 ft.	.19 A.F. at 7322.3 ft.	1.45 A.F. at 6761.5 ft.												
100% Sediment Capacity	.56 A.F. at 7354.83 ft.	.32 A.F. at 7325.33 ft.	2.42 A.F. at 6765.3 ft.												
	Principle and emergency spillway elevations.														
	<table border="1"> <thead> <tr> <th></th> <th><u>North Pond</u></th> <th><u>South Pond</u></th> <th><u>Waste Rock Pond</u></th> </tr> </thead> <tbody> <tr> <td>Principal Spillway Elevation</td> <td>7354.83</td> <td>7325.33</td> <td>6766.3</td> </tr> <tr> <td>Emergency Spillway Elevation</td> <td>7363.33</td> <td>7334.2</td> <td>6770.0</td> </tr> </tbody> </table>		<u>North Pond</u>	<u>South Pond</u>	<u>Waste Rock Pond</u>	Principal Spillway Elevation	7354.83	7325.33	6766.3	Emergency Spillway Elevation	7363.33	7334.2	6770.0		
	<u>North Pond</u>	<u>South Pond</u>	<u>Waste Rock Pond</u>												
Principal Spillway Elevation	7354.83	7325.33	6766.3												
Emergency Spillway Elevation	7363.33	7334.2	6770.0												

**Field Information.** Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on outslopes of embankments, etc.

	<u>North Pond</u>	<u>South Pond</u>	<u>Waste Rock Pond</u>
Water Elevation	DRY	DRY	DRY
Discharging	NO	NO	No
Inlet/Outlet Condition	Good	Good	Good
Slope conditions	Good	Good	Good

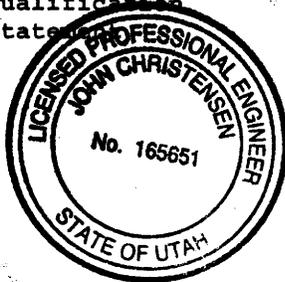
\*See "Hydrologic Monitoring Data" report submitted to DOGM quarterly for monitoring information.

**Field Evaluation.** Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

	<u>North Pond</u>	<u>South Pond</u>	<u>Waste Rock Pond</u>
Sediment Volume	0.10 AF	0.00 AF	1.19 AF
Remaining Sediment Storage Capacity	0.24 AF	0.19 AF	.26 AF
Water Impounded	0.0 AF	0.0 AF	0.0 AF
Changes, Comments,			

THE COTTONWOOD MINE WAS IDLED IN 2001, SO THE ONLY WATER THAT REPORTS TO THE PONDS are RUN-OFF DURING A STORM EVENT.

Qualification  
State



I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature: John Christensen  
Signature: Richard Cullum

Date: 10/28/08  
Date: 11/3/08

<b>IMPOUNDMENT INSPECTION AND CERTIFIED REPORT</b>		<b>Page 1 of 2</b>	
Permit Number	ACT/015/019	Report Date	DEC. 29, 2008
Mine Name	Cottonwood/Wilberg		
Company Name	PacifiCorp		
Impoundment Name...	North Pond	South Pond	Waste Rock Pond
Impoundment Number.			
UPDES Permit Number			
MSHA ID NUMBER.....		UT 0022896-003A	UT 0022896-005
	1211-UT-09-02052-02	1211-UT-09-02052-03	

**IMPOUNDMENT INSPECTION**

Inspection Date	DEC. 8, 2008
Inspected By	Rick Cullum/ John Christensen
	4TH Quarter Inspection 2008

1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.

North Pond: No instabilities or weaknesses observed.

South Pond: No instabilities or weaknesses observed.

Waste Rock Site Pond: No instabilities observed.

Required for an impoundment which functions as a SEDIMENTATION POND.

Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.

	<u>North Pond</u>	<u>South Pond</u>	<u>Waste Rock</u>
<u>Pond</u>			
60% Design Storage Capacity	.34 A.F. at 7351.0 ft.	.19 A.F. at 7322.3 ft.	1.45 A.F. at 6761.5 ft.
100% Sediment Capacity	.56 A.F. at 7354.83 ft.	.32 A.F. at 7325.33 ft.	2.42 A.F. at 6765.3 ft.

Principle and emergency spillway elevations.

	<u>North Pond</u>	<u>South Pond</u>	<u>Waste Rock Pond</u>
Principal Spillway Elevation	7354.83	7325.33	6766.3
Emergency Spillway	7363.33	7334.2	6770.0

Elevation

**Field Information.** Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on out slopes of embankments, etc.

	<u>North Pond</u>	<u>South Pond</u>	<u>Waste Rock Pond</u>
Water Elevation	DRY	DRY	DRY
Discharging	NO	NO	No
Inlet/Outlet Condition	Good	Good	Good
Slope conditions	Good	Good	Good

\*See "Hydrologic Monitoring Data" report submitted to DOGM quarterly for monitoring information.

**Field Evaluation.** Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

	<u>North Pond</u>	<u>South Pond</u>	<u>Waste Rock Pond</u>
Sediment Volume	0.10 AF	0.00 AF	1.19 AF
Remaining Sediment Storage Capacity	0.24 AF	0.19 AF	.26 AF
Water Impounded	0.0 AF	0.0 AF	0.0 AF

Changes, Comments,

THE COTTONWOOD MINE WAS IDLED IN 2001, SO THE ONLY WATER THAT REPORTS TO THE PONDS are RUN-OFF DURING A STORM EVENT. Snow covered the area.

**Qualification Statement**



I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature: John Christensen Date: 1/13/09  
 Signature: Richard Cullum Date: 1/14/09

**PACIFICORP  
ENERGY WEST MINING COMPANY  
TRAIL MOUNTAIN MINE  
DIVISION OF OIL, GAS, AND MINING PERMIT NUMBER:  
C/015/0009  
QUARTERLY POND INSPECTION REPORTS**

**PACIFICORP  
ENERGY WEST MINING COMPANY  
TRAIL MOUNTAIN MINE  
DIVISION OF OIL, GAS, AND MINING PERMIT NUMBER:  
C/015/0009  
QUARTERLY POND INSPECTION REPORTS**

**1<sup>ST</sup> QUARTER REPORT**

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT		Page 1 of 2	
Permit Number	ACT/015/009	Report Date	March 31, 2008
Mine Name	Trail Mountain Mine		
Company Name	Energy West Mining Company		
Impoundment Identification	Impoundment Name	Trail Mountain Mine Pond:	
	Impoundment Number		
	UPDES Permit Number	UT-G04003-001	
	MSHA ID Number	N/A	
<b>IMPOUNDMENT INSPECTION</b>			
Inspection Date	March 28, 2008		
Inspected By	John Christensen / Rick Cullum		
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	1st Quarter 2008 Inspection		
<p>1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.</p> <p>No unstable or structural weaknesses found.</p>			
Required for an impoundment which functions as a SEDIMENTATION POND.	<p>2. Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.</p> <p>60% Design Storage Capacity            0.282 A.F. at 7182</p> <p>100% Sediment Capacity                      0.47 A.F. at 7183.6</p>		
	<p>3. Principle and emergency spillway elevations.</p> <p>Principle Spillway Elevation (F.A.S.L.):            7186.6</p> <p>Emergency Spillway Elevation: (F.A.S.L.):            7194.6</p>		

4. **Field Information.** Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on outslopes of embankments, etc.

Water Elevation 7184.24  
 Discharging No  
 Inlet, Outlet Conditions Good  
 Slope conditions Good

\*See "Hydrologic Monitoring Data" report submitted quarterly to DOGM for monitoring information.

5. **Field Evaluation.** Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

Sediment Volume 0.16 A.F.  
 Remaining Sediment Storage Capacity 0.122 A.F.  
 Water Impounded 0.32 A.F.

Changes, comments, etc. Mining has seized at Trail Mtn. operations, only storm run off will run into the pond. The pond was cleaned in 4th Quarter 2005.

Qualification Statement



I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature: *[Signature]*  
 Signature: *[Signature]*

Date: 4/23/08  
 Date: 4/24/08

**PACIFICORP  
ENERGY WEST MINING COMPANY  
TRAIL MOUNTAIN MINE  
DIVISION OF OIL, GAS, AND MINING PERMIT NUMBER:  
C/015/0009  
QUARTERLY POND INSPECTION REPORTS**

**2<sup>ND</sup> QUARTER REPORT**

<b>IMPOUNDMENT INSPECTION AND CERTIFIED REPORT</b>		<b>Page 1 of 2</b>	
<b>Permit Number</b>	ACT/015/009	<b>Report Date</b>	June 25, 2008
<b>Mine Name</b>	Trail Mountain Mine		
<b>Company Name</b>	Energy West Mining Company		
<b>Impoundment Identification</b>	<b>Impoundment Name</b>	Trail Mountain Mine Pond:	
	<b>Impoundment Number</b>		
	<b>UPDES Permit Number</b>	UT-G04003-001	
	<b>MSHA ID Number</b>	N/A	
<b>IMPOUNDMENT INSPECTION</b>			
<b>Inspection Date</b>	June 3, 2008		
<b>Inspected By</b>	John Christensen / Rick Cullum		
<b>Reason for Inspection</b> (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)		2nd Quarter 2008 Inspection	
<p>1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.</p> <p>No unstable or structural weaknesses found.</p>			
<p>Required for an impoundment which functions as a SEDIMENTATION POND.</p>	<p>2. Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.</p> <p>60% Design Storage Capacity            0.282 A.F. at 7182</p> <p>100% Sediment Capacity            0.47 A.F. at 7183.6</p>		
	<p>3. Principle and emergency spillway elevations.</p> <p>Principle Spillway Elevation (F.A.S.L.):            7186.6</p> <p>Emergency Spillway Elevation: (F.A.S.L.):            7194.6</p>		

**4. Field Information.** Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on outslopes of embankments, etc.

Water Elevation 7182.84  
 Discharging No  
 Inlet, Outlet Conditions Good  
 Slope conditions Good

\*See "Hydrologic Monitoring Data" report submitted quarterly to DOGM for monitoring information.

**5. Field Evaluation.** Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

Sediment Volume 0.16 A.F.  
 Remaining Sediment Storage Capacity 0.122 A.F.  
 Water Impounded 0.26 A.F.

Changes, comments, etc. Mining has seized at Trail Mtn. operations, only storm run off will run into the pond. The pond was cleaned in 4th Quarter 2005.



I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature: *John Christensen* Date: 8/12/08  
 Signature: *Richard Cullum* Date: 8/12/08

**PACIFICORP  
ENERGY WEST MINING COMPANY  
TRAIL MOUNTAIN MINE  
DIVISION OF OIL, GAS, AND MINING PERMIT NUMBER:  
C/015/0009  
QUARTERLY POND INSPECTION REPORTS**

**3<sup>RD</sup> QUARTER REPORT**

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT		Page 1 of 2	
Permit Number	ACT/015/009	Report Date	Sept. 30, 2008
Mine Name	Trail Mountain Mine		
Company Name	Energy West Mining Company		
Impoundment Identification	Impoundment Name	Trail Mountain Mine Pond:	
	Impoundment Number		
	UPDES Permit Number	UT-G04003-001	
	MSHA ID Number	N/A	
<b>IMPOUNDMENT INSPECTION</b>			
Inspection Date	Sept. 29, 2008		
Inspected By	John Christensen / Rick Cullum		
		3rd Quarter 2008 Inspection	
<p>1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.</p> <p>No unstable or structural weaknesses found.</p>			
Required for an impoundment which functions as a SEDIMENTATION POND.	<p>2. Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.</p> <p>60% Design Storage Capacity            0.282 A.F. at 7182</p> <p>100% Sediment Capacity            0.47 A.F. at 7183.6</p>		
	<p>3. Principle and emergency spillway elevations.</p> <p>Principle Spillway Elevation (F.A.S.L.):            7186.6</p> <p>Emergency Spillway Elevation:(F.A.S.L.):            7194.6</p>		
<p>4. Field Information. Provide current water elevation, whether pond is discharging, type and number of</p>			

samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on outslopes of embankments, etc.

Water Elevation 7182.10  
 Discharging No  
 Inlet, Outlet Conditions Good  
 Slope conditions Good

\*See "Hydrologic Monitoring Data" report submitted quarterly to DOGM for monitoring information.

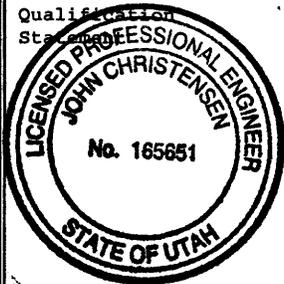
5. **Field Evaluation.** Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

Sediment Volume 0.24 A.F.

Remaining Sediment Storage Capacity 0.04 A.F.

Water Impounded 0.06 A.F.

Changes, comments, etc. Mining has seized at Trail Mtn. operations, only storm run off will run into the pond. The pond was cleaned in 4th Quarter 2005.



I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness, or other hazardous conditions of the structure affecting stability.

Signature: *John Christensen*  
 Signature: *Richard Cullum*

Date: 10/28/08  
 Date: 11/3/08

**PACIFICORP  
ENERGY WEST MINING COMPANY  
TRAIL MOUNTAIN MINE  
DIVISION OF OIL, GAS, AND MINING PERMIT NUMBER:  
C/015/0009  
QUARTERLY POND INSPECTION REPORTS**

**4<sup>TH</sup> QUARTER REPORT**

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT		Page 1 of 2	
Permit Number	ACT/015/009	Report Date	DEC. 29, 2008
Mine Name	Trail Mountain Mine		
Company Name	Energy West Mining Company		
Impoundment Identification	Impoundment Name	Trail Mountain Mine Pond:	
	Impoundment Number		
	UPDES Permit Number	UT-G04003-001	
	MSHA ID Number	N/A	
<b>IMPOUNDMENT INSPECTION</b>			
Inspection Date	DEC. 8, 2008		
Inspected By	John Christensen / Rick Cullum		
		4TH Quarter 2008 Inspection	
<p>1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.</p> <p>No unstable or structural weaknesses found.</p>			
Required for an impoundment which functions as a SEDIMENTATION POND.	<p>2. Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.</p> <p>60% Design Storage Capacity            0.282 A.F. at 7182</p> <p>100% Sediment Capacity                      0.47 A.F. at 7183.6</p>		
	<p>3. Principle and emergency spillway elevations.</p> <p>Principle Spillway Elevation (F.A.S.L.):            7186.6</p> <p>Emergency Spillway Elevation: (F.A.S.L.):            7194.6</p>		
<p>4. Field Information. Provide current water elevation, whether pond is discharging, type and number of</p>			

samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on outslopes of embankments, etc.

Water Elevation DRY  
 Discharging No  
 Inlet, Outlet Conditions Good  
 Slope conditions Good

\*See "Hydrologic Monitoring Data" report submitted quarterly to DOGM for monitoring information.

5. **Field Evaluation.** Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

Sediment Volume 0.24 A.F.  
 Remaining Sediment Storage Capacity 0.04 A.F.  
 Water Impounded 0.06 A.F.  
 Changes, comments, etc.

Mining has seized at Trail Mtn. operations, only storm run off will run into the pond. The pond was cleaned in 4th Quarter 2005.

Qualification  
 State



I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature: [Signature]  
 Signature: [Signature]

Date: 1/13/09  
 Date: 1/14/09

**APPENDIX B**

**Reporting of Technical Data**

Including monitoring data, reports, maps, and other information  
As required under the approved plan or as required by the Division

In accordance with the requirement of R645-310-130 and R645-301-140

**CONTENTS**

Vegetation Monitoring Report  
(Reported for Cottonwood/Wilberg, Des Bee Dove, Deer Creek, and Trail Mountain mines)



**MT NEBO SCIENTIFIC, INC.**

*research & consulting*

April 15, 2009

Dennis Oakley  
*Energy West Mining Company*  
P.O. Box 310  
15 North Main Street  
Huntington, Utah 84528

Dear Mr. Oakley:

Enclosed please find three (3) hard copies (1 bound, 2 unbound) and a CD with electronic files of the following vegetation monitoring reports:

*Vegetation Monitoring*  
*For Phase III Bond Release: Year 2*  
*at the*  
*Cottonwood Fan Portal Area*  
*2008*

*Vegetation Monitoring*  
*For Phase III Bond Release: Year 1*  
*for the*  
*Deer Creek Mine*  
*2008*

**VEGETATION MONITORING**  
**IN**  
**MILLER CANYON**  
Sample Year 1: 2008

New Reference Area Considerations  
for the New Waste Rock Site  
of the Cottonwood Mine,  
Emery County, Utah  
2008

Please call or write if you have questions or comments.

Sincerely,

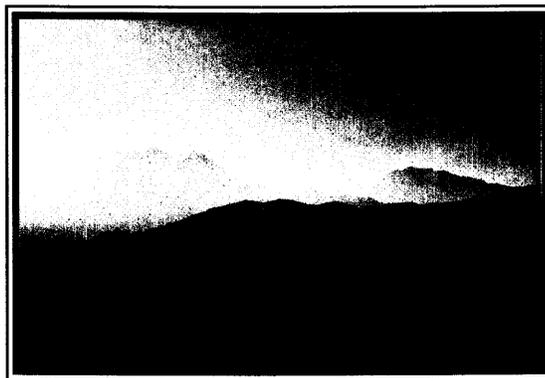
*(Transmitted Electronically)*

Patrick Collins, Ph.D.  
Biologist/Environmental Consultant

Enclosures

*Vegetation Monitoring  
For Phase III Bond Release: Year 2  
at the  
Cottonwood Fan Portal Area  
2008*

*Reclaimed Slope '81  
Reclaimed Slope '98  
and the  
Pinyon-Juniper Reference Area*



*Prepared by*

MT. NEBO SCIENTIFIC, INC.  
330 East 400 South, Suite 6  
P.O. Box 337  
Springville, Utah 84663  
(801) 489-6937

*Patrick D. Collins, Ph.D.*

*for*

ENERGY WEST MINING COMPANY  
P.O. Box 310  
Huntington, Utah 84528



March 2009

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## INTRODUCTION

The purpose of this document is to compare reclaimed areas of a mine site with a “reference area”, or an area chosen previously to represent final revegetation success standards. The content of this report provides **Year 2** results of the two consecutive years of sampling required prior to submittal of an application for bond release by the mine operator through the State of Utah.

Following final reclamation and revegetation of a mine site, a “*responsibility period*” for at least 10 years is required before the mine operator can submit a request for *Final or Phase III Bond Release* through state and federal regulatory authorities. It has been estimated that this period of time is long enough to determine whether or not adequate re-establishment of a given reclaimed plant community has occurred on sites at this precipitation zone in western United States.

Rehabilitated vegetation is usually monitored throughout the responsibility period, but beginning at year 9 of the 10-year period, intensive sampling can be initiated for two consecutive years to determine whether or not the reclaimed site has met pre-determined revegetation success standards. The vegetation of the reclaimed land must meet specific state and federal requirements as specified by the State of Utah, Division of Oil, Gas & Mining (DOG M) and the Department of Interior, Office of Surface Mining (OSM). As dictated by the rules, vegetative cover must be “*diverse, effective and permanent*”. Accordingly, there are often specific requirements associated with cover, density, productivity and diversity of reclaimed lands.

This document provides comparisons for two reclaimed slopes within Energy West's Cottonwood Fan Portal Area – the **Reclaimed Slope '81** and the **Reclaimed Slope '98** – with a native, undisturbed plant community located nearby called the **Pinyon-Juniper Reference Area**.

### General Site Description

The Cottonwood Fan Portal Area is located in Cottonwood Canyon, approximately 12 miles northwest of Orangeville, Utah. Elevation of the study sites ranged between 7,100 ft and 7,600 ft above sea level. Slopes of the study areas were relatively steep at approximately 35 degrees with exposures primarily to the west-southwest.

The descriptive name provided for the "Reclaimed Slope '81" implies the slope's general history – it is a reclaimed slope where the plant communities that once existed in the area were disturbed by previous mining activities, then were reclaimed and re-seeded in 1981.

Prior to disturbance, the native vegetation was most likely dominated by pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*), with Salina wildrye (*Elymus salinus*) as the dominant understory species.

Similarly named, the "Reclaimed Slope '98" was also the site of previous disturbance and was reclaimed and re-seeded in 1998. With similar slopes and exposures as the Reclaimed Slope '81, this area was also likely dominated by the same plant species before it was disturbed by mining

activities.

A Pinyon-Juniper Reference Area was chosen earlier to be used to create standards for revegetation success following final reclamation. The reference area was dominated by the same plant species as those listed above for the reclaimed slopes (before they were disturbed). The reference area was chosen earlier to comply with guidelines by DOGM and was thought to have similar slopes, soils, exposure, species composition, precipitation, elevation and other environmental variables.

## METHODS

Vegetation establishment on the reclaimed slopes has been monitored for several years following slope reclamation. Sampling methods have remained consistent for all monitoring years and follow those methods suggested in guidelines provided by DOGM.

### Transect Placement

Transect lines for quantitative sampling were randomly placed the length of the reclaimed slopes and reference areas to adequately represent each sample area as a whole. From these transect lines, sample locations were chosen using random numbers at right angles to them.

### Cover, Frequency and Composition

Cover estimates were made using ocular methods with meter square quadrats. Species composition and relative frequencies were also assessed from the quadrats. Additional information recorded on the raw data sheets were: estimated precipitation, slope, exposure, grazing use, animal disturbance and other appropriate notes. Plant nomenclature follows "*A Utah Flora*" (Welsh et al. 2003).

### Density

Density estimates for the woody plant species on the reclaimed slopes and reference area were made using a distance method called the point-quarter method. In this method, random points were placed on the sample sites and measured into four quarters. The distances to the nearest woody plant species were then recorded in each quarter. The average point-to-individual distance was equal to the square root of the mean area per individual.

### Production

Total annual biomass production was estimated by clipping, drying and weighing current annual growth in each sample quadrat. "Double sampling" methods were employed by placing four additional quadrats around the clipped quadrat, then estimating the production of them relative to

the clipped plot. Herbaceous and woody species production were recorded separately.

### Sample Adequacy

Sample adequacy for cover and density was attempted with the goal that 90% of the samples were within 10% of the true mean for the plant communities in the area. The following formula was used:

$$nMIN = \frac{t^2 s^2}{(dx)^2}$$

where,

<i>nMIN</i>	= minimum adequate sample
<i>t</i>	= appropriate confidence t-value
<i>s</i>	= standard deviation
<i>x</i>	= sample mean
<i>d</i>	= desired change from mean

### Diversity

Two diversity indices have been reported in this document for the reclaimed area and the reference area. To begin, **MacArthur's Diversity Index** was calculated. This index is an effective diversity measurement and is computed using the equation  $1/\sum pi^2$  (MacArthur and Wilson 1976, *The Theory of Island Biogeography*, Princeton: Princeton University Press). In this equation *pi* is the proportion of sum frequency contributed by the *i*th species in the sample area of concern. The proportional contribution of each species is then squared and the values for all species in the sample areas are summed. This index integrates the number of species and the

degree to which frequency of occurrence was equitably distributed among those species. In other words, this index provides greater weight to those species that are present more often (with greater frequency) than those that are merely “present” in one or two quadrats. The **average number of species** per sample quadrat is another measure of species diversity provided from the data in this report.

### Photographs

Color photographs were taken of the sample areas and are included in this report.

## RESULTS

### Reclaimed Slope '81

Quantitative sampling the vegetation on the Reclaimed Slope '81 in 2008 revealed that the area was dominated by sagebrush (*Artemisia tridentata*), Great Basin wildrye (*Elymus cinereus*), fourwing saltbush (*Atriplex canescens*) and Russian wildrye (*Elymus junceus*). For a list of all plant species present in sample quadrats along with their cover and frequency values, refer to Table 1.

The total living cover of this reclaimed slope was estimated at 49.30% (Table 2-A). Of that living

cover, shrubs comprised 55.33% of it, grasses 35.93% and forbs 8.74% (Table 2-B). The total woody species density was estimated at 4,334 individuals per acre and was dominated by sagebrush, rubber rabbitbrush and fourwing saltbush (Table 3). Total annual biomass production of the slope was estimated to be 495.27 pounds per acre, with 270.23 pounds coming from herbaceous species and 225.03 pounds from woody plants (Table 4).

### Reclaimed Slope '98

The Reclaimed Slope '98 was dominated by Gt. Basin wildrye, Pacific aster (*Aster ascendens*), western wheatgrass (*Elymus smithii*), Lewis flax (*Linum perenne* ssp. *lewisii*) and fourwing saltbush. For a list of the plant species present in sample quadrats along with their cover and frequency values, refer to Table 5.

The total living cover for this reclaimed slope was estimated to be 43.30% (Table 6-A). The composition of the cover by lifeform was 42.53% grasses, 37.41% forbs and 20.05% shrubs (Table 6-B). Woody species density in this area consisted of 2,205 individuals per acre with the dominants for this parameter consisting of fourwing saltbush, rubber rabbitbrush sagebrush (Table 7). Productivity for the slope estimated at 349.66 pounds per acre with 278.20 pounds coming from herbaceous and 71.46 pounds from woody species (Table 8).

### Pinyon-Juniper Reference Area

The reference area chosen earlier to be used for final revegetation success standards was located up-slope from the two reclaimed slopes in an undisturbed pinyon-juniper plant community. This community was also sampled during the same period to enable the results to be compared to the results of the reclaimed slopes.

Overstory cover of the reference area was estimated at 6.90%, all from pinyon pine (*Pinus edulis*). The understory living cover was dominated by Salina wildrye, pinyon pine, and Mormon tea (*Ephedra viridis*). For a cover and frequency listing of all species present in the sample quadrats refer to Table 9.

The total living cover of the Pinyon-Juniper Reference Area was estimated at 35.40%, of which 28.50% was from understory cover and 6.90% from overstory (Table 10-A). The composition of this cover consisted of 55.02% grasses, 42.25% shrubs and 2.73% forbs (Table 10-B). Woody species density of this area consisted of 1,235 individuals per acre with the most common plants for this parameter consisting of pinyon-pine, Mormon tea and rubber rabbitbrush (Table 11). Total annual biomass production was estimated at 196.19 pounds per acre, or 117.17 pounds from herbaceous plants and 79.02 pounds from woody species (Table 12).

## DISCUSSION

Statistical tests on the mean living covers, densities and productivity measurements were employed to compare the reclaimed slopes with the reference area. Additionally, diversity indices of all areas were also calculated so that comparisons of these parameters could also be made.

### Reclaimed Slope '81 vs. Reference Area

When a Student's t-test analysis was employed to compare the mean total living **cover** of the Reclaimed Slope '81 with the Pinyon-Juniper Reference Area, the test suggested that the reclaimed slope was significantly greater than the reference area (Table 13-A). Moreover, when woody species **density** of the two areas were compared by the same statistical analysis, results here also suggested that the number of woody plants per acre for the reclaimed slope was greater than that of the reference area (Table 13-A). Next, the mean total annual biomass **production** of the two areas were compared and results were consistent – the reclaimed slope had more the 2.5 times the production of the reference area. This difference was, of course, statistically significant (Table 13-A). Finally, two **diversity** indices, *MacArthur's Index* and the *Average Number of Species per Quadrat* of the two areas were compared. In 2008, the MacArthur's Index of the reclaimed slope was higher than the reference area; the Average Number of Species per Quadrat was also greater for the reclaimed slope (Table 14).

Lifeform composition of the understory was calculated and shown on the aforementioned summary tables.

#### Reclaimed Slope '98 vs. Reference Area

When the total living **cover** of the Reclaimed Slope '98 was compared with the cover of the Pinyon-Juniper Reference Area, Student's t-test suggested that the difference was significant – or the total living cover of the reclaimed slope was significantly greater than the reference area (Table 13-B). Woody species **density** was also compared of these two areas with the same results – the density of the reclaimed slope was greater (Table 13-B). **Production** of the Reclaimed Slope '98 was also significantly greater than the Pinyon-Juniper Reference Area according to a t-test (Table 13-B). Finally, when **diversity** indices were compared between the reclaimed slope and reference area, both diversity indices used were greater for the reclaimed slope (Table 14).

## SUMMARY

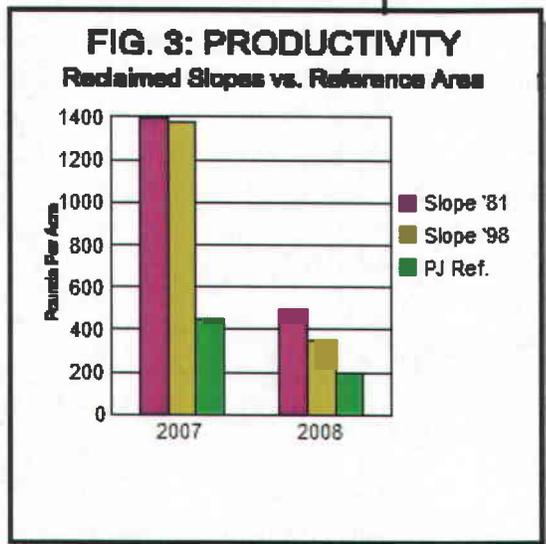
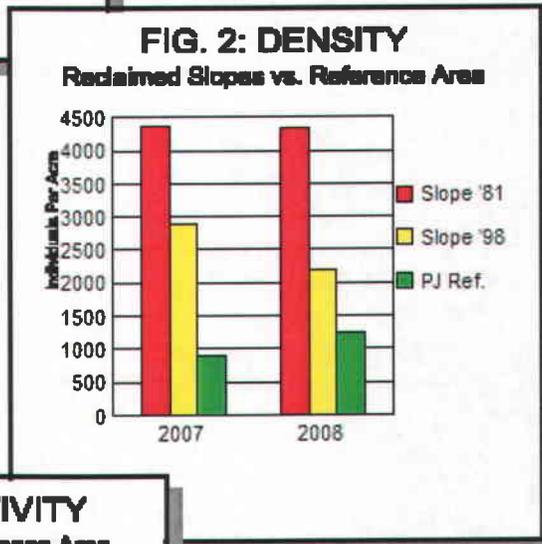
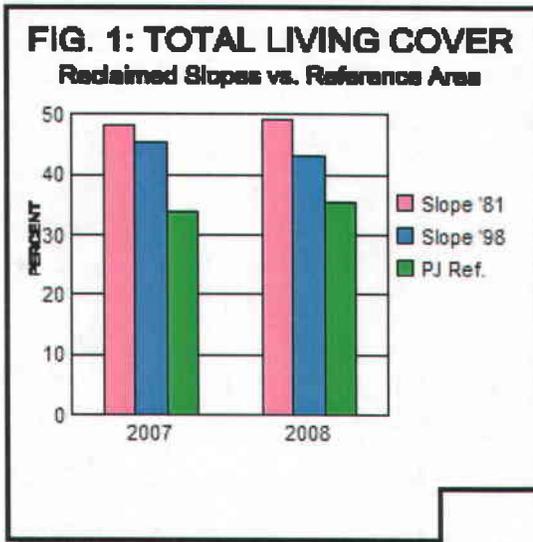
Quantitative sampling was conducted in three different plant communities at the Cottonwood Fan Portal Area in Cottonwood Canyon, Emery County, Utah. The sampling was conducted to provide Year 2 of two consecutive sample years required prior to submittal of an application for Phase III Bond Release of reclaimed areas at a coal mine site. A report was prepared and

submitted previously to Energy West that showed the sample results for the Year 1 sample period. Figures have been prepared for this section to show the data results graphically. Even though the scope of this document was intended to report Year 2 sample results, *the figures were prepared to include both Year 1 (2007) and Year 2 (2008) summaries for a comparison of both sample periods.*

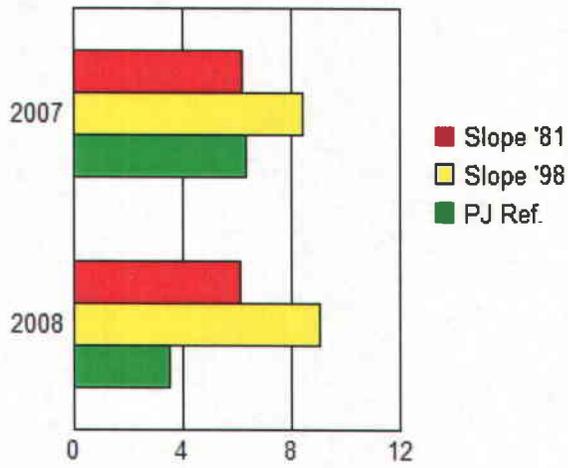
The reclaimed areas studied in 2007 and 2008 were the Reclaimed Slope '81 and Reclaimed Slope '98. The data from these restored plant communities have been compared to a Pinyon-Juniper Reference Area, or an area chosen previously to be used to provide revegetation success standards following final reclamation.

Statistical comparisons and other indices for the 2008 datasets (as well as 2007 reported in a previously mentioned document) suggest that the reclaimed areas in the Cottonwood Fan Portal Area have met or exceeded those standards that were pre-determined to be used at the time of final reclamation. The parameters of the reclaimed areas that were compared statistically with the reference area were: total living cover, woody species density and annual biomass production. Other parameters that can be compared by a review of the summary tables include: cover by individual plant species and lifeform composition. Finally, diversity of the reclaimed slopes was greater (or nearly equal to) than that of the reference area.

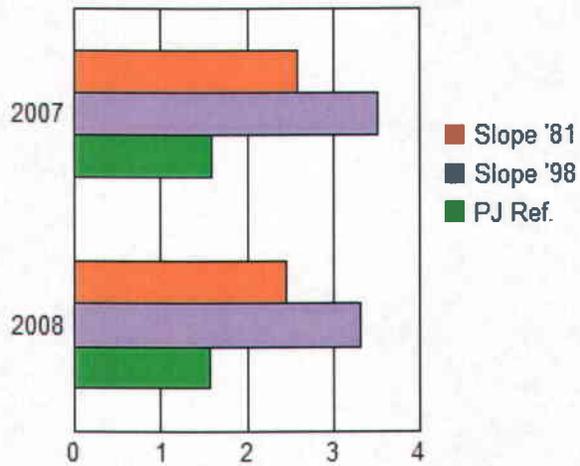
## FIGURES



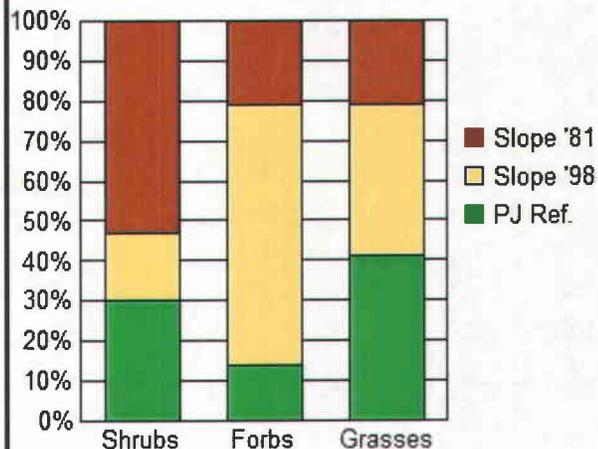
**FIG. 4: DIVERSITY**  
**MacArthur's Index**



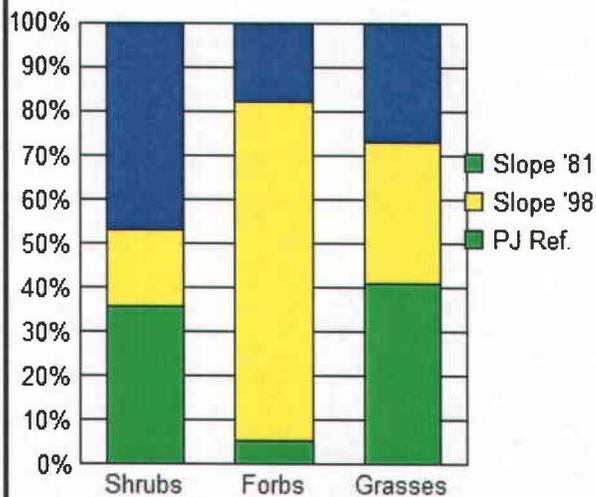
**FIG. 5: DIVERSITY**  
**Number Species Per Quadrat**



**FIG. 6: COMPOSITION  
2007**



**FIG. 7: COMPOSITION  
2008**



## DATA SUMMARY TABLES

### Reclaimed Slope '81

**Table 1: Cover and frequency by plant species at the Cottonwood Fan Portal area (2008).**

<i>Reclaimed Slope '81</i>	MEAN	STD. DEV.	FREQUENCY
<b>SHRUBS</b>			
<i>Artemisia nova</i>	0.70	4.90	2.00
<i>Artemisia tridentata</i>	16.40	17.38	62.00
<i>Atriplex canescens</i>	6.10	15.47	18.00
<i>Atriplex confertifolia</i>	0.70	3.47	4.00
<i>Chrysothamnus nauseosus</i>	2.90	5.84	22.00
<i>Gutierrezia sarothrae</i>	0.40	2.80	2.00
<b>FORBS</b>			
<i>Aster foliaceus</i>	4.50	9.76	20.00
<b>GRASSES</b>			
<i>Agropyron cristatum</i>	0.80	3.22	8.00
<i>Bromus carinatus</i>	0.66	2.08	10.00
<i>Elymus cinereus</i>	10.44	13.28	54.00
<i>Elymus junceus</i>	5.60	8.40	42.00
<i>Stipa hymenoides</i>	0.10	0.70	2.00

**Table 2: Total cover and composition at the Cottonwood Fan Portal area (2008).**

### *Reclaimed Slope '81*

	MEAN	STD. DEV.
<b>A. COVER</b>		
Total Living Cover	49.30	11.71
Litter	14.30	6.17
Bareground	13.40	6.04
Rock	23.00	13.11
<b>B. % COMPOSITION</b>		
Shrubs	55.33	32.74
Forbs	8.74	19.19
Grasses	35.93	27.44

**Table 3: Woody species density at the Cottonwood Fan Portal area (2008).**

<i>Reclaimed Slope ' 81</i>	<b>No/Ac</b>
<i>Artemisia nova</i>	126.39
<i>Artemisia tridentata</i>	2491.77
<i>Atriplex canescens</i>	487.52
<i>Atriplex confertifolia</i>	90.28
<i>Chrysothamnus nauseosus</i>	920.87
<i>Chrysothamnus viscidiflorus</i>	54.17
<i>Ephedra viridis</i>	90.28
<i>Gutierrezia sarothrae</i>	72.23
<b>TOTAL</b>	<b>4333.52</b>

**Table 4: Production at the Cottonwood Fan Portal area (2008).**

<i>Reclaimed Slope ' 81</i>	<b>Pounds/Acre</b>	
LIFEFORM	Mean	Std. Dev.
Herbaceous	270.23	201.82
Woody	225.03	204.52
<b>TOTAL</b>	<b>495.27</b>	<b>212.29</b>

Reclaimed Slope ' 98

**Table 5: Cover and frequency by plant species at the Cottonwood Fan Portal area (2008).**

Reclaimed Slope ' 98			
	MEAN	STD. DEV.	FREQUENCY
<b>SHRUBS</b>			
<i>Artemisia tridentata</i>	2.14	5.14	18.00
<i>Atriplex canescens</i>	5.30	9.97	30.00
<i>Chrysothamnus nauseosus</i>	1.40	4.48	12.00
<i>Rosa woodsii</i>	0.40	1.69	6.00
<b>FORBS</b>			
<i>Achillea millefolium</i>	0.20	1.40	2.00
<i>Aster ascendens</i>	7.60	10.01	56.00
<i>Hedysarum boreale</i>	0.10	0.70	2.00
<i>Linum lewisii</i>	7.36	9.28	56.00
<i>Melilotus officinalis</i>	0.30	1.19	6.00
<i>Penstemon palmeri</i>	0.20	1.40	2.00
<b>GRASSES</b>			
<i>Agropyron cristatum</i>	0.20	1.40	2.00
<i>Bromus tectorum</i>	0.20	1.40	2.00
<i>Dactylis glomeratus</i>	0.50	2.50	4.00
<i>Elymus cinereus</i>	7.80	10.40	50.00
<i>Elymus lanceolatus</i>	2.90	5.39	28.00
<i>Elymus smithii</i>	3.60	7.35	28.00
<i>Elymus spicatus</i>	1.50	4.27	14.00
<i>Poa pratensis</i>	0.10	0.70	2.00
<i>Stipa hymenoides</i>	1.50	4.92	12.00

**Table 6: Total cover and composition at the Cottonwood Fan Portal area (2008).**

Reclaimed Slope ' 98

A. COVER	MEAN	STD. DEV.
Total Living Cover	43.30	8.22
Litter	15.60	8.22
Bareground	19.00	8.25
Rock	22.10	9.06
<b>B. % COMPOSITION</b>		
Shrubs	20.05	22.24
Forbs	37.41	32.81
Grasses	42.53	27.88

**Table 7: Woody species density at the Cottonwood Fan Portal area (2008).**

<i>Reclaimed Slope ' 08</i>	<b>No/Ac</b>
<i>Amelanchier utahensis</i>	6.13
<i>Artemisia nova</i>	24.50
<i>Artemisia tridentata</i>	630.95
<i>Atriplex canescens</i>	918.87
<i>Atriplex confertifolia</i>	12.25
<i>Chrysothamnus nauseosus</i>	557.45
<i>Eriogonum corymbosum</i>	12.25
<i>Gutierrezia sarothrae</i>	6.13
<i>Pinus edulis</i>	6.13
<i>Rosa woodsii</i>	30.63
<b>TOTAL</b>	<b>2205.28</b>

**Table 8: Production at the Cottonwood Fan Portal area (2008).**

<i>Reclaimed Slope ' 08</i>	<b>Pounds/Acre</b>	
	Mean	Std. Dev.
<b>LIFEFORM</b>		
Herbaceous	278.20	191.61
Woody	74.46	139.17
<b>TOTAL</b>	<b>349.66</b>	<b>172.91</b>

Pinyon-Juniper Reference Area

**Table 9: Cover and frequency by plant species at the Cottonwood Fan Portal area.**

Pinyon-Juniper Reference Area			
	MEAN	STD. DEV.	FREQUENCY
<b>OVERSTORY</b>			
<i>Pinus edulis</i>	6.90	11.87	30.00
<b>UNDERSTORY</b>			
<b>TREES/SHRUBS</b>			
<i>Amelanchier utahensis</i>	0.60	3.10	4.00
<i>Atriplex confertifolia</i>	0.50	3.50	2.00
<i>Chrysothamnus nauseosus</i>	1.16	4.12	8.00
<i>Ephedra viridis</i>	4.10	10.18	16.00
<i>Juniperus osteosperma</i>	0.90	4.44	6.00
<i>Pinus edulis</i>	5.80	10.93	26.00
<b>FORBS</b>			
<i>Cryptantha sp.</i>	0.34	1.37	6.00
<i>Descurainia pinnata</i>	0.16	1.12	2.00
<i>Stanleya pinnata</i>	0.10	0.70	2.00
<b>GRASSES</b>			
<i>Elymus salinus</i>	13.58	11.49	76.00
<i>Stipa hymenoides</i>	1.26	5.31	8.00

**Table 10: Total cover and composition at the Cottonwood Fan Portal area.**

Pinyon-Juniper Reference Area

<b>A. COVER</b>	MEAN	STD. DEV.
Overstory (O)	6.90	11.87
Understory (U)	28.50	10.01
Litter	27.50	18.95
Bareground	16.36	10.91
Rock	27.64	14.08
O + U	35.40	8.36
<b>B. % COMPOSITION</b>		
Shrubs	42.25	41.84
Forbs	2.73	9.41
Grasses	55.02	40.41

**Table 11: Woody species density at the Cottonwood Fan Portal area (2008).**

<i>Pinyon-Juniper Reference Area</i>	
	No/Ac
<i>Amelanchier utahensis</i>	30.87
<i>Atriplex confertifolia</i>	30.87
<i>Cercocarpus montanus</i>	43.22
<i>Chrysothamnus nauseosus</i>	166.69
<i>Ephedra viridis</i>	401.29
<i>Eriogonum corymbosum</i>	6.17
<i>Juniperus osteosperma</i>	55.56
<i>Pinus edulis</i>	500.07
<b>TOTAL</b>	<b>1234.74</b>

**Table 12: Production at the Cottonwood Fan Portal area.**

<i>Pinyon-Juniper Reference Area</i>		
LIFEFORM	Pounds/Acre	
	MEAN	STD. DEV.
Herbaceous	117.17	99.42
Woody	79.02	122.90
<b>TOTAL</b>	<b>196.19</b>	<b>94.00</b>

**TABLE 13:** Statistical summary sheet for the reclaimed slopes and reference area at the Cottonwood Fan Portal Area (2008).

<b>A.</b>				
<b>RECLAIMED '81 SLOPE</b>				
Total Living Cover	$\bar{x}$ =49.30	s=11.71	n=50	nMIN=15.53
Density	$\bar{x}$ =4333.52	s=1844.77	n=60	nMIN=47.30
Production	$\bar{x}$ =495.27	s=212.29	n=60	nMIN=49.72
<b>P-J REFERENCE AREA</b>				
Total Living Cover	$\bar{x}$ =35.40	s=8.36	n=50	nMIN=15.09
Density	$\bar{x}$ =1234.74	s=379.04	n=50	nMIN=25.50
Production	$\bar{x}$ =196.19	s=94.00	n=80	nMIN=62.12
<b>STATISTICAL ANALYSES</b>				
Total Living Cover	t=6.831	df=98	SL=p<.001	
Density	t=11.666	df=108	SL=p<.001	
Production	t=11.228	df=138	SL=p<.001	
<b>B.</b>				
<b>RECLAIMED '98 SLOPE</b>				
Total Living Cover	$\bar{x}$ =43.40	s=8.22	n=50	nMIN=9.75
Density	$\bar{x}$ =2205.28	s=1105.79	n=90	nMIN=68.04
Production	$\bar{x}$ =349.66	s=172.91	n=80	nMIN=66.17
<b>P-J REFERENCE AREA</b>				
Total Living Cover	$\bar{x}$ =35.40	s=8.36	n=50	nMIN=15.09
Density	$\bar{x}$ =1234.74	s=379.04	n=50	nMIN=25.50
Production	$\bar{x}$ =196.19	s=94.00	n=80	nMIN=62.12
<b>STATISTICAL ANALYSES</b>				
Total Living Cover	t=4.825	df=98	SL=p<.001	
Density	t=6.005	df=138	SL=p<.001	
Production	t=6.975	df=158	SL=p<.001	

$\bar{x}$  = sample mean, s = sample standard deviation, n = sample size,  
nMIN= minimum adequate sample (@ 90% ± .10)  
NS = non-significant, t = Student's t-value, df = degrees of freedom,  
SL = significance level, p = probability level

TABLE 14: Diversity of the Cottonwood Fan Portal Area (2008).

---

**A.**

**MacArthur's Index** ( $1/\sum p_i^2$ ) =

Reclaimed Slope '81: 6.098

Reclaimed Slope '98: 9.064

P-J Reference Area: 3.509

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**B.**

**Average No. Species/Quadrat** =

Reclaimed Slope '81: 2.46

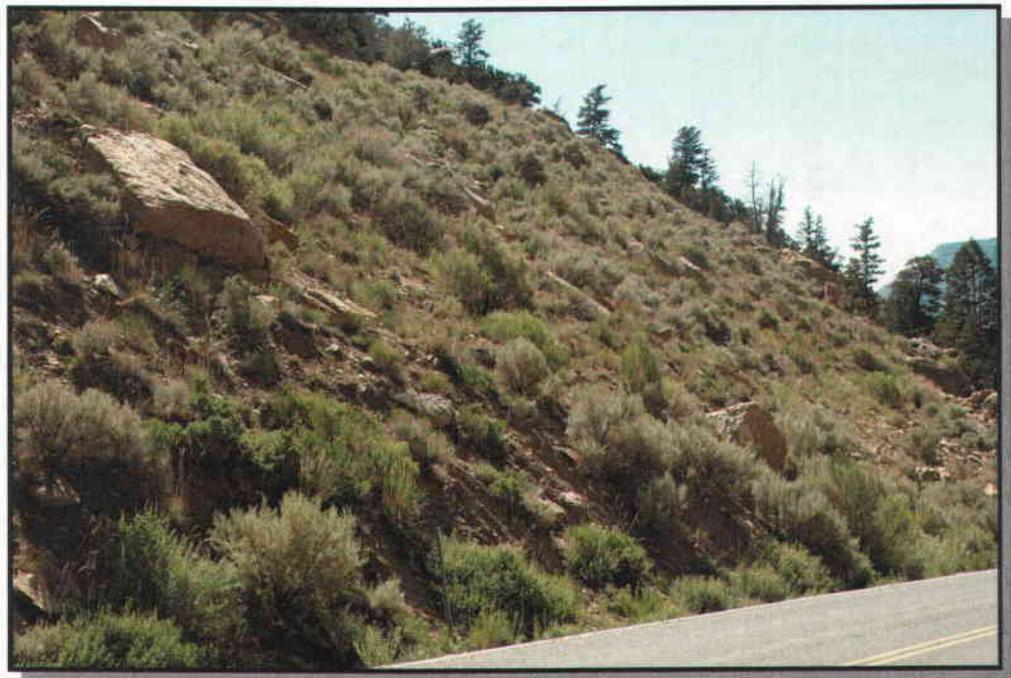
Reclaimed Slope '98: 3.32

P-J Reference Area: 1.56

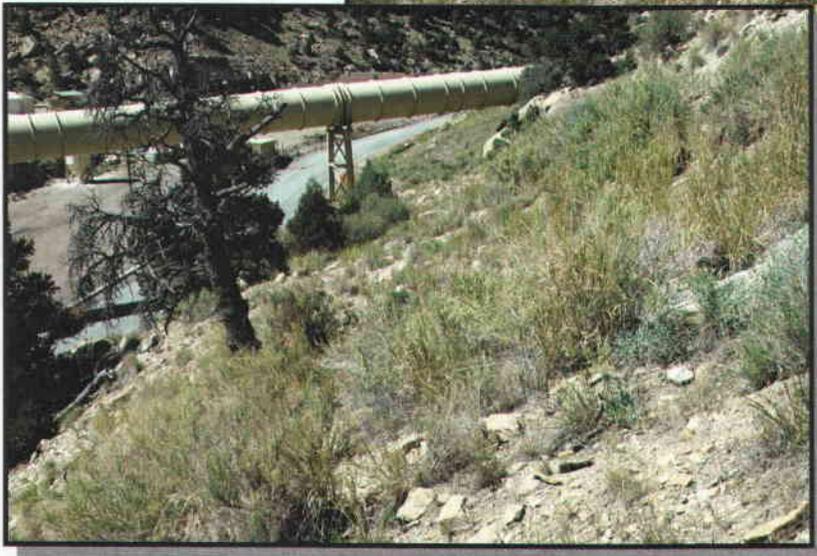
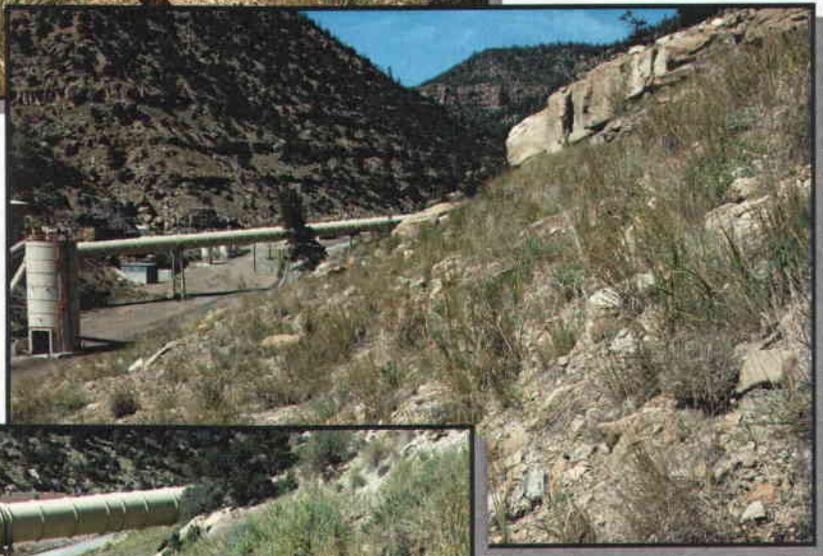
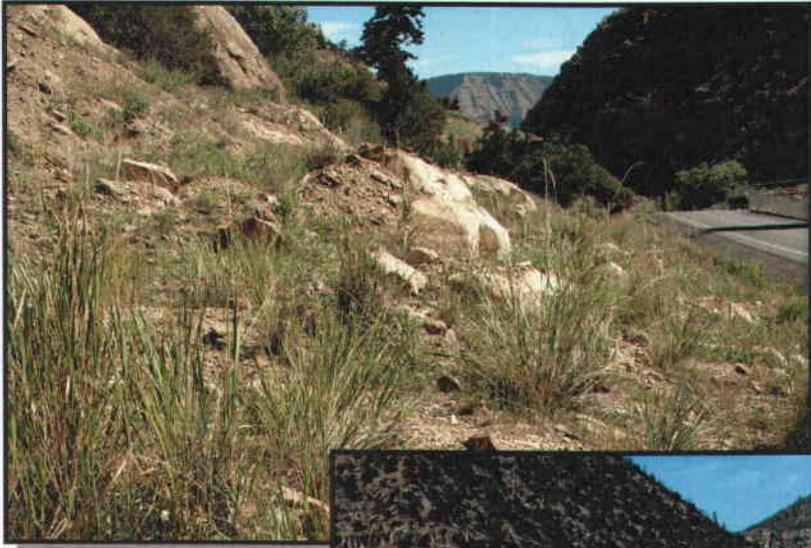
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COLOR PHOTOGRAPHS  
OF THE  
SAMPLE AREAS

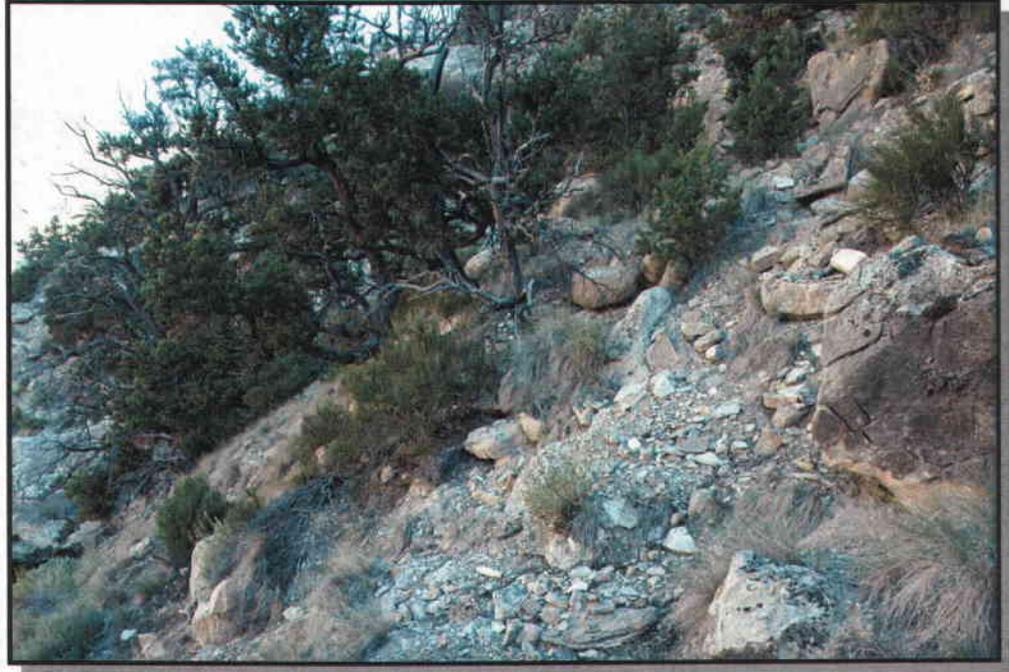
RECLAIMED SLOPE '81



# RECLAIMED SLOPE '98



PINYON-JUNIPER REFERENCE AREA



**Vegetation Monitoring  
For Phase III Bond Release: Year 1  
for the  
Deer Creek Mine  
2008**

**9<sup>th</sup> East Portal Areas &  
Pinyon-Juniper Reference Area  
Located in the  
Cottonwood Mine Area**



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**April 2009**

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## INTRODUCTION

This document provides quantitative data comparisons of a *reclaimed area* that was previous disturbed by coal mining activities and a *reference area* that was chosen previously to represent revegetation success standards at the time of final reclamation. Even though the sites are located near Cottonwood Mine, the reclaimed site is associated with the Deer Creek Mine, located approximately 2.5 air-miles northward. In this document the study sites are called the **Reclaimed 9<sup>th</sup> East Portal Area** and the **Pinyon-Juniper Reference Area** (see Photographs).

The purpose of this document was to compare a reclaimed area of a mine site with specific pre-determined standards for revegetation success. The content of this report provides **Year 1** results of the two consecutive years of sampling required prior to submittal of an application for bond release by the mine operator through the State of Utah, Division of Oil, Gas & Mining (DOGGM).

Following final reclamation and revegetation of a mine site, a "*responsibility period*" for at least 10 years is required before the mine operator can submit a request for *Final or Phase III Bond Release* through state and federal regulatory authorities. It has been estimated that this period of time is long enough to determine whether or not adequate re-establishment of a given reclaimed plant community has occurred on sites at this precipitation zone in western United States.

Rehabilitated vegetation is usually monitored throughout the responsibility period, but beginning at year 9 of the 10-year period, intensive sampling can be initiated for two consecutive years to

determine whether or not the reclaimed site has met pre-determined revegetation success standards. The vegetation of the reclaimed land must meet specific state and federal requirements. As dictated by the regulations, vegetative cover must be “*diverse, effective and permanent*”. Accordingly, there are often specific requirements associated with cover, density, productivity and diversity of reclaimed lands.

### General Site Description

The Cottonwood Mine Area is located in Emery County, Utah approximately 7 air-miles northwest of the town of Orangeville. Elevation of the study sites ranged between 7,400 ft and 7,800 ft above sea level.

Prior to disturbance, the reclaimed area was most likely dominated by pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*), with Salina wildrye (*Elymus salinus*) as the dominant understory species.

A Pinyon-Juniper Reference Area at the Cottonwood Mine site was chosen earlier to be used to create standards for revegetation success following final reclamation. The reference area was dominated by the same plant species as those listed above for the reclaimed area (before it was disturbed). The reference area was chosen earlier to comply with guidelines by DOGM and was thought to have similar slopes, soils, exposure, species composition, precipitation, elevation and other environmental variables.

## METHODS

Vegetation establishment on the reclaimed area has been monitored for several years following reclamation. Sampling methods have remained consistent for all monitoring years and follow those methods suggested in guidelines provided by DOGM.

### Transect Placement

Transect lines for quantitative sampling were randomly placed the length of the reclaimed area and reference areas in an attempt to adequately represent each sample area as a whole. From these transect lines, sample locations were chosen using random numbers at right angles to them.

### Cover, Frequency and Composition

Cover estimates were made using ocular methods with meter square quadrats. Species composition and relative frequencies were also assessed from the quadrats. Additional information recorded on the raw data sheets were: estimated precipitation, slope, exposure, grazing use, animal disturbance and other appropriate notes. Plant nomenclature follows "*Utah Flora*" (Welsh et al. 2003).

## Density

Density estimates for the woody plant species on the reclaimed and reference areas were made using a distance method called the point-quarter method. In this method, random points were placed on the sample sites and measured into four quarters. The distances to the nearest woody plant species were then recorded in each quarter. The average point-to-individual distance was equal to the square root of the mean area per individual.

## Production

Total annual biomass production was estimated by clipping, drying and weighing current annual growth in each sample quadrat. "Double sampling" methods were employed by placing four additional quadrats around the clipped quadrat, then estimating the production of them relative to the clipped plot. Herbaceous and woody species production were recorded separately.

## Sample Adequacy

Sample adequacy for cover and density was attempted with the goal that 90% of the samples were within 10% of the true mean for the plant communities in the area. The following formula was used:

$$nMIN = \frac{t^2 s^2}{(dx)^2}$$

where,

*nMIN* = minimum adequate sample  
 t = appropriate confidence t-value  
 s = standard deviation  
 x = sample mean  
 d = desired change from mean

## Diversity

Two diversity indices have been reported in this document for the reclaimed area and the reference area. To begin, *MacArthur's Diversity Index* was calculated. This index is an effective diversity measurement and is computed using the equation  $1/\sum pi^2$  (MacArthur and Wilson 1976, *The Theory of Island Biogeography*, Princeton: Princeton University Press). In this equation *pi* is the proportion of sum frequency contributed by the *i*th species in the sample area of concern. The proportional contribution of each species is then squared and the values for all species in the sample areas are summed. This index integrates the number of species and the degree to which frequency of occurrence was equitably distributed among those species. In other words, this index provides greater weight to those species that are present more often (with greater frequency) than those that are merely "present" in one or two quadrats. The *average number of species* per sample quadrat is another measure of species diversity provided from the data in this report.

## Photographs

Color photographs were taken of the sample areas and are included in this report.

## RESULTS

### Reclaimed 9<sup>th</sup> East Portal Area

This reclaimed area was dominated by the following plant species: sagebrush (*Artemisia tridentata*), Pacific aster (*Aster chilensis*), fourwing saltbush (*Atriplex canescens*) and thickspike wheatgrass (*Elymus lanceolatus*). All species present in the sample quadrats along with their cover and frequency values are shown on Table 1.

The total living cover of this reclaimed area was estimated at 47.50% (Table 2-B). Of this cover, shrubs comprised 42.03%, grasses 34.77% and forbs 23.20% (Table 2-B).

Woody species density totaled 4,154 plants per acre (Table 3) and was dominated by sagebrush, shadscale (*Atriplex confertifolia*), fourwing saltbush and rabbitbrush (*Chrysothamnus nauseosus*).

The total annual biomass productivity of the area was estimated at 407.84 pounds per acre, of which was divided into herbaceous (217.01 lbs/ac) and woody plants (190.83 lbs/ac).

Productivity measurements are shown on Table 4.

## Pinyon-Juniper Reference Area

The reference area chosen earlier to be used for final revegetation success standards was an undisturbed pinyon-juniper plant community. This community was also sampled during the same period to enable the results to be compared to the results of the reclaimed slopes.

Overstory cover of the reference area was comprised of Utah serviceberry (*Amelanchier utahensis*), Utah juniper (*Juniperus osteosperma*), pinyon-pine (*Pinus edulis*) and white fir (*Abies concolor*). The understory living cover had many species present, but was dominated by Salina wildrye (*Elymus salinus*) by a rather wide margin. For a cover and frequency listing of all species present in the sample quadrats refer to Table 5.

The total living cover of the Pinyon-Juniper Reference Area was estimated at 33.00%, of which 28.00% was from understory cover and 5.00% from overstory (Table 6-A). The composition of this cover consisted of 59.52% grasses, 30.51% shrubs and 9.97% forbs (Table 6-B).

Woody species density of this area consisted of 1,106 individuals per acre with the most common plants for this parameter consisting of Utah serviceberry and pinyon-pine (Table 7).

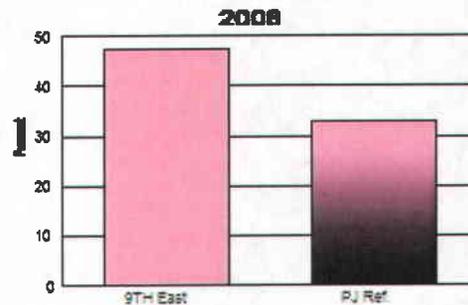
Total annual biomass production was estimated at 302.02 pounds per acre, or 151.55 pounds from herbaceous plants and 150.47 pounds from woody species (Table 8).

## DISCUSSION & SUMMARY

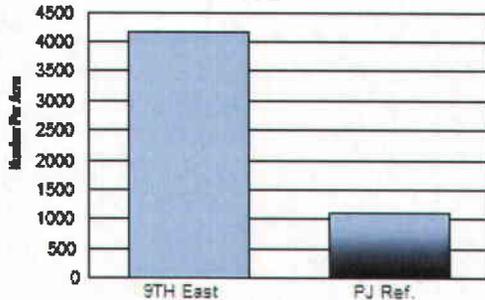
Statistical analyses (Student's t-tests) suggest that the reclaimed 9<sup>th</sup> East Portal Area had significantly higher total living cover, woody species density and biomass productivity when compared to the Pinyon-Juniper Reference Area

(Table 9). These parameters have been shown graphically. Figure 1 shows the **total living covers**

**Fig. 1: Total Living Cover**



**Fig. 2: Woody Species Density**



of for the 9<sup>th</sup> East Portal area and the Pinyon-Juniper Reference Area. Figure 2 compares the **woody**

**species densities** of these two areas, whereas Figure 3 shows the **productivity** values. Additionally, two

diversity indices were calculated from the quantitative data. Figure 4 suggests that the

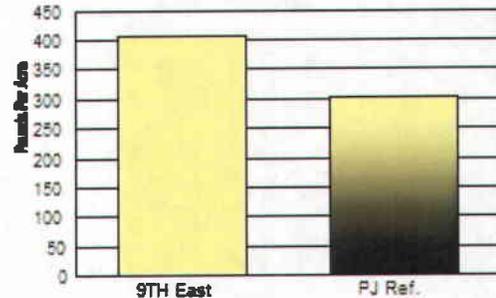
reclaimed area is more diverse than the reference

area using MacArthur's Index. Finally, diversity measured by the average number of species

found in each quadrat (Figure 5) also suggests that the

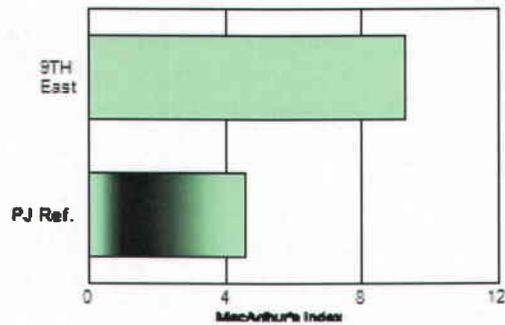
reclaimed area was more diverse.

**Fig. 3: Biomass Production**

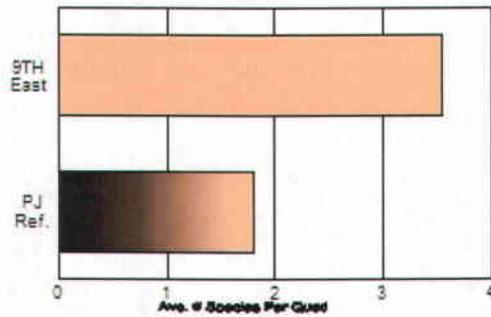


Results from quantitative sampling the vegetation of the reclaimed and reference areas suggest that revegetation of the site is proceeding well in Year 1 of the two consecutive sample years required for final bond release through the State of Utah.

**Fig. 4: Diversity 2008**



**Fig. 5: Diversity 2008**



## DATA SUMMARY TABLES

**Table 1: Cover and frequency by plant species (2008).**

<b>9<sup>th</sup> East Portals of Grimes Wash</b>			
	<b>MEAN</b>	<b>STD. DEV.</b>	<b>FREQUENCY</b>
<b>TREES &amp; SHRUBS</b>			
<i>Artemisia tridentata</i>	12.25	12.23	70.00
<i>Atriplex canescens</i>	5.00	8.94	27.50
<i>Atriplex confertifolia</i>	1.68	6.10	10.00
<i>Chrysothamnus nauseosus</i>	1.50	4.77	12.50
<i>Cercocarpus ledifolius</i>	0.13	0.78	2.50
<b>FORBS</b>			
<i>Linum lewisii</i>	1.25	2.90	17.50
<i>Aster chilensis</i>	9.18	10.76	60.00
<i>Penstemon palmeri</i>	0.25	1.56	2.50
<i>Hedysarum boreale</i>	0.45	1.63	7.50
<b>GRASSES</b>			
<i>Bromus carinatus</i>	0.25	1.56	2.50
<i>Poa secunda</i>	1.38	3.71	12.50
<i>Elymus spicatus</i>	2.33	4.93	20.00
<i>Elymus salinus</i>	2.50	5.36	22.50
<i>Elymus lanceolatus</i>	4.75	6.80	45.00
<i>Elymus smithii</i>	2.00	4.15	20.00
<i>Stipa hymenoides</i>	1.38	3.53	15.00
<i>Elymus trachycaulus</i>	0.63	3.90	2.50
<i>Elymus cinereus</i>	0.63	3.20	5.00

**Table 2: Total cover and composition (2008).**

**9<sup>th</sup> East Portals of Grimes Wash**

	<b>MEAN</b>	<b>STD. DEV.</b>
<b>A. COVER</b>		
Total Living Cover	47.50	11.35
Litter	15.63	6.04
Bareground	11.38	5.00
Rock	25.50	10.59
<b>B. % COMPOSITION</b>		
Shrubs	42.03	25.85
Forbs	23.20	24.15
Grasses	34.77	21.51

**Table 3: Woody species density (2008).**

<b>9<sup>th</sup> East Portals of Grimes Wash</b>	<b>Number/Acre</b>
<i>Artemisia tridentata</i>	2873.28
<i>Atriplex canescens</i>	346.18
<i>Atriplex confertifolia</i>	346.18
<i>Cercocarpus ledifolius</i>	51.93
<i>Chrysothamnus nauseosus</i>	328.87
<i>Eriogonum corymbosum</i>	155.78
<i>Gutierrezia sarothrae</i>	51.93
<b>TOTAL</b>	<b>4154.14</b>

**Table 4: Production (2008).**

<b>9<sup>th</sup> East Portals of Grimes Wash</b>	<b>Pounds/Acre</b>	
	<b>MEAN</b>	<b>STD. DEV.</b>
<b>LIFEFORM</b>		
Herbaceous	217.01	185.20
Woody	190.83	206.81
<b>TOTAL</b>	<b>407.84</b>	<b>187.72</b>

**Table 5: Cover and frequency by plant species (2008).**

<b>Pinyon-Juniper Reference Area</b>			
	<b>MEAN</b>	<b>STD. DEV.</b>	<b>FREQUENCY</b>
<b>OVERSTORY</b>			
<b>TREES &amp; SHRUBS</b>			
<i>Abies concolor</i>	0.50	3.12	2.50
<i>Amelanchier utahensis</i>	2.13	7.49	7.50
<i>Juniperus osteosperma</i>	1.25	5.45	5.00
<i>Pinus edulis</i>	1.13	4.94	5.00
<b>UNDERSTORY</b>			
<b>TREES &amp; SHRUBS</b>			
<i>Abies concolor</i>	1.00	4.36	5.00
<i>Amelanchier utahensis</i>	2.88	7.49	17.50
<i>Artemisia tridentata</i>	0.50	3.12	2.50
<i>Chrysothamnus nauseosus</i>	0.13	0.78	2.50
<i>Eriogonum corymbosum</i>	0.50	3.12	2.50
<i>Gutierrezia sarothrae</i>	0.70	2.80	7.50
<i>Juniperus osteosperma</i>	0.88	3.52	7.50
<i>Pinus edulis</i>	1.88	5.56	12.50
<b>FORBS</b>			
<i>Galium bifolium</i>	0.13	0.78	2.50
<i>Hedysarum occidentale canone</i>	2.63	5.74	22.50
<i>Machaeranthera grindelioides</i>	0.25	1.09	5.00
<b>GRASSES</b>			
<i>Elymus salinus</i>	14.50	12.03	75.00
<i>Stipa hymenoides</i>	2.05	5.42	17.50

**Table 6: Total cover and composition (2008).**

**Pinyon-Juniper Reference Area**

	<b>MEAN</b>	<b>STD. DEV.</b>
<b>A. COVER</b>		
Overstory (o)	5.00	10.12
Understory (u)	28.00	8.65
Litter	12.25	8.87
Bareground	9.88	6.17
Rock	49.88	13.58
o + u	33.00	7.65
<b>B. % COMPOSITION</b>		
Shrubs	30.51	35.92
Forbs	9.97	18.01
Grasses	59.52	34.73

**Table 7: Woody species density (2008).**

<b>Pinyon-Juniper Reference Area</b>	<b>Number/Acre</b>
<i>Abies concolor</i>	23.05
<i>Amelanchier utahensis</i>	378.05
<i>Artemisia tridentata</i>	4.61
<i>Atriplex confertifolia</i>	9.22
<i>Chrysothamnus nauseosus</i>	101.43
<i>Ephedra viridis</i>	13.83
<i>Eriogonum corymbosum</i>	50.71
<i>Gutierrezia sarothrae</i>	106.04
<i>Juniperus osteosperma</i>	92.21
<i>Pinus edulis</i>	272.01
<i>Pseudotsuga menziesii</i>	55.32
<b>TOTAL</b>	<b>1106.47</b>

**Table 8: Production (2008).**

<b>LIFEFORM</b>	<b>Pounds/Acre</b>	
	<b>MEAN</b>	<b>STD. DEV.</b>
Herbaceous	151.55	102.45
Woody	150.47	214.55
<b>TOTAL</b>	<b>302.02</b>	<b>162.40</b>

**TABLE 9:** Statistical summary sheet for the reclaimed and reference areas (2008).

**RECLAIMED 9<sup>th</sup> East Portal Area**

Total Living Cover	$\bar{x}$ =47.50	s=11.35	n=40	nMIN=15.54
Density	$\bar{x}$ =4154.14	s=1966.91	n=60	nMIN=60.67
Production	$\bar{x}$ =407.84	s=187.72	n=60	nMIN=57.33

**P-J REFERENCE AREA**

Total Living Cover (u+o)	$\bar{x}$ =33.00	s=7.67	n=40	nMIN=14.62
Density	$\bar{x}$ =1106.47	s=306.96	n=60	nMIN=20.83
Production	$\bar{x}$ =302.02	s=162.40	n=80	nMIN=78.24*

**STATISTICAL ANALYSES**

Total Living Cover	t=4.181	df=78	SL=p<.01
Density	t=11.859	df=118	SL=p<.01
Production	t=3.568	df=138	SL=p<.01

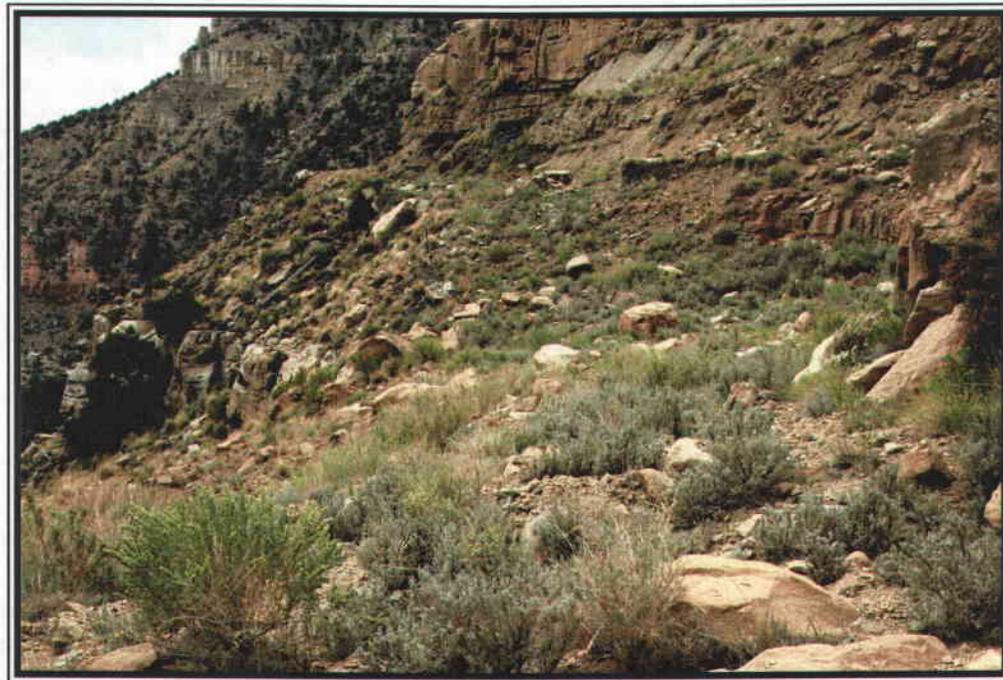
$\bar{x}$  = sample mean, s = sample standard deviation, n = sample size,  
nMIN= minimum adequate sample (@ 90%  $\pm$  .10)

NS = non-significant, t = Student's t-value, df = degrees of freedom,  
SL = significance level, p = probability level

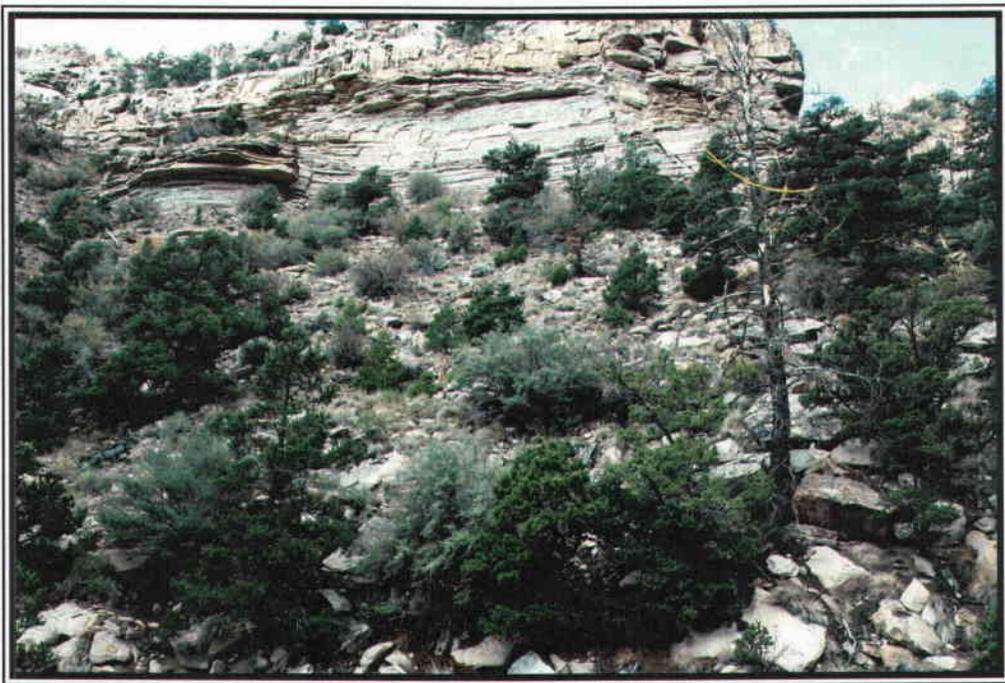
o=overstory; u=understory

\* sample adequacy here was met by disregarding the single highest and single lowest sample values.

RECLAIMED 9<sup>TH</sup> EAST PORTAL AREA



PINYON-JUNIPER REFERENCE AREA



**VEGETATION MONITORING  
IN  
MILLER CANYON**  
Sample Year 1: 2008



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April 2009

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## INTRODUCTION

Miller Canyon is a tributary of Cottonwood Canyon and is located in Emery County, Utah approximately 11 miles northwest of the town of Orangeville (Map 01). There were three portals in Miller Canyon, each only about 0.01 acre in size, that were once used for coal mine ventilation and limited access during mining activities in the area. In 2000, these portals were reclaimed with the goal to restore the disturbed plant communities to “*diverse, effective and permanent*” as dictated by the applicable regulations. Elevation of the study site is about 7,500 ft above sea level. Slopes of the study areas were relatively steep at approximately 35 degrees with exposures primarily to the southeast.

Following final reclamation and revegetation of a mine site, a “*responsibility period*” for at least 10 years is required before the mine operator can submit a request for *Final or Phase III Bond Release* through state and federal regulatory authorities. It has been estimated that this period of time is long enough to determine whether or not adequate re-establishment of a given reclaimed plant community has occurred on sites at this precipitation zone in western United States.

Rehabilitated vegetation is usually monitored throughout the responsibility period, but beginning at year 9 of the 10-year period, intensive sampling can be initiated for two consecutive years to determine whether or not the reclaimed site has met pre-determined revegetation success standards. The vegetation of the reclaimed land must meet specific state and federal requirements.

The purpose of this document is to compare a reclaimed area of a mine site with specific pre-determined standards for revegetation success. The content of this report provides **Year 1** results of the two consecutive years of sampling required prior to submittal of an application for bond release by the mine operator through the State of Utah, Division of Oil, Gas & Mining (DOGGM). This document provides quantitative data comparisons of a *reclaimed portals* with a *reference area* where an undisturbed native plant community was chosen in the immediate area to represent revegetation success standards. The reference area was chosen in an attempt to have similar slopes, soils, exposure, species composition, precipitation, elevation and other environmental variables of the plant communities in the portal area before they were disturbed.

## METHODS

### Transect Placement

Transect lines for quantitative sampling were randomly placed the length of the reclaimed portals and reference areas in an attempt to adequately represent each sample area as a whole. From these transect lines, sample locations were chosen using random numbers at right angles to them. The three portals were sampled with an equal amount of samples. The sample data were then combined to create a single dataset for each parameter.

## Cover, Frequency and Composition

Cover estimates were made using ocular methods with meter square quadrats. Species composition and relative frequencies were also assessed from the quadrats. Additional information recorded on the raw data sheets were: estimated precipitation, slope, exposure, grazing use, animal disturbance and other appropriate notes. Plant nomenclature follows "*A Utah Flora*" (Welsh et al. 2003).

## Density

Density estimates for the woody plant species on the reclaimed areas were made belt transects. Because the area of the portals were so small in size, enough belts were placed to virtually count all woody plants at each of the three portal sites. No woody species estimates were required in the reference area according to Energy West's Mining and Reclamation Plan.

## Sample Adequacy

Sample adequacy for cover was attempted with the goal that 90% of the samples were within 10% of the true mean for the plant communities in the area. The following formula was used:

$$n_{MIN} = \frac{t^2 s^2}{(dx)^2}$$

where,

<i>nMIN</i>	= minimum adequate sample
t	= appropriate confidence t-value
s	= standard deviation
x	= sample mean
d	= desired change from mean

## Diversity

Two diversity indices have been reported in this document for the reclaimed portals and the reference area. To begin, *MacArthur's Diversity Index* was calculated. This index is an effective diversity measurement and is computed using the equation  $1/\sum pi^2$  (MacArthur and Wilson 1976, *The Theory of Island Biogeography*, Princeton: Princeton University Press). In this equation *pi* is the proportion of sum frequency contributed by the *i*th species in the sample area of concern. The proportional contribution of each species is then squared and the values for all species in the sample areas are summed. This index integrates the number of species and the degree to which frequency of occurrence was equitably distributed among those species. In other words, this index provides greater weight to those species that are present more often (with greater frequency) than those that are merely “present” in one or two quadrats. The *average number of species* per sample quadrat is another measure of species diversity provided from the data in this report.

## Similarity Index

There are several well-documented methods to assess similarities in plant communities. The “Motyka Index” is a modified form of the “Sorenson Index”, but both are similarity indices. This

index was used on the data and the equation is shown below:

$$IS_{MO} = \left( \frac{2MW}{MA+MB} \right) \times 100$$

where,

MW =  $\sum$  of the smaller quantitative values of species of two communities,  
MA =  $\sum$  of the quantitative values of all species in one community,  
MB =  $\sum$  of the quantitative values of all species in another community.

### Photographs

Color photographs were taken of the sample areas and are included in this report.

## **RESULTS**

### Reclaimed Portals

Quantitative data for cover, cover by species, composition, and woody species density were recorded at the Reclaimed Portals in Miller Canyon (see Color Photographs). The portals were dominated by Salina wildrye (*Elymus salinus*), western wheatgrass (*E. smithii*) and thickspike wheatgrass (*E. lanceolatus*). All species present in the sample quadrats along with their cover and frequency values are shown on Table 1. The total living cover of this reclaimed area was estimated at 39.17% (Table 2-B). Of this cover, grasses comprised 59.94%, shrubs 37.91% and forbs 2.15% (Table 2-B). Woody species density totaled 3,293 plants per acre (Table 3) and was dominated by broom snakeweed (*Gutierrezia sarothrae*), coyote willow (*Salix exigua*), fourwing

saltbush (*Atriplex canescens*) and rabbitbrush (*Chrysothamnus nauseosus*).

### Reference Area

The reference area chosen in the area to be used for final revegetation success standards was an Salina wildrye (with scattered pinyon-juniper) plant community (see Color Photographs). This community was also sampled for the same parameters during the same period to enable the results to be compared to the results of the reclaimed portals.

The understory living cover had many species present, but was dominated by Salina wildrye by a wide margin. For a cover and frequency listing of all species present in the sample quadrats refer to Table 4. The total living cover of the Reference Area was estimated at 33.75% (Table 5-A); the composition of this cover consisted of 66.12% grasses and 33.88% shrubs (Table 5-B).

## CONCLUSIONS

Results from the summary tables have been described in the RESULTS section above. These data have been

used to compare the reclaimed and reference areas statistically.

When Student's t-tests were

employed to compare areas, the **total living cover** of the Reclaimed

Portals was significantly greater than the Reference Area (Figure 1).

Next, **diversity indices** of the two areas were compared. *MacArthur's Index* suggested that the Reclaimed Portals were more diverse than the Reference Area (Figure 2-A). Moreover, the *average number of plant species per quadrat* was higher in the Reclaimed Portals compared to the Reference Area (Figure 2-B).

Finally, a **similarity index** for the two areas was compared. Motyka's Index indicates that the

FIGURE 1: Statistical summary sheet for the reclaimed portals and reference areas in Miller Canyon (2008).

---

RECLAIMED PORTALS				
Total Living Cover	$\bar{x}$ =39.17	s=5.18	n=30	nMIN=4.73
REFERENCE AREA				
Total Living Cover	$\bar{x}$ =33.75	s=6.10	n=20	nMIN=8.84

---

STATISTICAL ANALYSES

Total Living Cover	t=3.375	df=48	SL=p<.01
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$\bar{x}$  = sample mean, s = sample standard deviation, n = sample size, nMIN = minimum adequate sample (@ 90% ± .10)  
 NS = non-significant, t = Student's t-value, df = degrees of freedom, SL = significance level, p = probability level

Reclaimed Portals were nearly 85% similar (Figure 3). The standard for similarity described in Energy West's MRP indicates that "the index value is at least 70% of the reference area".

FIGURE 2: Diversity Indices - A Comparison Between the Miller Canyon Reclaimed Portals and Reference Areas (2008).

A.

**MacARTHUR'S INDEX**

$$1/\sum p_i^2 =$$

Reclaimed Portals: 12.250

Reference Area: 10.354

B.

**AVG. NO. SPP/QUAD**

Reclaimed Portals: 2.80

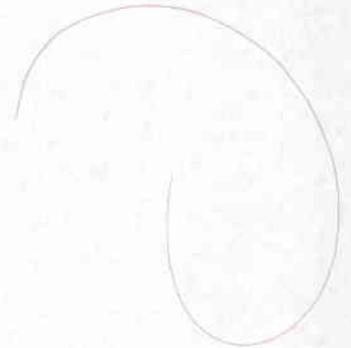
Reference Area: 2.20

In conclusion, for Year 1 of the two years required by DOGM to study and sample near the end of the *Responsibility Period* of the mine operator, the Reclaimed Portals in Miller Canyon appears to have met the standards set for revegetation success. These standards were derived from a native, undisturbed plant community that was located adjacent to the reclaimed areas.

FIGURE 3: MOTYKA INDEX - A Comparison Between the Miller Canyon Reclaimed Portals and Reference Areas.

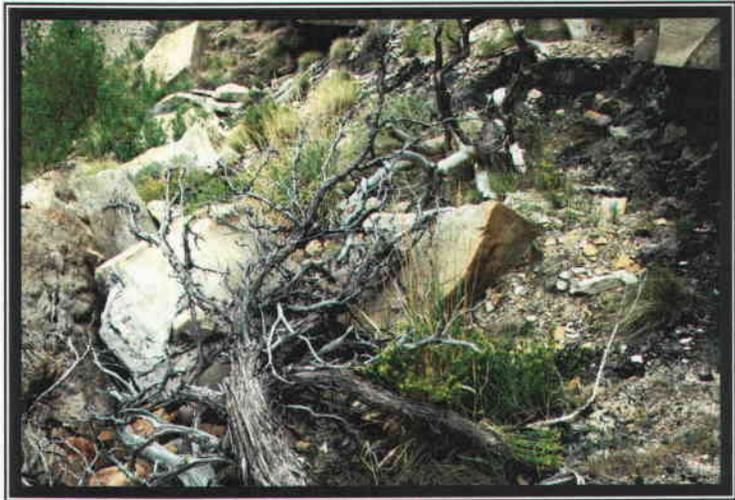
$$IS_{MO} = \left( \frac{2MW}{MA + MB} \right) \times 100 = 84.827$$

**COLOR PHOTOGRAPHS  
OF THE  
SAMPLE AREAS**





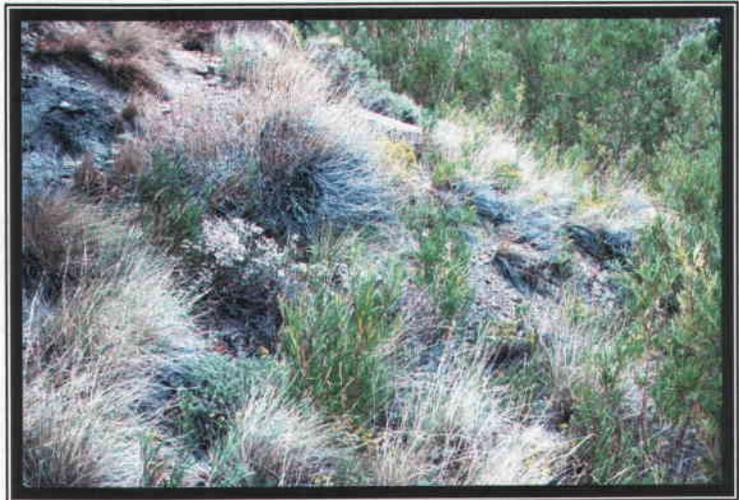
Reclaimed Area (East Portal)



Reclaimed Area (Middle Portal)



Reclaimed Area (West Portal)



Reference Area



Reference Area



Reference Area

## **DATA SUMMARY TABLES**

**Table 1: Cover and frequency by plant species (2008).**

<b>MILLER CANYON PORTALS</b>			
	<b>MEAN</b>	<b>STD. DEV.</b>	<b>FREQUENCY</b>
<b>TREES &amp; SHRUBS</b>			
<i>Atriplex canescens</i>	4.17	8.07	23.33
<i>Chrysothamnus nauseosus</i>	2.67	5.88	20.00
<i>Eriogonum corymbosum</i>	1.33	3.64	13.33
<i>Gutierrezia sarothrae</i>	4.40	5.75	43.33
<i>Salix exigua</i>	2.83	7.71	13.33
<b>FORBS</b>			
<i>Penstemon palmeri</i>	0.57	1.73	10.00
<i>Ranunculus cymbalaria</i>	0.33	1.80	3.33
<b>GRASSES</b>			
<i>Agrostis stolonifera</i>	1.33	4.07	10.00
<i>Elymus cinereus</i>	2.33	5.59	16.67
<i>Elymus lanceolatus</i>	4.77	9.32	30.00
<i>Elymus salinus</i>	7.33	10.06	40.00
<i>Elymus smithii</i>	6.77	7.78	53.33
<i>Juncus sp.</i>	0.33	1.80	3.33

**Table 2: Total cover and composition (2008).**

**MILLER CANYON PORTALS**

<b>A. COVER</b>	<b>MEAN</b>	<b>STD. DEV.</b>
Total Living Cover	39.17	5.18
Litter	14.50	5.82
Bareground	14.33	7.82
Rock	32.00	7.48
<b>B. % COMPOSITION</b>		
Shrubs	37.91	24.74
Forbs	2.15	5.65
Grasses	59.94	25.26

**Table 3: Woody species density (2008).**

<b>MILLER CANYON PORTALS</b>		<b>Number/Acre</b>
<i>Artemisia tridentata</i>		32.93
<i>Atriplex canescens</i>		460.95
<i>Atriplex confertifolia</i>		32.93
<i>Chrysothamnus nauseosus</i>		395.10
<i>Eriogonum corymbosum</i>		230.48
<i>Gutierrezia sarothrae</i>		1218.23
<i>Salix exigua</i>		888.95
<i>Tamarix chilensis</i>		32.93
<b>TOTAL</b>		<b>3292.52</b>

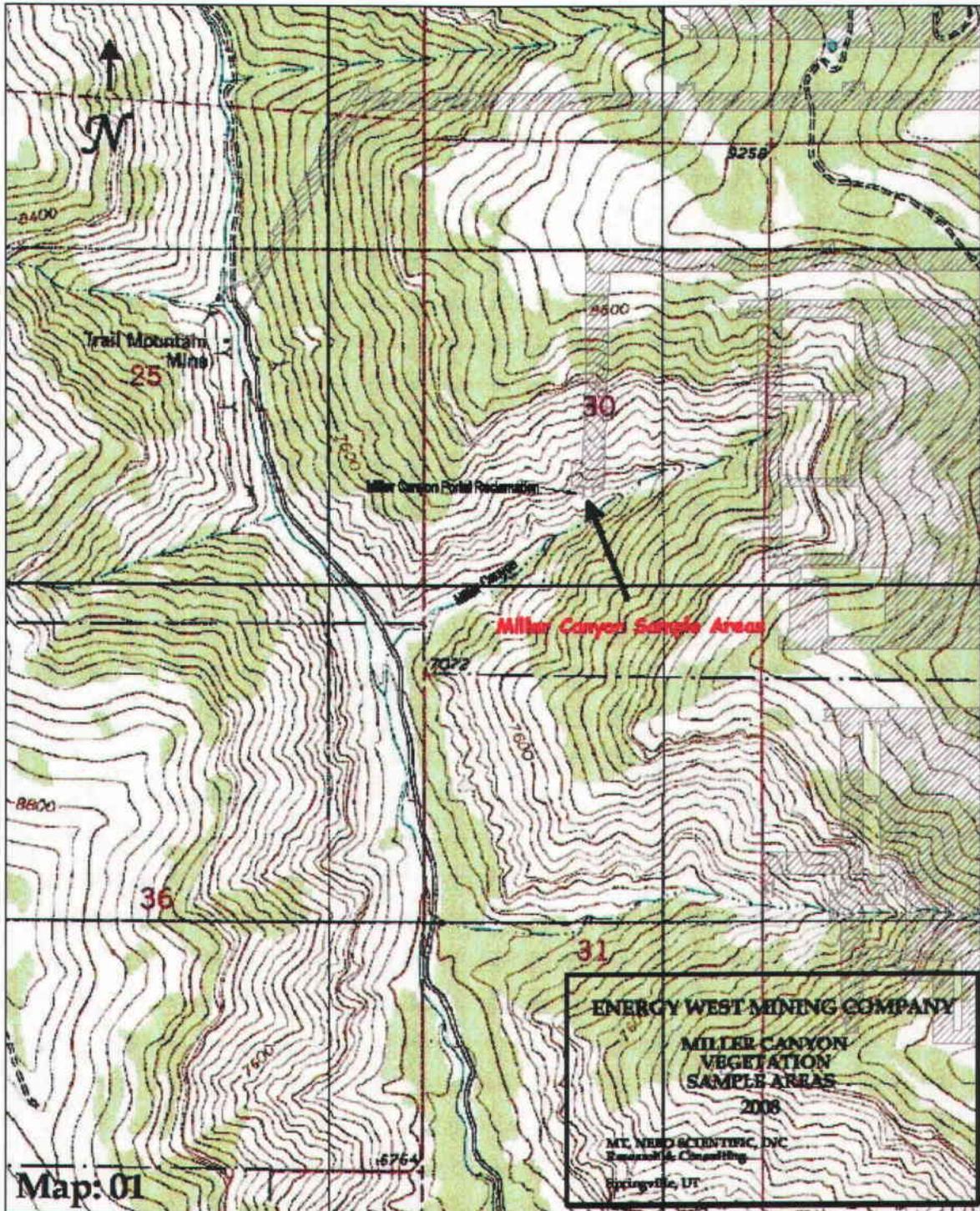
**Table 4: Cover and frequency by plant species (2008).**

<b>MILLER CANYON REFERENCE AREA</b>			
	<b>MEAN</b>	<b>STD. DEV.</b>	<b>FREQUENCY</b>
<b>TREES &amp; SHRUBS</b>			
<i>Atriplex confertifolia</i>	0.25	1.09	5.00
<i>Chrysothamnus nauseosus</i>	1.50	4.50	15.00
<i>Eriogonum corymbosum</i>	4.35	7.14	30.00
<i>Gutierrezia sarothrae</i>	4.65	4.34	65.00
<i>Salix exigua</i>	1.25	3.83	10.00
<b>FORBS</b>			
<b>GRASSES</b>			
<i>Elymus salinus</i>	21.75	9.78	95.00

**Table 5: Total cover and composition (2008).**

**MILLER CANYON  
REFERENCE AREA**

<b>A. COVER</b>	<b>MEAN</b>	<b>STD. DEV.</b>
Total Living Cover	33.75	6.10
Litter	13.00	7.48
Bareground	15.50	7.40
Rock	37.75	12.79
<b>B. % COMPOSITION</b>		
Shrubs	33.88	27.19
Forbs	0.00	0.00
Grasses	66.12	27.19





New Reference Area Considerations  
for the New Waste Rock Site  
of the Cottonwood Mine,  
Emery County, Utah  
2008



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# INTRODUCTION

## General Site Description

The Cottonwood Mine is an inactive coal mine located in Emery County, Utah. There are two waste rock sites associated with this mine. One such site often called the "Old" Waste Rock Site, has been reclaimed and may soon achieve Phase III or Final Bond Release status. The other site, commonly referred to as the "New" Waste Rock Site, is located less than a mile west of the older site and has not yet been reclaimed.

Native plant communities present at the site were disturbed at the time of construction of the New Waste Rock around 1990. In 1989 and prior to the disturbance to them, these plant communities were quantitatively sampled to provide data to enhance successful revegetation of the site in the future. Additionally, similar communities that would remain undisturbed, were also sampled to provide areas to be used for future revegetation success standards following final reclamation of the area. These areas are called "reference areas". The datasets for the plant communities of the proposed disturbed and reference areas were compared for their similarities or appropriateness to represent future success standards prior to permitting the site for construction. They will similarly be compared following final reclamation of the site to insure revegetation success prior to Phase III Bond Release for the State of Utah.

The plant communities disturbed to create the New Waste Rock Site were: Gardner Saltbush, Pinyon-Juniper and Black Sagebrush/Grass. Likewise, reference areas for these same communities were also chosen at that time for future revegetation success standards. Since the time of construction, the Black Sagebrush/Grass Reference Area was disturbed by other activities that were beyond the control of Energy West Mining Company. For example, a drill pad was created at the site followed by construction of a gas well. Additionally, the reference area was again disturbed by electrical power lines that were installed to provide power to the gas wells in the area. As a consequence of the disturbance to this reference area, the site is now inappropriate to provide future revegetation success standards for the waste rock site. It was therefore suggested that a new reference area be established to provide this function. This report addresses this issue.

## METHODS

The undisturbed plant communities in close proximity of the New Waste Rock Site of the Cottonwood Mine were surveyed, first by aerial photographs then by field reconnaissance, to locate potential Black Sagebrush/Grass communities that could be used as a replacement for a reference area that was recently disturbed by the construction of a gas well and powerlines activities in the area. Once a site was located that had the potential for representing the success standards, the plant community was sampled using quantitative methods approved by the State of Utah, Division of Oil, Gas & Mining (DOG M).

### Transect Placement

Transect lines for quantitative sampling were randomly placed in the potential Black Sagebrush/Grass Reference Area using methods to attempt to adequately represent the sample area on a non-biased basis. From these transect lines, sample locations were chosen using random numbers at right angles to them.

### Cover, Frequency & Composition

Cover estimates were made using ocular methods with meter square quadrats. Species composition and relative frequencies were also assessed from the quadrats. Additional information recorded on the raw data sheets were: estimated precipitation, slope, exposure, grazing use, animal disturbance and other appropriate notes. Plant nomenclature follows "*A Utah Flora*" (Welsh et al. 2003).

### Density

Density estimates for the woody plant species of the potential reference area were made using a distance method called the point-quarter method. In this method, random points were placed on the sample site and measured into four quarters. The distances to the nearest woody plant species were then recorded in each quarter. The average point-to-individual distance was equal to the

square root of the mean area per individual.

### Sample Adequacy

Sample adequacy for cover and density was attempted with the goal that 80% of the samples were within 10% of the true mean for the plant communities in the area. The following formula was used:

$$nMIN = \frac{t^2 s^2}{(dx)^2}$$

where,

<i>nMIN</i>	= minimum adequate sample
<i>t</i>	= appropriate confidence t-value
<i>s</i>	= standard deviation
<i>x</i>	= sample mean
<i>d</i>	= desired change from mean

### Photographs

Color photographs were taken of the sample area and one has been included in this report.

## RESULTS

### Black Sagebrush Reference Area (potential)

A new Black Sagebrush/Grass plant community was quantitatively sampled in 2008 that could

potentially replace the previous Black Sagebrush/Grass Reference Area that was disturbed (Figure 1). This plant community was dominated by black sagebrush (*Artemisia nova*), broom snakeweed (*Gutierrezia sarothrae*) and galleta (*Hilaria jamesii*). For a list of all plant species present in the sample quadrats, refer to Table 1.

The total living cover in the community was estimated at 34.25% (Table 2-A). Of that total living cover, shrubs comprise 79.93%, grasses 17.68% and forbs 2.39% (Table 2-B). Woody species density totaled 14,439 individuals per acre (Table 3) and was dominated by black sagebrush, broom snakeweed and Gardner saltbush (*Atriplex gardneri*).

#### Black Sagebrush Reference Area (existing)

Data recorded in 1989 from the existing Black Sagebrush/Grass Reference Area have been included in this report for comparisons with the potential new reference area. The area was dominated by black sagebrush by quite a wide margin, followed by Salina wildrye (*Elymus salinus*). A list of the plant species found in the sample quadrats at that time is shown on Table 4.

The total living cover at this site was estimated at 24.38% (Table 5-A). This cover was comprised of 81.24% woody species and 16.26% grasses. No forbs were present in the quadrats of this area (Table 5-B). Woody species density in this area was estimated at 4,519 individuals per acre (Table 6) and was dominated by black sagebrush and shadscale (*Atriplex confertifolia*).

## DISCUSSION

### Existing vs. Potential Reference Areas

Following the aerial photograph review and field survey that were conducted to locate an appropriate Black Sagebrush/Grass community as a new reference area, it became apparent that this community was relatively uncommon in the immediate vicinity of the New Waste Rock Site – especially a community that appeared to be quite similar to the existing Black Sagebrush/Grass Reference Area. When a black sagebrush community was finally located that appeared similar enough for further study (or quantitative sampling), it was sampled to be compared with the data of the existing Black Sagebrush/Grass Reference Area. Following the field study in the growing season, the data were later summarized in the office.

As can be observed by a Student's t-test that compared the total living cover of the *potential* Black Sagebrush/Grass Reference Area with the *existing* Black Sagebrush/Gras Reference Area, the datasets were dissimilar Table 10-A. Or the living covers and woody species densities were statistically different for these plant communities. Although it could be reasoned that differences may exist due to contrasting sample years, the differences and species compositions were dissimilar enough to consider other approaches for replacement of the reference area.

### A Possible New Approach

As a result of the conclusions of the aerial photograph review, then the field survey to locate potential representative Black Sagebrush plant communities, followed by data summations, and finally the statistical analyses comparing parameters of the potential and existing reference areas, another approach for replacement of the existing reference area could be considered.

Early maps were reviewed to determine the size or acreage of the Black Sagebrush/Grass community that was initially disturbed. It was then compared to the sizes of other plant communities that were disturbed as a result of construction of the New Waste Rock Site. Consequently, it was noticed that the disturbed acreage of the Black Sagebrush/Grass community was much smaller (< 10% of the total disturbed acreage) when compared to the other affected communities. With this in mind, perhaps using an existing reference area that was chosen for a different community could be considered for future standards, such as the existing Gardner Saltbush Reference Area (Tables 7, 8, and 9). When these datasets were compared – the *existing* Black Sagebrush/Grass Reference Area and *existing* Gardner Saltbush Reference Area – the similarities were noted. Or, when the total living covers of these two reference areas were compared, the differences were not statistically significant (Table 10-B). Additionally, when the woody species densities of these two communities were compared, the differences were again non-significant (Table 10-B). However, when one reviews the data summation tables, it is obvious that the species diversity of the Black Sagebrush/Grass was greater than that of the Gardner Saltbush community.

To summarize, because of the following reasons, the Gardner Saltbush Reference Area could be used to represent future revegetation success standards for the disturbed Gardner Saltbush community *and* the disturbed Black Sagebrush/Grass community:

- The Black Sagebrush/Grass community is relatively uncommon in the area.
- When a Black Sagebrush/Grass community was finally located and sampled as a candidate for replacement of the existing Black Sagebrush/Grass Reference Area, statistical analyses suggested that these datasets were quite dissimilar.
- The acreage of Black Sagebrush/Grass community that was disturbed by construction of the New Waste Rock site was relative small. Therefore, for practical reasons, it may be prudent to “lump” these two communities together when future revegetation activities are conducted.
- Finally, at the time of final reclamation, seed mixtures for revegetation could be formulated to represent both communities at the time of final reclamation. This mixture could be seeded over the entire reclaimed sites where both plant communities once existed – Gardner Saltbush and Black Sagebrush/Grass. Plant species most adapted to the physiognomic and other soil, exposure, and topological differences within the reclaimed area should become established, and community and species diversity should be achieved on an area-by-area basis.

In conclusion, replacement of the Black Sagebrush/Grass Reference Area could be accomplished by one of the two scenarios described above. First, the *potential* Black Sagebrush Reference Area could replace the *existing* Black Sagebrush/Grass Reference Area. Because the *potential* reference area was so dissimilar to the *existing* reference area, the first scenario, if approved, would represent more stringent standards for revegetation success than was present at the time of disturbance. This may be an unjust consequence for future reclamation and subsequent bond release considerations. Second, the *existing* Black Sagebrush/Grass Reference Area could be replaced by the *existing* Gardner Saltbush Reference Area. Accordingly, this reference area

could represent future revegetation success standards for the two affected communities, rather than separating them. This seems like a more practical scenario because the Black disturbed Sagebrush/Grass community was relatively smaller than the other impacted communities; also the data of these two reference areas were quite similar in many respects. Separating the communities by using different seed mixtures and standards for revegetation at the time of final reclamation may be impractical.

## SUMMARY

A Waste Rock Site was created in 1990 in association with coal mining operations at the Cottonwood Mine in Emery County, Utah. As such, native plant communities were disturbed as a result of construction of the site. "Reference Areas" or plant communities that were chosen to represent future success standards of the impacted communities. These reference areas were expected to remain undisturbed until final revegetation standards and goals were achieved. One such reference area, the Black Sagebrush/Grass Reference Area, was disturbed by activities beyond the control of Energy West Mining Company.

A potential new reference area was chosen and compared to the existing Black Sagebrush/Grass Reference Area. Datasets representing these two areas were shown to be dissimilar and the potential new Black Sagebrush/Grass Reference Area may represent more stringent standards for revegetation success than the existing approved Black Sagebrush/Grass Reference Area.

A new approach for replacement of the existing reference area was proposed. The existing Gardner Saltbush Reference Area could be used to represent the impacted Black Sagebrush/Grass *and* Gardner Saltbush communities that were impacted by construction of the New Waste Rock Site.

Although different scenarios for replacement of the Black Sagebrush/Grass Reference Area for the New Waste Rock Site for the Cottonwood Mine are presented in this report, the final decision will be an agreement between the State of Utah, Division of Oil, Gas & Mining and the Energy West Mining Company.



Figure 1: Potential Black Sagebrush/Grass Reference Area

**Table 1: Cover and frequency by plant species for the Cottonwood/Wilberg New Waste Rock Site (2008).**

<b>Black Sagebrush Reference Area (Potential)</b>			
	<b>MEAN</b>	<b>STD. DEV.</b>	<b>FREQUENCY</b>
<b>TREES &amp; SHRUBS</b>			
<i>Artemisia nova</i>	13.25	11.32	80.00
<i>Atriplex confertifolia</i>	2.10	5.86	15.00
<i>Atriplex gardneri</i>	2.75	6.02	25.00
<i>Eriogonum corymbosum</i>	0.25	1.09	5.00
<i>Gutierrezia sarothrae</i>	7.75	7.50	65.00
<i>Juniperus osteosperma</i>	1.25	3.11	15.00
<i>Sarcobatus vermiculatus</i>	0.50	2.18	5.00
<b>FORBS</b>			
<i>Machaeranthera canescens</i>	0.50	1.50	10.00
<i>Penstemon sp.</i>	0.25	1.09	5.00
<b>GRASSES</b>			
<i>Elymus elymoides</i>	0.25	1.09	5.00
<i>Elymus lanceolatus</i>	0.25	1.09	5.00
<i>Elymus salinus</i>	1.25	3.11	15.00
<i>Hilaria jamesii</i>	3.40	7.19	30.00
<i>Stipa hymenoides</i>	0.50	1.50	10.00

**Table 2: Total cover and composition for the Cottonwood/Wilberg New Waste Rock Site (2008).**

**Black Sagebrush Reference Area (Potential)**

	<b>MEAN</b>	<b>STD. DEV.</b>
<b>A. COVER</b>		
Total Living Cover	34.25	7.79
Litter	9.75	4.32
Bareground	20.75	6.57
Rock	35.25	11.01
<b>B. % COMPOSITION</b>		
Shrubs	79.93	23.10
Forbs	2.39	5.86
Grasses	17.68	23.64

**Table 3: Woody species density at the Cottonwood Fan Portal area (2008).**

<b>Black Sagebrush Reference Area (Potential)</b>	<b>Number/Acre</b>
<i>Artemisia nova</i>	7941.65
<i>Atriplex confertifolia</i>	541.48
<i>Atriplex gardneri</i>	1443.94
<i>Gutierrezia sarothrae</i>	3970.82
<i>Juniperus osteosperma</i>	180.49
<i>Pinus edulis</i>	180.49
<i>Sarcobatus vermiculatus</i>	180.49
<b>TOTAL</b>	<b>14439.36</b>

**Table 4: Cover and frequency by plant species for the Cottonwood/Wilberg New Waste Rock Site (1989).**

<b>Black Sagebrush Reference Area (Existing)</b>			
	MEAN	STD. DEV.	FREQUENCY
<b>TREES &amp; SHRUBS</b>	17.53	7.97	95.00
<i>Artemisia nova</i>	0.18	0.83	5.00
<i>Chrysothamnus viscidiflorus</i>	0.13	0.78	2.50
<i>Echinocereus triglochidiatus</i>	1.08	2.93	12.50
<i>Juniperus osteosperma</i>	0.63	2.29	7.50
<i>Opuntia polyacantha</i>	0.18	0.83	5.00
<i>Sclerocactus whipplei</i>	0.05	0.31	2.50
<b>FORBS</b>			
<b>GRASSES</b>			
<i>Elymus salinus</i>	3.00	5.79	30.00
<i>Stipa hymenoides</i>	1.63	2.77	30.00

**Table 5: Total cover and composition for the Cottonwood/Wilberg New Waste Rock Site (1989).**

**Black Sagebrush Reference Area (Existing)**

	MEAN	STD. DEV.
<b>A. COVER</b>		
Total Living Cover	24.38	9.95
Litter	5.48	2.41
Bareground	55.60	15.10
Rock	14.55	12.49
<b>B. % COMPOSITION</b>		
Tree/Shrubs	81.24	21.05
Forbs	0.00	0.00
Grasses	16.26	16.75

**Table 6: Woody species density at the Cottonwood Fan Portal area (1989).**

<b>Black Sagebrush Reference Area (Existing)</b>	<b>Number/Acre</b>
<i>Artemisia nova</i>	3012.45
<i>Atriplex confertifolia</i>	1066.91
<i>Atriplex gardneri</i>	156.90
<i>Chrysothamnus viscidiflorus</i>	31.38
<i>Eriogonum corymbosum</i>	156.90
<i>Gutierrezia sarothrae</i>	31.38
<i>Opuntia polyacantha</i>	31.38
<i>Sclerocactus whipplei</i>	31.38
<b>TOTAL</b>	<b>4518.68</b>

**Table 7: Cover and frequency by plant species for the Cottonwood/Wilberg New Waste Rock Site (1989).**

<b>Gardner Saltbush Reference Area (Existing)</b>			
	<b>MEAN</b>	<b>STD. DEV.</b>	<b>FREQUENCY</b>
<b>TREES &amp; SHRUBS</b>			
<i>Atriplex confertifolia</i>	25.13	9.65	100.00
<b>FORBS</b>			
<b>GRASSES</b>			

**Table 8: Total cover and composition for the Cottonwood/Wilberg New Waste Rock Site (1989).**

**Gardner Saltbush Reference Area (Existing)**

<b>A. COVER</b>	<b>MEAN</b>	<b>STD. DEV.</b>
Total Living Cover	25.13	9.65
Litter	7.75	4.18
Bareground	66.63	10.16
Rock	0.50	1.87
<b>B. % COMPOSITION</b>		
Shrubs	100.00	0.00
Forbs	0.00	0.00
Grasses	0.00	0.00

**Table 9: Woody species density at the Cottonwood Fan Portal area (1989).**

<b>Gardner Saltbush Reference Area (Existing)</b>	<b>Number/Acre</b>
<i>Atriplex confertifolia</i>	4927.30
<b>TOTAL</b>	<b>4927.30</b>

**TABLE 10:** Statistical summary sheet of the potential (2008) and existing (1998) Black Sagebrush Reference Areas for the New Waste Rock Site for the Cottonwood Mine.

**A.**

**POTENTIAL BLACK SAGEBRUSH REFERENCE AREA**

Total Living Cover	$\bar{x}$ =34.25	s=7.79	n=20
Density	$\bar{x}$ =20.84*	s=14.57	n=20

**EXISTING BLACK SAGEBRUSH REFERENCE AREA**

Total Living Cover	$\bar{x}$ =24.38	s=9.95	n=40
Density	$\bar{x}$ =34.48*	s=8.49	n=24

**STATISTICAL ANALYSES**

Total Living Cover	t= 3.876	df=58	SL=p<.01
Density	t= -3.870	df=42	SL=p<.01

**B.**

**EXISTING GARDNER SALTBUUSH REFERENCE AREA**

Total Living Cover	$\bar{x}$ =25.13	s=9.65	n=40
Density	$\bar{x}$ =33.69*	s=11.93	n=36

**EXISTING BLACK SAGEBRUSH REFERENCE AREA**

Total Living Cover	$\bar{x}$ =24.38	s=9.95	n=40
Density	$\bar{x}$ =34.48*	s=8.49	n=24

**STATISTICAL ANALYSES**

Total Living Cover	t= 0.342	df=78	SL=p<NS
Density	t= -0.280	df=58	SL=p<NS

$\bar{x}$  = sample mean, s = sample standard deviation, n = sample size,  
nMIN= minimum adequate sample (@ 90% ± .10)  
NS = non-significant, t = Student's t-value, df = degrees of freedom,  
SL = significance level, p = probability level  
\* average distance (inches) at each location in the pt. quarter distance method