WEST RIDGE MINE

007/041

CHANGE TO THE MINING AND
RECLAMATION PLAN

SUBMITTAL OF APPENDIX 5-19

**TO ALLOW TEMPORARY
RE-OPENING OF THE
B CANYON PORTAL**

SUBMITTED: FEBRUARY ____, 2012

COVER LETTER.....C1/C2 FORMS

C/007/041 Incoming

4010

R

WEST RIDGE
RESOURCES, INC.

P.O. Box 910, East Carbon, Utah 84520
Telephone (435) 888-4000 Fax (435) 888-4002

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

February 22, 2012

Attn: Darron Haddock
Permit Supervisor

Re: West Ridge Mine C/007/041
Change to Allow Re-Opening of B Canyon Portal

Dear Mr Haddock::

Enclosed are six (6 ea.) copies of an application to allow the re-opening of the B Canyon portal. This action is needed so that we may conduct safety related rehabilitation work in some of the old Kaiser mine entries prior to longwall development in that area. I have discussed the proposal in detail with both Priscilla Burton and Joe Helfrich, both who have visited the site and made recommendations for facilitating the permitting process. This action would be temporary (within six months after re-opening the portal, we would then seal it back up and reclaim it). As we discussed earlier, this portal was backfilled by AML back in 1998, but the steel canopy is still intact and easily accessible.

If you have questions or comments please contact me at (435) 888-4017.

Sincerely,

David Shaver
Resident Agent

File in:
☐ Confidential
☒ Shelf
☐ Expandable
Date Folder 022212 C/007/0041
Incoming see Confidential

RECEIVED
FEB 22 2012
DIV. OF OIL, GAS & MINING

Form DOGM - C1 (Last Revised February 21, 2012) File Folder # 3

APPLICATION FOR PERMIT PROCESSING

Permit Change ☐	New Permit ☐	Renewal ☐	Transfer ☐	Exploration ☐	Bond Release ☐

Permit Number: C/007/041

[redacted]of Proposal: Change to allow temporary re-opening of B Canyon portal

Mine: WEST RIDGE MINE

Permittee: **WEST RIDGE Resources, Inc.**

Description, include reason for application and timing required to implement:.

Instructions: *If you answer yes to any of the first 8 questions (gray), submit the application to the Salt Lake Office. Otherwise, you may submit it to your reclamation specialist.*

☒ Yes	☐ No	1. Change in the size of the Permit Area? _____ acres Disturbed Area? 0.25 acres ☒ increase ☐ decrease.
☐ Yes	☒ No	2. Is the application submitted as a result of a Division Order?
☐ Yes	☒ No	3. Does application include operations outside a previously identified Cumulative Hydrologic Impact Area?
☐ Yes	☒ No	4. Does application include operations in hydrologic basins other than as currently approved?
☐ Yes	☒ No	5. Does application result from cancellation, reduction or increase of insurance or reclamation bond?
☐ Yes	☒ No	6. Does the application require or include public notice/publication?
☐ Yes	☒ No	7. Does the application require or include ownership, control, right-of-entry, or compliance information?
☐ Yes	☒ No	8. Is proposed activity within 100 feet of a public road or cemetery or 300 feet of an occupied dwelling?
☐ Yes	☒ No	9. Is the application submitted as a result of a Violation?
☐ Yes	☒ No	10. Is the application submitted as a result of other laws or regulations or policies? Explain:
[redacted]s	☒ No	11. Does the application affect the surface landowner or change the post mining land use?
[redacted] Yes	☒ No	12. Does the application require or include underground design or mine sequence and timing?
☒ Yes	☐ No	13. Does the application require or include collection and reporting of any baseline information?
☒ Yes	☐ No	14. Could the application have any effect on wildlife or vegetation outside the current disturbed area?
☒ Yes	☐ No	15. Does application require or include soil removal, storage or placement?
☒ Yes	☐ No	16. Does the application require or include vegetation monitoring, removal or revegetation activities?
☒ Yes	☐ No	17. Does the application require or include construction, modification, or removal of surface facilities?
☒ Yes	☐ No	18. Does the application require or include water monitoring, sediment or drainage control measures?
☒ Yes	☐ No	19. Does the application require or include certified designs, maps, or calculations?
☐ Yes	☒ No	20. Does the application require or include subsidence control or monitoring?
☒ Yes	☐ No	21. Have reclamation costs for bonding been provided for?
☐ Yes	☒ No	22. Does application involve a perennial stream, a stream buffer zone or discharges to a stream?
☐ Yes	☒ No	23. Does the application affect permits issued by other agencies or permits issued to other entities?

☐ **Attach _3_ complete copies of the application.**

I hereby certify that I am a responsible official of the applicant and that the information contained in this application is true and correct to the best of my information and belief in all respects with the laws of Utah in reference to commitments, undertakings, and obligations, herein. (R645-301-123)

Signed - Name - Position - Date 2/21/2012 agent

[redacted]ed and sworn to before me this 21st day of February 2012

Notary Public

My Commission Expires: 3.27.13

Attest: STATE OF Utah

COUNTY OF Carbon

LINDA KERNS
NOTARY PUBLIC • STATE of UTAH
COMMISSION # 578211
COMM. EXP. 03-27-2013

Received by Oil, Gas & Mining
RECEIVED
FEB 22 2012
DIV. OF OIL, GAS & MINING

ASSIGNED TRACKING NUMBER

Application **for Permit Processing**
Detailed Schedule of Changes to the MRP

Title of Application: Change to allow temporary re-opening of B Canyon portal

Permit Number: C/007/041

Mine: WEST RIDGE MINE

Permittee: WEST RIDGE RESOURCES

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

			DESCRIPTION OF MAP, TEXT, OR MATERIALS TO BE CHANGED
☐ ADD	☒ REPLACE	☐ REMOVE	Chapter 1 text : all (changes shown in red)
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☒ REPLACE	☐ REMOVE	Chapter 5 text : 5-iv, 5-v, 5-1, 5-2, (changes shown in red)
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☒ ADD	☐ REPLACE	☐ REMOVE	Appendix 5-19 : B Canyon Portal Re-Opening Project
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☒ REPLACE	☐ REMOVE	Maps : 1-0/1-1, 5-2, 5-3
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	

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

RECEIVED
FEB 22 2012
DIV. OF OIL, GAS & MINING

CHAPTER 1.....REPLACEMENT TEXT

~WEST RIDGE MINE - PERMIT APPLICATION PACKAGE~

TABLE OF CONTENTS- CHAPTER 1
R645-301-100 PERMIT APPLICATION REQUIREMENTS: GENERAL CONTENTS

REGULATION NUMBER	CONTENTS	PAGE NUMBER
R645-301-112	Identification of Interests	1
R645-301-113	Violation Information	5
R645-301-114	Right of Entry Information	5
	Table 1-1 Federal Coal Lease and Right-of-Way Properties	8
	Table 1-2 State (SITLA) Coal Lease and Special Use Properties	10
	Table 1-3 Penta Creek Fee Lease Properties	11
	Table 1-4 Legal Description of Permit Area, by Leasehold	12
	Table 1-5 Legal Description of Permit Area, Total Area	14
	Table 1-6 Surface Ownership of Permit Area	15
	Table 1-7 Legal Description, Disturbed Areas	16
R645-301-115	Status of Unsuitability Claims	17
R645-301-116	Permit Term	17
R645-301-117	Insurance, Proof of Publication and Facilities or Structures Used In Common	18
R645-301-118	Filing Fee	18
R645-301-123	Notarized Statement	18
R645-301-130	Reporting Of Technical Data	18
R645-301-142	Maps And Plans	19

TABLE OF CONTENTS- APPENDICES
R645-301-100 CHAPTER 1

APPENDIX NUMBER	DESCRIPTION
APPENDIX 1-1	Certifications, Verifications, Publications
Attachment 1-1	Certificate of Liability Insurance
Attachment 1-2	Newspaper Advertisement
Attachment 1-3	Proof of Publication
Attachment 1-4	Filing Fee Verification
Attachment 1-5	Verification Statement
APPENDIX 1-2	Violation Information
APPENDIX 1-3	Reference List
APPENDIX 1-4	Proof of Lease Assignment
APPENDIX 1-4A	Federal Lease SL-068754, U-01215
APPENDIX 1-4B	Federal Lease UTU-78562
APPENDIX 1-4B(a)	Federal Lease UTU-78562 Modification
APPENDIX 1-4C	State Lease ML-47711
APPENDIX 1-4D	State Lease ML-49287
APPENDIX 1-4E	State Lease ML-51744
APPENDIX 1-4F:	Penta Creek Fee Lease, which includes
APPENDIX 1-4F(a)	Original Fee Lease
APPENDIX 1-4F(b)	Lease Extension #1, August 24, 2010
APPENDIX 1-4F(c)	Lease Extension #2, March 10, 2011
APPENDIX 1-4G:	Hinkins Fee Lease, which includes:
APPENDIX 1-4G(a)	David P. Hinkins 50%
APPENDIX 1-4G(b)	Emily P. Marston 25%
APPENDIX 1-4G(c)	Leonard J. Pagano 25%
APPENDIX 1-5	Current and Previous Coal Mining Permits
APPENDIX 1-6	Consultation and Coordination
APPENDIX 1-7	Ownership and Control
APPENDIX 1-8	Letter from Carbon County
APPENDIX 1-9	********Deleted*******
APPENDIX 1-10	SITLA - Special Use Lease (Topsoil Borrow Area)

TABLE OF CONTENTS- APPENDICES
R645-301-100 CHAPTER 1
(continued)

APPENDIX 1-11	Material Deposit Special Use Lease Agreement
APPENDIX 1-12	Waterline/Pump House Right of Way
APPENDIX 1-13	Correspondence Regarding Security Gate
APPENDIX 1-14	********Moved********
APPENDIX 1-15	Legal Description of Grassy Trail Reservoir

TABLE OF CONTENTS- MAP LIST
R645-301-100 CHAPTER 1

MAP NUMBER	DESCRIPTION	SCALE
MAP 1-0	**Permit Map**	**1" = 2000'**
MAP 1-1	Location Map	1" = 2000'

R645-301-100 PERMIT APPLICATION REQUIREMENTS: GENERAL CONTENTS

SCOPE

The objective of this chapter is to set forth all relevant information concerning ownership and control of WEST RIDGE Resources, Inc., the ownership and control of the property to be affected by mining activities and all other information and documentation required under Part UMC.

R645-301-112 IDENTIFICATION OF INTERESTS

112.100 WEST RIDGE Resources, Inc. is a corporation organized and existing under the laws of Utah and qualified to do business in Utah.

112.200 The applicant, WEST RIDGE Resources, Inc. will also be the operator.

WEST RIDGE Resources, Inc.
P.O. Box 910
East Carbon, Utah 84520
(435) 888-4000
David Hibbs - President

Employer Identification Number: 87-0585129

112.220 The resident agent of the applicant, WEST RIDGE Resources, Inc., is:

Dave Shaver
WEST RIDGE Resources, Inc.
P.0. Box 910
East Carbon, Utah 84520

(435) 888-4000

112.230 WEST RIDGE Resources, Inc. will pay the abandoned mine land reclamation fee.

112.300 **Ownership and Control** - See Appendix 1-7

WEST RIDGE Resources, Inc. is the permittee and operator of the WEST RIDGE Mine. WEST RIDGE Resources, Inc. is a wholly owned subsidiary of ANDALEX Resources, Inc.. WEST RIDGE Resources, Inc. is a Utah corporation licensed to do business in the State of Utah. All leases associated with the WEST RIDGE Mine are owned by ANDALEX Resources, Inc. ANDALEX Resources, Inc, is a wholly owned subsidiary of UtahAmerican Energy Inc., which in turn is a wholly owned subsidiary of Murray Energy Corporation.

112.340 See Appendix 1-5

112.350 See Appendix 1-5

112.410 See Appendix 1-5

112.420 See Appendix 1-7

112.500 Surface Owners:

Bureau of Land Management
Utah State Office
136 East South Temple
Salt Lake City, Utah 84111

Glen Wells
700 West U.S. Hwy 6
Price, Utah 84501

Penta Creek, LLC
140 S. Newton
Albert Lea, MN 56007

David Hinkins
155 West 100 South
Orangeville, Utah 84537

School and Institutional Trust
Lands Administration
355 West North Temple, Suite 400
Salt Lake City, Utah 84180-1204

Matt Rauhala
1236 East Main
Price, Utah 84501

Subsurface Owners:

Bureau of Land Management
Utah State Office
136 East South Temple
Salt Lake City, Utah 84111

Penta Creek, LLC
140 S. Newton
Albert Lea, MN 56007

School and Institutional Trust
Lands Administration
355 West North Temple, Suite 400
Salt Lake City, Utah 84180-1204

WEST RIDGE Resources, Inc. is the holder of record for federal lease SL-068754 and UTU 78562 (see Table 1-1), state lease ML 47711 and ML 49287 (see Table 1-2A) and the Penta Creek Fee lease (see Table 1-2B).

Proof of lease assignment for all leases (Federal leases SL-068754 and UTU 78562, and State leases ML 47711 and ML 49287), and the Penta Creek fee lease can be found in Appendix 1-4.

112.600 Contiguous surface owners:

Bureau of Land Management
Utah State Office
136 East South Temple
Salt Lake City, Utah 84111

Dave Hinkins
155 West 100 South
Orangeville, Utah 84537

Glen Wells
700 West U.S. Hwy 6
Price, Utah 84501

Penta Creek, LLC
140 S. Newton
Albert Lea, MN 56007

School and Institutional Trust
Lands Administration
355 West North Temple, Suite 400
Salt Lake City, Utah 84180-1204

Contiguous subsurface owners:

School and Institutional Trust
Lands Administration
355 West North Temple, Suite 400
Salt Lake City, Utah 84180-1204

Penta Creek, LLC
140 S. Newton
Albert Lea, MN 56007

David Hinkins
155 West 100 South
Orangeville, Utah 84537

Emily P Marston
843 Genodle Drive
Midvale, Utah 84047

Leonard J. Pagano
55 West main Street
Price, Utah 84501

Bureau of Land Management
Utah State Office
136 East South Temple
Salt Lake City, Utah 84111

112.700 See Appendix 1-5

112.800 There are no pending interests or bids existing on lands contiguous to the present leased area.

112.900 After WEST RIDGE Resources, Inc. is notified that the application is approved, but before the permit is issued, WEST RIDGE Resources, Inc. will update, correct or indicate that no change has occurred in the information previously submitted under R645-301-112.100 through R645-301-112.800.

R645-301-113 VIOLATION INFORMATION

113.100 The applicant or any subsidiary, affiliate or persons controlled by or under common control with the applicant has not had a federal or state permit to conduct coal mining and reclamation operations suspended or revoked in the five years preceding the date of submission of the application.

113.120 The applicant etc. has not forfeited any performance bond or similar security

113.200 Not applicable

113.300 A listing of violations received by the applicant in connection with any coal mining and reclamation operation during the three year period preceding the application date is provided in Appendix 1-2. MSHA numbers for the operations can be found in Appendix 1-5. There have been no unabated violations or cessation orders issued to any affiliated companies during the previous three years.

113.400 After WEST RIDGE Resources, Inc. is notified that the application is approved, but before the permit is issued, WEST RIDGE Resources, Inc. will update, correct or indicate that no change has occurred in the information previously submitted under R645-301-113.

R645-301-114 RIGHT OF ENTRY INFORMATION

114.100 WEST RIDGE Resources, Inc., currently holds 5256.16 acres of federal coal (2,650.67 acres leased under SL-068754 and 2605.49 acres leased under UTU 78562) in the Book Cliffs coal field (refer to Maps 1-0 and 5-3). A complete legal description of all Federal leases held by WEST RIDGE is found in Table 1-1. WEST RIDGE currently holds 2162.34 acres of state coal (801.24 acres under ML 47711, 881.10 under ML 49287, and 480 acres under ML 51744. A complete legal description of all State leases held by WEST RIDGE is found in Table 1-2. WEST RIDGE also holds 1189.84 acres leased on contiguous private (fee) coal lands located along the eastern side of the mineable reserve. A complete legal description of this fee lease is found in Table 1-3. None of these leases are the subject of any pending litigation. Proof of lease assignment for all leases can be found in Appendix 1-4.

WEST RIDGE Resources, Inc. bases its legal right to enter and conduct mining activities in the permit area pursuant to the language contained in the Federal Coal Lease, Part I Lease Rights Granted which reads as follows:

"That the lessor, in consideration of the rents and royalties to be paid and the covenants to be observed as hereinafter set forth, does hereby grant and lease to the lessee the exclusive right and privilege to mine and dispose of all the coal in, upon, or under the following described tracts of land, situated in the State of Utah... together with the right to construct all such works, buildings, plants, structures and appliances as may be necessary and convenient for the mining and preparation of the coal for market, the manufacture of coke or other products of coal, the housing and welfare of employees, and subject to the conditions herein provided, to use so much of the surface as may reasonably be required in the exercise of the rights and privileges herein granted."

In addition to the coal leases, WEST RIDGE also holds several surface use permits as part of the operation, including:

1) SITLA Special Use Lease Agreement No. 1163. The substitute topsoil borrow area, which is also included within the permit area, is located on lands administered by the Utah School and Institutional Trust Lands Administration (SITLA). This area is located within the SE1/4 of section 16, T 14 S, R 13 E. SITLA has issued a long term special use permit to WEST RIDGE Resources, Inc. which provides full assurance that the topsoil resource in this area will be available for (and, indeed dedicated to) final reclamation of the West Ridge minesite if needed. This area is not contiguous with the main coal leasehold. (See Appendix 1-10 for details)

2) BLM Right-of-Way UTU-77120 This right-of-way authorizes the installation and operation of a pumping station used to facilitate the delivery of culinary water to the West Ridge Mine. This area is not contiguous with the main coal leasehold. (See

Appendix 1-12 for details)

3) BLM Right-of-Way 87110 This right-of way authorizes the installation of three (3 ea.) catchment structures in the C Canyon drainage below the mine. These catchments are designed to provide containment of unanticipated coal-fines accumulations from the mine discharge water. These catchment structures comprises a total of 0.69 acres (Refer to Appendix 5-15 for details).

The total permit area is 7,600.38 acres. Refer to Map 1-1 for the permit area location. Refer to Table 1-4 for the legal description of the permit area by composite leasehold, and Table1-5 for the legal description of the permit area in total area. Table 1-6 describes the surface ownership of the permit area.

The permit area consists of the following areas:

1) all of federal coal leases SL-068754-U-01215 (2,650.67 acres)
2) most of federal coal lease UTU 78562 (2,403.07 acres),
3) all of state coal leases ML-47711 (801.24 acres)
4) all of state coal lease ML-49287 (881.10 acres)
5) much of state coal lease ML-51744 (212.5 acres)
6) much of the Penta Creek fee coal lease (650.49 acres)
7) SITLA surface lease 1163, for topsoil borrow area (9.6 acres).
8) BLM right-of-way UTU-77120, for pumping station (0.23 acres)
9) BLM right-of-way UTU-87110, for catchment structures A, C and E (0.69 acres)
10) Carbon County authorization, road security gate (0.79 acres). See Appendix 1-13

Disturbed area within the permit area consists of the following:

1)	Minesite surface facilities	29.82 acres
2)	Pumping station	0.23 acres
3)	GVH installation (main pad)	0.24 acres
4)	GVH installation (GVH 5 "pullout")	0.02 acres
5)	GVH topsoil storage	0.1 acres
6)	Catchment structures A	0.12 acres
7)	Catchment structures C	0.23 acres
8)	Catchment structures E	0.23 acres
9)	B Canyon Portal re-opening	0.25 acres
	TOTAL	31.24 acres

See Table 1-7 for complete legal description of disturbed areas.

114.200 Not applicable, the fee lease mineral estate is not severed from the surface estate.

TABLE 1-1
FEDERAL LEASE and R.O.W. PROPERTIES

PARCEL	ACREAGE	LEGAL DESCRIPTION	
1) FEDERAL COAL LEASE SL-068754 (SL-068754-U-01215)	2,650.67	T 14 S, R 13 E	
		Section 10:	NE, E2NW, N2SE, SESE
		Section 11:	All
		Section 12:	S2SW, NWSW
		Section 13:	S2, NW, S2NE, NWNE
		Section 14:	E2, N2NW, SENW
		Section 15:	NENE
		Section 24:	N2, N2SE, NESW
2) FEDERAL COAL LEASE UTU-78562	2,249.25	T 13 S, R13 E	
		Section 34:	NESE, S2SE
		Section 35:	All
		T 13 S, R 14 E	
		Section 31:	Lot 4, S2SESW, NESESW, SENWSESW, W2SWSE, S2SESWSE, S2S2SESE
		T 14 S, R 13 E	
		Section 1:	All
		Section 12:	Lots 1 thru 4, S2N2, NESW, SE
		Section 13:	NENE
		T 14 S, R 14 E	
		Section 5:	Lot 4, W2W2SWNW, SWNWSW, W2NWNWSW, W2SWSW
		Section 6:	Lot 6, NESW, NESE
		Section 7:	Lots 3 and 4

		Section 8:	W2NWNW, W2SENWNW, SWNENWNW, W2SWNW, W2E2SWNW, W2NWSW, SWSW
		Section 17:	N2NWNWNE
		Section 18:	Lot 1, E2NW
3) PUMPING STATION (BLM R.O.W. UTU-7712)	0.23	T 14 S, R 13 E	
		Section 21:	NENE (0.23 acres thereof)
4) CATCHMENT STRUCTURE A (BLM R.O.W. UTU-87110)	0.23	T 14 S, R 13 E	
		Section 15:	SESW (0.23 acres therein)
5) CATCHMENT STRUCTURE C (BLM R.O.W . UTU-87110)	0.23	T 14 S, R 13 E	
		Section 28:	NWNW (0.23 acres therein)
6) CATCHMENT STRUCTURE E (BLM R.O.W . UTU-87110)	0.23	T 14 S, R 12 E	
		Section 25:	SESE (0.23 acres therein)
TOTAL FEDERAL	**5257.08 acres**		

TABLE 1-2
STATE (SITLA) LEASE and SPECIAL USE PROPERTIES

PARCEL	ACREAGE	LEGAL DESCRIPTION	
1) STATE LEASE ML 47711	801.24	T 14 S, R 13 E	
		Section 2:	Lots 1 thru 4, S2N2, S2 (i.e. All)
		T 13 S, R 13 E	
		Section 36:	SW
2) STATE COAL LEASE ML 49287	881.10	T 14 S, R 13 E	
		Section 3:	Lots 1, 2, 3, S2N2, S2
		Section 10:	W2NW, SW, SWSE
3) STATE COAL LEASE ML 51744	480	T 13 S, R 13 E	
		Section 36:	N2, SE
4) STATE SURFACE LEASE SPECIAL USE PERMIT (Agreement #1163)	9.6	T 14 S, R 13	
		Section. 16:	E2NESE (9.6 acres thereof, containing substitute topsil area)
TOTAL STATE	**2171.94**		

TABLE 1-3
FEE LEASE PROPERTIES
(PENTA CREEK)

PARCEL	ACREAGE	LEGAL DESCRIPTION	
1) PENTA CREEK FEE LEASE	382.08	T 14 S, R 14 E	
		Section 6:	Lot 7, SESW
		Section 7*:	Lots 1* and 2*, NENW*, E2SW*, SWSE
		Section 18:	Lots 2 and 3, NWNE

*Less and excepting from the portion of the above legal subdivisions in Section 7, those lands under and around Grassy Trail Dam and Reservoir owned by East Carbon City and Sunnyside City, such lands being more accurately described in Appendix 1-15.

2) PENTA CREEK LEASE EXTENSION (Extension 1, August, 2010)	352.36	T 14 S, R 14 E	
		Section 6:	Lots 2, 3, 4 and 5, SENW, SWNE, NWSE, S2SE
3) PENTA CREEK LEASE EXTENSION (Extension 2, March, 2011)	295.40	T 14 S, R 14 E	
		Section 6:	Lot 1, SENE
		Section 7:	SWNE, NWSE, SESE, SENW
		Section 18:	NENE
4) HINKINS FEE LEASE**	160.00	T 14 S, R 14 E	
		Section 7:	N2NE, SENE, NESE
TOTAL FEE LEASES:	**1189.84**		

** This lease area is held as follows: (individually)

David P. Hinkins, Todd S. Hinkins and Ross D. Hinkins.....50%
Emily P. Marston.....25%
Leonard Pagano.....25%

TABLE 1-4
LEGAL DESCRIPTION OF PERMIT AREA
(BY LEASEHOLD)

PARCEL	ACREAGE	LEGAL DESCRIPTION	
1) FEDERAL LEASE SL-068754 (SL-068754-U-01215)	2,650.67	T 14 S, R 13 E	
		Section 10:	NE, E2NW, N2SE, SESE
		Section 11:	All
		Section 12:	S2SW, NWSW
		Section 13:	S2, NW, S2NE, NWNE
		Section 14:	E2, N2NW, SENW
		Section 15:	NENE
		Section 24:	N2, N2SE, NESW
2) FEDERAL LEASE UTU-78562	2403.07	T 13 S, R13 E	
		Section 34:	NESE, S2SE
		Section 35:	All
		T 13 S, R 14 E	
		Section 31:	Lot 4, S2SESW, NESESW, SENWSESW, W2SWSE, S2SESWSE, S2S2SESE
		T 14 S, R 13 E	
		Section 1:	All
		Section 12:	Lots 1 thru 4, S2N2, NESW, SE
		Section 13:	NENE
		T 14 S, R 14 E	
		Section 5:	W2W2SWNW, W2NWNWSW
		Section 6:	Lot 6, NESW, N2NESE, SWNESE
		Section 7:	Lots 3 and 4
		Section 18:	Lot 1, E2NW

TABLE 1-4 (continued)

3) STATE LEASE ML 47711	801.24	T 14 S, R 13 E	
		Section 2:	Lots 1 thru 4, S2N2, S2
		T 13 S, R 13 E	
		Section 36:	SW
4) STATE LEASE ML 49287	881.10	T 14 S, R 13 E	
		Section 3:	Lots 1, 2 and 3, S2N2, S2
		Section 10:	W2NW, SW, SWSE
5) STATE LEASE ML 51744	212.5	T 13 S, R 13 E	
		Section 36:	SW, SWNWSWNW, S2S2NW, S2SWNE, W2SE, SESE, S2NESE, NWNESE
6) PENTA CREEK FEE LEASE	238.17	T 14 S, R 14 E	
		Section 6:	Lot 7, SESW
		Section 7*:	Lot 1*, SESW, SWNESW
		Section 18:	Lots 2 and 3
7) PENTA CREEK LEASE EXTENSION (Extension #1, August, 2010)	402.32	T 14 S, R 14 E	
		Section 6	Lots 1, 2, 3, 4 and 5, SENW, SWNE, NWSE, SWSE, SENE, NWSESE
8) PUMPING STATION (BLM R.O.W. UTU-7712)	0.23	T 14 S, R 13 E	
		Section 21	NESENE (0.23 acres thereof, containing pumping station)

TABLE 1-4 (continued)

9) TOPSOIL SALVAGE AREA (SITLA special use agreement #1163)	9.6	T 14 S, R 13 E	
		Section 16:	E2NESE (9.6 acres thereof, containing substitute topsoil area)
10) CATCHMENT STRUCTURE A (BLM R.O.W . UTU-87110)		T 14 S, R 13 E	
	0.23	Section 15:	SESW (0.23 acres thereof, containing catchment structure)
11) CATCHMENT STRUCTURE C (BLM R.O.W . UTU-87110)		T 14 S, R 13 E	
	0.23	Section 28:	NWNW (0.23 acres thereof, containing catchment structure)
12) CATCHMENT STRUCTURE E (BLM R.O.W . UTU-87110)		T 14 S, R 12 E	
	0.23	Section 25:	SESE (0.23 acres thereof, containing catchment structure)
13) SECURITY GATE (Carbon County authorization)	0.79	T 14 S, R 13 E	
		Section 15:	NWSENE (0.79 acres thereof, containing security gate)
TOTAL PERMIT AREA	**7600.38 acres**		

*Less and excepting from the portion of the above legal subdivisions in Section 7, those lands under and around Grassy Trail Dam and Reservoir owned by East Carbon City and Sunnyside City, such lands being more accurately described in Appendix 1-15.

TABLE 1-5
LEGAL DESCRIPTION OF PERMIT AREA
(TOTAL AREA)

T13S, R13E	Section 34	NESE, S2SE
	Section 35	All
	Section 36	SW, SWNWSWNW, S2S2NW, S2SWNE, W2SE, SESE, S2NESE, NWNESE,
T13S, R14E	Section 31:	Lot 4, S2SESW, NESESW, SENWSESW, W2SWSE, S2SESWSE, S2S2SESE
T14S, R12E	Section 25	SESE (part thereof containing catchment structure E)
T14S, R13E	Section 1	All
	Section 2	All
	Section 3	Lots 1, 2 and 3, S2N2, S2
	Section 10	All
	Section 11	All
	Section 12	All
	Section 13	All
	Section 14	E2, N2NW, SENW
	Section 15	NENE, NWSENE (part thereof, containing security gate) SESW (part thereof, containing catchment structure A)
	Section 16	E2NESE (part thereof, containing substitute topsoil area)
	Section 21	NESENE (part thereof, containing pumping station)
	Section 24	N2, N2SE, NESW
	Section 28	NWNW (part thereof, containing catchment structure C)
T14S, R14E	Section 5:	W2W2SWNW, W2NWNWSW
	Section 6	Lots 1, 2, 3, 4, 5, 6 and 7, SENW, E2SW, W2SE, S2NE, N2NESE, SWNESE, NWSESE
	Section 7*	Lots 1*, 3 and 4, SESW, SWNESW
	Section 18	Lots 1, 2 and 3, E2NW

TOTAL PERMIT AREA = 7,600.38 acres.

*Less and excepting from the portion of the above legal subdivisions in Section 7, those lands under and around Grassy Trail Dam and Reservoir owned by East Carbon City and Sunnyside City, such lands being more accurately described in Appendix 1-15.

TABLE 1-6
SURFACE OWNERSHIP OF PERMIT AREA

T(S)/R(E)	Section	BLM	Penta Creek	Hinkins	Wells	Rauhala	SITLA	Total
13/13	34	-	-	-	120.00	-	-	120.00
13/13	35	40.00	-	448.91	151.09	-	-	640.00
13/13	36	-	372.50	-	-	-	-	372.50
13/14	31	108.82	-	-	-	-	-	108.82
14/12	25	0.23	-	-	-	-	-	0.23
14/13	1	283.75	328.68	-	-	39.92	-	652.35
14/13	2	-	641.24	-	-	-	-	641.24
14/13	3	-	-	-	80.66	-	520.44	601.10
14/13	10	360.00	-	-	-	-	280.00	640.00
14/13	11	650.87	-	-	-	-	-	650.87
14/13	12	-	648.96	-	-	-	-	648.96
14/13	13	640.00	-	-	-	-	-	640.00
14/13	14	440.00	-	-	-	-	-	440.00
14/13	15	41.02	-	-	-	-	-	41.02
14/13	16	-	-	-	-	-	9.60	9.60
14/13	21	0.23	-	-	-	-	-	0.23
14/13	24	440.00	-	-	-	-	-	440.00
14/12	28	0.23	-	-	-	-	-	0.23
14/14	5	-	-	15.00	-	-	-	15.00
14/14	6	76.41	478.88	30.00	-	-	-	585.29
14/14	7	74.08	86.69		-	-	-	160.77
14/14	8	-	-		-	-	-	0.00
14/14	18	117.25	74.92	-	-	-	-	192.17
		3272.89	2631.87	493.91	351.75	39.92	810.04	7600.38

TABLE 1-7
DISTURBED AREA WITHIN PERMIT AREA

1) Minesite surface facilities: portions of the following, totaling 29.82 acres (all BLM)

T14S, R13E	Section 10:	SESESE
		NESESE
T14S, R13E	Section 11:	SWNESW
		NWSESW
		NESWSW
		NWSWSW
		SWSWSW
		SESWSW
T14S, R13E	Section 15:	NENENE
		NWNENE
		SWNENE
		SENENE
		NWSENE

2) Pumphouse: portion thereof of the following, containing 0.23 acres (all BLM)

T14S, R13E	Section 21:	NESENE

3) Gob gas vent hole (GVH) installation (main pad): portion thereof of the following, containing 0.24 acres (all SITLA)

T14S, R13E	Section 3:	NESWSE

4) Gob gas vent hole (GVH) installation (GVH 5 "pullout"): portion thereof of the following, containing 0.02 acres (all SITLA)

T14S, R13E	Section 3:	NESWSE

5) Gob gas vent hole (GVH) topsoil pile: portion thereof of the following, containing 0.1 acres (all SITLA)

T14S, R13E	Section 10:	SENWNW

6) Catchment Structure A: portion thereof of the following, containing 0.12 acres (all BLM)

T 14 S, R 13 E Section 15: SESW

7) Catchment Structure C: portion thereof of the following, containing 0.23 acres (all BLM)

T 14 S, R 13 E Section 28: NWNW

8) Catchment Structure E: portion thereof of the following, containing 0.23 acres (all BLM)

T 14 S, R 12 E Section 25: SESE

9) B Canyon Portal Re-Opening: portion thereof of the following, containing 0.25 acres (all BLM)*

T 14 S, R 13 E Section 14 SWNE

TOTAL DISTURBED AREA = 31.24 acres

* Note: All disturbance associated with the B Canyon Portal Re-Opening will be within the area of previous (pre-SMCRA) disturbance.

R645-301-115 STATUS OF UNSUITABILITY CLAIMS

115.100 The proposed permit area is not within an area designated as unsuitable for mining. WEST RIDGE Resources, Inc. is not aware of any petitions currently in progress to designate the area as unsuitable for coal mining and reclamation activities.

The area in which the proposed facility will be located has been evaluated within area management plans. It has not been found unsuitable for mining activities under any categories of examination.

115.200 Not applicable.

115.300 WEST RIDGE Resources, Inc. will not be conducting mining operations within 100 feet of an occupied dwelling. WEST RIDGE Resources, Inc. has received permission from Carbon County to construct facilities and operate coal mining activities within 100 feet of a public road. Refer to the letter from Carbon County in Appendix 1-8.

R645-301-116 PERMIT TERM

116.100 The anticipated starting and termination dates of the coal mining and reclamation operation are as follows:

	Begin	Complete
Construction of Mining Pad, Mining Support Structures, and Portals	Apr. 1999	Dec. 1999
Begin Mining	Jan. 2000	
Terminate Mining		Dec. 2017*
Remove Facilities	Jan. 2018*	June 2018*
Regrade Area	July 2018*	Sept. 2018*
Revegetate Site	Oct. 2018*	Nov. 2018*

*This assumes mine life extended through acquisition of adjacent state and federal coal reserves.

116.200 The initial permit application will be for a five year term with successive five year permit renewals.

R645-301-117 INSURANCE, PROOF OF PUBLICATION AND FACILITIES OR STRUCTURES USED IN COMMON

117.100 The Certificate of Liability Insurance is included as Attachment 1-1 in Appendix 1-1.

117.200 A copy of the newspaper advertisement of the application for a permit and proof of publication are included as Attachment 1-2 and 1-3 respectively, in Appendix 1-1. A copy of the newspaper advertisement for the Whitmore lease revision is included as Attachment 1-3 in Appendix 1-1.

117.300 Not applicable.

R645-301-118 FILING FEE

Verification of filing fee payment is included as Attachment 1-4 in Appendix 1-1.

R645-301-123 NOTARIZED STATEMENT

A notarized statement attesting to the accuracy of the information submitted can be referenced as Attachment 1-5 in Appendix 1-1.

R645-301-130 REPORTING OF TECHNICAL DATA

Technical reports prepared by consultants specifically for WEST RIDGE Resources, Inc. are typically presented in an appendix format and, in general, provide the name and address of the person or company (consultant) preparing the report, the name of the report, the date of collection and analysis of the data, and descriptions of the methodology used to collect and analyze the data. The body of the report usually will provide the date the actual field work was conducted and a description of the methodology used to collect and analyze the data. The format of each report may vary depending on the contents of the report and organization preparing it.

For laboratory analyses, such as Appendix 7-2 and 7-3, the company performing the analyses as well as the date of the analyses, is presented on the laboratory report rather than the cover page.

A list of consultants and their appended reports is contained in Appendix 1-6, Consultation and Coordination. Sources used in the preparation of the permit application are referenced in Appendix 1-3. References in all chapters are keyed to this main reference list.

Mining and exploration activities had been conducted in the currently proposed disturbed area prior to August 3, 1977. A road existed into C Canyon in 1952 when drill hole B-6 was drilled in the right fork. A road was also constructed up the left fork of C Canyon to a drill hole site during the same year. In addition to the drill holes, the coal outcrop in the left fork of C Canyon was exposed for sampling purposes. A small pad was built at the outcrop location and it was left in place as were the roads.

In 1986, another drill hole, 86-2, was drilled west of the first drill hole in the right fork. A minor amount of road work was done in conjunction with this second drill hole. Kaiser Coal Company obtained permission from the BLM to grade the existing road and make it passable for the drill rig. The drill hole site was reclaimed but the road, a public road, was left in place.

Through use of aerial photography and site evaluations, it is possible to document previous mining related disturbances in C Canyon. Refer to Map 5-1 for delineation of the disturbance prior to August 3, 1977.

The total of all the previously disturbed areas within the minesite disturbed area is estimated to be as follows:

roads in right and left forks	=	1.27 acres
road culvert	=	.05 acres
water monitoring well	=	.05 acres
material storage pad	=	.05 acres
		1.62 acres

WEST RIDGE Resources, Inc. is proposing to utilize the entire previously disturbed area in their current proposal and to reclaim it upon cessation of mining operations.

In the 1950's a road was constructed in the Right Fork of Bear Canyon to access an exploratory drillhole site. This road now provides access to the site of the Bear Canyon GVH installation. (Refer to Appendix 5-14 for a detailed description of the Bear Canyon GVH facility)

ATTACHMENT 1-5
VERIFICATION STATEMENT

I hereby certify that I am a responsible official (Resident Agent) of the applicant (ANDALEX and IPA for WEST RIDGE Resources, Inc.) and that the information contained in this application is true and correct to the best of my information and belief in all respects with the laws of Utah in reference to commitments, undertakings, and obligations, herein

_____ **Signed - Name - Position - Date**

David Shaver, Resident Agent

Subscribed and sworn to before me this__ day of_____, 20_

_____

Notary Public

My commission Expires: _____, 20___)

Attest: STATE OF _____) ss:

COUNTY OF _____)

CHAPTER 5.....REPLACEMENT TEXT

TABLE OF CONTENTS- APPENDICES
R645-301-500 CHAPTER 5

APPENDIX NUMBER	DESCRIPTION
APPENDIX 5-1	Reclamation Bond Calculations
APPENDIX 5-2	Letter from Carbon County Commission
APPENDIX 5-3	Resource Recovery and Protection Plan (R2P2)
APPENDIX 5-3A	Amended R2P2 Approval Letter (BLM)
APPENDIX 5-3B	BLM R2P2, Approval of Full Extraction of Panel #7
APPENDIX 5-3C	BLM R2P2, Approval of Longwall Panel Block 18 through 20
APPENDIX 5-3D	BLM R2P2, Approval of Longwall Panel 23
APPENDIX 5-3E	BLM R2P2, Approval of Longwall Panel 22
APPENDIX 5-4	Stability Evaluation for Construction and Reclaimed Slopes, West Ridge Mine
APPENDIX 5-5	Construction/Reclamation Plan
APPENDIX 5-6	Spill Prevention Control and Countermeasure Plan (SPCC)
APPENDIX 5-7	Pump House Reclamation and Sediment Control
APPENDIX 5-8	Letter Regarding Pre-Subsidence Survey (Mayo and Associates)
APPENDIX 5-9	Alternate Highwall Reclamation Plan
APPENDIX 5-10	SITLA Mine Plan Approval State Lease ML-47711, ML-49287 and ML-51744
APPENDIX 5-11	Grassy Trail Dam and Reservoir Mining - Induced Seismicity Report, Pre-mining Report (RB&G Engineering)
APPENDIX 5-12	Grassy Trail Dam and Reservoir - Phase II Dam Safety Study (RB&G Engineering)

TABLE OF CONTENTS- APPENDICES
R645-301-500 CHAPTER 5
(Continued)

APPENDIX NUMBER	DESCRIPTION
APPENDIX 5-13	Grassy Trail Dam Monitoring/Inspection Plan, Panel #7
APPENDIX 5-13A	Grassy Trail Dam Monitoring/Inspection Plan, Panel Block #18-21
APPENDIX 5-14	Bear Canyon Gob Gas Vent Hole (GVH)
APPENDIX 5-15	Catchment Structure, C Canyon Drainage
APPENDIX 5-16	Grassy Trail Dam and Reservoir Mining-Induced Seismicity Summary Report, 2008
APPENDIX 5-17	Grassy Trail Dam and Reservoir Mining-Induced Seismicity Summary Update Report (RB&G Engineering, 2010)
APPENDIX 5-18	Subsidence Monitoring Survey Points, Right Fork of Whitmore Canyon
APPENDIX 5-19	B Canyon Re-Opening Project

CHAPTER 5
R645-301-500 ENGINEERING

Historical Note 1: In the spring of 2009, and again in the summer of 2010, the company constructed small catchment structures in the C Canyon drainage below the minesite. The purpose of these structures was to contain coal-fines which had accumulated in the drainage channel as a result of non-compliance discharge water from the mine, and to assist in the subsequent clean-up project. After the unit was constructed it was determined that it should be included within the Mining and Reclamation Plan. Please refer to Appendix 5-15 for a complete description of these catchment structures, including history, location, right-of-entry, as-built design, operational criteria, and reclamation information.

Historical Note 2: In the summer of 2011 the company acquired a modification of federal lease UTU-78562 along the eastern side of the permit area. Mining in this new lease will involve development mining under the stream in the Right Fork of Whitmore Canyon which supplies most of the water to the Grassy Trail Reservoir. Due to concerns for the water rights in this area the company has agreed to collecting additional hydrologic baseline data. This data acquisition will include, but is not limited to the following:

a) Installation and/or rehabilitation of measuring flumes in the upper and lower reaches of both Right and Left Forks of Whitmore Canyon above the reservoir (total of 4 ea. flumes).

b) Installation of subsidence monitoring stations at approximate 100' intervals along the bottom of the Right Fork drainage within the permit area.

c) Installation of flow meters within the underground mine water collection/pumping system sufficient to adequately assess the quantity and location of groundwater sources encountered in the mine works in the vicinity of the Right Fork.

d) On-site location and development of selected springs in the Right Fork area subject to future monitoring, conducted in conjunction with stakeholder input.

e) Expansion of the seep and spring survey in the Right Fork to include more of the upper drainage area above longwall Panel #22.

f) Completion of a detailed gain-loss analysis of the stream flow in the Right Fork within the area of proposed development mining.

It should be noted that there will be no longwall mining under (beneath) the Right Fork of Whitmore Canyon, nor any other mining that would result in subsidence under the drainage of the Right Fork. The only mining under the Right Fork will be a limited number of development entries associated with the longwall bleeder system. All such development mining associated with Panel #22 will be conducted at depths in excess of 2600' below the Right Fork drainage.

Information regarding the subsidence monitoring points in the Right Fork can be found in Appendix 5-18.

Information regarding the underground (in-mine) flow meters can be found in Appendix 7-16.

Information regarding the expanded seep and spring survey can be found in Appendix 7-6B.

Information regarding the gain-loss analysis of the Right Fork can be found in Appendix 7-14.

Historical Note 3: In the spring of 2012, the company made application to re-open a sealed-up portal located in B Canyon. This portal was constructed in the early 1960's as part of an underground mine extension of the old Kaiser Mine. The portal was later reclaimed by the Utah Division of Oil, Gas and Mining's Abandoned Mine Lands (AML) Program in the summer of 1998. West Ridge Resources now needs to re-open this portal to gain access to the underground workings in order to perform safety-related work in preparation for future longwall mining in this area. A complete description of the portal re-opening project is provided in Appendix 5-19.

R645-301-511 GENERAL REQUIREMENTS

Chapter 5 contains information regarding the proposed coal mining operation and reclamation plans, a discussion of its potential impact to the environment and methods to achieve compliance with design criteria.

Reclamation plans and estimates are presented for postmining restoration of the area.

NOTE: The following discussion for the remainder of R645-301-511 applies specifically to the Gob Gas Vent Hole (GVH) installation proposed in Bear Canyon. In order to facilitate the review it is presented here in its entirety rather than interspersed throughout the chapter. A more detailed and complete discussion of the Bear Canyon GVH proposal can be found in Appendix 5-14. Unless specifically noted in this following discussion, nothing related to the Bear Canyon GVH proposal affects the contents of the existing approved MRP as described hereinafter.

The GVH facility will consist of three drillholes, four methane extractor units, and interconnecting piping. A detailed description of the drillhole installation, and the assembly and operation of the methane extractor units can be found in Attachment 7 of Appendix 5-14. The site pad will consist of a narrow strip (approximately 35' wide x 300' long) located adjacent to and parallel with the road. The drillholes will be located at the southern (down-canyon) end of the site pad. The extractor units will be located in a serial arrangement along the northern (up-canyon) end of the site pad. The total facility area will be about 0.24 acres, including the adjacent cutslopes.

Three angled holes will be drilled at angles ranging from 20 degrees to 45 degrees from vertical. Drilling will be conducted using tri-cone rotary and/or hammer. Drilling fluid will be primarily compressed air (600-800 psi) with water and Baroid Quick Foam and EZ Mud (see Attachment 15 for MSDS sheets for these products). Cuttings will pass up the annulus and be diverted to the reserve pit on the surface. Each hole will be spudded with a 19" diameter hole into which a 16" diameter conductor casing will be set and grouted to an approximate depth of 20'. Thereafter, a 12.25" hole will be drilled to within 200' of the Lower Sunnyside coal seam (an inclined depth of 200'-300'). A 9.625" T&C casing will be set and grouted to total depth of the 12.25" bore. An 8.75" bit will be tripped in to drill out the shoe and will continue about 175' to within 25' of the coal seam horizon. Sections of 7" slotted casing will be tripped in from bottom of hole to about 40' above the bottom of the

APPENDIX 5-19

B CANYON PORTAL RE-OPENING PROJECT

APPENDIX 5-19
B CANYON PORTAL OPENING

ATTACHMENTS:

ATTACHMENT 1	MAP OF B CANYON PORTAL REHABILITATION PROJECT
ATTACHMENT 2	AML RECLAMATION INFORMATION FROM DOGM FILES (INCLUDES PRE-RECLAMATION PHOTOS)
ATTACHMENT 3	PHOTOS OF EXISTING PORTAL AREA
ATTACHMENT 4	ORDER 2 SOILS SURVEY (RELEVANT EXCERPTS), LONG RESOURCE CONSULTANTS
ATTACHMENT 5	INSPECTION REPORT AND SOILS RECOMMENDATION
ATTACHMENT 6	APPROVED SEED MIX FROM AML RECLAMATION OPERATION
ATTACHMENT 7	VEGETATION AND SENSITIVE SPECIES REPORT, MT NEBO SCIENTIFIC
ATTACHMENT 8	CULTURAL REPORT, SENCO-PHENIX ARCHEOLOGICAL
ATTACHMENT 9	2011 RAPTOR SURVEY AND AGENCY CORRESPONDENCE REGARDING GOLDEN EAGLE NEST
ATTACHMENT 10	ENGINEERING DRAWINGS: EXISTING PORTAL AREA TOPOGRAPHY PROPOSED PORTAL OPENING PROJECT

INTRODUCTION:

The company needs to uncover the B Canyon Portal in order to gain access to the old Kaiser mine works. As shown on Map 5-4A, there is a two-entry set of exploratory entries which extend from the old Kaiser mine works and was driven into the coal reserve block now controlled by West Ridge Resources. These entries were mined in the early 1960's, prior to the development of the West Ridge mine. These entries were driven from the underground works basically allong strike. However, Kaiser also drove a short set of entries to the surface in order to

assist the mine ventilation. These entries broke out to the surface in a single opening in B canyon, where a steel portal canopy was constructed, which still remains intact (see photo in Attachment 2). After the exploratory project was completed, Kaiser sealed the portal with a concrete barricade and a steel fence across the opening of the steel structure.

In 1998, the Utah Division of Oil,Gas and Mining's Abandoned Mine Lands (AML) group reclaimed the portal site. This was small isolated part of a much larger reclamation project involving the entire Sunnyside Mine site in nearby Whitmore Canyon. Reclamation of the B Canyon portal consisted primarily of backfilling the steel canopy and re-vegetating the site. The steel fence at the end of the canopy was removed, but the main portal structure, consisting of circular steel multiplate arch sets, was left in place. Part of the steel arch remains visable at present. According to AML records, approximately 10 cubic yards of earthen material was used to backfill the portal. This material was obtained by excavation the nearby bank. Relevant documentation regarding the AML reclamation of the B Canyon Portal, obtained from the Division's public records, is presented in Attachment 2.

As part of the planned West Ridge Mine development, the company is now proposing to extend longwall gate entries across these old Kaiser mine exploratory entries (see map in Attachment 1). In order to assess the conditions of the old works, the company proposes to uncover the B Canyon portal and breach the seal. This work will be done under the necessary approvals from US Mine Enforcement and Safety Administration (MSHA). The company will then inspect the old works and conduct any needed re-habilitation work, such as re-bolting the roof in selected areas, and perhaps erecting an additional seal in the underground portion of the old works.

Re-opening of the B canyon Portal will be a temporary action. It is estimated that it will take no longer than two-three days to uncover the portal and breach the seal. To provide the necessary ventilation, a small auxiliary face fan will be used, along with a portable generator to provide electrical power. These units will be supported by crib blocks. All installation of components will be temporary; there will be no concrete foundations used.. The drawings in Attachment 10 show the existing area and the reclaimed topographic contours, as well as the proposed equipment layout during the re-habilitation work.

Re-hab of the mine entries could take from several weeks to several months, depending on the roof conditions encountered in the old entries. However, after the mine re-hab work is completed, the portal will be re-sealed, and the site will be reclaimed to the same standard as the existing AML reclamation. The following discussion provides greater detail of the portal re-opening plan.

CHAPTER 1; LEGAL

The B Canyon portal is located approximately one-half mile southeast of the main mine surface facilities in C Canyon, as shown on Map 1-0/1-1. The are has been previously disturbed when

Kaiser Coal Company installed the portal in the early 1960's, and again when AML reclaimed the site in 1998. The site is accessed by an existing unimproved dirt road which was initially installed in the 1950's by US Steel to reach a drill site located up-canyon from the portal site. The road has been sufficiently maintained by local usage, and will not need to be upgraded as part of the portal re-opening project.

The portal site is located on BLM land, and is within federal coal lease SL-068754 which is held by West Ridge Resources (see Maps 5-3 and 5-4). Right of entry to do the portal work is granted under the terms and authority of this lease (see Appendix 1-4A). The site is located within the existing DOGM SMCRA permit area for the West Ridge Mine C/007/041). Total disturbance associated with the previous activities is approximately 0.62 acres, based on ground surveys of the area (see map in Attachment 10). Total disturbance associated with the proposed portal-opening project is estimated at about 0.25 acres, all within the previous disturbed area. Chapter 1 has been updated to reflect the additional disturbance associated with this proposal.

CHAPTER 2: SOILS

As stated above, the site has been previously disturbed on two separate occasions; initially in the early 1960's when Kaiser constructed the portals, and then again in 1998 when DOGM/AML did the partial reclamation. Because of this previous activity, there is no native topsoil remaining in the small area immediately in front of the portal, the area now proposed for disturbance as part of the portal re-opening project. DOGM soils scientist has reviewed the site and concluded that adequate reclamation should be obtained by removing the existing vegetation from the area to be disturbed, and then removing the top 12" of material from this area. The vegetation would be stockpiled separately in a nearby location, and the "topsoil" would likewise be stored in its own separate pile located nearby. The proposed location of these stockpiles is shown on the drawing in Attachment 10. The Division has provided its assessment of the topsoil situation in the form of a pre-construction inspection report, which is included in Attachment 5.

Even though this area has been previously disturbed, the company has recently conducted an on-site soils survey of the area associated with a proposed GVH project in the vicinity. In May, 2010, Long Resource Consultants prepared an Order 2 soils survey of the entire B Canyon road, which included soil samples taken at the portal site, as well as samples taken immediately above and below the site. Relevant sections of this survey report are presented in Attachment 4. In reviewing this report, it may be helpful to note that sample B-06 was taken directly at the portal site, while sample B-05 was taken approximately 300' up-canyon from the site, and sample B-07 was taken about 600' below the site. Therefore, the report is able to give a very accurate description of the soils existing in the area.

It should also be noted that the revegetation that was established at the site after the AML reclamation seems to have been successful, despite the fact that the AML team did not at the time have a designated topsoil resource to re-apply to the backfilled portal site. As the photos in

Attachment 3 show, subsequent re-vegetation appears healthy and diverse. Also, Mt Nebo Scientific has conducted an on-site vegetation report (see Attachment 7), which lists the plant species (shrubs, forbs and grasses) which have successfully re-established themselves at the site over the last 12 years since the AML reclamation.

Based on these observations, the company proposes to remove all existing vegetation from the area in front of the portal and store this material in a separate pile. A minimum of 12" of surface "topsoil" material will then be salvaged and stored in a nearby pile. The remaining earthen material in front of portal will be pulled down to construct the access ramp leading to the portal opening. As mentioned previously, the portal re-opening project will be temporary. The company estimates that it should be able to complete all the underground mine safety work in less than six months, at which time the portal would be re–sealed, and the site would then be backfilled and reclaimed to its existing (AML) condition and contour. At the time of reclamation, after the ramp has been removed and the portal has been backfilled, the "topsoil" material will be placed back over-top the backfill, and the vegetation material will then be spread back over the disturbed area as mulch.

The company proposes to re-seed the disturbed area with the same seed mix which was used by the AML reclamation team in 1998. Attachment 6 includes this seed mix, which was obtained from the Division's public records. As shown on the engineering drawing in Attachment 10, the maximum extent of new disturbance is about 0.25 acres. However, this area includes all the area potentially involved in the re-opening project. Much of this area will not be subject to any earthwork or excavation-type disturbance, but may be involved by placing portable equipment directly on the ground, or by parking vehicles at the existing vehicle turn-around area. In this sense, it could be disturbed, but there would be no vegetation removed nor any kind of invasive earthwork. The area of actual disturbance would be much smaller, and is estimated at about 0.07 acres. This is the area immediately in front of the portal associated with the access ramp. Assuming a salvage depth of 12", approximately 113 cubic yards of topsoil would be removed and stored in the adjacent stockpile. Another 50 cubic yards of underlying earth material would then be reworked to expose the portal and construct the access ramp. These quantities are estimates only, and could vary upon final construction, but it can be safely stated that the quantities involved in this project are small , and the project can be completed with minimal disturbance. Foe example, records from the previous AML backfill efforts indicate that the volume of material used in backfilling the portal was only about 10 cubic yards.

CHAPTER 3: BIOLOGY

As stated previously, the revegetation that has been established at the site after the AML reclamation seems to have been successful, despite the fact that the AML team did not at the time have a designated topsoil resource to re-apply to the backfilled portal site. As the photos in Attachment 3 show, subsequent re-vegetation appears healthy and diverse. Also, Mt Nebo Scientific has conducted an on-site vegetation report (see Attachment 7), which lists the plant

species (shrubs, forbs and grasses) which have successfully re-established themselves at the site over the last 12 years since the AML reclamation.

Included in the Mt Nebo report is an updated list of Threatened, Endangered and Sensitive Species for Carbon County, Utah. The report concludes that there should be no impacts to any of the listed species as a result of re-opening the B Canyon portal.

Based on the 2011 raptor survey, there are several eagle nests in the B Canyon area. In particular, nest 395 (tended in 2011) is located immediately above, and is visible from, the portal site. Nest 1056 (inactive in 2011) is located down-canyon about 2000' from and in line-of-sight of the portal. Nest 398 (tended in 2011) is located about a mile from the portal, but is around the cliff face out of line of site of the portal and the access road leading to the portal. A copy of the 2011 raptor survey is included in Attachment 9.

Due to the proximity of the eagle nests in the B Canyon area, the company has initiated discussions with DOGM biologist, US Fish & Wildlife Service (FWS) officials, and consulting wildlife specialist to determine to best approach to conduct the portal re-opening project so as to minimize the impact to any eagle activity in the area. A record of this correspondence is included in Attachment 9 as well. In summary, there has been eagle activity noted currently (February, 2012) in the vicinity of Nest 395 located above the portal. The current plan is to employ a trained wildlife biologist to monitor eagle activity in the area while the permitting process is underway. At such time as the permit is approved, the biologist would conduct a ground survey of the nests in question. This may also coincide with the regular annual helicopter raptor survey of the area. If there is no activity at the time (eggs, chicks, fledglings), the company would formally seek approval (from the Division and FWS) to begin construction activities at the portal site. However, if there is any eagle activity at that time, the company will wait until subsequent ground surveys of the nests verify that any fledglings have reached maturity and have left the nest.

CHAPTER 4: LAND USE

After the portal re-opening project has been completed (estimated six months after beginning), the site will be reclaimed. Present land use includes wildlife habitat and limited cattle grazing. Recreation use includes hunting and 4-wheeling. All existing land-use activities can continue during and after the completion of the portal project.

As mentioned previously, the site has been disturbed on several occasions in the past. It is assumed that AML provided the necessary cultural clearances prior to there 1998 reclamation work. However, in September, 2009, the company contracted Senco-Phenix Archeological Consultants to conduct an intensive cultural survey of the area as part of a GVH project that was being proposed nearby. The survey included the portal site, and as expected, recommended a finding of no effect and cultural clearance. A copy of this report is included in Attachment 8.`

CHAPTER 5: ENGINEERING

Before any construction starts an identification sign will be posted at the site. This sign will list the company name as permit holder, the permit number, address and phone number. Disturbed area perimeter markers and stream buffer zone signs will also be established around the construction site prior to any disturbance.

As mentioned above, construction activities associated with the portal re-opening will be minimal. Up to 113 cubic yards of topsoil material will be removed and stckpiled adjacent to the portal. Another 50 cubic yards of earth material will be rework to make a small equipment access ramp leading from the road up to the portal, a distance of about 50'-60'. According to AML records, about 10 cubic yards of material was placed in front of the portal during the 1998 backfill (reclamation) effort. It should be noted that all earth quantities given here are conservatively estimated on the high side. All earthwork can be done using a single small trackhoe, and can be done in less than a day.

After the portal is uncovered, the mining crews, working under strict oversight from the federal Mine Safety and Health Administration (MSHA) will remove the existing seal and begin to slowly and methodically work their way into the old works. In order to provide the necessary ventilation, a small portable face fan will be set up on the surface and vent tubing will be extended from the fan into the mine opening to provide fresh air. The crews will then advance into the mine, making sure the roof control is adequate as they proceed. This may require installing additional timbers and/or supplemental roof bolts. As shown on the underground drawing in Attachment 1, there are three areas where the West Ridge mine development entries are projected to cross the old Kaiser mine works; two longwall gate entries and one set of bleeder entries. Due to the additional abutement loads imposed during future longwall mining, these areas in particular may require supplemental roof support installed ahead of time, such as roof bolts, cable bolts, cribs and/or cans. Also as shown on the drawing, a set of seals will need to be installed to isolate to remaining old works from the new development district.

All facilities associated with the portal re-opening project will be temporary. The only equipment utilized will be a temporary ventilation fan and associated vent tubing, and a small electrical generator to provide power to the fan. This generator will also provide the power for the roof bolting machine. All equipment will be portable, and will be placed on crib blocks for support and leveling. There will be no concrete used. Equipment can be set along the existing roadway or turn-around area, with no excavation required.

The underground re-habilitation project is expected to require no more than six months to complete. During this time the only day-to-day activity at the B Canyon site will consist of several trips in and out of the portal for the work crew, and to deliver consumable supplies, such as roof bolts, timbers and concrete blocks needed for the re-habilitation work, and to deliver fuel for the generator. All of this deliver of men and materials can be accomplished using small

mine-approved diesel pick-up trucks. There will be no storage of supplies or materials on the surface at the site: all materials will be hauled directly underground for storage.

After the underground re-hab work is complete, the seal will be re-constructed at the B Canyon portal. All portable equipment (fan, generator, vent tubing, etc.) will be removed. The steel canopy will be left in place, just as it is now. The portal opening will be backfilled, the access ramp will be obliterated, the topsoil material will be laid back, and the stockpiled vegetation mulch material will be spread over the reclaimed area. This will result in achieving approximate original (AML) contour. The surface will be roughened (gouged/pocked) to aid in water retention and to minimize soil lose to erosion. The area will then be re-seeded with the seed mix approved by the previous AML reclamation project. A row of excelsior logs (sediment control structures) will then be placed around the down-slope toe of the disturbed area for additional erosion control. This row of excelsior logs will be in addition to the excelsior logs placed at the stream buffer prior to initial construction, which will also be left in place after reclamation until the Division has determined that re-vegetation has been established sufficient to provide adequate sediment control.

Due to the small size of the project site, it is estimated that the reclamation work can be completed in 2-3 days. According to AML records, an identification monument was placed on top of the backfill during the 1998 reclamation. If the monument is still there, the company will save it, and replace it after the re-opening reclamation has been completed.

Bonding calculations for reclamation of the site include earthwork and revegatation. Since all equipment used will be mobile, and since the existing steel portal canopy will remain in place (although backfilled and covered), there will be no demolition costs.

1) Earthwork.....Total earthwork volumes are liberally estimated to be no more than 163 cubic yards, including 113 yds for topsoil removal/replacement and 50 yards for ramp construction and portal backfill.

2) Revegetation....The total area to be re-vegetated is about 0.07 acres.

Given the small size of the reclamation requirements for this project, perhaps the most straight-forward means of determining an adequate reclamation cost amount is to compare it to a similar approved amount for a somewhat comparable installation. For example, in November, 2008, the Division approved the Bear Canyon GVH site, which is small isolated disturbed area located nearby within the West Ridge Mine permit area. The total reclamation cost of the Bear Canyon GVH site associated with earthwork is $2143, and for revegetation is $2461, for a total of $4604. This is for a 0.34 disturbed acre site, involving 842 cy of back fill, and 515 cy of topsoil replacement. In comparison the B Canyon portal disturbed area is 0.07 acres, involving 50 cy of backfill, and 113 cy of topsoil replacement. Again, there are no demolition costs associated with the B Canyon project. The Bear Canyon GVH site is obviously a much larger site to reclaim than the B Canyon portal site, with quantities generally about five times greater than for the B Canyon

portal site. Therefore, in the interest of expediency, the company would agree to a $4604 reclamation cost for the B Canyon portal job, as determined for the similar but more expansive Bear Canyon GVH installation.

At present (February, 2012), the total reclamation cost estimate for the entire West Ridge Mine is $1,998,000 (escalated to 2013), and the posted bond amount is $2,184,000. The difference between the current bond amount and the estimated reclamation cost is $218,000. Therefore, there is currently ample bonding in place for the West Ridge Mine to include the additional reclamation cost associated with the B Canyon portal re-opening project.

CHAPTER 6: GEOLOGY

The geology of the B Canyon portal area is nearly identical to the geology of the West Ridge minesite surface facilities located about a half mile away in nearby C Canyon. This geology is is described in detail in Chapter 6 of the MRP.

CHAPTER 7: HYDROLOGY

As shown in the drawings in Attachments1 and 10, and the photos if Attachment 3, the B Canyon portal is located in the bottom canyon near the drainage channel. B Canyon is an ephemeral drainage, typical of the Book Cliffs, and similar to the drainages of nearby C Canyon and Bear canyon described in greater detail in Chapter 7 of the MRP. All construction work associated with the re-opening of the B Canyon portal will be done with the area of previous disturbance, including the AML reclamation of 1998. There will be no activity within the drainage channel. In fact, there is an existing sediment-control berm, presumably constructed by AML, that separates the portal site from the drainage. This berm will remain in place during and after the portal re-opening project to provide adequate sediment control protection to the drainage channel. In addition, the company will install additional temporary sediment control protection between the construction area and the drainage, in the form of a continuous row of excelsior logs, as shown in Attachment 10. The company will also install a row of excelsior log sediment control around the base of the topsoil storage pile, even though this pile is temporary and should itself be reclaimed within six months of the re-opening project.

After the re-opening project is completed, the site will be reclaimed to its approximate original (AML) contour, will be covered back over with the topsoil material, and then re-seeded. An additional row of excelsior logs will be installed along the down-slope edge of the reclaimed area. In addition, the row of perimeter excelsior logs (installed during the initial construction) will also remain in place after reclamation of the site until it has been determined that the revegetation has been established sufficiently to provide sediment control. The existing AML berm will not be disturbed

ATTACHMENT 1

MAP OF B CANYON PORTAL SITE

WEST RIDGE MINE
SURFACE FACILITIES

PERMIT BOUNDARY

AREAS OF POSSIBLE
SUPPLEMENTAL ROOF
SUPPORT

B CANYON
PORTAL SITE

CONSTRUCT SEALS

NOTE: PERMIT AREA WILL BE EXPANDED AS NEEDED TO ACCOMMODATE LONGWALL BLEEDER ENTRIES IN THESE AREAS.

PANEL #31

PANEL #29

PANEL #30

PANEL #28

PANEL #27

BLEEDER ENTRIES

BLEEDER ENTRIES

BLEEDER ENTRIES

PANEL #4

PANEL #3

PANEL #2

PANEL #1

BARRIER

BARRIER

Kaiser Steel Corp.
Sunnyside Mine Workings (Inactive)
LOWER SUNNYSIDE SEAM WORKINGS

OUTCROP

OUTCROP

OUTCROP

OUTCROP

C-Canyon

C CANYON
HAUL ROAD

EXISTING
B CANYON ROAD

B-Canyon

JEEP TRAIL

B TRAIL

7000

400 0 800 1600 FEET

N

UTAH REGISTERED
#6449561
David W. Hibbs
2/20/12
PROFESSIONAL ENGINEER

B CANYON REHABILITATION PROJECT

WEST RIDGE
RESOURCES, INC.

794 NORTH "C" CANYON ROAD
EAST CARBON, UTAH 84520

MSHA MINE ID # 42-02233

DRAWN BY PJ	SCALE 1" = 800'
APPROVED BY DH	DATE 20 FEB. 2012
SHEET	PLATE #1 of 1

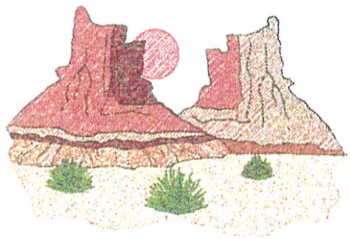
\Current Drawings\Buildings & Construction\West Ridge Mine\B Canyon Portal\Mine map with topo.dwg, 11x17, 2/20/2012 12:41:34 PM

ATTACHMENT 2

ABANDONED MINE LANDS (AML) RECLAMATION INFORMATION FROM DOGM FILES

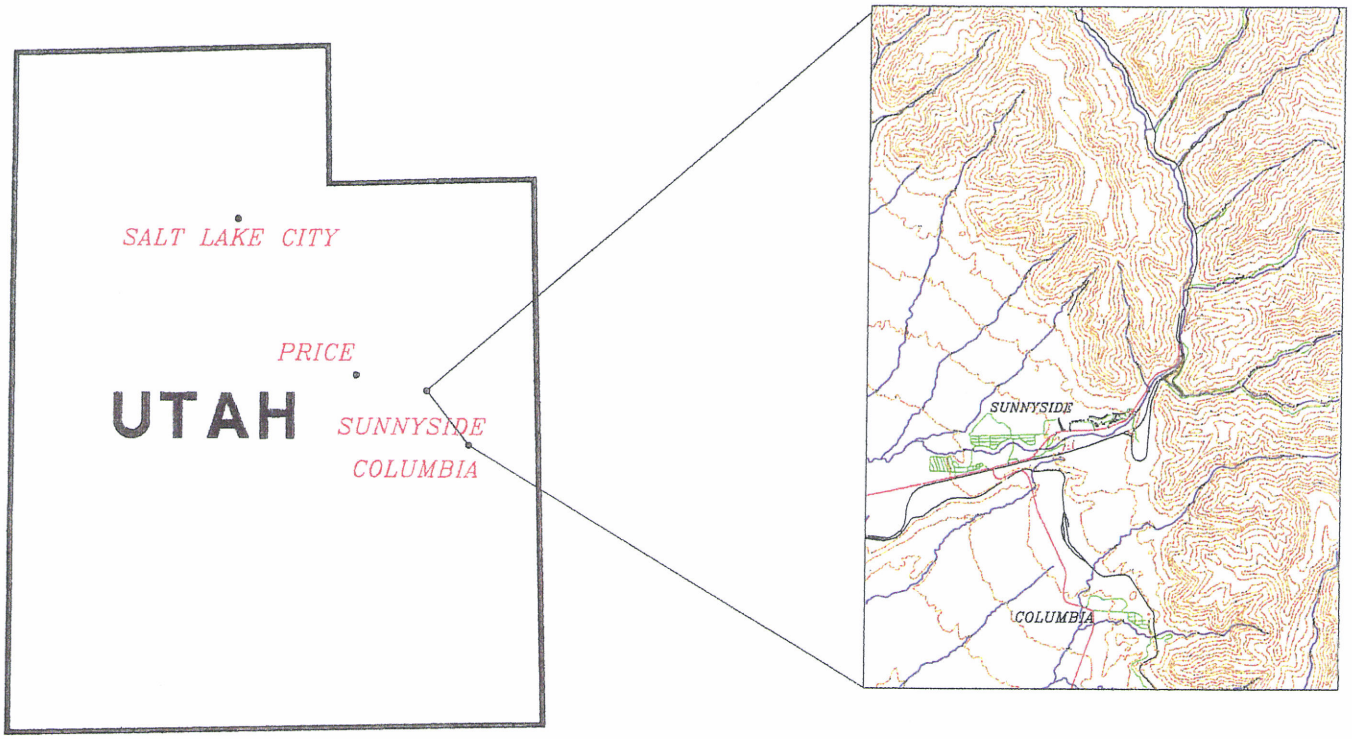
(INCLUDES PRE-RECLAMATION PHOTOS)

CASTLE VALLEY



TECHNICAL SERVICES

Evaluation report of Portals & Shafts of the Kaiser Steel and Sunnyside Coal Mines



Arranged and compiled for:

MONTGOMERY WATSON

September 1997

Location	Portal No.	Photo Page	Portal Description	Comments and Remarks
Inside Raise Portal	P36	27	This portal is located on the west facing slope in the head of the right fork of an unnamed canyon adjacent to and west of Fan Canyon. This portal is constructed of wooden timbers and props which extend approximately 5' from the hillside. The portal opening is approximately 8' wide by 6' high. An apparent seal is located approximately 80' from the mouth. The roof is constructed of 4 by 8 wooden caps and sides are supported by wooden timber. The seal appears to be block type with a Celtite foam covering. There is minimum air movement. Atmospheric testing reveals: 1. O2 = 19.5% 2. CO = 0.0% 3. CH4 = 0.0% Portal opening is screened and dangered off.	This portal is very remote. No real access exists other than by foot. Th[illegible]s very little evidence of a portal other than the opening itself. **Care** should be taken while working around this portal. Steep slopes and vertical ledges presents a hazard to personnel.
Inside Raise Portal No. 1 Mine	P37	28	This portal is located on the east facing slope in the head of the right fork of an unnamed canyon adjacent to and west of Fan Canyon. It is directly west of portal P36. This portal is constructed of a steel type arched support 17' wide by 9' high with wooden covering. This portal extends 12' from the hillside. A block seal has been constructed approximately 40' inside the portal. There is no air movement into or out of the portal. This portal is located on a ledged outcrop of rock approximately 30' to 40' high.	This portal is very remote. No real access exists other than by foot. **Care** should be taken while working around this portal. Steep slopes and vertical ledges presents a hazard to personnel.
B Canyon Portal	P38 or P39	29	This portal is located up B Canyon, it is a single portal which accesses two entries underground. This portal is of steel arched construction with sheet metal covering. It is faced with sheet metal and metal screen. The door has been removed but is still attached to the face by a chain and lock. Portal opening is 16' wide by 8' high. Steel arches are on 3' on center. A block seal with mortar face is located inby the portal opening. There is no obvious air movement, no openings nor voids. There is a 30' by 30' earthen pad immediately in front of the portal opening. A 40' long by 30' wide berm exists above the entry.	This portal is accessible by the use of B Canyon road. Care should be taken during demolition to ensure integrity. There is pressure against the inside of the seal as demonstrated when the test valve was opened. Only one portal exists as indicated by residences and veteran miners.
Shop Fan Shaft	S1	30	This shaft is located due south of the main shop. It is well capped with concrete and steel. The cap is 20' by 20' square, framed in 6" by 8" steel beam with 8" concrete. There are no obvious voids or openings, air flow is not evident.	Shaft is well sealed. However, care should be taken during reclamation to maintain the integrity of this seal.

B CANYON PORTAL - ONE PORTAL CONNECTS TWO ENTRIES
P38 OR P39

B CANYON PORTAL
P38 OR P39

FEATURE DESCRIPTION FORM
SHAFT or ADIT

Site ID: AMR / _____ / _____

Tag No: _____

CURRENT CONDITIONS:

Access to Feature *(check all that apply)*:
- ☐ no established trail
- ☒ foot trail
- ☐ ATV/motorcycle
- ☐ 4-WD road
- ☐ 2-WD dirt road
- ☐ paved road
- ☐ rubber-tired backhoe
- ☐ crawler (track) equipment
- ☐ helicopter
- ☐ wilderness restrictions

Condition of Entrance:
- ☐ Completely collapsed, no access to workings
- ☐ Partially collapsed or backfilled at portal, mine visible but not accessible
- ☐ Partially collapsed or backfilled at portal, mine workings accessible
- ☒ Portal open for access with little or no backfill or collapse (TO SEAL)
- ☐ Obstruction at opening makes evaluation of condition impossible
- ☐ Existing wall/fence/grate *(circle one)*
  - ☐ intact, acceptable
  - ☐ intact, unacceptable
  - ☐ damaged, mine accessible
- ☐ Shaft collar competent (rock or cribbing)
- ☐ Shaft collar sloughing
- ☐ Signs of interior visitation (litter/graffiti) present
- ☐ Other _____

Stability of Opening/Host Rock:
- ☐ unconsolidated soil (unstable)
- ☐ friable (unstable)
- ☐ highly jointed, fractured (unstable)
- ☐ somewhat jointed (fairly stable)
- ☒ massive (stable, competent)
  STEEL ARCH

Depth to Competent Rock: _____ feet

Water *(check all that apply)*:
- ☒ no water present
- ☐ dry, but appears to have occasional water
- ☐ seep/saturated soil (no flow)
- ☐ standing water in opening
- ☐ discharge flowing from opening
- ☐ discharge infiltrates w/in 50 ft of opening
- ☐ discharge flows into intermittent stream
- ☐ discharge flows into perennial stream
- ☐ water flows through/over waste rock
- ☐ water or ground surface discolored
- ☐ wetland vegetation present

Wildlife Observations In/Near Opening:
- ☐ bats: roosting/flying *(circle)*
- ☐ birds: nesting/roosting/flying *(circle)*
- ☐ guano/droppings/owl pellets
- ☐ mammal tracks
- ☐ herps

Apparent depth of workings: _____ feet
- ☒ terminus visible (SEAL)
- ☐ workings extend beyond visibility limits
- ☐ crosscuts, other workings visible

Roof or collar support present:
- ☐ none visible
- ☐ wood props/caps (occasional)
- ☐ stulls or square sets
- ☐ box cribbing (continuous wood lining)
- ☐ log/timber cribbed shaft collar
- ☐ loose rock walls or cribbing
- ☐ concrete shaft collar or adit bulkhead
- ☐ support is failing

MITIGATION/DESIGN CONSIDERATIONS:

Potential Mitigation Actions *(check all that apply)*:
- ☐ Masonry Bulkhead
- ☐ Backfill
- ☐ Bulkhead & Backfill
- ☐ Standard Adit Grate
- ☐ Bat Grate
- ☐ Cable Net
- ☐ Locking Adit Door
- ☐ Shaft Grate
- ☐ PUF Shaft Plug
- ☐ Blast
- ☐ Probe for mine opening (caved adit)
- ☐ Drainage Provisions Required
- ☐ Local Site Clean-up and Regrading
- ☐ Structure Demolition
- ☐ Surface Water Drainage Control
- ☐ Cultural Features Needing Protection Present
- ☐ No Action Required
- ☐ Other _____

Onsite Construction Material Availability:
- ☐ Stone suitable for bulkhead (w/in 100 ft)
- ☐ Backfill
- ☐ Materials not present

Backfill Material Source:
- ☐ mine dump
- ☐ dig or scale down from brow/adjacent slope
- ☐ blast from rock brow or adjacent rock face
- ☐ other _____

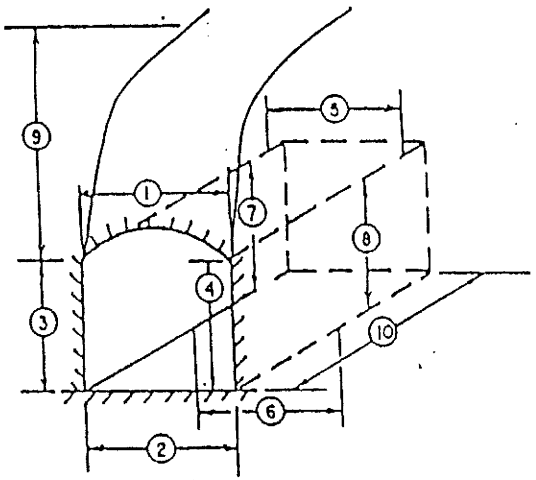
Mine Dump Size:
- ☐ small (<20 cubic yards)
- ☐ medium (20 - 100 cubic yards)
- ☐ large (>100 cubic yards)
- ☐ USFS Criteria A3 (>500 cubic yards)

AMR / _____ / _____

AMR PROGRAM INVENTORY FORM

Site Name P[illegible]

ADIT OPENING



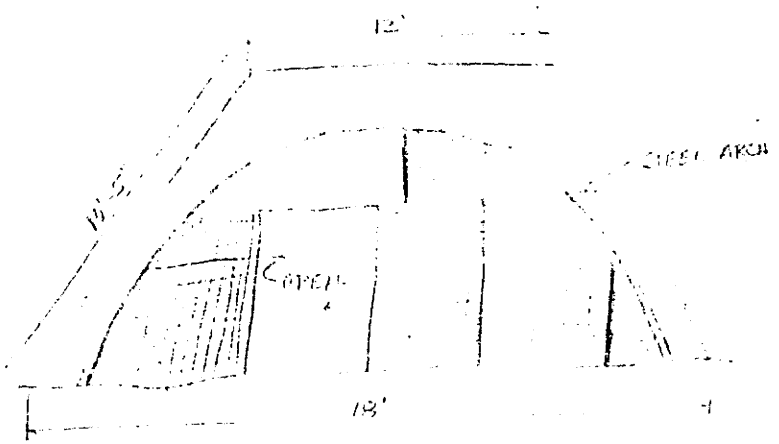
ENTRANCE MEASUREMENTS

Width at top entrance	1	_____
Width at bottom entrance	2	_____
Height left entrance	3	_____
Height right entrance	4	_____
Cover height above adit	9	_____
Type of Cover		_____

_____ FEET INSIDE MEASUREMENTS

Width at top inside	5	_____
Width at bottom inside	6	_____
Height left inside	7	_____
Height right inside	8	_____
Depth or Length	10	_____

SITE SKETCH



TAG NO. _____

DATE _____

PAGE _____ OF _____

PHOTOGRAPH NUMBERS:

ROLL D

PICTURE(S) [illegible]

INVENTORIED BY

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

ADIT OR TUNNEL
FIELD DESCRIPTION FORM

Utah Abandoned Mine Reclamation Program
Mine Portal Monument Record Form

MONUMENT NUMBER 1524

Date Installed 7 / 22 / 98 By Minchey Diggings

LOCATION

USGS Quad _____ 7½' 15' Code _____

County Carbon Code _____

Twp 14 N (S) Range 13 (E) W Section 14 : SW ¼ SW ¼ NE ¼ (SLBM) USM

UTM Coordinates: _____ m N _____ m E Zone 12

State Plane Coordinates: N _____ ft E _____ ft

PROJECT INFORMATION

Project Name: Sunnyside Mine Proj Project Number: AMR/00 71 930

Site Name: B-Canyon P-38 & P39

Construction Contractor: Minchey Diggings Commodity Coal

CLOSURE INFORMATION

Opening Type ☒ Horizontal ☐ Vertical ☐ Open (prior to reclamation)
☐ Inclined ☐ Subsidence ☒ Closed (prior to reclamation) Existing Wall

Portal Designation in Construction Specs B-Canyon P-38 & P39

Reclamation Date (mm/yy) 7 / 98

Reclamation Action (Check all that apply.)

☐ None	☐ Permanent grate/grid	☐ Fence
☐ Probe; no workings	☐ Lockable gate	☐ Other (explain)
☐ Probe + closure	☐ Cable Net	2 Rooms / 1 Common Entrance
☐ Wall (concrete block)	☐ Gas Sample Tube	
☐ Wall (native stone)	☐ Drain Pipe	
☒ Backfill	☐ Warning Sign	

Closure condition at time of monument installation: ☒ good ☐ needs maintenance

COMMENTS:

Monument at ~~center~~ top of Backfill

Filename: MONUMENT.FRM 5/6/91

☐ Data entry completed

B CANYON PORTAL - ONE PORTAL CONNECTS TWO ENTRIES
P38 OR P39

B CANYON PORTAL
P38 OR P39

ATTACHMENT 3

PHOTOS OF EXISTING PORTAL AREA

01/04/2012

01/04/2012

01/04/2012

01/04/2012

01/04/2017

01/04/2012

01/04/2012

01/04/2012

01/04/2012

01/04/2012

01/04/2012

01/04/2012

01/04/2012

ATTACHMENT 4

ORDER 2 SOILS SURVEY (RELEVANT EXCERPTS)

LONG RESOURCE CONSULTANTS

Order 2 Soil Survey

of

B Canyon Gas Vent Hole

B Canyon Road

Whitmore Canyon Gas Vent Hole

at

West Ridge Mine Area

Prepared by

Robert E. Long, CPSS
Long Resource Consultants, Inc.
1960 W Deep Creek Road
Morgan, Utah 84050
(801) 791-3447

for

Utah American Energy.
WEST RIDGE MINE
794 "C" Canyon Road
East Carbon, Utah 84520

May 4, 2010

B Canyon Road

Purpose of Soil Resource Assessment

The purpose of this soil resource assessment conducted along a portion of the B Canyon Road was to determine native topsoil depths. The intended use of this information was to determine:

- Potential topsoil suitability and salvage depths in areas where additional road development will be required.

- Depths of topsoil and topsoil-subsoil mixture that will need to be placed over the previously disturbed portion of the roadway for reclamation in order to achieve depths of suitable material similar to adjacent native soils.

General Description

The B Canyon Road traverses alluvial fans, stream terraces, and canyon sideslopes up to the proposed B Canyon Gas Vent Hole (GVH) location. Elevation ranges from 6,850 feet on the southwest end to approximately 7,280 feet at the B Canyon GVH site. Slopes range from 3 to 25 percent on the alluvial fans and stream terraces and from 30 to nearly 90 percent on the canyon sideslopes. The length of the evaluated portion of B Canyon Road was approximately 8, 530 feet.

The portion of B Canyon Road covered by this assessment is in Sections 14, 15 (SE/4), and 22 (NE/4), Township 14 South, Range 13 East, Salt Lake base meridian.

All sections of the B Canyon Road have been previously disturbed to some extent. The road is visible on the black and white Sunnyside digital orthophoto quadrangle (Utah GIS Portal, 2009) from the mid 1990's. The road surface of segments 1 through 5 was improved by grading just prior to this soil resource assessment to a width that allows by light duty vehicles and equipment. The imporved road terminated in the lower portion of segment 6. The road crosses a stream terrace and is just wide enough for ATV travel in the upper segment 6. Segment 7 is an old access road that is only wide enough for an ATV. A portion of the trail in segment 7 traverses through the B Canyon ephemeral drainage.

Soil materials removed during the most recent work on the road were generally bladed into a berm along the down-slope side of the B Canyon Road. This material will need to be pulled back across the road when it is reclaimed. The soil has cascaded down the slope in areas where the road traverses steep and very steep slopes.

Soil materials removed from the roadway prior to this resource assessment appeared to be a mixture of topsoil and subsoil.

Vegetation

The B Canyon Road traverses the following vegetative communities from the lower end to the B Canyon GVH site:

- Utah juniper – Pinyon pine
- Pinyon pine – Utah juniper
- Pinyon pine – Utah juniper – Rocky mountain maple - Mountain brush
- Wyoming big sagebrush
- Pinyon pine – Utah juniper
- Rocky mountain juniper – Rocky mountain maple – Douglas fir
- Douglas fir – Rocky mountain maple

NRCS Soil Map Units

The B Canyon Road crosses NRCS soil map units 37, 62, 95, 96, 113 (USDA- NRCS, Carbon Area, Parts of Carbon and Emery Counties, Utah, September 2009), figure 1.

NRCS soil map unit 37, Gerst – Strych – Badland complex, 50 to 70 percent slopes, is crossed by the B Canyon Road in segments 2, 3, 4, and 5. This NRCS map unit is typically located on very steep south facing slopes. Strych soils are a minor component in segment 2. Map unit 37 soils were not identified in road segments 3, 4, and 5.

NRCS soil map unit 62, Midfork family – Comodore complex, 50 to 70 percent slopes, is crossed by the B Canyon road in segments 5 and 6. Midfork family and Comodore soils have mollic epipedons (dark surfaces) and were not identified in these segments. Native vegetation indicated that the soil temperature was frigid rather than cryic for the Midfork family. The Cortyzack soil identified at B-7-09 is similar to Midfork family, but frigid. A soil similar to Comodore (Modo) was identified at B-8-09, but it did not have a mollic epipedon.

NRCS soil map unit 95, Rock outcrop, is crossed in B Canyon Road segments 3, 6, and 7. This NRCS map unit does not have any developed soils as major components. The soils identified by the B Canyon Road soil assessment were well developed and rock outcrop was a minor component.

NRCS soil map unit 96, Rock outcrop – Rubbleland – Travessilla complex, is crossed by B Canyon Road in the upper portion of segment 7. The soils identified by the B Canyon Road soil assessment were more developed than those described by this NRCS map unit.

NRCS soil map unit 113, Strych very stony loam, 3 to 15 percent slopes, is crossed by B Canyon Road segment 1 and the lower portion of segment 2. Strych soils were identified in segment 1 and are a minor component in segment 2.

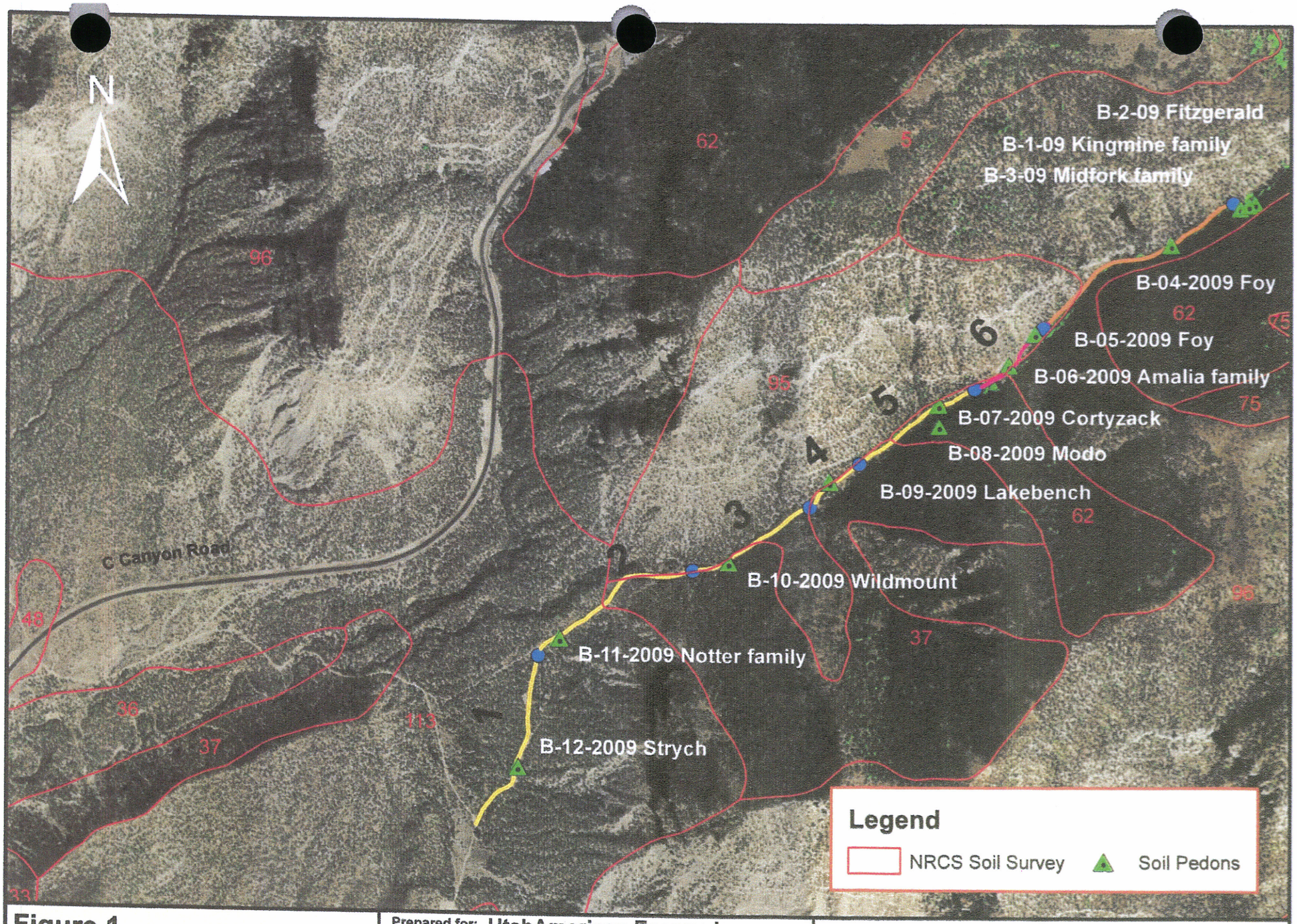


Figure 1.
NRCS Soil Map Units along B Canyon Road

Prepared for: UtahAmerican Energy, Inc.
West Ridge Mine

Prepared by:
Long Resource Consultants, Inc.

Feet
0 500 1,000 2,000 3,000

April 22, 2010

Soil Map Units

The B Canyon Road was divided into 7 segments or soil map units based on soil types, vegetation, aspect, and slope, figure 2. Aspect is west in segment 1, northwest in segments 2, 3, and 5, and southeast in segments 4, 6 and 7. Slopes range from 3 to nearly 90 percent. Soil temperature is mesic in segment 1 and frigid in the other road segments with some potentially cryic pockets in the bottom of the canyon and near the upper end of the road. Precipitation ranges from approximately 14 inches at the lower end of the B Canyon Road to 20 inches or greater at the B Canyon GVH site.

Table 1 lists the dominant soil types and typifying soil pedons for each segment of the B Canyon Road. The results of laboratory analysis for each of the typifying soil pedons are in appendix 1. Soil profile descriptions are in appendix 2. Field data sheets for the soil pedons described

Table 1. Soil segments and dominant soils in segments along B Canyon Road.

Road Segment	Percent	Soil Segment Name Component	Typifying Soil Pedon
1		Strych very cobbly sandy clay loam, 8 to 25 percent slopes	
	90	Strych very cobbly sandy clay loam	B-12-09
	10	Notter family sandy loam	
2		Notter family sandy loam, 8 to 16 percent slopes	
	85	Notter family sandy loam	B-11-09
	10	Strych very cobbly sandy clay loam	
	5	Wildmount very channery sandy loam	
3		Wildmount very channery sandy loam, 20 to 70 percent slopes	
	85	Wildmount very channery sandy loam	B-10-09
	12	Notter family sandy loam	
	3	Lakebench channery sandy loam	
4		Lakebench very channery sandy loam, 5 to 16 percent slopes	
	80	Lakebench very channery sandy loam	B-9-10
	10	Wildmount very channery sandy loam	
	10	Cortyzack cobbly loam	
5		Cortyzack - Modo complex 35 to 70 percent slopes	
	75	Cortyzack cobbly loam	B-7-09
	20	Modo sandy loam	B-8-09
	3	Lakebench very channery sandy loam	
	2	Rock Outcrop	
6		Amalia family – Foy complex, 3 to 80 percent slopes	
	65	Amalia family	B-6-09
	30	Foy very gravelly loam	B-5-09
	5	Cortyzack cobbly loam	

Table 1, continued. Soil segments and dominant soils in segments along B Canyon Road.

Road Segment	Percent	Soil Segment Name Component	Typifying Soil Pedon
7		Foy very flaggy sandy loam, 45 to 88 percent slopes	
	73	Foy very flaggy sandy loam	B-4-09
	12	Foy very gravelly loam	
	8	Modo sandy loam	
	5	Midfork family	
	2	Rock Outcrop	

The taxonomic classification of the major soils along the B Canyon Road is contained in table 2. These classifications were determined using the *Keys to Soil Taxonomy, Eleventh Edition* (USDA – NRCS, 2010).

Table 2. Taxonomic classification (USDA- NRCS, 2010) of dominant soils along B Canyon Road.

Series/Family	Taxonomic Classification
Amalia	Clacidic Haplustalfs loamy-skeletal, mixed, superactive, frigid
Cortyzack	Calcidic Argiustolls coarse-loamy, mixed, superactive, frigid
Foy	Typic Calciustepts loamy-skeletal, mixed, superactive, frigid
Lakebench	Aridic Calciustepts coarse-loamy, mixed, superactive, frigid
Modo	Lithic Haplustepts loamy, mixed, superactive, frigid
Notter	Calcidic Argiustolls fine-loamy, mixed, superactive, frigid
Strych	Ustic Haplocalcids loamy-skeletal, mixed, superactive, mesic
Wildmount	Aridic Calciustepts loamy-skeletal, mixed, superactive, frigid

Photos of each of the B Canyon Road soil profiles are contained in the "B Canyon Road Photos" section of this report.

Segment Descriptions

1 Strych very cobbly sandy clay loam, 8 to 25 percent slopes

Segment 1 consists of very deep soils on an undulating to moderately steep alluvial fan at the lower end of the B Canyon Road. Soils in this area are warmer (mesic) than the other road segments due to the westerly aspect and lower elevation. Soil profile B-12-09 is representative

of Strych soils in this segment. These soils have a gravelly or cobbly surface with a few scattered stones and boulders. Organic matter decreases and carbonates increase at 30 cm (12 inches).

Also included in this segment are Notter family soils on the steeper north facing slopes.

Vegetation is dominated by Utah juniper with some pinyon pine.

2 Notter family sandy loam, 8 to 16 percent slopes

Segment 2 consists of very deep soils on a strongly sloping alluvial fan where the aspect changes to northwest. These soils have a dark surface (mollic). The northwest aspect results in these soils being cooler (frigid) than soils in segment 1. The surface has a few scattered channers and flags. Soil profile B-11-09 is representative of Notter family soils in this segment. Organic matter decreases and carbonates increase at 29 cm.

Also included in this segment are Strych soils on moderately steep south facing slopes and Wildmount soils on the steep north to northeast facing slopes.

Vegetation is dominated by pinyon pine with some Utah juniper.

3 Wildmount very channery sandy loam, 20 to 70 percent slopes

Segment 3 consists of very deep soils on steep to very steep northwest to northeast facing canyon sideslopes. The surface has a variety of rock fragments with gravels and channers being dominate. Soil profile B-10-09 is representative of Wildmount soils in this segment. Organic matter decreases at 56 cm and carbonates increase below 33 cm.

Also included in this segment are Notter family soils on the alluvial fans and Lakebench soils on the stream terraces.

Vegetation is dominated by pinyon pine with Utah juniper, alderleaf mahogany, Utah serviceberry, and Wyoming big sagebrush.

4 Lakebench very channery sandy loam, 5 to 16 percent slopes

Segment 4 consists of very deep soils on south to northwest facing stream terraces along the ephemeral drainage in B Canyon. The surface is very channery with a few scatterd flags, stones,

and boulders. Soil profile B-9-09 is representative of Lakebench soils in this segment. Organic matter decreases at 10 cm and carbonates increase below 30 cm.

Also included in this segment are Wildmount soils on steep canyon sideslopes and Cortyzack soils on very steep canyon sideslopes.

Vegetation is dominated by Wyoming big sagebrush, rabbitbrush, and grasses.

5 Cortyzack - Modo complex 35 to 70 percent slopes

Segment 5 consists of a complex of very deep and shallow soils on steep to very steep northwest to north facing canyon sideslopes. The very deep Cortyzack soils have a dark (mollic) cobbly surface, B-7-09. Soil colors indicate a change from topsoil to subsoil at 25 cm, while organic matter and carbonates are variable in the upper 90 cm of the profile. The shallow Modo, B-8-09, soils are located near rock outcrops.

Also included in this segment are Lakebench soils on stream terraces and rock outcrop.

Vegetation is dominated by pinyon pine on the Cortyzack soils and mountain brush on the Modo soils. Big sagebrush, mountain snowberry, Douglas fir, rocky mountain maple, and grasses are also present.

6 Amalia family – Foy complex, 3 to 80 percent slopes

Segment 6 consists of very deep soils on southwest to southeast facing stream terraces and very steep canyon sideslopes. Soil profile B-6-09 is representative of Amalia soils and B-5-09 is representative of Foy soils in segment 6. Amalia soils are on the stream terrace and Foy soils are on canyon sideslopes near rock outcrops. Amalia soils have a gravelly surface while Foy soils have a very gravelly surface with scattered stones and boulders. Organic matter decreases and carbonates increase at 52 cm in the Amalia soils. Carbonates increase at 70 cm in the Foy soils.

Soil profile B-6-09 was described near an area that appeared to be a closed mine opening. Very fine and fine coal fragments (visually 2 to 4 percent) were observed between 12 and 52 cm in this soil profile. Total organic carbon laboratory analysis results ranged from 1.0 to 3.7 percent in these horizons which is suitable based on the Utah DOGM guidelines (Utah DOGM, 2005).

Also include in this segment are Cortyzack very cobbly soils on the sides of stream terraces and north facing canyon sideslopes.

Vegetation is dominated by big sagebrush on the stream terrace and pinyon pine on the canyon sideslope.

7 Foy very flaggy sandy loam, 45 to 88 percent slopes

Segment 7 consists of very deep soils on southeast facing canyon sideslopes. Soil profile B-4-09 is representative of Foy soils in this segment. Field observations indicated that carbonates increase at 138 cm, but laboratory data indicates no appreciable difference in the profile. Organic matter decreases at 78cm which corresponds with lighter soil colors below this depth.

Also included in this segment are Midfork family soils on north facing slopes near the upper end of the segment and shallow Modo soils near rock outcrop areas.

Vegetation is dominated by rocky mountain juniper, and Douglas fir. Rocky mountain maple is dominant in the bottom of the canyon.

Topsoil Resource

The depth of topsoil increases with elevation, figure 2. Table 3 lists the estimated average topsoil depths for each road segment along with the dominant vegetation type, and limiting features of the soils. The estimated average topsoil depth is 30 cm (12 inches) in road segments 1 through 5. Road segment 6 has an estimated average topsoil depth of 50 to 70 cm (20 to 28 inches). Average topsoil depths in road segment 7 are as deep as 138 cm with localized shallow areas near rock outcrops.

Topsoil depths vary along each segment of the B Canyon Road. Topsoil salvage from undisturbed areas should be monitored by a Certified Professional Soil Scientist. The presence of large stones, boulders, and rock outcrop will be limiting to topsoil salvage and replacement.

Topsoil in areas where the road was graded prior to this soils evaluation should be stockpiled in approved areas, so that it can be protected from erosion and road maintenance operations. The topsoil will need to be pulled back up the slope in areas where the road crosses steep to very steep canyon sideslopes.

Laboratory analysis of the soil profiles along the B Canyon Road did not identify any "Unacceptable" (Utah DOGM, 2005) properties in any of the analyzed materials. The most limiting soil features are *Fair* (Utah DOGM, 2005) levels of pH, saturation percent, texture, and carbonates in some of the soil horizon samples.

Table 3. Estimated topsoil depths for each segment of the B Canyon Road.

Road Segment	Length	Vegetation Type	Soil Temp Regime	Estimated Average Topsoil Depth	Limiting features
	feet			cm (inches)	
1	1,592	Utah juniper – Pinyon pine	mesic	30 cm (12 inches)	>40% rock fragments throughout profile; carbonates increase below 30 cm; organic matter decreases below 30 cm
2	1,522	Pinyon pine – Utah juniper	frigid	30 cm (12 inches)	>40% rock fragments below 29 cm; carbonates increase below 29 cm; organic matter decreases below 29 cm
3	1,097	Pinyon pine – Utah juniper	frigid	30 cm (12 inches)	>40% rock fragments throughout profile; carbonates increase below 33 cm
4	539	Big sagebrush	frigid	30 cm (12 inches)	carbonates with strong to violent effervescence below 30 cm; 45% rock fragments below 105 cm
5	1,126	Pinyon pine – Utah juniper Douglas fir – Mountain brush	frigid	25 to 30 cm (10-12 inches)	Cortyzack: >35% rock fragments below 25 cm; organic matter decreases below 25 cm. Modo: shallow soils
6	767	Big sagebrush – Pinyon pine	frigid	50 to 70 cm (20-28 inches)	Amalia: disturbed soils; carbonates increase below 52 cm; organic matter decrease below 52 cm; >35% rock fragments above 52 cm Foy: extremely slopes; carbonates increase below 70 cm; >40% rock fragments throughout profile; rock outcrops in area
7	1,887	Rocky mountain juniper – Douglas fir	frigid	78 to 138 cm (30-54inches)	Foy: extremely slopes; soil colors lighter below 78 cm; carbonates increase below 138 cm; >35% rock fragments throughout profile
Total	8,530				

Results of the laboratory analysis indicate that existing mixtures of topsoil and subsoil should result in materials that have at least a *Fair* suitability (Utah DOGM, 2005). Representative samples of the soil in berm and other stockpiles should be sampled and analyzed prior to placement in stockpiles.

Estimated available water capacities (AWC) were estimated (Saxton 2009) and are generally fair with some good and two poor values for some horizons. The estimated AWC values which were Poor along the B Canyon Road were B-7-09 (90 to123 cm) and B-9-09 (105 to 155cm).Both of these horizons have greater than 35 perdent rock fragments and are below the topsoil salvage depth of 30 cm (12 inches) for road segments 4 and 5.

Calculated K factor values were all good along the B Canyon Road.

Reclamation

Reclamation potential is good along the full length of the B Canyon Road. The reclamation plan will need to mitigate the potential soil erosion problems due to the steep to very steep traversed by the existing road alignment. Species and density of reclamation vegetation will be dependent on elevation, aspect, and effective precipitation. Reclamation seed mixes will need to account for these factors.

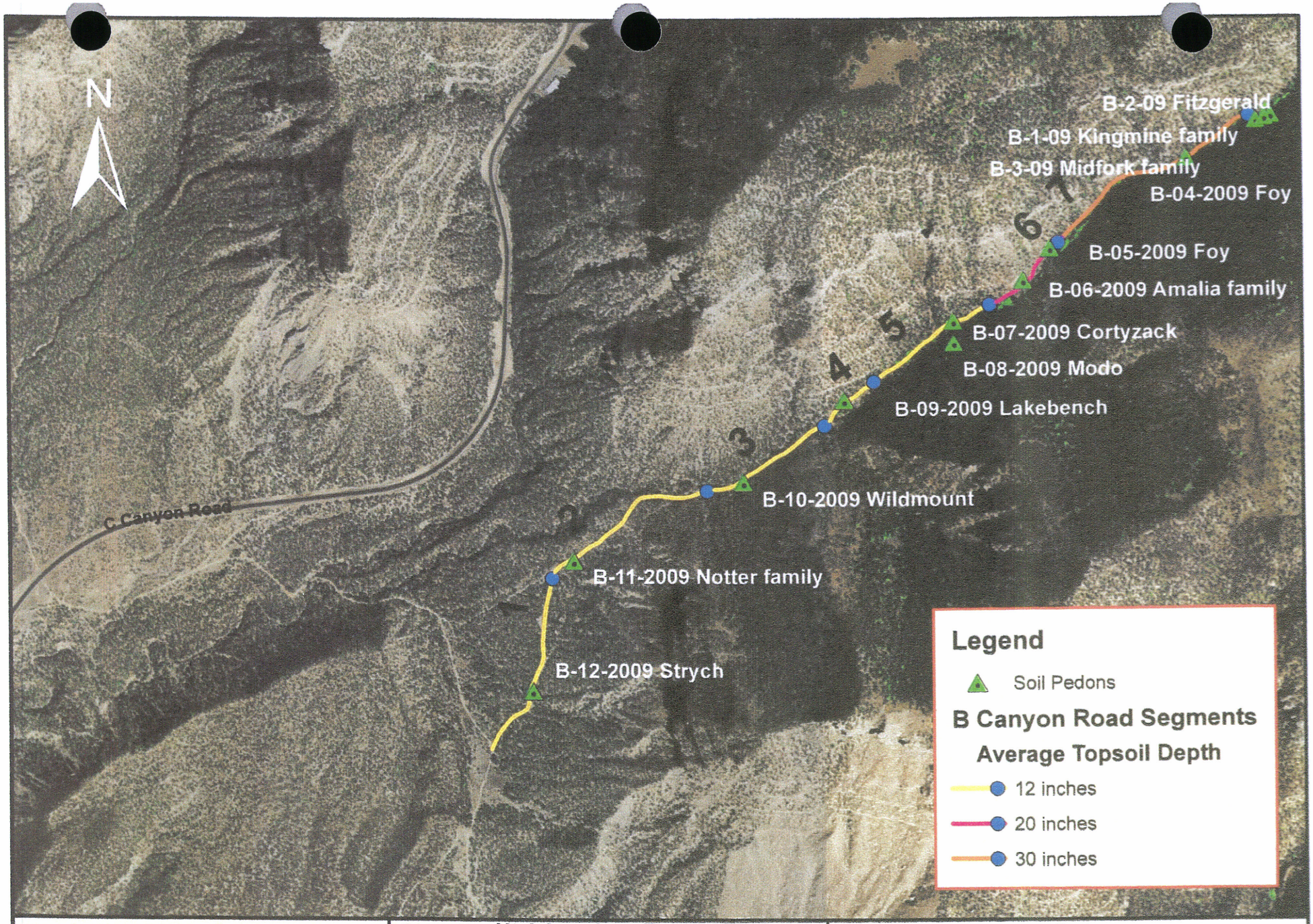


Figure 2.
B Canyon Road
Soil Resource Assessment

Prepared for: UtahAmerican Energy, Inc.
West Rridge Mine

Prepared by:
Long Resource Consultants, Inc.

April 22, 2010

Photo 4. Looking north-northwest up broken 86 percent sloped at B Canyon Road soil profile location B-5-09. Foy soil has formed in slope alluvium from inter-bedded sandstone and shale. Large sandstone outcrops are present upslope of this location. This soil profile is near the lower end of the narrow portion of the trail through B Canyon.

Photo 5. B-5-09 soil profile box, Foy series, Typic Calciustepts loamy-skeletal, mixed, superactive, frigid.

Photo 6. B Canyon Road soil profile B-5-09, Foy soil; Aridic Calciustpets loamy-skeletal, mixed, superactive, frigid. Profile is located in roadcut on north side of trail.

Photo 7. Looking south across B Canyon Road soil profile location B-6-09 (disturbed area in lower center) and B Canyon Road (center). This location is at the upper end of the portion of B Canyon Road that had been graded prior to the soils assessment. Native vegetation at location 6 consisted of big sagebrush, scattered young Utah junipers, rabbitbrush, and intermediate wheatgrass.

Photo 8. Looking northeast across soil profile location B-6-09. The area appeared to have been previously disturbed for some type of mine opening. The area had been reclaimed.

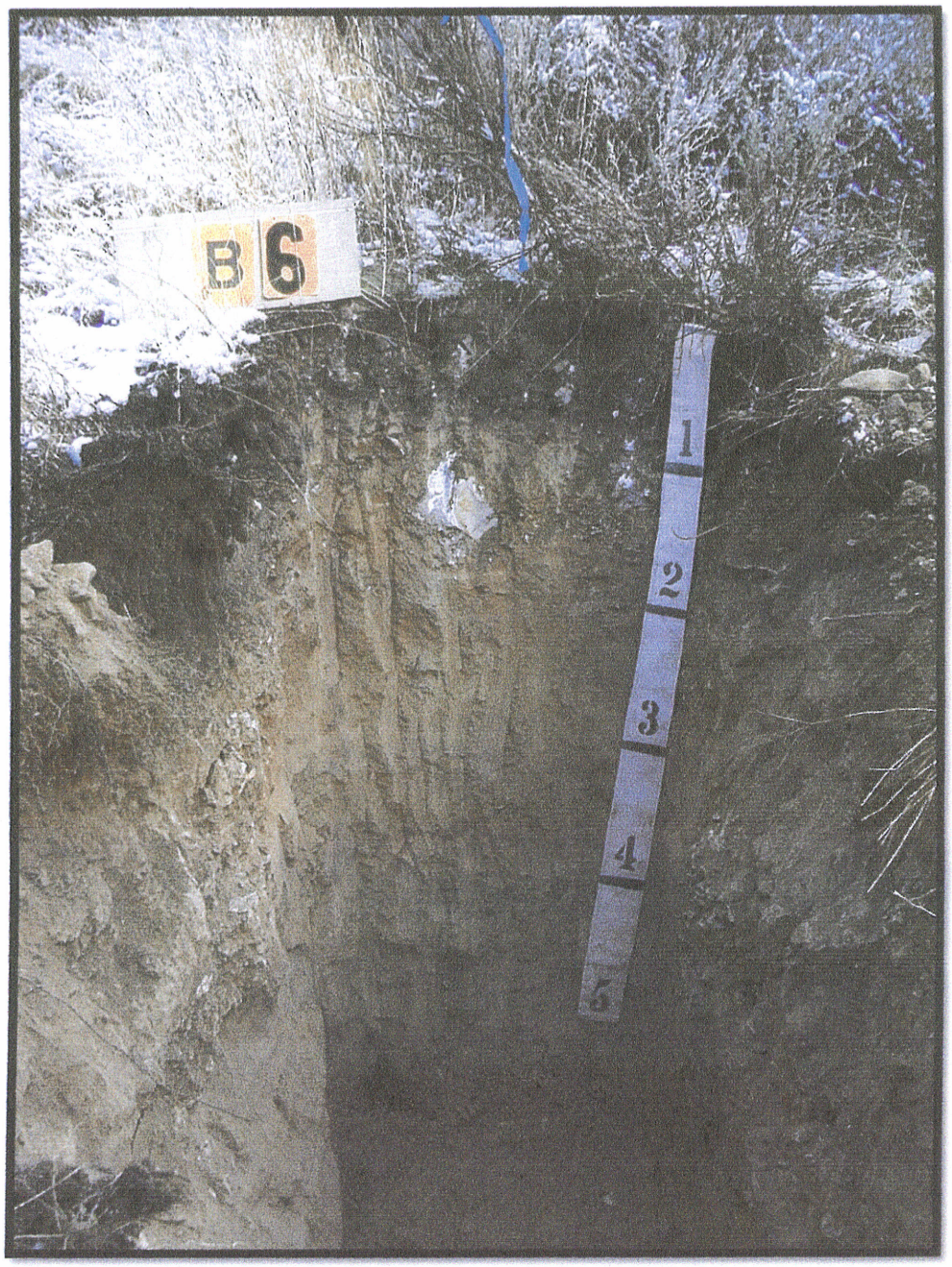


Photo 9. Soil profile location B-6-09, disturbed Amalia family; Calcidic Haplustalf loamy-skeletal, mixed, superactive, frigid. Rock fragments are concentrated in the upper 52 cm (20 inches) of the soil profile.

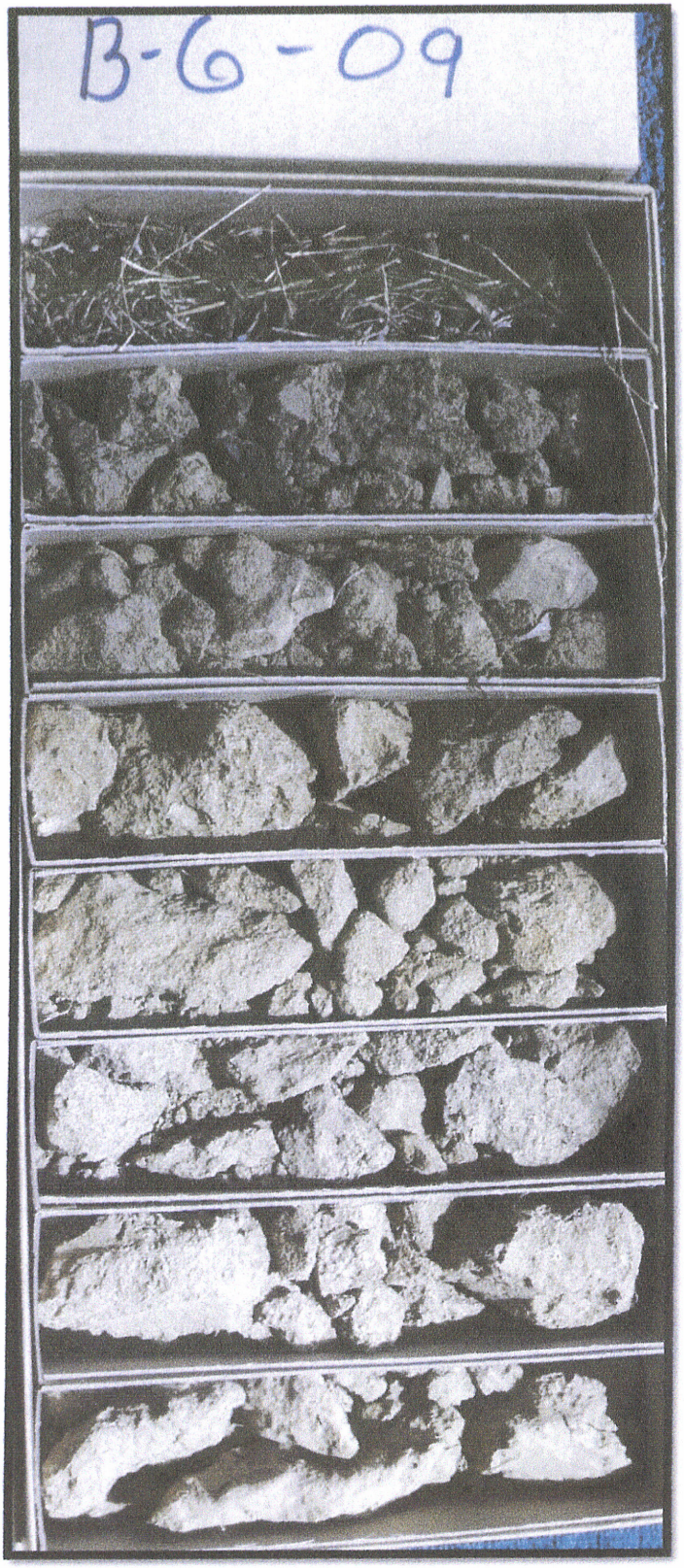


Photo 10. B-6-09 soil profile box, Amalia family, Calcidic Haplustalf loamy-skeletal, mixed, superactive, frigid.

Photo 11. Looking southwest across B Canyon Road soil profile location B-7-09. Native vegetation consists of Pinyon pine, Utah juniper, Douglas fir, Wyoming big sagebrush, bluegrass, and wheatgrasses. The northwest facing canyon sideslope has a slope of 45 percent.

Photo 12. B Canyon Road soil profile B-7-09, Cortyzack soil; Calcidic Argiustolls coarse-loamy, mixed, superative, frigid. Surface was covered with 3 cm (1.18 inches) of partially decomposing needles, twigs, and cones.

Photo 13. B-7-09 soil profile box, cotyzack series, Calcidic Argiustolls coarse-loamy, mixed, superactive, friigd.

Table [illegible]. Whitmore Canyon GVH, B Canyon GVH, and B Canyon Road laboratory analysis results of soil samples collected in fall 2009. Suitability ratings are based on Guidelines for Management of Topsoil and Overburden (Utah DOGM, 2005).

Soil Sample Identification	Begin Depth	End Depth	pH	Saturation	Electrical Conductivity	Organic Matter	PE Calcium	PE Magnesium	PE Potassium	PE Sodium
	cm	cm	s.u.	%	dS/m	%	meq/L	meq/L	meq/L	meq/L
WHT-1-2009	0	25	6.4	49.2	0.46	3.8	2.32	0.80	0.40	0.25
WHT-1-2009	25	46	6.7	38.5	0.43	1.6	2.57	0.76	0.24	0.18
WHT-1-2009	46	82	6.8	35.9	0.39	1.0	2.09	0.85	0.19	0.21
WHT-1-2009	82	122	7.2	35.7	0.38	0.8	1.39	0.66	0.14	0.87
B-1-2009	2	20	7.5	35.8	0.65	2.3	4.19	1.37	0.79	0.40
B-1-2009	20	50	7.5	37.3	0.47	2.7	2.73	0.85	0.68	0.20
B-1-2009	50	64	7.5	32.7	0.50	2.0	3.22	0.80	0.69	0.23
B-2-2009	3	18	6.6	46.5	0.39	6.1	2.39	0.70	0.19	0.21
B-2-2009	18	50	6.3	44.2	0.32	3.5	1.74	0.46	0.16	0.20
B-2-2009	50	95	6.5	43.4	0.26	2.8	1.14	0.63	0.14	0.16
B-2-2009	95	124	6.5	36.2	0.19	1.8	0.79	0.37	0.11	0.11
B-2-2009	124	184	6.9	41.1	0.38	1.7	2.20	0.94	0.11	0.18
B-3-2009	4	20	7.0	50.9	1.26	8.3	5.31	2.00	0.80	5.26
B-3-2009	20	44	7.1	46.0	0.58	6.0	3.90	0.92	0.43	0.69
B-3-2009	44	96	7.4	41.2	0.45	4.3	2.70	0.80	0.45	0.30
B-3-2009	96	124	7.3	48.1	0.47	6.6	3.21	1.09	0.49	0.15
B-4-2009	5	23	7.1	41.2	0.62	3.9	4.02	1.39	0.93	0.24
B-4-2009	23	78	7.2	37.3	0.55	4.5	4.13	0.94	0.34	0.29
B-4-2009	78	138	7.3	33.7	0.34	2.9	2.03	0.76	0.22	0.42
B-4-2009	138	180	7.1	67.7	0.91	2.5	5.13	1.81	0.14	1.07
B-5-2009	1	15	7.2	35.1	0.45	3.1	2.81	1.26	0.33	0.14
B-5-2009	15	35	7.2	38.8	0.45	2.7	2.81	1.32	0.25	0.26
B-5-2009	35	70	7.3	35.2	0.44	3.2	2.70	1.34	0.24	0.20
B-5-2009	70	108	7.2	34.4	0.48	2.6	3.13	1.57	0.26	0.47
B-5-2009	108	160	7.3	38.6	0.44	2.4	2.56	1.47	0.11	0.31

Good	Fair	Poor	Unacceptable

Table [redacted]. Whitmore Canyon GVH, B Canyon GVH, and B Canyon Road laboratory analysis results of soil samples collected in fall 2009. Suitability ratings are based on Guidelines for Management of Topsoil and Overburden (Utah DOGM, 2005).

Soil Sample Identification	Begin Depth	End Depth	SAR	Sand	Silt	Clay	Texture	Very Fine Sand	CO_3	Nitrogen Nitrate	Selenium
	cm	cm		%	%	%		%	%	ppm	ppm
WHT-1-2009	0	25	0.20	55.0	30.0	15.0	Sandy Loam	19.7	0.9	2.3	
WHT-1-2009	25	46	0.14	59.0	24.0	17.0	Sandy Loam	22.8	0.8	2.7	
WHT-1-2009	46	82	0.18	69.0	18.0	13.0	Sandy Loam	29.9	1.1	2.8	
WHT-1-2009	82	122	0.86	66.0	22.0	12.0	Sandy Loam	27.1	1.2	2.0	
B-1-2009	2	20	0.24	69.0	18.0	13.0	Sandy Loam	30.1	26.5	3.2	<0.02
B-1-2009	20	50	0.15	59.0	21.0	20.0	Sandy Clay Loam	23.8	11.7	2.2	<0.02
B-1-2009	50	64	0.16	65.0	21.0	14.0	Sandy Loam	26.6	18.7	<0.1	<0.02
B-2-2009	3	18	0.17	47.0	36.0	17.0	Loam	13.0	0.9	2.1	
B-2-2009	18	50	0.19	17.0	45.0	38.0	Silty Clay Loam	3.8	0.6	1.9	
B-2-2009	50	95	0.17	43.0	39.0	18.0	Loam	9.6	0.7	2.7	
B-2-2009	95	124	0.15	47.0	34.0	19.0	Loam	12.9	0.5	2.3	
B-2-2009	124	184	0.14	50.0	28.0	22.0	Loam	18.3	3.3	2.6	
B-3-2009	4	20	2.75	51.0	30.0	19.0	Loam	16.4	4.1	3.1	
B-3-2009	20	44	0.44	39.0	37.0	24.0	Loam	11.8	4.9	1.1	
B-3-2009	44	96	0.23	34.0	39.0	27.0	Clay Loam	10.9	10.4	2.6	
B-3-2009	96	124	0.11	28.0	45.0	27.0	Clay Loam	6.2	7.5	1.9	
B-4-2009	5	23	0.15	48.0	37.0	15.0	Loam	13.2	0.8	<0.1	
B-4-2009	23	78	0.18	44.0	37.0	19.0	Loam	11.1	0.8	<0.1	
B-4-2009	78	138	0.36	43.0	36.0	21.0	Loam	11.7	0.6	<0.1	
B-4-2009	138	180	0.58	34.0	39.0	27.0	Clay Loam	8.6	0.8	<0.1	
B-5-2009	1	15	0.10	64.0	25.0	11.0	Sandy Loam	24.4	8.1	<0.1	
B-5-2009	15	35	0.18	54.0	29.0	17.0	Sandy Loam	18.1	7.3	<0.1	
B-5-2009	35	70	0.14	60.0	26.0	14.0	Sandy Loam	20.3	7.2	<0.1	
B-5-2009	70	108	0.31	54.0	29.0	17.0	Sandy Loam	20.5	10.1	<0.1	
B-5-2009	108	160	0.22	54.0	26.0	20.0	Sandy Clay Loam	17.1	12.7	<0.1	

Good	Fair	Poor	Unacceptable

Table 1. Whitmore Canyon GVH, B Canyon GVH, and B Canyon Road laboratory analysis results of soil samples collected in fall 2009. Suitability ratings are based on Guidelines for Management of Topsoil and Overburden (Utah DOGM, 2005).

Soil Sample Identification	Begin Depth	End Depth	Boron	Phosphorus	Available Potassium	Total Carbon	Total Organic Carbon TOC	Total Sulfur	T.S. AB	Neutral. Potential	T.S.ABP
	cm	cm	ppm	ppm	meq/100g	%	%	%	t/1000t	t/1000t	t/1000t
WHT-1-2009	0	25		27.0	0.76	2.6	2.4			9.39	
WHT-1-2009	25	46		30.1	0.54	0.9	0.8			8.12	
WHT-1-2009	46	82		19.9	0.42	0.4	0.3			10.8	
WHT-1-2009	82	122		17.5	0.44	0.5	0.4			11.5	
B-1-2009	2	20	0.22	19.2	0.46	4.2	0.9	<0.01	0	270	270
B-1-2009	20	50	0.24	8.60	0.58	2.4	1.0	<0.01	0	113	113
B-1-2009	50	64	0.18	6.34	0.43	2.8	0.7	<0.01	0	180	180
B-2-2009	3	18		14.0	0.25	2.5	2.4			8.99	
B-2-2009	18	50		12.9	0.38	1.4	1.4			5.57	
B-2-2009	50	95		11.3	0.27	1.1	1.0			6.52	
B-2-2009	95	124		11.5	0.23	0.8	0.7			5.39	
B-2-2009	124	184		21.2	0.37	0.9	0.5			32.6	
B-3-2009	4	20		27.7	0.63	3.7	3.2			40.6	
B-3-2009	20	44		11.2	0.52	3.3	2.7			49.2	
B-3-2009	44	96		7.09	0.54	3.0	1.7			104	
B-3-2009	96	124		13.0	0.56	3.5	2.6			75.2	
B-4-2009	5	23		30.2	0.71	1.9	1.8			6.85	
B-4-2009	23	78		10.8	0.44	1.8	1.7			8.88	
B-4-2009	78	138		3.92	0.38	1.1	1.0			5.90	
B-4-2009	138	180		4.49	0.28	1.0	0.9			7.15	
B-5-2009	1	15		5.84	0.28	1.8	0.8			82.8	
B-5-2009	15	35		5.26	0.28	1.7	0.7			80.9	
B-5-2009	35	70		4.51	0.31	2.0	1.0			79.0	
B-5-2009	70	108		4.50	0.24	2.0	0.7			111	
B-5-2009	108	160		4.14	0.22	2.2	0.6			132	

Good	Fair	Poor	Unacceptable

Table [illegible]. Whitmore Canyon GVH, B Canyon GVH, and B Canyon Road laboratory analysis results of soil samples collected in fall 2009. Suitability ratings are based on Guidelines for Management of Topsoil and Overburden (Utah DOGM, 2005).

Soil Sample Identification	Begin Depth	End Depth	pH	Saturation	Electrical Conductivity	Organic Matter	PE Calcium	PE Magnesium	PE Potassium	PE Sodium
	cm	cm	s.u.	%	dS/m	%	meq/L	meq/L	meq/L	meq/L
B-6-2009	1	12	7.0	46.3	0.70	6.7	4.49	1.04	1.10	0.17
B-6-2009	12	23	7.0	40.7	0.55	5.5	3.83	1.24	0.63	0.16
B-6-2009	23	52	7.0	42.8	0.40	2.1	2.47	0.95	0.27	0.12
B-6-2009	52	90	7.1	31.5	0.51	1.2	2.24	1.53	0.61	0.19
B-6-2009	90	117	7.2	35.5	0.56	1.1	2.14	1.96	0.47	0.24
B-6-2009	117	133	7.4	35.5	0.59	1.2	2.02	2.93	0.26	0.24
B-6-2009	133	170	7.5	42.2	0.66	1.6	1.69	3.98	0.22	0.29
B-7-2009	5	13	7.2	57.3	0.63	6.8	3.89	1.97	1.15	0.31
B-7-2009	13	25	7.2	50.7	0.54	6.7	3.21	1.50	0.78	0.24
B-7-2009	25	60	7.2	47.1	0.53	3.2	3.67	1.30	0.42	0.29
B-7-2009	60	90	7.4	39.4	0.38	2.1	2.43	0.94	0.28	0.36
B-7-2009	90	123	7.5	40.6	0.46	3.1	3.24	1.27	0.13	0.61
B-7-2009	123	155	7.5	41.3	0.45	2.5	2.61	1.18	0.06	0.55
B-8-2009	2	11	7.4	45.5	0.40	4.1	2.93	0.69	0.17	0.17
B-8-2009	11	28	7.2	46.1	0.48	5.0	3.62	1.04	0.13	0.29
B-9-2009	0	10	7.4	36.8	0.47	2.6	3.49	0.69	0.19	0.17
B-9-2009	10	30	7.3	34.4	0.47	1.9	3.49	0.88	0.20	0.20
B-9-2009	30	65	7.4	32.2	0.45	2.0	3.05	1.00	0.31	0.21
B-9-2009	65	105	7.5	37.0	0.44	1.7	2.28	1.19	0.24	0.77
B-9-2009	105	155	7.7	30.9	0.42	1.3	2.32	1.36	0.21	0.62
B-10-2009	0	10	7.3	46.0	0.48	6.0	3.93	0.63	0.38	0.15
B-10-2009	10	33	7.4	44.1	0.52	3.8	3.64	1.55	0.24	0.11
B-10-2009	33	56	7.7	44.9	0.43	4.3	3.48	1.31	0.16	0.21
B-10-2009	56	80	7.8	40.6	0.40	2.2	2.98	1.22	0.06	0.18
B-10-2009	80	115	8.0	34.4	0.46	2.2	2.96	1.91	0.09	0.36
B-10-2009	115	160	8.1	34.5	0.49	1.9	1.70	3.26	0.04	0.31

Good	Fair	Poor	Unacceptable

Table 1-1. Whitmore Canyon GVH, B Canyon GVH, and B Canyon Road laboratory analysis results of soil samples collected in fall 2009. Suitability ratings are based on Guidelines for Management of Topsoil and Overburden (Utah DOGM, 2005).

Soil Sample Identification	Begin Depth	End Depth	SAR	Sand	Silt	Clay	Texture	Very Fine Sand	CO_3	Nitrogen Nitrate	Selenium
	cm	cm		%	%	%		%	%	ppm	ppm
B-6-2009	1	12	0.10	58.0	30.0	12.0	Sandy Loam	18.5	5.4	3.9	<0.02
B-6-2009	12	23	0.10	54.0	31.0	15.0	Sandy Loam	18.0	9.5	<0.1	<0.02
B-6-2009	23	52	0.09	46.0	35.0	19.0	Loam	14.0	7.4	<0.1	<0.02
B-6-2009	52	90	0.14	72.0	16.0	12.0	Sandy Loam	31.8	12.2	2.4	<0.02
B-6-2009	90	117	0.17	72.0	18.0	10.0	Sandy Loam	28.3	9.4	6.8	<0.02
B-6-2009	117	133	0.15	56.0	26.0	18.0	Sandy Loam	23.7	17.6	6.8	<0.02
B-6-2009	133	170	0.17	42.0	38.0	20.0	Loam	6.5	13.0	12.1	<0.02
B-7-2009	5	13	0.18	50.0	36.0	14.0	Loam	19.6	2.7	<0.1	
B-7-2009	13	25	0.15	52.0	32.0	16.0	Sandy Loam	15.7	2.3	<0.1	
B-7-2009	25	60	0.18	49.0	34.0	17.0	Loam	14.5	1.2	<0.1	
B-7-2009	60	90	0.28	51.0	32.0	17.0	Loam	12.6	2.1	<0.1	
B-7-2009	90	123	0.41	42.0	37.0	21.0	Loam	10.4	7.3	<0.1	
B-7-2009	123	155	0.40	46.0	34.0	20.0	Loam	12.4	8.3	<0.1	
B-8-2009	2	11	0.13	72.0	17.0	11.0	Sandy Loam	26.6	5.1	<0.1	
B-8-2009	11	28	0.19	63.0	24.0	13.0	Sandy Loam	23.1	3.0	<0.1	
B-9-2009	0	10	0.12	71.0	22.0	7.0	Sandy Loam	26.6	11.0	<0.1	
B-9-2009	10	30	0.13	72.0	19.0	9.0	Sandy Loam	26.7	12.0	<0.1	
B-9-2009	30	65	0.15	72.0	18.0	10.0	Sandy Loam	27.1	14.5	<0.1	
B-9-2009	65	105	0.58	70.0	17.0	13.0	Sandy Loam	29.6	14.0	<0.1	
B-9-2009	105	155	0.46	73.0	16.0	11.0	Sandy Loam	32.3	15.8	<0.1	
B-10-2009	0	10	0.10	70.0	18.0	12.0	Sandy Loam	28.7	10.8	<0.1	
B-10-2009	10	33	0.07	64.0	19.0	17.0	Sandy Loam	28.0	13.6	<0.1	
B-10-2009	33	56	0.14	58.0	21.0	21.0	Sandy Clay Loam	24.6	19.7	<0.1	
B-10-2009	56	80	0.13	61.0	21.0	18.0	Sandy Loam	26.4	18.9	<0.1	
B-10-2009	80	115	0.23	52.0	31.0	17.0	Sandy Loam	19.6	21.6	<0.1	
B-10-2009	115	160	0.20	56.0	28.0	16.0	Sandy Loam	24.0	20.2	<0.1	

Good	Fair	Poor	Unacceptable

Table [redacted] Whitmore Canyon GVH, B Canyon GVH, and B Canyon Road laboratory analysis results of soil samples collected in fall 2009. Suitability ratings are based on Guidelines for Management of Topsoil and Overburden (Utah DOGM, 2005).

Soil Sample Identification	Begin Depth	End Depth	Boron	Phosphorus	Available Potassium	Total Carbon	Total Organic Carbon TOC	Total Sulfur	T.S. AB	Neutral. Potential	T.S.ABP
	cm	cm	ppm	ppm	meq/100g	%	%	%	t/1000t	t/1000t	t/1000t
B-6-2009	1	12	0.45	20.4	0.65	4.0	3.4	0.04	1.21	53.9	52.7
B-6-2009	12	23	0.25	7.90	0.54	4.9	3.7	0.07	2.30	94.8	92.5
B-6-2009	23	52	0.14	4.92	0.40	1.9	1.0	<0.01	0	70.2	70.2
B-6-2009	52	90	0.13	4.59	0.35	1.5	0.2	<0.01	0	113	113
B-6-2009	90	117	0.15	4.96	0.26	1.4	0.3	<0.01	0	90.7	90.7
B-6-2009	117	133	0.23	4.32	0.32	2.3	0.2	<0.01	0	172	172
B-6-2009	133	170	0.22	5.44	0.31	1.7	0.2	<0.01	0	122	122
B-7-2009	5	13		21.9	1.07	3.5	3.2			27.0	
B-7-2009	13	25		13.4	0.90	2.7	2.5			22.6	
B-7-2009	25	60		7.11	0.56	1.6	1.4			13.2	
B-7-2009	60	90		4.84	0.42	0.8	0.6			18.4	
B-7-2009	90	123		5.40	0.27	1.9	1.0			78.6	
B-7-2009	123	155		4.86	0.18	1.5	0.5			79.9	
B-8-2009	2	11		10.7	0.30	2.1	1.5			49.2	
B-8-2009	11	28		10.8	0.33	2.0	1.6			29.6	
B-9-2009	0	10		7.57	0.31	1.7	0.5			105	
B-9-2009	10	30		4.11	0.19	1.8	0.4			121	
B-9-2009	30	65		4.49	0.22	2.3	0.5			144	
B-9-2009	65	105		3.79	0.23	2.0	0.4			132	
B-9-2009	105	155		3.29	0.14	1.9	<0.1			161	
B-10-2009	0	10		11.6	0.38	3.4	2.2			102	
B-10-2009	10	33		6.70	0.28	2.7	1.1			135	
B-10-2009	33	56		6.80	0.22	3.5	1.1			201	
B-10-2009	56	80		3.49	0.15	2.7	0.5			186	
B-10-2009	80	115		4.00	0.17	2.7	0.2			209	
B-10-2009	115	160		3.15	0.13	2.9	0.4			204	

Good	Fair	Poor	Unacceptable

Table 1-2. Available water capacity and K factor by soil horizon.

SampleID	Begin Depth	End Depth	Available Water Capacity[1] Estimate (Saxton 2006)	K Factor Estimate[2] (Renard 1997)
	cm	cm	in/in	
WHT-1-2009	0	25	0.12	0.21
WHT-1-2009	25	46	0.06	0.31
WHT-1-2009	46	82	0.04	0.35
WHT-1-2009	82	122	0.05	0.37
B-1-2009	2	20	0.04	0.25
B-1-2009	20	50	0.05	0.31
B-1-2009	50	64	0.05	0.32
B-2-2009	3	18	0.12	0.23
B-2-2009	18	50	0.11	0.28
B-2-2009	50	95	0.08	0.31
B-2-2009	95	124	0.06	0.32
B-2-2009	124	184	0.06	0.31
B-3-2009	4	20	0.10	0.16
B-3-2009	20	44	0.11	0.21
B-3-2009	44	96	0.08	0.30
B-3-2009	96	124	0.11	0.25
B-4-2009	5	23	0.08	0.30
B-4-2009	23	78	0.09	0.26
B-4-2009	78	138	0.09	0.29
B-4-2009	138	180	0.07	0.33
B-5-2009	1	15	0.06	0.31
B-5-2009	15	35	0.08	0.28
B-5-2009	35	70	0.06	0.27
B-5-2009	70	108	0.08	0.30
B-5-2009	108	160	0.08	0.31
B-6-2009	1	12	0.09	0.19
B-6-2009	12	23	0.09	0.22
B-6-2009	23	52	0.09	0.33
B-6-2009	52	90	0.08	0.35
B-6-2009	90	117	0.08	0.35
B-6-2009	117	133	0.09	0.34
B-6-2009	133	170	0.11	0.31

1. Available Water Capacity suitability ratings based on Guidelines for Management of Topsoil and Overburden (Utah DOGM, 2005). Good >0.10 in/in, Fair 0.05 to 0.10 in.in, and Poor <0.05 inches

2. Estimated K factor suitability ratings based on Guidelines for Management of Topsoil and Overburden (Utah DOGM, 2005). Good <0.37, Fair 0.37, and Poor >0.37.

Good	Fair	Poor	Unacceptable

Table 1-2. Available water capacity and K factor by soil horizon.

SampleID	Begin Depth	End Depth	Available Water Capacity[1] Estimate (Saxton 2006)	K Factor Estimate[2] (Renard 1997)
	cm	cm	in/in	
B-7-2009	5	13	0.07	0.33
B-7-2009	13	25	0.08	0.32
B-7-2009	25	60	0.06	0.31
B-7-2009	60	90	0.06	0.32
B-7-2009	90	123	0.04	0.35
B-7-2009	123	155	0.07	0.21
B-8-2009	2	11	0.08	0.24
B-8-2009	11	28	0.10	0.23
B-9-2009	0	10	0.07	0.33
B-9-2009	10	30	0.08	0.32
B-9-2009	30	65	0.06	0.31
B-9-2009	65	105	0.06	0.32
B-9-2009	105	155	0.04	0.35
B-10-2009	0	10	0.07	0.21
B-10-2009	10	33	0.06	0.25
B-10-2009	33	56	0.06	0.27
B-10-2009	56	80	0.06	0.29
B-10-2009	80	115	0.07	0.32
B-10-2009	115	160	0.06	0.34
B-11-2009	3	10	0.13	0.22
B-11-2009	10	29	0.12	0.25
B-11-2009	29	80	0.06	0.31
B-11-2009	80	114	0.10	0.33
B-11-2009	114	135	0.06	0.35
B-11-2009	135	160	0.12	0.35
B-12-2009	1	14	0.06	0.24
B-12-2009	14	30	0.07	0.29
B-12-2009	30	75	0.06	0.32
B-12-2009	75	120	0.05	0.34
B-12-2009	120	166	0.10	0.32

1. Available Water Capacity suitability ratings based on Guidelines for Management of Topsoil and Overburden (Utah DOGM, 2005). Good >0.10 in/in, Fair 0.05 to 0.10 in.in, and Poor <0.05 inches

2. Estimated K factor suitability ratings based on Guidelines for Management of Topsoil and Overburden (Utah DOGM, 2005). Good <0.37, Fair 0.37, and Poor >0.37.

Good	Fair	Poor	Unacceptable

Inter-Mountain Laboratories, Inc.
1673 Terra Avenue, Sheridan, Wyoming 82801
(307) 672-8945

Soil Analysis Report

Long Resource Consultants, Inc.
1960 West Deep Creek Road
Morgan, UT 84050

Report ID: S0911391001

Project: B Canyon Road Overburden
Date Received: 11/30/2009

Date Reported: 12/18/2009
Work Order: S0911391

Lab ID	Sample ID	Depths	pH	Saturation	Electrical Conductivity	Organic Matter	PE Calcium	PE Magnesium	PE Potassium	PE Sodium	SAR
		cm	s.u.	%	dS/m	%	meq/L	meq/L	meq/L	meq/L	
S0911391-001	B-6-2009	1-12	7.0	46.3	0.70	6.7	4.49	1.04	1.10	0.17	0.10
S0911391-002	B-6-2009	12-23	7.0	40.7	0.55	5.5	3.83	1.24	0.63	0.16	0.10
S0911391-003	B-6-2009	23-52	7.0	42.8	0.40	2.1	2.47	0.95	0.27	0.12	0.09
S0911391-004	B-6-2009	52-90	7.1	31.5	0.51	1.2	2.24	1.53	0.61	0.19	0.14
S0911391-005	B-6-2009	90-117	7.2	35.5	0.56	1.1	2.14	1.96	0.47	0.24	0.17
S0911391-006	B-6-2009	117-133	7.4	35.5	0.59	1.2	2.02	2.93	0.26	0.24	0.15
S0911391-007	B-6-2009	133-170	7.5	42.2	0.66	1.6	1.69	3.98	0.22	0.29	0.17

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neutral. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor

Inter-Mountain Laboratories, Inc.
1673 Terra Avenue, Sheridan, Wyoming 82801
(307) 672-8945

Soil Analysis Report

Long Resource Consultants, Inc.
1960 West Deep Creek Road
Morgan, UT 84050

Report ID: S0911391001

Project: B Canyon Road Overburden
Date Received: 11/30/2009

Date Reported: 12/18/2009
Work Order: S0911391

Lab ID	Sample ID	Depths cm	Sand %	Silt %	Clay %	Texture	Very Fine Sand %	CO3 %
S0911391-001	B-6-2009	1-12	58.0	30.0	12.0	Sandy Loam	18.5	5.4
S0911391-002	B-6-2009	12-23	54.0	31.0	15.0	Sandy Loam	18.0	9.5
S0911391-003	B-6-2009	23-52	46.0	35.0	19.0	Loam	14.0	7.4
S0911391-004	B-6-2009	52-90	72.0	16.0	12.0	Sandy Loam	31.8	12.2
S0911391-005	B-6-2009	90-117	72.0	18.0	10.0	Sandy Loam	28.3	9.4
S0911391-006	B-6-2009	117-133	56.0	26.0	18.0	Sandy Loam	23.7	17.6
S0911391-007	B-6-2009	133-170	42.0	38.0	20.0	Loam	6.5	13.0

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neutral. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor

INTER-MOUNTAIN LABS

Inter-Mountain Laboratories, Inc.
1673 Terra Avenue, Sheridan, Wyoming 82801
(307) 672-8945

Soil Analysis Report

Long Resource Consultants, Inc.
1960 West Deep Creek Road
Morgan, UT 84050

Report ID: S0911391001

Project: B Canyon Road Overburden
Date Received: 11/30/2009

Date Reported: 12/18/2009
Work Order: S0911391

Lab ID	Sample ID	Depths	Nitrogen Nitrate	Selenium	Boron	Available Phosphorus	Available Potassium	Total Carbon	TOC
		cm	ppm	ppm	ppm	ppm	meq/100g	%	%
S0911391-001	B-6-2009	1-12	3.9	<0.02	0.45	20.4	0.65	4.0	3.4
S0911391-002	B-6-2009	12-23	<0.1	<0.02	0.25	7.90	0.54	4.9	3.7
S0911391-003	B-6-2009	23-52	<0.1	<0.02	0.14	4.92	0.40	1.9	1.0
S0911391-004	B-6-2009	52-90	2.4	<0.02	0.13	4.59	0.35	1.5	0.2
S0911391-005	B-6-2009	90-117	6.8	<0.02	0.15	4.96	0.26	1.4	0.3
S0911391-006	B-6-2009	117-133	6.8	<0.02	0.23	4.32	0.32	2.3	0.2
S0911391-007	B-6-2009	133-170	12.1	<0.02	0.22	5.44	0.31	1.7	0.2

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neutral. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor

INTER-MOUNTAIN LABS

Inter-Mountain Laboratories, Inc.
1673 Terra Avenue, Sheridan, Wyoming 82801
(307) 672-8945

Soil Analysis Report

Long Resource Consultants, Inc.
1960 West Deep Creek Road
Morgan, UT 84050

Report ID: S0911391001

Project: B Canyon Road Overburden
Date Received: 11/30/2009

Date Reported: 12/18/2009
Work Order: S0911391

Lab ID	Sample ID	Depths cm	Total Sulfur %	T.S. AB t/1000t	Neutral. Potential t/1000t	T.S. ABP t/1000t
S0911391-001	B-6-2009	1-12	0.04	1.21	53.9	52.7
S0911391-002	B-6-2009	12-23	0.07	2.30	94.8	92.5
S0911391-003	B-6-2009	23-52	<0.01	<0.01	70.2	70.2
S0911391-004	B-6-2009	52-90	<0.01	<0.01	113	113
S0911391-005	B-6-2009	90-117	<0.01	<0.01	90.7	90.7
S0911391-006	B-6-2009	117-133	<0.01	<0.01	172	172
S0911391-007	B-6-2009	133-170	<0.01	<0.01	122	122

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neutral. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor

Inter-Mountain Laboratories, Inc.
1673 Terra Avenue, Sheridan, Wyoming 82801
(307) 672-8945

Soil Analysis Report

Long Resource Consultants, Inc.
1960 West Deep Creek Road
Morgan, UT 84050

Report ID: S0911393001

Project: B Canyon Road Topsoil
Date Received: 11/30/2009

Date Reported: 12/18/2009
Work Order: S0911393

Lab ID	Sample ID	Depths	pH	Saturation	Electrical Conductivity	Organic Matter	PE Calcium	PE Magnesium	PE Potassium	PE Sodium	SAR
		cm	s.u.	%	dS/m	%	meq/L	meq/L	meq/L	meq/L	
S0911393-001	B-4-2009	5-23	7.1	41.2	0.62	3.9	4.02	1.39	0.93	0.24	0.15
S0911393-002	B-4-2009	23-78	7.2	37.3	0.55	4.5	4.13	0.94	0.34	0.29	0.18
S0911393-003	B-4-2009	78-138	7.3	33.7	0.34	2.9	2.03	0.76	0.22	0.42	0.36
S0911393-004	B-4-2009	138-180	7.1	67.7	0.91	2.5	5.13	1.81	0.14	1.07	0.58
S0911393-005	B-5-2009	1-15	7.2	35.1	0.45	3.1	2.81	1.26	0.33	0.14	0.10
S0911393-006	B-5-2009	15-35	7.2	38.8	0.45	2.7	2.81	1.32	0.25	0.26	0.18
S0911393-007	B-5-2009	35-70	7.3	35.2	0.44	3.2	2.70	1.34	0.24	0.20	0.14
S0911393-008	B-5-2009	70-108	7.2	34.4	0.48	2.6	3.13	1.57	0.26	0.47	0.31
S0911393-009	B-5-2009	108-160	7.3	38.6	0.44	2.4	2.56	1.47	0.11	0.31	0.22
S0911393-010	B-7-2009	5-13	7.2	57.3	0.63	6.8	3.89	1.97	1.15	0.31	0.18
S0911393-011	B-7-2009	13-25	7.2	50.7	0.54	6.7	3.21	1.50	0.78	0.24	0.15
S0911393-012	B-7-2009	25-60	7.2	47.1	0.53	3.2	3.67	1.30	0.42	0.29	0.18
S0911393-013	B-7-2009	60-90	7.4	39.4	0.38	2.1	2.43	0.94	0.28	0.36	0.28
S0911393-014	B-7-2009	90-123	7.5	40.6	0.46	3.1	3.24	1.27	0.13	0.61	0.41
S0911393-015	B-7-2009	123-155	7.5	41.3	0.45	2.5	2.61	1.18	0.06	0.55	0.40
S0911393-016	B-8-2009	2-11	7.4	45.5	0.40	4.1	2.93	0.69	0.17	0.17	0.13
S0911393-017	B-8-2009	11-28	7.2	46.1	0.48	5.0	3.62	1.04	0.13	0.29	0.19
S0911393-018	B-9-2009	0-10	7.4	36.8	0.47	2.6	3.49	0.69	0.19	0.17	0.12
S0911393-019	B-9-2009	10-30	7.3	34.4	0.47	1.9	3.49	0.88	0.20	0.20	0.13
S0911393-020	B-9-2009	30-65	7.4	32.2	0.45	2.0	3.05	1.00	0.31	0.21	0.15

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neutral. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor

INTER-MOUNTAIN LABS

Inter-Mountain Laboratories, Inc.
1673 Terra Avenue, Sheridan, Wyoming 82801
(307) 672-8945

Soil Analysis Report

Long Resource Consultants, Inc.
1960 West Deep Creek Road
Morgan, UT 84050

Report ID: S0911393001

Project: B Canyon Road Topsoil
Date Received: 11/30/2009

Date Reported: 12/18/2009
Work Order: S0911393

Lab ID	Sample ID	Depths cm	Sand %	Silt %	Clay %	Texture	Very Fine Sand %	CO3 %	Nitrogen Nitrate ppm	Available Phosphorus ppm	Available Potassium meq/100g
S0911393-001	B-4-2009	5-23	48.0	37.0	15.0	Loam	13.2	0.8	<0.1	30.2	0.71
S0911393-002	B-4-2009	23-78	44.0	37.0	19.0	Loam	11.1	0.8	<0.1	10.8	0.44
S0911393-003	B-4-2009	78-138	43.0	36.0	21.0	Loam	11.7	0.6	<0.1	3.92	0.38
S0911393-004	B-4-2009	138-180	34.0	39.0	27.0	Clay Loam	8.6	0.8	<0.1	4.49	0.28
S0911393-005	B-5-2009	1-15	64.0	25.0	11.0	Sandy Loam	24.4	8.1	<0.1	5.84	0.28
S0911393-006	B-5-2009	15-35	54.0	29.0	17.0	Sandy Loam	18.1	7.3	<0.1	5.26	0.28
S0911393-007	B-5-2009	35-70	60.0	26.0	14.0	Sandy Loam	20.3	7.2	<0.1	4.51	0.31
S0911393-008	B-5-2009	70-108	54.0	29.0	17.0	Sandy Loam	20.5	10.1	<0.1	4.50	0.24
S0911393-009	B-5-2009	108-160	54.0	26.0	20.0	Sandy Clay Loam	17.1	12.7	<0.1	4.14	0.22
S0911393-010	B-7-2009	5-13	50.0	36.0	14.0	Loam	19.6	2.7	<0.1	21.9	1.07
S0911393-011	B-7-2009	13-25	52.0	32.0	16.0	Sandy Loam	15.7	2.3	<0.1	13.4	0.90
S0911393-012	B-7-2009	25-60	49.0	34.0	17.0	Loam	14.5	1.2	<0.1	7.11	0.56
S0911393-013	B-7-2009	60-90	51.0	32.0	17.0	Loam	12.6	2.1	<0.1	4.84	0.42
S0911393-014	B-7-2009	90-123	42.0	37.0	21.0	Loam	10.4	7.3	<0.1	5.40	0.27
S0911393-015	B-7-2009	123-155	46.0	34.0	20.0	Loam	12.4	8.3	<0.1	4.86	0.18
S0911393-016	B-8-2009	2-11	72.0	17.0	11.0	Sandy Loam	26.6	5.1	<0.1	10.7	0.30
S0911393-017	B-8-2009	11-28	63.0	24.0	13.0	Sandy Loam	23.1	3.0	<0.1	10.8	0.33
S0911393-018	B-9-2009	0-10	71.0	22.0	7.0	Sandy Loam	26.6	11.0	<0.1	7.57	0.31
S0911393-019	B-9-2009	10-30	72.0	19.0	9.0	Sandy Loam	26.7	12.0	<0.1	4.11	0.19
S0911393-020	B-9-2009	30-65	72.0	18.0	10.0	Sandy Loam	27.1	14.5	<0.1	4.49	0.22

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neutral. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor

Inter-Mountain Laboratories, Inc.
1673 Terra Avenue, Sheridan, Wyoming 82801
(307) 672-8945

Soil Analysis Report

Long Resource Consultants, Inc.
1960 West Deep Creek Road
Morgan, UT 84050

Report ID: S0911393001

Project: B Canyon Road Topsoil
Date Received: 11/30/2009

Date Reported: 12/18/2009
Work Order: S0911393

Lab ID	Sample ID	Depths cm	Total Carbon %	TOC %	Neutral. Potential t/1000t
S0911393-001	B-4-2009	5-23	1.9	1.8	6.85
S0911393-002	B-4-2009	23-78	1.8	1.7	8.88
S0911393-003	B-4-2009	78-138	1.1	1.0	5.90
S0911393-004	B-4-2009	138-180	1.0	0.9	7.15
S0911393-005	B-5-2009	1-15	1.8	0.8	82.8
S0911393-006	B-5-2009	15-35	1.7	0.7	80.9
S0911393-007	B-5-2009	35-70	2.0	1.0	79.0
S0911393-008	B-5-2009	70-108	2.0	0.7	111
S0911393-009	B-5-2009	108-160	2.2	0.6	132
S0911393-010	B-7-2009	5-13	3.5	3.2	27.0
S0911393-011	B-7-2009	13-25	2.7	2.5	22.6
S0911393-012	B-7-2009	25-60	1.6	1.4	13.2
S0911393-013	B-7-2009	60-90	0.8	0.6	18.4
S0911393-014	B-7-2009	90-123	1.9	1.0	78.6
S0911393-015	B-7-2009	123-155	1.5	0.5	79.9
S0911393-016	B-8-2009	2-11	2.1	1.5	49.2
S0911393-017	B-8-2009	11-28	2.0	1.6	29.6
S0911393-018	B-9-2009	0-10	1.7	0.5	105
S0911393-019	B-9-2009	10-30	1.8	0.4	121
S0911393-020	B-9-2009	30-65	2.3	0.5	144

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neutral. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor

Pedon ID: B-5-09
Description Date: 11/06/2009
Describer: Robert Long

Soil Name As Described/Sampled: Foy
Classification: Loamy-skeletal, mixed, superactive, mesic Aridic Calciustepts

County or Parish: WY007 - Carbon
State or Territory: UT - Utah
7.5' Quad: 39110-E4 - Sunnyside, Utah
UTM: 549185E, 4384530N -- Datum NAD83, Zone 12
Legal Description: Section 14, Township 14 South, Range 13 East of the Uintah Meridian

Landscape: plateau
Landform: alluvial fan
Geomorphic Component: Lower third of mountainflank
Profile Pos: Backslope
Slope: 86 percent
Elevation: 2165 meters (7103 feet)
Aspect: 150°
Shape: up/down: Convex; **across:** Linear
Complexity: Complex
Flooding: None
Ponding: None
Drainage: Well drained
Runoff: High
Permeability: Moderately rapid
Erosion: Class 1 - Sheet erosion

Primary Earth Cover: Grass/herbaceous cover; **Secondary Earth Cover:** Conifers
Existing Vegetation: PIED - twoneedle pinyon (*Pinus edulis*); ARTRW8 - Wyoming big sagebrush (*Artemisia tridentata ssp. wyomingensis*); POA - bluegrass (*Poa*); CHRYS9 - rabbitbrush (*Chrysothamnus*); JUOS - Utah juniper (*Juniperus osteosperma*); THIN6 - intermediate wheatgrass (*Thinopyrum intermedium*)
Parent Materials: colluvium
Bedrock:

Particle Size Control Section: 25 to 100 centimeters (9.8 to 39.4 inches)
Diagnostic Features: Cambic horizon: 15 to 70 centimeters (5.9 to 27.6 inches) and Calcic horizon: 70 to 160 centimeters (27.6 to 63 inches)

Oi --- 0 to 1 centimeter (0 to 0.4 inches); needles and twigs.

A — 1 to 15 centimeters (0.4 to 5.9 inches); light olive brown (2.5Y 5/3) dry, very gravelly sandy loam; olive brown (2.5Y 4/3) moist; 64 percent sand; 25 percent silt; 11 percent clay; weak medium subangular blocky parting to moderate fine granular and weak fine subangular blocky structure; very friable, slightly hard, nonsticky, nonplastic; common very fine roots throughout, common fine roots throughout and common coarse roots throughout; many very fine tubular pores; 3 percent nonflat subangular 250 to 600 millimeters (10 to 24 inches) calcareous sandstone fragments, 10 percent flat subangular 150 to 380 millimeters (6 to 15 inches) calcareous sandstone fragments, 5 percent nonflat subangular 76 to 250 millimeters (3 to 10 inches) calcareous sandstone fragments and 30 percent nonflat subangular 2 to 76 millimeters (0.1 to 3 inches) calcareous sandstone fragments; electrical conductivity of 0.5 mmhos/cm; noneffervescent by HCl, 1 normal; neutral, pH 7.2; clear smooth boundary; $CaCO_3$ 8.3 Percent.

Bw1 — 15 to 35 centimeters (5.9 to 13.8 inches); light brownish gray (10YR 6/2) dry, very flaggy sandy loam; dark grayish brown (10YR 4/2) moist; 54 percent sand; 29 percent silt; 17 percent clay; moderate medium subangular blocky structure; very friable, hard, nonsticky, nonplastic; many very fine roots throughout, common fine roots throughout, common medium roots throughout and common coarse roots throughout; common very fine tubular pores; 10 percent nonflat subangular 250 to 600 millimeters (10 to 24 inches) calcareous sandstone fragments, 5 percent flat subangular 150 to 380 millimeters (6 to 15 inches) calcareous sandstone fragments, 10 percent nonflat subangular 76 to 250 millimeters (3 to 10 inches) calcareous sandstone fragments and 10 percent nonflat subangular 2 to 76 millimeters (0.1 to 3 inches) calcareous sandstone fragments; electrical conductivity of 0.5 mmhos/cm; noneffervescent by HCl, 1 normal; neutral, pH 7.2; gradual smooth boundary; $CaCO_3$ 8.1 Percent.

Bw2 — 35 to 70 centimeters (13.8 to 27.6 inches); light brownish gray (10YR 6/2) dry, very stony sandy loam; dark grayish brown (10YR 4/2) moist; 60 percent sand; 26 percent silt; 14 percent clay; moderate medium subangular blocky structure; friable, hard, nonsticky, nonplastic; common very fine roots throughout, common fine roots throughout and common medium roots throughout; common very fine tubular pores; 15 percent flat subangular 150 to 380 millimeters (6 to 15 inches) calcareous sandstone fragments, 5 percent nonflat subangular 250 to 600 millimeters (10 to 24 inches) calcareous sandstone fragments, 10 percent nonflat subangular 76 to 250 millimeters (3 to 10 inches) calcareous sandstone fragments and 20 percent nonflat subangular 2 to 76 millimeters (0.1 to 3 inches) calcareous sandstone fragments; electrical conductivity of 0.4 mmhos/cm; noneffervescent by HCl, 1 normal; neutral, pH 7.3; clear smooth boundary; $CaCO_3$ 7.9 Percent.

Bk1 — 70 to 108 centimeters (27.6 to 42.5 inches); light brownish gray (10YR 6/2) dry, very stony sandy loam; dark grayish brown (10YR 4/2) moist; 54 percent sand; 29 percent silt; 17 percent clay; moderate medium subangular blocky structure; friable, very hard, nonsticky, nonplastic; common very fine roots throughout and common fine roots throughout; common very fine tubular pores; 2 percent (common) fine carbonate concretions on bottom of rock fragments; 15 percent nonflat subangular 250 to 600

millimeters (10 to 24 inches) calcareous sandstone fragments, 10 percent nonflat subangular 76 to 250 millimeters (3 to 10 inches) calcareous sandstone fragments and 20 percent nonflat subangular 2 to 76 millimeters (0.1 to 3 inches) calcareous sandstone fragments; electrical conductivity of 0.5 mmhos/cm; strongly effervescent by HCl, 1 normal; neutral, pH 7.2; gradual smooth boundary; $CaCO_3$ 11.1 Percent.

Bk2 — 108 to 160 centimeters (42.5 to 63 inches); light yellowish brown (2.5Y 6/3) dry, very channery sandy clay loam; light olive brown (2.5Y 5/3) moist; 54 percent sand; 26 percent silt; 20 percent clay; weak medium subangular blocky structure; friable, very hard, slightly sticky, nonplastic; common very fine roots throughout and common fine roots throughout; common very fine tubular pores; medium masses of carbonate on vertical faces of peds and 5 percent (common) fine carbonate concretions on bottom of rock fragments; 10 percent nonflat subangular 2 to 76 millimeters (0.1 to 3 inches) calcareous sandstone fragments and 20 percent flat subangular 2 to 150 millimeters (0.1 to 6 inches) calcareous sandstone fragments; electrical conductivity of 0.4 mmhos/cm; violently effervescent by HCl, 1 normal; neutral, pH 7.3; $CaCO_3$ 13.2 Percent.

Pedon ID: B-6-09

Description Date: 11/13/2009
Describer: Robert Long

Soil Name As Described/Sampled: Amalia family
Classification: Loamy-skeletal, mixed, superactive, frigid Calcidic Haplustalfs

County or Parish: WY007 - Carbon
State or Territory: UT - Utah
7.5' Quad: 39110-E4 - Sunnyside, Utah
UTM: 549119E, 4384451N -- Datum NAD83, Zone 12
Legal Description: Section 14, Township 14 South, Range 13 East

Landscape: plateau
Landform: stream terrace
Geomorphic Component: Base Slope
Profile Pos: Toeslope
Slope: 7 percent
Elevation: 2150 meters (7053.8 feet)
Aspect: 226°
Shape: up/down: Concave; **across:** Linear
Complexity: Simple
Flooding: None
Ponding: None
Drainage: Well drained
Runoff: Medium
Permeability: Moderately rapid
Erosion: None - deposition

Primary Earth Cover: Grass/herbaceous cover; **Secondary Earth Cover:** Shrubby rangeland
Existing Vegetation: ARTRW8 - Wyoming big sagebrush (*Artemisia tridentata ssp. wyomingensis*); JUOS - Utah juniper (*Juniperus osteosperma*); CHRYS9 - rabbitbrush (*Chrysothamnus*); THIN6 - intermediate wheatgrass (*Thinopyrum intermedium*)
Parent Materials: alluvium
Bedrock:

Particle Size Control Section: 12 to 52 centimeters (4.7 to 20.5 inches)
Diagnostic Features: Argillic horizon: 12 to 52 centimeters (4.7 to 20.5 inches) and Calcic horizon: 52 to 170 centimeters (20.5 to 66.9 inches)

Oi — 0 to 1 centimeter (0 to 0.4 inches); Leaves and Twigs.

A — 1 to 12 centimeters (0.4 to 4.7 inches); pale brown (10YR 6/3) dry, very cobbly sandy loam; brown (10YR 4/3) moist; 58 percent sand; 30 percent silt; 12 percent clay; moderate medium subangular blocky structure; very friable, slightly hard, nonsticky, nonplastic; many very fine roots throughout, common fine roots throughout, common medium roots throughout and common coarse roots throughout; 15 percent nonflat subangular 76 to 250 millimeters (3 to 10 inches) calcareous sandstone fragments and 20 percent nonflat subangular 2 to 76 millimeters (0.1 to 3 inches) calcareous sandstone fragments; very slightly effervescent by HCl, 1 normal; neutral, pH 7; clear smooth boundary; $CaCO_3$ 5.4 Percent.

Bt — 12 to 23 centimeters (4.7 to 9.1 inches); pale brown (10YR 6/3) dry, very cobbly sandy loam; brown (10YR 4/3) moist; 54 percent sand; 31 percent silt; 15 percent clay; moderate medium subangular blocky structure; friable, hard, nonsticky, nonplastic; many very fine roots throughout, common fine roots throughout, common medium roots throughout and common coarse roots throughout; 50 percent (many) clay films on all faces of peds; 1 percent (few) fine threadlike carbonate concretions on bottom of rock fragments; 15 percent nonflat subangular 76 to 250 millimeters (3 to 10 inches) calcareous sandstone fragments and 20 percent nonflat subangular 2 to 76 millimeters (0.1 to 3 inches) calcareous sandstone fragments; very slightly effervescent by HCl, 1 normal; neutral, pH 7; 4% f coal fragments; clear wavy boundary; $CaCO_3$ 9.5 Percent.

Btk — 23 to 52 centimeters (9.1 to 20.5 inches); very pale brown (10YR 7/3) dry, very gravelly loam; brown (10YR 5/3) moist; 46 percent sand; 35 percent silt; 19 percent clay; moderate medium subangular blocky structure; friable, hard, slightly sticky, nonplastic; common very fine roots throughout, common fine roots throughout, common medium roots throughout and common coarse roots throughout; 40 percent (common) clay films on all faces of peds; 2 percent (common) fine threadlike carbonate concretions on vertical faces of peds; 5 percent nonflat subangular 76 to 250 millimeters (3 to 10 inches) calcareous sandstone fragments and 25 percent nonflat subangular 2 to 76 millimeters (0.1 to 3 inches) calcareous sandstone fragments; slightly effervescent by HCl, 1 normal; neutral, pH 7; 2% vf coal fragments; clear wavy boundary; $CaCO_3$ 7.4 Percent.

2Bk1 — 52 to 90 centimeters (20.5 to 35.4 inches); very pale brown (10YR 7/4) dry, sandy loam; yellowish brown (10YR 5/4) moist; 72 percent sand; 16 percent silt; 12 percent clay; structure; friable, hard, nonsticky, nonplastic; common very fine roots throughout and common fine roots throughout; 2 percent (common) fine threadlike masses of carbonate on vertical faces of peds; strongly effervescent by HCl, 1 normal; neutral, pH 7.1; gradual smooth boundary; $CaCO_3$ 12.2 Percent.

2Bk2 — 90 to 117 centimeters (35.4 to 46.1 inches); very pale brown (10YR 7/3) dry, sandy loam; brown (10YR 5/3) moist; 72 percent sand; 18 percent silt; 10 percent clay; weak medium subangular blocky structure; friable, hard, nonsticky, nonplastic; common very fine roots throughout; 8 percent (common) fine threadlike masses of carbonate on

vertical faces of peds; strongly effervescent by HCl, 1 normal; neutral, pH 7.2; 1 cm of discontinous black soil at top of horizon; clear smooth boundary; $CaCO_3$ 9.4 Percent.

3Bk — 117 to 133 centimeters (46.1 to 52.4 inches); very pale brown (10YR 7/3) dry, cobbly sandy loam; brown (10YR 5/3) moist; 56 percent sand; 26 percent silt; 18 percent clay; moderate medium subangular blocky structure; friable, hard, nonsticky, nonplastic; common very fine roots throughout; 4 percent (common) fine threadlike masses of carbonate on vertical faces of peds; 5 percent nonflat subangular 76 to 250 millimeters (3 to 10 inches) calcareous sandstone fragments and 15 percent nonflat subangular 2 to 76 millimeters (0.1 to 3 inches) calcareous sandstone fragments; violently effervescent by HCl, 1 normal; slightly alkaline, pH 7.4; clear smooth boundary; $CaCO_3$ 17.6 Percent.

4Bk — 133 to 170 centimeters (52.4 to 66.9 inches); very pale brown (10YR 7/3) dry, cobbly loam; brown (10YR 5/3) moist; 42 percent sand; 38 percent silt; 20 percent clay; moderate medium subangular blocky structure; friable, hard, slightly sticky, nonplastic; common very fine roots throughout; 4 percent (common) fine threadlike masses of carbonate on vertical faces of peds; 5 percent nonflat subangular 76 to 250 millimeters (3 to 10 inches) calcareous sandstone fragments and 15 percent nonflat subangular 2 to 76 millimeters (0.1 to 3 inches) calcareous sandstone fragments; violently effervescent by HCl, 1 normal; slightly alkaline, pH 7.5; $CaCO_3$ 13 Percent.

Pedon ID: B-7-09

Description Date: 11/13/2009
Describer: Robert Long

Soil Name As Described/Sampled: Cortyzack
Classification: Coarse-loamy, mixed, superactive, frigid Calcidic Argiustolls

County or Parish: UT007 - Carbon
State or Territory: UT - Utah
7.5' Quad: 39110-E4 - Sunnyside, Utah
UTM: 548949E, 4384351N -- Datum NAD83, Zone 12
Legal Description: Section 10, Township 14 South, Range 13 East of the Salt Lake Meridian

Landscape: plateau
Landform: canyon
Geomorphic Component: Mountainbase
Profile Pos: Footslope
Slope: 45 percent
Elevation: 2176 meters (7139.1 feet)
Aspect: 336°
Shape: up/down: Convex; **across:** Linear
Complexity: Simple
Flooding: None
Ponding: None
Drainage: Well drained
Runoff: High
Permeability: Moderately rapid
Erosion: None - deposition

Primary Earth Cover: Tree cover; **Secondary Earth Cover:** Other shrub cover
Existing Vegetation: PIED - twoneedle pinyon (*Pinus edulis*); JUOS - Utah juniper (*Juniperus osteosperma*); PSME - Douglas-fir (*Pseudotsuga menziesii*); ARTRW8 - Wyoming big sagebrush (*Artemisia tridentata ssp. wyomingensis*); POA - bluegrass (*Poa*); AGROP2 - wheatgrass (*Agropyron*)
Parent Materials: colluvium
Bedrock:

Particle Size Control Section: 25 to 75 centimeters (9.8 to 29.5 inches)

Diagnostic Features: Mollic epipedon: 5 to 25 centimeters (2 to 9.8 inches), Argillic horizon: 25 to 90 centimeters (9.8 to 35.4 inches) and Calcic horizon: 90 to 155 centimeters (35.4 to 61 inches)

Oi --- 0 to 3 centimeters (0 to 1.2 inches); Partially decomposing needles, twigs, & cones.

A --- 3 to 13 centimeters (1.2 to 5.1 inches); grayish brown (10YR 5/2) dry, cobbly loam; very dark grayish brown (10YR 3/2) moist; 50 percent sand; 36 percent silt; 14 percent clay; structure; very friable, slightly hard, nonsticky, nonplastic; many very fine roots throughout, many fine roots throughout, common medium roots throughout and common coarse roots throughout; many very fine interstitial pores; 5 percent nonflat subangular 250 to 600 millimeters (10 to 24 inches) calcareous sandstone fragments, 15 percent nonflat subangular 76 to 250 millimeters (3 to 10 inches) calcareous sandstone fragments and 10 percent nonflat subangular 2 to 76 millimeters (0.1 to 3 inches) calcareous sandstone fragments; electrical conductivity of 0.6 mmhos/cm; noneffervescent by HCl, 1 normal; neutral, pH 7.2; clear wavy boundary; $CaCO_3$ 2.7 Percent.

AB --- 13 to 25 centimeters (5.1 to 9.8 inches); grayish brown (10YR 5/2) dry, cobbly sandy loam; very dark grayish brown (10YR 3/2) moist; 52 percent sand; 32 percent silt; 16 percent clay; moderate medium subangular blocky structure; very friable, slightly hard, nonsticky, nonplastic; many very fine roots throughout, many fine roots throughout, common medium roots throughout and common coarse roots throughout; many very fine dendritic tubular and common fine dendritic tubular pores; 15 percent (few) clay films on all faces of peds; 5 percent nonflat subangular 250 to 600 millimeters (10 to 24 inches) calcareous sandstone fragments, 15 percent nonflat subangular 76 to 250 millimeters (3 to 10 inches) calcareous sandstone fragments and 10 percent nonflat subangular 2 to 76 millimeters (0.1 to 3 inches) calcareous sandstone fragments; electrical conductivity of 0.5 mmhos/cm; noneffervescent by HCl, 1 normal; neutral, pH 7.2; clear smooth boundary; $CaCO_3$ 2.3 Percent.

Bt --- 25 to 60 centimeters (9.8 to 23.6 inches); light brownish gray (10YR 6/2) dry, extremely cobbly loam; dark grayish brown (10YR 4/2) moist; 49 percent sand; 34 percent silt; 17 percent clay; strong medium subangular blocky structure; friable, hard, nonsticky, nonplastic; many very fine roots throughout, common fine roots throughout, common medium roots throughout and common coarse roots throughout; common very fine dendritic tubular and common fine dendritic tubular pores; 15 percent (few) clay films on all faces of peds and 25 percent (common) clay films between sand grains; 5 percent nonflat subangular 250 to 600 millimeters (10 to 24 inches) calcareous sandstone fragments, 20 percent nonflat subangular 76 to 250 millimeters (3 to 10 inches) calcareous sandstone fragments and 5 percent nonflat subangular 2 to 76 millimeters (0.1 to 3 inches) calcareous sandstone fragments; electrical conductivity of 0.5 mmhos/cm; slightly effervescent by HCl, 1 normal; neutral, pH 7.2; clear wavy boundary; $CaCO_3$ 1.3 Percent.

Btk — 60 to 90 centimeters (23.6 to 35.4 inches); pale brown (10YR 6/3) dry, gravelly loam; brown (10YR 4/3) moist; 51 percent sand; 32 percent silt; 17 percent clay; structure; friable, hard, nonsticky, nonplastic; common very fine roots throughout, common fine roots throughout, common medium roots throughout and common coarse roots throughout; common very fine dendritic tubular pores; 5 percent (few) clay films on all faces of peds and 15 percent (few) clay films between sand grains; 2 percent (common) fine carbonate concretions on bottom of rock fragments; 2 percent nonflat subangular 76 to 250 millimeters (3 to 10 inches) calcareous sandstone fragments and 25 percent nonflat subangular 2 to 76 millimeters (0.1 to 3 inches) calcareous sandstone fragments; electrical conductivity of 0.4 mmhos/cm; strongly effervescent by HCl, 1 normal; slightly alkaline, pH 7.4; clear smooth boundary; $CaCO_3$ 1.8 Percent.

Bk1 — 90 to 123 centimeters (35.4 to 48.4 inches); pale brown (10YR 6/3) dry, very gravelly loam; brown (10YR 4/3) moist; 42 percent sand; 37 percent silt; 21 percent clay; moderate medium subangular blocky structure; friable, hard, slightly sticky, slightly plastic; common very fine roots throughout, common fine roots throughout, common medium roots throughout and common coarse roots throughout; common very fine dendritic tubular pores; 2 percent (common) fine masses of carbonate on vertical faces of peds and 4 percent (common) fine carbonate concretions on bottom of rock fragments; 10 percent nonflat subangular 76 to 250 millimeters (3 to 10 inches) calcareous sandstone fragments and 25 percent nonflat subangular 2 to 76 millimeters (0.1 to 3 inches) calcareous sandstone fragments; electrical conductivity of 0.5 mmhos/cm; violently effervescent by HCl, 1 normal; slightly alkaline, pH 7.5; clear smooth boundary; $CaCO_3$ 7.9 Percent.

Bk2 — 123 to 155 centimeters (48.4 to 61 inches); light brownish gray (10YR 6/2) dry, loam; brown (10YR 4/3) moist; 46 percent sand; 34 percent silt; 20 percent clay; moderate medium subangular blocky structure; friable, hard, slightly sticky, slightly plastic; common very fine roots throughout, common fine roots throughout, common medium roots throughout and common coarse roots throughout; common very fine dendritic tubular pores; 8 percent (common) fine masses of carbonate on vertical faces of peds and 2 percent (common) fine carbonate concretions on bottom of rock fragments; 10 percent nonflat subangular 2 to 76 millimeters (0.1 to 3 inches) calcareous sandstone fragments; electrical conductivity of 0.5 mmhos/cm; by HCl, 1 normal; slightly alkaline, pH 7.5; $CaCO_3$ 8 Percent.

10-5-2009

USDA | USDA-NRCS | PEDON DESCRIPTION FORM Draft 5/97 | MO6, LAKEWOOD, CO | USDA

Series or Comp Name:	Date:	State:	County:	SSA:	Unit:	MLRA:
Foy	11-6-09	CO	Routt			48A

MU Sym:	Pedon Type:	Lab #:	Photo #:	Land Use:
	Cut bank			Range

Surface Frag %: GR:	CB:	ST:	BD:	CN:	FL:	Permeability: Ksat:	Drainage:	Elevation:
35	10	2	2	1	10	mod	Well	2165m / 7100'

Major Landform:	Local Landform:	Moisture Regime:	Percent Slope:	Aspect:
PT	AF	Aridic Ustic	6	150

Up Shape:	Across Shape:	Geomorphic:	Hillslope:
convex	linear	Lower 1/3	BS

Erosion: Knd	Deg:	Runoff:	Classification:
sheet	1	H	Aridic Calciustepts loamy-skel mixed superactive mesic

Location:	Latitude:	Longitude:	UTM: Zone:	mE:	mN:
Sec. 14 T. 14S R. 13E 6L	° ' " N	° ' " W	12	549185	4384530

Parent Material/Bedrock:	Diagnostic:	Describer(s):
Sandstone slope colluvium	15-70 Cambic calcic 70-160	R Long

Moisture depth(s):	Control Section Ave: Clay %: 25-100 16	Rock Frag %: 38	Precipitation: 12-16"	Temperature @ 50 cm:

VEGETATION:

SYMBOL	COMMON NAME	% GD COVER
	Bluebunch wheatgrass	
	Wyo Big Sage	
	PSE	
	Rabbitbrush	
	Utah juniper	
	Intermediate wg	

NOTES:

	Depth cm	Horizon	Matrix Color Dry	Matrix Color Moist	Texture Lab	Structure	Rupture Resist Dry	Rupture Resist Mst	Rupture Resist Stk	Rupture Resist Pls	Mottles % Sz Con Col Shp Loc	Ped Surface Features Knd % Con Dst Loc Col Mst	Effer
1	0-1	Oi		Neddy		duff							
2	1-15	A	2.5Y 5/3	2.5Y 4/3	GRV SL	1fmsbk 2 fgr	sh	vfr	so	po	—	—	NE
3	15-35	Bw1	10YR 6/2	10YR 4/2	FLV SL	2msbk	h	vfr	so	po	—	—	NE
4	35-70	Bw2	10YR 6/2	10YR 4/2	STV SL	2msbk	h	fr	so	po	—	—	NE
5	70-100	Bk	10YR 6/2	10YR 4/2	STV SL	2msbk	vh	fr	so	po	—	—	ST
6	100-160	Bk2	2.5Y 6/3	2.5Y 5/3	CNV SCL	1msbk	vh	fr	ss	po	—	—	VE
7													
8													
9													

Lab Lab Lab Lab

	Roots Qty Sz Loc	Pores Shp Qty Sz	Concentrations Knd % shp Sz Loc Col	Rock Frag Knd % Rnd Sz	Wet	pH	Clay %	CCE	Bnd	Notes EC (e.g., Diagnostic)
1	—	—	—							
2	3vf 2f lmc	Tvf 6	—	SAm 30GR SA 5CB	10 2 EL ST	7.2	11	8.3	CS	0.45
3	3vf 2f lmc	Tvf 4	—	10GR 10CB	SL	7.2	17	8.1	gs	0.45
4	3vf T 2f lm	Tvf 2	—	20GR 10CB	SL	7.3	14	7.9	CS	0.44
5	3vf f T	Tvf 1	CAC2 F BRF	20GR 10CB	ST 15	7.2	17	10.1	gs	0.48
6	2vf f T	Tvf 1	CAC5 F BRF CAM M VPF	20CN 10GR	ST 10	7.3	20	13.2		0.44

12-6-09

USDA | USDA-NRCS | PEDON DESCRIPTION FORM Draft 5/97 | MO6, LAKEWOOD, CO | USDA

Series or Comp Name: Amalia family	Date: 11-13-09	State: UT	County: Carbon	SSA: B-Canyon	Unit:	MLRA: 48A
MU Sym:	Pedon Type: Backhoe	Lab #:	Photo #:	Land Use: Range		
Surface Frag %: GR: 12 CB: 5 ST: 3 BD: 1 CN: — FL: —	Permeability: Ksat: mod High	Drainage: well	Elevation: 2150m/7150'			
Major Landform: Plateau	Local Landform: SX stream Terrace	Moisture Regime: Aridic Ustic	Percent Slope: 7	Aspect: 226°		
Up Shape: concave	Across Shape: Linear	Geomorphic: BS	Hillslope: Toeslope			
Erosion: Kind: — Deg: —	Runoff: mod	Classification: Calcidic Haplustalf 10-sk el, mix, super, frigid				
Location: Sec. 14 T. 14S R. 13E SL	Latitude: ° ' "N Longitude: ° ' "W	UTM: Zone: 12 mE: 549119 mN: 4384451				
Parent Material/Bedrock: Alluvium	Diagnostic: argillic 12-52 calci 52-170	Describer(s): R Long				
Moisture depth(s):	Control Section Ave: Clay %: 12-52cm 18	Rock Frag %: 32	Precipitation: 12-16"	Temperature @ 50 cm: 10°C @ 30 cm		

VEGETATION:

SYMBOL	COMMON NAME	% GD COVER
	Big sag	
	Utah Juniper - young	
	Rabbitbrush	
	Intermediate wheatgrass	

NOTES:

Upper 52 cm shows evidence of previous disturbance - may have been a fen

Rock fragments in upper 50 cm appear to be result of disturbance

	Depth cm	Horizon	Matrix Color Dry	Matrix Color Moist	Texture	Structure	Rupture Resist Dry	Rupture Resist Mst	Rupture Resist Stk	Rupture Resist Pls	Mottles % Sz Con Col Shp Loc	Ped Surface Features Knd % Con Dst Loc Col Mst	Effer
1	0-1	Oi	Leaves & twigs										
2	1-12	A	10YR 6/3	10YR 4/2	CBV SL	2msbk	sh	vfr	so	po	—	—	VS
3	12-23	Bt1	10YR 6/3	10YR 4/2	CBV SL	2msbk	h	fr	so	po	—	CLF 50 PF	VS
4	23-52	Btk	10YR 7/3	10YR 5/3	GRV L	2msbk	h	fr	ss	po	—	CLF 40 PF	SL
5	52-90	2BK1	10YR 7/4	10YR 5/4	SL	2fmsbk	h	fr	so	po	—	—	ST
6	90-117	2BK2	10YR 7/3	10YR 5/3	SL	1msbk	h	fr	so	po	—	—	ST
7	117-133	3Bk	10YR 7/3	10YR 5/3	CB SL	2msbk	h	fr	so	po	—	—	VE
8	133-170	4Bk	10YR 7/3	10YR 5/3	CB L	2msbk	h	fr	ss	po	—	—	VE
9													

	Roots Qty Sz Loc	Pores Shp Qty Sz	Concentrations Knd % shp Sz Loc Col	Rock Frag Knd % Rnd Sz	Wet	pH (Lab)	Clay % (Lab)	CCE (Lab)	Bnd	Notes (e.g., Diagnostic)
1	—	—	—	—						
2	3VF 3F lmc		—	Sand 20 SR GR 15 Any CB	SM	7	12	5.4	CS	
3	6VF 2F lmc		CALIT BRF	Sand 30 SR GR 25 SR CB	SM	7	15	9.5	SU	4% f coal frags
4	4VF 2F lmc		CAC2FTVPF	Sand 25 GR 20 SR 5 CB	dry	7	10	7.0	W	2% vf coal
5	1VF 1F		CAM2TVPF	—	dry	7.1	12	11.2	CS	
6	1VF		CAM8TVPF	—	dry	7.2	10	9.1	CS	1cm [illegible]
	1VF		CAM4TVPF	Sand 15 Any CB	dry	7.4	18	17.2	CS	
	1VF		CAM4TVPF	Sand 15 Any CB	dry	7.5	20	12.2		

B-7-09

USDA-NRCS PEDON DESCRIPTION FORM MO6, LAKEWOOD, CO
Draft 5/97

Series or Comp Name:	Date:	State:	County:	SSA:	Unit:	MLRA:
Corty Zach	11-13-09	UT	Carbon			48A

MU Sym:	Pedon Type:	Lab #:	Photo #:	Land Use:
	Cutbank			woodland

Surface Frag %: GR:	CB:	ST:	BD:	CN:	FL:	Permeability:	Drainage:	Elevation:
5	5	3	2	—	—	Ksat: mod High	well	2176m/7140'

Major Landform:	Local Landform:	Moisture Regime:	Percent Slope:	Aspect:
Plateau	Canyon	Ustic	45	330°

Up Shape:	Across Shape:	Geomorphic:	Hillslope:
Convex	Linear	MB	Footslope

Erosion: Kind:	Deg:	Runoff:	Classification:
T		H	calcidic Argiustolls

Coarse-loamy, mixed, superactive, frigid

Location:	Latitude:	Longitude:	UTM: Zone:	mE:	mN:
Sec: 14 T. 14S R. 13E SL	° ' "N	° ' "W	12	548949	4384351

Parent Material/Bedrock:	Diagnostic:	Describer(s):
colluvium sandstone	mollic 5-25 argillic 25-90 calcic 90-155	R Long

Moisture depth(s):	Control Section Ave: Clay %:	Rock Frag %:	Precipitation:	Temperature @ 50 cm:
	25-75 17	30	16-24"	

VEGETATION:

SYMBOL	COMMON NAME	% GD COVER
	Pinyon Pine	
	Utah Juniper	
	Douglas Fir	
	ARTRW	
	Poa	
	wheatgrass	

NOTES:

Clay increase in Bk likely due to carbonate clays.

	Depth cm	Horizon	Matrix Color Dry	Matrix Color Moist	Texture lab	Structure	Rupture Resist Dry	Rupture Resist Mst	Rupture Resist Stk	Rupture Resist Pls	Mottles % Sz Con Col Shp Loc	Ped Surface Features Knd % Con Dst Loc Col Mst	Effer
1	0-3	Oi	Partially decom pine needles, twigs etc										
2	3-13	A	10YR 5/2	10YR 3/2	CBL	1msbk 2msbk	sh	vfr	so	po	—	—	VE
3	13-25	AB	10YR 5/2	10YR 3/2	CBSL	2msbk	sh	vfr	so	po	—	CLF 15 BG	NE
4	25-60	B2	10YR 6/2	10YR 4/2	CBVL	3msbk	h	fr	so	po	—	CLF 25 BG CLF 15 PF	NE
5	60-90	BCK	10YR 6/3	10YR 4/3	GA L	2fmsbk	h	fr	so	po	—	CLF 15 BG CLF 5 PF	SL
6	90-123	BK1	10YR 6/3	10YR 4/3	GRV L	2msbk	h	fr	ss	sp	—	—	ST
7	123-155	BK2	10/6/2	10YR 4/3	L	2msbk	h	fr	ss	sp	—	—	VE
8													
9													

	Roots Qty Sz Loc	Pores Shp Qty Sz	Concentrations Knd % shp Sz Loc Col	Rock Frag Knd % Rnd Sz	Wet	pH	Clay %	CCE	Bnd	Notes (e.g., Diagnostic)
						Lab	Lab	Lab		
1	—	—	—	— —	—	—	—	—	—	
2	12vf T 6f1mc	I 12vf	—	Sand 10 GR 5 CB 5 ST 5A	dry	7.2	14	2.7	CW	0.63
3	9vf T 6f2mc	D 6vf D 2f	—	Sand 10 GR 15 CB 5 ST 5A	dry	7.2	16	2.3	CW	0.54
4	7vf T 3f2mc	D 3vf D 1f	—	Sand 10 GR 20 CB 5 ST 5A	dry	7.2	17	1.3	CW	0.53
5	4vf T 1fmc	D2vf	CAC2 Thin BRF	25 GR 2 CB	dry	7.4	17	1.8	CS	0.38
6	2vf T Hmc	D1vf	CAC4 Thin BRF CAM2f T VPF	25 GR 10 CB	dry	7.5	21	7.9	CS	0.46
	2vf 1fm	D1vf	CAC2 Thin BRF CAM8f T VPF	10GR	dry	7.5	20	8.0		0.46

ATTACHMENT 5

DOGM INSPECTION REPORT AND SOILS RECOMMENDATION

GARY R. HERBERT
Governor
GREG BELL
Lieutenant Governor

State of Utah
DEPARTMENT OF NATURAL RESOURCES
MICHAEL R. STYLER
Executive Director
Division of Oil, Gas and Mining
JOHN R. BAZA
Division Director

Inspection Report

Permit Number:	C0070041
Inspection Type:	COURTESY
Inspection Date:	Tuesday, January 17, 2012
Start Date/Time:	1/17/2012 10:00:00 AM
End Date/Time:	1/17/2012 1:30:00 PM
Last Inspection:	Tuesday, December 06, 2011

Representatives Present During the Inspection:	
OGM	Priscilla Burton
Company	Dave Shaver

Inspector: Priscilla Burton,
Weather: sun 10F
InspectionID Report Number: 2990
Accepted by: jhelfric
2/6/2012

Permitee: **WEST RIDGE RESOURCES**
Operator: **WEST RIDGE RESOURCES**
Site: **WEST RIDGE MINE**
Address: **PO BOX 910, EAST CARBON UT 84520-0910**
County: **CARBON**
Permit Type: **PERMANENT COAL PROGRAM**
Permit Status: **ACTIVE**

Current Acreages

7,600.38	**Total Permitted**
30.99	**Total Disturbed**
	Phase I
	Phase II
	Phase III

Mineral Ownership

- [x] Federal
- [x] State
- [ ] County
- [ ] Fee
- [ ] Other

Types of Operations

- [x] Underground
- [ ] Surface
- [ ] Loadout
- [ ] Processing
- [ ] Reprocessing

Report summary and status for pending enforcement actions, permit conditions, Division Orders, and amendments:

Dave Shaver and James Newman (both engineers with Andalex) and I discussed the permitting requirements for re-opening a pre-SMCRA exploration breakout in B Canyon (1/5 mile east of the west ridge mine) that was developed by Kaiser Coal Co in the 1960s. The site was reclaimed by DOGM/Abandoned Mines in May 1998 (AMR/007/930). West Ridge anticipates reopening this breakout to examine roof stability prior to mining through the area and reclaiming the site again within 6 months. We drove to the site which has slight snow cover (approximately 4 inches) to observe site conditions..

Inspector's Signature: Priscilla Burton
Priscilla Burton,
Inspector ID Number: 37

Date Tuesday, January 17, 2012

Note: The inspection report does not constitute an affidavit of compliance with the regulatory program of the Division of Oil, Gas and Mining.

REVIEW OF PERMIT, PERFORMANCE STANDARDS PERMIT CONDITION REQUIREMENTS

1. *Substantiate the elements on this inspection by checking the appropriate performance standard.*
   a. *For COMPLETE inspections provide narrative justification for any elements not fully inspected unless element is not appropriate to the site, in which case check Not Applicable.*
   b. *For PARTIAL inspections check only the elements evaluated.*
2. *Document any noncompliance situation by reference the NOV issued at the appropriate performance standard listed below.*
3. *Reference any narratives written in conjunction with this inspection at the appropriate performace standard listed below.*
4. *Provide a brief status report for all pending enforcement actions, permit conditions, Divison Orders, and amendments.*

	Evaluated	Not Applicable	Comment	Enforcement
1. Permits, Change, Transfer, Renewal, Sale	☐	☐	☐	☐
2. Signs and Markers	☐	☐	☐	☐
3. Topsoil	☑	☐	☑	☐
4.a Hydrologic Balance: Diversions	☐	☐	☐	☐
4.b Hydrologic Balance: Sediment Ponds and Impoundments	☐	☐	☐	☐
4.c Hydrologic Balance: Other Sediment Control Measures	☐	☐	☐	☐
4.d Hydrologic Balance: Water Monitoring	☐	☐	☐	☐
4.e Hydrologic Balance: Effluent Limitations	☐	☐	☐	☐
5. Explosives	☐	☐	☐	☐
6. Disposal of Excess Spoil, Fills, Benches	☐	☐	☐	☐
7. Coal Mine Waste, Refuse Piles, Impoundments	☐	☐	☐	☐
8. Noncoal Waste	☐	☐	☐	☐
9. Protection of Fish, Wildlife and Related Environmental Issues	☐	☐	☐	☐
10. Slides and Other Damage	☐	☐	☐	☐
11. Contemporaneous Reclamation	☐	☐	☐	☐
12. Backfilling And Grading	☑	☐	☑	☐
13. Revegetation	☐	☐	☐	☐
14. Subsidence Control	☐	☐	☐	☐
15. Cessation of Operations	☐	☐	☐	☐
16.a Roads: Construction, Maintenance, Surfacing	☐	☐	☐	☐
16.b Roads: Drainage Controls	☐	☐	☐	☐
17. Other Transportation Facilities	☐	☐	☐	☐
18. Support Facilities, Utility Installations	☐	☐	☐	☐
19. AVS Check	☐	☐	☐	☐
20. Air Quality Permit	☐	☐	☐	☐
21. Bonding and Insurance	☐	☐	☐	☐
22. Other	☐	☐	☐	☐

3. Topsoil

The site is previously disturbed. Soil surveys upstream of the site may provide baseline information. Vegetation visible on the site included sagebrush and rabbitbrush. The shrubs should be grubbed ans stockpiled for replacement on the surface as mulch. The surface foot of soil should be salvaged and stockpiled to be replaced on the surface of the reclaimed site.

12. Backfilling And Grading

The surface foot of material should be handled separately and stored for replacement on the surface of the reclaimed site. The remainder of the fill may be stockpiled or used for construction of a ramp or roadway to the portal.

ATTACHMENT 6

APPROVED SEED MIX FROM AML RECLAMATION PROJECT

97-011-8742

SUNNYSIDE MINE PROJECT

RECLAMATION CONSTRUCTION

◂ CONTRACT SPECIFICATIONS ▸

AMR/007/930

MAY 1998

Requisition Number RX 560 820000018

Carbon County, Utah

UTAH
NATURAL RESOURCES
Oil, Gas & Mining
Abandoned Mine Reclamation Program
Salt Lake City, Utah

Copy 11 of 30

APPENDIX D

SUNNYSIDE PROJECT REVEGETATION SEED MIX
MIXED SHRUB/HERBACEOUS SEED MIXTURE

APPENDIX D

SUNNYSIDE PROJECT REVEGETATION SEED MIX
MIXED SHRUB/HERBACEOUS SEED MIXTURE

A. Seed

Common Name	Scientific name	Pounds PLS/Acre*
Grasses		
Thick spike wheatgrass	*Elymus dasystachum*	1.00
Western wheatgrass	*Pascopyrum smithii*	2.00
Slender wheatgrass	*Elymus trachycaulum*	2.00
Mountain brome	*Bromuopsis cilatus*	3.00
Indian ricegrass	*Stipa (Oryzopsis) hymenoides*	2.00
Green needlegrass	*Stipa viridula*	2.00
Forbs		
Cicer milkvetch	*Astragalus cicer*	0.50
Palmer penstemon	*Penstemon palmeri*	2.00
Strawberry clover	*Trifolum sp*	2.00
Everyday Aster	*Aster cilensis*	2.00
Shrubs		
Mountain big sagebrush	*Artemisia tridentata vaseyana*	0.50
Rubber rabbitbrush	*Chrysothamnus nauseosus*	1.00
Four-wing saltbush	*Atriplex canescens*	4.00
Winterfat	*Ceratoides lanata*	2.00
Wild rose	*Rosa woodsii*	2.00
		28.00

The planting rate indicated (pounds PLS/acre) is for broadcast seeding and hydroseeding.

*PLS= Pure Live Seed.

Because packaged seed contains nonviable seed, chaff, and other inert materials in addition to live seed, the actual application rate of total seed mix material will be greater than 28 pounds per acre.

ATTACHMENT 7

VEGETATION AND SENSITIVE SPECIES REPORT

MT. NEBO SCIENTIFIC

Vegetation & Sensitive Species at the "B" Canyon Portal Area West Ridge Mine

2012

Prepared
for
West Ridge Resources, Inc.

Prepared by

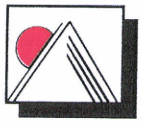
MT. NEBO SCIENTIFIC, INC.
330 East 400 South, Suite 6
Springville, Utah 84663
(801) 489-6937

by

Patrick D. Collins, Ph.D.

for

WEST RIDGE RESOURCES, INC.
West Ridge Mine
P.O. Box 910
East Carbon, Utah 84520



February 2012

TABLE OF CONTENTS

INTRODUCTION..... 1

METHODS..... 2

RESULTS..... 3

Portal Reclamation..... 3
Plant Species Seeded..... 4
Threatened, Endangered & Sensitive Species..... 6

SUMMARY & CONCLUSIONS..... 9

INTRODUCTION

The West Ridge Mine, an underground coal mine, is located in "C" Canyon of the Book Cliffs Plateau in eastern Utah. West Ridge Resources has plans to re-open an old mine portal in an adjacent drainage called "B" Canyon. The UTM coordinates for the B Canyon Portal area are 0549177m E; 4384246m N (NAD 27).

The B Canyon Portal was originally constructed in conjunction with early coal mining activities by Kaiser Steel and Sunnyside Coal Mines. Long after the portal was vacated, a 1997 technical report called "Evaluation Report of the Portal & Shafts of the Kaiser Steel and Sunnyside Coal Mines" (Castle Valley Technical Services, September 1997) described the B Canyon Portal as follows:

> *"The portal is located up B Canyon, it is a single portal which accesses two entries underground. This portal is of steel arched construction with sheet metal covering. It is faced with sheet metal and metal screen. The door has been removed but is still attached to the face by a chain and lock.*
>
> *Portal opening is 16' wide by 8' high. Steel arches are on 3' center. A block seal with mortal face is located in by the portal opening. There is no obvious air movement, not opening nor voids. There is a 30' by 30' earthen pad immediately in front of the portal opening. A 20' long by 30 ' wide berm exists above the entry."*

For an early photograph of the portal, see Figure 1.

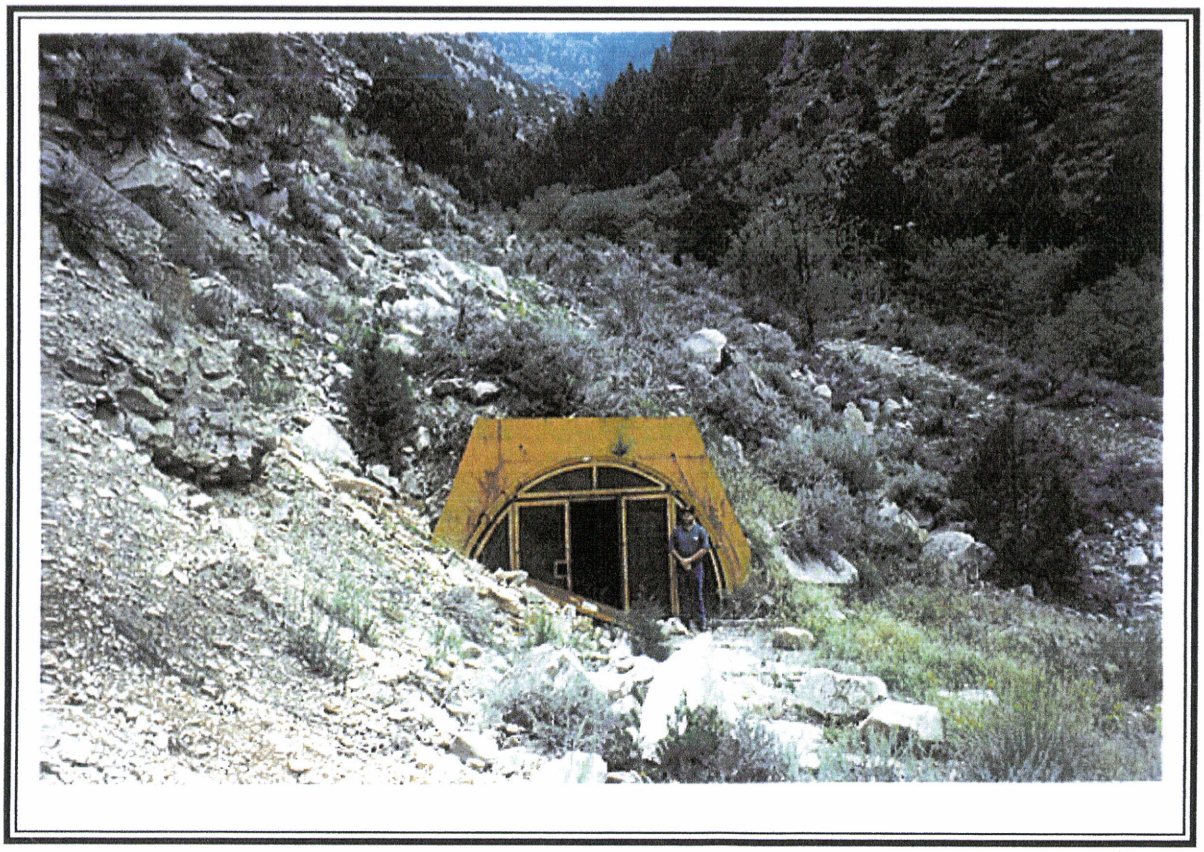


Figure 1: Historical Photograph of the B-Canyon Portal (from a Castle Valley Technical Services report, September 1997)

METHODS

A review of the available information about the B Canyon was completed. A site visit was then conducted on January 18, 2012 that included the author, Dave Shaver, an engineer from West Ridge Resources, and Joe Helfrich, a biologist from the State of Utah, Division of Oil, Gas & Mining (DOGM). Qualitative data about the habitat and plant species present onsite were collected during the site visit.

RESULTS

Portal Reclamation

Although the exact date that the B Canyon Portal was constructed was not shown in the information that was reviewed for this report, it appears that the State of Utah, Abandoned Mine Lands (AML) program sealed and reclaimed the site in July 1998. A current photograph of the reclaimed site is shown in Figure 2 (compare the yellow arch barely visible here with that shown in Figure 1).

Figure 2: Current Photograph of the B-Canyon Portal site (photo by J. Newman, December 2011).

Plant Species Seeded

The AML information indicated that a mixture of shrub and herbaceous plants were seeded at the site after the portal was sealed and backfilled. The list of species planted is shown on Table 1.

Table 1: Seed Mixture for Revegetation at the B Canyon Portal (1998).

SCIENTIFIC NAME*	COMMON NAME
Shrubs	
Artemisia tridentata var. vaseyana	Mountain big sagebrush
Atriplex canescens	Four-wing saltbush
Ceratoides lanata	Winterfat
Chrysothamnus nauseosus	Rubber rabbitbrush
Rosa woodsii	Wild rose
Forbs	
Aster chilensis	Pacific aster
Astragalus cicer	Cicer milkvetch
Penstemon palmeri	Palmer penstemon
Trifolium sp.	Strawberry clover
Grasses	
Bromus ciliatus	Fringed brome
Elymus lanceolatus	Thickspike wheatgrass
Elymus trachycaulum	Slender wheatgrass
Elymus smithii	Western wheatgrass
Stipa hymenoides	Indian ricegrass
Stipa viridula	Green needlegrass
** Scientific names updated for this document.*	

Although not the optimum time of the year to identify all plant species at the site, a list of species observed at the B Canyon Portal area in January 2012 is shown on Table 2.

Table 2: Plant Species List for the B Canyon Portal (2012).

SCIENTIFIC NAME	COMMON NAME
Shrubs	
Artemisia tridentata var. tridentata	Basin big sagebrush
Artemisia tridentata var. vaseyana	Mountain big sagebrush
Atriplex canescens	Four-wing saltbush
Chrysothamnus nauseosus	Rubber rabbitbrush
Ephedra viridis	Mormon tea
Juniperus osteosperma	Utah juniper
Pinus edulis	Pinyon-pine
Pseudotsuga menziesii	Douglas fir
Forbs	
Artemisia dracunculus	Tarragon
Aster chilensis	Pacific aster
Astragalus cicer	Cicer milkvetch
Grindelia squarrosa	Gumweed
Penstemon palmeri	Palmer penstemon
Sisymbrium altissimum	Tumbling mustard
Grasses	
Agropyron cristatum	Crested wheatgrass
Elymus lanceolatus	Thickspike wheatgrass
Elymus spicatum	Bluebunch wheatgrass
Elymus trachycaulum	Slender wheatgrass
Elymus smithii	Western wheatgrass
Stipa hymenoides	Indian ricegrass

Threatened, Endangered & Sensitive Species

A vegetation study and a sensitive species survey were conducted previously at a nearby proposed Gas Vent Site (*Vegetation & Sensitive Species: Gas Vent Site in "B" Canyon for the West Ridge Mine, Carbon County, Utah.* Mt. Nebo Scientific, Inc., Springville, UT. April 2010). The access road for this study began at the B Canyon Portal site and continued up-canyon to the proposed drill site. In the earlier study, no federally listed or otherwise sensitive species were found in the area. Since that study, an updated list of the threatened, endangered & candidate species list for Carbon County, Utah has been formulated and has been included in this report, along with comments about habitat and the likelihood of potential impacts to these species as a result of re-opening the B Canyon Portal (Table 3).

Table 3: Federally listed threatened, endangered & candidate species in Carbon County, Utah and notes regarding potential impacts to them as a result of the proposed construction in B Canyon.

NOTE: This list was compiled using known species occurrences and species observations from the Utah Natural Heritage Program's Biodiversity Tracking and Conservation System (BIOTICS). This list includes both current and historic records. (Last updated on January 12, 2012).

Scientific Name	Common Name	Status*	Site-Specific Notes
Gila cypha	Humpback chub	E	Humpback chub in Utah are now confined to a few white-water areas in the Colorado, Green, and White Rivers. These rivers do not occur in the study area. The drainage control measures of the site limit impacts to the downstream drainage of the Colorado River system. There should be no impacts to this species as a result of re-opening of the portal.

Table 3: Federally listed threatened, endangered & candidate species in Carbon County, Utah and notes regarding potential impacts to them as a result of the proposed construction in B Canyon.

NOTE: This list was compiled using known species occurrences and species observations from the Utah Natural Heritage Program's Biodiversity Tracking and Conservation System (BIOTICS). This list includes both current and historic records. (Last updated on January 12, 2012).

Gila elegans	Bonytail	E	The bonytail is a very rare minnow originally native to the Colorado River system. These rivers do not occur in the study areas. The drainage control measures of the site limit impacts to the downstream drainage of the Colorado River system. There should be no impacts to this species as a result of re-opening of the portal.
Xyrauchen texanus	Razorback sucker	E	This species prefers slow backwater habitats and impoundments in the Colorado River system. Utah Division of Wildlife Resources distribution maps of this species for Carbon County shows to occur near the Green River in extreme eastern portion of the county. These rivers do not occur in the study areas. The drainage control measures of the site limit impacts to the downstream drainage of the Colorado River system. There should be no impacts to this species as a result of re-opening of the portal.
Ptychocheilus lucius	Colorado pikeminnow	E	The Colorado pikeminnow is a fish that prefers medium to large rivers. With the loss of habitat they are now restricted to the upper Colorado River system. These rivers do not occur in the study area. The drainage control measures of the site limit impacts to the downstream drainage of the Colorado River system. There should be no impacts to this species as a result of re-opening of the portal.
Canus lupus	Gray Wolf	E	Although once common in Utah, the gray wolf was extirpated (exterminated) from the state by early settlers. Although they have been reintroduced in adjacent states, and may move into the state, reintroduction to Utah has been planned to-date. There should be no impacts to this species as a result of re-opening of the portal.

Table 3: Federally listed threatened, endangered & candidate species in Carbon County, Utah and notes regarding potential impacts to them as a result of the proposed construction in B Canyon.

NOTE: This list was compiled using known species occurrences and species observations from the Utah Natural Heritage Program's Biodiversity Tracking and Conservation System (BIOTICS). This list includes both current and historic records. (Last updated on January 12, 2012).

Mustela nigripes	Black-footed ferret	Ex	Black-footed ferret habitat is primarily prairie grasslands. The ferret has a diet consisting of almost 90% prairie dogs. This habitat and food source does not occur in the study areas. There should be no impacts to this species as a result of re-opening of the portal.
Centrocercus urophasianus	Greater sage-grouse	C	Greater sage-grouse inhabit sagebrush zone in Utah's mountain valleys and foothills. No brooding or winter habitat for this species is shown on the DWR database. This area in B Canyon is not viable habitat for these birds. There should be no impacts to this species as a result of re-opening of the portal.
Sclerocactus wetlandicus	Uinta Basin hookless cactus	T	*Sclerocactus wetlandicus* (also known as *S. glaucus* and *S. whipplei var. roseus*) generally occurs on cobblely, gravelly, or rocky surfaces on river terrace deposits along the White and Green Rivers of Utah.. *Sclerocactus wetlandicus* occurs on varying exposures, but is more abundant on south facing exposures, and on slopes to about 30 percent grade; it is most abundant at the point where terrace deposits break from level tops to steeper side slopes. Plant communities and species associated with this species are bud sage, shadscale, black sagebrush and horsebrush. There is no habitat for this cactus at or adjacent to the portal site. There should be no impacts to this species as a result of re-opening of the portal.
Penstemon grahamii	Graham beardtongue	T (P)	*Penstemon grahamii* is uncommon and mostly found on shale and talus ledges in the Green River formation. This formation does not outcrop near the portal area. There should be no impacts to this species as a result of re-opening of the portal.

* Status
C = Candidate
E = Endangered
T = Threatened
Ex = Extirpated
P = Proposed

SUMMARY & CONCLUSIONS

West Ridge Resources has proposed to re-open an old mine portal in B Canyon. This portal was closed, sealed, reclaimed and seeded by the State of Utah, Abandoned Mine Lands (AML) program in 1998. A qualitative assessment of the vegetation and sensitive species at the portal site was conducted in 2012. A list of plant species currently present at the site has been included in this report. Additionally, an updated list of the threatened, endangered & candidate species list for Carbon County, Utah has also been provided, as well as comments about habitat and the likelihood of potential impacts to these species as a result of re-opening the B Canyon Portal. When the work in the re-opened portal is complete and the site is reclaimed, a similar seed mixture as was used by AML could be used for revegetation purposes.

ATTACHMENT 10

ENGINEERING DRAWINGS:

a) EXISTING PORTAL AREA TOPOGRAPHY
b) PROPOSED PORTAL OPENING PROJECT

EXTENT OF EXISTING DISTURANCE (0.64 ACRES)

OLD KAISER MINE ENTRIES (UNDERGROUND)

EXISTING SEAL IN-PLACE

EXISTING STEEL ARCH PORTAL STRUCTURE (BURIED/RECLAIMED AML, 1008)

EXISTING 'B' CANYON ROAD

EXISTING BERM

EXISTING BERM

EXISTING 'B' CANYON DRAINAGE (EPHEMERAL)

7115 7110 7105 7100 7095 7090 7085 7080 7075 7070 7065 7060 7055 7050 7045

N

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

UTAH REGISTERED PROFESSIONAL ENGINEER
#6449561
David W. Hibbs
2/15/12

10 0 20 40 FEET

'B' CANYON PORTAL

EXISTING PORTAL AREA TOPOGRAPHY

WEST RIDGE RESOURCES, INC.
794 NORTH "C" CANYON ROAD
EAST CARBON, UTAH 84520

MSHA MINE ID # 42-02233

DRAWN BY: PJ	SCALE: 1" = 20'
APPROVED BY: DH	DATE: 15 FEB. 2012
SHEET:	PLATE #1 of 2

G:\Current Drawings & Construction\West Ridge Mine\B Canyon Portal\B Canyon Portal Revision 2.dwg, Existing, 2/15/2012 PM

EXTENT OF EXISTING DISTURANCE (0.64 ACRES)

OLD KAISER MINE ENTRIES (UNDERGROUND)

EXISTING STEEL ARCH PORTAL STRUCTURE

EXISTING SEAL REMOVED

MAXIMUM EXTENT OF NEW DISTURBED AREA (0.25 ACRES)

APPROXIMATE AREA OF "TOPSOIL" REMOVAL (0.07 ACRES)

TEMPORARY VEGETATION GRUB PILE

ACCESS RAMP

TEMPORARY "TOPSOIL" STORAGE PILE

CONTINUOUS SEDIMENT CONTROL

MOBILE FAN

PORTABLE GENERATOR

EXISTING 'B' CANYON ROAD

EXISTING 'B' CANYON DRAINAGE (EPHEMERAL)

CONTINUOUS SEDIMENT CONTROL (TO BE LEFT IN-PLACE UNTIL AFTER FINAL RECLAMATION)

VEHICLE TURN-AROUND AREA

CONTINUOUS SEDIMENT CONTROL (TO BE LEFT IN-PLACE UNTIL AFTER FINAL RECLAMATION)

EXISTING BERM (REMAINING FROM 1998 AML RECLAMATION)

10 0 20 40 FEET

N

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

UTAH REGISTERED #6449561 David W. Hibbs PROFESSIONAL ENGINEER 2/16/12

NOTES:

1. RAMP CONFIGURATION AND EQUIPMENT PLACEMENT MAY VARY UPON FINAL CONFIGURATION.

2. ALL QUANTITIES AND AREAS ARE APPROXIMATE.

ESTIMATED MATERIAL QUANTITIES

DESCRIPTION	TOTAL
AREA OF PREVIOUS DISTURBANCE	0.64 ACRES
AREA OF POTENTIAL DISTURBANCE	0.25 ACRES
AREA OF "TOPSOIL" REMOVAL	0.07 ACRES
VOLUME OF "TOPSOIL" REMOVAL AND STORAGE	113 yds.^{3}
VOLUME OF PORTAL BACKFILL REMOVAL	10 yds.^{3}
VOLUME OF ACCESS RAMP CONSTRUCTION	50 yds.^{3}

NOTE:
TEMPORARY STORAGE PILE SLOPES SHALL NOT EXCEED 2' HORIZONTAL TO 1' VERTICAL.

'B' CANYON PORTAL

PROPOSED RE-OPENING PROJECT

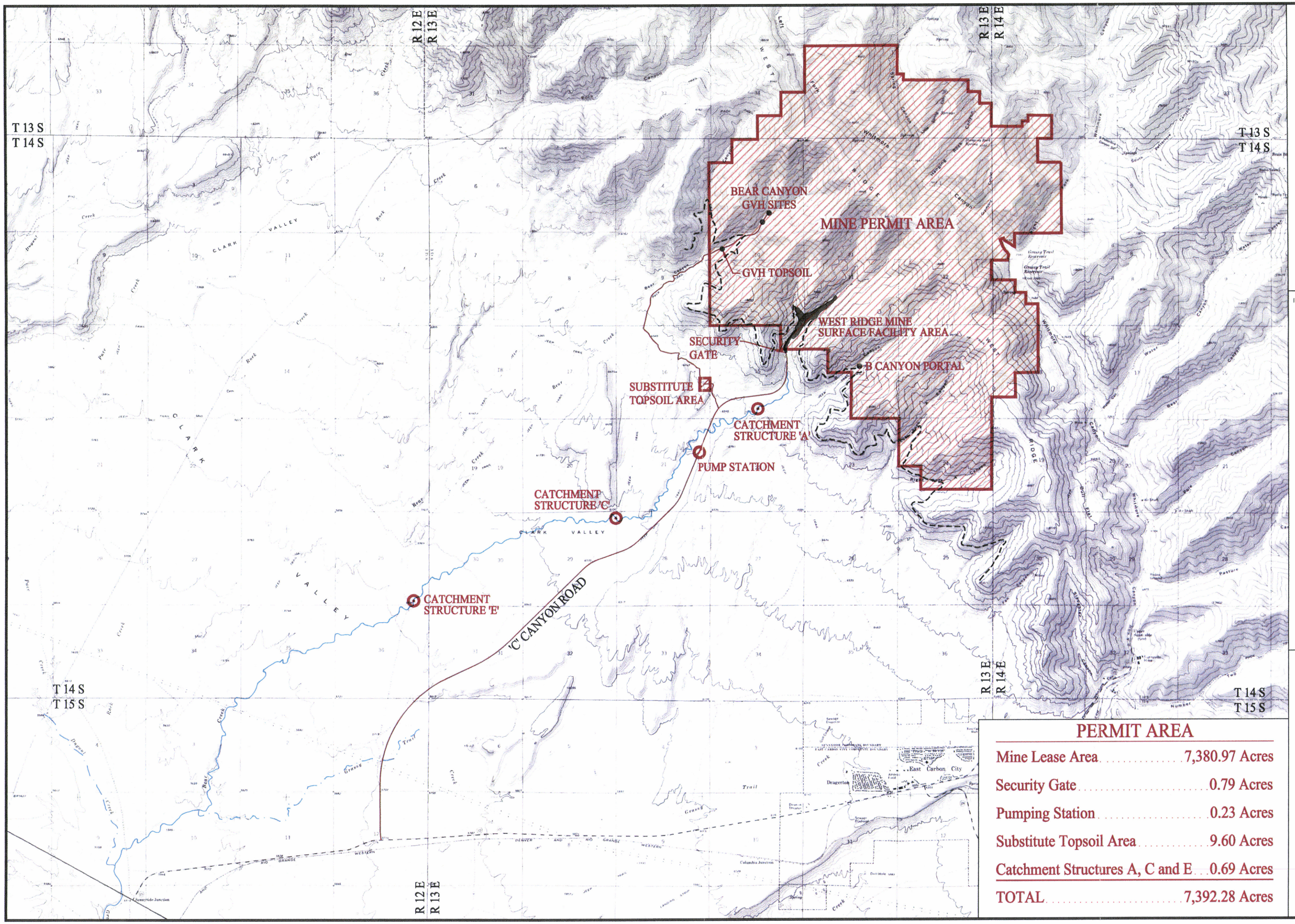
WEST RIDGE RESOURCES, INC.

794 NORTH "C" CANYON ROAD
EAST CARBON, UTAH 84520

MSHA MINE ID # 42-02233

DRAWN BY: PJ	SCALE: 1" = 20'
APPROVED BY: DH	DATE: 15 FEB. 2012
SHEET:	PLATE #2 of 2

MAPS



PERMIT AREA

Mine Lease Area	7,380.97 Acres
Security Gate	0.79 Acres
Pumping Station	0.23 Acres
Substitute Topsoil Area	9.60 Acres
Catchment Structures A, C and E	0.69 Acres
TOTAL	7,392.28 Acres

WEST RIDGE RESOURCES, INC.

RECEIVED
FEB 22 2012
DIV. OF OIL, GAS & MINING

SCALE: 1"=5000'

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

UTAH REGISTERED
#6449561
David W. Hibbs
2/21/12
PROFESSIONAL ENGINEER

LEGEND:
- Lease Areas
- Surface Facility Area
- GVH Site
- Outcrop

N

WEST RIDGE MINE
Map 1-0, Permit Map
Map 1-1, Location Map

DATE: 2-20-12 REV: 16 ACAD REF: Maps 1-0 and 1-1 Rev 16

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

UTAH REGISTERED #6449561 David W. Hibbs PROFESSIONAL ENGINEER 2/21/12

Catchment Structures C and E (Permit Areas)
Catchment Structure C: U.S.A. (BLM)
Catchment Structure E: U.S.A. (BLM)
See Appendix 5-15; Attachment 11

WEST RIDGE MINE
Map 5-2
Surface Ownership Map

DATE: 2-20-12 REV: 26 ACAD REF: MAP5-2 SURFOWN REV26

LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- GVH Site
- Outcrop

- School Trust Land (SITLA)
- Penta Creek/ Magnificent Seven
- U.S.A. (BLM)
- Dave Hinkins, et al.
- Glen L. Wells
- Matt Rauhala
- Milton & Ardith Thayn
- East Carbon City
- Utah Reverse Exchange

WEST RIDGE RESOURCES, INC.

RECEIVED
FEB 22 2012
DIV. OF OIL, GAS & MINING

SCALE: 1"=2500'

WEST RIDGE MINE

Map 5-3

Sub-surface Ownership Map

DATE: 2-20-12 REV: 26 ACAD REF: MAP5-3 SUBSURFOWNREV26

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

UTAH REGISTERED #6449561 David W. Hibbs PROFESSIONAL ENGINEER 2/21/12

Catchment Structures C and E (Permit Areas)
Catchment Structure C: U.S.A. (BLM)
Catchment Structure E: U.S.A. (BLM)
See Appendix 5-15; Attachment 11

LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- GVH Site
- Outcrop
- School Trust Lands (SITLA)
- Penta Creek/ Magnificent Seven
- U.S.A. (BLM)
- Dave Hinkins, et al.
- East Carbon City
- James T. Jensen, et al.
- Paul Sims, et al.

WEST RIDGE RESOURCES, INC.

RECEIVED
FEB 22 2012
DIV. OF OIL, GAS & MINING

SCALE: 1"=2500'