WEST RIDGE RESOURCES, INC.

794 N. "C" Canyon Road, P. O. Box 910,
East Carbon, Utah 84520
Phone: (435) 888-4000
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August 24, 2017

C/007/0041
Received 8/29/17
Task #5464

Dana Dean
Associate Director, Mining
Utah Division of Oil, Gas & Mining 1594
West North Temple, Ste. 1210 Salt Lake
City, Utah 84116

Re: West Ridge Mine, C/007/0041

Revision of MRP to Remove Gob Vent Hole Project ("GVH Project") Application for Alternative Postmining Land Use. TASK ID #5464

Dear Dana:

On behalf of West Ridge Resources, Inc. ("WRR"), enclosed are the corrections to deficiencies listed in Task ID#5464 including C1/C2 forms regarding proposed revisions to the West Ridge Mine Mining and Reclamation Plan ("MRP"). The revisions change text in the MRP, as well as eliminate Appendices 5-14 and 5-14a, which describe the GVH Project.

WRR has entered into an agreement, dated February 27, 2017, to sell the GVH Project to Global Carbon Strategies Corporation ("GCS"). The sale is conditioned on the Division's approval of an alternative postmining land use for the GVH Project. GCS will modify the GVH Project and operate the facilities as a commercial methane destruction project, independent of any coal mining and reclamation operations. To facilitate its operations, GCS has entered into a lease with the School and Institutional Trust Lands Administration ("SITLA") to allow GCS to use the SITLA owned surface lands to extract and destroy coal mine methane also owned by SITLA. Upon approval of the application for alternative postmining land use by the Utah Division of Oil, Gas and Mining, SITLA will assume responsibility for regulating GCS's project pursuant to the terms of the SITLA lease. GCS will post a reclamation bond with SITLA and will submit a operation and reclamation plan for approval by SITLA, and the GVH Project and bonding will be removed from the West Ridge MRP.

A revised Public Notice has been included in this submittal relaying this information. Please notify West Ridge Resources that the Public Notice meets the Division's requirements as soon as possible so publication can take place.

WRR respectfully requests expedited review of this amendment and requests that the postmining land use application be approved concurrently with removal of the GVH Project from the MRP.

Please feel free to contact me should you have any questions.

Sincerely,

David W. Hibbs

David W. Hibbs President/CEO
West Ridge Resources, Inc.

WEST RIDGE RESOURCES, INC.
APPLICATION FOR APPROVAL OF ALTERNATIVE POSTMINING LAND USE

June 8, 2017

I. INTRODUCTION AND BACKGROUND

West Ridge Resources, Inc. ("WRR"), a Utah corporation, is the owner and operator of the West Ridge Coal Mine ("Mine"), MRP No. 007/0041 ("MRP"), in Carbon County, Utah. WRR on behalf of itself and ANDALEX Resources, Inc. ("ANDALEX"), an affiliate, submits this Application to the Utah Department of Natural Resources, Division of Oil, Gas and Mining ("Division") pursuant to UTAH ADMINISTRATIVE CODE ("U.A.C.") R645-301-414 et seq., requesting approval of an alternative postmining land use (sometimes, "APLU") for the Gob Vent Hole ("GVH") Project used to vent coal mine methane ("CMM") from the Mine. WRR and ANDALEX have entered into an agreement to sell the GVH Project to Global Carbon Strategies Corporation ("GCS"), a Colorado corporation authorized to transact business in Utah. The sale is conditioned on the Division's approval of an alternative postmining land use for the GVH Project. GCS proposes to modify the GVH Project and operate the facilities as a commercial CMM destruction project independent from the Mine's coal mining and reclamation operations ("ER Project").

In essence, once the Division approves this Application, the GVH Project will be removed from the Mine's MRP and the Utah Coal Program. GCS will then post a reclamation bond with the School and Institutional Trust Lands Administration ("SITLA"), and will be subject to the jurisdiction of: (i) SITLA under a Limited Methane Lease, dated September 1, 2017, No. M.L. 53402 – OBA, ("SITLA Methane Lease" or "Lease") and a plan of operations and reclamation ("Plan of Operations") approved by SITLA; (ii) the Utah Department of Environmental Quality's Division of Air Quality ("DAQ") under the terms and conditions of an Approval Order that will authorize GCS to operate the ER Project consisting of an enclosed flare system or methane destruction device ("MDD") and associated methane extraction units (MEUs); and (iii) a Conditional Use Permit ("CUP") issued by Carbon County for ER Project operations, which will include provisions for the maintenance and upgrading of Bear Canyon Road, the primary access to the main facility area. The main components of SITLA's Plan of Operations are identified herein.

Background

The GVH Project's description, the Division's approval of the operations, and all supporting documents are set forth in Chapter 5 of the MRP in the following documents:

- Appendix 5-14: Bear Canyon Gob Vent Hole ("GVH"), dated November 12, 2008; and
- Appendix 5-14A: Addendum to Bear Canyon GVH for GVH 4 and GVH 5, dated May 3, 2011 (collectively, "GVH Appendices")

Appendix 5-14 and Appendix 5-14A are attached hereto as Exhibits "A" and "B", respectively, and incorporated herein by this reference.

The lands subject to the GVH Appendices are in Bear Canyon on three (3) separate tracts, totaling three (3) acres, more or less, in Sections 3 and 10, T14S, R13E in Carbon County, Utah ("GVH Lands"). A map depicting the general location of the GVH Lands within the MRP permit boundary is attached hereto as Exhibit "C" and incorporated herein by this reference.

From 2008 to 2013, the WRR operated the GVH Project under the MRP pursuant to approvals from the Division and DAQ. WRR constructed, installed, and operated five (5) GVHs, four (4) 190 hp MEUs, and associated equipment and infrastructure (collectively, "GVH Facilities") to extract and vent CMM from the Mine for the safety of the underground workforce ("GVH Operations"). The GVH Operations were part of the Mine and regulated by the Division as coal mining and reclamation operations under the Utah Coal Program.

In the first quarter of 2016, WRR suspended mining operations at the Mine due primarily to market conditions. As of the date of this Application, the Division has classified the Mine as being in "temporary cessation" under the Utah Coal Program.

In September 2016, SITLA issued to GCS the SITLA Methane Lease, in which GCS was granted exclusive rights to "obtain access to and capture, extract, gather, produce, remove, ventilate, and destroy" CMM from the Mine's underground workings on 2,162 acres of Utah State Lands ("Leased Premises"). Among other things, the Lease requires GCS to do the following:

- Section 6.1: Submit to SITLA for approval a plan of operations and reclamation ("Plan of Operations") prior to commencing ER Project operations.

- Section 6.2: Comply with all applicable federal, state and local laws, regulations and plans.

- Section 8: Post with SITLA the reclamation bond and any other financial guarantees required by the agency to assure that GCS' activities comply with the covenants and obligations of the Lease.

A copy of the SITLA Methane Lease is attached hereto as Exhibit "D" and incorporated herein by this reference.

In February 2017, GCS ("Buyer") and WRR and ANDALEX (collectively, "Sellers") entered into a Methane Extraction Equipment Asset Sale and Purchase Agreement ("APA") pursuant to which GCS proposes to purchase all of the Mine's rights, duties, and obligations in and with respect to the GVH Project, including the following: (i) all rights, if any, to capture, remove, and destroy CMM produced from the underground mine workings; and (ii) all obligations to plug and abandon the GVHs and reclaim each of the locations as now required in the GVH Appendices. Closing of the APA is conditioned upon WRR and GCS acquiring all permits, plan approvals and posting all reclamation bonds or financial guarantees required for GCS to operate the ER Project. At the closing of the APA, the parties will enter into an Assignment and Assumption Agreement in the form attached hereto as Exhibit "E" and incorporated herein by this reference. In accordance with this instrument, WRR will assign the GVH Project to GCS and GCS will assume responsibility for the GVH Project. Upon the Division's approval of this Application, the GVH Project will be removed from the MRP and from jurisdiction of the Division under the Utah Coal Program and will be regulated by SITLA and other governmental agencies as required under the terms of the SITLA Methane Lease.

II. PROPOSED INDUSTRIAL/COMMERCIAL POSTMINING LAND USE

The currently approved postmining land use under the MRP is for grazing, wildlife habitat, and limited recreation. Carbon County's land use code authorizes the GVH Project and other MRP activities under the mining and grazing zone as a permitted conditional use. The GVH Lands, which cover less than three (3) acres, are located in the Bear Canyon grazing allotment and no change in grazing activity will result from the ER Project. Exhibit "A," Appx. 5-14, Chap. 4, p. 11; Exhibit "B," Appx. 5-14A, Chap. 4, p. 4; MRP Map 4-1. Further the land uses for the proposed ER Project's CMM extraction operations involve the same activities and uses now approved for WRR's GVH Project operations under the MRP. To accommodate the continued, independent, commercial operation of the GVH Facilities by GCS pursuant to the SITLA Methane Lease, WRR requests approval of "Industrial/Commercial Land Use" as an alternative postmining land use for the GVH Lands. With the exception of the GVH Lands, the postmining land use of all other property in the MRP will not change.

"Industrial/Commercial Land Use" is defined in the Utah Coal Program to include, "Land used for, among other things, (a) extraction or transformation of materials for fabrication of products, wholesaling of products, or long-term storage of products; this includes all heavy and light manufacturing facilities." R645-100-200. The ER Project proposed by GCS will produce carbon offsets or credits, which are registered and sold in California's voluntary carbon market. The ER Project and its operations will be separate and independent from WRR's coal mining and reclamation operations under the Utah Coal Program, which will remain the sole responsibility of WRR. Given the current operating status of the Mine, WRR asks the Division to approve this Application for an alternative postmining land use change so as to enable GCS to conduct commercial GVH operations and CMM destruction using the GVH Facilities as part of the ER Project. Upon the Division's approval of the alternative post mining land use change responsibility for regulating GCS' ER Project will shift to SITLA as provided in the SITLA Methane Lease.

The Utah Coal Program provides that the Division can approve an alternative postmining land use if it presents "the 'highest and best' use" that can be achieved which is consistent with the surrounding area", R645-301-413.220, <u>and</u> if <u>other</u> specific criteria are satisfied as provided in R645-301-413.300 et seq.

Typically, a property's "highest and best" use is the use that maximizes value and increases revenue from the subject property, in this case the three (3) acres of GVH Lands comprising the ER Project.

WRR and GCS representatives have met with SITLA's senior staff on numerous occasions to discuss all aspects of the ER Project. It is WRR's and GCS' understanding from those discussions that SITLA's mission and goals are aligned with the Utah Coal Program's regulations requiring the "highest and best use" for approving an alternative postmining land use change. SITLA serves as the fiduciary and land management agency for the State of Utah's 3.4 million acres of trust lands that support Utah's public education system and other state institutions. The agency's mission is to administer "trust lands prudently and profitably for Utah's school children and other beneficiaries." In performing its mission, SITLA's "main goal is to maximize the revenues from the land it manages."

In performing the "highest and best" use analysis for the GVH Lands and the ER Project, some of the direct economic benefits for the State of Utah and Carbon County include the following:

1. GCS will invest over $1,000,000 in the development and 1st year start-up operation of the ER Project. Operating and capital costs during the life of the ER Project are expected to exceed $2,600,000, most of which will be spent by GCS in Carbon County.

2. GCS expects to hire local contractors in Carbon County to maintain and service the ER Project facilities and equipment.

3. SITLA will receive annual rentals and royalties pursuant to the SITLA Methane Lease. Average annual payments to SITLA during the life of the ER Project are expected to exceed $30,000 per year as further described in Part III. A. below.

4. GCS will contribute to the annual maintenance and upgrading of the Bear Canyon Road, a Class D public access road used for recreation, grazing, hunting, and mineral resource exploration and development.

An important environmental and public health benefit resulting from the economic investment in the ER Project is the elimination of a potential major source of greenhouse gas (sometimes, "GHG") emissions from the Mine into the atmosphere over time. Accordingly, for the reasons set forth above, the ER Project is the "highest and best use" for the three (3) acres comprising the project area and contributes to the achievement of SITLA's mission and goals for its trust beneficiaries.

In the course of conducting its operations, the ER Project must meet the environmental stipulations of the SITLA Methane Lease as noted above in Par I. Specifically, Section 6.1 of the Lease provides that GCS' activities must conform to a Plan of Operations approved by SITLA. GCS must also obtain all necessary approvals and permits for its operations required by the Division, DAQ, and Carbon County. Section 6.2 requires GCS to comply with all applicable federal, state and local regulations now in effect or in the future. Section 6.3 requires GCS to act as a prudent operator and protect the operations at the Mine and SITLA's interest in the Leased Premises including the surface estate subject to the Lease. Section 6.4 requires GCS to plug and reclaim all GVH wellbores and surface disturbance upon completion. Section 6.5 requires GCS to comply with all cultural resource inventory and mitigation requirements. Last, but not least, Section 8 provides that before commencing operations on the Leased Premises, GCS is required to post a surety bond or other financial guarantees to assure performance of all covenants and obligations under the Lease. In meeting the aforementioned Lease obligations, all relevant reports and studies and applicable operating terms and conditions developed for the GVH Project and contained in the GVH Appendices will be adopted by GCS and incorporated by reference in the ER Project's permits and approvals.

As currently permitted under the Utah Coal Program, the GVH Project meets many of the SITLA Methane Lease requirements. While this Application is seeking approval of an alternative postmining use, GCS proposes to use the GVH Lands for its ER Project in a similar manner to the existing use approved by the Division and DAQ for CMM extraction operations, with the addition of a fully enclosed gas flare system to destroy CMM removed from the Mine. For DOGM's reference the ER Project's preliminary facility site plan is attached hereto as Exhibit "F" and incorporated herein by this reference. Upon cessation of CMM destruction operations all ER Project equipment decommissioning and reclamation will be performed as required by SITLA's in Plan of Operations and other applicable permits and approvals.

III. The Application Meets the Specific Criteria at R645-301-413.300.

The specific approval criteria under the Utah Coal Program for an alternative postmining land use are:

- Consultation with the landowner or land-management agency, R645-301-413.300;
- A reasonable likelihood for achievement of the use, R645-301-413.310;
- The use does not present any actual or probable hazard to public health or safety, or threat of water diminution or pollution, R645-301-413.320; and
- The use will not be impractical or unreasonable, inconsistent with applicable land-use policies or plans, involve unreasonable delay in implementation, or cause or contribute to violation of federal, Utah, or local law. R645-301-413.330.

A. Landowner Consultation (R645-301-413.300).

Under the terms of the SITLA Methane Lease, SITLA specifically grants GCS, as lessee, the rights to use the surface and mineral estate within the GVH Lands for the purpose of conducting a commercial CMM ER Project. As consideration for entering into the SITLA Methane Lease, Section 3 of the Lease requires the payment of a $5,000 annual rental and Section 4 requires a royalty of 12.5¢ for every one million British thermal units (BTUs) delivered to the MDD and destroyed ("Leased Substances). GCS has advised WRR that the average annual rentals and royalties from the ER Project are projected to be in excess of $30,000 per year. As described above, ER Project operations are required to comply with a Plan of Operations approved by SITLA as well as other applicable state and local permits, approvals and regulations.

B. Reasonable Likelihood of Achievement of the Use (R645-301-413.310).

GCS is confident that the ER Project, including the existing GVH Facilities, to be acquired from WRR will be eligible under the State of California's mine methane capture protocol to generate offset credits from the destruction of CMM removed from the underground workings. See discussion at Part III.D. below. Based on that understanding, GCS has entered into the SITLA Methane Lease and signed an APA with WRR to acquire the GVH Project. Closing of the APA is conditioned upon the issuance of all required ER Project permits and approvals. GCS has applied for an air quality permit from DAQ. See discussion of permits at Part III. D. below. WRR has been advised that GCS is prepared to commence development and operation of an ER Project on the GVH Lands upon obtaining the Division's approval of the proposed alternative post mining land use and all other approvals and permits required for ER Project operations.

Since most of the ER Project's facilities are already permitted, in place and operational for the purpose intended (i.e. the capture and extraction of CMM), the likelihood of achieving the intended use is high. As for future operations, based on current prices in the California carbon offset market, the ER Project is expected to be able to profitably operate to at least 2028.

C. No Threat of Public Harm (R645-301-413.320).

At all times since 2008, the WRR's GVH Project has operated safely under the Utah Coal Program without endangering the public. Under the terms and conditions of WRR's APA with GCS the closing and sale of the GVH Lands and GVH Facilities is expressly conditioned on CGS' acquisition of all necessary permits and approvals to operate the ER Project. As stated above, the SITLA Methane Lease expressly requires GCS to comply with all applicable statutes, regulation, ordinances, and rules relating to, among other things, public health, pollution control, and management of hazardous substances. WRR is informed that with the addition of the MDD and related equipment and infrastructure, GCS plans to install remote monitoring and shut down capabilities along with a security fence, and 24 hr. video site surveillance to further reduce any potential concerns or hazards to the public.

From a public health perspective the proposed use will reduce CMM emissions from the Mine into the atmosphere and improve air quality. Historically, CMM extracted from the underground workings was vented into the atmosphere. With the addition of the MDD and associated equipment and infrastructure to the Mine's existing GVH Facilities, the ER Project will convert the CMM to carbon dioxide, a less-potent greenhouse gas. Prior to closing, WRR has required GCS to obtain DAQ air quality permit approval as further described in in Part III. D. below. The acquisition of ER Project permits and approvals together with the destruction of potential GHG emissions will result in an improved environment as a result of the Division approving the requested postmining land use.

D. Feasibility, Consistency, and Legality (R645-301-413.330).

1. The ER Project is feasible and will not require unreasonable delay under subpart 331 and 333 of the Division's rules as a potential project qualifying for offset credits under the State of California's Offset Protocols. As proposed the ER Project is expected to meet the offset project requirements set forth in the California Environmental Protection Agency's Air Resources Board's (ARB) Compliance Offset Protocol for Mine Methane Capture Projects for operations engaged in capturing and destroying methane from U.S. coal and trona mines ("MMC Protocol")

As background, in 2006, California passed the Global Solutions Warming Act ("AB 32"), which calls for the state to reduce GHG emissions to 1990 levels by 2020. ARB is responsible for implementing the program to meet AB 32's objectives. A key component of ARB's action plan was the development of a national Cap-and Trade-Program in which voluntary carbon ER projects can earn offset credits that are then sold in a carbon market to buyers seeking to either reduce certain air quality compliance obligations or their business activities' carbon footprint. Carbon credits are issued for specific types of ER projects (such as forestry, livestock, and mine methane capture projects) authorized under Offset Protocols approved by ARB or other carbon markets.

In April 2014, ARB adopted the MMC Protocol. The Protocol's stated purpose is to:

> quantify greenhouse gas emissions reductions associated with the capture and destruction of methane that would otherwise be vented into the atmosphere at active underground and surface coal and trona mines and abandoned underground coal mines. (Sec. 1.1(a) MMC Protocol (2014))

Under the terms of the GVH Appendices and DAQ's existing Approval Order, CMM extracted from the existing underground mine methane drainage system developed during active mining operations is permitted to be vented or otherwise released from the Mine into the atmosphere. Accordingly, with the addition of the MDD and associated equipment and infrastructure to the Mine's existing GVH Facilities, the facility can qualify as a potential ER Project under the terms of the MMC Protocol.

In order to be eligible or qualify under the MMC Protocol, a coal or trona mine must be classified by the Mine Safety and Health Administration ("MSHA") as "active", "intermittent", or "temporarily idle", and abandoned mines must be classified as "abandoned" or "abandoned and sealed". Prior to GCS listing the ER Project with ARB the Mine and GVH Facilities are expected to fully satisfy all of the eligibility requirements in the MMC Protocol.

The Division's approval of the ER Project as an alternative postmining land use meets the criteria of subpart 331 and 333.

2. <u>The ER Project complies with subpart 332 and 334 in that it is consistent with existing land use plans and will not violate Federal, Utah or local law</u>. The GVH Lands are currently zoned for mining and grazing uses by Carbon County. The GVH Project's buildings, structure and uses are permitted uses within that zone. As discussed above, the GVH Lands are located in the Bear Canyon grazing allotment and no change in grazing activity will result from the ER Project. Under the MRP, the GVH Project's postmining land use is to be returned to pre-mining grazing and recreational uses. Following removal from the MRP, the ER Project's post operations land use will also be returned to pre-mining, grazing, wildlife and recreational uses.

Once the Division approves the ER Project as an alternative post mining land use, the ER Project will no longer be regulated under the Utah Coal Program but will be governed by the SITLA Methane Lease, which requires compliance with all applicable federal, state, and local laws, statutes, regulations, and rules as a condition of holding the lease. Specifically, the ER Project will be subject to the conditions and requirements in the following permits and authorizations:

- <u>Department of Air Quality (DAQ)</u>: Rule 307-403 and 405 implement the federal New Source Review (NSR) permitting program. Specifically, U.A.C. Rule 307-401.5 requires GCS to amend the Mine' existing Approval Order, dated February 13, 2013, DAQE-AN121670001-13 (AO) issued by DAQ and obtain a Notice of Intent (NOI) to construct the MDD and operate the ER Project. GCS has applied for this approval.

- <u>Division: APLU Application</u>: R645-301-412 et seq. sets forth the requirements for obtaining DOGM's approval of an alternative postmining land use change, which is the subject of this Application.

- SITLA: Plan of Operations and Reclamation: Under the terms of the SITLA Methane Lease, prior to commencing operations on the Leased Premises, GCS is required to submit to SITLA for approval a Plan of Operations and Reclamation. Among other things, the Plan will provide reasonable measures to address the "prevention of waste, protection of mineral and surface resources, protection of cultural resources, reclamation, and any other measures deemed necessary" by SITLA. Approval of the Plan of Operations by SITLA will be expressly conditioned upon GCS obtaining an Approval Order of the ER Project from DAQ and DOGM's approval of this Application. The proposed Plan of Operations and Reclamation is expected to be filed by GCS within 45 days of filing this Application. (See: Section 6.1 of SITLA Methane Lease, Exhibit "D")

- Carbon County: Bear Canyon Road: GCS will renew WRR's Encroachment Permit from Carbon County for road improvements and maintenance needed for the ER Project. Exhibit "B," Appx. 5-14, Attachment 10. Waiver or consent from Carbon County's authorized representative will also be required for any proposed installation of facilities or major operations conducted within a 100' buffer zone along the outer perimeter of the road. GCS is aware of these requirements and will contact the County for approval.

- Carbon County: Conditional Use Permit. A CUP is expected to be required from Carbon County for construction of the MDD and operation of the ER Project. The CUP application is expected to be filed by GCS within 45 days of the filing of this Application.

At the time that the Division approves the APLU, WRR requests that the Division concurrently approve an amendment of the MRP to remove the GVH Appendices and associated GVH Lands. Simultaneously with the Division's approval of the APLU an Approval Order is expected to be issued by DAQ for the ER Project. All required permits and approvals for ER Project operations and Bear Canyon Road maintenance and upgrades are expected to be obtained by the end of September. GCS' receipt of permit approvals for the ER Project is a condition to closing the APA with WRR.

IV. POST USE RECLAMATION

Future reclamation of the GVH Land is required by and under the jurisdiction of SITLA, the land management agency for the State of Utah, the landowner and lessor. Under Section 6 of the SITLA Methane Lease, upon eventual closure of the ER Project facilities, all surface disturbances will be reclaimed, and the drill holes plugged and abandoned in accordance with SITLA's Plan of Operation.

Upon acquiring all of Sellers' rights, title, and interests in and to the GVH Lands and GVH Facilities, GCS will assume and perform any and all duties and obligations hereafter required by SITLA, the GVH Appendices, and SITLA Methane Lease with respect to the following:

1. Plugging and abandoning the five (5) GVHs on the GVH Lands;

2. Decommissioning and removing from the GVH Lands, the MDD, MEUs, pipelines, and all associated equipment and infrastructure; and

3. Reclaiming and restoring the surface area of the GVH Lands to its original pre-mining use as grazing and recreational lands. (See: Appx. 5-14, 5-14A, Chapter 4 attached as Exhibits "A" and "B.")

We appreciate your consideration of the Application. Please contact me if you have questions or would like to discuss.

West Ridge Resources, Inc.

David W. Hibbs

By David W. Hibbs
Its President

ANDALEX Resources, Inc.

David W. Hibbs

By David W. Hibbs
Its President

APPLICATION FOR PERMIT PROCESSING

Permit Change X	New Permit ☐	Renewal ☐	Transfer ☐	Exploration ☐	Bond Release ☐	Permit Number: ACT/007/41

Title of Proposal: WR 17-003 GVH Removal, Post Mine Land Use
Task ID #5464

Mine: West Ridge

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*

☐ Yes	☐ No	1. Change in the size of the Permit Area? 0 acres Disturbed Area? 0.36 acres ☐ increase X decrease.
☐ Yes	☐ No	2. Is the application submitted as a result of a Division Order? DO #
☐ 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? NOV #
☐ Yes	☐ No	10. Is the application submitted as a result of other laws or regulations or policies? Explain:
☐ Yes	☐ No	11. Does the application affect the surface landowner or change the post mining land use?
☐ Yes	☐ No	12. Does the application require or include underground design or mine sequence and timing? (Modification of R2P2?)
☐ Yes	☐ No	13. Does the application require or include collection and reporting of any baseline information?
☐ Yes	☐ No	14. Could the application have any effect on wildlife or vegetation outside the current disturbed area?
☐ Yes	☐ No	15. Does 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?

X **Attach 1 complete digital copy 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.

[signature] / Karin Madsen / Engineering Tech. / 8-24-17
Signed - Name - Position - Date

Subscribed and sworn to before me this 24th day of August 2017

[signature] Linda Kerns
Notary Public

My Commission Expires: March 27 2021
Attest: STATE OF Utah
COUNTY OF Carbon

LINDA KERNS
NOTARY PUBLIC
STATE OF UTAH
COMMISSION # 693708
COMM.EXP.03-27-2021

Received by Oil, Gas & Mining

ASSIGNED TRACKING NUMBER

Application for Permit Processing
Detailed Schedule of Changes to the MRP

WR 17-003 Postmine Land Use GVH Removal Task ID #5464	Permit Number: ACT/007/041
	Mine: West Ridge
	Permittee: West Ridge Resources, Inc.

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

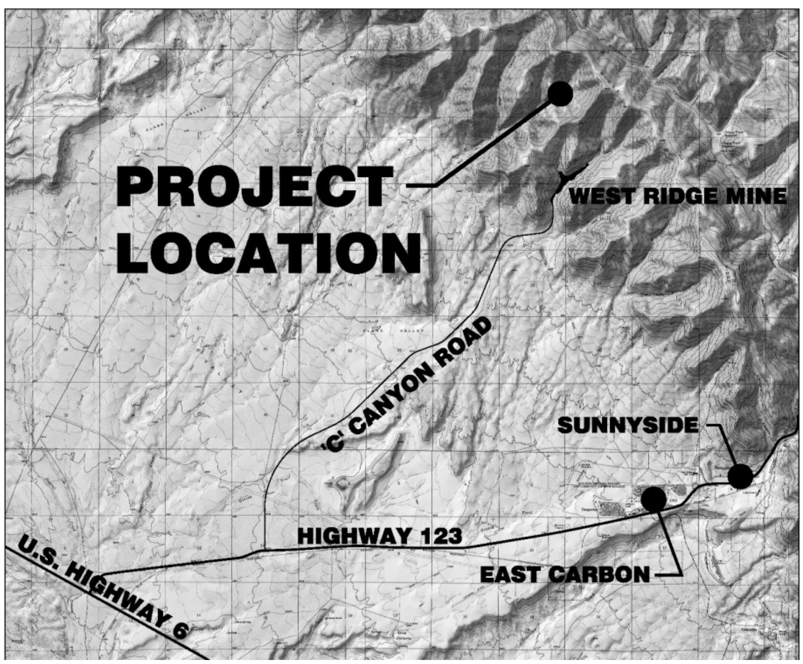
☐ ADD	☐ REPLACE	☐ REMOVE	Bonding Calculations and totals
☐ ADD	☐ REPLACE	☐ REMOVE	Chapter 1 Pages: 1, 7, 17, 18, 21
☐ ADD	☐ REPLACE	☐ REMOVE	Chapter 2 Pages: i, ii
☐ ADD	☐ REPLACE	☐ REMOVE	Appendix 2-10
☐ ADD	☐ REPLACE	☐ REMOVE	Chapter 3 Pages: iii, 1, 2, 3, 4
☐ ADD	☐ REPLACE	☐ REMOVE	Appendix 3-13
☐ ADD	☐ REPLACE	☐ REMOVE	Chapter 4 Pages: i,ii, 1, 2, 3
☐ ADD	☐ REPLACE	☐ REMOVE	Appendix 4-7
☐ ADD	☐ REPLACE	☐ REMOVE	Appendix 4-8
☐ ADD	☐ REPLACE	☐ REMOVE	Chapter 5 Pages: v, vi, 2, 3, 4, 5, 31, 32
☐ ADD	☐ REPLACE	☐ REMOVE	Appendix 5-14
☐ ADD	☐ REPLACE	☐ REMOVE	Appendix 5-14a
☐ ADD	☐ REPLACE	☐ REMOVE	Chapter 6 Pages: ii, iii, 1
☐ ADD	☐ REPLACE	☐ REMOVE	Chapter 7 Pages: v, 2, 3, 4, 5, 23, 24, 25, 26
☐ ADD	☐ REPLACE	☐ REMOVE	Appendix 7-11
☐ ADD	☐ REPLACE	☐ REMOVE	Appendix 7-12
☐ ADD	☐ REPLACE	☐ REMOVE	Plates: 1-0 and 1-1 2-1 Regional Soil 3-1 General Veg 3-4B Deer 3-4C Elk 3-4D Antelope 4-1 Land Use 4-2 Archeology 5-2 Surface Ownership 5-3 Subsurface ownership 5-4A Timing 5-7A Subsidence 6-1 Geology 6-2 Structure 6-3 Isopach 7-3 Water Rights 7-5 Seep Spring 7-6 Monitoring History 7-7 Monitoring Operation 7-8 Watershed

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

PUBLIC NOTICE
APPLICATION FOR BOND RELEASE ASSOCIATED WITH
APPLICATION FOR POSTMINE LAND USE
WEST RIDGE RESOURCES, INC.
BOX 910
EAST CARBON, UTAH 84520
WEST RIDGE MINE

Notice is hereby given that West Ridge Resources, Inc. submitted a Phase III bond release application in conjunction with the "Application for Post Mine Land Use" under 645-880.120 for Permit ACT/007-041 for the West Ridge Mine to the State of Utah, Department of Natural Resources Division of Oil, Gas, and Mining.

The bond release application relates to the Gob Vent Hole (GVH) Project Site located in Bear Canyon, at the end of Bear Canyon Road, which intercets C Canyon Road in East Carbon, Utah. The Post Mine Land Use Permit will allow for a methane emissions reduction project which will no longer be regulated under the Utah Coal Program. A new reclamation bond for the emissions reduction project will be held by the Utah School and Institutional Trust Lands Administration. The Permit area encompasses approximately 3 acres in the West Ridge Permit. The area is shown on the area map below. The area will be removed from the West Ridge bonded and disturbed area and the Post Mine Land Use Operator has an agreement with SITLA to bond and reclaim the site as determined by regulation.



A copy of the bond release application may be examined at the office of the Division of Oil, gas, and Mining: 1594 West North temple, Suite 12310, Salt Lake City, Utah 84114-5810 and also at the Recorder's office located in the Carbon County Courthouse in Price, Utah.

Written comments, objections, or requests for an informal conference may be submitted to the Salt Lake City address. Said comments must be submitted no later than thirty (30) days from the date of the last publication of this notice. This notice is being published to comply with the Surface Mining and Reclamation Act of 1977, and State and Federal regulations promulgated pursuant to said Act.

Published in the Sun Advocate XX ___,___,___, and_ __ 2017

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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:

~~Jay Marshall~~Karin Madsen
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 5,736.36 acres of federal coal (3,130.87 acres leased under SL-068754 and 2,605.49 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 8,080.58 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 (3,130.87 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~~3)	Catchment structures A	0.12 acres
~~7~~4)	Catchment structures C	0.23 acres
~~8~~5)	Catchment structures E	0.23 acres
~~9~~6)	B Canyon Portal re-opening	0.25 acres
	TOTAL	3~~1~~0.~~24~~88 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)	3,130.87	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, SWNW, N2NWSW, E2SW
		Section 15:	NENE, W2NE, E2SENE
		Section 23:	Lot 1, N2NE, SWNE, NENW
		Section 24:	N2, N2SE, NESW, NWSW
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
<u>3) PUMPING STATION</u> (BLM R.O.W. UTU-7712)	0.23	T 14 S, R 13 E		
			Section 21:	NENE (0.23 acres thereof)
<u>4) CATCHMENT STRUCTURE A</u> (BLM R.O.W. UTU-87110)	0.23	T 14 S, R 13 E		
			Section 15:	SESW (0.23 acres therein)
<u>5) CATCHMENT STRUCTURE C</u> (BLM R.O.W . UTU-87110)	0.23	T 14 S, R 13 E		
			Section 28:	NWNW (0.23 acres therein)
<u>6) CATCHMENT STRUCTURE E</u> (BLM R.O.W . UTU-87110)	0.23	T 14 S, R 12 E		
			Section 25:	SESE (0.23 acres therein)
<u>TOTAL FEDERAL</u>	**<u>5,736.36 acres</u>**			

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)	3,130.87	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, SWNW, N2NWSW, E2SW
		Section 15:	NENE, W2NE, E2SENE
		Section 23:	Lot 1, N2NE, SWNE, NENW
		Section 24:	N2, N2SE, NESW, NWSW
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	**8080.58 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, SWNW, N2NWSW, E2SW
	Section 15	NENE, NWSENE (part thereof, containing security gate) SESW (part thereof, containing catchment structure A), W2NE, E2SENE
	Section 16	E2NESE (part thereof, containing substitute topsoil area)
	Section 21	NESENE (part thereof, containing pumping station)
	Section 23	Lot 1, N2NE, SWNE, NENW
	Section 24	N2, N2SE, NESW, NWSW
	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 = 8,080.58 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	580.00	-	-	-	-	-	580.00
14/13	15	141.20	-	-	-	-	-	141.20
14/13	16	-	-	-	-	-	9.60	9.60
14/13	21	0.23	-	-	-	-	-	0.23
14/13	23	200.02	-	-	-	-	-	200.02
14/13	24	480.00	-	-	-	-	-	480.00
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
		3753.09	2631.87	493.91	351.75	39.92	810.04	8080.58

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)~~

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

T 14 S, R 13 E   Section 15:   SESW

~~7)~~4 Catchment Structure C: portion thereof of the following, containing 0.23 acres (all BLM)

T 14 S, R 13 E   Section 28:   NWNW

~~8)~~5 Catchment Structure E: portion thereof of the following, containing 0.23 acres (all BLM)

T 14 S, R 12 E   Section 25:   SESE

~~9)~~6 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.

R645-301-142 MAPS AND PLANS

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**
Jay Marshall, Resident Agent

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

____
Notary Public

My commission Expires: ___________, 20___)

Attest: STATE OF _________________) ss:

COUNTY OF _________________)

~WEST RIDGE MINE - PERMIT APPLICATION PACKAGE~

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CHAPTER 2
R645-301-200 SOILS

Historical Note: In the spring of 2009, the company constructed a small catchment structure in the C Canyon drainage below the minesite. The purpose of this structure 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 this catchment structure, including history, location, right-of-entry, as-built design, operational criteria, and reclamation information.

R645-301-200 SOILS

~~NOTE: The following discussion for the remainder of R645-301-200 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 location of the GVH in Bear Canyon is adjacent to the end of the existing road in the canyon. Construction of the GVH facilities will involve disturbing about 0.24 acres in the east side of the bottom of the canyon. Before any excavation begins at the GVH site, all available topsoil will be salvaged. Bob Long, CPSS, of Long Resource Consultants, Inc., has conducted an Order 1 soils survey of the site. His report is included in Appendix 2-10, and also Attachment 2 of Appendix 5-14. Three test pits were dug in the hillside and the soil resources were measured and catalogued. There is a significant layer of soil material present, which will be salvaged and stored nearby for final reclamation. Due to its location in the bottom of the canyon, and the varying steepness of the sideslope, the thickness of the soil varies considerably over the site. Also, as is typical for the Book Cliff canyons, there are a number of large boulders lying on the surface, surrounded by pockets of topsoil. Based on the results of the survey, the average depth of topsoil at the site is about 16". The area of the GVH site, including both the pad and the adjacent cutslope, is approximately 0.24 acres. Therefore, according to the soils survey, at least 515 cu. yds., or 13,878 cu. ft. of topsoil should be salvaged from the site.~~

~~Soils samples were taken by Mr. Long and have been sent to the laboratory for analysis. Once the analysis results are obtained they will be submitted to the Division and inserted as part of Appendix 2-10. Soil profile field descriptions are included in this Attachment as well. If laboratory analysis of the soils indicates a need for additives, fertilizers, or enhancement of other kinds, the Company commits to providing such at the time of final reclamation as determined by the Division . However, it is felt that this~~

~~soil in its existing condition should be adequate for final reclamation because it appears to be well developed and of sufficient quantity. In fact, it is the identical same soil removed from the site which will be replaced at the time of reclamation. The Order 1 Soils Reports concludes that *"the potential for successfully reclaiming the Bear Canyon GVH location is good based on the estimated quality and quantity of topsoil that may be salvaged."*~~

~~The topsoil will be carefully removed using a trackhoe which can reach up the slope from the road surface below. Large boulders will be separated from the material, and the topsoil will then be loaded into rock-trucks and hauled off-site for storage. The storage site is located approximately 3300' down-canyon from the GVH site, in a flat area adjacent to the road. This storage area is located on SITLA surface and SITLA coal lease ML49287 (see Attachment 1 of Appendix 5-14 for location). The pile will be constructed with overall dimensions of approximately 100' long, 40' wide, and 8' high, with 2:1 sideslopes (see Appendix 2-10 and/or Attachment 3 of Appendix 5-14 for details of the pile configuration). The pile will be kept low to prevent unnecessary compaction, and to help maintain viable micro-organisms. Attachment 3 shows that a pile configuration with a capacity in excess of 700 cu. yds. can easily be stored at this site.~~

~~Upon completion of topsoil salvage, the storage pile will be pocked (roughened) and reseeded with a previously approved seed mix as shown in Table 3-3, and is also included in Attachment 13 of Appendix 5-14 for ready reference. As an alternate, Attachment 13 also includes a seed mix which was used on the Crandall Canyon East Mountain drillhole reclamation project and is readily available, subject to Division concurrence of its use. A layer of wood straw will then be scattered over the surface. The pocking, re-seeding and wood straw are all measures to help minimize erosion, and promote a healthy interim re-vegetation until the time of final reclamation. A containment berm made of sub-soil material, and a siltation control structure (such as excelsior logs) will be installed around the perimeter of the pile to prevent erosional loss of topsoil material from the pile. A topsoil identification sign will be installed on the pile upon completion. An as-built drawing of the pile will be prepared and supplied to the Division, and a final assessment of the volume of salvaged material will be updated in the MRP.~~

During topsoil salvaging and stockpiling, the Company commits to having an monitor on site at all times. The purpose of this person will be to make sure that all topsoil resources are properly salvaged, to maintain accurate truck count of material, take photos, and generally make sure that the salvage and stockpiling operations are done according to the plan. The monitor will be someone familiar with topsoil salvaging and pre-approved by the Division.

R645-301-220 ENVIRONMENTAL DESCRIPTION

The West Ridge Mine is located in eastern Carbon County, Utah on the east side of the Price River drainage basin at the western edge of the Book Cliffs. The Book Cliffs are oriented northwest-southeast in the vicinity of the proposed permit area. The mine site surface facilities is located in C Canyon (just north of B Canyon) in an east-west trending canyon incised down through the cliff face. The elevation differences in the area of the mine site range from approximately 6,800 feet amsl at the mouth of C Canyon to over 8,800 feet on top of West Ridge. Elevations of the mine site area range from 6,900 feet amsl to 7,200 feet amsl.

In addition to the mine site, a substitute topsoil borrow area has been permitted as backup soil material for reclamation at the proposed mine site. This site is located approximately 1 ½ miles west of the mine site and would only be used to supplement existing soil resources at the mine site if reclamation efforts do not prove successful utilizing the materials on site. The elevation of the proposed borrow site is about 6,500-6,600 feet. Refer to Map 2-3 for details of the proposed borrow site disturbed area and soil mapping information.

The average annual precipitation in the area of the mine site is 12-14 inches with the majority of the precipitation occurring from October to March. The mean annual air temperature is 45-47 degrees F and the average frost-free period is 80 to 120 days.

No shallow water table is present as evidenced through the soil pits dug throughout the proposed mine site area. The ephemeral streams flow only in direct response to heavy rainfall events. Valley bottoms are narrow and comprised of sands and coarse alluvial soil materials with low organic matter content. Steep hillslopes and narrow benches have been formed in the alternating sedimentary lithologic units, primarily sandstones and shales. The majority of the soils are shallow and well drained.

R645-301-221 PRIME FARMLAND INVESTIGATION

The U.S.D.A. Soil Conservation Service (SCS) and the U.S.D.I. Bureau of Land Management (BLM) were contacted concerning the existence of prime farmland in or around the permit area. Andalex, as predecessor to WEST RIDGE Resources Inc., contacted the Soil Conservation Service office in Salt Lake City with the request that they review the proposed permit area and determine whether or not Prime Farmland exists in any portion of the permit area. A Prime Farmland Determination was performed by the Natural Resources Conservation Service. The determination, dated August 7, 1997, was made by Mr. Leland Sasser stating the NRCS has determined that no prime farmland or farmland of statewide importance occurs on the permit area, mine site or topsoil borrow site. Refer to Appendix 2-3 for the determination letter dated Aug. 7, 1997.

R645-301-222 SOIL SURVEY

222.100 The "Soil Survey of Carbon Area, Utah" was prepared by the Soil Conservation Service, in cooperation with the Bureau of Land Management and Utah Agricultural Experimental Station. The soil survey is a publication of the National Cooperative Soil Survey, a joint effort between federal, state and local agencies. The majority of the fieldwork for the Carbon County soil survey was completed in 1980. Soil names and descriptions were approved in 1982. A regional soil map, which includes the proposed permit area, has been included as Map 2-1 Regional Soil Map.

The area of the proposed mine site is mapped primarily as Rock Outcrop-Rubbleland-Travessilla complex (slopes 30-70%, 100-200 feet long, elevation ranging from 6,500 to 8,700 feet). The southeast portion of the mine yard includes soils mapped as Midfork family-Commodore complex (slopes 50-70%, 200-300 feet long, elevation 7,900-9,500 feet). Soil survey information for map units shown on Map 2-1 are presented in Appendix 2-1.

Site specific Order One soil surveys for the proposed mine site and proposed topsoil borrow area were performed by Mr. Jim Nyenhuis, a certified, professional soil scientist, during June 1997. The mine site disturbed area soils map is presented as Map 2-2. The topsoil borrow area mapping is provided on Map 2-3. A detailed report of the on-site field work and laboratory analyses for the mine site is presented in Appendix 2-2 "Soil Resource Assessment West Ridge Mine, Carbon County, Utah". A report on the proposed topsoil borrow soils is presented in Appendix 2-4 ("Soil Resource Assessment - Topsoil Borrow Area, Carbon County, Utah").

222.200 Soil types of the proposed mine site disturbed area and topsoil borrow area are identified on Maps 2-2 and 2-3, respectively. During June 1997, Mr. Jim Nyenhuis spent a week in the field conducting field mapping of the proposed minesite and substitute topsoil borrow area. A backhoe was used to dig a number of soil test pits to examine the full soil profile at various locations around each soil unit. Several soil pits were dug by hand. The backhoe pits were dug to the deepest possible depth to provide a full view of the soil horizons and an opportunity to deep-sample the soil. As the field test pits were dug, soil samples were collected for laboratory analyses. A full description of the physical and chemical characteristics of the soil is provided in Appendix 2-2 for the mine site and in Appendix 2-4 for the topsoil borrow area.

Additional field work was conducted on October 13 and 14, 1997. Field mapping of the soils in C Canyon was carried further up the right fork of C Canyon to evaluate conditions of an area of the minesite proposed to be utilized for material storage.

Soils data from previous investigations and reports was reviewed and evaluated prior to initiation of the field work. The review included: (1) the existing soils information contained in the former Kaiser Coal Sunnyside No. 5 Mine permit document (June 1986), and (2) the Natural Resources Conservation Service (formerly the USDA Soil Conservation Service) soils information for the study area as contained in the Soil Survey of Carbon Area, Utah (Jensen and Borchert, 1988). Aerial photography and project maps were also reviewed.

222.300 Soil descriptions from the Carbon Area Survey are contained in Appendix 2-1. The detailed Order One surveys for the mine site and substitute topsoil borrow area are contained in Appendix 2-2 and Appendix 2-4, respectively.

Once a backhoe pit was dug and the pit walls cleaned off, each soil pedon was described and sampled according to the National Cooperative Soil Survey as described in the Soil Survey Manual (Soil Survey Staff, 1993), the National Soil Survey Handbook, (Soil Survey Staff, 1993), and Keys to Soil Taxonomy, seventh edition (Soil Survey Staff, 1996).

Four map units were delineated in the proposed mine yard. They are Rock Outcrop, Rock Outcrop-Rubbleland-Travessilla complex, Midfork very stony fine sandy loam, and Brycan loam. Of these, only Midfork, Brycan and Strych have recoverable soil material at the mine site. Based on the field pits, it is estimated that up to 4,723 cubic yards the Midfork unit, 785 cubic yards of Brycan soil and 998 cubic yards of Strych may be available for salvage at the proposed disturbed area assuming an average development depth of 18 inches. No testpits were installed in the areas designated as Rock Outcrop/Rubbleland as no soils resources are available for salvage from these areas other than small, isolated pockets of Travesilla.

In the vicinity of the proposed substitute topsoil borrow area, three soil units were mapped. They are Strych stony fine sandy loam, Atrac fine sandy loam and Gerst-Badland-Rubbleland Complex. Only the Strych and Atrac units have enough soil depth for soil removal. The Gerst-Badland-Rubbleland Complex was determined to have little, if any, removable soil resources.

If reclamation proves unfeasible at the minesite using the proposed method of leaving some of the topsoil protected in place, approximately 37,000 cubic yards of material could be salvaged from the substitute topsoil borrow area. Approximately 12,000 cubic yards could be salvaged from the from the Strych unit and 25,000 cubic yards from the Atrac unit. These salvage volumes assume that 18 to 24 inches of material would be left in place for reclamation of the topsoil borrow area.

Each soil pedon sampling location was divided into major soil horizons. About 2 quarts of soil material was collected for each sample. The samples were sent to Inter-Mountain Laboratories, Inc. in Sheridan Wyoming for soil characterization according to UDOGM guidelines. Fifty-six soil samples were sent in for standard analyses as specified in UDOGM Table 1 (Analytical Methods for Baseline Soils Data), Table 6 (Recommended Laboratory Methods), as well as discussions with a UDOGM soil scientist/reclamation specialist (Nyenhuis 1997). The parameters include: soil texture, pH, organic matter percent, saturation percent, electrical conductivity, $CaCO_3$, soluble potassium, soluble magnesium, soluble calcium, soluble sodium, sodium adsorption ratio, selenium and boron. Based on a discussion with a UDOGM soil scientist/reclamation specialist (Nyenhuis 1997) certain tests were not necessary at this time. They are: available water capacity, alkalinity, total nitrogen and available phosphorus. Organic matter percent was substituted for organic carbon.

In addition, rock fragment content (% by volume), Munsell color, and qualitative calcium carbonate content were determined in the field by Mr. Nyenhuis, as well as soil texture by the hand-texture method. Field methodology as well as laboratory analyses and field descriptions for the soil horizons can be referenced in Appendix 2-2 and 2-4.

As part of the effort to present an alternate “reduced slope” highwall reclamation plan (see Appendix 5-9), additional sampling and analysis of the topsoil/subsoils (from the designated topsoil storage pile) was performed by Colorado Analytical Laboratories, Inc. in early 2003. These evaluations are presented in Appendix 2-9.

222.400 Present and potential productivity of the existing soils was conducted by Mr. George Cook from the Natural Resources Conservation Service and is presented in the Tables of Appendix 3-1.

R645-301-223 SOIL CHARACTERIZATION

The soil survey was conducted according to the standards of the National Cooperative Soil Survey as described in the Soil Survey Manual (Soil Survey Staff, 1993), the National Soil Survey Handbook, (soil Survey Staff, 1993), and Keys to Soil Taxonomy, seventh edition (Soil Survey Staff, 1996).

R645-301-224 SUBSTITUTE TOPSOIL

A supplemental soil resource area has been identified in the event that reclamation efforts are not successful utilizing the topsoil resources at the mine site. Sufficient quantities of soil material will be available from the proposed substitute topsoil borrow area to re-cover the mine site topsoiled areas with more than 24 inches of substitute material. The supplemental soil site has been investigated to document the physical and chemical characteristics of this material and to determine its suitability as substitute topsoil material. Refer to Appendix 2-4 for soil descriptions and analyses.

The substitute topsoil borrow area is located on lands administered by the State of Utah, School and Institutional Trust Lands Administration (SITLA) 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. (See Appendix 1-10).

The proposed substitute topsoil borrow area has three soil types, two of which contain sufficient depth of material for recovery. The Atrac soil unit is located in the sagebrush portion of the potential borrow site and has a depth of about 60 inches. The Strych soil is located under the Pinyon-Juniper portion of the borrow area and has a depth of approximately 48 inches. The other soil unit in the borrow area, Gerst-Badland-Rubbleland Complex, has been designated as unsuitable for salvage because of unsuitability for reclamation, steep slopes and very high stone and boulder content.

The substitute soil material would remain in place until the time of final reclamation. Then, only the necessary quantity would be removed (if any) and used to supplement the soil material stockpiled from the mine site. Sufficient soil will remain intact at the borrow location to provide for reclamation of the borrow site.

R645-301-230 OPERATION PLAN

231.100 A detailed and in-depth discussion of the construction plan for the West Ridge Mine site is presented in Appendix 5-5. Appendix 5-5 should be reviewed and thoroughly understood prior to continuing with the review of this 231.100 section. The information presented below is a brief outline of the detailed discussion and should only be used as a quick reference for Appendix 5-5. It is also important to remember that although the construction tasks are listed in a consecutive sequence, it is likely that various stages of these events may be occurring simultaneously in different parts of the mine yard.

A topsoil protection plan has been formulated for the C Canyon minesite which incorporates protection of soil resources both by the traditional method of salvaging/stockpiling and by the experimental practice of protecting the in-place soil with a layer of geotextile fabric. In pad fill areas where topsoil is to be protected in-place, geotextile fabric will be used to provide a protective barrier between the existing soil and the imported fill material which will be used to construct the mine yard. Geotextile placement will be utilized on approximately 4.75 acres of the mine yard. In this manner, the existing stream channel morphology and original ground surface configuration will be preserved with the layer of geotextile fabric. The fill material, which will be placed on top of the geotextile, will be hauled in by trucks from an off-site source. The fill will be built up in compacted lifts until the required yard elevation has been reached.

Second, in areas which contain topsoil and are proposed to be excavated during construction of the mine yard, the existing topsoil will first be salvaged and stockpiled. This topsoil material will be excavated with a backhoe, then trucked to the topsoil storage pile where it will be stockpiled and protected for the life of the mine. Brycan, Midfork and Strych soil units exist in these areas. Salvaging of topsoil in these areas would be accomplished under the on-site direction of a competent soil scientist.

A third type of construction area exists which is composed entirely of rock outcrop/rubbleland (RO/RL). In this area, bare rock or very minimal surficial cover exists over the bedrock materials. Isolated pockets of Travesilla soil exist within the RO/RL area. These pockets of soil will be removed during construction and stockpiled. The total volume obtained from salvage of this material, however, is not expected to be great in comparison with the other soil unit areas. The RO/RL area will not be covered with geotextile, but instead, fill will be placed directly over the existing ground surface which will be marked with brightly colored flagging.

Colluvial surface material from the RO/RL areas; in the truck loop area and the west side of the left fork coal storage area, will be stored separately to be reused during final reclamation. This surface colluvium material contains pockets of Travesilla and is a naturally occurring growth media. The Travesilla pockets would be salvaged and placed in the topsoil stockpile. Colluvial growth medium (CGM) from the loop area will be stored within the core of sediment pond embankments (a sign will be placed on these stockpile areas to indicate the nature of the material stockpiled and to protect the material from contamination); CGM from the left fork coal pile area will be stored within the coal pad. During final reclamation the CGM in the sediment pond impoundments will be used to backfill the loop area cutslopes. The structural material forming the inside surface of the sediment ponds (ie. the imported, compacted material) will first be removed and disposed of since it may be contaminated with coal fines. Likewise, the cap layer overlying the coal pad CGM material will be removed and disposed of, revealing the CGM material stored below. This coal pad CGM material will then be used to backfill the cutslopes in the left fork of the coal storage area.

During construction, material available from the cut slopes will be used as fill and placed into the adjacent pad areas. During reclamation, the process will be performed in reverse order. The native fill, will be used primarily to fill in and restore the adjacent cut slopes. Fill from the pads will be replaced in the adjacent cuts in 18"-24" lifts and compacted sufficiently to achieve adequate structural stability.

The reverse order of construction and reclamation applies to large boulders as well. During initial construction, large boulders which occurred naturally along the surface were placed in the bottom of the fill areas above the culvert after the culvert had been installed. Native fill materials from the adjacent cut slopes were then placed over these boulders as the pads were constructed. In essence, the larger boulders were being "stored" in the depths of the pad fill until the time of final reclamation. During reclamation, the boulders will be re-exposed and will be placed once again on the reclaimed surface to replicate their original premining occurrence. Since the boulders were the first to go into the fill during construction, (followed by the native fill and lastly by the imported fill), they will be the last to come back out of the fill during reclamation. Since they will come out last, they will be available to be placed back along the surface of the reclaimed slopes.

In the main canyon area, where pad fills are more shallow, the boulders were "stored" in the outslopes of the sediment ponds along with the colluvial growth medium (CGM) obtained from the loop area rubbleland. (The structural portion along the inside surface of the pond embankments was constructed with imported fill material, which was placed and compacted as needed, to achieve the necessary structural engineering parameters. This structural portion of the pond embankment will have been in contact with impounded water and coal fines during the operational life of the mine. Therefore, it will be removed separately and disposed of at an approved waste disposal site such as ECDC at the time of final reclamation).

After the original surface has been re-exposed, many of the original boulders will be re-exposed as well. To the extent possible, the backhoe operator will pull the boulders up through the remnant layer of fill so that the boulder sits prominently on top of the surface and not buried within it. This will help to create protected microclimates around the base of the boulders which will help to assure successful revegetation.

In areas where topsoil is to be salvaged, the soils will be removed with one or more of the following types of equipment: bulldozer, grader, front-end loader, and/or trackhoe. A soil scientist will provide on-site consultation during the topsoil removal process to maximize harvest of quality topsoil.

Topsoil material will be stockpiled at the primary storage area located above the mine yard in the right fork of C Canyon. An secondary storage area location has been designated in the left fork of C Canyon if more space is needed. These locations will allow the soil materials to be located away from mining activities to minimize the potential impacts from mine-related activities. The storage areas will be located over the bypass culvert so that the main canyon drainage will be culverted beneath the stockpile and will not impinge on the stockpiled topsoil. Drainage ditches will also be located along the sides of the stockpile to divert drainage away from the stockpile surface. The stockpile area in the left fork will be a Best Technology Currently Available (BTCA) area treated by an alternate method of sediment control, such as silt fences and revegetation. Refer to Map 2-4 for details of the proposed topsoil storage areas. Refer to Appendix 7-4 for details of the drainage control designs proposed for the alternate sediment control areas (ASCAs).

It should be noted that the topsoil storage areas depicted on Map 2-4 show the potential area available for topsoil stockpile placement and not necessarily the final configuration of the stockpiled topsoil. This map portrays stockpiles totaling 9,600 cubic yards of topsoil storage which is more than sufficient to handle the projected topsoil storage requirements from the minesite (6,506 cubic yards). However, if additional topsoil is salvaged during construction (under the supervision of qualified soil scientist) the designated topsoil storage areas can easily accommodate the additional volume. The designated topsoil storage areas, ASCA X and ASCA Y, occupy approximately 0.5 acres and 0.64 acres respectively. The actual area occupied by the stockpiled topsoil is expected to be less, however.

The primary topsoil storage area will be located in the right fork of the mine yard. This area is large enough to accommodate the total projected volume of salvaged topsoil. However, if additional stockpiling capacity is required, the left fork storage area will be utilized.

The stockpiled material will be loosely piled and have an irregular, pitted surface to help retain runoff from precipitation events and to reduce erosion. Diversion ditches will be cut around the edge of the pile to divert runoff around the pile and reduce erosion due to runoff from the surrounding undisturbed areas. Silt fencing will be placed around the perimeter of the stockpile to treat any runoff from the pile and to prevent the loss of topsoil from the site. The surface of the stockpile will be roughened /gouged to prevent rapid runoff and help to control erosion until vegetation becomes reestablished.

The stockpile will be seeded after it is constructed with an effective, quick-growing vegetative cover to protect it from wind and water erosion. The seed mix to be utilized for stockpile revegetation is presented in Table 3-3. If supplemental seeding is needed, it will be done the following year. Sideslopes will be monitored for erosion as well and will be repaired if erosion appears to be excessive.

Approximately 1.62 acres of the proposed minesite has been subject to prior disturbance and has not been regraded or reclaimed. During past coal exploration activities, cuts and fills were made in the canyon. Areas were leveled for staging areas, coal seam exposure and drilling pads. The cuts were left in place. No topsoil was salvaged prior to the previous disturbance. No reclamation was done and no topsoil was placed over the disturbed areas. Natural vegetation has moved in and become well established on the previously disturbed areas even without the replacement of topsoil materials and seeding. This disturbed acreage will be incorporated into the reclamation plan for the proposed minesite. At the time of final reclamation, the area will be regraded to approximate original contour and topsoil materials, which have been gathered from the mine site area, will be utilized for reclamation of these previously disturbed areas.

231.200 Analyses from the soil samples taken in the substitute topsoil borrow area are listed in Appendix 2-4. The suitability of this material for reclamation is discussed in Appendix 2-4. Based on chemical and physical parameters it appears that soil from the proposed borrow area is suitable for use as substitute material.

231.300 Topsoil will be sampled, as it is hauled from the storage pile, for nitrogen, phosphorus and potassium content. A composite sample will be made by taking one grab sample from each truck dumped. A field instrument will also be used to sample the regraded material for pH and EC parameters. Field sampling will allow immediate identification of salinity, acidity or sodicity problems. If sampling identifies a potential concern, additional samples will be collected to better define the nature and extent of the potential problems.

In order to evaluate the effects of the geotextile and fill over the existing in-place topsoil resources a test plot area will be established at the upper end of the mine yard in the right fork northeast of the topsoil stockpile. The experimental practice test plots are being established to evaluate the reclamation plan proposed for the mine yard area. After the test plot area is constructed, the cut/fill area will remain intact for five years to simulate the operation phase of the mine yard. Following the five year period, reclamation will be performed on the test plot area to actually implement and test the final reclamation plan. Refer to Appendix 2-6 for the complete discussion of the experimental practice test plot plan.

The experimental practice test plot area will be constructed during initial construction of the mine yard and topsoil stockpile area. On half of the test plot area, the topsoil will be salvage from the upper foot of both the Strych and Midfork soil types. The topsoil will then be stockpiled on the other half of the experimental test plot area where the original soil surface is protected using geotextile fabric. (No soil will be salvaged from the stockpile area.) Prior to placing the topsoil on the Strych Topsoil Stockpile/Geotextile portion of the test plot, fill material will be placed and compacted to a depth of about 6 feet deep on the test plot area. The fill will be obtained from the Midfork and Strych Cut areas. The topsoil will be separated from the fill material by laying geotextile on top of the fill material.) This plot design will, in effect, simulate the fill over geotextile on topsoil stored in-place within the mine yard.

In the portion of the test plot area where topsoil has been removed, material will be excavated to use as fill. This is being done to replicate 1) fill over the buried Strych in the mine yard, and 2) a yard cut area in the Midfork and Strych soil types.

After five years the test plot area will be restored to its original configuration by removing the fill overlying the buried Strych and replacing the soil in the Midfork and Strych cut areas. (Topsoil located on the Strych Topsoil Stockpile/Geotextile area will be temporarily relocated in order to remove the fill material). Topsoil will be replaced on their respective areas When the fill and topsoil has been relocated to the Midfork and Strych areas and approximate original contour re-established, the geotextile fabric covering the Strych and Midfork topsoil areas will be removed. Both the Strych and Midfork areas will then be gouged to relieve compaction, retain moisture and reduce erosion. Gouging will provide surficial depressions approximately 24" x 36" x 18" deep. One ton of weed free hay will be worked into the top 12-18" during the gouging process.

The four test plots will be identified as the “replaced topsoil test plot” and the “in-place topsoil test plot”, one of each for both the Midfork and Strych areas. One portion of the test plot area could be treated/inoculated with a commercially available soil activator designed for revitalizing soil in order to evaluate whether inoculating the topsoil promotes faster or more diverse revegetation. Although this is not currently being proposed in the final reclamation plan, it could be used to assist vegetation establishment in the geotextile area at the time of final reclamation.

After the surface treatments have been applied, the plots will be seeded with the final reclamation seed mix. Hedysarum occidentale var. canone Canyon Sweetvetch will also be seeded on the test plots. Because of the small area to be treated (about .3 acres), the seed will be broadcast on the surface and raked in by hand. Straw mulch will be applied over the seed bed of the test plot at a rate of 2,000 pounds per acre. Then the surface will be sprayed with a mulch and tackifier. This type of application has appeared to be successful at other reclamation sites in the area. The test plot area will be accessed via the stockpile during late summer or early fall. Any compaction or disturbance to the stockpile surface will be ripped and reseeded following completion of the installation of the test plots.

Vegetation monitoring will compare the results of plant growth between the experimental practice in-place soils to replaced topsoil. Monitoring will compare re-vegetation response for each soil type (Strych and Midfork) for each of the two soil surfaces. For example, comparisons will be made between in-place soils and replaced soils for the area consisting of Strych soils; likewise, comparisons will be made for Midfork soils. The experimental practice test plot area will also be compared with the reference area for the Douglas Fir/Maple vegetation type. Vegetation will be monitored for five years or until a determination of success has been made for the experimental practice. WEST RIDGE Resources will consult closely with the Division regarding the results of the test plot study. Should the results show a need to revise the reclamation plan, WEST RIDGE Resources will work with the Division to amend the plan and incorporate the changes needed to ensure reclamation of the mine yard area will be successful.

231.400 Construction of the topsoil storage site will begin by removing any large, existing vegetation and installing a bypass culvert in the drainage channel. The stockpile will be built up over the bypass culvert. Once the topsoil stockpile has been created with the material removed during construction of the mine site, it will be reseeded and will remain in place until final reclamation occurs.

The surface of the stockpile will be left rough and irregular to increase retention of rainfall and snowmelt. Seeding will be done following placement of the topsoil to promote vegetation re-establishment and deter erosion.

A silt fence will be installed at the perimeter of the pile to protect it from water erosion and vehicular traffic. Maintenance of the topsoil pile, during the life of the mining operation, will consist of: seeding the new stockpile, reseeding if erosion or other elements cause a loss of vegetation, and maintenance of the ditches and/or silt fence in the stockpile area.

R645-301-232 TOPSOIL AND SUBSOIL REMOVAL

232.100 Topsoil material will be removed from those areas of the mine yard where material will be excavated in order to achieve final yard configuration and which have been identified as good, suitable topsoil for reclamation based on the Order One soil survey.

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

AVAILABLE SOIL RESOURCES

Map Unit	Acres	Horizon	Depth (inches)	Volume (cu yds)
Brycan	*0.33*	*A*	*18*	*785*
Midfork	*1.95*	*A*	*18*	*4,723*
Strych	*0.41*	*A*	*18*	*998*
RO/RL	*0*	*none*	*0*	*0*
Totals	*2.67*	*A*	*18*	*6,506*

232.200 Where materials are unrecoverable due to depth or where rock outcrop appears at or near the surface no material will be salvaged. Where pockets of suitable material exist within the RO/RL areas, such as the Travesilla areas, they will be excavated and hauled to the stockpile site

.

232.600 Topsoil will be removed from excavation areas and stockpiled prior to any construction activity. Vegetation and boulders that might interfere with topsoil salvage will be cleared prior to removal and stockpiling of the topsoil.

232.700 Rock outcrop and rock outcrop-rubble land areas have limited topsoil resources. Isolated pockets of Travesilla exist within the RO/RL area. These pockets would be salvaged and stockpiled when encountered, but the total volume of this material is not expected to be great in comparison with the other soil unit areas. Those areas where topsoil harvest would be restricted due to steep slopes or lack of soil are indicated on Map 2-2 as Rock Outcrop/Rock Outcrop-Rubbleland.

R645-301-233 TOPSOIL SUBSTITUTES AND SUPPLEMENTS

233.100 A suitable quantity of quality substitute topsoil material is available at the proposed substitute topsoil borrow area. The quantity and the quality of this material has been verified by a number of test pits located within the topsoil borrow area. This material will be available should there be a need for supplemental topsoil material at the minesite at the time of final reclamation.

Soil descriptions and analyses from soil pits in the proposed borrow site indicate this material has physical and chemical properties comparable to the soil at the minesite. Refer to Appendix 2-4 for details. Vegetation currently growing at the topsoil borrow site appears healthy and diverse, indicating that the topsoil material at this site is suitable for reclamation purposes.

The substitute topsoil borrow area materials would be left in place during the life of the mine and would be utilized only if needed during final reclamation.

233.200 Physical and chemical descriptions of the materials sampled in the topsoil borrow area are presented in Appendix 2-4. Based on the laboratory results and field investigations, the soil in the proposed borrow area appears to be suitable soil for reclamation purposes.

233.300 Refer to Appendix 2-4 for the results of physical and chemical analyses of the borrow area material.

R645-301-234 TOPSOIL STORAGE

234.100 It will not be possible to redistribute the topsoil immediately. Therefore, the topsoil will be stockpiled for the purpose of final reclamation of the mine site.

234.200 Stockpiled materials will be selectively placed on a stable site within the permit area, be protected from contaminants and unnecessary compaction, be protected from wind and water erosion and not be moved unless it is unavoidable. The site will be located up and away from the active mine yard area in the right fork of C Canyon. The topsoil would not be moved without prior approval from the Division.

Stockpiled topsoil will be seeded with the seed mix presented in Chapter 3, Table 3-3 and mulched to minimize erosion.

The topsoil storage areas could occupy an area of up to approximately 1.2 acres. The stockpile areas can accommodate more than 9,600 cubic yards of material. Stockpile outslopes will be approximately 2 to 1. The soil depth within the stockpile will range from 0 to 20 feet deep, however, the average depth will be about 15 feet deep. The slopes will have an irregular, pitted surface or contour furrows to help retain precipitation and minimize runoff.

Drainage from the topsoil stockpile area~~s~~ will be treated by the mine yard sediment pond. The topsoil stockpile will be designed to treat runoff by several methods: including vegetation for soil stabilization**,** surface roughening/gouging and silt fencing. The pile surface will be roughed and pitted to minimize surface runoff. A silt fence will be placed along the base of the stockpile to treat any runoff from the pile surface and to retain material within the stockpile area. Refer to Map 2-4 for details of the stockpile area~~s~~.

R645-301-240 RECLAMATION PLAN

A detailed and in-depth discussion of the reclamation plan for the West Ridge Mine site is presented in Appendix 5-5. Appendix 5-5 should be reviewed and thoroughly understood prior to continuing with the review of this 301-240 reclamation section. The information presented below is a brief synopsis of the detailed discussion in Appendix 5-5 and should only be used as a quick reference. It is also important to remember that although the reclamation tasks are listed below in a consecutive sequence, it is likely that various stages of these events may be occurring simultaneously in different parts of the mine yard during reclamation. ~~(Note: A detailed discussion of the reclamation of the Bear Canyon GVH site can be found in Appendix 5-14)~~

Reclamation of the proposed disturbed area will begin once all surface facilities and structures have been demolished and removed. Cut areas will be restored to approximate original contour as the yard fill is removed. These areas will be backfilled and regraded using fill material taken from the adjacent pad area. The uppermost part of the fill (consisting primarily of the imported material) will be removed first and will be disposed of underground or off-site as previously described. The native fill, located at the lower (deeper) level of the pads (i.e. located under the imported fill) will be used primarily to fill in and restore the adjacent cut slopes. Fill from the pads will be replaced in the adjacent cuts in 18"-24" lifts and compacted sufficiently to achieve adequate structural stability. Fill material will be inspected and tested to insure that it is free of salts, oils, petroleum products and any other contaminants before being used as backfill in the cut areas. After the cut slopes have been re-contoured and re-topsoiled they can then be revegetated. Much of the revegetation efforts on these slopes can be accomplished by using the adjacent pad fill areas as a work platform for equipment and materials.

Track hoes, dozers, and/or front end loaders will be used to backfill the cuts. Heavy equipment will utilize the existing adjacent pads as work platforms from which the backfilling operation can be staged. In areas where the pad fill is relatively deep, fill removal will involve heavy machinery such as dozers and/or end loaders. Fill material will be removed from the pads and relocated to the adjacent cutslopes in lifts. However, once the fill removal process gets close to the geotextile or marker strip boundaries, work will proceed with the track hoes instead of dozers. Care will be taken to not sub-excavate down into the original surface as the pad fill is being removed. The marker strips will aid in this process. After the pad fill has been removed, the backfilled culvert will then serve as the primary access way for machinery and materials associated with the remaining reclamation efforts.

After approximate original contour re-established, the surface of the regraded backfilled area will be roughed with a backhoe to provide a suitable surface for subsequent top soiling and/or reseeding operations. Boulders and large rocks will be harvested from their repository near the bottom of the pad fills and placed back up along the surface of the regraded slopes to replicate the pre-mining slope condition.

During construction of the mine yard area colluvial surface material from the truck loop area and the west side of the left fork coal storage area was stored separately to be reused during final reclamation. This surface colluvium contains pockets of Travesilla and is a naturally occurring growth media. Colluvial growth medium (CGM) from the loop area was stored within the core of sediment pond embankments; CGM from the left fork coal pile area was stored within the coal pad. During final reclamation the CGM in the sediment pond impoundments will be used to backfill the loop area cutslopes. The structural material forming the inside surface of the sediment ponds (ie. the imported, compacted material) will first be removed and disposed of since it may be contaminated with coal fines. Likewise, the cap layer overlying the coal pad CGM material will be removed and disposed of, revealing the CGM material stored below. This coal pad CGM material will then be used to backfill the cutslopes in the left fork of the coal storage area.

In areas where topsoil was replaced after approximate original contour (AOC) was achieved, the surface will be roughed/gouged, seeded and mulched. Hay mulch will be applied to the surface at a rate of 2,000 pounds per acre to areas that have been regraded and covered by topsoil or substitute topsoil. These areas will then be roughened/gouged using a backhoe bucket. The surface roughening/gouging will result in a pattern of irregularly shaped depressions measuring approximately 24" x 36" x 18 " deep over the surface of the regraded area. The purpose of these depressions is to capture and retain water (moisture), provide a cradle for seedlings and other plant materials, as well as minimize sediment loss from the revegetated slopes. Gouging will also serve to incorporate the hay mulch into the top 12-18 inches of the soil. The appropriate seed mix from Tables 3-2A through 3-2D will be used to seed the prepared surface. Reseeding will be accomplished by hydroseeding or broadcast seeding the areas. Hydroseeding will combine the tackifier and a small amount of mulch with the seed mix to mark the area of coverage during application. A weed-free straw mulch will be applied over the seed at a rate of 2,000 pounds per acre and held to the surface with a mulch and tackifier applied at a rate of 500 pounds per acre.

In areas where topsoil has been protected with geotextile fabric, the fill will be removed from the geotextile area and the geotextile carefully peeled away from the soil. Where necessary, the soil will be reclaimed and revegetated in 5-10 foot horizontal increments that can easily be accessed and worked from the adjacent remaining pad fill level. It is anticipated that after the pad fill is removed in lifts and the geotextile fabric is peeled away in vertical increments, the underlying soil material could be somewhat compacted. To increase the ability of the soil to absorb moisture, the surface of the re-exposed soil will be gouged and a hay mulch worked into the soil. The hay will be applied at a rate of 2,000 pounds per acre. Gouging would create a pattern of depressions measuring approximately 24" x 36" x 18" deep and will serve to control erosion through water retention, minimize siltation and allow for air and water penetration into the soil horizon thus promoting vegetation establishment and growth. Gouging will allow rain, snowmelt and runoff to infiltrate the soil to provide aeration and moisture at depth. The winter freeze/thaw cycles will also help to reduce soil compaction.

The re-exposed soil will most likely be undamaged but lacking in microbes and nutrients. To enhance soil microbial establishment and promote more rapid stabilization of the soil, the seed mixture (as listed in Chapter 3) will be hand broadcast over the area and raked into the soil surface. A straw mulch will be applied over the seed bed, then the surface will be sprayed with mulch and tackifier. This type of treatment have proved relatively successful in holding the straw in place until vegetation can become re-established.

During initial construction, large boulders which occur naturally along the surface will be placed in the bottom of the fill areas above the culvert after the culvert has been installed. Native fill materials from the adjacent cut slopes will then be placed over these boulders as the pads are constructed. In essence, the larger boulders are being "stored" in the depths of the pad fill until the time of final reclamation. After the original surface has been re-exposed during reclamation, the boulders will be re-exposed and will be placed once again on the reclaimed surface to replicate their original premining occurrence. To the extent possible, the backhoe operator will pull the boulders up through the remnant layer of fill so that the boulder sits prominently on top of the surface and not buried within it. This will help to create protected microclimates around the base of the boulders which will help to assure successful revegetation. Since the boulders were the first to go into the fill during construction, (followed by the native fill and lastly by the imported fill), they will be the last to come back out of the fill during reclamation. Since they will come out last, they will be available to be placed back along the surface of the reclaimed slopes.

Sediment control during pad fill excavation will be met by continued use of the sediment pond located at the downstream end of from the yard area. The main bypass culvert inlets and an adequate amount of fill to maintain the existing headwall will be left intact during this phase of the fill retrieval process. The backfilled culvert will then serve as the primary access way for machinery and materials associated with the remaining reclamation efforts. After the fill removal process reaches the bottom of the canyon, the bypass culvert will be exposed. At this time, the culvert will be removed and the underlying geotextile fabric lifted away from the soil surface below.

R645-301-242 SOIL REDISTRIBUTION

Topsoil materials that were previously stockpiled will be redistributed on the same areas in a uniform thickness on the scarified, postmining regraded fill surface. The material will be hauled to the regraded area by dump truck. The material will be placed using a front-end loader on steeper slopes and a road grader on the flat areas. The soil will be reapplied in 5-10 foot horizontal zones that can be easily accessed and worked by equipment and handwork from the adjacent pad fill level. Revegetation work will then continue on the next increment of hillside below the previously reclaimed level. After the backfill is placed to approximate original contour and the topsoil is respread, the hillside will be roughened/gouged and revegetated.

R645-301-243 SOIL NUTRIENTS AND AMENDMENTS

Nutrients and soil amendments will be applied to the redistributed material if deemed necessary by assessment of the laboratory analyses. Nutrients and amendments will be added, to make the redistributed soil similar to the undisturbed soils and aid in establishment of the vegetative cover. The nutrients can be added by hydroseeding or by broadcasting. If the nutrients and amendments are broadcast to the ground surface during the roughening procedure they will be intermixed with the hay and soil during this process.

The topsoil will be sampled as it is being put in place. Grab samples will be collected from the trucks during redistribution of the topsoil. Fertilizer, if needed, will be applied to the topsoil prior to seeding and mulching activities. The fertilizer will be broadcast using a hand spreader and then turned into the soil during surface gouging and roughening process.

R645-301-244 SOIL STABILIZATION

244.100 Exposed surface areas will use vegetative stabilization where practical to control erosion and fugitive dust. Revegetative efforts (including regrading, topsoiling, fertilizing and mulching) will be conducted prior to the end of October. Soil erosion control methods at the time of final reclamation will also include best technology currently available at that time.

244.200 On areas where topsoil is reapplied after approximate original contour (AOC) is achieved, the surface will be prepared according to the R-V-M (roughen, vegetate, mulch) method. Gouging will be the primary method used to roughen the surface. Gouging consists of imprinting the surface with a pattern of depressions measuring approximately 24" x 36" x 18" deep. The purpose of the depressions is to capture and retain water (moisture), provide a cradle for seedlings and other plant materials, and minimize soil erosion from the site. Hay mulch will be applied at a rate of 2,000 pounds per acre to the regraded surface prior to gouging so that it may be incorporated into the top 12-18 inches. After the surface has been gouged, the appropriate seed mix will be broadcast over the surface. A straw mulch will be blown on the surface at a rate of 2,000 pounds per acre. The straw will be tacked to the surface using mulch and tackifier.

244.300 Rills and gullies of an excessive nature, which form on regraded and retopsoiled areas and disrupt the approved postmining land use or cause or contribute to a violation of water quality standards for receiving streams, will be filled, regraded or stabilized. The area will then be reseeded.

R645-302-321 ALLUVIAL VALLEY FLOOR DETERMINATION

The proposed mine site is located in C Canyon which is drained by an ephemeral drainage system. During the Order One Soil Survey in June 1997, several test pits were placed in the alluvial/colluvial materials near the bottom of the canyon. No water was encountered or observed in any of these test pits. Refer to Appendix 2-2 Field Soil Profile Descriptions.

The West Ridge mine site would be the only surface disturbance within the permit area during the life of the mine. Factors are present within the permit area that would preclude the mine site, as well as the permit and adjacent areas including the substitute topsoil borrow area, from classification as alluvial valley floors. They are:

1. Steeper slopes and limited flat areas within the vicinity of the mine site and permit area preclude cultivation and irrigation.

2. No seeps or springs are present within the proposed disturbed area. The mine site is located near the west edge of the outcrop of the Black Hawk formation. The beds dip northeastward away from the outcrop at 7-10 degrees. Due to the outcrop and dip, this area does not produce groundwater discharge from the exposed stratigraphy.

3. There are no agriculturally beneficial plant species in the mine site area.

4. There is no stream baseflow in C Canyon and no unconfined aquifer is present in the alluvium at the mine site, as indicated by the soil pits and field surveys of the area.

   Stream runoff monitoring stations were established in the right fork of C Canyon (the larger drainage area) to measure the depth of flow during precipitation events. Even though there were numerous, significant rainfall events that occurred in the West Ridge area during the summer and fall of 1997 and 1998, no flow was recorded in the channel of C Canyon.

5. Irrigation water is not available, nor has it been used historically at the mine site or within the permit area.

6. No farming exists or has ever existed within the permit area. Due to the rugged terrain and general lack of available water the area, farming would be very limited. Refer to Appendix 2-3 for the Prime Farmland evaluation prepared by the Soil Conservation Service.

There are no alluvial valley floors in the permit area or adjacent area. Refer to Appendix 2-7.

~WEST RIDGE MINE - PERMIT APPLICATION PACKAGE~

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CHAPTER 3
R645-301-300 BIOLOGY

R645-301-320 ENVIRONMENTAL DESCRIPTION

The West Ridge Mine is located on the western escarpment of the Book Cliffs about 25 miles east of Price and 5 miles northwest of the town of East Carbon. The Book Cliffs consist of steep canyons and high mountains east of the mine site. Topographic elevations within the permit area range from 6,500 to over 8,800 feet. The highest point located above West Ridge is approximately 8,866 feet. Because of the rugged topography in the region, the present land uses are limited to wildlife habitat, rangeland and recreation. A large portion of the surface area is public land managed by the Bureau of Land Management (BLM).

The permit area lies within the cool, semiarid climatic zone characterized by warm, moist springs and summers and by cold, dry winters. The mean annual precipitation is about 12 inches in the vicinity of the mine site, with most of the annual precipitation occurring during the summer months. Temperatures range from summer highs in the 90's to below zero during the winter months. The average frost free period is 141 days per year.

Habitat types in the canyons range from mixed mountain conifer on north and east-facing slopes and pinyon-juniper woodland on south and west-facing slopes to rock outcrops which form multi-layered barren cliffs. Where barren rock outcrop is present, little or no vegetation exists. On the ridges above the canyons, mixed mountain brush and sage/grass plateau dominate with some extensive aspen woodland below West Ridge to the northeast of the permit area. Pinyon-juniper woodland occurs at the mouths of the canyons with interspersed patches of sagebrush shrubland, such as the area around the proposed borrow site. An area of Pinyon-Juniper adjacent to the mouth of B and C Canyons was chained in the late 1960's, however, the trees have now regrown at this site.

Vegetation types for the permit and surrounding area were mapped on color aerial photos at a scale of 1" = 2,000', with six primary vegetation types being identified. The information was then field checked for accuracy of mapping. The regional vegetation map is included as Map 3-1 General Vegetation Communities

~~NOTE: The following discussion for the remainder of R645-301-320 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 site is located in the bottom of Bear Canyon at an elevation of 7200'. The site is located less than 6000 feet (straight-line) from the main surface facilities which are located one canyon over to the southeast in C Canyon, which also sits at an elevation of 7200'. Both canyons face in the same direction, i.e., to the northeast. The canyons are nearly identical in terms of elevation, lithology, orientation, exposure, rainfall, etc. Therefore, the vegetation at the Bear Canyon GVH site is basically identical to that found at the C Canyon minesite. The vegetation at the Bear Canyon site is classified as Douglas Fir/Maple Community. Much of the minesite in C Canyon is also identified as Douglas Fir/Maple Community. Dr. Patrick Collins of Mt. Nebo Scientific, conducted a vegetation survey of the GVH site and concluded that, given the similarities in the locales, the existing vegetation reference source for the mine in C Canyon is appropriate to represent the GVH site as well as a basis for determining final reclamation performance. According to the report, Dr Collinss is of the opinion that~~ ~~*"...the Douglas Fir/Maple Reference Area (1998) would be an appropriate area for revegetation success standards at the time of final reclamation....".*~~ ~~A copy of Dr. Collins' report is included in Appendix 3-13, and also in Attachment 4 of Appendix 5-14. Also refer to Appendix 3-1 for a description of the Dougas Fir/Maple Community nearby in C Canyon, and to Appendix 3-1A for a discussion of the existing Douglas Fir/Maple vegetation reference are in C Canyon.~~

~~The sensitive plant species Canyon Sweetvetch (Hydysarum occidentale var. canone) exists in Bear Canyon, as well as all other outward-facing Book Cliff canyons within the permit area, including C Canyon where the minesuite is located.. The Canyon Sweetvetch generally occurs in the canyon bottom in and adjacent to the stream channel. As a pro-active mitigation measure, however, West Ridge employees, working on species identification from Dr. Patrick Collins of Mt. Nebo Scientific, have collected a significant amount of Sweetvech seed from the surrounding area in September, 2008. This seed will be included in the seed mix for interim cutslope revegetation, and/or topsoil pile revegetation, if requested by the Division. A similar commitment was included previously in the MRP prior to the construction of the West Ridge Mine surface facilities in C Canyon, which occurs in R645-341.100, and is reprinted herein for ready reference:~~

~~*Canyon sweetvetch seed was collected by Dr. Patrick Collins (Mount Nebo Scientific) in C Canyon in 1999 prior to construction of the minesite. This seed was later used to re-seed the topsoil pile. This constitutes the on-going field test to determine the viability of using canyon sweetvetch in the seed mix for final reclamation. Dr. Collins is presently monitoring the success of the sweetvetch population on the topsoil pile. If it appears that the sweetvetch is successful and can be added to the reclamation seed mix, seed will be collected from the topsoil population, as well as other populations in C Canyon and/or nearby canyons, at the time of final reclamation.*~~

~~At the location of the GVH site, Bear Canyon is an ephemeral stream, and there is no riparian habitat located at or near the GVH site. The GVH site is located close to the~~

~~area where the depth of cover over the longwall panels is the shallowest within the permit area. As a result, this area has been an area of interest in previous MRP amendments, and a more detailed discussion of the biology and hydrology can be found in R645-301-322.100 of the approved MRP. It should be noted that the area has been now been completely undermined since November, 2006, and subsidence has stabilized at about 3'. No adverse affects to biologic or hydrologic resources has been observed. The area is subject to on-going hydrologic and subsidence monitoring under the presently approved MRP.~~

~~After the topsoil has been removed and the GVH pad area constructed, the new cutslopes will be prepared for interim reclamation. This will be done by pocking the newly exposed surface (roughening) and re-seeding with the previously approved interim seed mix as shown in Table 3-3 (reprinted in Attachment 13 of Appendix 5-14 for ready reference), or with an alternate seed mix approved by the Division subject to availability. (Attachment 13 of Appendix 5-14 includes a seed mix which was used on the Crandall Canyon East Mountain drillhole reclamation project and is readily available, subject to Division concurrence.) A layer of wood straw will then be scattered over the surface. The pocking, re-seeding and wood straw are all measures to help minimize erosion, and promote a healthy interim re-vegetation until the time of final reclamation.~~

~~On final reclamation, the pad area and cutslopes will be backfilled to approximate original contour, and topsoil will be re-applied to the reclaimed slope (see Attachment 1) The slope will be re-vegetated according to the same existing approved plan for the minesite in nearby Canyon, as specified in R645-301-341. For completeness, the reclamation plan elements are included herein as taken directly from the currently approved plan:~~

~~*a) Fill will be placed in the cut in 18" lifts until approximate original contour is achieved. The fill will be obtained from the adjacent pad fill.*~~

~~*b) A certified noxious weed-free alfalfa hay mulch will be blown over the topsoiled surface at a rate of 2000 pounds per acre. Fertilizer, if determined necessary by soil testing, would also be applied at this time.*~~

~~*c) The surface will be gouged with irregular depressions approximately 24" x 36" x 18" deep. This will also mix the hay into the upper portion of the soil surface.*~~

~~*d) The appropriate seed mix (Table 3-2B, for Douglas Fir/Maple Community) will be either broadcast by hand or hydroseeded on the area at the rate specified on the table. (Table 3-2B is reprinted in Attachment 13 for ready reference.)*~~

~~*e) A certified noxious weed-free straw mulch will be applied to the surface at a rate of 2000 pounds per acre and held to the surface with a wood fiber mulch and tackifier applied to the surface at a rate of 500 pounds per acre.*~~

~~The revegetation monitoring schedule for the Bear Canyon GVH site will be the same~~

~~as for the minesite reclamation, and is reprinted in Table 3-4 in Attachment 13 of Appendix 5-14 for ready reference.~~

~~Revegetation success standards for the GVH site will be the same as for the C Canyon minesite, as presented in R645-341.250. The revegetation timetable for the GVH site will also be the same as the minesite, as presented in Table 3-1, reprinted in Attachment 13 of Appendix 5-14 for ready reference.~~

~~There are no threatened or endangered species in the Bear Canyon GVH area. Refer to Appendix 3-4B for current (2008) T&E information. Various species of concern during previous amendments, such as the Mexican Spotted Owl and the Yellow-Billed Cuckoo have been adequately addressed in the presently approved MRP and are not a factor.~~

~~An annual raptor survey was conducted for the permit area, including Bear Canyon, by Division of Wildlife Resources (DWR) in the spring of 2008, and is included in Appendix 3-2B, and also in Attachment 5 of Appendix 5-14. The survey shows no raptor nests in the Bear Canyon area, neither at the GVH site nor the topsoil storage area.~~

~~As shown on Maps 3-4A,3-4B and 3-4C, wildlife range for deer, elk, and antelope is basically the same at the GVH site as for the minesite, which is to be expected given their proximity and many similarities.~~

~~There will be no additional water consumption, nor disruption of flow, from the West Ridge Mine as a result of the GVH installation. Therefore, construction and operation of the GVH facility will have no affect on the Colorado River Endangered Fish Recovery Program.~~

R645-301-321 VEGETATION INFORMATION

321.100 Vegetation types for the region are shown on Map 3-1 (a generalized map depicting regional vegetation types) for the permit area and surrounding area. This information was derived from mapping done by Dr. Patrick Collins, Mt. Nebo Scientific. The vegetation map is presented as an overview of the regional vegetation and based on aerial photographs taken in June 1997. The general vegetation type listed for each different area constitutes the generally predominate vegetation for that area.

A vegetation survey of the proposed disturbed area in C Canyon and the proposed borrow area west of C Canyon was performed during June 1997 by Dr. Patrick Collins of Mt. Nebo Scientific. The survey entitled "Plant Communities of the West Ridge Project Mine Area" is appended as Appendix 3-1. A survey and general description of the riparian habitat near Grassy Trail Creek within the permit area will be conducted by Mt. Nebo Scientific, Inc. during the growing season of 2002. This report will be added to the MRP as Appendix 3-12, "A Survey of the Riparian Plant Communities Near Grassy Trail Creek for the West Ridge Mine". The riparian areas along Grassy Trail Creek are shown on Map 3-1 as interpreted from aerial photographs. This map will be revised as needed following ground-truthing conducted during the riparian survey to be completed in 2002 as described above.

C Canyon is a narrow, rugged box canyon dissected by ephemeral drainages. The main canyon drainage forks about one half mile up the canyon with the main branch continuing northeastward and the left fork cutting off to the north. The drainage bottom is dry, rocky and strewn with branches, leaves and other vegetative debris. The canyon appears to be very dry with no sign of runoff down the main or side channels. Due to the dryness of this drainage, no riparian vegetation exists along the drainage channels in C Canyon. Vegetation for forage in the canyons is also limited due to the steep, rocky slopes of the canyons.

Vegetation within the proposed mine site disturbed area is depicted on Map 3-2, Mine Site Vegetation Map. Also included on this map are the reference areas for the mine yard disturbed area. The reference area for the Douglas Fir/Maple vegetation type is shown on Map 3-1. Specific information on vegetation species and productivity at these sites is included in Appendix 3-1.

The proposed substitute topsoil borrow area was also mapped during the June 1997 field work. Refer to Map 3-3, Vegetation of the Topsoil Borrow Area. This information is provided in Appendix 3-1.

321.200 Productivity and range conditions estimates for the mine site disturbed area and the proposed borrow area were performed by the Natural Resource Conservation Service. Those estimates are presented in Appendix 3-1.

R645-301-322 FISH AND WILDLIFE INFORMATION

322.100 Appendix 3-3 presents a listing of species that potentially occur in the West Ridge area. This information was compiled by the Utah Division of Wildlife Resources for the Kaiser Coal permit application. The report is included for reference. The Division, in consultation with state and federal agencies, will be contacted in regard to designing the protection and enhancement plan required by R645-301-333.

322.200 Wildlife Of The Proposed Permit Area

The diversity of wildlife species in and around the permit area is large. Vertebrate species total almost 360 species (Dalton and others 1977), of which the most common are mule deer, cougar (mountain lion), bobcat, black bear, coyote, red fox, gray fox, kit fox, raptors, chukar partridge, blue and ruffed grouse, mourning doves, and rabbits.

Mule deer are the most prevalent big game species found in the vicinity of the permit area. They are found in low abundance during the summer on the ridges above B and C canyons but seldom sighted in the canyons.

Pronghorn antelope occur west of the cliffs in the flat areas. Elk are found to the north and east of the permit area. Coyotes are the most prevalent mammalian carnivore and golden eagles the most abundant avian carnivore. Eagle nests are found throughout the canyons and western face of the Book Cliffs. No peregrine falcons or black-footed ferrets occur in or near the proposed permit area.

The permit area is located in the Anthro/Range Creek herd unit #11 where wildlife is managed by the UDWR. Herd Unit #11 occupies the central and eastern portion of Carbon County, part of the northeast corner of Emery County, the southeast corner of Duchesne County and a small area in the southwest portion of Uinta County (Utah Division of Wildlife Resources, 1997). The unit is bounded by the Green River on the east and highways 191 and 6 on the northwest and southwest. The permit area lies in the south-central area of the unit. The only commonly occurring big game species in the permit area is mule deer. The higher elevations (habitats of mixed mountain conifer, pinyon-juniper woodland, mixed mountain brush, and sage/grass) are considered to be summer range. The lower elevations (habitats of mixed mountain conifer, pinyon-juniper woodland and sagebrush shrubland) are considered winter range. A transition zone area is used as winter snow depth begins increasing. The mine site facility area would be located in the transition zone between summer and winter deer range. Deer summer range exists on West Ridge, Patmos Ridge and higher elevations to the north and east. Winter range exists at lower elevations in Whitmore Canyon and the flatter Pinyon-Juniper areas to the west of C Canyon. Winter range is generally utilized between November 1 and May 15 of each year, depending on the weather conditions.

Vegetative types relating to wildlife habitat can be referenced on the Regional Vegetation Map (Map 3-1).

Cougar inhabit the proposed permit area and are closely associated with the seasonal distribution of deer, which serve as their primary food source. Black bears range in the permit area, developing well-defined home areas that are linearly oriented up slope and down slope (Jonkel and Cowan, 1971).

Cottontail rabbits, black-tailed and white-tailed jack rabbits, several squirrel, chipmunk and mice species occur throughout the area. The permit area is year-round habitat for cottontail rabbits and snowshoe hare. The habitat for the snowshoe hare is provided by the spruce-fir vegetation type. Most of these species are prey to badgers, skunks, bobcats, coyotes, foxes, and raptors that exist in the area.

Chukar partridge were introduced in 1951 and live along the base of the Book Cliffs around the mouth of B and C Canyons. Blue and ruffed grouse may be found in the vicinity of the proposed mine site along with mourning doves, which are common spring-summer nesting residents. Probably the most important habitat component for nesting doves is available water followed by nest trees. Doves prefer tree nest sites over nesting in shrubs.

A small number of elk reside in the vicinity of the permit area, with a moderate number wintering in the general area of C Canyon. Although this area has a high potential carrying capacity for wintering elk, the area has a low elk population which presently meets the population objective.

It is likely that the permit area is also used by a limited number of black bear, cougar, fox and bobcat. There are no fish in the permit area.

322.210 Threatened and Endangered Species

The U.S. Fish and Wildlife Service was contacted by Mr. Dave Steed of Environmental Industrial Services, for information regarding federally listed threatened or endangered species in the project area. The U.S. Fish and Wildlife Service responded with a letter which lists federally threatened, endangered and candidate species found in Carbon County. Refer to Appendix 3-4 for the letters of correspondence. None of the species on their list are known to reside within the project area.

The West Ridge Project EA incorporates a letter from U.S. Fish and Wildlife Service that states "The U.S. Fish and Wildlife Service advises that no federally listed threatened or endangered species are known to occur on the project site". This would include all of the proposed mine site disturbed area.

The black-footed ferret has a potential habitat area west of the permit area on the pediment slopes. However a search of the area failed to locate any prairie dog towns, prairie dogs being the primary prey species of the ferret who also uses their burrows as ferret dens. Black footed ferrets have not been previously identified in this region. It is unlikely that any would be found in the vicinity of the permit area.

The permit area is habitat for several raptor species which utilize the cliffs for nesting and the surrounding area for hunting. Bald eagles utilize the region in the winter. Peregrine falcons have been sighted in the Wasatch Plateau cliffs, and recently (1998) in the Book Cliffs region. One Peregrine Falcon nest was located in the Book Cliffs during the 1998 raptor survey. It appears to be an active nesting site which has been used for many years and is located over ten miles away from the proposed West Ridge mine site area in a northerly direction. Peregrines usually live in open country around rock cliffs overlooking or within one mile of a stream or reservoir. An abundance of birds for a food supply is needed within their hunting range. Refer to Map 3-4A for the results of the June 1997 and May 1998 raptor surveys. The 1998 raptor survey report has been included as Appendix 3-2A. The 2008 raptor survey is included in the Confidential Binder.

Several species of bats occur in the area including the Silver-haired bat, the Western small-footed Mytosis, and the Big brown bat. The Spotted bat is also thought to exist in the area. Since these species roost in small isolated groups rather than large colonies, finding their sites among the rock crevices and trees would be extremely difficult. Protecting them would be nearly impossible. Mine-related subsidence could potentially kill a small number of bats and adversely affect some roosting areas. Although subsidence may close some existing habitat cracks, it would more than likely create just as many new ones in the process. Mining activity should therefore have no net adverse affect to the habitat. Because the bats are spread out over wide areas rather than roosting in large localized colonies, the overall population should not be adversely impacted by the effects of subsidence.

The yellow-billed cuckoo is not thought to occur in the permit area. (Refer to Appendix 3-11, Letter from DWR regarding yellow-billed cuckoo.)

The burrowing owl is also not expected to be found within the permit area as they use prairie dog burrows as nest sites. No fish are found within the permit area.

A Mexican spotted owl was reported in Desolation Canyon, approximately 25 miles east of the permit area. On Oct. 9, 2002 officials from Utah Division of Wildlife Resources surveyed the permit area and determined that the area was not suitable habitat for the spotted owl. A letter from DWR verifying this conclusion is included in Appendix 3-9.

322.220 No streams, wetlands, riparian areas, or special migration areas are located within the permit area southwest of West Ridge. Grassy Trail Creek is an intermittent stream located in the permit area in Whitmore Canyon located northeast of West Ridge. Riparian areas exist along Grassy Trail Creek in this area, as depicted on Map 3-1. Wildlife wintering areas are depicted on Maps 3-4B, 3-4C and 3-4D.

R645-301-323 MAPS AND AERIAL PHOTOGRAPHS

323.100 The location of the reference areas for determining the success of revegetation is depicted on Map 3-2. The areas have been marked in the field using steel range posts.

323.200 Fixed monitoring stations were not used to gather information for fish and wildlife.

323.300 No permanent facilities are being proposed for the enhancement of fish, wildlife and related environmental values. The sediment treatment facilities, although temporary in nature, may provide a source of water until final reclamation. Reclamation will focus on providing wildlife forage and habitat.

323.400 Vegetation types and plant community, as well as sampling locations are shown on Map 3-2. Sampling transects utilized during the vegetation survey are shown on the map. The vegetation sampling transects were also utilized by the Natural Resources Conservation Service when they conducted the range condition evaluation at the proposed mine site.

R645-301-330 OPERATION PLAN

331 Measures to be taken to minimize disturbance and surface erosion.

An effort has been made, during the design of the mine surface facility area, to minimize the amount of disturbance and utilize the minimum amount of area. Loadout facilities will be located in the left fork of C Canyon and the mine office and bath house in the right hand fork. The buildings will be designed for maximum efficiency of space. The drainage from the left and right forks will be diverted under the yard pad and discharged beyond the sediment pond area. This will minimize the amount of drainage flowing to the sediment pond and thus minimize the amount of disturbed area drainage to be treated.

After the facilities have been constructed, fill slopes, side slopes and the topsoil stockpile will be reseeded with an interim seed mix (listed in Table 3-3) to stabilize the soil and slopes. Drainage ditches will be riprapped, lined with concrete or culvert, where needed, to reduce erosion. The outslope of the sediment pond will be seeded.

Interim reclamation will be performed, where practical, on surfaces where erosion may be a concern. The surface of the area to be seeded will be roughened or gouged to promote seed growth and water harvesting. Fertilizer will be added if soil testing indicates a lack of nutrients. Seeding will be done soon after construction activities are completed so that vegetation will be established as soon as possible on the topsoil stockpile and regraded slopes. Refer to the interim seed mix shown on Table 3-3. Straw will be spread on the surface, where practical, to promote seedling growth and to control erosion. On larger areas such as the topsoil stockpile, a mulch and tackifier will be applied over the straw to help hold it in place.

332 Anticipated impacts of subsidence and mitigation measures.

With the proposed mine plan utilizing longwall methods, surface effects of subsidence could be possible. Similar mining in the region shows that subsidence generally occurs as a broad lowering of the surface over mined out panels.

The overburden strata consist of interbedded sandstone and shale typical of the Blackhawk Formation. These types of sediments should yield more flexibly to subsidence than thick sandstone beds, thus lessening the chance for effects of subsidence to occur on the surface. The areas where mining might create subsidence, thick sequences of interbedded sandstone and shales overlie the coal seam. Subsidence expression on the surface would most likely be manifest as a broad, gentle downwarping of the surface and be visually undetectable.

In order to minimize the potential for unstable cliffs and to protect major drainage channels, coal pillars and barriers will be left in place.

A detailed discussion of potential subsidence effects and mitigation measures can be referred to in Chapter 5 under R645-301-525. Should any cattle be lost as a result of mining induced subsidence, WEST RIDGE Resources commits to providing fair compensation for the loss.

WEST RIDGE Resources, Inc. will conduct infrared photography in areas of potential subsidence as a means of collecting baseline information with regard to vegetation. WEST RIDGE Resources, Inc. will resurvey the same area at a minimum of once every five years, during the same season, to observe any change in vegetation following mining. The photography shall serve as incremental baseline monitoring.

333 Minimizing impacts to fish and wildlife and enhancement of resources.

Based on field surveys and communication with the U. S. Fish and Wildlife Service as well as on-the-ground surveys in the vicinity of the mine and permit area, no endangered or threatened species of fish or wildlife are thought to exist within the lease or adjacent areas. All drainages within the permit area southwest of West Ridge are ephemeral in nature. Because of the lack of available water, the quality of the region for wildlife habitat is somewhat restricted.

Grassy Trail Creek is an intermittent stream located in the permit area in Whitmore Canyon located northeast of West Ridge. In this area the coal seam to be mined is 2000' below the streambed. In the "Investigation of Surface Water and Ground Water Systems in the Whitmore LBA Area, Carbon County, Utah" (Appendix 7-1A), Mayo and Associates concludes that "the stream channel in this area is underlain by approximately 2,000 feet of cover, which includes the entire thickness of relatively unfaulted and unfractured North Horn Formation, which is known to form an effective barrier to vertical groundwater migration (Mayo and Associates, 1998) and is known to contain hydrophyllic clays that swell when wetted to seal any fractures that may form. Therefore, the potential for the interception and diminution of surface water flows in Grassy Trail Creek as a result of mining induced subsidence is minimal." Mining related impacts to fish and wildlife is expected to be correspondingly minimal.

In order to protect raptors using the area, power lines will be designed and installed utilizing a raptor-proof design. The poles may also serve to enhance the hunting success for raptors passing through the area. In coordination with the Division of Wildlife Resources, hunting platforms could be installed on select poles.

Locations within the permit area that contain potential raptor nesting habitat will be surveyed in the field within one year of any proposed mining activity that could result in subsidence. Should any nests be found, WEST RIDGE Resources, Inc. would consult with the Division (DOGM), the Division of Wildlife Resources and the U.S. Fish and Wildlife Service.

Surface water will be protected from contamination due to mining activities through the use of sedimentation controls including channeling all disturbed area runoff to a sedimentation pond.

The sediment pond will be visually monitored on a daily basis to evaluate its impact on wildlife. WEST RIDGE Resources, Inc. would notify the Division of Wildlife Resources should the sediment pond adversely impact any wildlife.

Should mining disrupt either a seep or spring within the permit area that had a state appropriated water right, WEST RIDGE Resources, Inc. would commit to replace the quantity of water depleted from that particular source at a similar location unless the seep is restored naturally in the same general area.

Water consumption and usage from the proposed mining activities are proposed to be less than 100 acre-feet per year. Refer to the Estimated Water Use table included in Appendix 7-7. The longwall began operation in May, 2001. Since that time water consumption has averaged approximately 1,300,000 gallons per month. This equates to 48 acre-feet of water per year. This water usage provides for the longwall, plus 2 each continuous miner sections, the newly completed bathhouse, and all other ancillary features located both underground and on the surface. The mine is now completely constructed and is operating at close to full production. Longwall production will increase approximately 30% starting in 2002, but from then on overall water consumption should stay within the ranges projected on the Water Usage Table in Appendix 7-7. Water consumption is not expected to increase much, if any, beyond these levels as mining progresses northeasterly direction into Federal lease UTU-78562. Firstly, according to the current mine plan, one of the two continuous miner sections will be pulled out of production at the end of 2009, resulting in a corresponding decrease in water consumption requirements. Secondly, if the mine begins to make water, as is not uncommon as mines expand deeper into the mountain, some of this water could be utilized for underground dust control sprays which would directly off-set the current water consumption requirements.

A raptor survey conducted by DWR and WEST RIDGE Resources, Inc. in June 1997 located two eagle nests in the right fork of C Canyon near the center of Section 11, T 14 S, R 13 E. One nest was classified as a "tended" eagle nest and the other as an inactive nest. In May 1998, DWR personnel conducted another survey of C Canyon. Both nests were found to be inactive in 1998. A small portion of the proposed mine yard lies within one half mile of the nest. This part of the mine site includes the right fork topsoil storage area and a small part of the mine material storage yard. Once the topsoil pile has been established there will be minimal activity in this portion of the mine yard. During the May 1998, DWR personnel evaluated the nest locations with respect to the location of the topsoil stockpile area in order to evaluate the potential impacts of the mine construction and operation. It was determined that, due to the visual screening between the nests and the mine site offered by the high trees and the cliff lines within the canyon, mine construction/operation would have no effect on the nest sites in the right fork of C Canyon. A site specific buffer zone was established for the nest sites in C Canyon and is depicted on Map 3-4A. The site specific buffer zone was addressed and recommended in the EA prepared by the BLM. Since the mine site disturbance will be outside of the site specific buffer zone, a take permit will not be required for the nests in the right fork. Mine construction and operation can proceed outside the site specific buffer zone and the construction season will not be affected. DWR did recommend however, that annual monitoring be continued for the C Canyon area.

The same raptor survey (DWR, 1997) also re-located an inactive golden eagle nest in the left fork of C Canyon in the southeast quarter of Section 10, T 14 S, R 13 E. Most of the minesite lies within ½ mile of this nest. Because this nest site has been inactive when it has been monitored during raptor surveys conducted in 1981, 1997 and 1998, it is classified as abandoned under the established BLM guidelines and no take permit is required. Mine construction and operation will not negatively impact this nest.

In the spring of 2001, DWR conducted its annual raptor survey of the West Ridge mine area. (Refer to Appendix 3-10 for the results of this survey.) The survey included the cliff escarpments and canyons within the permit area southwest of West Ridge. It is this area that contains the majority of raptor nesting activity and is the area underlain by current active mining operations. The Whitmore Canyon area on the northeast side of West Ridge was not covered during this latest survey although it has been covered within the last several years. The Whitmore Canyon area contains considerably less nesting activity than the area southwest of the ridge and mining related subsidence is not scheduled to occur in this area until the year 2005. WEST RIDGE Resources will coordinate with DWR to ensure that the Whitmore Canyon area is included in the annual raptor survey prior to mining in this area.

The proposed topsoil borrow area is a site that may be utilized at the time of final reclamation if need. Because it is fairly likely that the proposed topsoil borrow area will not be required for final reclamation, the operator commits to mitigate for the disturbance when and if it occurs.

In coordination with DWR, WEST RIDGE Resources, Inc. commits to conducting wildlife education sessions for their employees and their contractor’s employees to develop an awareness of the wildlife in the area.

R645-301-340 RECLAMATION PLAN

Refer to Appendix 5-5 for a detailed discussion of the West Ridge Mine Construction/Reclamation Plan.

R645-301-341 REVEGETATION

A revegetation plan has been formulated for the mine site area in C Canyon based on conversations with DOGM technical specialists and consultants that specialize in specific fields. Because of the experimental practice being proposed for approximately 5 of the 25 acres, some of the reclamation techniques being proposed may be somewhat different than the usual practice. In the mine site area, WEST RIDGE Resources, Inc. is proposing to use a geotextile fabric to protect topsoil resources in place along the bottom of the right fork drainage and adjacent south slope and also near the confluence of the forks with the main canyon drainage. The yard fill will be placed on either the original ground surface or the geotextile fabric, depending on the area. During reclamation of the mine yard, the yard fill will be removed and approximate original contour re-established and the geotextile removed. Following the removal and regrading, three different reclamation methods will be implemented depending on the area. Revegetation will proceed in the following manner.

Reclamation of the mineyard, with the exception of the experimental practice/geotextile area will proceed as outlined below:

1) In areas where topsoil previously existed but was removed prior to construction the following method will be used.

   a) Fill will be removed until approximate original contour is achieved.

   b) Topsoil will be replaced in each area and reapplied to the prepared surface to a depth of 12-18 inches.

   c) A certified noxious weed-free alfalfa hay mulch will be blown over the topsoiled surface at a rate of 2,000 pounds per acre. Fertilizer, if determined necessary by soil testing, would also be applied at this time.

   d) The surface will be gouged with irregularly shaped depressions approximately 24" x 36" x 18" deep. This will also mix the hay and fertilizer into the upper portion of the soil surface.

   e) The appropriate seed mix (Tables 3-2A, 3-2B, 3-2C, and 3-2D) will be either broadcast or hydroseeded on the area at the rate specified on the table. Hydroseeding would combine a tackifier and small amount of mulch with the seed mix to mark the area of coverage during application.

f) A certified noxious weed-free straw mulch will be applied to the surface at a rate of 2,000 pounds per acre and held to the surface with a wood fiber mulch and tackifier applied to the surface at a rate of 500 pounds per acre.

g) If root stock is listed in the seed mix, the containerized plants will be planted at the rate specified in the seed list table.

2) For areas devoid of topsoil resources, such as the rock outcrop/rubbleland areas, a different methodology will be applied.

a) In fill areas, fill will be removed down to the original slope as marked by brightly colored marker strips. Approximate original contour will be achieved by removing fill material down to that original, pre-existing surface. A remnant layer of fill material will be left in place to serve as a growth medium. The thickness of this layer may vary from a skiff (i.e. 2-3") up to 18-24" in areas where natural depressions and irregularities occur in the original existing surface.

b) For cut areas, fill will be placed in the cut in 18" lifts until approximate original contour is achieved. The fill will be obtained from the adjacent pad fills.

c) A certified noxious weed-free alfalfa hay mulch will be blown over the topsoiled surface at a rate of 2,000 pounds per acre. Fertilizer, if determined necessary by soil testing, would also be applied at this time.

d) The surface will be gouged with irregularly shaped depressions approximately 24" x 36" x 18" deep. This will also mix the hay into the upper portion of the soil surface.

e) The appropriate seed mix (Tables 3-2A, 3-2B, 3-2C, and 3-2D) will be either broadcast or hydroseeded on the area at the rate specified on the table.

f) A certified noxious weed-free straw mulch will be applied to the surface at a rate of 2,000 pounds per acre and held to the surface with a wood fiber mulch and tackifier applied to the surface at a rate of 500 pounds per acre.

3) Reclamation of the experimental practice/geotextile area, where topsoil was protected in-place, will proceed as outlined below:

   a) Once the yard fill has been removed, the geotextile fabric covering the original ground surface will be removed.

   b) A certified noxious weed-free alfalfa hay mulch will be blown over the topsoiled surface at a rate of 2,000 pounds per acre. Fertilizer, if determined necessary by soil testing, would also be applied at this time.

   c) The re-exposed soil surface will be gouged with a pattern of irregularly shaped depressions approximately 24" x 36" x 18" deep. This will also mix the hay into the upper portion of the soil surface.

   d) The area will be either broadcast or hydroseeded with the appropriate seed mixture listed in Tables 3-2A through 3-2D. The seed will be applied at a rate specified on the table.

   e) A certified noxious weed-free straw mulch will be applied to the surface at a rate of 2,000 pounds per acre and held to the surface with a wood fiber mulch and tackifier applied at a rate of 500 pounds per acre.

   f) If root stock is listed in the seed mix, the containerized plants will be planted at the rate specified in the seed list table.

Reclamation of the minesite will begin once all surface facilities and structures have been demolished and removed. Cut areas will be restored to approximate original contour as the yard fill is removed. The cut areas will be backfilled and regraded using fill material taken from the adjacent pad area. Fill will be placed in the cuts in 18"-24" lifts and compacted sufficiently to achieve adequate structural stability. After the cut slopes have been re-contoured and re-topsoiled they can then be revegetated. Much of the revegetation efforts on these slopes can be accomplished by using the adjacent pad fill areas as a work platform for equipment and materials.

Fill will be removed from the pads in 5-10 foot lifts starting from the upper end of the yard and proceeding down canyon. As the yard area is being removed to establish approximate original contour, the yard pad fill will be excavated and hauled underground or off-site for permanent storage. At the intersection of the pre-existing topsoiled slope and the pad fill, the geotextile fabric will be re-located. The pad fill will be carefully removed from the top of the geotextile fabric as the yard fill is being excavated. This will allow reclamation to be done on vertical increments of the hillside that will be easy to access from the adjacent yard level.

As the mine site is being regraded, approximate original contour (AOC) will be restored and the topsoil reapplied. The surface will then be mulched and gouged. An alfalfa hay mulch will be applied at a rate of 2,000 pounds per acre to the reclaimed areas that have been regraded and covered by topsoil or substitute topsoil and reseeded. A certified noxious weed-free hay will be utilized for mulch during final reclamation. Gouging will be used to roughen the surface to capture and retain water (moisture) for seedlings and to incorporate the hay into the soil. Gouging consists of imprinting the surface with a pattern of depressions measuring approximately 24" x 36" x 18" deep.

Exposed surface areas will use vegetative stabilization, where practical, to control erosion and fugitive dust. Revegetative efforts (including regrading, topsoiling, fertilizing and mulching) will be conducted as soon as possible after regrading and retopsoiling but prior to the end of October.

A species seed list and amount of seed per acre for revegetation of the mine yard area are listed in Tables 3-2A, 3-2B, and 3-2C (from Chapter 3 of the West Ridge PAP) and are included herein for ease of reference.

Reseeding will be accomplished by hydroseeding or broadcast seeding the regraded prepared surface areas concurrently during final reclamation. Hydroseeding will combine a tackifier and a small amount of mulch with the seed mix to mark the area of coverage during application. Steeper areas of the mine yard, such as the experimental practice/geotextile area, will be broadcast seeded and raked in or hydroseeded.

Revegetated areas will be visually monitored on a quarterly basis, or following heavy storm events, for damage and erosion problems. Water will be diverted away from active rills and gullies. Erosion will be repaired if the gully is unstable and repair can be done without jeopardizing healthy vegetation. Surface roughening should significantly increase water retention and minimize the potential for erosion.

Sediment control during pad fill excavation will be met by continued use of the sediment pond located at the downstream end of the yard area. The main bypass culvert inlets and an adequate amount of fill to maintain the existing headwall will be left intact during this phase of the fill retrieval process. After the fill removal process reaches the bottom of the canyon, the bypass culvert will be exposed. At this time, the culvert will be removed and the underlying geotextile fabric lifted away from the soil surface below.

Once the culvert is removed, access up through the canyon will no longer be possible. Therefore, prior to removing the culvert, all other phases of reclamation will have to be completed (ie, cutslopes regrading, backfill removal, highwall reclamation, topsoil replacement, and soil treatment on the regraded and re-contoured slopes). Once these pre-requisite reclamation stages have been completed, removal of the culvert (and reclamation if the channel) can begin.

Rills and gullies of an excessive nature, which form on regraded and re-topsoiled areas and disrupt the approved postmining land use or cause or contribute to a violation of water quality standards for receiving streams, will be filled, regraded or stabilized. The area will then be reseeded.

Pest damage will also be evaluated during the quarterly inspection. Should a problem persist and endanger the viability of the entire revegetated area, a response appropriate for the situation will be initiated.

Supplemental irrigation is not planned for the site. However, mulching is planned and should decrease evaporation and optimize use of soil moisture and natural precipitation. Other measures will be used, in conjunction with mulching, to conserve available soil moisture. Depending on the slope and areal extent of application, other methods that could be used would include disking along the contour where slopes allow and land imprinting, pitting or gouging. A small backhoe or comparable piece of equipment would be used to create gouged depressions approximately 24" x 36" x 18" deep. WEST RIDGE Resources will continue to investigate alternative means of increasing water availability.

Pesticides and herbicides will be used only if a problem is identified and spraying is deemed necessary to control damage to reclamation. Using certified noxious weed-free straw will reduce the potential for noxious weeds to become a problem. Pest control measures to be utilized would depend on what type of problem exists.

Revegetation success will be judged on the effectiveness of the vegetation for the approved postmining land use. The sampling techniques for measuring success and methods identified in DOGM's "Vegetation Information and Monitoring Guidelines, Appendix A" will be referenced during the post revegetation evaluation. A revegetation timetable is provided in Table 3-1 at the end of this text. Annual monitoring will be included as part of the annual report submitted to DOGM.

Based on the information available from the vegetation survey on-site, it appears that reclamation at this site is feasible. Native species have re-established themselves successfully on previous disturbances without seed or mulch application or surface preparation. Also, reclamation has been done on the Horse Canyon minesite, about 10 miles south of C Canyon, with considerable success. The Horse Canyon minesite has a similar orientation and aspect. Precipitation is also similar between the sites.

Landscape diversity will be achieved by restoring the site to approximate original, premining topography through site regrading. The variation in slope aspects, grades and lengths will serve to promote diversity in vegetative species and communities within the reclaimed area. Replacement of soil materials and storage of the undisturbed soils in-place will help to restore the pre-existing vegetation to what previously existed at the site. Roughening of the soil surface will promote retention of moisture in the soil and thus diversity in the species that can establish on the regraded site. The placement of large rocks and boulders on the regraded soil surface will serve to promote species diversity by creating mico-climates on a particular slope and aspect. The rocks will also create visual diversity on the regraded slopes making them appear similar to the adjacent undisturbed slopes.

341.100 A Revegetation Timetable is provided as Table 3-1.

Annual monitoring will be included as part of the annual report submitted to DOGM.

Revegetation will be monitored on an annual basis in June of each year. During the first three years following final reclamation, the site will be inspected, visually, on a quarterly basis in order to monitor for adverse affects. Should excessive erosion be noted, water will be diverted away from the critical area and the gully repaired as soon as possible. Refer to R645-301-355.

341.200 Species and Amount Of Seed Per Acre

341.210 A species seed list and amount of seed per acre for revegetation of the mine yard area are listed in Tables 3-2A, 3-2B, and 3-2C. The seed mix for the proposed topsoil borrow site is provided on Table 3-2D.

341.220 Reseeding will be accomplished by hydroseeding or broadcast seeding the large areas during final reclamation. Hydroseeding will combine tackifier and a small amount of mulch with the seed mix to mark the area of coverage during application. Steeper areas of the mine yard will be broadcast seeded and raked in or hydroseeded. For interim reclamation, the seed mixture will be hand broadcast over the surface and raked to cover the seed.

341.230 Straw mulch will be utilized on all areas that are seeded during final reclamation. The straw will be held in place with a tackifier and wood fiber mulch applied over the straw at the recommended rate. This will provide a cohesive cover that will resist water and wind erosion. The straw will be certified as certified noxious weed-free.

341.240 Supplemental irrigation is not planned for the site. However, mulching is planned and should decrease evaporation and optimize use of soil moisture and natural precipitation. Other measures will be used, in conjunction with mulching, to conserve available soil moisture. Depending on the slope and areal extend of application, other methods to be used would include disking along the contour where slopes allow and land imprinting, pitting, pocking and gouging. For gouging, a backhoe or comparable piece of equipment would be used to create irregularly shaped depressions approximately 24" x 36" x 18" deep. WEST RIDGE Resources, Inc. will continue to investigate alternative means of increasing water availability.

Pesticides and herbicides will be used only if a problem is identified and spraying is deemed necessary to control damage to reclamation. Using certified noxious weed-free straw will reduce the potential for noxious weeds to become a problem. Pest control measures to be utilized would depend on what type of problem exists.

341.250 Revegetation success will be judged on the effectiveness of the vegetation for the approved postmining land use. The sampling techniques for measuring success and methods identified in DOGM's "Vegetation Information and Monitoring Guidelines, Appendix A" will be referenced during the post revegetation evaluation.

The reference area method will be used to demonstrate adequate cover and production in revegetated areas. Reference area locations are shown on Maps 3-1 and 3-2, and Appendices 3-1 and 3-1A.

Regarding erosion control monitoring, WEST RIDGE Resources, Inc. proposes to utilize "Erosion Condition Classification System" (Humphreys, 1990), the erosion classification system developed by the BLM and modified by Mark Humphreys of OSM. In utilizing this system, SSF values would be kept at less than or equal to the surrounding undisturbed areas.

The Division has developed woody plant density success standards for this site which have also been reviewed and approved by DWR. The standards are as follows:

Pinyon/Juniper	800 per acre
Douglas Fir/Maple	2,000 per acre
Douglas Fir/Rocky Mountain Juniper	2,500 per acre
Sagebrush/Grass	2,500 per acre

Quantitative vegetative information for the Douglas Fir/Maple reference area is provided in Appendix 3-1A.

Diversity Index

Species diversity will be measured using MacArthur's diversity index. This is an effective diversity measurement and is computed using the equation $1/\sum pi^2$ (MacArthur and Wilson 1976, *The Theory of Island Biogeography*, Princeton: Princeton University Press). In this equation *pi* is the proportion of sum frequency contributed by the *i*th species in the sample area of concern. The proportional contribution of each species is then squared and the values for all species in the sample areas are summed. This index integrates the number of species and the degree to which frequency of occurrence was equitably distributed among those species. In other words, this frequency) than those that are merely "present" in one or two quadrats.

The standard to be used for achieving diversity will be 90% of the reference area value.

341.300 Based on the information available from the vegetation survey on-site, it appears that reclamation at this site is feasible. Native species have re-established themselves successfully on previous disturbances without seed or mulch application or surface preparation. Also, reclamation has been done on the Horse Canyon minesite, about 10 miles south of C Canyon, with considerable success. The Horse Canyon minesite has a similar orientation and aspect. Precipitation is also similar between the sites.

In order to maximize reclamation efforts, WEST RIDGE Resources, Inc. will work with DOGM to observe and document the results of revegetation of the topsoil stockpile. Information gathered from the stockpile and experimental practice test plots will be used to determine optimum methods of planting, mulching as well as the most appropriate time of planting. The seed mix to be used on the topsoil stockpile will be the same as for interim reclamation (Table 3-3). As information is gained by monitoring the field results, the seed mix and reclamation plan will be adjusted to suit the site specific conditions. The stockpile will be seeded as soon as the surface has been prepared. No irrigation is being proposed. However, water collection techniques, such as gouging, will be used on the stockpile surface.

Erosion would be evaluated annually utilizing the methodology indicated in R645-301-341.250. Quantitative evaluations of cover by species and woody species density would be made according to the schedule presented on Table 3-4. Productivity would be measured in years 5 and 10.

Canyon sweetvetch seed was collected by Dr. Patrick Collins (Mount Nebo Scientific) in C Canyon in 1999 prior to construction of the minesite. This seed was later used to re-seed the topsoil pile. This constitutes the on-going field test to determine the viability of using canyon sweetvetch in the seed mix for final reclamation. Dr. Collins is presently monitoring the success of the sweetvetch population on the topsoil pile. If it appears that the sweetvetch is successful and can be added to the reclamation seed mix, seed will be collected from the topsoil population, as well as other populations in C Canyon and/or nearby canyons, at the time of final reclamation.

TABLE 3-1
REVEGETATION TIMETABLE

Refer to Table 5-1, Reclamation Time Table - West Ridge Mine for details of entire reclamation schedule.

YEAR 1	BEGIN	END
Reseed/ mulch	following regrading	October 31

YEAR 2 - 4	BEGIN	END
Perform Maintenance Work On Site	as needed	
Perform Annual Qualitative Vegetation Monitoring	June	June
Perform Quantitative Vegetation Monitoring During Second & Third Years	June	August

YEAR 5 - 10	BEGIN	END
Perform Quantitative Vegetation Monitoring During Fifth, Ninth and Tenth Years	June	August
Obtain Bond Release	September	

TABLE 3-2A

MINESITE RECLAMATION -FINAL RECLAMATION
SPECIES LIST AND SEEDING RATE
SEED MIXTURE FOR THE PINYON/JUNIPER COMMUNITY

SCIENTIFIC NAME	COMMON NAME	BROADCAST RATE #PLS LBS/ACRE
GRASSES		
Elymus trachycaulus	Slender Wheatgrass	2.0
Elymus lanceolatus	Thickspike Wheatgrass	2.0
Elymus smithii	Western Wheatgrass	2.0
Elymus spicatus	Bluebunch Wheatgrass	2.0
Stipa hymenoides	Indian Ricegrass	2.0
Poa secunda	Sandberg bluegrass	0.5
FORBS		
Achillea millefolium	Yarrow	0.1
Hedysarum boreale	Northern Sweetvetch	1.5
Linum lewisii	Lewis Flax	1.0
Penstemon eatonii	Eaton’s Penstemon	0.5
Penstemon palmeri	Palmer’s Penstemon	0.5

TABLE 3-2A (CONTINUED)

SHRUBS		
Amelanchier utahensis	Serviceberry	2.0
Artemisia tridentata	Big Sagebrush	0.1
Cercocarpus ledifolius	Mountain Mahogany	2.0
Chrysothamnus nauseosus	Rubber Rabbitbrush	0.5
Purshia tridentata	Bitterbrush	1.0
Ceratoides lanata	winter fat	1.0
	TOTAL	20.7

TABLE 3-2B

MINESITE RECLAMATION -FINAL RECLAMATION
SPECIES LIST AND SEEDING RATE
SEED MIXTURE FOR THE DOUGLAS FIR/MAPLE COMMUNITY

SCIENTIFIC NAME	COMMON NAME	BROADCAST RATE #PLS LBS/ACRE
GRASSES		
Elymus trachycaulus	Slender Wheatgrass	2.0
Elymus lanceolatus	Thickspike Wheatgrass	2.0
Elymus spicatus	Bluebunch Wheatgrass	3.0
Poa pratensis	Kentucky Bluegrass	0.2
Stipa comata	Needle-and-thread	2.0
Poa fendleriana	Muttongrass	0.3
Stipa hymenoides	Indian ricegrass	2.0
FORBS		
Achillea millefolium	Yarrow	0.1
Aster chilensis	Pacific Aster	0.1
Geranium viscosissimum	Sticky Geranium	1.0
Hedysarum boreale	Northern Sweetvetch	1.5
Hedysarum occidentale var. canone	Canyon Sweetvetch	0.0*
Linum lewisii	Lewis Flax	1.0

TABLE 3-2B (CONTINUED)

TREES/SHRUBS

Acer glabrum	Rocky Mountain Maple	2.5
Prunus virginiana	Chokecherry	2.0
Rhus trilobata	Squawbush	1.0
Symphoricarpos oreophilus	Snowberry	0.5
	TOTAL	21.2

The following would be planted as five gallon containerized plants along the reclaimed channel. The plants would be spaced about five feet apart along each side.

Amelanchier alnifolia	Serviceberry
Cercocarpus ledifolius	Mountain Mahogany

* To be determined by future field tests and on-site seed availability.

TABLE 3-2C

MINESITE RECLAMATION -FINAL RECLAMATION
SPECIES LIST AND SEEDING RATE
SEED MIXTURE FOR THE DOUGLAS FIR/ROCKY MOUNTAIN JUNIPER COMMUNITY

SCIENTIFIC NAME	COMMON NAME	BROADCAST RATE #PLS LBS/ACRE
GRASSES		
Elymus lanceolatus	Thickspike Wheatgrass	2.0
Elymus spicatus	Bluebunch Wheatgrass	3.0
Poa secunda	Sandberg’s bluegrass	0.4
Stipa comata	Needle-and-thread	2.0
Stipa hymenoides	Indian ricegrass	2.0
Poa fendleriana	Muttongrass	0.3
FORBS		
Achillea millefolium	Yarrow	0.1
Aster engelmannii	Engelman Aster	0.5
Hedysarum boreale	Northern Sweetvetch	1.5
Linum lewisii	Lewis Flax	1.0
Penstemon eatonii	Eaton’s Penstemon	0.5

TABLE 3-2C (CONTINUED)

TREES/SHRUBS		
Amalanchier utahensis	Serviceberry	2.0
Artemisia tridentata var. vaseyana	Mountain Big Sagebrush	0.2
Cercocarpus ledifolius	Mountain Mahogany	2.0
Pseudotsuga menziesii*	Douglas Fir	1.0
Symphoricarpos oreophilus	Snowberry	0.5
	TOTAL	19.0

* Containerized plants of this species will also be planted at a rate of 300 plants/acre. If possible, plants would be inoculated with ectomycorhizae to promote growth.

TABLE 3-2D

MINESITE RECLAMATION -FINAL RECLAMATION
SPECIES LIST AND SEEDING RATE
SEED MIXTURE FOR THE SAGEBRUSH/GRASS COMMUNITY

SCIENTIFIC NAME	COMMON NAME	BROADCAST RATE #PLS LBS/ACRE
GRASSES		
Elymus lanceolatus	Thickspike Wheatgrass	2.0
Elymus spicatus	Bluebunch Wheatgrass	3.0
Hilaria jamesii	Galleta	2.0
Stipa hymenoides	Indian Ricegrass	2.0
Stipa comata	Needle and thread grass	2.0
FORBS		
Achillea millefolium	Yarrow	0.1
Hedysarum boreale	Northern Sweetvetch	4.0
Linum lewisii	Lewis Flax	1.0
Penstemon palmeri	Palmer’s Penstemon	0.5

TABLE 3-2D (CONTINUED)

TREES/SHRUBS		
Amalanchier utahensis	Serviceberry	2.0
Artemisia tridentata	Big Sagebrush	0.1
Ceratoides lanata	Winterfat	1.0
Chrysothamnus nauseosus	Rubber Rabbitbrush	0.5
Artemisia nova	Black sagebrush	0.5
	TOTAL	20.7

TABLE 3-3

MINESITE RECLAMATION -INTERIM RECLAMATION
SPECIES LIST AND SEEDING RATE
INTERIM REVEGETATION SEED MIXTURE FOR
TEMPORARY DISTURBANCE AT THE MINESITE

SCIENTIFIC NAME	COMMON NAME	BROADCAST RATE #PLS LBS/ACRE
GRASSES		
Elymus lanceolatus	Thickspike Wheatgrass	4.5
Elymus smithii	Western Wheatgrass	5.0
Poa pratensis	Kentucky Bluegrass	0.4
Stipa hymenoides	Indian Ricegrass	4.0
Elymus spicatus	Bluebunch Wheatgrass	6.0
FORBS		
Achillea millefolium	Yarrow	0.1
Artemisia ludoviciana*	Louisiana sage	0.1
Hedysarum occidentale var. canone	Canyon Sweetvetch	0.0**
	TOTAL	20.1

* Subject to availability

**Hedysarum occidentale var. canone (Canyon Sweetvetch) will be seeded on the topsoil stockpile only as an interim revegetation measure and to propagate seed. The seeding rate would be determined by future field tests and on-site seed availability.

TABLE 3-4

REVEGETATION MONITORING SCHEDULE

<u>QUALITATIVE OBSERVATIONS</u>

<u>TYPE OF REVEGETATION</u>	YEAR 1	2	3	4	5	6	7	8	9	10
Permanent Revegetation	X	X	X	X	X	X	X	X	X	X
Interim Stabilization	X	X	X	X	X	X	X	X	X	X
Test Plots/Field Trials	X	X	X	X	X	X	X	X	X	X

<u>QUANTITATIVE OBSERVATIONS</u>

<u>PARAMETER</u>	YEAR 1	2	3	4	5	6	7	8	9	10
Cover		X	X		X				X	X
Frequency		X	X		X				X	X
Woody Plant Density		X		X				X	X	X
Productivity:										
Test Plots					X					X
All Other Revegetation								X	X	X

R645-301-342 FISH AND WILDLIFE PLAN

342.100 Reclamation of the disturbed area following mining activities will seek to promote the reestablishment of wildlife habitat for small mammals and reptiles, and forage for grazing. At the present time, approximately 1.62 acres of the proposed disturbed area was been previously disturbed by mining and exploration activities. As this work was performed prior to the enactment of SMCRA, very little reclamation work was performed on-site. The vegetation now existing on the site has re-established itself without the assistance of broadcasted seed, irrigation or mulch. The plan WEST RIDGE Resources, Inc. is proposing is based on regulatory requirements and guidelines for reclamation and revegetation. However, the proposed reclamation plan adds elements which currently do not exist on-site and would provide a greater variety of vegetative types and cover than presently exists at the site.

Wildlife habitat replacement in the postmining phase will include revegetation with a seed mixture that has nutritional value to wildlife. West Ridge Resources, Inc. will place rocks and rock piles on the surface of the regraded area at the time of final reclamation to provide habitat for small mammals. Surface gouging will allow water to collect in the depressions to provide a minor amount of water for the wildlife on-site.

The drainage channel will be restored during the reclamation activities with a natural channel with a capacity capable of carrying the peak flow from the 100-year, 6-hour precipitation event and a capacity at least equal to the unmodified stream channel immediately upstream and downstream from the proposed disturbance.

As the natural channel is ephemeral and in a natural state of change, no riparian zone exists adjacent to the channel. The final reclamation seed mix will be applied to the channel slopes by hydro or broadcast seeding. A straw mulch and tackifier will be applied following application of the seed.

342.200 As the postmining land use will be for wildlife habitat and grazing, plant species were selected that have forage nutrition and cover value as well as being a competitive species in this environment.

WEST RIDGE Resources, Inc. has received comment from the Division of Wildlife Resources regarding additional wildlife enhancement measures. Their comments are contained in Appendix 3-6. WEST RIDGE Resources, Inc. has incorporated several of their suggestions in the permit application package. WEST RIDGE Resources, Inc. will continue to work with DOGM and DWR with regard to wildlife enhancement measures.

WEST RIDGE Resources, Inc. has consulted with DWR and BLM regarding off-site wildlife habitat enhancement measures to mitigate loss of habitat associated with the West Ridge mine project. DWR and BLM jointly concur that there are two potential mitigation projects. An area identified by the BLM as a potential for mitigation of the anticipated wildlife impacts would be located on public land at T 14 S, R 13 E, Section 22 and 23. Mitigation activities associated with this area would include the hand planting of approximately 320 acres with 150 seedling per acre. The species would be selected for their forage potential for area winter big game. The second action would be the installation of a guzzler to provide water for big game species in this area. WEST RIDGE Resources, Inc. is presently working with the BLM and DWR on the plans for performing the mitigation activities.

R645-301-353 REVEGETATION: GENERAL REQUIREMENTS

The proposed vegetative plan focuses on providing a varied and useful revegetation cover designed primarily for wildlife habitat and grazing. A fast growing, temporary stabilizing cover compatible with final reclamation and the natural vegetation of the area may be utilized as a nurse crop as well as to minimize erosion. The final seed mix is composed primarily of species that are presently native to the area, diverse, effective and permanent and useful for stabilizing the soil surface.

The selected species, other than those intended as a nurse crop, are: compatible with the approved postmining land use; have the same seasonal characteristics as the original vegetation; capable of self-regeneration and plant succession; acceptable with regard to state species laws or regulations; and desirable for erosion control and wildlife forage.

WEST RIDGE Resources, Inc. will investigate seed source to determine the seed best suited for the site based on its location of origin, elevation and variety. WEST RIDGE Resources, Inc. will try to obtain seed from the most similar of the region. Efforts will be made to ensure that the seed obtained is of high quality and in compliance with the Utah Seed Act. WEST RIDGE Resources, Inc. will require the supplier to provide the pure live seed rate as well as certification of origin.

Also included in the seed mix will be seed for Canyon Sweet Vetch (Hedysarum occidentale var. canone) collected from the vicinity of the mine. The seed will be added to assist in restoring this native sensitive species to the mine site area.

R645-301-354 REVEGETATION: TIMING

Areas to be revegetated will be seeded following regrading and retopsoiling activities but prior to late October. This will allow time to get the seed on the ground before winter snowfall makes the site inaccessible.

R645-301-355 REVEGETATION: MULCHING AND OTHER SOIL STABILIZING PRACTICES

Suitable mulch and other soil stabilizing practices will be used on regraded, retopsoiled areas as delineated for each site. A certified noxious weed-free straw will be utilized for mulch during final reclamation. Typically, the straw will be applied over seeded areas at a rate of 2,000 pounds per acre and tacked to the surface using mulch and tackifier.

Revegetated areas will be visually monitored on a quarterly basis, or following heavy storm events, for damage and erosion problems. Water will be diverted away from active rills and gullies. Erosion will be repaired if the gully is unstable and repair can be done without jeopardizing healthy vegetation.

Pest damage will also be evaluated during the quarterly inspection. Should a problem persist and endanger the viability of the entire revegetated area, a response appropriate for the situation will be initiated.

R645-301-356 REVEGETATION: STANDARDS FOR SUCCESS

Standards for reclamation success will be evaluated accordance with DOGM's "Vegetation Information and Monitoring Guidelines", Appendix A. The success of final reclamation will be judged on the effectiveness of the vegetation for the postmining land use and the extent of cover compared to the extent of cover for the reference area. Ground cover, production or stocking will be considered equal to the approved success standard when it reaches 90% of the success standard. Statistical adequacy of all statistical sampling will be determined using the following formula:

$$N_{min} - \frac{t^2\ S^2}{(dx)^2}$$

where: t = the value from appropriate t-table*, (2-tail test for pre-mine studies, 1-tail test for success studies)

s = the sample standard deviation,

d = the desired change in the mean,

x = the sample mean of the parameter in question

* = All parameters are to be tested at the 90% confidence level with a 10% change in the mean (d = .1).

Ground cover will be estimated by using one of the methods listed in "Vegetation Information Guidelines" Appendix A.

Production measurements will be made in accordance with DOGM's "Vegetation Information Guidelines" Appendix A. Estimates may be made by the methodology which the vegetation consultant feels is the most suitable method to used for the work being performed.

An evaluation of species composition will be made, including species present, form and diversity.

For a postmining land use of grazing and wildlife habitat, the ground cover and production will be equal to or greater that a reference area. The Division's "Vegetation Information Guidelines", Appendix A will be utilized for the evaluation of the success of revegetation. Appendix B will be references for calculating diversity.

For areas previously disturbed by mining activities that were not reclaimed to the requirements of the regulations, and will be reclaimed after proposed mining operations have ceased, the vegetative ground cover will not be less than the ground cover existing before redisturbance and will be adequate to control erosion.

Siltation structures will be maintained until the disturbed area is revegetated and stabilized. They will remain in place at least two years after the last augmented seeding. Siltation structures may include sediment traps, straw bales, silt fences or filter baskets. Removal will be contingent upon revegetation and stabilization of the area as well as DOGM concurrence. Following removal, the area of the sediment control structure will be revegetated in accordance with the reclamation plan.

R645-301-358 PROTECTION OF FISH, WILDLIFE AND RELATED ENVIRONMENTAL VALUES

The operator will attempt to minimize disturbance and adverse impacts to wildlife and related environmental values. No threatened or endangered species are known to exist in the permit area. No fish habitat exists in or near the permit area. The operator will report the occurrence of any state- or federally-listed endangered or threatened species located within the permit area of which the operator becomes aware. The operator will take appropriate precautions to eliminate the chance of taking of a bald or golden eagle, its nest, or any of its eggs.

No riparian or wetlands exist within the proposed permit area. No mitigation is being proposed.

Power lines within the permit area will be designed to be raptor-proof, thus minimizing the potential electrocution hazard to raptors.

Fences and overland conveyors will be designed to minimized their potential as barriers to large mammals. The sediment pond will not be fenced as it will not contain hazardous concentrations of toxic-forming materials.

~WEST RIDGE MINE - PERMIT APPLICATION PACKAGE~

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CHAPTER 4
R645-301-400 LAND USE AND AIR QUALITY

R645-301-410 LAND USE

Pre-mining land use of the C Canyon/West Ridge region in and around the permit area includes grazing, wildlife habitat, coal mining and recreational activities such as hunting. No agricultural activities have been or are currently being conducted in or around the proposed permit area.

Post-mining land use will be the same as those which existed prior to construction of the mine. Land use will include grazing, wildlife habitat, and recreational activities such as hunting.

~~NOTE: The following discussion for the remainder of R645-301-410 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 site is located in the Bear Canyon grazing allotment, and no change in grazing activity will result from the GVH installation. (Refer to Map 4.1)~~

~~The GVH site is located at the site of previous coal exploration drilling done in the early 1950's.~~

~~The site is located at the end of the Bear Canyon Road. This is a pre-existing road constructed in the early 1950's, and is a public road located on public land. The road has been upgraded to provide better year-around access to the GVH site. The improved road access will facilitate existing public uses of the area such as grazing management, big-game hunting, and other recreational pursuits, and on-going environmental monitoring associated with the West Ridge Mine operation. The road will be used on a daily basis by mine maintenance personnel.~~

~~It is SITLA's position that the road will be left in place (i.e., not reclaimed) to facilitate grazing management, hunting and other recreational use, mineral development, and other public multiple use (refer to correspondence in Appendix 4-8 and Attachment 9 of Appendix 5-14)~~

~~Class 3 (intensive) cultural resources surveys have been completed for both the GVH site and the topsoil storage site by Senco-Phenix Archeological Consultants. These surveys~~

~~conclude that, for both sites, *"no cultural resources were located and the potential for undetected remains is remote. A finding of no effect is appropriate and archeological clearance without stipulation is recommended."* Copies of these reports are included in Appendix 4-7 and also in Attachment 6 of Appendix 5-14, and will be transferred to the Confidential Binder after Division review.~~

~~Operational areas that are used by mobile equipment will be water sprayed to control fugitive dust. The application of water will be of sufficient frequency and quality to maintain the surface material in a damp/moist condition unless it is below freezing.~~

R645-301-411 ENVIRONMENTAL DESCRIPTION

411.110 Land use of the C Canyon/West Ridge region in and around the permit area consist primarily of grazing, wildlife habitat, coal mining and recreational activities such as hunting. No agricultural activities (other than grazing) are currently being conducted in or around the proposed permit area. This is primarily because of lack of an available water source and the steep, rugged terrain. Refer to Map 4-1, Existing Land Use, for the grazing allotment boundaries and existing land uses.

There is no evidence that the land use in this area has changed within the last five years prior to the submittal of this permit application.

Grazing allotments in the West Ridge region have remained the same for the last ten years or more. The permit area is located primarily within the Bear Canyon Allotment and, to a smaller extent, in the Grassy Trail and Mud Springs Allotments. The Mud Springs Allotment lies along the western sloping pediment surfaces of the Book Cliffs. The vegetation consists of native Pinyon-Juniper close to the cliff face and Grassland on the lower pediment surfaces. About 338 cattle use the allotment from October 20 - December 20 and April 10 - June 10, for a total of 2,314 AUM's. Water for the cattle is hauled to the northeast portions of the allotment. The Grassy Trail allotment lies to the south and east of the Bear Canyon allotment. The allotment is active from November 1 to March 31, with a total of 50 AUM's. The Bear Canyon allotment lies to the north and east of the Mud Springs Allotment. The allotment is used to graze 42 cattle from June 10 to October 31. This allotment contains 100 AUM's.

411.120 The land surface of the permit area consists of rugged, southwest-facing cliffs which are deeply dissected by steep ephemeral drainages. The elevation ranges from 6,800 near the minesite to 8,800 feet on top of the ridge two miles to the northeast. Large boulders and sandstone slabs from cliff weathering lie along the sides of the canyon bottoms. Given the rugged terrain and lack of available water in the region, this area has limited historical usage other than for wildlife habitat, grazing and coal mining.

The SCS performed a range capacity survey of the mine site area in 1985 and found the range condition to be fair with an estimated vegetation yield of about 300 pounds per acre of forage per year.

Due to the topography, limited available water resources, limited access and remote location, the capability of the land to support a variety of uses is limited. The narrow, steep topography of this area as well as lack of available water limits its use for agricultural or residential purposes. The greatest variety of compatible uses for this land is a combination of recreation, wildlife habitat, grazing and coal mining.

411.130 Carbon County's zoning classification for the mine area is Mining and Grazing. Carbon County has also issued a Conditional Use Permit to WEST RIDGE Resources, Inc. for a Major Underground And Surface Mine Development for the West Ridge mine in C Canyon. Grazing is the most pervasive existing use of the land in the West Ridge area. Previous mining activity also has taken place in B and C Canyons. The road along the bottom of C Canyon was first constructed in the mid-1950's for a drill site in the right hand fork. The road was improved again in 1985 to facilitate drilling equipment for a drill hole site also in the right hand fork. A road also leads up the left hand fork to the coal outcrop where the coal seam was exposed and coal was mined for testing purposes.

The BLM and SITLA are the land managers for most of the area. Within the permit area, most of the permit acreage is managed by the BLM and SITLA.. There is a small area of privately owned land (surface only) in the permit area on the east side. Also, the surface and subsurface of the proposed topsoil borrow area is owned by the School and Institutional Trust Lands Administration. Refer to Map 5-2.

411.140 Archeological investigations have been performed in the vicinity of the permit area in the past. Refer to Map 4-2, Archeology Map, for the locations of previous survey work. Appendix 4-3 includes information from previous survey work as well as a compilation of previously known archeological sites within and adjacent to the permit area. Detailed archeological ground surveys have been conducted at the mine site and topsoil borrow area by Senco-Phenix personnel. The surveys found no evidence of cultural resources within either of these proposed disturbed areas. Refer to the Senco-Phenix report which is included as Appendix 4-1. No sites eligible for the National Register of Historic Places were found within the proposed disturbed areas. Clearance letters from SHPO to the BLM and State School Trust can be found in Appendix 4-2. ~~Senco-Phenix has also prepared a cultural survey for the site of the GVH installation in the right Fork of Bear Canyon (see Appendix 4-7 and Attachment 6 of Appendix 5-14).~~

411.141.1 The locations of cultural and historical resources listed in the National Register of Historic Places and known archeological sites within and adjacent to the permit area are presented in Appendix 4-3. The file search was prepared by Senco-Phenix.

411.141.2 No cemeteries are located in or within 100 feet of the proposed permit area.

411.141.3 No land within the proposed permit area is within the boundaries of any units of the National System of Trails or the Wild and Scenic Rivers System.

411.142 As discussed under 411.140, no cultural resources of significance were located. SHPO has issued a determination of No Historic Properties for the proposed minesite and the topsoil borrow area.

No publicly owned parks or places listed on the National Register of Historic Places would be adversely affected by the proposed coal mine.

411.200 Previous Mining Activity

Previous mining and exploration activities have occurred with the proposed permit area within the last 20 years. In the mid-1950's, the road along the bottom of C Canyon was constructed to a drill site located in the right fork. The road was improved again in 1985 to facilitate drilling equipment for a water monitoring drill hole site in the right fork. Another road also leads up the left fork to the coal outcrop where the coal seam was exposed and bulk coal samples were collected for testing purposes. Coal was probably removed from the outcrop with hand tools or a front-end loader. The excavation indicates only a small amount of coal was previously removed. Coal was removed from the Lower Sunnyside Seam. Only a small amount of coal (less than one ton) was removed for testing purposes. The exact date of the coal outcrop excavation is unknown, but done sometime in the late 1960's or early 1970's. The land use prior to the outcrop excavation was the same a currently exists in the area, which is: wildlife habitat, grazing, and coal exploration and mining.

Mining has also occurred underground within this lease from the Sunnyside No. 2 mine. During 1959 and 1960 Kaiser Coal mined a two entry exploration section northwestward into the center of the coal lease (SL-068754), for a total distance of 11,000 feet along the strike of the Lower Sunnyside coal seam. A section was developed off from this main entry in which mining proceeded in an up-dip direction to the west for approximately 2,000' feet before breaking out in B Canyon. This breakout was utilized as an intake air portal until 1991 when the portal was sealed and backfilled. This mining was conducted utilizing continuous mining equipment, no longwall mining was done in this lease. Only development work was performed, no pillars were pulled. The land use in B Canyon prior to portal development was wildlife habitat, grazing and coal exploration and mining.

R645-301-412 RECLAMATION PLAN

412.100 Post mining land use will be the same as currently exists today, that being: wildlife habitat, grazing and limited recreational activities.

412.110 After all mining activity has been completed and the disturbed area regraded and reseeded, the site will enter a post reclamation phase. During the first ten years the site will be monitored for vegetative success and erosion control. The reclaimed, revegetated area may be fenced to discourage livestock grazing until final reclamation has been achieved and the reclamation bond released.

Support activities to achieve the postmining land use plan include: site monitoring, remedial actions including regrading, reseeding, remulching and replanting; and fencing as necessary to restrict access and grazing on the site until the reclamation bond has been released.

412.120 After the reclamation bond has been released, the property will be returned to the care of the surface land owner which in this case is the BLM and SITLA. Management of the site will be according to the BLM and SITLA's current range management plan for the region existing at that time.

412.130 Not applicable.

412.140 This postmining program is in accordance with the Carbon County and BLM management framework plans.

Based on the desire expressed by the BLM, SITLA or Carbon County, at the time of reclamation of the mine site, WEST RIDGE Resources, Inc. would agree to work with the BLM, SITLA and/or Carbon County to achieve future land use objectives.

412.200 Resumption of the original land use at the mine site should not need approval of the land management agency.

412.300 WEST RIDGE Resources, Inc. does not propose to leave fills containing excess spoil.

R645-301-413 PERFORMANCE STANDARDS

413.100 All disturbed areas will be restored to the conditions equal to or better than existed prior to disturbance.

413.200 Wildlife habitat and grazing will resume following reclamation activities of the mine site.

413.300 No alternative postmining land use is being proposed at this time.

R645-301-420 **AIR QUALITY**

R645-301-421 Coal mining and reclamation activities will be conducted in compliance with appropriate state and federal air quality regulations.

R645-301-422 The applicant is in the process of applying for an air quality permit from the Utah Division of Air Quality. The Air Quality Approval Order is included in Appendix 4-5.

R645-301-423 All mining will be conducted by underground mining methods. Efforts will be made through seeding, mulching and erosion control technologies to eliminate excessive fugitive dust resulting from erosion.

Areas where rills and gullies have formed will be repaired and reseeded as soon as possible with an interim or permanent seed mix.

Fugitive dust will be controlled by establishing temporary vegetative coverage where possible and by watering road and other unpaved surfaces frequently used by mine vehicles.

The air quality permit for the West Ridge Mine is included in Appendix 4-5. Mining activities will meet the requirements of the air quality permit issued by the State of Utah in accordance with applicable State and Federal air quality regulations.

<u>Climatological Information</u>

The U.S. Geological Survey's "Final Environmental Statement, Development of Coal Resources in Central Utah" (1979) provides climatological information for the region as well as for the C Canyon area. Daily climatic information is also collected at a National Weather Service station in Sunnyside, Utah.

Precipitation in the permit area consists of occasional winter snow, with an average annual accumulation of about one foot of snow and summer thundershowers which occur during July, August and September. Figure 7-1 in Chapter 7 shows the mean annual precipitation for the Sunnyside area to be about thirteen inches. Snow accumulation over the permit area varies with elevation, topography and aspect. At the mouth of Whitmore Canyon, elevation 6750, snow accumulations range from 0 to 21 inches during October through March while snow accumulations at an elevation of 7,280 ranged from 0 to 50 inches. Mean, minimum and maximum daily snow accumulations have been collected and compiled for a 10 year period for years 1973 through 1983 and are presented below.

SNOW ACCUMULATION 1973-1983 (Inches)

	Maximum	Mean Maximum	Mean Daily
October	6.5	1.35	0.73
November	6.0	1.69	0.28
December	14.00	4.42	1.73
January	21.00	9.86	4.01
February	21.00	6.44	2.84
March	15.00	5.30	0.60

Ground accumulations of snow are characteristically of short duration due to melting and sublimation.

Temperature ranges of the permit area are typical for the semi-arid region. Colder temperatures would be encountered above 8,000 feet above the mine site.

The pan evaporation rate for the area is 0.69.

Wind

Canyon topography dominates both wind direction and speed. The wind high in the atmosphere tend to be strong but decease toward the surface where obstructions and surface friction come into play. Thus high ridges and plateaus will generally have stronger winds than the valleys. Upper level winds, 1,600 feet or more above the ground level, are generally from the southwest during most of the year. During the winter, air flow from the northeast is more common.

Night air flow in the region is primarily drainage controlled, generally following the canyon bottoms from the mountains down to the valleys. Wind speed is induced by decent of colder air and is generally light. The daytime flow is strongly influenced by surface heating effects which result in mixing between the surface and upper flows. There is a general air flow toward the north and northeast during the day, and movement toward the southwest away from the high surface elevations during the night. Winds are usually light to moderate (less than 20 mph) unless influenced by localized thunderstorms or moving frontal systems.

The area around the permit area has been designated as a Class II air area for the purpose of determining significant air quality deterioration. The mine will not have a wash plant or coal processing plant. The conveyor belt leading across the yard to the coal pile will be covered. Parking areas and roads will be paved to control dust. Gravel areas will be sprayed with a chemical surface stabilizer, such as potassium chloride, or sprayed with water to control dust during prolonged dry spells. Refer to R645-301-526.400 for a complete discussion of the air quality control measures proposed for the West Ridge Mine.

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~~*Not included on disk~~

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.

Historical Note 4: In 2010, The Bear Canyon GVH Plan was approved by the Division to degas sections of the underground workings. In April, 2011 the company applied for an amendment of the MRP to add two additional GVH holes (GVH 4 and GVH 5) to the Bear Canyon GVH installation. In 2017, the Bear Canyon GVH Project was no longer needed, and a Post-Mine Land Use agreement with Global Carbon Strategies was begun. At this time, all GVH related information and appendices were removed from the MRP.

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 upper casing, but will not be grouted so that it can move with any additional subsidence.~~

~~Before construction starts identification signs will be posted at the site. These signs will list the company name as permit holder, the permit number, address and phone number. During the initial phase of construction, topsoil will be salvaged. Based on a recent Order 1 soils survey the current estimate of topsoil to be salvaged is approximately 515 cubic yds. (See Appendix 2-10 and also Attachment 2 of Appendix 5-14.). After the topsoil has been removed, the slope will be excavated back for a distance of about 20', leaving a 1:1 cutslope against the hillside. Based on current surveys it is estimated that about 1,357 total yds of material will be excavated from the bank. This includes the estimated 515 yds of topsoil, so the remaining amount of excavated material will be about 842 yds (see Cut Slope Excavation Volumes, Attachment 1 of Appendix 5-14 for details). Material excavated from the cutslope will be used to level off the area for the drillhole (for the drilling operation) and for the individual methane extractor units. Excess material may be used to raise the grade of the adjacent roadway. All fill areas will then be compacted for stability.~~

~~During the drilling phase of the GVH installation, the pad area will be used as an equipment lay-down area for drill steel, drill casing, drilling mud, concrete, etc. The pad will also be used to accommodate the mud pits needed during the drilling operation. The mud pit will measure approximately 30' long x 10' wide x 10' deep, and will be located immediately down-canyon, i.e., southwest of, the drillholes, as shown in Attachment 1. The pit will be lined with a 12 mil plastic liner, with a 20 mil felt underlayment. Based on the diameter and total combined length of the drillholes, and assuming a swell factor of 40% for the cuttings, the estimated volume of cuttings is 1283 cubic feet, or 47 yds. This would result in a total depth of cuttings remaining in the bottom of the pit of 4.28 ft. After the drillholes have been completed the remaining cuttings will be mixed with native material until it can be handled with heavy machinery. It will then be removed from the pit and hauled off-site to an approved disposal facility.. After the cuttings have been removed, the pit will be backfilled and eliminated. The site will then be cleaned up and fine-graded prior to installing the methane extractor units (see Attachments 1 and 7 of Appendix 5-14 for details).~~

~~After the cutslopes have been excavated, the slopes with be reclaimed (interim reclamation) by pocking, re-seeding and applying a layer of wood straw as described above. A disturbed area drainage ditch will be constructed along the toe of the cut. This ditch will be designed to handle the flow from the up-slope undisturbed area, the reclaimed cutslope, the drillpad, and the adjacent section of road. Runoff from the ditch will be routed through a series of sediment-control structures (silt fences, excelsior logs, etc.) to effectively remove sediment. (A more detailed description of the sediment control measures associated with the site can be found in the Chapter 7,~~

~~Hydrology discussion of Appendix 5-14.)~~

~~A security fence may be installed around the perimeter of the pad between the facilities and the road.. The facilities will not encroach upon nor affect the road nor the road turn-around, and neither will public use of the road be affected. The Company will provide the Division with an as-built drawing of the facility upon completion of construction.~~

~~Operation of the GVH facility is expected to continue for the life of the West Ridge operation. Therefore, reclamation of the site will be done at the same time and under the same conditions as for the minesite surface facilities in C Canyon. However, if temporary cessation of mining operations occurs, the GVH well will continue to function.~~

~~Prior to final reclamation, all drillholes will be plugged and sealed in accordance with State and Federal regulations. The casings will be plugged at the bottom to hold the concrete. A lean concrete mixture will be poured into the casing until the concrete is within five (5) feet of the surface. At that time the casing will be cut off at ground level and the rest of the casing will be filled with lean concrete. The concrete will be allowed to harden before final reclamation is completed. There will be three drillholes installed and therefore plugged at reclamation. (This commitment is identical to the currenty approved plan for the Tower (Centennial, C/007/014) GVH reclamation plan.) Based on current projections the holes will be drilled at 45 degree angles into the mine, and will have individual depths (lengths) of 504', 376', and 502', for a combined total depth of 1382'. Using 9-5/8" casing for all holes, the volume of concrete needed to plug all three holes would be 26 cu. yds.~~

~~On final reclamation, the pad area and cutslopes will be backfilled to approximate original contour (see Reclamation Contours, Attachment 1 of Appendix 5-14). Fill material will be obtained from the adjacent roadway and leveling pads. This is the exact same material that was excavated from the cutslope during initial construction. The cutslope will be backfilled in 18"-24" lifts and compacted with rubber-tired vehiclesand/or vibratory mechanical equipment. The reclaimed slopes, at approximate original contour, will average about 1.5: 1, so slope stability will not be an issue. Because of the compaction in lifts, and the rocky nature of the backfill material (one and the same as the original native material), stability of the reclaimed slopes is sufficient to achieve approximate original contour and eliminate the potential for remnant cutslope exposures. A slope stability analysis prepared by Blackhawk Engineering concludes that~~ ~~*"calculations show safety factors well in excess of the required 1.3 for the reclaimed cut slopes of 1.5H:1V and up to 30' in height. This is not inconsistent with the natural conditions of the area, and will allow for complete reclamation of all cut slopes created by the emergency drilling pads."*~~ ~~(See Attachment 8 of Appendix 5-14 for the complete slope stability analysis report.) The slope will then be re-topsoiled and re-vegetated according to the same existing approved plan for the minesite in nearby Canyon, as specified in R645-301-341, and as described in the Chapter 3, Biology discussion in Appendix 5-14.~~

~~The amount of backfill material is estimated to be up to 842 cubic yards, and the amount of replaced topsoil is estimated at about 515 cubic yards. Total reclaimed area, including both pad and cutslopes will be approximately 0.24 acres. Because the cutslopes are only about 20' maximum high, all work, both backfilling and topsoil replacement, can easily be done from the existing adjacent road-pad surface, using trackhoes with sufficient boom reach. After the reclaimed slopes have been topsoiled and reseeded, a row of excelsior logs will be installed along the full length of the toe of the slope between the slope and the remaining road. The purpose of this row of excelsior logs is to control sediment of the site until the revegetation has become established.~~

~~Bonding and reclamation costs for the Bear Canyon GVH installation can be found in Appendix 5-14 in the Chapter 8, Bonding discussion.~~

~~*HISTORICAL NOTE: The preceeding discussion of the Bear Canyon GVH was approved by the Division on May 25, 2010, as was Appendix 5-14 which described the GVH installation in detail. In April, 2011 the company applied for an amendment of the MRP to add two additional GVH holes (GVH 4 and GVH 5) to the Bear Canyon GVH installation. Complete details of the GVH 4 and 5 amendment can be found in Appendix 5-14A, which is an addendum to the approved GVH Appendix 5-14.*~~

R645-301-512 CERTIFICATION

512.100 Cross Sections And Maps

Maps, cross sections, figures and tables which require certification will be certified by a qualified, registered, professional engineer or land surveyor.

Cross sections, maps and drawings will be certified prior to determination of completeness for the permit application.

512.200 Plans And Engineering Designs

A qualified registered professional engineer will certify plans and designs for impoundments and primary roads. No excess spoil or durable rock fill designs are proposed.

R645-301-513 COMPLIANCE WITH MSHA REGULATIONS AND APPROVALS

513.100 MSHA regulations 30 CFR 77.216-1 & 30 CFR 77.216-2 do not apply as no coal processing dams or embankments are being proposed.

513.200 MSHA regulation 30 CFR 77.216 (a) does not apply because of the restricted size of the sediment ponds and low hazard potential.

513.300 No coal processing waste is proposed to be disposed of in underground workings. Refer to R645-301-528.321.

513.400 No refuse piles are being proposed.

513.500 Upon completion of final mining activities, any shafts, drifts, exploratory holes or entryways from the surface will be capped, sealed, backfilled or otherwise properly managed consistent with MSHA, 30 CFR 75.1771. All exploration holes will be filled with concrete.

Mine portals will be sealed by constructing a concrete block stopping at least 25 feet in from the surface opening and backfilling the 25 feet of the entry from the surface opening to the stopping with incombustible earth materials. The area in front of the portal will be backfilled and graded to approximate original contour using materials stored in the mine pad fill. Topsoil will be applied on the regraded fill. The surface will then be seeded and mulched.

513.600 No discharge into an underground mine is proposed, therefore MSHA approval is not required.

513.700 No surface mining is proposed in the permit area. No surface mining is proposed for areas within 500 feet of an active underground mine.

513.800 Not applicable.

R645-301-514 INSPECTIONS

All engineering inspections, other than those inspections to be done by a qualified person designated by the operator, will be performed by a registered, professional engineer or other qualified specialist under the direction of the professional engineer.

514.100 No excess spoil is anticipated at the proposed underground mine site.
A soil scientist will be on-site during final reclamation to oversee topsoil redistribution.

514.200 No refuse piles are being proposed.

514.300 Impoundments

Properly sized sediment control facilities will be constructed below the mine yard. Inspection of the sediment ponds will be made on a regular basis by a professional engineer or specialist during construction, upon completion of construction and once per year until the structures are removed or the performance bond has been released.

A registered, professional engineer will provide a certified report to DOGM after each inspection stating if the impoundment has been constructed and maintained as designed. The report will discuss, if detected, any sign of instability, structural weakness (or other hazardous condition), depth and elevation of any impounded water, existing storage capacity, and existing or required monitoring procedures and instrumentation. A copy of the report will be kept on file at or near the mine site.

In addition to the above certified annual inspection and report, the sediment pond will be inspected on a quarterly basis by a qualified person designated by the operator. Any appearance of structural weakness or other hazards will be recorded. See R645-301-515-200 for the reporting procedures if a hazard is found. A copy of the report will be kept on file at or near the mine site.

Weekly inspection requirements of MSHA, 30 CFR 77.216 do not apply due to the size of the sediment control structures and low hazard potential. See R645-301-533-600.

R645-301-515 REPORTING AND EMERGENCY PROCEDURES

515.100 Should a landslide occur which may have a potential adverse effect on public property, health, safety or the environment, WEST RIDGE Resources, Inc. will notify the Division by telephone and comply with required remedial measures.

515.200 Impoundment Hazards

If any examination or inspection discloses that a potential hazard exists for the sediment pond or other facilities which impound water that warrant initiation of emergency procedures, the person making the examination will promptly inform the Division of the finding and of the emergency procedures formulated for public protection and remedial action. Emergency procedures would include immediately notifying those individuals on site responsible for performing the necessary remedial action.

515.300 Procedures For Temporary Cessation Of Operations

Before temporary cessation of coal mining and reclamation operations for a period of 30 days or more, or as soon as it is known that a temporary cessation will extend beyond 30 days, WEST RIDGE Resources, Inc. will submit to the Division a notice of intent to cease or abandon operations. The notice will include: a statement of the exact number of surface acres and the horizontal and vertical extent of subsurface strata which have been in the permit area prior to cessation or abandonment; the extent and kind of reclamation of surface area which will have been accomplished; and identification of the backfilling, regrading, revegetation, environmental monitoring, underground opening closures and water treatment activities that will continue during the temporary cessation.

Support and maintenance of all surface access to underground operations and surface facilities will continue. Temporary cessation will not relieve any obligation to comply with any provision of the approved permit.

R645-301-520 OPERATION PLAN

R645-301-521 GENERAL

WEST RIDGE Resources, Inc. holds federal, state and fee coal leases SL-068754 and UTU-75862, state leases ML 47711, ML 49287 and ML 51744, and the Penta Creek fee lease, totaling 7796.7 acres in the West Ridge area of eastern Carbon County. Much of the Penta Creek Fee Lease, is not included within the permit area at this time and cannot be mined until the permit is amended. Refer to Map 5-4B, Mining Projections - Extended Reserves.

The mine, consists of one longwall and two continuous miner sections. The mining sequence is shown on Map 5-4A, Mining Projections. Initial mine production will come from reserves located in the southeastern portion of the existing lease area. Panels will be developed to the north and south of the mains, progressing in an eastward direction. With the existing leases, the projected life of the West Ridge Mine is 15 years. After the economically recoverable reserves within the permit area have been depleted, the portals would be sealed and reclamation of the surface facility area would begin unless additional leases were acquired.

Surface facilities will be located in C Canyon, where the left and right forks converge, in a previously disturbed area. The extent of the previous disturbance includes access roads, outcrop excavations and exploration drill holes. Previous disturbance at this site is estimated to be approximately 1.62 acres. The total proposed surface disturbed area, as delineated by the tan line on the maps, amounts to approximately 29 acres. Actual anticipated disturbance for surface facilities and topsoil stockpiles (within the disturbance area) is estimated at 26.02 acres. This includes approximately 0.79 acres of Carbon County road which has been included in the disturbed area down to the C Canyon gate, and 0.23 acres for the pumphouse area located below the minesite.

An alternate (substitute) topsoil borrow area would be located about 1 ½ miles to the west of the proposed mine site on a ten acre parcel of State School Trust land. This area would not be included unless needed for final reclamation. No surface disturbance would take place at this location until the time of final reclamation. No additional acreage should be required for the project as proposed in this permit application.

521.100 Cross Sections And Maps

The lease area is located northwest of the old Sunnyside No. 1 underground mine workings. The lease was, at one time, held by U.S. Steel Corp., who authorized Kaiser Coal Company to extend a set of test entries from the Sunnyside No. 1 mine part way through the lease. These test entries were driven to the surface in B Canyon. The portal for this test entry breakout exists presently although it has been sealed. B Canyon is located approximately one mile southeast of C Canyon where the surface facilities for the West Ridge Mine are being proposed. The extent of the underground test entry development within the lease is shown on Map 5-7, Subsidence Map. The old Sunnyside Mine test entries driven north into the proposed permit area were mined in 1959 and 1960, are now inactive and sealed to prevent public access.

The proposed surface facilities are to be situated in C Canyon. north of the old underground mine workings in the Sunnyside No. 1 Mine. The location of the old workings with respect to the proposed development is shown on Map 5-4A. Map 5-1, Previous Disturbance, shows the areal extent of the previous surface disturbance in C Canyon.

521.120 Existing Surface And Subsurface Facilities And Features

No surface or subsurface features, such as commercial buildings, transmission lines, pipelines, or agricultural related features, exist in or near the proposed permit area. Refer to Map 4-1. A pre-mining (pre-subsidence) survey was conducted prior to mining operations, which included the area of lease UTU-78652. Refer to Appendix 5-8. A recreational cabin (seasonal occupation) and trailer are located in Spring Canyon in the northern part of the permit area. In this area, the depth of cover exceeds 2500'. Within 18 months prior to longwall mining in this area a pre-subsidence survey of the cabin/trailer will be conducted. The location of this cabin is shown on Map 4-1, 5-2 and 5-7.

Man-made features in or near the proposed permit area consist primarily of roads. Refer to Map 4-1. Several small roads exist within the permit area. These roads are Carbon County RS2477 roads. They are used primarily to access the top of West Ridge by ranchers in the area.

Approximately 960' of the existing Carbon County road into “C” Canyon has been added to the West Ridge Mine permit and included as disturbed area. The addition of this portion of road was necessitated by the placement of a gate (owned by Carbon County) to allow for better visibility and turnaround area for the public during those times when the gate is closed by the operator.

Roads that lie in or within 100 feet of the proposed permit area are depicted on Map 4-1.
No spoil, waste, noncoal waste, dams, embankments, sediment pond, water treatment or air pollution control facilities exist within the proposed permit area. A small portion of the Grassy Trail Reservoir (less than 0.6 acres) lies within a corner of the

permit area.

521.130 Landownership And Right Of Entry Maps

Ownership boundaries and the names of the present owners of record for surface lands as well as underground are depicted on Maps 5-2, Surface Ownership and 5-3, Subsurface Ownership.

Map 5-4B delineates the federal coal lease SL-068754 and UTU-78562, state lease ML 47711, ML49287 and ML 51744 and the Penta Creek fee lease, totaling 7796.7 acres held by WEST RIDGE Resources, Inc., which is the area for which WEST RIDGE Resources, Inc. Resources has the legal right to enter and begin coal mining and reclamation operations. Much of the Penta Creek Fee Lease is not included within the permit area at this time.

Included in Appendix 5-2 is a letter from Carbon County granting WEST RIDGE Resources, Inc. permission to conduct mining operations within 100 feet of the Carbon County road. This would basically be that segment of road where the road enters the mine facility area.

Also included in Appendix 5-2 is an approval letter from Carbon County, allowing for the periodic closure of approximately 960' of the "C" Canyon Road from the gate to the original mine permit area. The permit area has been extended to the gate, as shown on Plate 4-1.

A public notice has been published providing for request for a public hearing as provided in R645-103-234. A copy of this notice is also included in Appendix 5-2.

521.140 Mine Maps And Permit Area Maps

The permit area proposed to be affected by the coal mining and reclamation operation is shown on Map 5-3. Permit renewals will be reapplied for on five year intervals.

521.141 The mining operation has been divided into five year mining blocks in an attempt to show future areas that will be mined under the permit renewals. The mining blocks are shown on Map 5-4B. All projections and timing are preliminary and general in nature and may change in the future depending on mining, marketing, environmental conditions and/or acquisition of additional state and federal reserves.

Surface support facilities in C Canyon will be utilized for the life of mine operations. The proposed mine surface facility area is depicted on Map 5-5, Surface Facility Map. Reclamation of the facilities will be performed following completion of mining activities and sealing of the portals.

521.142 The surface above mined out longwall panels may be subject to conditions associated with subsidence. Subsidence may occur under the mined out area.

Map 5-7 identifies the mining area for which planned subsidence mining methods will be used. Based on experience at other nearby mines located in the Book Cliffs (i.e. Soldier Creek, Sunnyside and Andalex Tower), a conservative angle of draw of 20 degrees was used to project the maximum extent of subsidence.

521.143 No underground development waste or excess spoil will be stored at the mine site.

521.150 Land Surface Configuration Map

Map 5-1 represents the existing land surface configuration in the proposed disturbed area. Areas of previous disturbance exist within the proposed disturbed area. These are shown on Map 5-1 and involve approximately 1.62 acres. Map 5-1 extends at least 100 feet beyond the area to be disturbed. Map 5-5 depicts the disturbed area boundary with regard to the proposed structures and facilities. All previous disturbance will be included within the proposed disturbed area boundary and included within the reclamation plan. The proposed disturbed area boundary is depicted on most 1" = 100' scale drawings regardless of subject covered.

521.160 Maps And Cross Sections Of Proposed Features For The Proposed Permit Area

Buildings, utility corridors and facilities, to be constructed and used in conjunction with the mine, are shown on Map 5-5.

The proposed surface disturbance area is shown on Map 5-5. This exhibit depicts the maximum potential disturbance around the facilities that would be used for the life of the mine. The proposed maximum disturbance area amounts to approximately 29 acres. This is composed of the anticipated on-the-ground disturbance (projected at about 25 acres) plus extra buffer acreage around the perimeter of the facility which would remain undisturbed. The proposed disturbed area will be the total disturbance needed for the life of the mine. The actual disturbed area will be reclaimed following the completion of underground mining activities.

The area to be affected during the permit term according to the mining sequence is depicted on Map 5-4A.

A bond will be posted for reclamation of the disturbed area acreage depicted on Map 5-5.

The coal pile area, truck loadout and associated facilities are shown on Map 5-5.

Noncoal waste will be stored in the main storage area immediately southwest of the shop area, as shown on Map 5-5. The locations of the fuel storage facility is shown on Map 5-5. The proposed topsoil stockpiles are shown on Map 2-4. Cross-sections for the topsoil stockpile areas are presented on Map 2-4 as well.

The explosive storage and handling facility and the sediment pond are depicted on Map 5-5.

Map 7-2 depicts the location of the main undisturbed area bypass culverts. Additional details on the mine yard drainage control structures are shown on Map 5-8, Undisturbed Drainage Culvert Profile. Refer to Map 5-8 for the bypass culvert slope and length. These culverts have been sized to pass the 100 year/6 hour event. Refer to Table 7 in Chapter 7, Appendix 7-4.

The pump house area below the minesite is shown on Plates 1-1 and 5-14.

521.170 Transportation Facilities Map

Transportation of the coal from the mine site to shipping points will be by truck. WEST RIDGE Resources, Inc. proposes to use a Carbon County public road for access to the mine site from State Highway 123.

521.180 Support Facilities

No additional support facilities will be constructed within the permit area.

521.200 Signs And Markers

Signs and markers will be posted, maintained, and removed by the WEST RIDGE Resources, Inc. Signs and markers will be a uniform design that can be easily seen and read, will be made of a durable material, and will conform to local laws and regulations. Signs and markers will be maintained during all activities to which they pertain.

Mine and permit identification signs will be placed at each point of public access to the permit area from public roads. The mine and permit identification sign(s) will indicate the permittee's name, address, phone and permit number. The signs will be retained until after release of all reclamation bonds for the permit area.

521.250 Perimeter Markers

A suitable marker (such as a red or yellow steel, wood or fiberglass post or brightly colored rope tied around a tree trunk) will be used to mark the perimeter of the disturbed area prior to conducting mining activities. The proposed disturbed area is depicted on most of the 100 scale maps regardless of subject covered by each map.

521.260 Buffer Zone Markers

By regulatory definition (i.e. drainage area greater than one square mile) the left fork of C Canyon is classified as an ephemeral drainage as it has a drainage area of 231 acres. The right fork is classified as an intermittent drainage by regulatory definition. The drainage are for this fork is just over one square mile, at 687 acres. A stream gauge located in the right fork channel never detected any channel flow even during heavy precipitation events in the summer of 1997.

The right and left fork drainages will be culverted beneath the mine yard facilities; flows will be released down stream from the mine office pad. A sediment pond will be used to treat site drainage to prevent intermingling with the undisturbed area drainage. A stream buffer zone sign will be posted at the upper end of the right fork of the mine yard and below the office pad to indicate a stream buffer zone.

521.270 Topsoil Markers

Signs will be posted to identify stockpiled topsoil materials.

R645-301-522 COAL RECOVERY

A Resource Recovery and Protection Plan (R2P2), has been approved by the BLM. The R2P2 will assure that coal mining and reclamation operations are conducted so as to maximize the utilization and conservation of the coal, while utilizing the best technology currently available to maintain environmental integrity, so that reaffecting the land in the future through coal mining and reclamation operations is minimized. Refer to Appendix 5-3, 5-3A, 5-3B and 5-3C for the R2P2 which includes a discussion of coal resource utilization and conservation. The Utah School and Institutional Trust Lands Administration (SITLA), with concurrence from the BLM, has approved the mining plan for all State Leases (see Appendix 5-10).

R645-301-523 MINING METHODS

Both longwall and continuous miner methods will be employed to recover the coal resource. Longwall will be the primary production method, while continuous miners will be used mainly for mine development to support the longwall. The longwall panels shown on Map 5-4B have been laid out to maximize recovery of the primary coal reserves. Continuous miners will be utilized to develop main entries, longwall gate entries, sumps and other similar development areas.

Initial mine production has come from reserves located in the southeastern portion of the existing lease area. Panels will be developed to the north and south of the mains, progressing in an eastward direction. Longwall panel layout may change depending on conditions encountered in the underground workings.

The projected life of the West Ridge Mine is 15 years. Acquisition of additional federal coal reserves in the West Ridge area would extend the life of the mine beyond 15 years. In the unlikely event that non federal reserves cannot be acquired then the mine plan projection will be altered to maximize the economic and recovery of federal coal in the irregular blocks not amenable to mining. After the economically recoverable reserves within the lease area have been depleted, the portals would be sealed and reclamation of the surface facility area would begin unless additional leases were acquired.

The West Ridge mine is being proposed as an average size underground longwall mine by Utah industry standards, producing at an average rate of about 3 million tons per year. Mine production is subject to normal fluctuations depending on operational variables such as geologic mining conditions, marketing, equipment availability, and/or worker productivity. The mine is expected to produce about 42 million tons of coal from the existing leases. The existing mine plan assumes that mining in the area northeast of Whitmore Canyon will be limited by heavy cover (plus 3000'). However, if conditions allow, mining activity will continue as far as possible in this direction on federal coal which would be leased in the future.

Full production could be reached by a gradual buildup during the first two years of mining. See Map 5B for mine projections and timing information for the future expanded mining area.

Major equipment for the mine will include:

Continuous Mining System:

Drum-Type Continuous Mining Machine
Shuttle Cars
Roof Bolter
Diesel Scoop Tractor
Feeder Breaker
Section Power Center
Section Auxiliary Face Ventilation Fan

Longwall Mining System:

Double Drum Shearing Machine
Armored Face Conveyor
Hydraulically Activated Shield Roof Support
Armored Stage Loader and Crusher
Longwall Power Center
High Pressure Hydraulic Pumping System

No surface coal mining (strip mining) will be done.

All mining will be done in accordance with the provisions of the approved R2P2 and the terms and stipulations of the federal and state leases within the West Ridge mining area. Stipulation 17 of federal lease UTU-78562 has been complied with. A seismic analysis report of the Grassy Trail Dam and Reservoir has been completed and BLM has determined that the seismic/subsidence effects of longwall mining on the Grassy Trail dam and reservoir have been satisfactorily addressed. The BLM has approved the R2P2 to allow full extraction longwall mining in panel #7. BLM has also approved longwall mining of panels 18, 19 and 20 on federal lease UTU-78562.

R645-301-524 BLASTING AND EXPLOSIVES

For surface blasting incident to underground mining, R645-301-524.100 through R645-301-524.700 are required to be addressed. Blasting will be utilized when necessary during the construction phase of the mine site. Blasting will not be used routinely during the operation or reclamation phase of the mining operations and will not be used as a method of coal extraction.

524.100 All surface blasting incident to underground mining operations will be conducted under the direction of a certified blaster. The blaster will have a current certification or recertification.

Certificates of blaster certification will be on file at the permit area during blasting operations.

A certified blaster and at least one other person will be present at the firing of a blast. The blaster will be familiar with the blasting plan and site-specific performance standards.

524.200 Submittal of blast designs for shots using more than 5 pounds of explosives will be made to the Division for approval prior to conducting surface blasting at the mine site. A schedule will be presented to DOGM prior to conducting blasting activities. The blast design will be prepared and signed by a certified blaster.

Once construction is completed and the mine is in operation, no surface blasting should be necessary.

524.300 A preblasting survey should not be necessary because there are no residents, dwellings or other structures located within one-half mile of the permit area.

524.400 Blasting Schedule

Blasting will be performed, as needed, during the earthwork phase of the minesite construction. The operator will use audible signals to notify those in the vicinity immediately before the blast. No residents live within one-half mile of the proposed blasting site. All blasting will be conducted between sunrise and sunset.

If the blast utilize more than five pounds of explosives, a blast design with a sketch of the drill patterns, delay periods and decking will be submitted for approval. The plan will indicate the type and amount of explosives to be used, critical dimensions, and the location and general description of structures to be protected as well as design factors to protect the public and meet applicable airblast, flyrock and ground vibration standards.

The operator will notify the Carbon County Sheriff's Department, East Carbon City and Sunnyside by phone at least 24 hours to conducting any blasting.

524.500 Blasting Signs, Warnings And Access Control

Signs reading "Blasting Area" will be placed along the edge of any blasting area within 100 feet of the public road right of way and at the point where the road provides access to the blasting area.

At all entrances to the permit area by public road signs will display the message "Warning! Explosives In Use" and describe the audible blast warning and marking of the blasting area.

Each person within the permit area will be notified of the meaning of the blasting signals.

Access within the blasting area will be controlled to prevent the presence of livestock or unauthorized persons during blasting operations.

524.600 Control Of Adverse Blasting Effects

Blasting will be conducted to prevent injury to persons, damage to public or private property outside the permit area, adverse impacts on any underground mine, and change in the course, channel, or availability of surface or ground water outside the permit area. Because of the remoteness of the blast site, it is unlikely that damage to property will occur. Access to the area will be restricted to only those personnel necessary to perform blasting activities.

524.700 Records Of Blasting Operations

Blasting records will be maintained at the mine site for at least three years and will be available for inspection by the Division or the public. Blasting records will contain the following information:

- Name of the operator conducting the blast
- Location, date, and time of the blast
- Name, signature and certification number of the blaster conducting the blast
- Identification, direction, and distance from the nearest blast hole to the nearest

dwelling or building outside the permit area

- Weather conditions
- A record of the blast including: type of material blasted; sketch of the blast pattern including number of holes, burden, spacing, decks, and delay pattern; diameter and depth of holes; types of explosives used; total weight of explosives used per hole; maximum weight of explosives detonated in an eight-millisecond period; initiation system; type and length of stemming; mats or other protection used.

524.800 Utah and federal laws and regulations in the use of explosives

WEST RIDGE Resources, Inc. commits to comply with all Utah and federal explosive use laws and regulations.

R645-301-525 SUBSIDENCE

525.100 Subsidence Control Plan

Structure and Renewable Resource Survey, Effects and Mitigation.

A survey of the proposed permit area for renewable resource lands has not found any agriculture or sylviculture conducted within or adjacent to the area. There is no food or fiber production within the permit area. The area is primarily used for wildlife habitat and grazing lands.

Seeps and Springs

A ground survey was conducted in September 1985 and also in May and October of 1997. Relatively few spring were found on the west face of West Ridge, probably due to the steep dip of the beds away from the cliff line. More seeps and springs were found on the down-dip side of the ridge. These seeps and springs within the permit area were found to be associated with perched aquifers in the immediate area. Almost all of the springs produced flows of less than 10 gpm. Ground water movement within the permit area moves from areas of high elevation where recharge occurs downgradient in the direction of the slope of the beds. Fractures and local variations in permeability can create an advantage for precipitation infiltration. In alluvial and colluvial deposits, movement of the unconfined water is controlled by the extent of the alluvium or colluvium. Water flows through the unconsolidated material until a less permeable zone is reached, causing the water to emerge at the surface as a seep or spring. Some water may percolate down through cracks into the deeper, consolidated rock thereby becoming a perched aquifer. Movement continues to occur in a downdip direction between beds of less permeable material such as shale or mudstone. The shale and mudstone units typically occur as laterally discontinuous deposits. Water builds up in the permeable bed as the extent of the sandstone unit pinches out.

If the sandstone unit is exposed at the surface, water emerges from the containing bed on top of the confining unit as seen by springs in the Colton, North Horn and Price River Formations. Perched aquifers discharging at either surface springs where a sandstone overlies a less permeable shale bed, or, where the down-dip edge of a less permeable bed ends wither in the sub-surface or in contact with alluvial or colluvial deposits. Approximately 35% of the springs and seeps identified in the spring 1986 spring and seep survey occurred from sandstone/shale interfaces either at or near the surface or surface deposits. Few springs or seeps were found to be discharging from consolidated aquifers.

In the fall of 1985 and spring of 1986, a seep and spring survey was done on West Ridge to evaluate the density of springs over a mined out area compared to the permit area which had not been mined. The seep and spring density was found to be roughly the same. The mined out area had a density of 21.1 springs and seeps per square mile producing an average of 74.8 gpm/sq mi compared with 22.4 springs and seeps per square mile in the unmined area, producing an average of 79.3 gpm/sq mi. This information indicates that subsidence from mining in the existing Sunnyside Mines has produced no quantifiable difference in flow of seeps and springs on the west side of Whitmore Canyon.

This is particularly valuable information as it substantiates experience with subsidence effects at an adjacent mined area with the same geologic conditions. Observations at the Sunnyside Mines and also above coal mines in the Wasatch Plateau show that subsidence occurs over longwall panels. However, at some distance above the mined out area, the beds no longer break but deform in a more plastic manner which does not disrupt the functionality of the aquifers and aquitards.

Beyond nine coal seam thicknesses above the extracted coal seam the strata behaved like an intact unit. The strata deflected into the rubbled area by bending rather than breaking. This information indicates that at some distance above the extracted longwall panel, the strata will deform plastically rather than experience a caving style subsidence. And although there may be perched aquifers visible as seeps and springs above the mining area, the perched aquifers and aquitards will remain intact following mining. There may be a transitory phase during which tension cracks may form, but over all, the aquifers over ten seam thicknesses above the mined out area will not be affected.

An additional geologic factor which will tend to mitigate the effects of subsidence on the upper layers of overburden is the Castlegate Sandstone. The Castlegate Sandstone is a thick, massive, high strength unit which occurs over the entire permit area. The Castlegate ranges in thickness from 120 to 230 feet thick and lies between the coal seam to be mined and the surface beds containing the seeps and springs. Because of its great thickness and high strength, the sandstone will tend to distribute stresses more evenly at the edge of the subsidence zone and will more greatly increase the radius of curvature for the beds above the Castlegate in the mining area. In addition to the capability of the Castlegate to span subsided zones, other actions also occur which will serve to fill the void created by removal of the coal. They include: coal seam floor movement upward into the void of the mined out panel, lateral movement of the adjacent coal in the ribs, and local roof failure and rubblization.

Subsidence information gathered at the Sunnyside Mine workings have shown a maximum subsidence of three feet where 10.5 feet of coal was mined. The minimal amount of subsidence is attributable to the massive Castlegate Sandstone which lies about 200 feet above the Sunnyside seam. This 150 foot thick sandstone appears to act as a buffering action for subsidence. The Castlegate may limit the vertical extent of the cave and reduce the total amount of subsidence that is measured.

The Sunnyside Mines had an on-going subsidence monitoring program over longwalled panels. The subsidence base net was established in May 1982 and extended in August 1986 to determine the vertical extent of subsidence in an area with the least amount of overburden and the greatest coal height remaining to be mined. This area was chosen to provide a worst case scenario. The maximum subsidence observed was 3 feet over an mined out area where the coal was 10.5 feet high. The low amount of subsidence measured is probably due to the underlying massive, 150 foot thick, Castlegate Sandstone. This sandstone appears to act as a buffering action for subsidence by limiting the vertical extent of the cave and reduce the total amount of subsidence that is measured. The sandstone appears to act as a monolithic slab thus providing a vertical barrier to upward migration of the underlying cave. The sandstone is located about 200 feet over the coal seam which was mined.

It is likely that the affects of mining may cause disruption and dewatering of the strata immediately above the coal seam and for about 100 feet above the mined out area. The areas in excess of 100 feet above the mine out area will experience increasingly lesser effects from subsidence. The remaining Blackhawk between the coal seam and the bottom of the Castlegate ranges from 165 feet to almost 400 feet. Taking a minimum of 165 feet of Blackhawk plus a minimum of 120 feet of Castlegate above that, it is unlikely that there will be any effect on the aquifers above the mining area. Overburden in the mining area averages 1,800 feet, getting up to as much as 2,500 feet under the top of West Ridge.

Based on field surveys and the findings of the Probable Hydrologic Consequence (PHC report), it is concluded that the area above the mine should not be adversely affected by coal mining operations.

As previously discussed, the massive Castlegate Sandstone would minimize the affect of subsidence on the land surface, seeps and springs.

Surface Structures

No surface structures such as pipelines, commercial buildings, or fences exist within the permit area. Several single lane, unmaintained roads occur on public land throughout the permit area. These roads could easily be regraded if subsidence were to occur. Warning signs would be posted and fences established, if necessary, to protect the public. A recreational cabin (seasonal occupation) and trailer are located in Spring Canyon in the northern part of the permit area. In this area, the depth of cover exceeds 2500'. Within 18 months prior to longwall mining in this area a pre-subsidence survey of the cabin/trailer will be conducted. The location of this cabin is shown on Map 4-1, 5-2 and 5-7.

Prime Farmland

The BLM and NRCS (Natural Resource Conservation Service) have determined that no prime farmland exists on or near West Ridge. Historically, the area has not been utilized for agricultural production. Unless a dependable, economical source of water could be established, farming is not likely to take place. The rough terrain and steep slope would preclude farming over much of the permit area.

In a worst case scenario, seeps could dry up if subsidence cracks were to intersect the surface at these particular locations. Should the seeps not be restored naturally, a combined loss of less than one gallon per minute could be expected. WEST RIDGE Resources, Inc. commits to mitigate the loss by providing an alternate source of water by means of a guzzler or water trough.

The West Ridge area is utilized primarily for wildlife habitat and cattle grazing. If subsidence were to create significant surface cracks, grazing might be restricted within the affected area until subsidence diminished. However, experience with other Utah underground mines, particularly on Forest Service lands, has shown that subsidence has little if any impact on the grazing potential of the affected lands and little impact on springs above the mining area. Should mining disrupt either a seep or spring within the permit area that had a state appropriated water right, WEST RIDGE Resources, Inc. would commit to replace the quantity of water depleted from that particular source at a similar location unless the seep is restored naturally in the same general area.

Description Of Mining Methods

Both longwall and continuous miner methods will be employed to recover the coal resource. Longwall will be the primary production method, while continuous miners will be used mainly for mine development to support the longwall. The longwall panels shown on Maps 5-4A and 5-4B have been laid out to maximize recovery of the primary coal reserves. Continuous miners will be utilized to develop main entries, longwall gate entries, sumps and other similar development areas.

The mine plan shown on Map 5-4A and 5-4B is color coded by year for reference to scheduled development and extraction. The tailgate and headgate entries for each longwall panel will be developed utilizing a continuous miner section which includes the continuous miner, shuttle cars and roof bolters.

After the entries have been driven the length of the panel, the longwall equipment will be moved in. The longwall face will consist of a panline with a chain conveyor to collect the mined coal, a shearer, and hydraulic jacks that support the roof while the shearer cuts the coal. Coal is cut as the shearer makes passes across the face (width) of the longwall panel. Coal is moved by the chain conveyor to the headgate end of the longwall panel. The coal then passes through a feeder/breaker (stage loader) before being transferred to the conveyor system that carries the coal outside. On the west side of the mine the longwall equipment will start on the east end of the panels and mine to the west, i.e., from the extremity of the reserve toward the mains in the middle of the reserve. Mining on the east side would follow the same pattern, from the outside to the interior of the reserve.

Description of Physical Conditions

The cover over the coal seam to be mined varies from 0 feet, at the outcrop, to approximately 2,500 feet under the crest of West Ridge. Cover throughout the mining area is shown on Map 5-7. See R645-301-600 for a description of the geology of the permit area.

The coal seam to be mined, the Lower Sunnyside Seam, ranges in thickness from less than six feet to over ten feet thick within the permit area. The average mineable thickness is approximately eight feet.

Mine Subsidence Effects and Control Measures

Surface movements due to mine subsidence will vary depending on the location, geology and depth of mining. Major factors affecting how subsidence is manifest at the surface include the properties of the underlying rock strata, the mining depth, the mining height and width of extraction and the method used to mine the coal reserve.

The two methods being proposed for mining the coal are the standard room-and-pillar method and longwall mining methods. The room-and- pillar method will be used to develop the main entries, headgate and tailgate entries. The longwall method will be employed to mine the outlined panels.

The surface expression of a single subsided longwall panel is in the form of a broad trough with the maximum lowering of the surface elevation over the center of the panel. From the maximum subsidence at the panel center, the lowering of surface elevations tapers to zero at a point outside the boundary of the mined panel. This effect produces a gradual slope toward the center of the panel. Subsidence will be at its maximum if the width of the excavation is at its "critical" value. Subcritical widths are too narrow for maximum subsidence to occur at more than one point. A recent Bureau of Mines study in Utah found the critical width to be nearly 1.6 times the depth.

As the minimum dimension of the extraction exceeds the critical width and becomes "supercritical", the subsidence profile assumes a characteristic flat-bottomed shape with more than a single point reaching maximum possible subsidence (Allgaier, 1988). This would be the case when adjacent longwall panels are mined or a single panel is mined under lesser overburden. Pillars between adjacent longwall panels can cause humps in the subsidence profile if they are not designed to crush under the weight of the collapsing roof.

Accompanying the subsidence process are tensile (+E) and compressive (-E) strains. Strain is defined as change in length per unit of original ground length. Excessive tensile strains can cause surface fissures, while compressive strains can cause buckling.

Specific relationships have been found among strain, the subsidence profile and the mined opening. Tensile strain occurs on both sides of the subsidence profile; whereas, compressive strain is located around the center. The transition from tension to compression coincides with the point of one-half maximum subsidence. The maximum tensile strain is located directly above or near but outside the edge of the mined opening. The maximum compressive strain is located either above the center or near but inside of the edge of the mined opening. Maximum possible tensile strain is found in subcritical openings, while maximum possible compressive strain is found in supercritical openings. In the case of the West Ridge Mine, the final mined-out area will be supercritical. As a result, fissure causing tensile strains will be supercritical.

The areas most likely to be affected by surface cracking will be near the periphery of the mine where a transition is made from the subsided area to areas of no subsidence. Experience in Utah has shown that these surface cracks often heal themselves in about six months (Clawson, 1990).

Use of the longwall mining method will minimize surface impacts from subsidence. Removal of coal by this method leaves no blocks or stumps and coal pillars left between the panels will yield. The result will be a broad gradual subsidence profile as opposed to the abrupt profiles which can cause increased surface impacts. Uniform subsidence can be restricted to specific predictable areas.

The surface will decline in elevation in a broad gentle trough over the extracted panels. From the maximum subsidence at the panel center, the lowering of surface elevations tapers to zero at a point outside the boundary of the mined panel. Movements over the mid-section of longwall panels are vertical and horizontal. As a result, some surface fractures may result at the panel edges. These fractures would be slip fractures rather than gap fractures and could be repaired by minimal earthwork (grading) if necessary.

Experience in other parts of Utah has shown that the maximum surface subsidence over the center of a longwall panel can range from 33% to 65% of the mining height. ("Coal Mine Ground Control", Peng, p. 284, Table 9.2.2). This is dependent on the local geology and the mining method used. Subsidence is expected to fall within this range at the West Ridge Mine because conditions and geology are similar to other mining districts of Utah. Based on these observations and the seven foot mining height projected for longwall extraction in the West Ridge Mine, maximum subsidence (S max) could approach 4.5 feet in the center of certain panels.

Experience has shown that common angles of draw for western mines range between

12^0 and 27^0 ("Coal Mine Ground Control", Peng, p. 283, Table 9.2.1). Subsidence analysis by the U.S. Bureau of Mines over central Utah longwall mines in similar geologic conditions have demonstrated draw angles of 10^0 - 27^0 (Surface Subsidence Over Longwall Panels In The Western United States, Frederick K. Allgaier, U.S. Bureau of Mines Circular 8896). The subsidence information gathered by the Sunnyside Mines indicates the angle of draw in the West Ridge area is about 15 degrees. A more conservative angle of 20 degrees has been used to project the maximum extent of subsidence for the West Ridge Mine as shown on Map 5-7.

Map 5-7 shows the results of using a 20^0 angle of draw to identify zones of potential subsidence over the projected mining area. This map depicts several areas in which the potential subsidence may extend slightly beyond the permit area. These areas are on adjacent SITLA coal lands which are included in the extended mining projections. The SITLA reserves are presently secured under an option agreement. There is an extremely high probability that these areas will be mined as shown on the extended mine plan depicted by the black projections on Map 5-7. If, for any reason, these adjacent reserves cannot be acquired and mined as shown, the underground longwall panels will be reconfigured as necessary (i.e., shortened and/or narrowed) to ensure that subsidence effects do not extend beyond the permit area onto these adjacent lands. By the time these panels are mined the actual angle of draw characteristic of the West Ridge reserve will have been more accurately determined from actual empirical subsidence monitoring survey measurements and can be used to more accurately configure the longwall panels in those areas. Map 5-7 clearly notes that "longwall panels will be reconfigured to prevent unauthorized subsidence beyond the permit area if extended reserves are not acquired in the future." The mine plan depicted on Map5-7 has been approved by the BLM as part of the current Resource Recovery and Protection Plan (R2P2).

Wherever feasible, longwall mining has been planned. This will minimize the impacts of subsidence because of the uniform nature of longwall related subsidence. Support pillars in main entries, permanent air courses and travelways will be developed on 80' x 80' (minimum) centers. Entries will be driven 20' wide leaving 60' x 60' (minimum) remaining pillars. Main entries and air courses will be driven approximately 8' high.

Subsidence Monitoring

Monitoring for subsidence will be conducted to document the effects of mining activities and to develop a model for subsidence prediction. Aerial photography and mapping will be used to monitor subsidence. Aerial photography for subsidence monitoring is commonly used in the industry and is highly accurate.

In order to monitor for subsidence, a network of ground control stations will be located on the surface outside the mining area. Typical locations for the first set of control points for the initial five year mining area are shown on Map 5-7. These control stations will be field surveyed and used for baseline reference data. Additional control points will be added as mining progresses.
Aerial photographs of the designated area will be taken prior to longwall mining.

Elevations on a predetermined grid pattern over the area to be mined will then be mapped. Data from this initial grid pattern will provide a base for comparison to the photogrammetric data obtained after subsidence has occurred.

New photography will be obtained annually as mining progresses. Elevation changes of the initial grid pattern points will then be noted and the amount of subsidence recorded. The photogrammetric subsidence readings (baseline elevation minus the new elevation) will then be contoured into a map to depict the net change in elevation of the area. The accuracy of this process is plus or minus two tenths of an inch.

In October, 2000, thirteen permanent subsidence monitoring control points were established in the southeastern half of the permit area. This included four control points within the newly acquired federal lease UTU-78562. The location of these points is shown on Map 5-7. These points were surveyed in using state-of-the-art GPS (Global Positioning System) technology. The area was then aerially photographed and the pre-exiting, pre-mining contour elevations were established. This initial control area covers the mining area scheduled longwall extraction over the three years through the year 2004. Longwall mining began in May, 2001. On October 9, 2001, the area was re-surveyed (GPS) and aerially photographed. The pre-mining and post mining surveys were then digitally overlain for comparison. WEST RIDGE Resources will continue to conduct annual surveys in the fall of each year to monitor the surface effects of subsidence. As longwall extraction progresses to the northeast under West Ridge, addition control points will be added. The approximate location of these future points is shown on Map 5-7.

A report of the subsidence monitoring results will be kept on record at the mine office. A copy will be supplied to DOGM in an annual report.

Panels will no longer be monitored once the effects of mining have stabilized and vertical movement is less than six inches/year. The above procedure will be repeated as mining progresses.

Visual observations will also be made at least quarterly on the surface to determine if the effects of subsidence appear on the surface. A record will be kept which will include: mining progress by date, dates of inspection, dates of any observed effects, and a description of effects.

If and when other means of monitoring subsidence in areas of heavy cover become available and are shown to have as good or better detection capabilities, WEST RIDGE will investigate utilizing the best technology available to conduct annual subsidence monitoring.

Mitigation

Mitigation measures may include: grading of damage resulting from subsidence on grazable lands (where accessible), fencing to restrict access (where necessary) and restoration of adversely affected roads and trails. Graded areas will be reseeded using a seed mix designated by the BLM.

525.130 State Appropriated Waters-Quantity and Use

Refer to Appendix 7-5 for all state appropriated water right within and adjacent to the permit area, including appropriated quantities and designated usage.

525.200 Subsidence Control

WEST RIDGE Resources, Inc. will adopt measures which are technologically and economically feasible to prevent subsidence under areas to be protected and to provide for planned controlled subsidence in all other areas. WEST RIDGE Resources, Inc. will comply with all provisions of the approved subsidence control plan.
Material damage resulting from subsidence will be corrected to the extent technologically and economically feasible. Where possible, the land will be restored to a condition comparable to the use it supported prior to subsidence.

Mining will not be conducted beneath or adjacent to public buildings, churches, schools, hospitals. None of these structures exist within or adjacent to the permit area. A small portion of Grassy Trail Reservoir (less than 0.6 acres) lies within a corner of the permit area. Grassy Trail Reservoir impounds more than 20 acre feet of water. However, there will be no mining or mining related subsidence below this reservoir.

The Grassy Trail Reservoir, which impounds more than 20 acre-feet of water, is located partially within and adjacent to the permit area. There will be no mining conducted beneath the reservoir or impoundment structure. As presently planned, Panel 7 is the closest longwall panel to Grassy Trail Reservoir, located approximately 995' from the reservoir measured horizontally. This panel is also 1664' below the reservoir at this point.

WEST RIDGE Resources hired RB&G Engineering to prepare a study of the risk to the Grassy Trail dam and reservoir from seismicity and subsidence associated with longwall mining in the West Ridge Mine. This study involved collection of additional data from newly-installed accelerometers, subsidence monitoring stations, and piezometers in the area around the dam. This study was conducted with input from BLM, DOGM, Division of Dam Safety, and East Carbon City.
On August 5, 2005 RB&G Engineering completed the seismicity study. (Refer to Appendix 5-11, Grassy Trail Dam & Reservoir Mining - Induced Seismicity Report.) In addition, RB&G prepared a second report which analyzed the Grassy Trail Dam so that East Carbon City can comply with the regulatory requirements of Utah Division of Dam Safety. There are a number of overlapping and interconnected issues addressed in the seismicity study and the dam safety study. Therefore the dam safety study is included as Appendix 5-12 (Grassy Trail Dam & Reservoir, Phase II Dam Safety Study, August 27, 2005.)

After a thorough review of the study the BLM approved a minor modification of the R2P2 (see Appendix 5-3B) to allow full extraction longwall mining of Panel #7. In the approval BLM concluded that *"The submitted report from RB&G concludes that* *it is unlikely that the anticipated mining of panel 7 would impact the performance of the dam and reservoir. The analysis of seismic impacts used a large maximum event (3.9 Richter Scale Magnitude) which is well above any recorded event in the immediate area. Using the maximum event, RB&G still anticipates a factor of safety still well above minimum Utah State Dam Safety standards. The BLM accepts the report and agrees with the recommendations. West Ridge is hereby authorized to extract longwall panel #7 per the approved R2P2, having met the conditions for approval."*

The seismicity report addressed the issues of dam stability analysis, subsidence, internal erosion potential, reservoir seepage and landslide potential. The report concluded that "it is unlikely that the anticipated mining induced seismicity will impact the performance of the dam and reservoir." The report also recommended the following inspection and monitoring program during the longwall mining of Panel #6 and Panel #7:

- *Bi-weekly site reconnaissance to observe any change of conditions in the embankment crest or slopes and landslide areas. Particular attention should be given to cracking, ground deformation or seepage.*

- *Monthly measurement of inclinometers, piezometers and ground motion monitoring devices.*

- *Annual survey of control points on the embankment and in the landslide areas.*

- *Daily monitoring of the UUSS list of recent seismic events (www.seis.utah.edu/recactivity/recent.shtml) should be performed. A daily record should be maintained of the largest recorded event within 5 miles of the site. When an event greater than 3.0 occurs within 5 miles of the site, a site reconnaissance of the embankment crest, slopes and landslide areas should be performed within 24 hours and a review of ground motion recordings should be made. If recorded ground acceleration exceeds 0.4g, instrumentation readings should be performed.*

- *Site reconnaissance and instrumentation reports should be forwarded to RB&G Engineering and the Utah State Dam Safety Engineer within 24 hours, and the daily monitoring record should be submitted on a monthly basis.*

The BLM R2P2 approval is conditioned upon WEST RIDGE Resources monitoring the inspection/monitoring program as outlined above. Therefore WEST RIDGE Resources, Inc. commits to implementing this inspection/monitoring program effective immediately upon Division approval for full extraction of Panel #7. This monitoring plan has been expanded to address concerns raised by Utah Division of Dam Safety (refer to Appendix 5-13).

Based on subsequent approval of the mine plan, panel #7 was extracted starting in December, 2005, and completing in September 2006. Extraction closest to the Grassy

Trail Reservoir occurred in March, 2006. Monitoring, as described above, was conducted continuously during the mining of panel #7. As predicted by the RB&G report, there was no mining related damage to the dam, although some slumpage of the adjacent hillside occurred, resulting in minor movement of the west abutment of the dam. There was no loss of integrity of the earthen structure of the dam. In January, 2008, after the area above and adjacent to panel 7 had completely stabilized, RB&G Engineering prepared a post-mining Summary Report of the mining-induced seismicity. This report is included in Appendix 5-16.

After panel 7 was completed, longwall mining moved to the west side of the mains near the outcrop (more than two miles distant from the dam), and then proceeded to the northeast. Also during this time, the company went to a panel-barrier system of longwall extraction, replacing the previous side-by-side panel method. This panel-barrier system leaves a 400' wide solid barrier pillar between each longwall panel, and has significantly reduced the magnitude and frequency of mining-related seismic events. During the ensuing five years of mining, the company has continued to monitor the dam and reservoir. Results of this monitoring have been provided to all the regulatory agencies and the owners of the reservoir on a regular basis. The results of this monitoring have shown that all mining-related effects on the reservoir have stabilized. RB&G Engineering then, in September, 2010, prepared a summary report of the subsequent mining-induced seismicity, and this report is included in Appendix 5-17.

On July, 21, 2010, BLM approved the R2P2 for federal lease UTU-78562 and approved mining of panels 18, 19 and 20 on the east side of the mains in the vicinity of the Grassy Trail Reservoir. In the decision document, BLM states, *"We agree with the conclusion that mining longwall panels 18 through 20 as submitted should have no adverse effects on the dam structure or reservoir. The dam structure has seen no detectable affects from the mining of panel number 7. The proposed panels are further distant from the reservoir and much further from the Grassy Trails Reservoir dam. Also, the new panel-barrier design has reduced dramatically the amount and intensity of any mining induced seismisity or subsidence. Additionally, this mining plan will comply with the lease stipulation to not subside perennial streams, unless authorized, as the Left Fork Whitmore Canyon Stream will be under a barrier pillar and no full extraction mining is planned under the stream."* A copy of the approved R2P2 for panels 18-20 is included in Appendix 5-3C. As with the previous mining of panel 7, the company commits to conducting the same level of intensive monitoring of the dam during mining of panel block 18-20, as previously approved by the regulatory agencies, as stated above. This monitoring plan has been updated for panel block 18-21, and is included in Appendix 5-13A.

As mentioned in the BLM approval letter, mining of panel block 18-20 will be further distance away from the Grassy Trail dam than with panel 7. Panel 7 mined within 995' (horizontal) from the dam, while the closest mining from Block 18-20 would be more than 3000' (horizontal) away. Also, panel 7 was about 1664' stratigraphically lower than the dam, while panel block 18-20 is located more than 2200' lower than the dam. The hypocentral distance of panel 7 was 1939' from the dam, compared to 3723' for the closest distance for panel block 18-21. Also, panel 7 was mined using side-by-side panels, whereas panel block 18-20 will be mined as panel-barrier, further reducing the potential for seismicity.

In the 2005 approval of Panel 7, BLM added a special stipulation #17 to the federal lease related specifically to the Grassy Trail Reservoir, stating, "*The Lessee is and will remain liable for any and all damages or hazardous conditions resulting from the mining operations under the lease.*" This new 2010 BLM approval for panel block 18-20 contains reference to this same lease stipulation #17. It should also be noted that, as with previous mining of panel 7, the Utah Division of Dam Safety will have authority to stop any longwall mining of panel block 18-21 if it determines that mining-related seismicity or subsidence is creating, or has created, an unacceptable level of risk to the Grassy Trail dam or reservoir, based on monitoring at the time.

On June 17, 2011, BLM approved longwall panel 23 within the Federal lease modification UTU-78562 (see Appendix 5-3D). On September 20, 2011, BLM approved extraction of longwall panel 22, also in lease modification UTU-78562 (see Appendix 5-3E). 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. However, due to concerns for the stream-flow in the Right Fork, the company has installed survey monitoring stations at approximate 100' intervals in the bottom of the Right Fork drainage within the permit area to detect any potential vertical or horizontal movement in the area. These monitoring stations are shown in greater detail on Map 5-7 and in Appendix 5-18. These points will be monitored for at least eighteen months after the final mining in this area has been completed and the lower (northeast) half on the mine has been sealed, according to MSHA and BLM approvals, presently scheduled for March, 2013. These points will be monitored quarterly (subject to winter-time accessability) and the results will be forwarded electronically to the Division, and will also be provided in the annual reports. Again it should be emphasized that there will be no longwall mining conducted under the Right Fork drainage. The only mining will be the development entries associated with the ventilation bleeders, identical to those previously approved by the Division for similar gate roads already developed under the Right Fork for longwall panel #20. All mining in this area is under more than 2500' of cover.

525.300 Public Notice of Proposed Mining

No coal mining will be conducted under any buildings, facilities or impoundments (other than the recreational cabin referred to in 521.120). The BLM will be kept informed as to the dates and locations of mining activities. All owners of surface property and structures (BLM) above the underground works will receive notification at least six months prior to mining of the specific areas in which mining will take place, dates of mining and the location at which the subsidence control plan may be examined.

525.480 State Appropriated Water Replacement Mitigation

WEST RIDGE Resources, Inc. commits to mitigate the diminution or degradation of state appropriated waters within or adjacent to the permit area caused by surface affects of mine related subsidence. Mitigation measures would include such measures as sealing surface cracks with expansive clay materials (such as bentonite), trucking water, piping across fracture zones, transfer of water rights, installation of wildlife guzzlers and/or compensation to water rights owners.

525.480

~~Bear Canyon is situated in the northwest portion of the permit area within the SITLA lease area. This canyon is unique because it is within the right fork of this drainage that the cover over the longwall subsidence zone is the shallowest of anywhere in the entire permit area. In one part of the bottom of the (right fork) Bear Canyon drainage the cover over the longwall panes is approximately 325'. Due to the increased potential for the effects of subsidence to reach the surface in this area special attention has been focused on the hydrologic character of the Bear Canyon drainage.~~

~~Bear Canyon is typical of the canyons draining the southwest-facing front slopes of the Book Cliffs in this area. These canyons are generally shorter and drier than those drainages on the back-side of the Cliffs. Several baseline surveys of Bear Canyon right fork done in the late 1980's showed the drainage to be mostly dry and the canyon was identified as ephemeral along with other similar front-facing canyons in the permit area, such as "C" Canyon, "B" Canyon, and "A" Canyon. However, during site visits in June and July of 2005, substantial stream-flow was observed in the drainage. This occurrence of flow, along with the observation of riparian vegetation in the lower stretches of the canyon, has led to a re-evaluation of the classification of the drainage as intermittent. Also, because the area of the Bear Canyon watershed is greater than one square mile the drainage is classified as intermittent under DOGM regulations.~~

~~Historical observation of Bear Canyon shows the streamflow in the bottom of the drainage to be a combination of surface flow and subsurface flow. In those areas where bedrock is at or close to the surface, flow is forced up to the surface. In other areas where the alluvium in the channel is thick and porous the flow is subsurface and the stream channel is often dry. The stretches of channel exhibiting surface flow as opposed to subsurface flow will vary from season to season, and year to year depending on prior precipitation trends in the watershed. There are times when the entire length of the channel could be expected to exhibit surface flow, and other times~~

~~when surface flow is confined to certain segments. And, according to past monitoring observations, there are often times when there is no flow in the stream channel. In order to better define the hydrologic character of the canyon WEST RIDGE Resources will expand the monitoring program in Bear Canyon by adding two new monitoring sites and relocating a third site (see Map 7-7 and Table 7-1).~~

~~As mentioned previously, there is a point in the right fork of Bear Canyon where cover over the longwall panel will be about 325' which is the shallowest surface cover of any place within the current WEST RIDGE mine plan. This, along with the fact that there are state-appropriated surface water rights in this drainage (refer to Appendix 7-5), makes this an area of special interest. There is reason to expect that full-extraction longwall mining will not adversely affect the hydrologic resources of the canyon in this area. According to Syd S. Peng, ("Coal Mine Ground Control", 1978, Wiley, New York) a general rule-of-thumb is that subsidence-related fractures can be expected for a distance above the coal seam equal to 50 times the mining height, which works out to be 316' for the shallow point in Bear Canyon, which is slightly less than the cover in that area. Therefore due to the shallowness of cover in this area there could be subsidence fractures which reach the surface in the bottom of the canyon, and mitigation will be done to protect the resource.~~

~~The shallow overburden point coincides with the inflection point of the longwall subsidence profile. Based on a 22 degree angle of draw the tension zone will extend along the surface from the inflection point (shallow point) downstream approximately 130'. Areas upstream from the inflection point will be in compression as the longwall panel are extracted in progression from the southwest to the northeast according to the approved mining plan. Cracks are more likely to open up in the tension zone as compared to the compression zone where lateral forces are pushing toward each other rater than pulling apart. As mining progresses to the northeast, cover increases rapidly because of the gradient of the channel bottom and the dip of the coal seam, and surface effects of subsidence should diminish in that direction. Therefore, it is expected that any cracking which might reach the surface should most likely appear in the canyon bottom in the 130' (plus/minus) tension zone down-canyon from the inflection point. Special subsidence monitoring will be focused on this area.~~

~~WEST RIDGE will establish two new hydrologic monitoring sites in the right fork of Bear Canyon. The first site (ST-11) will be located within the tension zone described above. This site was chosen because this location should be well-suited to determine if tension cracks have affected stream flow. It is also, coincidentally, one of the areas where the bedrock nature of the channel bottom forces water to the surface, thereby making streamflow measurements more accurate. The second site (ST-12) will be located about 2400' farther up-canyon in another area where, again, the bedrock nature of the channel allows for a more accurate streamflow measurement. A third monitoring site (ST-13) will be located below the forks of Bear Canyon just outside the permit area boundary. This site will replace the existing monitoring site ST-4.~~

~~During the flow season of 2005 and 2006 (that is, May 15 through September 15) site ST-11 will be monitored monthly as long as flow is present. This monthly monitoring will help better define the nature of streamflow prior to longwall extraction in the area,~~

~~which is presently scheduled for May, 2007. Thereafter, monitoring will be done on the regular quarterly basis. Site ST-12 is more inaccessible, and could be dangerous to reach in the winter. Therfore this site will be monitored twice a year, once during late spring/early summer (expected peak flow) and once in late summer/early fall, when the canyons are normally much drier. Site ST-13 will be monitored quarterly.~~

The longwall is presently scheduled to pass under Bear Canyon in the spring of 2007. Prior to that, WEST RIDGE will complete a survey of a series of subsidence monitoring points established up the bottom of the drainage on either side of the inflection point. After the longwall has passed under the drainage these points will be re-surveyed and an accurate account undermined WEST RIDGE will visually inspect the area to determine if any effects of subsidence are apparent. Within thirty days of the inspection WEST RIDGE will submit a written report to the Division outlining the results of this inspection.

Recent site visits have determined the existence of riparian type vegetation in the lower reaches of Bear Canyon below the forks. WEST RIDGE commits to preparing a detailed vegetation survey and mapping of the canyon bottom with emphasis on the existence of riparian specie. This survey will be conducted during the growing season of 2005 or 2006. The survey will be done in consultation with Division biologists and the completed report will be added to the Mining and Reclamation Plan as an appendix.

If it is determined that mining-related subsidence has adversely impacted the hydrologic resources of Bear Canyon, including and state-appropriated water rights, WEST RIDGE will mitigate the damage. The first option would be to seal any cracks with the application of bentonite clay. Bentonite sealing compounds are available commercially made specifically for such applications. Access to the are would be by pack animals along the remnants of an old existing drill-hole access road. If larger mechanical equipment is needed. Access could be improved as necessary because the surface is owned by the BLM and SITLA and the coal leases held by WEST RIDGE provides for such surface rights. If bentonite sealing proved ineffective, WEST RIDGE would propose the installation of piping to transport stream water across the fracture zone to continue the flow downstream. Any work done in the stream channel would most likely require the issuance of a channel alteration permit from the Utah Division of Water Rights.

Spring Canyon is located in the northern part of the permit area in SITLA lease 44771. There are no state-appropriated water rights on this lease. (Refer to Appendix 7-5 for additional details.) The surface is privately owned by Penta Creek with whom WEST RIDGE maintains coal mining rights. Longwall mining in this area is not scheduled until the year 2014. In this area the coal seam is 2500' deep under the bottom of the Canyon. Spring Canyon, as the name would imply, contains several springs. The drainage area of Spring Canyon is well in excess of one square mile. The canyon supports a number of beaver dams indicative of perennial flow. WEST RIDGE will add three additional monitoring points to collect baseline water monitoring data in Spring Canyon, namely ST-15 located upstream from the junction of Grassy Trail Creek, SP-101 located on a channel-bottom spring a short ways up Little Spring

Canyon (a fork of Spring Canyon), and SP-102 located about 1000' upstream from the junction of Little Spring Canyon. This spring emanates from the west side of the canyon approximately 200' up from the canyon bottom. Refer to Map 7-7 and Table 7-1 for details. For the first two years (starting with the third quarter of 2005) these sites will be monitored on a quarterly basis for baseline data according to the field measurements and laboratory measurements outlined in Table 7-2 (Surface Monitoring) and Table 7-3 (Groundwater Monitoring). Thereafter, all sites will be monitored for flow and field parameters on a quarterly basis.

R645-301-526 MINE FACILITIES

526.100 Mine Structures And Facilities

Surface structures and facilities for the West Ridge Mine, an underground mine, will be constructed in C Canyon near the fork in the canyon, in portions of sections 10, 11, 14 and 15; T14S, R13E, Carbon County, Utah. The function of the surface facility area is to provide for mine access, mine ventilation, coal storage, coal loading, warehousing, offices, and bathhouse. A plan view of this complex is provided on Map 5-5.

Access to the underground mine will be through drift entries on the south side of the mine yard along the outcrop of the coal seam to be mined. Material generated by face up work in the portal area will be used to construct a mine pad area. Mine structures and facilities will be constructed on this mine pad area.

Prior to construction of the mine pad, steel drainage diversion culverts will be placed in the bottom of the main drainage channels. These culverts will allow undisturbed drainage from above the disturbed area to be bypassed underneath the mine yard. After these culverts are in place, they will be covered and backfilled with material excavated from cut slopes or hauled in from an off-site borrow source.

To control runoff and drainage from the disturbed area, all drainage from the constructed mine facility disturbed area will be collected and treated in a properly sized and constructed sediment pond. Ditches and culverts throughout the disturbed area have been designed to effectively convey site drainage to the pond. Inlet structures to the pond will be protected through rip rapping or culverting to prevent channel erosion and scouring.

The final lower cell will be constructed with a combination of 2 spillways. The principal spillway located in the lowest pond cell will be a 36" C.M.P. culvert riser and oil skimmer. This spillway will overflow at an elevation at least 3' below the top of the dam. This spillway will discharge directly into the bypass culvert (UC-OO) which is located beneath the pond. In the unlikely event of failure of the principal spillway, the lower pond cell will also be equipped with a second (emergency) culvert spillway, consisting of a 36" C.M.P. culvert riser and oil skimmer, with a minimum depth of 2.0' below the top of the dam. This spillway will also flow directly into the undisturbed bypass culvert (UC-OO).

Buildings to be constructed at the minesite include: an administrative office, a shop/warehouse building, and a bathhouse/lamphouse building. The shop/warehouse will be used to repair and store mine equipment and supplies. The yard area around these buildings will be used for additional outside storage and parking. The bathhouse and office buildings will be sized to accommodate a workforce of approximately 130 people.

The following facilities will be constructed in conjunction with the mining operation:

a) Administration Office

The main office will be a framed building measuring approximately 40' wide x 60' long. It will handle the administrative functions such as accounting, engineering, payroll, marketing and management. The main office will be located on a dedicated pad at the lower (southernmost) extent of the mineyard. Parking will be made available in the area adjacent to the main office.

b) Sediment Pond

The sediment pond will consist of a two individual cells located at the lower (southern) end of the mineyard. The cells will be designed to accommodate the entire runoff from the disturbed area plus additional runoff from several adjacent undisturbed areas as well. Runoff and sediment will enter both cell A and B. If runoff exceeds the capacity of the upper cell, it will then flow to the lower cell by way of an open channel spillway. The total combined capacity of the cells will be sufficient to handle a 10 year, 24 hour precipitation event. A principal spillway consisting of a 36" cmp culvert riser and oil skimmer will permit runoff in excess of the 10 year-24 hour event to flow into the bypass culvert. A second 36" cmp culvert riser and oil skimmer in cell B will route emergency overflow (in excess of the 25 year, 6 hour) back into the natural canyon drainage through the bypass culvert beneath the pond embankment.

c) Bypass Culvert

A continuous culvert system will be installed within the main drainage channel to carry the natural undisturbed drainage underneath the mineyard, thereby bypassing the disturbed areas of the minesite. This bypass culvert system will effectively segregate drainage coming off the undisturbed areas adjacent to the mine yard from the drainage coming off the disturbed area of the mine operations. The bypass culvert will handle the mine canyon drainage from both the left and right fork of C Canyon. It will also collect drainage from several smaller side drainages in the area of the minesite. The culvert will be sized to adequately handle a 100 year, 6 hour flow event. Risers will be installed at regular intervals to provide hydraulic venting and access for inspection and maintenance.

d) Mine Portals

Mine portals will be located in the right fork on the southeast side of the canyon where the coal seam outcrops. Four portal openings will be constructed to provide surface access to the underground mine workings. Two portals will provide intake ventilation to the mine, one of which will serve as the primary accessway for employees and materials in and out of the mine. One portal will contain the main conveyor belt used to bring coal out of the mine. The fourth portal will accommodate the main mine fan. These portals will be spaced as close together as possible to minimize the length of highwall required for access to the underground workings.

e) Mine Fan

The mine fan will be located at the return air portal. It will be a 12' diameter, direct drive, 1,000 hp, axial vane exhausting type fan. The fan housing will include airlock travel doors for machinery and personnel. The exhaust ductwork will be quipped with acoustical sound-proofing material to keep noise levels at a minimum.

f) Bathhouse/Lamphouse

The bathhouse building will be a pre-fabricated metal structure measuring approximately 40 feet wide by 120 feet long. It will be located in the central part of the mineyard in convenient proximity to the mine portals. An employee parking lot will be located nearby. The bathhouse will be sized to accommodate the anticipated workforce of about 130 employees. Located at one end of the bathhouse building will be the lamp house and the offices for the mine supervisory personnel.

g) Shop/Warehouse

The shop/warehouse building will be a pre-fabricated metal structure measuring approximately 60 feet wide by 160 feet long. It will be located in the northern part of the mineyard conveniently adjacent to the mine portals. A storage area for materials and supplies will be located nearby, as will be the fuel storage, rock dust storage and garbage repository (dumpster) facilities. A 40' x 60' enclosed storage shed will be constructed adjacent to the shop on the south end.

h) Coal Stockpiling Facilities

Coal will be brought out of the mine and delivered to the surface via a 2,000 ton per hour, 60" wide mine conveyor belt. The mine conveyor will exit out of a portal located about 40' high on the east side of the right fork of C Canyon. Even though the mine portals are located in the right fork, the run of mine coal will be stockpiled in a storage area located in the left fork. Coal will be transported from the right fork portals to the left fork stockpile by an 800 foot long, elevated overland conveyor gallery. This 2,000 ton per hour, 60" wide conveyor will be covered, and will be supported along a series of box truss galleries elevated approximately 50-60 feet above the right fork mineyard. These conveyor truss galleries are, in turn, supported by several two-legged steel bents spaced approximately 120' apart. After crossing the nose of land that separates the right and left forks, the conveyor will terminate at a cantilevered discharge structure at a location above the coal stockpile area in the left fork. A conical coal pile will be built directly below the discharge structure. The pile will be about 80 feet high at full capacity and will contain about 30,000 tons of coal. Additional storage can be obtained by pushing the pile northward onto the coal storage pad extending up the left fork.

i) Coal Reclaiming Facilities

A 13 foot diameter multiplate reclaim tunnel will be located below (underneath) the coal pile. Two reclaim draw down ports located at the end of the tunnel will allow coal to be reclaimed from the bottom of the pile directly onto a 54" reclaim conveyor located within the tunnel. Each reclaim port will contain a pile activator, a hydraulically operated single bladed shut-off gate, and a discharge chute leading to the reclaim conveyor. Each port will be capable of loading the reclaim conveyor at a full capacity of approximately 1,400 tons per hour. Once the coal has been loaded onto the reclaim conveyor, it will then be transported out from underneath the pile. The reclaim conveyor will bring the coal out of the tunnel and transport it to a crushing/screening building.

The crusher building will be an open steel structure. It will contain a 40 hp, 8' x 20' scalping screen which will remove all minus 2" coal ahead of the crusher. The plus 2" coal from the top screen deck will be fed to a 300 hp hammermill impact crusher where the coal will be reduced to a 2" x 0" product. All transfer points within the crusher building will utilize enclosed chutework to contain and control fugitive dust emissions. These transfer points include the transfer from the reclaim conveyor to the screen, the screen unders (minus 2") to the loadout conveyor, the screen overs (plus 2") to the crusher, and the crusher discharge (minus 2") to the loadout conveyor.

Within the crusher building will also be located a self cleaning tramp iron magnet (located at the reclaim conveyor discharge pulley ahead of the crusher), and an automated ASTM sampling system. The crusher building and the coal reclaim tunnel will be separated by a wire reinforced earth wall (e.g. Hilfiker wall) constructed about 25 feet high. The crusher building will be located on a bench on the lower (down-canyon) side of the wall and will be positioned in such a manner that gravity flow will aid the movement of coal through the screening, crushing, and sampling operations.

From the crusher building the crushed and screened 2" x 0" coal will then be loaded onto a covered 48" wide loadout conveyor operating at a rate of 1,400 tons per hour. The coal will then be transported to an automated truck loadout station. The truck loadout will be an elevated steel frame structure constructed high enough to allow the trucks to be positioned under a pant-leg loading chute during loading. Electronic sensors will determine when the truck is properly positioned under the chute. The feed conveyors (i.e. loadout conveyor and reclaim conveyor) will start and stop automatically to load the individual truck trailers with a predetermined amount of coal. Certified belt scales will be used to control the loading process.

The truck loadout will be located at the upper end of the truck loop. The loop will be long enough to accommodate up to 4 empty trucks in the queuing lane waiting to be loaded. After being loaded, the trucks will leave the minesite and haul the coal to a train loading facility located off-site. All conveyors will be covered and all conveyor transfer points will be enclosed.

j) Electrical power

An overhead 46 KV powerline will be installed and maintained by the local utility company. The line will originate from an existing Utah Power 69KV Helper-Columbia #1 powerline near the Sunnyside Junction. From there it will follow the County road to the mine site, where it will terminate at the mine substation. The mine substation will be located in the right fork below the portal bench. The substation will contain a 12 MVA 46 KV/12.5 KV transformer, along with various other electrical power control apparatus (air-break switches, visual disconnects, bussing, ground fault detection, vacuum circuit breakers, power factor capacitor banks, metering equipment, and a control room). From the secondary side of the substation, power will be distributed throughout the mine yard and to the underground workings at 12,500 volts. At various locations within the mineyard, the power will be routed through a set of 12.5 KV/4160 V/480 V transformer banks and motor control centers (MCCs) to operate the surface equipment. These combination transformer/MCC units will be located at the crusher building, overhead conveyor drive station, mine fan, and shop/warehouse. All power poles will be designed and constructed using an approved raptor safe design to protect raptors from electrocution.

k) Water Facilities

Water will be delivered to the site by a 6" pipeline originating in East Carbon City. Water storage facilities (tanks) will be located on the surface to provide storage for culinary (potable) usage and as pre-storage before being pumped into the mine to an underground storage sump for use in the mining operation. The surface storage tanks would be located above the bath house to provide sufficient static head (pressure) for yard distribution.

l) Other Structures

Additional, smaller structures will include miscellaneous storage sheds, pump house, above ground storage tanks (for fuel, water, and dust control chemicals), powder magazines, rock dust storage tanks and trash containment structures. All buildings and structures will be made of conventional construction materials including wood, masonry, or steel. Buildings will be color coordinated to blend in with the natural surroundings.

It should be noted that the pump house area has been added to the minesite permit area, although it is located offsite. This area is shown on Plates 1-1 and 5-14. The pumphouse and related fence area contains approximately 0.44 acres, and is designated as an ASCA. Sediment control is accomplished through use of recontouring, roughening, reseeding and a slag/gravel coating over non-vegetated areas, as shown on Map 5-14. This area will be maintained throughout the life of the project, and reclaimed upon completion. Reclamation will consist of removal of the power supply, fence, pumps and building, along with regrading and reseeding according to the approved plan. Reclamation costs and sediment control for the pumphouse are described in Appendix 5-7. Right of Way information for the waterline and pumphouse is included in Appendix 1-12

Maintenance of Facilities

Maintenance of the mine surface complex will include the following procedures. The sediment pond, drainage control ditches and culverts will be periodically cleaned. Cleanout material will be disposed of off-site in an approved solid waste disposal facility such as ECDC. Dust will be controlled on the conveyor system and transfer points by enclosures, telescoping chutes and sprays as necessary. Dust from unpaved roads will be controlled by applying water or a dust suppressing solution. Drainage culverts will be cleaned and maintained in operable condition. Erosion will be controlled on constructed earth slopes by planting vegetation and/or other suitable methods. All disturbance will be confined within the approved disturbed area boundary. Sediment controls such as the sediment pond, silt fences or straw bales will be utilized.

Reclamation of Facilities

Upon completion of final mining activities, the mine surface complex will be reclaimed in accordance with the approved reclamation plan. Reclamation will begin with the removal of all buildings, structures and concrete. The highwalls will then be backfilled to their approximate original contour utilizing the yard pad material. The undisturbed diversion culverts will be removed to reestablish the canyon drainage channels. The regraded area will then be revegetated. For a detailed discussion of the reclamation plan refer to Appendix 5-5.

526.110 Existing structures

No structures currently exist within the proposed surface facility area other than the monitoring well.

526.200 Utility Installation And Support Facilities

Mining and reclamation will be conducted in a manner which minimizes damage, destruction, or disruption of services provided by oil, gas, and water wells; oil, gas, and coal-slurry pipelines; railroads; electric and telephone lines; and water and sewage lines which pass over, under, or through the permit area. None of the utilities listed above exist within the permit area.

Support facilities will be operated and maintained in accordance with the permit issued for the West Ridge Mine and will be located, operated and maintained in a manner that: prevents or controls erosion and siltation, water pollution and damage to public or private property and, to the extent possible using the best technology currently available, minimize damage to fish, wildlife, and related environmental values. The support facilities will be designed to minimize additional contributions of suspended solids to the stream flow or runoff outside the permit area and, should any contributions occur, such contributions will not be in excess of limitations of Utah or Federal law.

For a discussion of the proposed mine facilities see R645-301-526-100.

526.300 Water Pollution Control Facilities

A spill prevention control and countermeasure plan (SPCC plan) has been developed to protect the undisturbed drainages from accidental spills of oil or other petroleum products within the disturbed area. This plan is included as Appendix 5-6 and will be available for review at the West Ridge mine site after facilities have been constructed.

All drainage from the minesite disturbed area will be conveyed to and treated by a sediment pond located within the disturbed area. This system of collection ditches, culverts, and sediment pond is shown of Map 7-2. (This map also shows the undisturbed drainage culvert system.) The sediment pond size has been calculated based on a 10 year, 24 hour event. Ditch and culvert design are also based on a 10 year, 24 hour event. Refer to Appendix 7-4 for the Sedimentation and Drainage Control Plan For the West Ridge Mine.

The undisturbed drainage areas contributing to the sediment pond are shown on Map 7-2. Refer to Appendix 7-4 for ditch and pond sizing calculations.

Prior to construction of the mine yard facilities, properly sized undisturbed drainage culverts (bypass culverts) must first be installed in the bottom of the main canyon and side canyons within the proposed disturbed area. These culverts will divert natural drainage under and past the minesite construction area, including the sediment pond embankment. Details of the design of the undisturbed drainage culvert system can be found in Appendix 7-4 and Map 7-2.

Expeditious installation of the bypass culvert system will be a top priority when construction of the mineyard is initiated. This is important for several reasons. First, undisturbed drainage from above the mine yard area must be routed past the facility area by means of the culvert system as quickly as possible to minimize the potential for storm-related impacts. Secondly, the bypass system must be in place prior to the construction of overlying facilities and the sediment impoundment (which will be installed as soon as possible). This construction methodology will provide the most expeditious installation of the bypass culvert in the shortest time frame possible, thus minimizing exposure of the yard area to storm runoff events and providing permanent sediment control for the minesite construction as soon as practical.

Prior to beginning installation of the bypass culvert system, interim (temporary) sediment control measures (berms, silt fences and temporary sediment pond) will be constructed in the drainage near the downstream end of the proposed mine yard area. These features, which will treat disturbed area runoff, will be installed as temporary measures to control sediment during the installation of the bypass culvert system.

Refer to the construction plan in Appendix 5-5 for details regarding the culvert installation and mine yard construction.

As the sediment pond embankment is being constructed, it will be inspected on a regular basis and at critical construction phases by a certified, professional engineer. Following construction, the pond will be inspected and the as-built design will be certified. During routine operation, the pond will be visually inspected daily for unusual conditions.

Details of the sediment pond design are shown on Maps 7-4 and 7-4A and presented in Appendix 7-4. The pond will be composed of two cells. The two cells will be connected from one to the other with open channel spillways. The final (lower-most) cell will be constructed with two 36" riser culverts acting as the principal and emergency spillways. The principal spillway will be a 36" culvert riser combined with an oil skimmer. The emergency spillway also be a 36" culvert riser with the inlet at least one foot higher than the primary spillway and two feet below the top of the dam. The spillway is designed for the flow from a 25 year, 6 hour event. The pond capacity will hold 7.67 acre-feet allowing for an excess of 0.62 acre-foot over the design requirement for the 10 year, 24 hour event.

526.400 Air pollution control facilities

An air quality permit for the West Ridge Mine has been obtained from the Utah Division of Air Quality. The air quality plan will include the following dust control measures:

a) all conveyors will be covered;

b) all conveyor transfer points will be enclosed;

c) the coal pile will be built and reclaimed in a manner that minimizes the drop distance from the conveyor discharge structure to the pile;

d) coal will be reclaimed from the bottom of the stockpile directly onto a conveyor belt located within an enclosed tunnel located under the pile;

e) chute work for draw down ports within the reclaim tunnel will be enclosed;

f) all chutework leading into and exiting from the crusher and the screen will be enclosed;

g) all chute work and transfer points at the truck loadout will be enclosed;

h) the coal moisture level within the coal pile will be maintained at approximately 6.0% or greater. This will be accomplished by means of water sprays located on the main mine conveyor;

i) access roads and high traffic work areas will be treated with water and/or dust suppressant chemicals, as needed;

j) the truck loop/loading area will be broom swept and/or water flushed as needed;

k) non-working areas of the minesite (i.e., pad slopes, road embankments, cut slopes, etc.) will be revegetated.

R645-301-527 TRANSPORTATION FACILITIES

527.100 Road classification

Map 4-1 shows all of the roads found within and adjacent to the permit area and their classification. The Carbon County public road will enter the permit area from the southwest. This road will extend into the permit area and terminate at the junction of the truck loop. This road is classified as a primary road within the permit area.

The existing county roads within the permit area have been in existence for a number of years. Map 4-1 shows the relationship of the roads to other roads in the area.

The majority of the roads within the permit area were developed many years ago. They are still in use today as access for grazing permittees, drilling, and recreational vehicles. WEST RIDGE Resources, Inc. may use existing roads on an infrequent basis for purposes such as subsidence monitoring and water monitoring. Carbon County plans to construct/reconstruct a public road to provide improved access into the area.

Approximately 1,960 feet of the northern end of the Carbon County road will extend into the minesite disturbed area. This includes approximately 1000' of road from the original disturbed area boundary up to the junction of the truck loop, and an additional 960' of road above the newly installed gate. The gate was installed at this location to provide better visibility and turn around area for the public during those times the gate is closed. Carbon County has approved the installation and periodic closure of this portion of road (see Appendix 5-2). The road will terminate at the junction of the truck loop. A turn around will be constructed at this terminus to give public vehicles an opportunity to turn around without having to drive though the mine yard. This segment of public road, from the terminus of the road at the truck loop junction to the gate will be included within the permit area of the West Ridge mine and will be classified as a primary road. Carbon County will allow special mine-related utilization of this segment of the road, such as the ability to operate mine vehicles thereon. In return, WEST RIDGE Resources, Inc. will be responsible for maintenance along this road segment, including maintenance of drainage ditches and culverts. Runoff from this road surface will be treated according to the mine's sedimentation and drainage control plan, as presented in Appendix 7-4. Refer to Figure 5-3 West Ridge Road - Typical Cross-Section for the typical engineering cross-section of the Carbon County road.

Other mine roads within the permit's disturbed area are shown on Map 5-15. The road from the county road to the warehouse pad will be classified as a primary road as will the ramp up to the coal storage pad. The road up to the overland belt drive on the "nose" will be classified as an ancillary road.

R645-301-528 HANDLING AND DISPOSAL OF COAL, OVERBURDEN, EXCESS SPOIL AND COAL MINE WASTE

528.100 Coal Removal, Handling, Storage, Cleaning And Transportation Facilities

WEST RIDGE Resources, Inc. proposes to use longwall and continuous miner methods to mine the coal reserve. A conveyor belt system will transport the coal from out of the mine to the surface where it will be crushed and transported, as a run-of-mine product, by truck to railroad loading facilities located off the permit area.

Coal will be transported to the surface from underground by a 60" mine conveyor. The coal will be transported to a discharge structure located at a height of about 80 feet above the ground. The discharge structure will deposit coal on the stockpile. The operational storage capacity of the stockpile is estimated at approximately 30,000 tons.

Draw-down ports located within the reclaim tunnel under the stockpile will feed coal from the bottom of the stockpile onto a reclaim conveyor. Reclaimed coal will then be delivered to a coal crushing structure.

The crusher and all associated chutework will be enclosed to contain fugitive dust emissions. Run-of-mine coal will be reduced from 8 x 0 inch down to a 2 x 0 inch product. Coal will be shipped as a run-of-mine product to various markets. For a more detailed description of the coal handling facilities refer to R645-301-526.100.

All conveyor transfers in the mine yard will be enclosed to minimize fugitive dust emissions.   The conveyors leading to the stockpile will be covered. The reclaim tunnel and the chute work leading to and from the crushing structure will also be enclosed.

Dust will be controlled on unpaved roads in the disturbed area by restricting the speed limit, and by treatment with a chemical stabilizer solution as needed. This solution will be applied in accordance with the manufacturers directions and will be applied with a water truck sprayer.

Conveyor transfers in the mine yard will be enclosed to minimize fugitive dust emissions. The reclaim tunnel will be enclosed as will the chutework leading to and from the crushing facility.

Mine facilities will be operated in accordance with an approved air quality permit issued by the Utah Division of Air Quality. For a more detailed discussion of air quality control measures, refer to R645-301-526.400.

Maintenance of the mine surface complex will include the following procedures. Sediment pond and drainage control ditches will be periodically cleaned. Drainage culverts will be kept open and free of obstructions. Erosion will be controlled on constructed earth slopes by planting vegetation or equivalent methods. All disturbances will be confined within the approved disturbed area boundary.

All drainage from the disturbed area will be contained within the sediment pond. Drainage will flow through culverts and ditches that have been sized for the 10 year, 24 hour runoff event. Where the flow velocity is expected to exceed 5 feet per second, a concrete lining or rip rap will be used to minimize erosion of the ditches. Sediment production from the disturbed area will be minimized, where practical, by vegetation cover and land imprinting.

Upon permanent cessation of mining, all facilities will be disassembled and removed. The area will then be regraded to approximate original contour and revegetated.

528.200 Mining will be conducted using underground mining techniques. No overburden will be removed during underground mining operations.

528.300 Spoil, Coal Processing Waste, Mine Development Waste And Noncoal Waste Removal, Handling, Storage, Transportation, And Disposal Areas And Structures;

528.310 No excess spoil is anticipated at the proposed underground mine site.

528.320 Coal Mine Waste

528.321 WEST RIDGE Resources, Inc. is not proposing to return any coal processing waste to abandoned, underground workings. There are no plans to wash or process the coal, therefore, no coal mine waste rock is anticipated. If, however, minor amounts of waste rock are developed from inside the mine, (overcast material, roof fall cleanup, etc.) which cannot be stored underground and is brought to the surface, it will be hauled off site after 12 cubic yards total (one truck load) has accumulated or after storage on-site for six months. The waste rock will be disposed of in an approved coal refuse site at the Andalex Wildcat loadout facility or ECDC. Two temporary waste rock storage areas are depicted on Map 5-5.

528.322 No refuse piles are being proposed.

528.323 Burning And Burned Waste Utilization

Coal mine waste fires are not anticipated because no coal mine waste will be stored at the minesite.

528.330 Noncoal Mine Waste

Noncoal mine wastes including grease, lubricants, flammable liquids, garbage, abandoned mining equipment, lumber and other combustible materials generated during mining activities will be placed and stored in a controlled manner in a designated portion of the permit area. Refer to Map 5-5 for the Storage Area location. Grease, lubricants, flammable liquids, lumber and other combustible material that are mine supplies and not noncoal mine waste will not be subject to this provision.

Final disposal of noncoal mine waste will be in a State-approved solid waste disposal site such as ECDC.

The noncoal mine waste storage site will not be located within eight feet of any coal outcrop or coal stockpile.

Any noncoal mine waste defined as "hazardous" under Resource Conservation and Recovery Act (RCRA) and 40 CFR Part 261 will be handled accordingly and disposed of properly.

528.340 Underground Development Waste

Underground development waste will not be stored in surface excess spoil piles (no surface excess spoil piles are being proposed).

528.350 Disposal Of Acid-Forming, Toxic-Forming And Flammable Materials

Noncoal mine waste, including combustible material, is discussed in R645-301-528.330.

For compliance with R645-301-542.740 and R645-301-747 refer to the discussion under R645-301-528.330.

Noncoal waste will not be permanently disposed of within the permit area.

Also, refer to discussions under: R645-301-537.200, 553.100 through 553.600, and 553.900.

528.400 Dams, Embankments And Other Impoundments

Embankments constructed in conjunction with the sediment pond will be designed and constructed according to standard engineering practices. The embankment of the sediment pond will be constructed using imported fill material. Refer to Maps 7-4 and 7-4A for the design of the sediment pond embankment.

The sediment pond design has been certified by a professional engineer (see Map 7-4). The constructed pond will be certified "as built" upon completion of construction. The pond will be designed to contain the 10 year, 24 hour event as required by the regulations. Two 36" culvert riser primary/emergency spillways are designed to safely handle a 25 year, 6 hour precipitation event and will be utilized to convey overflow from the pond in case of an emergency.

Inspection of the sediment pond will be made on a regular basis by a professional engineer or specialist during construction, upon completion of construction and once per year until the structure is removed or the performance bond released.

A registered, professional engineer will provide a certified report to DOGM after each inspection stating that the impoundment has been constructed and maintained according to the approved design. The report will discuss any detected sign of instability, structural weakness or other hazardous condition, depth and elevation of any impounded water, existing storage capacity, and existing or required monitoring procedures and instrumentation. A copy of the report will be kept on file at or near the mine site.

In addition to the above certified annual inspection and report, the sediment pond will be inspected on a quarterly basis by a qualified person designated by the operator. Any appearance of structural weakness or other hazards will be reported and addressed, then recorded. A copy of the report will be kept on file at or near the mine site. Weekly inspection requirements of MSHA, 30 CFR 77.216 do not apply.

R645-301-529 MANAGEMENT OF MINE OPENINGS

Portals within the permit area will be sealed by constructing a concrete block wall (or seal) a minimum of 25' inside of the portal entrance. The area between the seal and the entrance to the portal will then be backfilled with incombustible material. The seal will be constructed out of solid concrete blocks with cement mortar joints. The seal will be built on solid footing with two rows of block keyed into the solid rib of coal. Refer to Figures 5-1 and 5-2 for a typical backfilling and seal design.

At most, four portals will have to be sealed. This includes two intake portals, the belt portal and one return portal. Approximate dimensions of each portal to be backfilled would be 8' high by 20' wide by 25' long. Incombustible material will then be graded over the coal seam at the entrance to the portals. This will be done as the yard is being regraded to approximate original contour during final reclamation operations.

Should periods of temporary cessation of mining operations occur, the portals or portal areas will be secured by steel chain-link fence or equivalent physical barriers to prevent access into underground workings by unauthorized persons. The fences will be secured with locks. Gates at points of access will be locked and signs posted to discourage unauthorized access.

R645-301-530 OPERATIONAL DESIGN CRITERIA AND PLANS

R645-301-531 GENERAL

The sediment pond will not be located over old or new works. Mining will not affect the sediment pond, the embankment or any other structure in the area.

R645-301-532 SEDIMENT CONTROL

Sediment control measures within the proposed disturbed area will include the installation of a sediment pond below the disturbed area. All surface, disturbed area runoff, coal fines and sediment will be diverted into the pond. Drainage ditches and culverts designed to convey the 10 year, 24 hour flow will channel runoff to the sediment pond. Refer to Map 7-2 for the minesite drainage control structures.

Ditches and culverts incorporate the 10 year, 24 hour event design requirements applied for temporary structures. The sediment treatment facility has been designed for the 10 year, 24 hour event. The design of the sediment pond incorporates a sediment storage allowance of three years as estimated by the Universal Soil Loss Equation. Refer to Appendix 7-4 for the Sedimentation And Drainage Control Plan and drainage calculations.

Where the flow velocity is determined to be excessive (i.e. in excess of 5 ft/sec), concrete liners or other equivalent erosion control methods will be used to minimize erosion of the ditches. Sediment production from the disturbed area will be minimized by vegetation cover, grade control and riprapped ditches where necessary.

R645-301-533 IMPOUNDMENTS

533.100 The proposed sediment pond does not meet the size or other criteria of 30 CFR 77.216(a). The sediment pond has been designed to be stable under all conditions with a minimum static safety factor of 1.3. Refer to Appendix 5-4 for slope stability analyses.

533.200 The foundation for the sediment pond will be excavated down to bedrock or other stable material. All vegetative and organic materials will be removed. Available topsoil material in the sediment pond area will be removed and stockpiled in the designated topsoil storage area prior to constructing the pond facilities. The slopes of the pond embankment will be approximately 2:1 on the inslope and 3:1 on the outslope. Where the pond slopes are incised into competent material, interior slopes (other than those of the embankment) may exceed 2:1.

533.300 The bottom and sides of the open channel spillways will be lined with adequately sized riprap or concrete to prevent surface erosion. Slopes will be revegetated to reduce surface erosion.

533.400 The outslopes of the pond will be revegetated to the extent possible to provide surface stabilization and prevent erosion. The vegetation planted will consist of forbs and grasses included in the reclamation seed mix. None of the species planted will threaten the integrity of the pond. The vegetation will enhance the stability of the slopes by curbing erosion and holding the soil in place. Seeding will be done immediately following construction. The seed will be spread by hand and raked in. Straw mulch will be applied at a rate of one ton per acre and will be anchored with hydro mulch.

533.500 Not applicable.

533.600 The sediment pond impoundment proposed for the mine site does not meet the criteria of MSHA, 30 CFR 77.216(a) for the following reasons:

- The proposed total pond capacity is 7.67 acre-feet. The pond can not impound a volume of 20 acre-feet or more, which is the storage volume stated in 30 CFR 77.216(a)(1).

- The pond can not impounded water, sediment, or slurry to an elevation of 20' or more above the upstream toe of the dam structure as stated in 30 CFR 77.216(a)(2). The maximum height water could be impounded in either of the cells is 16.5 feet (to the principal spillway in cell A). The 36" cmp riser spillway is designed for a 25 year, 6 hour event.

- The impoundment would not present a hazard to the coal miners per 30 CFR 77.216(a)(3).

- The design for the sediment pond is shown on Map 7-4. Cross-sections for the pond are shown on Map 7-4A. These maps include construction details for the structure. Refer to the Sedimentation And Drainage Control Plan in Appendix 7-4 for additional calculations.

R645-301-534 ROADS

534.100 Roads within the disturbed area have been designed to prevent damage to public and private property. A nonacid, nontoxic-forming substance (such as gravel or asphalt) will be used to surface the road. Embankments have been designed to be stable at a minimum static safety factor of 1.3 by using standard engineering practices (refer to Appendix 5-4).

Construction of the road, within the disturbed area, will take place once the undisturbed drainage bypass culvert and the sediment pond have been installed. Maintenance of the road within the mine site will be the responsibility of WEST RIDGE Resources, Inc.

The road will have a 24' wide running surface with shoulders and ditches along the length. Cross culverts will be located along the length of the road to facilitate drainage control. Drainage control structures will be sized to handle the 10 year, 24 hour event.

The road will have a crowned, gravel or asphalt surface on top of 6" untreated base coarse overlying a granular borrow sub-base. Concrete "Jersey Barriers" or equivalent will be installed as required along berms and outslopes.

All roads within the disturbed area will be removed and the area reclaimed according to the approved reclamation plan.

Dust will be controlled on unpaved roads within the disturbed area by restricting the speed limit, and by treatment with a chemical stabilizer solution as needed. This solution will be handled in accordance with the manufacturers directions and will be applied with a water truck sprayer.

Maintenance of the roads within the minesite will include the following procedures. Ditches will be periodically cleaned. Drainage culverts will be checked and cleaned as needed after each storm event.

534.200 The type and size of vehicular use has been considered in the design of the road. A relatively flat grade will be constructed in the truck loop area to better facilitate truck loading. Adequate surface width and appropriate spacing of culvert crossings have been incorporated into the design to prevent road damage and promote safety.

534.300 Primary Roads

The primary road will meet the requirements of R645-301-358, R645-301-527.100, R645-301-527.230, R645-301-534.100, R645-301-534.200, R645-301-542.600, R645-301-762.

The access road (primary road) is a Carbon County road. It is a public road and will remain a public accessway after mining operations have ceased.

Other primary roads are the rad from the county road to the warehouse pad and the ramp up to the coal storage pad.

The access road design (within the permit area) has been certified by a registered professional engineer and is included as Figure 5-3. The other primary road designs are shown on Map 5-15.

All drainage culverts installed under the primary road will be designed, installed and maintained according to AASHTO standards as part of the overall Carbon County road design.

R645-301-535 SPOIL

535.100 No excess spoil is anticipated at the proposed underground mine site. Cut and fill operations for the drift entry faceup and yard construction have been balanced so that all materials will be used during final reclamation to restore approximate original contour or taken underground for permanent storage. See Appendix 5-1 for the mass balance calculations.

Earth and rock materials excavated during operations for the portal faceup and yard construction will be placed in the yard fill. The yard area (pad) will be used for the life of the mine. This pad material will be regraded to approximate original contour or permanently stored underground following cessation of mining activities.

535.200 No excess spoil is anticipated. No valley fills or head-of-hollow-fills are proposed.

535.300 No excess spoil is anticipated. Disposal of excess spoil by gravity placement methods is not proposed.

535.400 No excess spoil is anticipated. WEST RIDGE Resources, Inc. Is not proposing disposal of excess spoil by placement on pre-existing benches.

535.500 Rock material resulting from faceup operations for underground coal mine development will be placed in the mine pad fill as part of a cut and fill structure. Fill will be placed in accordance with: R614-301-211, R614-301-212, R614-301-412.300, R614-301-512.210, R614-301-512.220, R614-301-514.100, R614-301-528.310, R614-301-535.100 through R614-301-535.130, R614-301-535.500, R614-301-536.300, R614-301-542.720, R614-301-553.240, R614-301-745.100, R614-301-745.300 and R614-301-745.400. Refer to a discussion of the above referenced regulations in the following text preceded by a # (pound sign).

For the discussion with regard to R614-301-512.210, R614-301-512.220, R614-301-514.100, R614-301-528.310, R614-301-535.100 through R614-301-535.130, and R614-301-535.500 refer to the appropriate section of the permit application.

#210 GENERAL REQUIREMENTS

#211 A description of the pre-mining soil resources as specified under R614-301-221 is presented in Chapter 2. Topsoil will be removed and segregated from other material as required by R614-301-232.

#212 After topsoil has been removed, it will be stockpiled pending redistribution are specified by R645-301-234. Topsoil removal procedures are discussed under R614-301-232. Refer to Appendix 5-5.

#412.300 No excess spoil is anticipated at the proposed underground mine site.

#536.300	No excess spoil is anticipated at the proposed underground mine site. Coal mine waste will not be disposed of in excess spoil fills.
#542.720	No excess spoil is anticipated at the proposed underground mine site.
#553.240	No excess spoil is anticipated at the proposed underground mine site.
#745.100	No excess spoil is anticipated at the proposed underground mine site.
#745.300	No excess durable rock spoil is anticipated at the proposed underground mine site.
#745.400	No excess spoil is anticipated at the proposed underground mine site.

R645-301-536 COAL MINE WASTE.

The proposed surface facilities of the West Ridge Mine do not include any coal preparation systems that will generate processing waste. There are no plans to wash or process the coal, therefore, no coal mine waste rock is anticipated. If, however, minor amounts of waste rock are developed from inside the mine, (overcast material, roof fall cleanup, etc.) which cannot be stored underground and is brought to the surface, it will be hauled off site after either 12 cubic yards (one truck load) has accumulated or 180 days has elapsed. The waste rock will be stored in an approved coal refuse site at the Andalex Wildcat loadout facility. Sediment pond wastes will not be taken into underground workings for disposal. Coal mine waste generated from the cleanout of the sediment pond will be trucked to the ECDC landfill in East Carbon. No refuse disposal facilities will be located within the permit area.

R645-301-537 REGRADED SLOPES

537.100 No alternate specifications are being proposed at this time.

537.200 Fills utilized during the operational phase of mining will be regraded back to approximate original contour.

R645-301-540 RECLAMATION PLAN

R645-301-541 GENERAL INFORMATION

541.100 Upon final cessation of coal mining activities at the proposed site, WEST RIDGE Resources, Inc. will permanently reclaim all affected areas in accordance with the regulations and approved permit.

541.200 WEST RIDGE Resources, Inc. is not proposing surface coal mining and reclamation activities.

541.300 All surface equipment, structures, or other facilities not designated to be left in conjunction with the post-mining land use plan will be disassembled and removed. The affected area will then be reclaimed.

541.400 The reclamation plan for the proposed disturbed areas within the proposed permit area is presented in detail in Appendix 5-5. The plan is outline below for quick reference. Appendix 5-5, however, contains the detail and discussion for the reclamation plan. All proposed plans have been designed to comply with R645-301 and environmental protection requirements.

All lands within the proposed permit area affected by impacts of mining will be reclaimed in accordance with the approved DOGM permit. WEST RIDGE Resources, Inc. commits to mitigate the impacts caused by mining as soon as possible upon discovery of those impacts.

Reclamation of the mine site will begin with the demolition of all buildings and structures. The materials will be removed from the site and hauled to an approved solid waste landfill. After demolition and structural removal of all existing structures at the site, regrading activities will commence. The yard area will be restored to approximate original contour. Excess fill material will be hauled into the abandoned mine entries. The portals will be then be sealed and backfilled according to the approved sealing plan. See Figures 5-1 and 5-2.

The highwalls will be backfilled as described in Appendix 5-9. Fill will be placed to the top of the highwall area. Boulders will be used on the highwall benches to add an additional measure of stability to the fill slopes.

During reclamation activities, the undisturbed drainage diversion culverts will be removed to reestablish the canyon drainages. Diversion culverts will be excavated and the natural drainages re-established beginning at the top of the culverts and working downstream.

As portions of the mineyard are regraded, topsoil will be re-applied and the area gouged to contain runoff and sediment. The area will then be reseeded and mulched. This will be done for the entire reclaimed area. Map 5-9, Mine Site Reclamation, shows the reclamation drainage plan. See Appendix 7-4 for the design details regarding reclaimed channels.

Drainage from the reclaimed areas will be treated prior to entering the undisturbed drainage in the reestablished channels. Surface gouging, silt fences, and straw bales will be utilized for sediment treatment.

Restoration of the drainage channels will seek to present a natural appearance to the drainage while providing a suitable channel configuration. The designs presented are for a permanent structure and calculated for a 100 year, 6 hour event.

The reclaim channel side slopes, widths, and gradients have been designed to closely resemble the premining channel and the channel above and below the disturbed area. The reclaimed channel will be capable of passing the same flow as the undisturbed channel above and below the reclaimed area. As no riparian zone exists along the drainage channel, the regraded slopes will be hydroseeded and mulched with the same treatment used on the yard areas.

In response to a request from the Division an alternate to the approved highwall reclamation plan using a lessor slope is included in Appendix 5-9. The Division approved this alternate reclamation plan on April 24, 2006. Therefore, WEST RIDGE Resources, Inc. has now adopted it as the preferred reclamation plan. Under this “reduced slope” plan, the amount of backfill placed against the highwall will increase by approximately 50,000 cubic yards. However, the amount of excess pad fill which will have to be hauled away will decrease by the same amount. According to the current approved bonding calculations (Nov. 2001) the Division estimates the cost of backfilling the highwall at $2.15/yd (x 50,000 yd = $107,000). And the cost of removing the excess pad fill at $2.92/yd (x 50,000 yd = $146,000). Therefore the cost of adopting the “reduced slope” reclamation plan should be approximately

$38,500 less than the currently approved plan. Therefore, the existing reclamation bond should be adequate for the alternate "reduced slope" reclamation plan.

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TABLE 5-1
RECLAMATION TIMETABLE

ACTIVITY	SCHEDULE

R645-301-542 NARRATIVES, MAPS AND PLANS

542.100 A schedule for the completion of each major step in the reclamation plan is provided on Table 5-1.

542.200 The anticipated final surface configuration is shown on cross-sections of the regraded area (Maps 5-6, 5-6A, 5-6B and 5-6C, Mine Site Cross-Sections). The final surface topography and the replaced drainage channels is depicted on Map 5-9.

Appendix 5-1 contains the details of the reclamation mass balance cut and fill calculations. Appendix 5-5 contains the detailed description of the reclamation plan for the mine site.

As the yard fill is being excavated, the drainage diversion culverts (bypass culverts) will be removed and replaced by open channels. The alignments of the restored channels are shown on Map 5-9. Profiles of the channel gradients are shown on Map 5-8.

During construction activities, up to 6,506 cubic yards of topsoil material will be stockpiled for replacement during final reclamation activities. In addition, approximately 37,000 cubic yards of substitute topsoil material is available to be utilized from the topsoil borrow area, if needed. This substitute material would be used only if necessary to supplement the stockpiled material in order to provide adequate topsoil/growth medium over the regraded yard area.

At the time of final reclamation after the final contouring has been established, the surface will be scarified to a depth of 6" to 12". Topsoil from the stockpile will be trucked to the regraded slope areas and spread with a dozer, loader or grader to the required depth. The area will then be gouged, hydroseeded and mulched. This portion of the reclamation activity will take place as the surface areas are prepared.

On the area where the topsoil has been protected in-place, the geotextile will be removed and a hay mulch applied over the surface at a rate of 2,000 pounds per acre. Then, the surface will be gouged to relieve compaction and promote water infiltration. The area will be either broadcast or hydroseeded with the seed mixture listed in Table 3-2B. The seed will be applied at a rate specified on the table. Next, a weed-free straw mulch will be blown onto the surface at a rate of 2,000 pounds per acre and held to the surface with mulch and a tackifier. If root stock is listed in the seed mix, the containerized plants will be planted at the rate specified in the seed list table. Refer to Appendix 2-6 Plan For Experimental Practice In-Place Topsoil Storage for more details.

Refer to R645-301-537.200, R645-301-552 through R645-301-553.230, and R645-301-553.260 through R645-301-553.900 for additional detail regarding backfilling and grading during final reclamation.

All water monitoring wells will be sealed in accordance with the requirements for abandonment and reclamation in the Administrative Rules for Water Wells established by the Division of Water Rights. WEST RIDGE Resources, Inc. commits to complying with the requirements for closure and will use a certified water well driller to close the wells. Abandonment reports will be submitted to the Division of Water Rights at the time.

542.300 Map 5-9 shows the anticipated final surface to be achieved for the reclaimed area. The earth work calculations for the reclamation activities are presented in Appendix 5-1.
Maps 5-6A, 5-6B and 5-6C show the approximate original contour that will be replaced during reclamation activities in plan view. Maps and cross-sections have been certified as required by R645-301-512.

Refer to Map 5-9 for the segment of Carbon County road which will remain in the permit area as a permanent feature.

542.400 Before seeking bond release, a description of the site ensuring that all temporary structures have been removed and reclaimed will be submitted to the Division.

542.500 The timetable provided on Table 5-1 provides a schedule which includes removal of the sediment pond.

542.600 The access road within the mine site will be reclaimed during reclamation of the mine site. All other roads within the disturbed area will be removed and the area reclaimed according to the approved reclamation plan. The Carbon County public road will be left in place as an approved post-mining land use. The road will terminate at a turnaround. The road will continue to serve as permanent access to public lands in the West Ridge Area.

542.700 Final Abandonment Of Mine Openings And Disposal Areas

542.710 Map 5-9 shows the proposed final reclaimed surface configuration.

Figure 5-2 shows the method for sealing mine portals upon final reclamation. Refer to the discussion presented under R301-645-529.

Surface exploration holes will be sealed to within one foot of the surface with concrete. The water monitoring well, when deemed no longer necessary for ground water monitoring, will be filled with concrete to within one foot of the surface. Plans for final abandonment of surface and mine openings are in accordance with R645-301-529, R645-301-551, R645-301-631, R645-301-738 and R645-301-765.

542.720 Excess rock and spoil material are not anticipated at this location.

542.730 Not applicable.

542.740 Disposal Of Noncoal Mine Wastes

Noncoal mine wastes including, but not limited to grease, lubricants, paints, flammable liquids, garbage, abandoned mining machinery, lumber and other combustible materials generated during mining activities will be disposed of in a permanent, state approved landfill facility approved for disposal of such materials. These wastes will not be disposed of within the permit area. Grease, lubricants, flammable liquids, lumber and other combustible material that are mine supplies and not noncoal mine waste will not be subject to this provision.

Prior to their permanent disposal, noncoal mine waste will be temporarily placed and stored in a controlled manner (such as dumpsters) in the main yard storage area near the shop/warehouse. Mine waste may be temporarily placed next to the dumpsters until it can be sorted into the proper dumpster (i.e. garbage, scrap metal, recyclables, copper, etc.). The area will be suitable for storage of such materials and will be maintained so reclamation and revegetation will not be hindered. Dumpsters will be used to temporarily store trash.

542.800 A detailed cost estimate for reclamation operations is presented in Appendix 5-1. The costs are based on the criteria presented in R645-301-830.100 through R645-301-830.300, and estimated per assumptions stated in section R645-301-540. Unit costs presented are found in the "Means Site Work Cost Data" book for 1997.

R645-301-550 RECLAMATION DESIGN CRITERIA AND PLANS

Site specific plans which incorporate the required design criteria for reclamation activities are presented below.

R645-301-551 CASING AND SEALING OF UNDERGROUND OPENINGS

When no longer needed for monitoring or mining purposes, each shaft, drift, tunnel or other opening to the surface from mine workings will be capped, sealed and backfilled as required by the Division and MSHA, 30 CFR 75.1771. Permanent closure plans are designed to prevent access to the mine workings by people, livestock, fish, wildlife, machinery and to prevent drainage from entering ground or surface waters.

Portals within the proposed permit area will be sealed by constructing a concrete block wall (seal) a minimum of 25' inside of the portal entrance. The area between the seal and the entrance to the portal will then be backfilled with incombustible material. The seal will be constructed of solid concrete blocks with cement mortar joints. The concrete seal will be built on solid footing with two rows of block keyed into the solid rib of coal. Refer to Figures 5-1 and 5-2 for typical backfilling and seal design.

At most, four portals would be sealed. Approximate dimensions of the portals to be backfilled would be 8' high by 20' wide by 25' long. Incombustible material will then be graded over the coal seam at the entrance to the portals when the mine yard is regraded to approximate original contour during final reclamation operations. Map 5-9 depicts the final reclaimed surface configuration.

R645-301-552 PERMANENT FEATURES

552.100 Gouging or land imprinting is being proposed as a method of water harvesting. Depressions approximately 24" x 36" x 18" are being proposed to assist reclamation efforts.

552.200 No permanent impoundments will be retained. No stock ponds are being proposed as permanent features.

R645-301-553 BACKFILLING AND GRADING

553.100 Upon final cessation of coal mining activities at the proposed site, WEST RIDGE Resources, Inc. will permanently reclaim all affected areas in accordance with the regulations and approved permit.

Disturbed areas will be regraded to achieve approximate original contour, eliminate highwalls and achieve a stable, long term slope having a static safety factor of 1.3. The disturbed areas will be backfilled and graded to minimize erosion and water pollution, and will support the approved postmining land use.

The postmining highwall slopes will be constructed to achieve long-term stability. The slope stability has been analyzed for the steepest highwall fill. In general, 2:1 fill slopes will be used. However, because of existing topography or physical constraints a steeper slope of up to 1:1 is planned for certain areas, such as the portal highwall area and the conveyor gallery nose-cut. The slope stability analyses are found in Appendix 5-4.

During backfilling and grading operations, the sediment pond will remain in place to minimize degradation of the undisturbed drainage. Silt fences and straw bales will be used where needed to supplement erosion and sediment controls.

The portals will be sealed and backfilled according to the design presented in Figures 5-1 and 5-2. Because all of the portals are in the same stratigraphic location and all have a highwall, they will all be reclaimed using the same design. A block wall (seal) will be built a minimum of 25 feet inby the portal. Incombustible material will be used to fill the portal and block the entrance.

In order to comply with MSHA regulations, a minimum of four feet of incombustible material will used to cover the exposed coal seam. Where the seam has been exposed, a minimum of four feet of material will be compacted over the coal outcrop.

The area will be regraded to approximate original contour. Map 5-9 depict the final reclaimed surface configuration, and the erosion and water pollution control systems.

The post mining land use of the area will consist of the same uses that presently exist, namely, grazing, recreation, and wildlife habitat. Restoration of the approximate original contour of the mine yard will allow revegetation to be performed on the site. Native plants will be utilized in the revegetation plan. The reclaimed area will resemble the adjacent, undisturbed area and will be capable of supporting the same uses. Refer to Appendix 5-5 for the complete reclamation plan.

The success of natural revegetation within the mine yard area and areas of prior disturbance has demonstrated that reclamation of the land can be achieved. The condition and existing uses of the previously disturbed and regraded land document the fact that backfilling and grading will support the proposed postmining land use.

Several site specific locations within the proposed disturbed area demonstrate this.

553.200 Spoil and Waste

No excess spoil is expected based on cut and fill calculations. Map 5-6A, 5-6B, 5-6C and 5-9 and Figures 5-1 and 5-2 show the methods for sealing mine portals upon final reclamation.

Appendix 5-1 contains the details of the reclamation mass balance cut and fill calculations. Enough material will be on hand to completely regrade the disturbed area. Excess fill material will be hauled off-site or disposed of in the abandoned mine workings.

No terraced excess spoil fills are proposed.

553.250 No refuse piles will be constructed or reclaimed.

553.260 No coal processing wastes or underground development waste will be disposed of in any mined-out surface areas.

553.300 All exposed coal seams will be covered with at least four feet of nontoxic, noncombustible materials during reclamation activities to prevent spontaneous combustion of the seam and to assist with revegetation of the site.

553.400 Terracing is not currently being proposed in the reclamation design.

553.500 Previously Mined Areas

Areas of prior disturbance have been incorporated in the reclamation plan and will be reclaimed at the same time as the proposed surface facilities.

553.600 Approximate Original Contour

The disturbed area will be regraded to approximate original contour. No highwalls will be left.

553.700 The applicant is not proposing surface coal mining activities.

553.800 The applicant is not proposing surface coal mining activities.

553.900 The applicant is not proposing to leave settled and revegetated fills in place at the conclusion of coal mining and reclamation operations.

R645-301-560 PERFORMANCE STANDARDS

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

FIGURES

Replace with

FIGURE 5-1

TYPICAL PORTAL RECLAMATION

Replace with

FIGURE 5-2

TYPICAL PORTAL SEAL

~WEST RIDGE MINE - PERMIT APPLICATION PACKAGE~

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CHAPTER 6
R645-301-600 GEOLOGY

R645-301-610 INTRODUCTION

R645-301-611 GENERAL REQUIREMENTS

Descriptions of the geology within and adjacent to the permit area are provided in R645-301-621 and R645-301-627. A description of the proposed operation plan for the casing and sealing of exploration holes and boreholes is provided in R645-301-630.

~~NOTE: The following discussion for the remainder of R645-301-611 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 geology of the GVH site is essentially the same as at the West Ridge Mine surface facilities located nearby in C Canyon, as shown on Map 6-1. The primary difference is that the mine site is located in the upper part of the Blackhawk Formation where the Sunnyside coal seam outcrops, whereas the Bear Canyon GVH site is located stratigraphically about 384' above the coal seam within the part of the canyon where the Castle Gate Sandstone begins to outcrop. This results in the GVH site being situated in a narrow, ledgebound part of the canyon. The drillholes will reach down to near the top of the mined out coal seam horizon (see Attachment 7 of Appendix 5-14 for details). Because the coal seam in this area has been completely extracted by longwall mining, the GVH drillholes will penetrate through subsided and fractured strata. Based on previous subsidence monitoring the GVH site has subsided about 3 feet, but subsidence has now stabilized.~~

R645-301-612 CROSS SECTIONS, MAPS, AND PLANS

Certified cross sections, maps, and plans have been provided per R645-301-622 and R645-301-512.100.

R645-301-620 ENVIRONMENTAL DESCRIPTION

R645-301-621 GENERAL REQUIREMENTS

Regional Geologic Description

The Book Cliffs contain major coal beds of economic importance in central Utah. The rocks of this continuous, roughly horseshoe-shaped band of Cretaceous age rocks partly surround and dip gently away from the broad regional dome of the San Rafael Swell. Steep escarpments and deeply incised canyons are prominent features, above which are gently rolling plateaus. In the Book Cliffs coal field, of which the lease area is part, elevations range from 4,000 to 6,000 feet along the base of the Book Cliffs to nearly 10,300 feet at the highest point. The strike of the beds in the Book Cliffs is generally parallel to the face of the cliffs with a dip of 3 to 8 degrees to the northeast. Scattered faults of a west-northwest trend are limited to a few miles in length and from 25 to 200 feet in displacement.

Clark (1928) mapped the geology and coal outcrops in the western part of the Book Cliffs coal field from the Standardville 7 ½ minute quadrangle on the west

to Patmos Head quadrangle on the east. Fisher (1936) mapped the eastern part of the coal field. Osterwald (1962) made a detailed study of the structural features of the Sunnyside No. 1 Mine area. Doelling (1972) has also summarized geology and coal data reported in earlier reports.

The coal beds of economic importance in the Book Cliffs coal field are upper Cretaceous in age and are found in the Blackhawk Formation of the Mesa Verde Group. The Mesa Verde Group contains three formations that are, in ascending order, the Blackhawk Formation, the Castlegate Sandstone, and the Price River Formation. The upper Cretaceous Mancos Shale underlies and intertongues with the Blackhawk Formation but lies well below the mining horizon.

The lowest bed of the Blackhawk Formation is the Kenilworth Sandstone member. The lower section of this cliff-forming unit is thinly bedded and divided by shale partings, but the major part is a massive sandstone member about 130 feet thick. The coal-bearing portion of the Blackhawk Formation lies above the Kenilworth Sandstone and has been divided roughly into three members recognized by Fisher (1936). The lower division consists of alternating sandstone, shaley sandstone, shale and coal. It contains the Kenilworth coal bed. The middle division is dominated by massive cliff-forming sandstone but near the top has lagoonal deposits which include the upper and lower Sunnyside coal beds. The upper division is a sequence of shaley sandstone, shale and coal. The entire Blackhawk Formation is about 700 feet thick.

The cliff-forming Castlegate Sandstone overlies the Blackhawk Formation. It is about 180 feet thick and is composed mainly of fine to medium grained light gray sandstone.

The Price River Formation overlies the Castlegate and is about 500 feet thick. It consists of interbedded sandstone and shale. The sandstone is light colored, slightly calcareous to argillaceous, and thinly bedded to massive. The shale is medium to dark gray, carbonaceous, and contains minor beds of bony coal.

The strata successively overlying the Price River Formation include the North Horn Formation (upper Cretaceous and Paleocene), the Colton and Wasatch Formation (Eocene) and the Green River Formation (Eocene). The North Horn Formation consists of interbedded yellowish-gray sandstone, light yellow to greenish-gray shale and limestone, and a conglomeritic sandstone at the base of the formation. The Colton Formation is composed of interbedded sandstone, siltstone and shale. The Green River Formation is the youngest formation in the area. The formation consists mainly of greenish-gray and white claystone and shale.

Description of the Coal Seam Geology

In the West Ridge-C Canyon area there are six coal seams that have been identified, however, the four lowest seams are thin, of limited extent and not mineable. The lowest seam is the Kenilworth coal seam. This seam rests directly on the massive Kenilworth Sandstone Member of the Blackhawk Formation or is separated from it by several feet of shale. The C Canyon mining area is on the eastern margin of this coal seam. The seam averages two feet thick along the outcrop and does not exceed four feet anywhere on the property.

About 20 feet above the Kenilworth coal is the Gilson coal horizon. This seam is most developed in the northwestern part of the property in the vicinity of Pace Canyon where thicknesses in the range of 12 feet have been measured. Toward the southeast in B Canyon, the seam splits and thins. By Whitmore Canyon, the coal has been replaced by marine sands. Over the northern portion of the lease area, the main Gilson bed is less than 2 feet thick. It is separated from the Kenilworth seam approximately 30 feet in the northern area.

The Fish Creek coal horizon lies about 15 to 25 feet above the Gilson seam. This seam averages 1 to 2 feet in thickness in the lease area, never developing into a mineable reserve. About 55 to 70 feet above the Gilson seam is the Rock Canyon coal horizon. This seam is not developed anywhere in the lease area.

The principal coal-bearing horizon beneath the C Canyon lease area is the Sunnyside coal zone. This zone begins 125 feet above the Rock Canyon seam and ends 200 to 275 feet below the Castlegate Sandstone. This zone varies between several feet to more than 60 feet in thickness between the lower and upper seams. Within this zone, the Sunnyside Mine has found nine coal beds. The bottom three have been assigned to the Lower Sunnyside Seam and the remainder to the Upper Sunnyside Seam.

The Lower Sunnyside Seam is the most important coal seam in the area. It exceeds 6 feet throughout most of the lease area. But, toward the south and east within the Sunnyside #3 Mine, the seam thins to 3.5 feet. The seam has a characteristic sandstone floor. The roof of the Lower Sunnyside Seam throughout the lease area is composed of either a black sandy shale or a fine grained sandstone with shale partings. To the north and west of C Canyon the Lower Sunnyside seam occurs as a single seam. However, to the south and east, one or two rider seams are present above the main coal seam. Neither of the rider seams reaches mineable thickness. Within the vicinity of the Sunnyside Mines to the south, the rider seams combine with the Upper Sunnyside to form a single seam 10-15 feet thick.

The Lower Sunnyside coal is brittle, tough and hard to pick. It has a metallic ring when struck with a hammer (Clark, 1928). It is a bright coal lacking definite fracture lines and breaks into large irregular lumps (Thiessen and Sprunk, 1937). Doelling (1972) summarized the coal's description as "a uniform attrital-anthraxulous bright coal largely derived from small plant material such as small stems, twigs, roots and leaves". Clark (1928) reported that the Upper and Lower Sunnyside coal beds contain the best coking coal known in the Book Cliffs coal field in Utah and that "the coal weathers very slowly on exposure to the air and therefore makes a good stocking fuel..."

The Upper Sunnyside Seam is the least well defined of all of the coal horizons. Many of its six beds are lenticular and cannot be correlated between widely spaced data points. The seam ranges in overall thickness from 2.0 to 15.0 feet in the Sunnyside Mine to an average of 7 feet in the Sunnyside No. 1 Mine and 5.7 in the workings of the Sunnyside No. 3 Mine. On the C Canyon lease area, the average seam height is less than 4 feet. Because of its thinness and close proximity to the Lower Sunnyside Seam, none of the Upper Sunnyside is considered to be mineable.

Overburden depths (cover lines) for the Lower Sunnyside Seam are shown on Map 5-7. The maximum cover exceeds 2,500 feet. The average overburden under West Ridge is approximately 1,500'. For more details regarding overburden depths refer to Map 5-7.

TABLE 6-1
GENERALIZED GEOLOGIC SECTION
CRETACEOUS STRATIGRAPHY IN THE WEST RIDGE AREA

R645-301-622 CROSS-SECTIONS, MAPS AND PLANS

622.100 Elevations of the coal seam to be mined and locations of drill holes are shown on Map 6-2, Coal Seam Structure Map. Drill hole collar elevations and intervals cored and plugged are presented in Appendix 6-2 in a table format.

622.200 The depth and thickness of surrounding strata are depicted in the stratigraphic column (Table 6-1). For additional information on the typical stratigraphic lithology and coal thickness within the permit area refer to the drill logs contained in Appendix 6-2. The mineable thickness of the Lower Sunnyside Seam is shown on the isopach map (Map 6-3, Lower Sunnyside Coal Seam Isopach Map). Map 6-1A, Geologic Cross-Section A-A', is an east-west cross-sections through the permit area. The depth of the Lower Sunnyside Seam is depicted by overburden contours on Map 5-7.

Representative drill hole logs depicting the nature, depth and thickness of the coal seam to be mined and rider seams in the overlying strata are presented in Appendix 6-2. The drill holes selected are shown on Map 6-2.

A detailed cross-section of the lithology in the Whitmore Canyon area depicting the heterogeneous nature of the stratigraphy is included in Appendix 6-2 on Plate 1.

622.300 The outcrop line of the seam to be mined (i.e. the Lower Sunnyside Seam) is shown on Map 6-1, Regional Geology Map. The strike and dip of the seam in the permit area is also shown on Map 6-1.

622.400 No oil and gas wells exist within the proposed permit area.

R645-301-623 GEOLOGIC INFORMATION

623.100 Acid or Toxic-Forming Strata

Analyses have been performed on strata above and below the coal seam to be mined. This data is presented in Appendix 6-1. Analyses of the rock strata indicate that the potential for acid and/or toxic-forming material is minimal. The guidelines to which the analyses are compared are designed to be used for material in the vegetative rooting zone. WEST RIDGE Resources, Inc. is not proposing to use the material sampled in reclamation operations. Roof and floor material would be permanently stored underground and not stockpiled on the surface.

The only underground development waste generated as part of the mining operation would consist of roof rock that is shot down during construction of ventilation overcasts. This material will be stored permanently in underground mine workings such as cross-cuts or storage rooms; it will not be brought out of the mine for outside storage and will therefore not be a factor in the final reclamation of the minesite.

Because WEST RIDGE Resources, Inc. intends to ship a mine-run product from the mine no coal processing wastes are anticipated. WEST RIDGE Resources, Inc. has been successfully marketing a mine-run product from its central Utah operations for the last fifteen years.

623.200 Reclamation Feasibility

Within the proposed disturbed area, there has been previous coal exploration work that occurred from the mid 1950's through 1986. None of the sites have undergone reclamation work. However, native vegetation has been re-established naturally on the disturbed areas such as the road and drillhole sites. Evidence indicates that successful reclamation of the minesite should be achievable and capable of supporting postmining land uses. In most of the previously disturbed areas, vegetation has reestablished itself naturally on the regraded fill material. This is significant because post reclamation efforts at this site in the past were quite limited compared to today's standards. No topsoil was spread over the area. Seeding, mulching and imprinting generally were not done.

At the Horse Canyon mine site, about 5 miles to the south, reclamation was conducted on an old minesite. The canyon is similar in aspect and elevation to C Canyon. Reclamation has progressed quite successfully at this site. There appears to be no adverse affects from the previous coal mining activities to diminish successful reclamation.

Samples of the Lower Sunnyside seam and the adjacent roof and floor material were collected for analyses in November 1997. The samples were taken from the outcrop in the left fork of C Canyon were the coal seam was previously excavated for a bulk coal sample. The results of these analyses are presented in Appendix 6-1. The analyses were conducted according to Table 6 of DOGM's "Guidelines For Management Of Topsoil And Overburden For Underground And Surface Coal Mining". The location of the sampling site is shown on Map 2-2, Minesite Order 1 Soil Survey. The samples were collected by taking a channel sample of the roof, floor and coal material from the exposed outcrop. The analyses indicate that the coal contains potentially acid forming materials. This should not pose a significant problem because the coal will be stockpiled in a relatively contained area of the mineyard and all runoff from the site will flow to the sediment pond for containment. At the time of reclamation, the coal will be removed from the site prior to the commencement of any regrading activities. Also, any waste rock generated through underground activities, such as construction of overcasts, will be permanently stored underground and therefore should not be a factor in surface reclamation activities.

623.300 Subsidence Control Plan

Map 5-7 shows the locations of the subsidence monitoring control points proposed for the initial mining area. Refer to R645-301-525 in Chapter 5 for the discussion on subsidence. The geology of the area around Grassy Trail reservoir is discussed in a seismic analysis report (see Appendix 5-11) and the Phase II dam safety report (see Appendix 5-12). These reports conclude that it is unlikely that mining induced seismicity or subsidence will impact the performance of the Grassy Trail Dam and Reservoir. Based on the conclusion of this study the BLM has approved the R2P2 to allow full extraction longwall mining of Panel #7.

R645-301-624 GEOLOGIC DESCRIPTION

624.100 Regional and Structural Geology

The proposed permit area is located in the Sunnyside coal-mining district, an area in the western Book Cliffs on the northern margin of the Colorado Plateau. The proposed permit area is bounded on the southwest by East Carbon Valley and on the northeast by Whitmore Canyon. The permit area is bounded by the existing (abandoned) Sunnyside Mines on the south. Elevations in the area range from 7,000 to 8,500 feet.

The permit area is underlain by north to northeast dipping clastic sedimentary rocks deposited during the Cretaceous and Tertiary period. The regional dip is a result of the effect of the San Rafael Swell located to the southwest.

Professional papers by Osterwald et al. (1981) and Doelling et al. (1979) have described the geology of the region. Kaiser Coal Corporation (1986) has described the geology of the proposed permit area in a previous permit application submitted to the Division of Oil, Gas and Mining during the mid 1980’s. Pike Coal Company (1988) has prepared a report describing the geology and coal reserves of the general permit area (in-house report). Sunnyside Coal Company (1993) has described the geology of the coal leases located immediately to the southeast of the proposed permit area. The geologic description that follows is based on information from these sources.

Stratigraphy

Six bedrock formations, ranging in age from Cretaceous to Eocene, crop out in the lease area. These formations are (from oldest to youngest), the Mancos Shale, Blackhawk Formation, Castlegate Sandstone, Price River Formation, North Horn Formation, and Colton Formation. These sedimentary rock units are associated with the Western Cretaceous Interior Seaway and the highland areas of the Sevier Orogenic Belt. Sediments eroded from highland areas were carried eastward toward the seaway by fluvial systems and deposited in terrestrial, shoreline, and marine depositional environments. Overall, this sequence of rocks represents the regression of the interior seaway. Many smaller-scale regressions and transgressions occurred during this time as well. This depositional history has resulted in a heterogeneous rock record that has had a profound effect on the water-bearing characteristics of these rocks.

Stratigraphy is illustrated on Table 6-1 and Map 6-1A and described below.

<u>Mancos Shale</u>

The Mancos Shale was deposited in deep, quiescent portions of the Western Cretaceous Interior Seaway from Early to Late Cretaceous time. Consequently, the Mancos Shale is over 4,000 feet thick and underlies vast portions of the Colorado Plateau. The Mancos Shale is carbonaceous, gypsiferous, and slightly calcareous. The unit is medium-gray to bluish-gray and is locally fissile with discontinuous stringers of siltstone and mudstone. The Bluegate Member of the Mancos Shale is exposed at the base of the Book Cliffs, on the floor of East Carbon Valley, and in the mouth of Whitmore Canyon.

The contact of the Mancos Shale with the overlying Blackhawk Formation is conformable and intertonguing. The shale units in the lower Blackhawk are lithologically equivalent to the Mancos and the gradual change in depositional environments resulting from a regression of the shallow Cretaceous sea.

Blackhawk Formation

The Late Cretaceous Blackhawk Formation intertongues with the upper Mancos Shale. The Blackhawk Formation is the product of an eastward-prograding deltaic complex that formed during the retreat of the Western Cretaceous Interior Seaway. In the West Ridge area, the Blackhawk Formation is a moderately resistant, cliff-forming sandstone that forms the lowermost and most predominant cliffs of the Book Cliffs. Slope-forming mudstones are interbedded with sandstone in the lower portion of the formation creating steep slopes. Unit thickness ranges from 625 to 800 feet.

Five distinct members of the Blackhawk are recognized in the proposed permit area. In ascending stratigraphic order, these are the Aberdeen Member, Kenilworth Member, lower mudstone member, Sunnyside Member, and upper mudstone member. The Aberdeen member is a shaley siltstone and sandstone member that is bounded above and below by the Mancos Shale.

The Kenilworth Member ranges from 110 to 220 feet thick and is comprised of three distinct sandstone tongues interbedded by shale. The base of the Kenilworth is defined as the lowest persistent sandstone bed in the Blackhawk.

The lower mudstone member of the Blackhawk has no formal stratigraphic name. It is 150 to 200 feet thick and made up of dark gray clayey mudstone, shales, and sandy siltstones. The lower part of the member is marine and the upper part is continental having been deposited east of the beaches that later formed the sandstones in the underlying Kenilworth. The Rock Canyon Coal Seam lies at the base of this member directly on top of the Kenilworth Member. The Rock Canyon Coal bed is lenticular and discontinuous, being exposed on the outcrop most notably in Rock Canyon.

The Sunnyside Member is predominately sandstone. The Aberdeen, Kenilworth, and Sunnyside Members represent beach and barrier bars depositional environments. The intervening mudstone members are shallow marine foreshore deposits. The Sunnyside Member overlies the lower mudstone and is approximately 100 to 190 feet thick. The basal portion of the unit is comprised of interbedded sandstone and siltstone. This lithology grades upward through thinly bedded, medium-grained sandstone in the upper Sunnyside Member. The upper part of the unit represents a high-energy depositional environment as evidenced by abundant crossbedding and ripple marks.

Overlying the Sunnyside Member is a 100 to 200 foot thick sequence of mudstone and siltstone with discontinuous sandstone beds that comprise the upper unnamed mudstone member of the Blackhawk. Large channel sandstone lenses are common in the upper part of the member and are equivalent to estuarine and beach deposits. The upper contact of the Sunnyside Member is a diastemic unconformity. Following deposition of this unit, stream channels cut into the mudstones and deposited channel sands similar to those in the overlying Castlegate Sandstone. Thin and discontinuous lenses of coal occur throughout the upper mudstone member; however, the principal coal bed in the member is the Sunnyside Coal bed that lies at the base of the unit. The Sunnyside coal often occurs in two splits. In the proposed permit area, the lower split is the seam that occurs in greater thickness.

Coal deposits in the Book Cliffs Coal Field occur within the Blackhawk Formation. Of economic interest in the proposed permit area is the Lower Sunnyside Seam, which lies directly above the Sunnyside Sandstone. The thickness of the Lower Sunnyside Seam in the proposed permit area ranges from 4 to 10 feet with an average mining thickness of approximately 7 feet. Coal seams which are not of economic interest include the Kenilworth Seam and Gilson Seam which occur in the Kenilworth Member, the Rock Canyon Seam, which occurs at the base of the lower mudstone member, and the Upper Sunnyside Seam. The stratigraphic location of these seams is shown on Table 6-1.

Castlegate Sandstone

The resistive Castlegate Sandstone forms a distinct cliff above the slope-forming upper mudstone member of the Blackhawk Formation. The formation is about 200 feet thick in the lease area. The Castlegate was deposited by a bed-load fluvial channel system. The unit lithology is dominated by sandstone with occasional siltstone and claystone interbeds. Sandstone channels are varied in size and interpenetrate. Sands within the channels are coarse grained and can be conglomeratic. The Castlegate forms a prominent cliff above the Blackhawk. The units overlying the Castlegate form a series of retreating ledges and slopes.

Price River Formation

The Price River Formation forms a series of ledges and slopes. It ranges in thickness from 160 to 600 feet. The formation is divided into two members, the lower mudstone member and the Bluecastle Sandstone. The lower member is 150-300 feet thick. The unit is poorly cemented, argillaceous sand that is easily eroded. The depositional environment of the lower Price River Formation is a mixed-load fluvial channel system, which created interbedded sandstone and shale/claystone layers. This unit was deposited on a coastal plain and as a result contains thin lenses of channel sands and thin, discontinuous coal beds. It is easily eroded thereby forming slopes.

The Bluecastle Sandstone is medium- to fine-grained sandstone with silica, carbonate, and ferruginous clay cement. The thickness of the Bluecastle Sandstone varies greatly within the permit area. The unit is 10-300 feet thick, and although it thins to the east, the Bluecastle Sandstone is a substantial unit in the lease area. The Bluecastle represents an alluvial fan/alluvial plain depositional environment and weathers to form abrupt vertical cliffs.

North Horn Formation

This unit is reddish-brown and grayish-brown mudstone with interbedded siltstone, sandstone, and limestone. Limestone beds are dark gray, dense, thin-bedded, and locally fossiliferous. The deposition of the North Horn Formation was in fluvial, alluvial plain, and lacustrine environments. Mud is more abundant than sand, which appears mostly in fluvial channels. Sandstone channels are isolated spatially by overbank mudstone deposits and lacustrine clays.

The North Horn Formation caps much of the permit area. Where exposed at the surface, it forms variegated slopes. The North Horn is about 800 feet thick in the West Ridge area.

Colton Formation

The Eocene Colton Formation is the cap rock for much of West Ridge and forms the steep slopes and cliffs of the Roan Cliffs to the east. The unit is dark-reddish brown mudstone and shaley siltstone. Locally the formation is distinctly variegated red and gray. The formation is formed from clastic materials shed from adjacent highlands in ancient Lake Flagstaff and Lake Uintah. Deposits include interbedded alluvial, marginal lacustrine, and lacustrine sediments. In the West Ridge area, the ancient Colton fan-delta formed an especially thick (1,600-2,700 feet) section of Colton Formation rocks.

The Colton Formation forms the Roan Cliffs located on the east side of Whitmore Canyon, east of the permit area. Within the lease area, the Colton is divided into two subunits. The lower one is comprised of mudstone with some channel sandstone deposits and some thin limestone interbeds. It is primarily a slope former. The upper unit is made up primarily of fluvial sandstone and forms cliffs and bluffs with an occasional intervening slope. The upper unit has been called the Wasatch Formation by some.

Colton Formation sediments were deposited during an intra lacustrine period between the time of deposition of the older Flagstaff limestones and the deposition of the limestones and marls of the Green River Formation, which overlies the Colton Formation. There is no Green River Formation remaining in the lease area.

Structure

The structure in the region is controlled predominately by uplift of the San Rafael Swell. Beds are mostly uniform and are inclined 3 to 8 degrees away from the uplift. The strike of the beds is generally parallel to the face of the cliffs. Steep escarpments and canyons are prominent features, above which are rolling plateaus, while below are pediments and plains.

No major faults have been mapped in the lease area. The Sunnyside fault is a major north-northwest striking fault throughout much of the Sunnyside Mining District to the south. The vertical displacement on this fault decreases northward and is not detectable from surface mapping within the lease area.

Doelling, 1973, shows dashed fault lines in the vicinity of C Canyon. However, an extensive field investigation by Agapito Associates, Inc. during October 1997 did not locate any faulting in this vicinity. See the letter report discussing the field investigation results in Appendix 6-3.

Groundwater

As noted above, the depositional history of the geologic formations in the permit and adjacent areas has resulted in a heterogeneous rock record that has a profound effect on the water-bearing characteristics of these rocks. This heterogeneous lithology creates alternating horizons of mostly impermeable rocks and relatively permeable rocks. Relatively permeable sandstone channels preferentially support groundwater systems, and areally extensive groundwater systems or aquifers are precluded.

As described in R645-301-724.100, active groundwater flow in the permit area occurs almost exclusively in near-surface groundwater systems that are often associated with colluvial and alluvial materials. Groundwater that is encountered in the Blackhawk Formation is associated with inactive groundwater flow systems. Mining is not expected to impact near-surface active groundwater systems. Mining may potentially dewater localized inactive groundwater systems of the Blackhawk Formation. These impacts will not affect the discharge of springs and streams in the permit and adjacent areas because the dip of the Blackhawk Formation into the Book Cliffs prevents water in the Blackhawk Formation from discharging.

624.110 Cross Sections, Maps, Plans.

624.120 Information for this section is found in R645-301-624.200, R645-301-624.300 and R645-301-625.

624.130 Geologic Literature and Practices.

The geologic literature utilized in preparing R645-301-600 is contained in the reference list at the end of this chapter.

Much of the geologic data of the permit area was obtained during exploration programs conducted by previous lease holders. WEST RIDGE Resources, Inc. has recently supplemented this data through additional field work within the permit area.

All practices and procedures for obtaining geologic information have been standard for the industry. This includes lithologic logs, drill hole E logs, columnar sections, detailed coal bed lithology, core photographs, and coal sample analysis. This data was then used to compile seam correlation maps, geologic
cross sections, fence diagrams, coal isopachs, rock isopachs, overburden isopachs and paleochannel delineation. Professional engineering and geological organizations were employed to collect and interpret the geologic information.

The data was obtained from numerous drill holes in and adjacent to the permit area and from the adjacent Sunnyside Mines.

624.200 Drill hole logs did not contain any information about water encountered during the drilling process. It is unknown whether no water occurred or it was just not noted.

624.300 Drill Hole Sample Analyses

624.310 Lithologic logs of drill holes in the permit and adjacent areas are compiled in Appendix 6-2. A summary of the drill hole collar elevations and depths has been added to Appendix 6-2.

624.320 Strata above the coal seam to be mined consist of interbedded sandstone and shale. Samples of the roof and floor material was collected and analyzed for the parameters listed in Table 6 of "Guidelines For Management Of Topsoil And Overburden For Underground And Surface Coal Mining". The results are presented in Appendix 6-1. Based on laboratory analyses and observations on site, the strata above the seam does not contain material or elements in concentrations which would be adverse to vegetative growth when it is covered with backfill material.

624.330 Chemical analyses of the coal seam to be mined have been performed. The analyses include all of the parameters listed in Table 6 of "Guidelines For Management Of Topsoil And Overburden For Underground And Surface Coal Mining". The results of these analyses are included in Appendix 6-1. The analyses for total sulfur include organic, pyritic and sulfate sulfur. Based on the laboratory analyses and observations on site, the coal seam to be mined does not appear to contain constituents in concentrations that would adversely affect vegetative growth and should not produce acid soil problems.

In the Wasatch Plateau and Book Cliffs Coal Fields, acid mine drainage generally not a concern because of abundant carbonate minerals in the coal-bearing stratum and the relatively low concentration of sulfur within the coal. The dissolution of

carbonate minerals quickly consumes any acid produced from the oxidation of pyrite.

The sample location for the roof/floor material of the Lower Sunnyside seam is in the left fork in an area where the outcrop has been exposed and tested in the past. This sample is considered to be representative of the roof/floor material which is expected to be encountered throughout the mine. The Lower Sunnyside seam is also the most consistent and widespread seam in the area and will be the only seam mined at the West Ridge mine. The floor for the Lower Sunnyside seam is typically the Sunnyside Sandstone which is a distinctive beach sandstone. This sandstone member is continuous and widespread and is a distinguishable geologic member throughout the West Ridge area. Based on visual observations the roof lithology at the left fork site, it is similar to the lithology depicted in numerous drill holes throughout the reserve area.

WEST RIDGE will commit to taking additional roof/floor samples when the coal seam is exposed at the portal area in the right fork. These additional samples can be used to verify the results of the left fork sample. It should be noted that WEST RIDGE Resources intends to produce a mine run product and does not propose to process and of the coal or dispose of any mine generated reject material.

624.340 Engineering Properties

The mining technique to be utilized for the West Ridge Mine is longwall mining. This regulation is not applicable in this situation.

R645-301-627 OVERBURDEN THICKNESS AND LITHOLOGY

The overburden thickness above the Lower Sunnyside Seam for the proposed mining area is depicted on Map 5-7. Typical drill logs have been provided in Appendix 6-2 for additional overburden and lithology information.

Due to the complex depositional environment of the coal deposits, roof rock types will vary throughout the mining area. In general, the Lower Sunnyside Seam is overlain by sandstone or shale. In areas where paleochannels exist, the immediate roof will be sandstone. Mine planning will take into account the variability of roof materials. Roof rock will be monitored during the mining operation through roof bolting activities, mine mapping and/or underground drilling.

R645-301-630 OPERATION PLAN

R645-301-631 PLAN FOR CASING AND SEALING EXPLORATION HOLES

All drill holes from previous exploration activities have already been sealed to the surface with cement and reclaimed. Any future drill holes will be sealed with cement to within one foot of the surface. The remainder of the hole will then be filled with local fill materials to allow regrowth of vegetation over the site. All drill holes will meet the specifications set forth by the State Engineer and the Division of Water Rights as required. A licensed driller will perform the work of sealing the drill holes.

R645-301-632 SUBSIDENCE MONITORING

Refer to R645-301-525 in Chapter 5 for the subsidence information required for this section. Map 5-7 shows the locations of the subsidence monitoring control points proposed for the initial mining area.

R645-301-640 PERFORMANCE STANDARDS

641 All exploration holes and boreholes will be permanently cased and sealed according to the requirements of R645-301-630.

642 All monuments and surface markers will be reclaimed in accordance with R645-301-521.210.

REFERENCES

Doelling, H.H., et al, 1979, Observations on the Sunnyside Coal Zone: Coal Studies, Special Studies 49, Utah Geological and Mineral Survey, p. 44-68.

Kaiser Coal Corporation, 1986, Mining and Reclamation Permit for the Sunnyside Number 5 Mine, Carbon County, Utah.

Osterwald, F. W., Maberry, J. O. and Dunrud, C. R., 1981, Bedrock, surficial and economic geology of the Sunnyside Coal-Mining District, Carbon and Emery Counties, Utah: U. S. Geological Survey Professional Paper 1166, 68 p.

Pike Coal Company, 1980, B-Canyon geological report, 22 p.

Sunnyside Coal Company, 1993, Mining and Reclamation Permit for the Sunnyside Mines, Carbon County, Utah, Chapter 6-Geology, ACT 007/007.

~WEST RIDGE MINE - PERMIT APPLICATION PACKAGE~

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CHAPTER 7
R645-301-700 HYDROLOGY

Historical Note: 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. 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 4ea. flumes).

b) Installation of measuring/recording devices at each flume, within the normal operating flow limits of the flumes.

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

d) 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.

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

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

g) 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 7-15.

R645-301-711 General Requirements

This chapter includes a description of hydrology and hydrogeology of the West Ridge permit area. Specifically, this permit application includes:

711.100 Existing hydrologic resources according to R645-301-720.

711.200 Proposed operations and potential impacts to the hydrologic balance according to R645-301-730.

711.300 The methods and calculations utilized to achieve compliance with the hydrologic design criteria and plans according to R645-301-740.

711.400 Applicable hydrologic performance standards according to R645-301-750.

711.500 Reclamation activities according to R645-301-760.

~~NOTE: The following discussion for the remainder of R645-301-711 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 site will be located on the opposite side of the road (southeast side) from the primary canyon drainage channel. Therefore, construction and operation of the GVH facility will have no affect on the natural canyon drainage. Because of the limited size of the site (0.24 acres) and the narrow configuration within the confines of the narrow ledges of the canyon, there is insufficient room to construct a sediment control pond. Therefore the company intends to employ a combination of alternate sediment control methods at the site. During the construction phase of the pad site, adequate rows of excelsior logs will be placed downgrade from the site to prevent construction sediment from entering the channel. Once the pad site is finished, which should take less than two weeks, a disturbed area drainage ditch will be constructed along the toe of the cut. This ditch will be designed to handle the flow from the up-slope undisturbed area, the reclaimed cutslope, the drillpad, and the adjacent section of road. This ditch will discharge into the natural drainage channel a short distance below the drillhole location. This ditch will be armored with adequately-sized rip-rap for its entire length. This rip-rap will~~

~~decrease the potential for erosion in the ditch, and will also act initially as a siltation trap as a certain amount of sediment is allowed to settle into the rip-rap voids.~~

~~The total length of the drainage ditch will be approximately 350'. At 50' intervals along its length energy dissipaters will be installed in the ditch. These energy dissipaters will consist of excelsior logs laid in the ditch perpendicular to the flow direction, and anchored securely with stakes. These dissipaters will reduce the flow velocity to help reduce erosion, and will also serve as siltation filters to help remove sediment prior to reaching the natural channel. In addition, a terminal set of excelsior logs will be installed in the ditch immediately above the point where it discharges into the natural channel. The installation, consisting of four (4 ea.) closely-spaced rows of excelsior logs will serve primarily as sediment traps, rather than energy dissipaters. This set will be located conveniently close to the road to facilitate regular cleaning and maintenance. The sediment traps will be inspected routinely to make sure they are functioning properly. There will be mine personnel attending to the GVH units on a daily basis, and will be instructed to check the sediment traps on a regular basis, and especially after storm events. If they are in need of repair and/or cleaning such maintenance will be done immediately. Sediment cleaned from the traps will be hauled off-site and disposed of at an approved facility, such as the permitted Wildcat Loadout Coal Mine Refuse Disposal Site (DOGM permit C/007/033). All excelsior logs will be installed according to the manufacture's instructions.~~

~~Immediately after the cutslopes have been excavated to create the pad-site, the slopes will be pocked, and reseeded. A layer of woodstraw will then be spread over the reseeded slopes. This straw serves to not only provide microclimate conditions to encourage seed germination, it also absorbs some of the energy from falling raindrops, and therefore helps control erosion on the slopes until revegetation can become established. The pocking, which consists of irregular depressions measuring about 24" x 36" x 18" deep, helps revegetation by holding the seed and water in place, and thereby helps minimize erosion as well.~~

~~During the drilling phase of the GVH installation, the pad area will be used as an equipment lay-down area for drill steel, drill casing, drilling mud, concrete, etc. The pad will also be used to accommodate the mud pits needed during the drilling operation. The mud pit will measure approximately 30' long x 10' wide x 10' deep, and will be located immediately down-canyon, i.e., southwest of, the drillholes, as shown in Attachment 1. The pit will be lined with a 12 mil plastic liner, with a 20 mil felt underlayment. Based on the diameter and total combined length of the drillholes, and assuming a swell factor of 40% for the cuttings, the estimated volume of cuttings is 1283 cubic feet, or 47 yds. This would result in a total depth of cuttings remaining in the bottom of the pit of about 4.28 ft. After the drillholes have been completed the remaining cuttings will be mixed with native material until it can be handled with heavy machinery. It will then be removed from the pit and hauled off-site to an approved disposal facility. After~~

~~the cuttings have been removed, the pit will be backfilled and eliminated. The site will then be cleaned up and fine-graded prior to installing the methane extractor units (see Attachments 1 and 7 for details). A period of approximately two weeks will be required to construct the drillpad and to drill the holes. During this time interim sediment control will be provided by several rows of excelsior logs installed at the lower end of the construction site. Sediment is not expected to be a problem because of the short construction time involved (approx. 2 weeks), the low probability of rainfall events in late November at this elevation, and the temporary installation of the excelsior logs.~~

~~After the site has been constructed the entire operational pad area, as well as the adjacent road area and turnaround, will be graveled from the channel crossing up to the end of the road . This gravel will consist of a crushed rock 1.5" x 0" road base material, laid down and then compacted to a tight surface. This graveled surface will also serve to reduce erosion on the pad (and adjacent road segment) and thereby decrease sedimentation to the natural drainage.~~

~~In summary, the site will be an alternate sediment control area. Sediment will be controlled by the following combination of treatment methods:~~

~~1) Armoring the entire length of the drainage ditch with rip-rap.~~

~~2) Installation of energy dissipaters within the ditch to slow the flow velocity.~~

~~3) Installation of set of sediment control excelsior logs in the ditch ahead of the discharge point.~~

~~4) Pocking and revegetating the cutslope, including a layer of protective wood straw.~~

~~5) Graveling the pad-site and adjacent roadway~~

~~Refer to the site plan in Attachment 1 of Appendix 5-14 for the location of the drainage ditch, energy dissipaters, excelsior log siltation controls, and graveled area. See Attachment 11 of Appendix 5-14 for the drainage control calculations determined by Blackhawk Engineering. This report concludes that with *"....installation of the proposed sediment and erosion controls, there should be no adverse effects to the surface hydrology of this area."*~~

~~The GVH installation and operation should have no adverse affect on ground-water hydrology. The GVH site is located close to the area where the depth of cover over the longwall panels is the shallowest within the permit area. As a result, this area has been an area of interest in previous MRP amendments, resulting in enhanced water monitoring and subsidence monitoring requirements both above and below the GVH site. A more detailed discussion of the area~~

~~hydrology can be found in R645-301-322.100 and R645-301-738 of the approved MRP. It should be noted that this area has been now been completely undermined since November, 2006, subsidence has stabilized, and no adverse affects to underground or surface hydrologic resources have been observed. Prior to final reclamation, all drillholes will be plugged and sealed in accordance with State and Federal regulations, as discussed in the Chapter 5 section of Appendix 5-14. See Attachment 10 of Appendix 5-14, prepared by Petersen Hydrologic, for a discussion of the potential hydrologic affects from the GVH installation and operation. This report concludes that *"adverse impacts to the hydrologic balance resulting from the installation and operation of the Bear Canyon GVH system are not anticipated."* The probable hydrologic consequences (PHC) section of the MRP (645-301-738) has been updated to include a discussion of the Bear Canyon GVH installation.~~

~~During drilling operations, as well as during the remainder of the operational life of the GVH installation, noncoal mine waste will be stored in suitable containers, and then disposed of off-site at an approved waste disposal facility. Hydrocarbons, including Diesel fuel, gasoline, oil and grease, will be stored in the factory supplied containment mounted within the machinery. If any stand-alone storage tanks are used they will be equipped with built-in containment capable of holding the entire contents of the tank. Absorbent pads and bags of absorbent granules will be kept on hand during the drilling operation, and later during the GVH operation, to be used in case of a spill of oil, fuel or grease. Used absorbent material will be disposed of at an approved disposal facility. All operations will be subject to the current Spill Prevention Control and Countermeasure Plan (SPCC) for the West Ridge Mine currently on file with the Division, and included in Attachment 14 for ready reference.~~

~~Prior to final reclamation, all drillholes will be plugged and sealed in accordance with State and Federal regulations, as discussed in the Chapter 5 section above. Upon final reclamation, any portion of the gravel surface that is stained or contaminated in any way with hydrocarbons will be dug up and hauled off the site to an approved waste disposal facility. After removing any contaminated gravel, the pad area and cutslopes will then be backfilled to approximate original contour, using fill material obtained from the adjacent roadway and leveling pads, and covering up the diversion ditch and the remaining gravel in the process. The slopes will then be re-topsoiled. The surface will then be pocked and re-seeded with an approved seed mix as described in the Chapter 2 discussion. A layer of wood straw will also be spread over the reclaimed slopes to help minimize erosion, and promote vegetation growth. After the reclaimed slopes have been topsoiled and reseeded, a row of excelsior logs will be installed along the full length of the toe of the slope between the slope and the remaining road, as shown on the Reclamation Plan, Attachment 1. The purpose of this row of excelsior logs is to control sediment off the site until the revegetation has become established. These sediment control logs will remain in place until vegetation has been established adequate for Phase 2 bond release.~~

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R645-301-712 Certification

All cross sections, maps, and plans have been prepared per R645-301-512.

R645-301-713 Inspection

Impoundments will be inspected as described under R645-301-514.300.

R645-301-720 Environmental Description

R645-301-721 General Requirements

The existing, pre-mining hydrologic resources within the permit and adjacent areas that may be affected by coal mining and reclamation operations are described by Mayo and Associates (1997; 7-1 "Groundwater Investigation of Proposed Mine Permit Area", 2001; 7-1A "Investigation of Surface-Water and Groundwater Systems in the Whitmore LBA Area") and Petersen Hydrologic (2012; Appendix 7-17) and summarized below.

Groundwater Resources

A spring and seep survey of the West Ridge area was conducted in 1985-86 by Kaiser Coal Corporation (1986) as shown in Appendix 7-6. Additional seep and spring survey data from the northeastern part of the project area was collected later in 1999 and 2010, as shown in Appendix 7-6A. Locations of the springs and seeps in this area are shown on Map 7-6 “Hydrologic Monitoring Map (Historical Monitoring Locations)”. No water supply wells exist in the permit and adjacent areas.

Within the permit and adjacent areas, groundwater naturally discharges from alluvium and colluvium, and the Colton, North Horn, and Price River Formations. Over 90% of springs in the permit and adjacent areas issue either from alluvium/colluvium or the Colton and North Horn Formations, which form the caprock of nearly the entire permit area. Springs that issue from the Price River Formation are uncommon. Groundwater does not naturally discharge from the Castlegate and Blackhawk Formations within the permit and adjacent areas. However, groundwater occurs in some permeable horizons of the Blackhawk Formation. Most notably, groundwater is present in well DH86-2, which is open to the entire thickness of the Sunnyside Sandstone member of the Blackhawk Formation.

Springs that discharge from alluvium and colluvium and the Colton and North Horn Formations on the east slope of West Ridge in Whitmore Canyon contribute base flow to Grassy Trail Creek. Discharge from springs on the west side of West Ridge is small and is consumed by evapotranspiration and infiltration before reaching perennial streams.

Information on groundwater systems encountered in the underground West Ridge Mine workings, including seasonal water quality and quantity, likely source areas, and radiocarbon and tritium age dating of groundwaters is presented in Appendix 7-17.

Surface Water Resources

The mine permit area drains into Grassy Trail Creek via two principal drainages. The region east of West Ridge and west of Patmos Ridge drains into Grassy Trail Creek through Whitmore Canyon. Numerous small ephemeral creeks drain the western face of West Ridge and flow westward toward lower Grassy Trail Creek. Grassy Trail Creek ultimately discharges into the Price River near Woodside, Utah, approximately 20 miles to the south.

R645-301-722 Cross Sections and Maps

722.100 As described by Mayo and Associates (1997; Appendix 7-1, 2001; Appendix 7-1A), groundwater systems in the permit and adjacent area have limited areal and vertical extent due to the heterogeneous lithology of the rock units containing and overlying the coal-bearing strata. No aquifers exist in the permit and adjacent areas. Therefore, no map has been prepared to show the location and extent of subsurface water.

722.200 The location of surface water bodies can be found on Map 7-3 "Water Rights", which shows Grassy Trail Reservoir and its location with respect to the permit area.

722.300 Baseline monitoring stations are shown on Map 7-6 "Hydrologic Monitoring Map (Historical Monitoring Locations)". This map shows the stations that were utilized to collect historical baseline information in earlier monitoring programs conducted between 1985 and 1996. Maps and cross-sections relating to groundwater systems encountered in the West Ridge Mine underground workings are provided in Appendix 7-17.

722.400 The location of water wells is also shown on Map 7-6. DH 86-2 was monitored during 1986, 1987, 1997 and 1998.

722.500 Map 5-1 shows contours of the proposed disturbed mineyard area.

R645-301-723 Sampling and Analysis

Water quality sampling and analyses have been and will be conducted according to the "Standard Methods for the Examination of Water and Wastewater" or EPA methods listed in 40 CFR Parts 136 and 434. Laboratory reporting sheets indicate the specific method used for each parameter.

R645-301-724 Baseline Information

Baseline groundwater, surface water, geologic, and climatologic data are described by Mayo and Associates (1997; 7-1, 2001; 7-1A) and by Petersen Hydrologic (2012; 7-17).

724.100 Groundwater Information

The location of wells and springs are shown on Map 7-5, Seep/Spring Survey Map, and 7-6, Hydrologic Monitoring Map (Historical Monitoring Locations). Locations of underground monitoring points used for baseline data collection are shown in Appendix 7-17. Groundwater rights in and around the permit and adjacent areas are shown on Map 7-3 and tabulated in 7-5 "Water Rights Summary".

Kaiser Coal Company (a previous owner of the WEST RIDGE lease area) had identified and proposed monitoring for several other springs in the region. Review of their 1986 permit application to DOGM was interrupted by the sale of the coal leases to BP America in 1987. BP America retained JBR Consultants to proceed with baseline water monitoring. JBR Consultants renumbered previously monitored points into a different numbering system. In places of this WEST RIDGE Permit Application Package (such as Appendix 7-1, Table A-1) a cross-reference is made between the previous (Kaiser) spring numbers and the present (JBR) labels. Mining plans for both Kaiser Coal and BP America included a larger mining area. When WEST RIDGE acquired the property they did not acquire a portion of the coal lease area referred to as the north area. Therefore, in the WEST RIDGE PAP, those monitoring points that were north of Bear Canyon were eliminated from the baseline monitoring plan due to their distance from the current proposed mine workings and the low potential to be impacted by mining operations.

SP-1, SP-2 and SP-3 were spring monitoring points used by Kaiser Coal during the mid-1980's. These three points were located in Rock Canyon, several miles to the north of the WEST RIDGE permit area. They were eliminated from the monitoring program because they are quite a distance from the permit area and would not be affected by the WEST RIDGE mining operations.

Also, SP-4 and SP-5 (referred to in the Kaiser plan as S-40 and S-39) were eliminated from the monitoring plan because they occur about a mile north of Bear Canyon and are separated from the proposed mining area by several large drainages. The likelihood of impact to these sites is negligible since WEST RIDGE did not acquire coal leases in this area. SP-4 and SP-5 were monitored in 1988 and 1989 and found to be dry. These sites have been added to Map 7-6 for reference to historical monitoring locations.

SP-7 (Kaiser point S-22) is located about ½ mile north of the permit area. It was not included in the baseline monitoring program because access is poor and, during previous monitoring in the spring of 1986, flows were low (1-3 gpm). When this site was re-checked in 1988, 1989 and the fall of 1997 no flow could be found in the vicinity of the old spring. SP-10 (Kaiser S-1) is in the lower right-hand corner of the permit area was also eliminated from the baseline monitoring plan because of difficulty of access and low previous flow measurements. This site was also revisited in 1988, 1989 and 1997 and no flow or dampness could be located. No water rights exist on SP-4, SP-5, SP-7 or SP-10. SP-7 and SP-10 are included on Map 7-6 for reference to historical points.

Seasonal quality and quantity of groundwater and usage is described in the 1985-86 spring and seep survey (Appendix 7-6) and WEST RIDGE Resources, Inc.'s baseline monitoring during 1997 (Appendix 7-2 "Baseline Ground Water Monitoring & Analyses"). Additional information on seasonal quality and quantity of groundwater and usage is provided in Appendix 7-17. These data have been analyzed by Mayo and Associates (1997; Appendix 7-1, 2001; Appendix 7-1A).

Drill Hole 90-1

DH90-1 was developed as a water supply well by Sunnyside Coal Company, East Carbon City, and Sunnside City. Sunnside City and East Carbon City have a water right (91-4960) for 31.621 ac-ft per year (19.6 gpm) from this well.

Information for the state engineer's office in Price (Mark Page, Personal Communication) indicates that the well has a total depth of 500 feet. The well has a gravel pack from 207 to 500 feet below ground surface. According to Sunnyside Coal Company (1993), the well is completed in the Price River and North Horn Formations.

Because the well is located two thirds of a mile from the lease boundary, and is completed in the Price River and North Horn Formations, it is very unlikely that mining in the permit area will affect groundwater systems that contribute water to DH90-1.

A spring and seep survey was performed by Petersen Hydrologic, LLC in the Right Fork of Whitmore Canyon drainage. The survey area encompasses portions of Sections 31 and 32, Township 13 South, Range 14 East, and Sections 5 and 6, Township 14 South, Range 14 East. The report of this spring and seep survey is provided in Appendix 7-6B.

Based on records of the Utah Division of Water Rights, there are no water rights associated with any of the springs or seeps located in the Right Fork of Whitmore Canyon within the permit area, although there are several stockwatering rights for surface water in the bottom of the drainage. Within the adjacent area outside the permit area the August, 2011 spring and seep survey (Appendix 7-6B) identified two springs which appear to have been developed in the past for livestock use. These are identified as RFS-6 and RFS-11. Neither of these springs have an associated water right. Upon further investigation it has been determined that RFS-11 is the same spring as the Section 5 Spring (see Map 7-7) which was previously identified by the stakeholders as one of the springs which should be monitored and which is now included in the company's operational water monitoring plan. Even though none of the springs within the permit area in the Right Fork have assigned water rights, based on discussions with Marc Stilson of the Utah Division of Water Rights, Price field office (December, 2011), all water in the Right Fork of Whitmore Canyon is appropriated (see Appendix 7-17).

724.200 Surface Water Information

The location of streams, reservoirs, and stock watering ponds are shown on Map 4-1. Surface water rights in and around the permit and adjacent area are shown on Map 7-3 and tabulated in Appendix 7-5 “Water Rights Summary”.

WEST RIDGE Resources, Inc. anticipates that as mining progresses, it may become necessary to discharge water from the proposed mine. Mine water will be discharged to the ephemeral drainage in C Canyon. The location of the mine discharge point is shown on Maps 5-5 and 7-2, Mine Site Drainage Map.

Surface water quality and quantity is shown in WEST RIDGE Resources, Inc.’s baseline monitoring data (Appendix 7-3 “Baseline Surface Water Monitoring & Analyses”) and is described in detail by Mayo and Associates (1997; Appendix 7-1, 2001; Appendix 7-1A). Additional surface and groundwater baseline data has been added to Appendix 7-1, Table A-1. Monitoring records from Kaiser Coal Company have been located and added to the data base. This includes monitoring of surface sites on ephemeral drainages around the area.

As described in R645-301-728.320, no acid drainage is expected from the proposed mining operation.

Upper Grassy Trail Creek Drainage

Most of the surface water flowing into Grassy Trail Creek in Whitmore Canyon above Sunnyside discharges from several ephemeral streams located on the western slopes Patmos Ridge (1998 Mayo and Associates report, Figure 15). These streams include Number Two Canyon, Pasture Canyon, Pole Canyon. Bear Canyon, Water Canyon, the Right and Left Forks of Whitmore Canyon, Graveyard Canyon, Hanging Rock Canyon, and Spring Canyon. No major streams flow into Grassy Trail Creek in Whitmore Canyon from the eastern slope of West Ridge due to the asymmetry of the ridge. Discharge in Grassy Trail Creek in Whitmore Canyon is regulated at Grassy Trail Reservoir.

Side tributaries to Grassy Trail Creek along the western slope of Patmos Ridge are characterized by steep gradients (greater than 25%), narrow canyons, and gravel streambeds with sand and silt where gradients are reduced. Tributary flow is intermittent and in response to precipitation events.

Above the reservoir, Grassy Trail Creek lies in a relatively broad canyon (30 to 100 yards wide) with a low gradient (3 to 4%). The channel bottom locally consists of boulders, gravel, sand, or mud. The Right and Left Forks of Grassy Trail Creek lie in narrow canyons with steep gradients. The Utah Supreme Court has determined that Grassy Trail Creek is an intermittent stream (Decree #3028). During wet periods, base flow above the reservoir is sustained by high elevation springs, mostly in the

Colton Formation. During dry years, there is no sustaining groundwater baseflow to support flow in the creek. Below the reservoir Grassy Trail Creek is now a perennial stream due to the buffering effect of the reservoir.

Monitoring stations on Grassy Trail Creek have been established at ST-3, which is above Grassy Trail Reservoir near Hanging Rock Canyon, and below the reservoir at ST-8 near the confluence with Water Canyon (Mayo and Associates 1998 report, Figure 16). During May, June, August, and October of 1997, Andalex made stream flow measurements at these locations. On average, discharge between ST-3 and ST-8 increases by about 200 gpm during this time. In June, However, flow increased between these two stations by 1,700 gpm. We suspect that this increase is the result of surface water inflows from ephemeral side drainages during the snowmelt period.

Visual observations during low-flow stream conditions suggest significant base flow gains in the reach between the reservoir and the mouth of Whitmore Canyon. Mayo and Associates observed Grassy Trail Creek between the confluence with Water Canyon and the mouth of Whitmore Canyon on 21 November 1997. The results of the observations are presented below.

Location	Discharge (gpm)
Confluence with Water Canyon	150[1]
Base of Blue Gate Sandstone	298
Mouth of Whitmore Canyon	275[1]

[1] Estimated values; the channel was frozen over and measurements were not possible.

Discharge in Grassy Trail Creek doubled in the reach from the confluence with Water Canyon (alluvium overlying North Horn Formation) to the base of the Bluecastle Member of the Price River Formation. Much of the increase comes from several small springs and seeps, which visibly discharge from the stream bank into the creek. In the reach from below the Bluecastle Member to the mouth of Whitmore Canyon flow remained relatively constant. Most of the increase in flow occurs as the stream flows over alluvial and colluvial deposits. The canyon widens substantially in this reach and the alluvial deposits appear to be thicker than in the higher elevations in the canyon. The increase in stream flow is likely the result of delayed drainage from the alluvial and colluvial deposits. However, it is possible, though less likely, that the increase in flow is the result of groundwater leakage from permeable sandstone horizons in the Price River Formation.

No increase in discharge in Grassy Trail Creek is observed as the creek flows over the Blackhawk Formation near the mouth of the canyon. This suggests that there is no appreciable discharge from the Blackhawk Formation to the creek. This finding is in agreement with many other stream gain-loss measurements performed by Mayo and Associates in the Book Cliffs and Wasatch Plateau coal fields.

In the mouth of Whitmore Canyon, streamflow in Grassy Trail Creek is lost to the alluvial sediments associated with the Mancos Shale. Waddell (1981) reports that the composition of groundwater in the alluvium near the mouth of Whitmore Canyon in Whitmore Spring (D-15-13)1ddc-S1 and well (D-15-13)2 dad-1 have solute compositions and TDS concentrations that are similar to those in lower Grassy Trail Creek. This suggests that the creek and the thick alluvial deposits in the mouth of the canyon are probably in good hydraulic connection. Several springs with discharges of less than 10 gpm discharge from the alluvium near the mouth of the canyon. These springs are likely recharged from leakage from Grassy Trail Creek. During dry periods, Grassy Trail Creek dries up completely before reaching the confluence with Bear Creek and Rock Canyon Creeks west of the permit area. The reduction of flow in the creek in this reach is due primarily to infiltration into the thick alluvium and to losses to evapotranspiration.

Water Rights

Water rights on Grassy Trail Creek are shown on Map 7-3 and tabulated in Table 7-5.

Water Quality

Surface water in upper Grassy Trail Creek is of the magnesium-calcium-bicarbonate type with considerable concentrations of sodium and sulfate. Average TDS concentrations are approximately 350 mg/l at ST-3 and 277 mg/l at ST-8. Below the confluence with Water Canyon Creek, the TDS and chemical character of Grassy Trail Creek changes. The TDS steadily increases to about 1,000 mg/l. Na^+ becomes the dominant cation and there are also substantial increases in SO_4^{2-} and HCO_3^-.

Bear Canyon Drainage

Flow Characteristics

The discharge from the Bear Canyon drainage (which is tributary to Dugout Creek) is described as ephemeral in the Mayo and Associates report (p. 53). However, historical monitoring location ST-2 in the left fork of Bear Canyon is considered an intermittent stream monitoring site (Mayo and Associates report, page 52).

Flow in the upper reach of the left fork of Bear Canyon is intermittent for about 500 feet. Water in this upper reach is supported by intermittent discharge from a spring complex (including historical monitoring location SP-6). Intermittent flow is not sustained below this stretch of the drainage due to infiltration and therefore does not reach the LBA boundary.

Data from monitoring sites ST-4 and M-2 indicate that discharge from the Bear Canyon drainage is ephemeral. In May 1988, no flow was observed at M-2 (refer to Table A-1). The PHDI (Figure 3a and 3b) indicates that 1988 was not a drought year. No flow was observed at ST-4 during 1989; however, this year was the beginning of a drought period in the region. At ST-4, no flow was observed in the drainage in March, May, June, July, August or September 1997, or May, June, July, August or September 1998.

M-1 (ST-1) was a monitoring point used by Kaiser Coal during the mid-1980's. The point was identified as M-1 by Kaiser Coal in their 1986 permit application package. It was later redesignated as ST-1 by JBR Consultants in a monitoring plan later submitted for BP America. This point was located in Rock Canyon (approximately 2 miles to the northwest of the WEST RIDGE permit area in T. 13 S. R 13 E. Section 32 NW1/4 SW1/4 on Rock Creek. When WEST RIDGE (Andalex) took over the monitoring program in 1997, they decided to utilize the same numerical designations of the monitoring points to minimize confusion over numbering and to maintain continuity in the baseline monitoring plan and facilitate utilization of previously collected hydrology information. Rock Creek was not included in the baseline monitoring plan for the WEST RIDGE mine because of the distance from the lease area and the low potential for mining operations to have any impacts. However, rather than renumbering the stations and causing confusion, it was decided to leave the existing numbering scheme in place but sample only those site important to the current mining proposal. The WEST RIDGE monitoring program does not include ST-1 and this point is not shown on the operational monitoring map (Map 7-7).

Water Rights

Surface water rights (91-1717 and 91-1722) for the intermittent reach of the left fork of Bear Creek have a period of use of March 15 to October 31. Data from ST-2 indicate that water is available in the upper left fork during this period in normal to wet years. During dry years, this stretch is dry.

All other surface water rights for Bear Creek below the intermittent reach have a year-round period of use. However, as discussed above, all of Bear Creek below the headwaters of the upper left fork only supports ephemeral flow.

Water Quality

Surface water at ST-2 is a Mg^{2+}-HCO_3^--SO_4^{2-} type water with elevated TDS (1,100 mg/l) relative to surface water in upper Grassy Trail Creek. Only one surface water sample has been collected at the ephemeral monitoring location M-2. This water had a TDS of 1,820 mg/l indicating that the quality of water naturally degrades between ST-2 and M-2.

Hydrologic Resources of the Topsoil Borrow Area

The 9.6 acre area identified as the topsoil borrow site is a gently, westward sloping bench. The surface is covered with sagebrush and pinyon juniper. No seeps or springs exist in or around the borrow site. What little surface runoff occurs would flow to ephemeral drainages downstream from the borrow site. Surface runoff is minimized by the vegetative cover and relatively deep soil horizons in this area. Due to the limited areal extent of the borrow area, it does not appear to contribute a significant amount of runoff to adjacent drainages. There are no known aquifers in this area that would be recharged by this watershed area.

During reclamation, if it is determined that topsoil resources from this potential borrow site are needed to achieve reclamation of the mine site, silt fencing would be placed around the outer limits of the borrow area to be disturbed. Topsoil would be stripped and stockpiled. The required amount of topsoil would then be removed from the borrow site. Care would be taken to contour the borrow pit such that runoff would be utilized to the fullest extent in the disturbed area. This would include gouging the regraded surface with pits approximately 24" wide, 36" long and 18" deep as well as sloping the regraded slopes inward to encourage precipitation infiltration on-site.

724.300 Geologic Information

Geologic information in sufficient detail to determine the probable hydrologic consequences of mining and determine whether reclamation can be accomplished, as required by R645, is provided in Chapter 6 of this permit application package and in Mayo and Associates (1997; Appendix 7-1, 2001; Appendix 7-1A).

724.400 Climatological Information

724.411 Seasonal precipitation

Average annual precipitation at Sunnyside is 13.3 inches (NCDC, 1997) while estimated potential evaporation is over 60 inches (Sunnyside Coal Company, 1993). Mean monthly precipitation at Sunnyside is shown on Figure 7-1 “Hydrologic Monitoring Protocols and Locations”. On average, the area receives the greatest quantity of moisture in the late summer and early fall (August-October). The driest months are November to February.

The precipitation and temperature data described above is typical of the lowland areas at the base of the Book Cliffs. Although data are not available for the higher elevations of the permit area, average precipitation likely increases and average temperatures likely decreases with elevation.

The Palmer Hydrologic Drought Index (PHDI; NCDC, 1997; Karl, 1986; Guttman, 1991) indicates long-term climatic trends for the region. The PHDI is a monthly value generated by the National Climatic Data Center (NCDC) that indicates the severity of a wet or dry spell. The PHDI is computed from climatic and hydrologic parameters such as temperature, precipitation, evapotranspiration, soil water recharge, soil water loss, and runoff. Because the PHDI takes into account parameters that affect the balance between moisture supply and moisture demand, the index is a useful for evaluating the long-term relationship between climate and groundwater recharge and discharge. Figures 7-2 Palmer Hydrologic Drought Index for Utah Division 6 and 7-3 Palmer Hydrologic Drought Index for Utah Division 7 show the PHDI for Utah Division 6 (Uintah Basin) and Division 7 (Southeastern Utah), respectively. The permit area lies at the boundary of these two regions. These graphs indicate extremely wet years between the early and late 1980s, followed by several years of drought in the late 1980s and early 1990s. Since about 1993, wet and dry cycles have been shorter.

724.412 Winds direction and velocity

Wind data have been collected by SCA (Sunnyside Cogeneration Associates) during 1982 and 1983 for permitting of the power plant. These data (Sunnyside Coal Company, 1993) were collected in Dragerton (near East Carbon, Utah) atop a 45-meter tower. The data show that the majority of the winds are from the north-northeast clockwise through the south-southwest. The average annual wind speed is 6.2 mph.

Upper level winds, over 1,600 feet above the ground level, are generally from the southwest during most of the year. During the winter, air flow from the northeast is common. Local airflow patterns are primarily influenced by stream and river drainages. Wind speeds induced by the descent of dense cold air is generally light. The daytime flow is strongly influenced by surface heating effects which result in mixing between surface and upper level flows. In the permit area there is a general air flow toward the north and northeast during the day (high elevations) and toward the southwest (lower elevation) during the night. Wind speeds are usually light to moderate (below 20 mph). Higher wind speeds are generally associated with storm systems and higher elevations such as ridge tops.

724.413 Seasonal temperature ranges

Temperatures in the permit area vary greatly both daily and seasonally. Temperature data collected at the Sunnyside Mine engineering office (Sunnyside Coal Company, 1993) indicate that average temperatures are generally below freezing in the winter months and summertime temperatures range from 50 - 90°F.

724.500 Supplemental Information

Adverse impacts to the hydrologic balance either on or off the permit area are not expected to occur based on the probable hydrologic consequences determination in R645-301-728. Acid- and toxic-forming materials present in mining materials will not cause contamination of groundwater or surface-water supplies. Consequently, information regarding remedial and reclamation activities has not been prepared.

724.600 Renewable resource lands

Aquifers or areas for the recharge of aquifers do not exist within the permit and adjacent areas. As described by Mayo and Associates (1997; Appendix 7-1), groundwater systems in the permit and adjacent area have limited areal and vertical extent due to the heterogeneous lithology of the rock units containing and overlying the coal-bearing strata.

Limited groundwater recharge occurs on the land surface within the permit area because of the steep slopes and cliffs. Springs that discharge in the permit area are most likely associated with shallow alluvial and colluvial materials. Mining should not affect the recharge or discharge of these springs. Groundwater recharge to the Colton and North Horn Formations within the permit area may discharge as springs in Whitmore Canyon because of the northeasterly dip of the rocks. Due to abundant claystone and mudstone in these formations and the thickness of the interburden between these formations and the mining horizon, mining will not impact groundwater in these horizons.

Adjacent to the permit area, the upper slopes of the east side of West Ridge are the recharge area for Colton Formation groundwater systems that discharge as springs in Whitmore Canyon and contribute base flow to Grassy Trail Creek. These groundwater systems occur in the shallow subsurface and will not be undermined. Mining will have no impact on the recharge and discharge of these springs.

724.700 Not applicable.

R645-301-725 Baseline Cumulative Impact Area Information

Mayo and Associates (1997; Appendix 7-1, 2001; Appendix 7-1A) have analyzed geologic and hydrologic information and prepared a document describing the surface-water and groundwater systems of the permit and adjacent areas. Petersen Hydrologic (2012; Appendix 7-17) performed a solute chemical and isotopic investigation of groundwater systems within the West Ridge Mine workings. This report included additional baseline information and analysis of groundwater systems. These reports contain the information to assess the probable cumulative hydrologic impacts of coal mining and reclamation operations as required by R645-301-729.

The hydrology and geology of the area around Grassy Trail reservoir is discussed in a seismic analysis report (see Appendix 5-11) and the Phase II dam safety report (see Appendix 5-12). These reports conclude that it is unlikely that mining induced seismicity or subsidence will impact the performance of the Grassy Trail Dam and Reservoir. Based on the conclusion of this study the BLM has approved the R2P2 to allow full extraction longwall mining of Panel #7. BLM also added a special stipulation #17 to the federal lease related specifically to the Grassy Trail Reservoir, stating, "*The Lessee is and will remain liable for any and all damages or hazardous conditions resulting from the mining operations under the lease."*

Based on BLM's approval the company then successfully mined longwall panel 7 from December, 2005 through September, 2006. Soon thereafter, RB&G Engineering prepared a summary post-mining report on the mining related affects on the reservoir (see Appendix 5-16). Still later, in 2010, RB7G Engineering prepared an additional update to the summary report (see Appendix 5-17). Based on these reports, BLM has recently approved the R2P2 to allow additional longwall mining of panel block 18-20 on the east side of the mains in the vicinity of (i.e., west and north of) Grassy Trail reservoir (see Appendix 5-3C). This new approval contains the same lease stipulation #17, as with the previous approval of panel 7.

R645-301-726 Modeling

No numerical models have been created for the permit area.

R645-301-727 Alternative Water Source Information

The determination of the probable hydrologic consequences (R645-301-728) indicates that the proposed coal mining activities will not result in the contamination, diminution, or interruption of groundwater or surface-water sources within the proposed or adjacent areas. Therefore, WEST RIDGE Resources, Inc. has not prepared information regarding alternative water sources.

The operator may be required to replace state-appropriated water only if a water user establishes that underground operations have contaminated, interrupted or diminished the flow of such appropriated rights. See Utah Code Ann. Section 40-10-18(15)(a). In Castle Valley Special Service District v. Utah Board of Oil, Gas & Mining, 938 P.2d 248, 252 (Utah 1996), the Utah Supreme Court determined that a water replacement plan is not required until a water user has shown impairment. No such showings have been made by any water users regarding these underground mining operations.

R645-301-728 Probable Hydrologic Consequences (PHC) Determination

This section describes the probable hydrologic consequences (PHC) of underground coal mining in the permit area. This determination is based on the data and information presented previously in this chapter and by Mayo and Associates (1997; Appendix 7-1, 2001; Appendix 7-1A) and Petersen Hydrologic (2012; Appendix 7-17). The PHC will be updated, if needed, following the collection and analyses of information gathered during the 1998 field season.

In association with the proposed mining in the Panel 22 extension area, additional hydrologic data have been collected and analyzed. A supplemental spring and seep survey was performed in the Panel 22 area by Petersen Hydrologic, LLC (See Appendix 7-6b). A stream gain/loss investigation was also performed in the Right Fork of Whitmore Canyon by Petersen Hydrologic, LLC (see Appendix 7-14). Permanently installed Parshall flumes were installed/rehabilitated in the Right Fork of Grassy Trail Creek both above and below proposed mining areas. Baseline streamflow information from the Right Fork of Grassy Trail Creek is included in Appendix 7-14.

728.310 Potential adverse impacts to the hydrologic balance

Longwall coal mining may result in land subsidence and bedrock fracturing. Subsidence and fracturing have the potential to impact the hydrologic balance if fracturing increases the vertical hydraulic conductivity of overburden rock. Possible consequences of fracturing include decreasing discharge rates of near-surface groundwater while increasing the recharge rates of deeper groundwater systems.

Mining occurs in the Lower Sunnyside Seam of the Blackhawk Formation. Over 90% of the springs in the West Ridge area discharge from near-surface groundwater systems in alluvial/colluvial materials and the Colton and North Horn Formations. The thick interburden between the mined horizon and the near-surface groundwater systems and the presence of swelling clays in the North Horn Formation will prevent fracturing and subsidence from increasing vertical hydraulic conductivities and decreasing spring discharge rates.

Groundwater encountered by mining operations in the West Ridge Mine is old. Radiocarbon age dating of in-mine groundwater samples by Petersen Hydrologic during 2011(Appendix 7-17) demonstrates that the sampled groundwaters recharged between about 10,000 and 23,000 years ago. The low tritium contents of these waters (near the laboratory detection levels) indicate that the mine waters have been isolated from the land surface and shallow groundwaters for at least the past 50 years. The result of the carbon-14 analysis indicates a radiocarbon content of 2.28 percent modern carbon. This is suggestive of very old groundwater. However, because of uncertainties in the characterization of the carbon history of the water (based on the positive carbon-13 composition), the calculation of a groundwater "age" is not possible. The groundwater at one of the 2011 sampling locations (15^{th} West XC 32 Gob Drainage) had a positive carbon-13 composition. Because of uncertainties in the characterization of the carbon history of the water, the calculation of a groundwater "age" for that sample is not possible. Well DH86-2 encountered water in the Sunnyside Sandstone below the coal seam to be mined. This water has a radiocarbon age in excess of 11,000 years.

Groundwater systems encountered in the Blackhawk Formation occur in isolated sandstone paleochannels, fractures, and faults. The results of radiocarbon age dating and tritium analysis indicates that these groundwater systems are not in active hydraulic communication with the surface. These systems have limited areal and vertical extent. Mining could dewater some of these systems if they are intercepted during mining operations. Based on the sizes and groundwater storage volumes of water-bearing features potentially intercepted by mining operations, discharges that may persist for longer periods of time may be encountered in some portions of the West Ridge Mine. However, the potential for very long-term discharges of water from intercepted groundwater systems is considered low. This is because as described by Petersen Hydrologic (2012) the waters intercepted by the West Ridge Mine workings are of ancient origin and do not contain any appreciable tritium. Petersen Hydrologic indicates that the intercepted water is being removed from storage and is not being actively recharged by overlying shallow recharge sources. Accordingly, the volume of water that can be discharged into the mine workings from an inflow source is finite, and is largely a function of the size and water-bearing characteristics of the geologic feature being intercepted. If a groundwater system in one of the major Blackhawk Formation beach/barrier bar sandstones present in the geologic sequence adjacent to the coal seam were to be intercepted by the mine workings, the potential for discharge to occur over from that unit over a more prolonged period of time would exist. However, as discussed by Mayo and Associates (1998), groundwater systems in the Blackhawk Formation within the mountain core are not in good hydraulic communication with overlying recharge sources. Accordingly, the potential for the continued draining of a Blackhawk Formation sandstone unit deep within the mountain core to affect overlying shallow groundwater systems that support springs and seeps and provide baseflow to streams in the area would be minimal.

Groundwater discharging from the mine roof from a sandstone paleochannel into the West Ridge Mine workings was sampled for carbon-14 and tritium content on 24 October 2000 (Main Dips Belt XC21). The tritium content of this sample was very low (0.17 tritium units), which is near the lower laboratory detection limit. This indicates that the water sampled in the mine has been isolated from the land surface for at least the past 50 years. The result of the carbon-14 analysis indicates a radiocarbon content of 2.28 percent modern carbon. This is suggestive of very old groundwater. However, because of uncertainties in the characterization of the carbon history of the water (based on the positive carbon-13 composition), the calculation of a groundwater “age” is not possible. The antiquity of the water encountered underground at the West Ridge Mine demonstrates the lack of appreciable hydraulic communication with shallow groundwater systems and recharge sources. This condition is consistent with conditions encountered at coal mines elsewhere in the Book Cliffs and Wasatch Plateau coal mining districts of Utah.

Mining could also encounter water impounded in the old Sunnyside mine workings. In order to avoid accidentally mining into flooded workings, the West Ridge mine will perform exploratory drilling ahead of development when active mine works are within 500 feet of the projected Sunnyside workings. Face drills will be used to drill at least 100 feet out in advance of the actual mine face development. The exploratory face drill will be a small diameter and if water is encountered from the old works the drill hole can easily be plugged and sealed. The West Ridge mine plan assumes that development will proceed to within 300 feet of the old works. West Ridge mine intends to stay away from the old works but will drill ahead as a precautionary measure in the event that the mine maps or surveying has a margin of error.

Based on the analysis of the probable hydrologic consequences (PHC), it has been concluded that it is highly unlikely that mining in the West Ridge area will result in the decrease of groundwater discharge rates. This conclusion is based in large part on the observation that the deep, inactive-zone groundwaters intercepted in the West Ridge Mine workings are of ancient origin and are isolated from the shallow groundwater systems that support discharge at most springs in the permit and adjacent area. Mayo and Associates (Appendix 7-1) report that most springs in the permit and adjacent area have appreciable tritium contents and exhibit seasonal variability in discharge rates. These systems are isolated from the deep, inactive-zone groundwater systems encountered in the underground West Ridge Mine workings.

Grassy Trail Creek above Grassy Trail Reservoir flows across the WEST RIDGE permit area. The stream channel in this area is underlain by approximately 2,000 feet of cover, which includes the entire thickness of relatively unfaulted and unfractured North Horn Formation, which is known to form an effective barrier to vertical groundwater migration (Mayo and Associates, 1998) and is known to contain hydrophillic clays that swell when wetted to seal any fractures that may form. Therefore, the potential for the interception and diminution of surface water flows in Grassy Trail Creek as a result of mining induced subsidence is minimal. Where differential subsidence may potentially occur beneath Grassy Trail Creek, such as along longwall panel ends or above gate roads, there is the potential for localized increases or decreases in stream gradients. These changes can result in minor changes to the stream morphology, including changes in the number of pools, runs, glides, etc. Differential subsidence of the channel substrate also has the potential to result in temporary increases or decreases in sediment yield. However, because a steep, mountain stream flowing on alluvial or soft bedrock substrate has the tendency to rapidly erode elevated areas and deposit sediment in lowered areas, these effects are commonly short-lived, as the stream system is rapidly brought back into equilibrium.

In order to assess the impacts of full extraction mining beneath perennial streams in the Utah Coal District, several comprehensive investigations of the Burnout Canyon drainage above Canyon Fuel's Skyline Mine have been conducted (Forest Sciences Laboratory, 1998; Sidel, 2000). The findings of these investigations indicated that 1) baseflow discharge rates during and after subsidence of the drainage were not statistically different at the 0.05 level, 2) there was no indication that water was lost from Burnout Creek as a result of longwall undermining of the drainage, and 3) some minor changes in stream morphology, including changes in the pool/riffle ratio of the stream channel were noted; however, similar changes in the study's control area (James Canyon) were also noted, indicating that the observed morphological changes could have been at least in part the result of non-mining-related factors. They found that the changes in channel morphology were generally short lived. Subsequent to the publication of these investigations, the Burnout Canyon drainage has been further subsided as a result of multiple seam extraction beneath the creek. No perceptible or quantifiable impacts to the drainage have been detected as a result of this mining activity (USFS, 2001).

Burnout Creek and upper Grassy Trail Creek, both being relatively steep-gradient mountain streams, are in many senses generally comparable. However, while overburden thicknesses in the Burnout Canyon area range from about 600 to 850 feet, overburden thicknesses beneath Grassy Trail Creek are approximately 2,000 feet. Therefore, it is reasonable to assume that the hydrologic impacts to upper Grassy Trail Creek, where only single seam extraction under significantly greater cover, will be similar to (or lesser than) the minimal impacts experienced in the Burnout Canyon area.

For the reasons discussed above, it is believed that the impacts to Grassy Trail Creek above Grassy Trail Reservoir as a result of longwall mining beneath the creek will be negligible.

No mining is proposed beneath or within the angle of draw of Grassy Trail Reservoir. Therefore, the potential for loss of water from reservoir leakage is believed to be negligible.

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~~Bear Canyon is situated in the northwest portion of the permit area within the SITLA lease area. This canyon is unique because it is within the right fork of this drainage that the cover over the longwall subsidence zone is the shallowest of anywhere in the entire permit area. In one part of the bottom of the (right fork) Bear Canyon drainage the cover over the longwall panes is approximately 325'. Due to the increased potential for the effects of subsidence to reach the surface in this area special attention has been focused on the hydrologic character of the Bear Canyon drainage.~~

~~Bear Canyon is typical of the canyons draining the southwest-facing front slopes of the Book Cliffs in this area. These canyons are generally shorter and drier than those drainages on the back-side of the Cliffs. Several baseline surveys of Bear Canyon right fork done in the late 1980's showed the drainage to be mostly dry and the canyon was identified as ephemeral along with other similar front-facing canyons in the permit area, such as "C" Canyon, "B" Canyon, and "A" Canyon. However, during site visits in June and July of 2005, substantial stream-flow was observed in the drainage. This occurrence of flow, along with the observation of riparian vegetation in the lower stretches of the canyon, has led to a re-evaluation of the classification of the drainage as intermittent. Also, because the area of the Bear Canyon watershed is greater than one square mile the drainage is classified as intermittent under DOGM regulations.~~

~~Historical observation of Bear Canyon shows the streamflow in the bottom of the drainage to be a combination of surface flow and subsurface flow. In those areas where bedrock is at or close to the surface, flow is forced up to the surface. In other areas where the alluvium in the channel is thick and porous the flow is subsurface and the stream channel is often dry. The stretches of channel exhibiting surface flow as opposed to subsurface flow will vary from season to season, and year to year depending on prior precipitation trends in the watershed. There are times when the entire length of the channel could be expected to exhibit surface flow, and other times when surface flow is confined to certain segments. And, according to past monitoring observations, there are often times when there is no flow in the stream channel. In order to better define the hydrologic character of the canyon WEST RIDGE Resources will expand the monitoring program in Bear Canyon by adding two new monitoring sites and relocating a third site (see Map 7-7 and Table 7-1).~~

~~As mentioned previously, there is a point in the right fork of Bear Canyon where cover over the longwall panel will be about 325' which is the shallowest surface cover of any place within the current WEST RIDGE mine plan. This, along with the fact that there are state-appropriated surface water rights in this drainage (refer to Appendix 7-5), makes this an area of special interest. There is reason to expect that full-extraction longwall mining will not adversely affect the hydrologic resources of the canyon in this area. According to Syd S. Peng, ("Coal Mine Ground Control", 1978, Wiley, New York) a general rule-of-thumb is that subsidence-related fractures can be expected for a distance above the coal seam equal to 50 times the mining height, which works out to be 316' for the shallow point in Bear Canyon, which is slightly less than the cover in that area. Therefore due to the shallowness of cover in this area there could be subsidence fractures which reach the surface in the bottom of the canyon, and mitigation will be done to protect the resource.~~

~~The shallow overburden point coincides with the inflection point of the longwall subsidence profile. Based on a 22 degree angle of draw the tension zone will extend along the surface from the inflection point (shallow point) downstream approximately 130'. Areas upstream from the inflection point will be in compression as the longwall panels are extracted in progression from the southwest to the northeast according to the approved mining plan. Cracks are more likely to open up in the tension zone as compared to the compression zone where lateral forces are pushing toward each other rater than pulling apart. As mining progresses to the northeast, cover increases rapidly because of the gradient of the channel bottom and the dip of the coal seam, and surface effects of subsidence should diminish in that direction. Therefore, it is expected that any cracking which might reach the surface should most likely appear in the canyon bottom in the 130' (plus/minus) tension zone down-canyon from the inflection point. Special subsidence monitoring will be focused on this area.~~

~~WEST RIDGE will establish two new hydrologic monitoring sites in the right fork of Bear Canyon. The first site (ST-11) will be located within the tension zone described above. This site was chosen because this location should be well-suited to determine if tension cracks have affected stream flow. It is also, coincidentally, one of the areas where the bedrock nature of the channel bottom forces water to the surface, thereby making streamflow measurements more accurate. The second site (ST-12) will be located about 2400' farther up-canyon in another area where, again, the bedrock nature of the channel allows for a more accurate streamflow measurement. A third monitoring site (ST-13) will be located below the forks of Bear Canyon just outside the permit area boundary. This site will replace the existing monitoring site ST-4.~~

~~During the flow season of 2005 and 2006 (that is, May 15 through September 15) site ST-11 will be monitored monthly as long as flow is present. This monthly monitoring will help better define the nature of streamflow prior to longwall extraction in the area, which is presently scheduled for May, 2007. Thereafter,~~

~~monitoring will be done on the regular quarterly basis. Site ST-12 is more inaccessible, and could be dangerous to reach in the winter. Therefore this site will be monitored twice a year, once during late spring/early summer (expected peak flow) and once in late summer/early fall, when the canyons are normally much drier. Site ST-13 will be monitored quarterly.~~

~~The longwall is presently scheduled to pass under Bear Canyon in the spring of 2007. Prior to that, WEST RIDGE will complete a survey of a series of subsidence monitoring points established up the bottom of the drainage on either side of the inflection point. After the longwall has passed under the drainage these points will be re-surveyed and an accurate account undermined WEST RIDGE will visually inspect the area to determine if any effects of subsidence are apparent. Within thirty days of the inspection WEST RIDGE will submit a written report to the Division outlining the results of this inspection .~~

~~Recent site visits have determined the existence of riparian type vegetation in the lower reaches of Bear Canyon below the forks. WEST RIDGE commits to preparing a detailed vegetation survey and mapping of the canyon bottom with emphasis on the existence of riparian specie. This survey will be conducted during the growing season of 2005 or 2006. The survey will be done in consultation with Division biologists and the completed report will be added to the Mining and Reclamation Plan as an appendix.~~

~~If it is determined that mining-related subsidence has adversely impacted the hydrologic resources of Bear Canyon, including and state-appropriated water rights, WEST RIDGE will mitigate the damage. The first option would be to seal any cracks with the application of bentonite clay. Bentonite sealing compounds are available commercially made specifically for such applications. If bentonite sealing proved ineffective, WEST RIDGE would propose the installation of piping to transport stream water across the fracture zone to continue the flow downstream. Any work done in the stream channel would most likely require the issuance of a channel alteration permit from the Utah Division of Water Rights.~~

~~Adverse impacts to the hydrologic balance resulting from the installation and operation of the Bear Canyon gob vent holes (GVH) are not anticipated. The basis for this conclusion is summarized below.~~

~~The gob vent holes will be constructed in a manner that minimizes the potential for adverse impacts to groundwater and surface-water resources and the hydrologic balance in the area. The proposed construction designs for the GVH holes include a nominal 20 foot length of 16-inch non-perforated steel surface casing that will be cemented in place. The surface casings will isolate the wells from surface-water, soil moisture, and any shallow groundwater potentially present in the upper 20 feet and will prevent shallow water from entering the GVH wells. From approximately 20 to 200 feet below the surface, the proposed well construction plans call for the placement of 9.625-inch non-perforated steel~~

~~casing that will be cemented into place. The cemented steel well casing will isolate groundwaters that may be present in bedrock groundwater systems in the upper 200 feet from the GVH wells and prevent the inflow of groundwater into the wells.~~

~~Proposed construction plans call for the lower approximately 150 feet of the GVH wells to be cased with 8.75-inch slotted steel casing that will be left open to the rock strata and will not be cemented. The purpose of the slotted steel casing is to allow the drainage of gob gasses into the well bore in the fractured rock strata overlying the Panel 8 gob. While there is the potential for drainage of some Blackhawk Formation groundwater into the GVH holes in the 150 feet interval overlying the longwall gob, the potential for appreciable or sustained groundwater drainage through these wells is minimal. This is because 1) groundwater systems in the Blackhawk Formation occur in hydraulically isolated groundwater partitions that are not in hydraulic communication with adjacent groundwater partitions, which limits the amount of groundwater that could potentially be drained, 2) the GVH holes are situated near the up-dip ends (outcrop locations) of the Castlegate Sandstone and Blackhawk Formation which limits groundwater recharge potential and the potential for the interception of regional groundwater systems, and 3) the 150-foot interval of the Blackhawk Formation overlying the gob area was likely intensely fractured as a result of the longwall mining prior to the construction of the wells which would likely have drained the groundwater partitions immediately overlying the gob area at the time of mining. For these reasons, the potential for drainage of appreciable groundwater or surface-water resources through the GVH drill holes is considered low.~~

~~The potential for detrimental impacts to the ephemeral Bear Canyon Creek drainage or any associated alluvial groundwater systems is considered remote. Appreciable baseflow alluvial groundwater systems were not identified near the GVH location during the 7 October 2008 site visit. Additionally, because the GVH well bores will be hydraulically isolated from the upper approximately 200 feet, the potential for impacts to water quality in the drainage are unlikely. The implementation of appropriate sediment control management practices will minimize the potential for increased sediment yield from the GVH site during the construction and operational phases of the GVH system.~~

~~Prior to final reclamation, the GVH drillholes will be plugged and sealed in accordance with State and Federal regulations. The casings will be plugged at the bottom to hold the concrete. A lean concrete mixture will be poured into the casing until the concrete is within five feet of the surface. At that time the casing will be cut off at ground level and the rest of the casing will be filled with lean concrete. The concrete will be allowed to harden before final reclamation is completed. In this manner, the potential for any long-term impacts to the hydrologic balance resulting from the GVH system will be minimized.~~

Spring Canyon is located in the northern part of the permit area in SITLA lease

44771. There are no state-appropriated water rights on this lease. (Refer to Appendix 7-5 for additional details.) The surface is privately owned by Penta Creek with whom WEST RIDGE maintains coal mining rights. Longwall mining in this area is not scheduled until the year 2014. In this area the coal seam is 2500' deep under the bottom of the Canyon. Spring Canyon, as the name would imply, contains several springs. The drainage area of Spring Canyon is well in excess of one square mile. The canyon supports a number of beaver dams indicative of perennial flow. WEST RIDGE will add three additional monitoring points to collect baseline water monitoring data in Spring Canyon, namely ST-15 located upstream from the junction of Grassy Trail Creek, SP-101 located on a channel-bottom spring a short ways up Little Spring Canyon (a fork of Spring Canyon), and SP-102 located about 1000' upstream from the junction of Little Spring Canyon. This spring emanates from the west side of the canyon approximately 200' up from the canyon bottom. Refer to Map 7-7 and Table 7-1 for details. For the first two years (starting with the third quarter of 2005) these sites will be monitored on a quarterly basis for baseline data according to the field measurements and laboratory measurements outlined in Table 7-2 (Surface Monitoring) and Table 7-3 (Groundwater Monitoring). Thereafter, all sites will be monitored for flow and field parameters on a quarterly basis.

The Grassy Trail Dam and Reservoir is located immediately outside the eastern boundary of the permit area. This dam/reservoir is owned and operated by the cities of East Carbon and Sunnyside, has a storage capacity of 916 acre-feet, and provides most of the culinary water supply to these municipalities. The dam lies approximately 1664' vertically and 995' horizontally away from the nearest point of projected underground mining (longwall panel #7). This equates to 31 degrees, which is greater than the normal angle of draw associated with longwall subsidence. WEST RIDGE Resources has hired R,B&G Engineering to prepare a detailed evaluation report of the potential effects of longwall mining on the dam and reservoir. This evaluation report was reviewed by the Division of Dam Safety, DOGM, Bureau of Land Management, and the cities of East Carbon and Sunnyside. The report analyzed the potential impacts from both subsidence and seismicity associated with full extraction mining, with specific emphasis on panel #7, the longwall panel projected for mining nearest to the dam. The report concluded that the risk to the dam and reservoir is minimal, and that event the maximum probable seismic event or subsidence scenario would be well within the safety factor of the dam. In addition, there are no known faults that intercept the dam that could be encountered in the mining of Panel #7. The Division of Dam Safety, the BLM, and the cities of East Carbon and Sunnyside have all accepted the conclusions of the report. This report (Grassy Trail Dam and Reservoir Seismicity Report) is included in Appendix 5-11. This report also includes as an appendix an independent report prepared by Agapito Associates (Estimated Impacts to the Grassy Trail Reservoir due to Longwall Mining) which addresses the potential effects on the dam/reservoir due to longwall induced subsidence. A companion report (Grassy Trail Dam & Reservoir Phase II Dam Safety Study) is included as Appendix 5-12. WEST RIDGE has committed to an intensive program of monitoring of the dam and reservoir during the mining of Panel #7. This monitoring plan is outlined in section 301-114.100 of this Mining & Reclamation Plan and is included in detail in Appendix 5-13.

Based on subsequent approval of the mine plan, panel #7 was extracted starting in December, 2005, and completing in September 2006. Extraction closest to the Grassy Trail Reservoir occurred in March, 2006. Monitoring, as described above, was conducted continuously during the mining of panel #7. As predicted by the RB&G report, there was no mining related damage to the dam, although some slumpage of the adjacent hillside occurred, resulting in minor movement of the west abutment of the dam. There was no loss of integrity of the earthen structure of the dam. In January, 2008, after the area above and adjacent to panel 7 had completely stabilized, RB&G Engineering prepared a post-mining Summary Report of the mining-induced seismicity. This report is included in Appendix 5-16.

After panel 7 was completed, longwall mining moved to the west side of the mains near the outcrop (more than two miles distant from the dam), and then proceeded to the northeast. Also during this time, the company went to a panel-barrier system of longwall extraction, replacing the previous side-by-side panel method. This panel-barrier system leaves a 400' wide solid barrier pillar between each longwall panel, and has significantly reduced the magnitude and frequency of mining-related seismic events. During the ensuing five years of mining, the company has continued to monitor the dam and reservoir. Results of this monitoring have been provided to all the regulatory agencies and the owners of the reservoir on a regular basis. The results of this monitoring have shown that all mining-related effects on the reservoir have stabilized. RB&G Engineering then, in September, 2010, prepared a summary report update of the subsequent mining-induced seismicity, and this report is included in Appendix 5-17.

On July, 21, 2010, BLM approved the R2P2 for federal lease UTU-78562 and approved mining of panels 18, 19 and 20 on the east side of the mains in the vicinity of the Grassy Trail Reservoir. In the decision document, BLM states, *"We agree with the conclusion that mining longwall panels 18 through 20 as submitted should have no adverse effects on the dam structure or reservoir. The dam structure has seen no detectable affects from the mining of panel number 7. The proposed panels are further distant from the reservoir and much further from the Grassy Trails Reservoir dam. Also, the new panel-barrier design has reduced dramatically the amount and intensity of any mining induced seismicity or subsidence. Additionally, this mining plan will comply with the lease stipulation to not subside perennial streams, unless authorized, as the Left Fork Whitmore Canyon Stream will be under a barrier pillar and no full extraction mining is planned under the stream."* A copy of the approved R2P2 for panels 18-20 is included in Appendix 5-3C. As with the previous mining of panel 7, the company commits to conducting the same level of intensive monitoring of the dam during longwall mining of panel block 18-20, as previously approved by the regulatory agencies, as stated above, and included in

Appendix 5-13.

As mentioned in the BLM approval letter, mining of panel block 18-20 will be further distance away from the Grassy Trail dam than with panel 7. Panel 7 mined within 995' (horizontal) from the dam, while the closest mining from Block 18-20 would be more than 3000' (horizontal) away. Also, panel 7 was about 1664' stratigraphically lower than the dam; while panel block 18-20 is located more than 2200' lower than the dam. Also, panel 7 was mined using side-by-side panels, whereas panel block 18-20 will be mined as panel-barrier, further reducing the potential for seismicity.

It is considered very unlikely that adverse impacts to the hydrologic balance will occur as a result of mining activities in the 273.43-acre permit boundary change area that will allow longwall mining of Panel 22. The reasons for this conclusion are summarized below.

The coal seam in the development entries to be mined in the Panel 22 permit modification area is separated from the land surface by more than 2,650 feet of bedrock cover. The depth of cover overlying longwall Panel 22 will range from about 2,800 to 3,500 feet, which will make the West Ridge Mine the deepest coal mining in operation in the world when this area is mined.

The overburden in the Panel 22 permit modification and surrounding areas is made up of a heterogeneous sequence of bedrock formations which creates alternating horizons of mostly impermeable rocks and relatively permeable rocks (See Appendix 7-1). This heterogeneity prevents significant vertical or horizontal movement of groundwater within the overburden. The overburden present above the Panel 22 longwall mining area includes the entire thickness of the North Horn Formation, Price River Formation, Castlegate Sandstone, and portions of the Colton Formation. A southwest to northeast geologic cross section through the Whitmore Canyon and adjacent areas that depicts these relationships is provided in Appendix 7-1 (see cross-section A-A' in Figure 6 of Appendix 7-1). In particular, the North Horn Formation is known regionally to contain hydrophyllic clays that swell when wetted to seal fractures that may form (Appendix 7-1).

There will be no longwall mining beneath the Right Fork of Whitmore Canyon Creek. The only mining under the Right Fork will be the full-support mining of development entries associated with the longwall bleeder system. Using these mining techniques, no subsidence of the land surface is anticipated, and the potential for fracturing of overlying strata is minimized.

Accordingly, because only full-support development mining techniques will be used, there should be *no* subsidence of the stream bed in the Right Fork of Whitmore Canyon in the Panel 22 permit modification area. Accordingly, the potential for fracturing of overlying strata beneath the stream bed will be negligible.

It should be noted that the Division has previously approved development mining beneath the Right Fork of Whitmore Canyon. Development mining for longwall panel 20 has already occurred under the currently approved mining plan (under about 2,200 feet of cover). The proposed mining of development entries for longwall panel 20 in the panel 20 extension area will occur under an additional at least 400 feet of cover.

A stream gain/loss study was performed by Petersen Hydrologic, LLC in the Right Fork of Grassy Trail Creek in October 2011. A report summarizing the findings of this investigation is provided in Appendix 7-14. The purpose of the gain/loss study was to provide a baseline characterization of spatial variability in baseflow stream discharge rates in the stream reaches in proposed mining areas (i.e. to characterize gaining and losing reaches of the stream). Additionally, the study provides insights into interactions between groundwater and surface-water systems in the canyon.

Petersen Hydrologic reports that the maximum upstream flow (above proposed mining areas) on 24 October 2011 was 673 gpm measured at monitoring site 2. The maximum downstream flow (below proposed mining areas) on that same day was 712 gpm monitored at site 11. Discharge rates measured in the middle portions of the surveyed stream reach are somewhat lower.

During the field investigation, it was observed that materials comprising the stream channel substrate in the Right Fork consist of cobbles, gravels, and fine-grained sands and silts in varying proportions. The width of the valley bottom is also variable within the surveyed reach of the Right Fork. Both the uppermost and lowermost portions of the surveyed stream channel were relatively narrow bottomed, while the valley bottom widened considerably in the middle reaches. Also present in the middle reaches of the Right Fork was a series of beaver dams.

Discharge rates were measured at 11 locations along the surveyed stream course (see Appendix 7-14 for locations). At nine of these locations, discharge measurements were performed using a current-velocity meter and a wading rod. The other two measurements were performed at the permanently installed Parshall flumes in the Right Fork. The results of these measurements are presented in Appendix 7-14, (Appendix 7-14; Table 1, and are plotted in Figure 2).

When the stream was surveyed in October 2011, there was a net increase of 39 gpm from the maximum measured upstream flow (673 gpm) to the maximum downstream flow (712 gpm), which represents a gain of approximately 5.8%. The maximum up-stream discharge measurement was determined using the newly installed 3-foot Parshall flume at station RF-2. The maximum downstream discharge measurement was performed using a current-velocity meter and a wading rod at a location a short distance below the lower flume (RF-1). It should be noted that under ideal conditions, the accuracy range of stream flow measurements performed using a current velocity meter and wading rod is typically on the order of 5 to 10 percent. The typical range of measurement error for a well constructed and maintained Parshall flume is approximately 3 to 5% plus head detection error (see USBR water measurement manual). Thus the 5.8% measured difference between the maximum upstream and maximum downstream flow readings is within or slightly greater than the anticipated margin of error anticipated for the flow measurement techniques utilized.

Petersen Hydrologic concluded that it is likely that the decrease in stream discharge rates measured in the middle portion of the surveyed stream channel results from groundwater-surface-water interactions (i.e. the infiltration of surface flows into zones of permeable alluvium beneath the stream channel). This effect is likely most significant in the middle portions of the surveyed Right Fork where the canyon bottom widens and a series of beaver dams impounds surface waters on the underlying alluvial sediments.

Petersen Hydrologic concluded that the flux of water moving down the Right Fork drainage includes both surface flows within the stream channel and also waters migrating through subsurface zones of coarse alluvial sediments beneath the stream channel. Such occurrences are very common in streams in the region. In some zones, more water moves through the alluvium, in other zones it is less. Most notably, in the middle reaches of the surveyed stream, where the valley bottom is wide and a series of beaver dams impounds water over broad portions of the valley floor, the stream looses water which flows into the underlying alluvial groundwater system. In the lower reaches of the surveyed stream the valley bottom becomes narrower and stream discharge rates increase as water flows from the alluvium into the stream channel. It is important to note that discharge rates in the Right Fork at the most downstream monitoring point are similar to or slightly greater than those measured at the maximum upstream monitoring point (RF-2). What this indicates is that, while some Right Fork stream water recharges the alluvial groundwater system in the middle reaches of the surveyed stream, this same water likely reemerges at downstream locations in the drainage (i.e. there is no apparent loss of water from the drainage).

Petersen Hydrologic concluded that the measured 5.8 percent increase in discharge rate at the lower monitoring site relative to the maximum upstream site may be explained by 1) the forcing of alluvial groundwater to the surface near the mouth of the canyon as the valley width decreases, and perhaps also as the Grassy Trail Reservoir groundwater system is intersected, , 2) typical discharge measurement error, 3) minor contributions of groundwater to the stream flow in the surveyed reach of the stream, or 4) a combination of these factors.

What this indicates is that, while there may possibly be a modest gain of water in the stream, there is apparently no large source of groundwater gain between the stream areas above and below proposed mining areas.

What these discharge measurement indicate is that during baseflow conditions, approximately 94% of the water that flows down the Right Fork of Whitmore

Canyon in proposed mining areas is sourced from regions higher in the drainage. These source areas are completely outside areas which could potentially be impacted by mining operations at the West Ridge Mine. Given that no mining-related subsidence of the stream channel or valley bottom is anticipated, and that the stream is separated by the underlying development entries by at least 2,650 feet of cover, it seems exceedingly unlikely that detrimental impacts to discharge rates in the Right Fork drainage could occur. Similarly, in the absence of physical changes to the stream channel itself, detrimental impacts to water quality in the stream are likewise not anticipated.

In the very unlikely event that impacts to the stream channel or underlying alluvial groundwater system were to occur as a result of mining-related activities at the West Ridge Mine, these would be readily detectable in discharge rates at the lower monitoring station in the Right Fork relative to upstream discharge rates measured at flume RF-2. Petersen Hydrologic indicates that in the lower reaches of the drainage, there is readily measurable discharge of alluvial groundwater into the overlying stream channel. Any potential upstream losses of flow (either from the stream itself or from the underlying alluvial groundwater system) should be manifest as a decrease in flow in the vicinity of the lower flume RF-1. Accordingly, because impacts to either the surface-water and/or alluvial groundwater components of the hydrologic balance in the area can be monitored at RF-1, and because of the very low level of risk associated with full-support development mining only, with no anticipated subsidence, under more than 2,650 feet of cover, the construction of alluvial groundwater monitoring wells does not seem warranted at this time. The fact that the essentially all of the water present in the drainage under baseflow conditions originates from areas outside the proposed mining areas (which will not be impacted) further supports this conclusion (see Appendix 7-14).

It should be noted here that Petersen Hydrologic indicates that the lower flume in the Right Fork of Whitmore Canyon (RF-1) is situated atop coarse grained alluvial deposits consisting largely of cobbles and gravels. Discharge measurements performed in the Right Fork on 24 October 2011 suggest that during baseflow conditions, an appreciable portion of the surface water present above the flume bypasses the flume itself and flows through the coarse alluvium beneath the flume (see Appendix 7-14). Accordingly, these factors should be considered when discharge data from RF-1 are interpreted. Accordingly, when discharge monitoring occurs at RF-1 during low-flow periods (when the relative contribution of the subsurface flow component is substantial and when the flows are near the lower working range of the flume, discharge monitoring will be performed a short distance below the RF-1 flume in order to gain a more accurate measurement of the stream flow in the lower Right Fork.

It should also be noted that during drought periods or at times when the stage of the Grassy Trail Reservoir is lowered, water levels in the Right Fork alluvial groundwater system near the reservoir may correspondingly decline. As a result of the declining alluvial water levels, upwelling of alluvial groundwater into the lower Right Fork stream channel could temporarily diminish or cease (i.e. much or even all of the water in the drainage could migrate through the coarse, permeable alluvium beneath the stream channel). The lack of the reemergence of the alluvial groundwater into the channel in this area would result in a decrease in the measured flow in the stream. Thus under persistent drought conditions or low reservoir levels it is possible that surface flow could be present in the vicinity of the upper flume (where the alluvium is apparently both less extensive and less permeable), but absent near the mouth of the drainage where the abundance of coarse-grained, permeable alluvium is present beneath the stream channel. Accordingly, it will be necessary to carefully evaluate climatic conditions and reservoir stage levels when evaluating the reasons for potential future low flows in the lower reaches of the Right Fork.

If in the future a loss of flow in the Right Fork is suspected, it would be useful to at that time repeat the gain/loss investigation as performed by Petersen Hydrologic (Appendix 7-14) to quantify changes to the system that may have occurred.

While no longwall mining beneath the Right Fork drainage will occur, longwall mining beneath the adjacent upland areas will occur at panels 20, 21, and 22. For several reasons, it is considered very unlikely that the undermining of these areas will result in detrimental impacts to the hydrologic balance. The basis of this conclusion is described below.

It has been the previous experience at the West Ridge Mine that subsidence measured above longwall mining panels in this portion of the mine has been minimal (typically on the order of an inch or less, and in many instances it has been undetectable). Because of the very large depth of cover in proposed mining areas (2,700 to 3,500 feet), and the minimal amount of anticipated surface subsidence, it is considered unlikely that groundwater systems in the Colton Formation exposed at the land surface and in the upper several hundred feet of overburden in the area would be adversely affected by the proposed mining activities.

No springs have been identified in the area directly overlying longwall panel 22 within the panel 22 extension area. The springs identified in the area surrounding Panel 22 discharge from the Colton Formation. Beneath the Colton Formation lies the entire thicknesses of the North Horn Formation, Price River Formation, and the Castlegate Sandstone. The presence of these formations between the coal mine workings and the land surface creates an effective hydraulic barrier to downward groundwater flow. A single spring (6-113) overlies a gateroad entry for Panel 22 in the existing permit area which has already been approved for mining. Spring 6-113 discharges from the Colton Formation at a rate of about 1.5 gpm (Appendix 7-6a). Spring 6-113 is separated from the proposed Panel 22 mine workings by about 2,800 feet of bedrock overburden. The presence of the more than ½ mile vertical thickness of relatively impermeable bedrock strata that separates spring 6-113 from the mine workings, and the minimal anticipated ground subsidence associated with the longwall mining (likely less than an inch) suggests that the potential for impacts to this spring is minimal.

Springs RFS-1 and RFS-2 were identified in the 2011 Petersen Hydrologic spring and seep survey (Appendix 7-6b). These springs are located several hundred feet from Panel 22 and, due to the thick overburden thickness and the lack of any anticipated subsidence should not be impacted.

Springs 6-104, 6-105, 6-106, and 6-107 all discharge from alluvial deposits near the Right Fork stream channel (Appendix 7-6a). Coal mining in the vicinity of these alluvial springs will consist of full support development mining only. As no subsidence in these areas is anticipated, and because the springs are separated from the development mine entries by more than 2,600 feet of overburden, impacts to these springs are considered unlikely.

It is illustrative to compare the recommended minimum overburden thicknesses for coal mines as recommended by the SME in the Mining Engineers Handbook (See Chapter 10.6, "Mine Subsidence"). The Mining Engineers Handbook recommends that *for total extraction mining* a vertical distance between the mine and a water body *with potential for causing catastrophic damage* should be a minimum of 60 times the coal mining height. The same vertical separation distance is recommended for protection of aquifers overlying total extraction mining areas. (A similar standard has often been applied by Federal and State regulatory agencies in Utah coal mining permitting activities). Using a conservative estimate of a 10-foot coal seam thickness to be mined, the minimum overburden thickness required for protection of overlying surface water bodies and aquifers situated above total extraction areas would be 600 feet. Given that the overburden thickness above the proposed longwall Panel 22 ranges from about 2,800 to 3,500 feet, it is calculated that the overburden thickness present above Panel 22 is 4.6 to 5.8 times the minimum recommended by SME. Similarly, given that the vertical distance between the Panel 22 bleeder entries and the stream channel in the Right Fork of Whitmore Canyon exceeds about 2,650 feet, it is calculated that the overburden thickness there is 4.4 times the minimum thickness recommended by SME for *total extraction mining* below the creek. Given that only full support development entry mining will occur beneath the creek, it follows that the potential for adverse impacts to the creek bed as a result of the proposed development mining is negligible based on considerations set fourth by SME.

It should be noted that groundwater has previously been encountered in fault systems at the West Ridge Mine. Water bearing fault zones have also been occasionally encountered at other surrounding coal mines in the Book Cliffs coal mining district. If a water-bearing fault system were to be intercepted by the mine workings in the Panel 22 permit modification area, groundwater inflows from the fault system could occur. However, because of the thickness of the overburden in the area (> 2,700 feet), and the poor vertical water transmitting potential of the clay-rich overburden lithologies (which are known regionally to contain clay minerals that have the tendency to heal mining-induced fractures when wetted), the potential for a possible fault system to intercept shallow groundwater systems that could support springs or provide baseflow to streams is considered low (See Appendix 7-1). Geologic information regarding the fault system encountered in the mine and associated fault-related groundwater systems are provided in Appendix 7-18.

As mining progresses beneath the Right Fork of Grassy Trail Creek drainage, the rates of groundwater interception in each longwall panel area will be closely monitored. West Ridge Resources plans to install a total of six flow meters to measure the discharge from each of the three longwall panels in the Right Fork of Grassy Trail Creek drainage (two each in Panels 20, 21, and 22). The locations of these flow meters are shown in Appendix 7-16. By having flow meters at the outflow points of the longwall panels (located at sumps in both the headgate and tailgate entries) it will be possible to quantify the groundwater interception rates in each panel as the drainage is undermined.

If substantial, sustained inflows of groundwater (exceeding about 250 gpm for more than one month) are encountered when mining in the Right Fork drainage (longwall Panels 20, 21, and 22), a qualified Hydrogeologist will perform a hydrogeologic investigation of the intercepted groundwater system. It should be noted that the interception of modest quantities of ancient Blackhawk Formation groundwater during mining operations in the Left Fork is anticipated (this is a common occurrence in essentially all Utah coal mines). The less common occurrence of a sustained, significant flow will warrant further hydrogeologic investigation. The purpose of the hydrogeologic investigation will be to characterize the intercepted groundwater system and, where possible, determine its likely source. Where directed to do so by the Division, the results of the hydrogeologic investigation will be incorporated as a revision of this PHC.

It should be noted that after the mining in this district is completed, that portion of the mine will be permanently sealed. As a result, discharge data from this area can be collected only for as long as the area remains open and accessible. Based on current mining projections, this area will likely be sealed in early- to mid-2013.

As noted by Petersen Hydrologic (2012) the discharge rate from the West Ridge Mine has increased substantially over time since discharge first occurred from the mine in 2003 (see discharge rate data for site UPDES 002). This condition is likely attributable in large part to the fact that the rate of mining in recent years has greatly exceeded the mining rate in the first years of mining. Mining rates have increased substantially since 2009. West Ridge Mine personnel indicate that the total mining area opened during the period from 2009 to 2012 is significantly greater than that opened during the previous 8-year period from 1999-2007 (Personal Communication, David Hibbs, 2012). When mine openings intersect isolated, water-bearing geologic units with water held in storage, the rate at which such units are intersected and drained will largely control the rate at which the groundwater enters the mine workings. Thus, it is not unanticipated that the mine groundwater interception and mine water discharge rates would increase substantially as the mining rates, particularly the rates at which new mining districts are opened, increase.

West Ridge Mine personnel indicate that relatively little water was encountered in the mine workings when mining near the outcrop occurred during the early years of mining activities. The water that was encountered was predominantly sourced from the mine roof in these areas (Personal communication, Gary Gray, 2012). As mining progressed rapidly down-dip under deeper cover, increased amounts of water began to be intercepted. Much of this water originated from upwelling from the mine floor. It seems likely that the floor water is derived largely from the underlying Sunnyside Sandstone member of the Blackhawk Formation which directly underlies the mined Lower Sunnyside Coal Seam at the West Ridge Mine.

The specific water-bearing stratums that yield water to the mine workings are not known. This is largely due to the fact that most of the water intercepted in the West Ridge Mine drains from mined-out longwall gob areas (Personal communication, Dave Shaver, 2011). Because these areas are completely inaccessible to personnel, it is not possible to identify the specific origins of the water entering the mine gob areas after mining. However, in the general sense, it has been observed that groundwater enters the mine workings through 1) sandstone paleochannels in the mine roof, 2) upwelling of groundwater from the mine floor, and 3) along fault and fracture damage zones. A discussion of the fault system and associated fault-related groundwater systems in the mine is provided in Appendix 7-18 It is likely that the bedrock fracturing associated with the longwall mining process enhances the permeability of water bearing strata adjacent to the mine openings through which groundwater enters the gob areas. The removal of the coal resource (which in most locations is largely impermeable) may also facilitate the inflow of groundwaters from overlying or underlying water-bearing strata.

While the exact source(s) of the intercepted mine waters are not known, it seems plausible that a major beach-barrier bar sandstone deposits within the Blackhawk Formation (such as the Sunnyside Member) could potentially contribute to the volume of water intercepted by the mine workings. The mined coal seam (the Lower Sunnyside Coal Seam) lies directly above the Sunnyside Sandstone Member. The Sunnyside Member is predominantly sandstone and is approximately 100 to 190 feet thick in the mine area (Mayo and Associates, 1998) which gives it a large potential groundwater storage volume. Additionally, large channel sandstone deposits are present in the upper unnamed member of the Blackhawk Formation, which is a shallow marine foreshore deposit that directly overlies the Lower Sunnyside Coal Seam. Appreciable groundwater storage volumes are potentially present in these channel sandstones. Other water-bearing sandstone units intersected by mining-induced fractures in the overburden geologic sequence could also potentially contribute water to the West Ridge Mine workings. As indicated previously, the carbon-14 and tritium data indicate that groundwater from the shallow, near-surface systems that support most springs in the area is not in good hydraulic communication with the deep, inactive-zone groundwaters encountered in the underground mine workings at the West Ridge Mine. Accordingly, it is considered exceedingly unlikely that shallow, active-zone groundwater systems that support springs and seeps in the area, or provide baseflow discharge to streams could be the source of the groundwater intercepted in the West Ridge Mine.

It should be noted that fault- and fracture-related groundwater inflows have been observed in the West Ridge Mine. As evidenced by the old carbon-14 dates and the absence of tritium in groundwaters encountered in the West Ridge Mine, it is evident that hydrodynamic communication with overlying active-zone groundwater systems has not been established through these faults or fractures (See Appendix 7-17 and 7-18). It is considered likely that the fault and fracture systems in the mine area provide pathways of enhanced secondary porosity which interconnect the mine openings with nearby, adjacent water-bearing strata. The abundant presence of soft shales, mudstones, and claystones, and the presence of hydrophyllic swelling clays in the rock strata likely limit the potential for fracture planes to remain open within these strata, particularly under the considerable confining pressures associated with the very thick overburden present at the West Ridge Mine.

The quantity of water utilized underground as mine process water is variable based on mining conditions. Typically, in total the amount utilized over the entire underground mining operation may amount to a few hundred gallons per minute. However, a substantial amount of the water (perhaps more than 50%) used underground is non-consumptive. After use, this water generally flows to sump areas where it is pumped from the mine as part of the mine discharge water.

728.320 Presence of acid-forming or toxic-forming materials

Acid-forming materials in western coal mines generally consist of sulfide minerals, namely pyrite and marcasite, which, when exposed to air and water, are oxidized causing the production of H^+ ions (acid). Oxidation of pyrite will occur in the mine; however, acidic waters will not be observed in the mine. The acid is quickly consumed by dissolution of abundant, naturally occurring carbonate minerals. Iron is readily precipitated, as iron-hydroxide, and excess iron will be not observed in mine discharge water.

No other acid-forming materials or any toxic-forming materials have been identified or are suspected to exist in materials to be disturbed by mining.

728.331 Sediment yield from the disturbed area

Undisturbed drainage from C Canyon upstream from the mine yard facility area will, for the most part, be culverted underneath the mine site by means of a 4' diameter corrugated metal pipe in the right fork and a 3' diameter culvert in the left fork drainage. This culvert has been sized to meet or exceed the design storm for this drainage area. Runoff from the mine site disturbed area and whatever natural runoff which flows onto the disturbed area will be channeled to the mine site sediment pond. The drainage control system for the mine site is shown on Map 7-2.

The culvert and ditch system is designed to handle drainage from a 10 year, 24 hour event. Any storm event that exceeds this amount will flow through the mine yard drainage structures to the sediment pond. If a storm should exceed the design event and the magnitude of the runoff exceeds the pond capacity, the over flow will be channeled through the pond cells and out the emergency spillway to the natural drainage channel below the sediment pond. This overflow will have a lower suspended solid content than the inflow to the pond or any drainage which may be flowing down the natural drainage channel. The sediment pond will detain the inflowing water and allow suspended solids to settle out in the pond cells prior to discharge. Given the ephemeral nature of the drainages and the fact that the sediment pond is designed for the complete retention of the 10 year, 24 hour storm event, it is unlikely that discharge from the sediment pond will occur very often if ever. Since the sediment pond is designed to completely contain the 10 year, 24 hour event, only a limited amount of outflow, that in excess of the design event, would be discharged. Excess water contained in the sediment pond following runoff events would be allowed to settle and evaporate, or be decanted in a controlled manner through the primary discharge pipe to reduce the potential for erosion downstream.

Using the Universal Soil Loss Equation (USLE), an estimate of the annual sediment yield from the mine site disturbed area (in the pre-mining condition) is 0.3082 acre-feet per year. In the operational phase, this same area (the mine yard disturbed area) would then yield 0.3090 acre-feet per year. During the postmining phase, the estimated annual sediment yield is projected to be 0.2679 acre-feet per year. Even though the sediment yield from this area will be greater during the operational phase, the sediment pond has been designed to handle the sediment yield from the disturbed area and retain it in the pond. This will effectively reduce the sediment yield from the disturbed area to an insignificant amount during the operational phase of the mine.

The sediment pond will be constructed as soon as practical at the mine site during construction. When reclamation of the mine yard is initiated following the operational phase, the sediment pond will be removed during removal of the bypass culvert and restoration of the natural channel through the site. Silt fences will be installed adjacent to the reclaimed channel to collect and contain sediment from the regraded site. The silt fences will be constructed approximately along contour with overlapping ends to prevent drainage from going around the ends. Refer to Map 5-9. Because the surface of the regraded area will be gouged with a backhoe bucket to create large depressions, the depressions of the regraded area will also act as a sediment trap. It is anticipated that sediment yield from the reclaimed area will be similar to other adjacent undisturbed areas.

During reclamation, if it is determined that topsoil resources are needed from the topsoil borrow site to achieve reclamation of the mine site, silt fencing would be placed around the outer limits of the borrow area to be disturbed. Topsoil would be stripped and stockpiled. The required amount of topsoil would then be removed from the borrow site. Care would be taken to contour the borrow pit such that runoff infiltration would be maximized to the fullest extent within the disturbed area. This would include gouging the regraded surface with pits approximately 24" wide, 36" long and 18" deep as well as sloping the regraded slopes inward to encourage precipitation infiltration on-site.

There will be no new surface disturbances associated with the 273.43-acre Panel 22 permit modification area. Little or no subsidence of the land surface is anticipated as a result of the proposed mining operations (likely a few inches or less). Accordingly, no increase in sediment yield from disturbed areas is anticipated as a result of mining and reclamation activities in the permit modification area.

728.332 Impacts to important water quality parameters

Since 2003, mine discharge waters from the West Ridge Mine have been discharged to the C Canyon drainage. The distance from the discharge point in the ephemeral C Canyon to the confluence with the first perennial stream, Grassy Trail Creek near Sunnyside Junction, is approximately 10 miles. Because of the general aridity of the region, and the permeable nature of the alluvial sediments over which the discharge water will flow, it is likely that some of the mine discharge water will infiltrate into the alluvial sediments beneath the creek bed. When mine water is discharged into an ephemeral drainage from Andalex's Tower Mine (located in the Book Cliffs 15 miles north of West Ridge), water flows in the drainage for less than one mile before the flow is entirely lost to infiltration or evapotranspiration. Likewise, Icelander Creek, which flows over alluvial sediments at the base of the Book Cliffs Escarpment just south of East Carbon, flows for only about 4 miles before being totally lost to infiltration. Currently, West Ridge Mine discharge waters do flow from the mine to the confluence with Grassy Trail Creek. As anticipated, it is apparent that the saturation of alluvial sediments along the C Canyon drainage has occurred as a result of the mine water flowing through the C Canyon drainage. The alluvial groundwater systems are likely perched atop the underlying low-permeability Mancos Shale sediments.

The discharge rate of West Ridge Mine water during 2011 averaged approximately 1,800 gpm. During the 15-month period from January 2011 to March 2012, the TDS concentration of the West Ridge Mine discharge water averaged 1,254 mg/L.

Discharge water from the Sunnyside Mines located southeast of West Ridge had TDS concentrations of about 1,600 mg/l, with the dominant ions being sodium, sulfate, and bicarbonate (Sunnyside Coal Company, 1993). The chemical composition of this water is similar to that of waters that have been in contact with the Mancos Shale. The TDS concentration of discharge water from the West Ridge Mine is likely similar to or of better quality than that discharged from the Sunnyside Mines

The TDS concentration of water in Grassy Trail Creek at the mouth of Whitmore Canyon, (USGS station 0931430) near the upper contact with the Mancos Shale, averaged 988 mg/l between 1979 and 1984, with the dominant ions being sodium, sulfate, and bicarbonate (Waddell, 1981). The water quality of Grassy Trail Creek after flowing over 11 miles of Mancos Shale sediments to the confluence with the C Canyon drainage near Sunnyside Junction is significantly degraded.

Due to the similarity of the chemistry of the mine discharge water to the water in the creek, the water quality in Grassy Trail Creek will likely not be significantly impacted by mine discharge water.

Because of the poor quality of the water naturally flowing in Grassy Trail Creek near Sunnyside Junction and the apparent quality of the West Ridge Mine discharge water which are flowing into the creek, important water quality parameters in Grassy Trail Creek, such as sodium, sulfate, and bicarbonate will not be significantly increased.

Some of the water from the West Ridge Mine infiltrates into the alluvial sediments in Clark Valley near the Book Cliffs escarpment. This results in a rise in the local water table, or the creation of a perched water table above impermeable layers. Shale layers in the Mancos Shale will prohibit significant downward migration of these waters. The raising of the local water table has apparently resulted in increased vegetation in the area. The increase in vegetation and the presence of surface water in the drainage would be a positive impact on wildlife and the local ecosystem. There are no known water rights or surface facilities adjacent to the stream drainage that could be impacted by the rising water table. Because the water quality of groundwaters in the Mancos

Shale is naturally poor (with TDS significantly greater than 1,600 mg/l), the addition of mine discharge water to this system will not have any detrimental effects on water quality.

The Sunnyside mines discharged water from the mine workings for many years. This water was put to beneficial use for agricultural purposes such as growing alfalfa crops and also for irrigating the municipal golf course, from the time it was built in 1967 up to the closure of the mine in 1993. The city park also used the mine water for irrigation since the mid-1940's. Sunnyside Coal Company had an approved UPDES permit with a TDS concentration limit of 1,650 mg/l for the mine water discharge. Excess water was discharged into Grassy Trail Creek where it was also utilized by cattle and wildlife.

The chemical quality of groundwater discharging from springs above the proposed coal mine will not be adversely affected by underground mining operations. The chemical quality of surface water flowing in upper Grassy Trail Creek will likewise not be adversely affected by underground mining operations. It has been demonstrated (Mayo and Associates, 1997; Appendix 7-1, 2001; Appendix 7-1A) that deep groundwaters adjacent to the coal seams throughout the Book Cliffs and Wasatch Plateau coal fields are hydraulically isolated from shallow overlying groundwater systems which support springs and provide baseflow to streams at the surface. There is no mechanism by which important water quality parameters in shallow groundwater systems above the West Ridge Mine may be adversely impacted by mining operations.

There are no known springs of significance in the lease and adjacent area which discharge from locations that are stratigraphically or topographically below the coal seam to be mined. The thick Mancos Shale will prevent the migration of any mine discharge water downward to formations underlying the Mancos Shale. No seeps or spring exist within or adjacent to the proposed topsoil borrow area to the west of C Canyon.

There should be no change to the quality of mine discharge waters as a result of mining in the 273.43-acre Panel 22 permit modification area. This conclusion is based on the assumption that mining conditions and the hydrogeochemical regime in the proposed mining area will be similar to those encountered elsewhere in the West Ridge Mine. The chemical quality of groundwater discharging from springs in the permit boundary change area should not be adversely impacted as a result of the proposed mining operations. This conclusion is based on the fact that 1) springs in the area are separated from the underlying mine workings by more than 2,500 feet of overburden, and 2) because of the minimal subsidence anticipated in the area, significant impacts to bedrock or alluvial strata that support groundwater flow to spring discharge locations likely will not occur.

728.333 Flooding or streamflow alteration

Discharge from the West Ridge Mine has occurred on an essentially continuous basis since 2003. The mine water is discharged to the C Canyon drainage. The discharge point is about 1 mile above the confluence with B Canyon. Both C and B Canyons are ephemeral drainages that rarely have flow. The stream channel in this drainage is large enough to contain torrential thunderstorm events that commonly exceed several cfs in this region. The anticipated discharge rate from the mine is unknown at this time. However, historic discharges from nearby mines in the Book Cliffs coal field (Soldier Canyon and Sunnyside) average about 300 to 400 gpm. It is possible that over the life of the mine the discharge rate from the West Ridge Mine could be in this same range. However, it must be noted that as new mine workings are developed in "wet" areas, the discharge rate may temporarily exceed this amount. It is anticipated that similar mining conditions will be encountered in mine workings in the proposed the 273.43-acre permit boundary change area that will allow longwall mining of Panel 22. The discharge rates from these mines have been quite variable over time due to the nature of the groundwater systems encountered in the mines. Groundwater encountered in coal mines in the Book Cliffs and Wasatch Plateau coal fields is contained mostly in sandstone channels and in fractures and faults. It is not unusual for large portions of the mines to be mostly dry. For these reasons, the mine discharge rate is more a function of the amount of new mine area recently opened than the total size of the mine. At the Soldier Canyon Mine, mining proceeded for several years before any significant water sources were encountered and thus, no discharge occurred. Similar experiences are reported at Andalex's Tower Mine. For the first four years of mining at the West Ridge Mine, discharge of mine water did not occur. Beginning in February 2003, sustained discharge of mine water from the West Ridge Mine began to occur. During 2003, the mine discharge rate averaged about 170 gpm. During the next several years, the mine-water discharge rate increased. By 2011, the average discharge rate exceeded 1,700 gpm.

It is not anticipated that the discharge of a few cubic feet per second (cfs) of mine discharge water will cause flooding or significant alteration of the streambed in the C Canyon drainage. The channel geometry in C Canyon is primarily the result of erosion which occurs during torrential thunderstorm events where the flow in the drainage is several times that anticipated from the West Ridge Mine. The mine discharge will easily be contained within the inner stream channel, which should be stable. Additionally, if a constant discharge is achieved in C Canyon as a result of mine discharge, the net effect will be a positive one. Vegetation densities along the stream bank will increase causing increased bank stability and decreased erosion. Wildlife habitat will also be improved with the available water and the vegetation growing on the stream bank.

No streams exist in or adjacent to the proposed topsoil borrow area west of C Canyon in section 16, T. 14 S., R. 13 E.

Rates of Groundwater interception at the West Ridge Mine have varied with time and location during the period of operation of the mine. While some areas of the mine have been relatively dry, other portions have been considerably wetter. While it is not possible to predict with certainty the quantities of water that will be intercepted in any given mining area, it seems unlikely that anomalous quantities of water (of such a magnitude that flooding or streamflow alteration resulting from the discharge of mine water to the surface) will be encountered in the Panel 22 permit modification area.

Based on several factors, it is considered unlikely that gravity discharge will occur from the West Ridge Mine portals after mine closure. However, it should be noted that due to the complex nature of the hydrogeology of the mountainous regions in which the West Ridge Mine exists, there can be no guarantee that discharge from the mine portals after mine closure will not occur.

The coal seam at the West Ridge Mine dips steeply to the northeast at about 13 degrees into the mountain escarpment. Accordingly, for groundwater to discharge from the mine portals, it would be necessary for the entire mined are to fill completely with groundwater (i.e. all of the mine workings are at an elevation lower than the mine portal elevation). Petersen Hydrologic, LLC (2012; Appendix 7-17) reports that the water intercepted by the West Ridge Mine working is ancient in origin, with radiocarbon ages ranging from about 10,000 to 23,0000 years. The lack of tritium in the intercepted mine water indicates that the groundwaters have been isolated from the surface for at least the past 50 years. Petersen Hydrologic (2012) further concludes that the groundwaters encountered in the West Ridge Mine are apparently being removed from storage in the deep, mountain-core area. The heterogeneity and low permeability of the rock strata overlying mined areas minimizes the potential for both vertical and horizontal flow of groundwater. Accordingly, the potential for recharge to the groundwater systems from which old water has been drained from storage is low. Therefore, because the rocks which previously held the stored groundwater would be drained with little potential for the system to recharge, the potential for continued inflows of groundwater into the mine workings from the deep, mountain-core groundwater systems after mine closure also seems low. It should also be noted that because of the steep dip of the rock strata to the northeast into the mountain front, in order for the flooded mine workings to have sufficient hydraulic head to result in portal discharge, the groundwater system that recharges the abandoned mine workings must have a hydraulic head equal to or greater than the portal elevation. Additionally, the quantity of water that would be required to recharge the abandoned mine workings would also need to include sufficient water to re-saturate the adjacent permeable bedrock horizons that are hydraulically connected to the mine openings which have previously been drained during mining operations in addition to sufficient water to fill the volume of the open mine voids themselves. As indicated by Mayo and Associates, strong hydraulic communication between the Blackhawk Formation coal seams and overlying geologic formations is not apparent.

It is noteworthy that gravity discharge from the adjacent Kaiser Steel Corp. Sunnyside Mine workings has not occurred in the 19 years that have transpired since the closure of that mine in 1993. Similar conditions would be anticipated at the adjacent West Ridge Mine workings after mine closure.

728.334 Groundwater and surface water availability

Mining in the permit area (including the 273.43-acre permit boundary change area that will allow longwall mining of Panel 22) will not significantly affect the availability of groundwater. Groundwaters in the Blackhawk Formation exist in highly compartmentalized partitions, both vertically and horizontally, and the formation does not act as a hydraulically continuous aquifer. Groundwater systems in the Blackhawk Formation are hydraulically isolated from overlying, modern groundwaters (See Appendix 7-1 and Appendix 7-17). The effects of locally dewatering the Blackhawk Formation adjacent to mine openings will not have any significant impact on groundwater availability in the region surrounding the mine.

There are no groundwater supply wells in the mine lease area or adjacent to it. Likewise, there are no water supply wells in the 273.43-acre Panel 22 permit modification area. The removal of water from horizons immediately above and below the mined horizon will not impact any water supplies. Rather, underground mining makes water available from the Blackhawk Formation that was previously inaccessible.

Because of the extreme thicknesses of the bedrock overburden in the Panel 22 permit modification area, and the fact that only full-support development mining will occur beneath the Right Fork of Whitmore Canyon Creek (with more than 2,700 feet of cover), it is considered very unlikely that adverse impacts to the availability of surface waters in the creek will occur (See discussion in Section 728.310). Similarly, because of the extreme thickness of bedrock overburden overlying longwall Panel 22 (about 2,700 to 3,500 feet), adverse impacts to discharge from springs in the area are not anticipated (See discussion in Section 728.310).

Petersen Hydrologic (2012; Appendix 7-17) performed an isotopic investigation of groundwater systems at the West Ridge Mine. In-mine groundwaters sampled as part of this investigation were old, with radiocarbon ages ranging from about 10,000 to 23,000 years. Tritium was absent in the sampled groundwaters. These isotopic characteristics of the in-mine groundwater systems demonstrate that they are isolated from the shallow, tritium-rich active-zone groundwater systems that support most spring and seep discharges in the area (see Mayo and Associates, 1998; Appendix 7-1). As a result of the hydraulic isolation that exists between the deep, inactive-zone groundwater systems encountered in the West Ridge Mine and the shallow, active-zone groundwater systems that support springs and seeps, and the heterogeneous, low-permeable character of the rocks that comprise the interburden between these two groundwater systems, contamination, diminution, or interruption of State-appropriated waters are not anticipated.

For the reasons discussed above (including Section 728.310) the underground coal mining and reclamation activities in the Panel 22 permit modification area should not result in the contamination, diminution, or interruption of State-appropriated water.

728.400 The hydrology and geology of the area around Grassy Trail reservoir is discussed in a seismic analysis report (see Appendix 5-11) and the Phase II dam safety report (see Appendix 512). These reports conclude that it is unlikely that mining induced seismicity or subsidence will impact the performance of the Grassy Trail Dam and Reservoir. Based on the conclusion of this study the BLM has approved the R2P2 to allow full extraction longwall mining of Panel #7. BLM also added a special stipulation #17 to the federal lease related specifically to the Grassy Trail Reservoir, stating, "*The Lessee is and will remain liable for any and all damages or hazardous conditions resulting from the mining operations under the lease."*

Based on BLM's approval the company then successfully mined longwall panel 7 from December, 2005 through September, 2006. Soon thereafter, RB&G Engineering prepared a summary post-mining report on the mining related affects on the reservoir (see Appendix 5-16). Still later, in 2010, RB7G Engineering prepared an additional update to the summary report (see e). Based on these reports, BLM has recently approved the R2P2 to allow additional longwall mining of panel block 18-20 on the east side of the mains in the vicinity of (i.e., west and north of) Grassy Trail reservoir (see Appendix 5-3C). This new approval contains the same reference to lease stipulation #17, as with the previous approval of panel 7.

R645-301-729 CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT (CHIA)

The Division will provide an assessment of the probable cumulative hydrologic impacts of the proposed coal mining and reclamation operation and all anticipated coal mining and reclamation operations upon surface and groundwater systems in the cumulative impact area.

R645-301-730 OPERATION PLAN

R645-301-731 GENERAL REQUIREMENTS

A plan has been included to minimize disturbance to the hydrologic balance, to prevent material damage, and to support postmining land use.

731.100 Hydrologic Balance Protection

Groundwater Protection

Although testing has shown that no significant impacts from acid or toxic producing materials should occur, groundwater quality will be protected by handling runoff in a manner which minimizes the infiltration into the groundwater system. Examples of techniques that may be utilized to accomplish this would include routing disturbed area drainage to the sediment pond through properly sized ditches and culverts and diverting undisturbed drainage through a bypass pipe past the disturbed area.

Within the disturbed area, drainage will be directed to ditches by sloping the yard areas. The ditches will be appropriately sized to handle flow from the 10 year/24 hour event. Culverts within the drainage system have also been sized to meet or exceed the 10 year, 24 hour design criteria.

Surface Water Protection

Coal mining and reclamation activities will be conducted according to the following plan.

The sediment pond will be installed as soon as possible during construction of the surface facility area. The pond will be appropriately sized to handle the design storm event (10 year, 24 hour) for the mine site.

Protection of surface water will incorporate measures cited under Groundwater Protection. All surface runoff from the mine site disturbed area will be diverted to the sediment pond for treatment. The sediment pond has been designed to provide total containment for the 10 year/24 hour storm plus three years of sediment accumulation. Based on sampling of the soils in the area and the fact that waste rock material will not be stored on the surface, it is unlikely that the sediment pond will impound acid- or toxic-drainage.

It is anticipated, based on the climate of the area, that the sediment pond will remain dry most of the time. (This has been demonstrated to be true for existing coal mining operations in central Utah.) Water in the pond should evaporate rapidly following precipitation events. Infiltration into ground water zones is not expected because of the interbedded nature of the strata below the pond. Thick sequences of shale in the bedrock below the pond will greatly limit the vertical movement of water. Also, the alkaline nature of other sediment flowing to the sediment pond would serve to neutralize any low pH materials when mingled together.

To minimize disturbance to the undisturbed drainage, large diameter bypass culverts will be installed beneath the mine yard facility to allow runoff upstream above the mine site to continue downstream without coming in contact with and becoming contaminated by the mine yard area.

The bypass culvert system will be the first structure to be installed during construction of the mine site facility. Undisturbed area drainage will be bypassed under the disturbed area to minimize the amount of drainage that must be treated by the sediment pond. The bypass culverts will allow natural drainage to continue down the drainage course unaffected by the mining operation. A 36" diameter culvert will be installed in the left fork and a 48" diameter culvert will be installed in the right fork. A 48" culvert will be installed in the main canyon below the confluence of the forks. The size of the culverts will adequately pass the 100 year, 6 hour flow event even though a smaller culvert would meet the requirements of the regulations.

At the topsoil pile locations, undisturbed drainage will be diverted around the stockpiles with ditches at the edge of the pile toward the undisturbed drainage channel. The ditches will divert water away from the stockpile to minimize erosion. The ditches have been sized to convey flow from the 10 year, 24 hour event. The ditches will slope 1% toward the natural drainage. A typical ditch design is presented in Appendix 7-4 “West Ridge Mine Sedimentation and Drainage Control Plan”. The stockpiled topsoil material will be loosely piled and have an irregular, pitted surface or contour furrows to help retain runoff from precipitation events and to reduce erosion until vegetation becomes reestablished. A diversion ditch will be constructed at the edge of the stockpile to divert undisturbed drainage away from the stockpile. Silt fencing will be placed around the perimeter of the stockpile to treat any runoff from the pile.

The topsoil stockpile and test plots will be designated as Alternate Sediment Control Areas (ASCAs).

Refer to Appendix 5-5 for a complete discussion on the construction of the topsoil stockpiles. Refer to Appendix 7-4 for details of the drainage control designs. Map 2-4 depicts the drainage controls of the topsoil stockpile areas.

731.200 Water Monitoring

This section describes the hydrologic monitoring plan. Locations of operational surface-water and groundwater monitoring sites are indicated on Map 7-7. Hydrologic monitoring protocols, sampling frequencies, and sampling sites are described in Tables 7-1 through 7-5. Operational field and laboratory hydrologic monitoring parameters for surface water are listed in Table 7-2, and for groundwater in Table 7-3. The hydrologic monitoring parameters have been selected in consultation with the DOGM's directive Tech-004, *Water Monitoring Programs for Coal Mines.*

Water monitoring reports will be submitted on a quarterly basis to UDOGM. Should any ground water or surface water samples indicate noncompliance with the permit conditions, the operator will promptly notify the Division and immediately provide for any accelerated or additional monitoring necessary to determine the nature and extent of noncompliance and will provide the results of the sampling to the Division.

Operational field and laboratory parameters were measured quarterly for the first ten years of mine operation, rather than for only the first two years as originally proposed in the MRP. The original MRP stated that after a two-year period of quarterly monitoring, if sampling has adequately characterized the hydrology in the area, a request would be made to reduce monitoring to field parameters and one operational analytical sample collected during low flow (3rd Quarter). It also stated, the physical parameters and chemical composition of springs and streams in and around the permit area should be adequately characterized following the collection of three years of baseline laboratory data and two years of operational laboratory data. (The first year of field data was collected in 1985-1986. The original MRP further stated that, thereafter, continued quarterly monitoring for laboratory parameters would probably not enhance the scientific understanding of hydrologic systems in the mine permit area. Beginning in 2nd Quarter of 2011, WEST RIDGE Resources, Inc. will officially drop stream sites ST-5, ST-6A, ST-7, ST-11, ST-12 and ST-13 and spring sites SP-15, SP-16, WR-1 and WR-2. Also, beginning 2nd Quarter of 2011, a total of four flumes will be added, two in the left fork, (LF-1 and LF-2) and two in the right fork, (RF-1 and RF-2). Two springs in the right fork will be added, road spring and Section 5 spring; and 1 stream in the right fork, Patterfore Stream.

Each of the sampling locations and their hydrologic significance are described below. However, in order to comply with UDOGM directive Tech-004, baseline samples will be collected from each spring in the monitoring program during the low flow (fall) sampling and from each stream monitoring site during low flow every five years beginning with the first mid-term review. The five year baseline samples will be repeated every five years until reclamation is complete.

Two years of baseline monitoring has been performed at all monitoring sites; subsequently, the quarterly operational monitoring schedule was utilized through 2010. Monitoring as specified herein will continue through reclamation until bond release unless otherwise modified.

Streams

Grassy Trail Creek is the only perennial stream in the permit and adjacent areas. Four sites on Grassy Trail Creek have been monitored.

Stream site ST-10 is located on the north end of our mining panels, this site will be replaced by a new 2' parshall flume called LF-2. Stream site ST-3 is located below the confluence with Hanging Rock Canyon. Stream site ST-8 is located just above the confluence with Water Canyon, downstream of the permit area and ST-9 is located on upper Grassy Trail Creek at the inlet to Grassy Trail Reservoir. In 2nd Quarter of 2011, Patterfore Stream was added to the permit. This stream site is located north of the extent of our mining panels in the right hand fork of Grassy Trail. These monitoring sites on Grassy Trail Creek will be used to document any potential changes in stream flow or water quality that may be attributable to mining at WEST RIDGE, so data collection efforts at these sites will continue. A description of Upper Grassy Trail water quality included above, which was included in the original verison of the MRP based upon two years of data, indicates that magnesium, calcium, and bicarbonate are the major ionic components, and that TDS at ST-3 is 350 mg/L. After 10 more years of data collected, analysis indicates that the assessment is still correct: those three ions still represent the majority of the dissolved solids in Upper Grassy Trail Creek, and calculated average TDS at ST-3 is 358 mg/L. Further, quarterly water quality monitoring shows that there is relatively minor temporal variation in water quality at these sites, based upon an assessment of their major ions as represented by Stiff, Piper, and Schoeller Diagrams (see Appendix 7-11).

One tributary to Grassy Trail Creek within Whitmore Canyon is also monitored. ST-15 is located in at the mouth of Spring Canyon, and has been monitored since 2003. No flows have been reported since that time. It will continue to be monitored quarterly, and operational samples will be collected if flow is occurring during quarterly visits.

The sample point RST-1 was added 3rd Quarter of 2010. This site is located on the right fork of Whitmore Canyon above Grassy Trail Reservoir. In 2nd Quarter of 2011, this site will be replaced by a 3' parshall flume called RF-1. This site will continue to be monitored quarterly and analyzed for operational field and laboratory parameters.

On the west side of West Ridge, five stations have been monitored for many years on ephemeral drainages contributing to lower Grassy Trail Creek. They are ST-4 (lower Bear Creek), ST-5 (below confluence of B and C Canyons), ST-6A and ST-6 (above and below the mine site, respectively, in C Canyon) and ST-7 (below A Canyon). ST-4 was monitored by visual observation of the channel for flowing water. ST-5 had a crest gauge and automatic sampler while ST-6A, ST-6 and ST-7 each had a crest gauge and bottle samplers. The west side of West Ridge stream monitoring stations are described as follows:

ST-4 No monitoring equipment was ever located at this site. The purpose of this station was to conduct baseline observations for two years to determine whether this portion of Bear Creek acted as an ephemeral or intermittent stream channel. Based on monthly monitoring during 1997 and 1998, it has been determined that intermittent flow does not occur in the lower section of Bear Creek and the channel responds only as an ephemeral drainage following substantial rainfall events. This continued to be documented at this site until 2005, when it was officially dropped from the monitoring plan in July 2005.

ST-5 From 1997 through 2008, this location contained the ISCO automatic sampler and a crest gage. This station monitored drainage from both the B and C Canyon drainages. However, based on field observations, virtually all of the flow comes from the B Canyon drainage, primarily the lower side drainages and adjacent Mancos slopes. Both the B and C Canyon drainages respond as ephemeral drainages. In recent years, this site typically continued flows that were 100 percent comprised of mine discharge. While originally intended to cover both B and C Canyon drainages because surface facilities were contemplated in both of these canyons, its locations below the confluence is no longer important since surface facilities are contained within C Canyon, and not in B Canyon. Because the site has served its primarily purpose (to document the ephemeral nature of flows) and because it represents essentially the same data as is also collected upstream at ST-6, this site will be dropped from the monitoring plan beginning 2nd quarter of 2011.

ST-6 and ST-6A

These two stations are located below and above the proposed mine site in C Canyon, respectively. A crest gage (as described above) and bottle samplers were installed at these sites in 1997, with only partial success at registering flows or collecting samples. Once operations began at the mine, improving access and communications, these structures were less important. The long record of data at ST-6A indicated very little, if any, flow at this site even during severe precipitation events; snow melt runoff often appears to consist of underflow through the heavy organic matter in the cannel bottom. Further, once mine discharge began, ST-6 generally receives continuous flow comprised of 100 percent mine discharge. Therefore, there is no correlation between flows at ST-6A and ST-6. The area below ST-6A was last mined in February 2007. Beginning 2nd quarter of 2011 ST-6A will be dropped while ST-6 will continue to be monitored. Although there have been some changes in ionic strength of this water over the years, as shown by Stiff, Piper, and Schoeller Diagrams (see Appendix 7-11), the basic ionic makeup of the water remains fairly constant. This water is also sampled for UPDES samples just a short distance upstream from ST-6 on a monthly basis, which provides analytical data for compliance purposes.

ST-7 A crest gage and sampler bottles have been located in the A Canyon drainage since 1997, however equipment functionality in this very flashy and sediment-laden stream has been minimal. Originally established to document drainage, it has not served any purpose in the monitoring plan for many years, since the haul road was constructed elsewhere. Further, there are no surface facilities planned for this drainage and underground mining has been progressing in the opposite direction. This site will no longer be monitored after 2nd quarter of 2011.

ST-11 This site, located in Bear Canyon, was added to the monitoring plan in 2005, for reasons described above in Section 728. It has been monitored since that time, but no flows have ever been reported. The area below ST-11 was mined out in November, 2006. This site will be dropped beginning 2nd quarter of 2011.

ST-12 This site, also located in Bear Canyon and described above in Section 728, has similarly been monitored since 2005. The area below ST-12 was mined out in October 2007. No flows have been reported since that time. It will be dropped from the monitoring plan beginning in 2nd quarter 2011 as there is no longer any reason to document flow regime in this reach of Bear Canyon.

ST-13 Similarly, this site is located in Bear Canyon, and was added to the monitoring plan in 2005, for reasons described above in Section 728. It has been monitored since that time, but no flows have been reported. This site will be dropped from the monitoring plan beginning in 2nd quarter 2011.

<u>Springs</u>

Eight springs in the permit and adjacent areas have been monitored since at least 1999; some of these have been monitored by WEST RIDGE since 1997, and some even earlier by other entities. Two other springs, SP-101 and SP-102 have been monitored since 2003. Four of these springs (SP-12, SP-13, SP-15, and SP-16) discharge from the lower slopes of West Ridge in Whitmore Canyon. Two springs, WR-1 and WR-2, discharge from the upper slope of West Ridge in Whitmore Canyon. Refer to Map 7-7. One spring (SP-8) discharges in the upper drainage of C Canyon. Hanging Rock Spring (S-80), SP-101 and SP-102 are located near the northeast corner of the permit area and discharges from the east slopes of Whitmore Canyon.

Most of the monitoring stations in this monitoring program are located on the east slope of West Ridge. This is because, with the exception of SP-8, there are no springs that are suitable for monitoring on the west side of West Ridge.

Beginning in 2nd Quarter of 2011, monitoring at SP-15, SP-16, WR-1 and WR-2 will be discontinued. These sites are away from the direction that mining is occurring or will occur in the future, a long record is in place to document that no impacts have occurred, and any past subsidence activities have long ceased. WR-1 is located outside the West Ridge Mine permit area. It was undermined by the adjacent Sunnyside Mine workings at a depth of more than 2000' below the surface as shown on Plate 7-7. This area was undermined at least fifteen years ago. WR-2 is located 2400' above the underlying coal seam and was undermined in June, 2004 as part of the West Ridge mining operation. Subsidence monitoring has been conducted by Ware Surveying as a part of the continuing monitoring program for the Grassy Trail Reservoir located not far away. Several of the subsidence points were located above longwall panel 7 and are less than 1700' feet from WR-2. These points were undermined in March, 2006. This survey shows that mining-induced subsidence in these areas has been completely stabilized for the past three years (see Appendix 7-13). Since WR-2 was undermined by longwall panel 5 nearly two years prior to the Grassy Trails subsidence points, this provides strong assurance that the area around WR-2 has now been similarly stabilized for an even longer time period.

At sites SP-12, SP-13, SP-101, SP-102, S-80 and SP-8, quarterly monitoring will continue.

Beginning 2nd Quarter of 2011, two springs in the right fork will be added to the monitoring plan. The first will be called road spring and the second will be called Section 5 spring.

Wells

Only one groundwater monitoring well (DH86-2) exists in the permit area. This well monitors the Sunnyside Sandstone Member of the Blackhawk Formation, which is below the coal seam that will be mined. In addition to field parameters and operational water quality parameters, water level will be measured in this well. Because data collected at this site since 1997 exhibits more variability than at the other monitoring sites, quarterly analytical sampling will continue.

Underground Sampling

UG-1 Staring in the fall of 2010, West Ridge Resources will begin an underground monitoring program on the pre-treatment mine-water. A monthly sample of the in-mine water will be collected prior to treatment and analyzed for operational field and laboratory parameters. Parameters will include total and dissolved iron, sulfate, alkalinity, total and dissolved solids, field conductivity, field temperature, field dissolved oxygen and field pH. The sample will be collected in 9th right between the seal and treatment area. This sample point will be called UG-1. Please refer to Appendix 5-15, Attachment 10 for a description and location of UG-1.

Underground Flow Meters, Right Fork Longwall Panels

In order to determine the possible affects of mining within the watershed of the Right Fork of Whitmore Canyon, the company has committed to installing flow meters in the underground mine works. Longwall panels #20, 21 and 22 are the only panels proposed to mine within the Right Fork watershed, as depicted on Map 5-4A and Map 7-8. (It should be noted that there will be no longwall mining conducted under the Right Fork; the only mining to extend under the Right Fork will be the development mining associated with the gate-roads and bleeder entries.) Any water encountered in mining these panels will have to be pumped out of the mine through any of the six development entries (gate-roads) associated with these panels (2 each gate-roads per panel). Therefore the company commits to installing a total of 6 each flow meters, one in each gate-road of the these panels in order to measure the amount of water encountered in the mine within the vicinity of the Right Fork drainage. The flow meters will be installed at the sumps where the gate-roads connect to the main entries, and where the minewater is collected and pumped into the main discharge waterline.

The specific location of these flowmeters is shown on the map in Appendix 7-16, and also Map 7-7. The flow meters will be installed at such time that any water is encountered in quantities sufficient to require pumping. The flow meters will be equipped to read instantaneous flow and total flow. The flow readings will be reported to the Division on a monthly basis. If the total cumulative flow from these meters exceeds 250 gpm (0.5 cfs) for a period of more than one month, the company will notify the Division and will initiate a hydrogeologic investigation and a subsequent revision of the PHC. The flow meters will be monitored and reported as long as any water continues to flow from these panels, or until this area of the mine is sealed, according to MSHA and BLM approvals. Under the current production schedule, the entire lower end of the mine will be sealed around March, 2013 for safety reasons, at which time the only remaining mining will be several small longwall panels near the outcrop.

Grassy Trail Flumes

In response to an agreement between the company and the owners of the Grassy Trail Dam/Reservoir (East Carbon City, Sunnyside City and Sunnyside Cogen Power Plant) flow measurements, field parameters, and lab analysis of the Right and Left Forks of Whitmore Canyon above the reservoir will be taken, as described below:

RF-1 This is a 3' Parshall flume located in the Right Fork immediately above the reservoir. This is an existing flume, owned by East Carbon City, which was recently restored to operational condition. Initial flow readings began in May, 2011. This flume will be equipped with a recording device. This flume is located downstream from any proposed mining activity below (underground). This flume now replaces RST-1 as a stream monitoring point.

RF-2 This is a newly installed 3' Parshall flume, (June, 2011). It is located in the Right Fork approximately one mile upstream (north) of the reservoir. It is also located upstream from the most northerly extent of any proposed projected future mining below. The location of this flume was selected to provide baseline flow data, in conjunction with RF-1 located downstream, to help assess the affects of potential future mining on the stream flow of the Right Fork. This flume will be equipped with a recording device.

LF-1 This is a newly installed 2' Parshall flume, (June, 2011) located in the Left Fork immediately above the reservoir. It is located in an area where an old flume, owned by East Carbon City, was previously located, but has for many years been dysfunctional. Although the coal reserves under the Left Fork have already been mined, LF-1 will provide baseline flow data to help assess the affects of previous longwall mining on the stream flow of the Left Fork. LF-1 will become an active monitoring site as soon as construction is complete, scheduled for July, 2011. This flume will be equipped with a recording device. When completed, LF-1 will replace ST-9 as a stream monitoring location.

LF-2 This is a new 2' Parshall flume located in the Left Fork approximately two miles upstream (west) of the reservoir, and is presently (July, 2011) under construction. Although the coal reserves under the Left Fork have already been mined, LF-2 will be located upstream from any mined out area below. The location of this flume was selected to provide baseline flow data, in conjunction with LF-1 downstream, to help assess the affect of previous longwall mining on the stream flow of the Left Fork. This flume will be equipped with a recording device. LF-2 will become an active monitoring site as soon as construction is complete, scheduled for July, 2011. When completed, LF-2 will replace ST-10 as a stream monitoring location.

In previous discussions with the Division, West Ridge Resources had committed to installing Parshall flumes with continuous recording devices in both the Right and Left Forks of Whitmore Canyon. These commitments were based on the then proposed mining plan, which contemplated longwall mining with potential subsidence directly beneath the Right Fork drainage. Subsequently, as mining has progressed, due to unforeseen geologic conditions, the proposal for longwall mining beneath the Right Fork was abandoned.

Under the currently proposed mining plan, only full-support mining of development entries beneath the Right Fork is proposed. Given that 1) no subsidence of the stream channel is anticipated, and 2) the proposed development entries are isolated from the overlying stream channel by more than 2,000 feet of low-permeability bedrock overburden, the potential risk associated with the currently proposed mining activities in the Right Fork is minimal, and as such does not seem to warrant the intensive, continuous monitoring protocols previously contemplated. Additionally, it has become evident that the collection of continuous stream discharge data from the Whitmore Canyon Flumes would likely not be straightforward. The basis for this conclusion and West Ridge Resources' proposal for on-going monitoring at the Whitmore Canyon monitoring stations are discussed below.

While the currently installed continuous stream flow monitoring devices at the Whitmore Canyon Flumes can be operated successfully during the snow-free and ice-free period of the year, these systems generally cannot provide reliable discharge data when there is the possibility of snow and ice being present in the canyon (which can be approximately half of the year). This is because 1) the water in the stilling wells and piping can become frozen or blocked during cold periods resulting in the collection of non-representative discharge data, or 2) the primary measuring device (i.e. the flume itself) can be impacted by ice or accumulated snow (i.e. the accumulation of ice along the edges of the flume throat, the development of layers of surface ice in the flume throat or approach section, or the physical blockage of the flume with ice, snow, or other debris). These conditions can result in the user unknowingly computing and compiling erroneous discharge data at the flumes. The interpretation of data collected when there is a possibility of snow and ice being present becomes very problematic (i.e. it is unknown whether a change in the flume stage is a result of an actual change in the stream flow rate or whether it is a result with a problem at the flume).

Additionally, the flumes installed in Whitmore Canyon are either 2-foot or 3-

foot Parshall flumes. Accurate discharge data can be determined using these flumes during the high-flow and mid-season flows when discharge rates are in the normal working range of the flumes. However, during seasonal low-flow conditions, or during drought conditions, the flows in the streams may drop below the normal working range of the flumes (resulting in less accurate flow readings). Accordingly, discharge monitoring at these sites during the seasonal low-flow or drought conditions may be performed using an alternate appropriate discharge measurement technique a short distance below the flume locations. However, during these conditions when the alternate, manual data collection techniques are employed, continuous data collection obviously cannot be accomplished.

It should also be noted that the flumes and the automated data collection systems are not the property of West Ridge Resources. Accordingly, the maintenance and availability of these systems is beyond the control of West Ridge Resources.

While no impacts to discharge rates in the streams are anticipated, the types of impacts that could conceivably occur would likely not be of the sort that would necessitate the collection of continuous discharge data collected at frequent intervals. The level of risk to these stream associated with the proposed mining activities in the drainage is considered to be very low. Accordingly, it seems reasonable that quarterly monitoring of these streams would be sufficient to identify and quantify potential future impacts to the streams.

See Appendix 7-14 for Grassy Trail Reservoir - Right Fork Historical Flow Data. See Plate 7-7 for Water Monitoring Location Points.

The company acknowledges that concerns have been raised by certain stakeholders regarding previous proposals for longwall mining under the Right Fork. However, due to unfavorable geologic conditions recently encountered in the coal seam, the company has now abandoned plans for any longwall mining under the Right Fork. Nonetheless, in deference to the concerns of the stakeholders, the company proposes to continue with additional hydrologic baseline measures discussed previously, including 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 4ea. flumes).*

b) *Installation of measuring/recording devices at each flume, within the normal operating flow limits of the flumes.*

c) *Installation of survey elevation monitoring stations at 100' intervals along the bottom of the Right Fork drainage within the permit area.*

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

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

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

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

Table 7- 1 HYDROLOGIC MONITORING PROTOCOLS AND LOCATIONS

Name	Sample Parameters	Sample Frequency	Location Description
Streams			
RST-1 (1)			See note below
ST-3	Flow, Field, Lab Analysis	Quarterly	Grassy Trail Creek
ST-6	Flow, Field, Lab Analysis	Quarterly	C Canyon
ST-8	Flow, Field, Lab Analysis	Quarterly	Grassy Trail Creek
ST-9 (2)			See note below
ST-10 (3)			See note below
ST-15	Flow, Field, Lab Analysis	Quarterly	Spring Canyon Stream
Patterfore	Flow, Field, Lab Analysis	Quarterly	Right Fork of Grassy Trail Reservoir
Flumes			
LF-1	Flow (4), Field, Lab Analysis	Quarterly	Left Fork of Grassy Trail Reservoir
LF-2	Flow (4), Field, Lab Analysis	Quarterly	Left Fork of Grassy Trail Reservoir
RF-1	Flow (4), Field, Lab Analysis	Quarterly	Right Fork of Grassy Trail Reservoir
RF-2	Flow (4), Field, Lab Analysis	Quarterly	Right Fork of Grassy Trail Reservoir
Springs			
SP-8	Flow, Field, Lab Analysis	Quarterly	North Horn Fm. In C Canyon
SP-12	Flow, Field, Lab Analysis	Quarterly	Colton Fm. Upper Whitmore Canyon
SP-13	Flow, Field, Lab Analysis	Quarterly	Colton Fm. Upper Whitmore Canyon
SP-101	Flow, Field, Lab Analysis	Quarterly	Little Spring Bottom
SP-102	Flow, Field, Lab Analysis	Quarterly	Spring Canyon Hillside
S-80	Flow, Field, Lab Analysis	Quarterly	Hanging Rock Spring
Road Spring	Flow, Field, Lab Analysis	Quarterly	Right Fork of Grassy Trail Reservoir
Sec 5 Spring	Flow, Field, Lab Analysis	Quarterly	Right Fork of Grassy, Section 5
Wells			
DH86-2	Water Level, Field, Lab	Quarterly	Sunnyside Sandstone in C Canyon
Underground			
UG-1	Field, Lab Analysis	Monthly	West Ridge Mine
U-14E	Flow only	Monthly	West Ridge Mine – 14 East
U-15E	Flow only	Monthly	West Ridge Mine – 15 East
U-16E	Flow only	Monthly	West Ridge Mine – 16 East

U-17E	Flow only	Monthly	West Ridge Mine – 17 East
U-18E	Flow only	Monthly	West Ridge Mine – 18 East
U-19E	Flow only	Monthly	West Ridge Mine – 19 East

Notes:

(1) RF-1 replaced RST-1 in 2011.
(2) LF-1 replaced ST-9 in 2011.
(3) LF-2 replaced ST-10 in 2011.
(4) During low-flow conditions, discharge at these sites may be measured a short distance below the flumes using an appropriate alternate measurement technique.

ST-5, ST-6A, ST-7, ST-11, ST-12, ST-13, SP-15, SP-16, WR-1 and WR-2 were dropped in 2011.

Table 7-2 SURFACE WATER OPERATIONAL WATER QUALITY MONITORING

Field Measurements	Reported As
Flow	gpm
pH	pH units
Specific Conductivity	μs/cm @ 25°C
Dissolved Oxygen	mg/l
Temperature	°C
Laboratory Measurements	**Reported As**
Total Dissolved Solids	mg/l
Total Suspended Solids	mg/l
Carbonate	mg/l
Bicarbonate	mg/l
Alkalinity, Total	mg/l
Hardness	mg/l
Calcium (Dissolved)	mg/l
Chloride	mg/l
Iron (Total)	mg/l
Iron (Dissolved)	mg/l
Magnesium (Dissolved)	mg/l
Manganese (Total)	mg/l
Manganese (Dissolved)	mg/l
Potassium (Dissolved)	mg/l
Sodium (Dissolved)	mg/l
Sulfate	mg/l
Oil and Grease	mg/l
Cations	meq/l
Anions	meq/l
Cation/Anion Balance	%

Table 7-3 GROUNDWATER OPERATIONAL WATER QUALITY MONITORING

Field Measurements	Reported As
pH	pH units
Specific Conductivity	μs/cm @ 25°C
Temperature	°C
Laboratory Measurements	**Reported As**
Total Dissolved Solids	mg/l
Carbonate	mg/l
Bicarbonate	mg/l
Alkalinity, Total	mg/l
Hardness	mg/l
Calcium (Dissolved)	mg/l
Chloride	mg/l
Iron (Total)	mg/l
Iron (Dissolved)	mg/l
Magnesium (Dissolved)	mg/l
Manganese (Total)	mg/l
Manganese (Dissolved)	mg/l
Potassium (Dissolved)	mg/l
Sodium (Dissolved)	mg/l
Sulfate	mg/l
Cations	meq/l
Anions	meq/l
Cation/Anion Balance	%

Table 7-4 UPDES DISCHARGE POINT MONITORING

MONITORING POINTS	FREQUENCY
001	Monthly
002	Monthly

FIELD MEASUREMENTS	REPORTED AS
Flow	gpd
pH	pH units
Specific Conductivity	μs/cm @ 25°C
Temperature	$^\circ$C

LABORATORY MEASUREMENTS	MAXIMUM
Oil and Grease (if sheen is visible)	10 mg/l
Total Suspended Solids	70 mg/l
Total Iron	1.0 mg/l
Total Dissolved Solids	One ton/day

Table 7-5 UG-1 UNDERGROUND MONITORING POINT

MONITORING POINT	FREQUENCY
UG-1	Monthly

FIELD MEASUREMENTS	REPORTED AS
pH	pH units
Specific Conductivity	μs/cm @ 25°C
Dissolved Oxygen	mg/l
Temperature	°C

LABORATORY MEASUREMENTS	REPORTED AS
Total Dissolved Solids	mg/l
Total Suspended Solids	mg/l
Iron (Total)	mg/l
Iron (Dissolved)	mg/l
Sulfate	mg/l
Alkalinity	mg/l

*Please refer to Appendix 5-15, Attachment 10 for a description and location of UG-1.

MONITORING POINT	FREQUENCY
U-14E	Monthly
U-15E	Monthly
U-16E	Monthly
U-17E	Monthly
U-18E	Monthly
U-19E	Monthly

FIELD MEASUREMENTS	REPORTED AS
Flow	gpm

*If the total cumulative flow from these meters exceeds 250 gpm (0.5 cfs) for a period of more than one month, the company will notify the Division and will initiate a hydrogeologic investigation and a subsequent revision of the PHC.

731.300 Based on testing of roof and floor materials, formation of acid- or toxic-materials does not appear to be a concern. Roof and floor materials will be permanently stored underground and will not brought to the surface for disposal.

Samples of the roof, floor and coal from an outcrop of the Lower Sunnyside coal seam in the left fork of C Canyon were collected for analyses. The samples were sent to Inter-Mountain Laboratories, Inc. in Sheridan, Wyoming and analyzed according to Table 6 in DOGM's "Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining". The Table 6 parameters were run on the samples to look for toxic or acid-forming materials. Refer to Appendix 6-1 for the laboratory analyses. The Table 6 sampling regime was intended for soil materials which are going to be used a plant growth medium during final reclamation. It is not likely that any significant amount of the roof, floor or coal material would be incorporated in the regraded fill material at the time of final reclamation because there will not be any coal processing or coal preparation at the minesite. Also, prior to reclamation of the minesite, all coal will be removed from the minesite and sold.

Chemicals and petroleum products to be used at the mine will be stored in a controlled manner. The following products may be used by mining operations: diesel fuel, gasoline, grease, motor oil, water based hydraulic fluid, antifreeze, brake fluid, gear lubricating oil, rock dust, magnesium chloride, spray paint and stopping sealant. Chemicals and petroleum products to be used at the mine will be stored in a controlled manner. Petroleum products such as diesel fuel, transmission oil and grease will be stored in the mine yard in a contained, concrete structure. Other miscellaneous products would be stored in the mine warehouse.

Emulsion fluid spills will be minimized through the following:

-Emulsion fluid will not be mixed on the surface. The emulsion concentrate is delivered to the minesite in factory sealed 500 gallon containers. These containers area specifically designed to be easily handled by standard equipment at the mine site and transferred to mobile equipment for transport underground near the longwall equipment.

-Most longwall installations now utilize a bio-degrade able emulsion fluid in accordance with the manufacturer's recommendations. The emulsion mixture is very dilute, typically 2 parts emulsion fluid to 98 parts water.

-Any accidental longwall fluid spills on the surface would be cleaned up like any other spill in accordance with the site specific Spill Prevention Control and Countermeasure Plan. The sediment pond cells would provide an effective line of defense against any offsite contamination.

-Any emulsion fluid spill underground would go to an underground sump where water is typically stored and reused underground. Any water discharged from the mine would be tested and analyzed in accordance with the approve UPDES permit.

-The C Canyon drainage is ephemeral and supports no aquatic life. The closest flowing stream is Grassy Trail Creek which is over 11 miles to the southwest.

731.400 All water wells utilized during the operating phase will be abandoned in accordance with the rules outlined in "Administrative Rules For Water Well Drillers, State of Utah, Division of Water Rights, 1987". Closure of the wells will be conducted by a licensed well driller.

Final abandonment of the proposed water monitoring well DH 86-2 (at the mine site) will be conducted prior to completion of final reclamation. The abandoned well will be filled to within two feet of the surface with Neat Cement conforming to ASTM standard C150, a cement grout consisting of equal parts of cement conforming to ASTM standard C150 and sand/aggregate with no more than 6 gallons of water per sack of cement or bentonite-based products specifically designed for permanent well abandonment.

The cement will be introduced at the bottom of the well and placed progressively upward to within two feet of the surface. The casing will be severed a minimum of two feet below the ground surface. A minimum of two feet of compacted native material will be placed above the abandoned well upon completion.

Within 30 days of the completion of well abandonment procedures, a report will be submitted to the state engineer by the responsible licensed driller giving data related to the abandonment of the well. The report shall be made on forms furnished by the state engineer and shall contain the information required, including but not limited to:

1) Name of licensed driller or other person(s) performing abandonment procedures,

2) Name of well owner at time of abandonment,

3) Address or location of well by section, township and range,

4) Abandonment materials, equipment and procedures used,

5) Water right or file number covering the well,

6) Final disposition of the well,

7) Date of completion.

731.500 Discharges

731.510 The West Ridge Mine will be operating in the Lower Sunnyside seam which is the same seam mined by Kaiser Sunnyside mine immediately to the southeast of the West Ridge reserves. WEST RIDGE intends to mine around old Sunnyside mine workings. There is a possibility that the old Sunnyside works may contain water, especially in the northeasterly areas which are the furthest down dip. WEST RIDGE Resources has acquired all of the most current certified mine maps of the Sunnyside old works. The Kaiser mining operation was a large operation with a sophisticated engineering, surveying and drafting department. WEST RIDGE Resources is confident that these maps were accurately surveyed and updated and accurately portray the extent of the old works. Nonetheless, extreme caution will be exercised as mine development is being driven out toward the old works. WEST RIDGE Resources will employ professional licensed, certified land surveyors to monitor the progress of the underground mine development. All surveying in the West Ridge mine will be tied to the same surveying coordinates and control as was used for the Sunnyside mine. When the West Ridge works are within 500 feet of the projected Sunnyside works exploratory drilling will begin ahead of the development. Face drills will be used to drill at least 100 feet out in advance of the actual mine face development. The exploratory face drill will be a small diameter and if water is encountered from the old works the drill hole can easily be plugged and sealed. The West Ridge mine plan assumes that development will proceed to within 300 feet of the old works. West Ridge mine intends to stay away from the old works but will drill ahead as a precautionary measure in the event that the mine maps or surveying has a margin of error.

731.520 Gravity Discharges From Underground Mining Activities

Surface entries and accesses to underground workings will be located and managed to prevent or control gravity discharge from the mine. All workings will dip away (downdip) from the portals. It is anticipated that the mine will be relatively dry but in the event that discharge becomes necessary, the discharge will comply with the performance standards of the regulations and requirements of the UPDES permit before being discharged off the permit area.

Refer to Map 6-2, Coal Seam Structure Map for the Lower Sunnyside seam structure contours.

731.520 Gravity Discharges From Underground Mining Activities

Surface entries and accesses to underground workings will be located and managed to prevent or control gravity discharge from the mine. All workings will dip away (downdip) from the portals. It is anticipated that the mine will be relatively dry but in the event that discharge becomes necessary, the discharge will comply with the performance standards of the regulations and requirements of the UPDES permit before being discharged off the permit area.

Refer to Map 6-2, Coal Seam Structure Map for the Lower Sunnyside seam structure contours.

731.600 Stream Buffer Zones

The natural drainage channels in the main C Canyon and right fork of C Canyon drainage are classified as intermittent by the regulatory definition. (The watershed area is greater than one square mile). The channel operates like a ephemeral drainage channel although no drainage flow in the channel has been recorded during the last two years of monitoring.

A buried culvert will be placed through the proposed disturbed area to convey drainage from precipitation events past the mine site. The undisturbed bypass culvert system will be sized to handle runoff from the 100 year, 6 hour precipitation event. This is well in excess of the 10 year, 6 hour design event required by the regulations for a temporary diversion. The larger culvert is being proposed as an extra measure of safety and protection for the mineyard. Stream buffer zone markers will be placed at the north and south ends of the mine site facility area above the drainage channel to prevent channel disturbance by surface operations.

Mining activities will minimize impact to the undisturbed area by use of diversion ditches and the sediment pond to control and contain sediment and disturbed area runoff within the mineyard facility area.

It was determined by the Division of Water Rights that no stream alteration permit would be required for culverting of the C Canyon drainage. Refer to the August 19, 1998 letter included in Appendix 7-9.

The proposed undisturbed drainage channel diversion is discussed in greater detail under R645-301-742.300 and in Appendix 7-4.

Grassy Trail Creek is an intermittent stream located in the permit area in Whitmore Canyon located northeast of West Ridge. In this area the coal seam to be mined is 2000' below the streambed. Technically speaking, mining will be conducted within the 100' stream buffer zone, but only as measured horizontally. Therefore, no stream-buffer zone protection measures on the surface are anticipated. In the "Investigation of Surface Water and Ground Water Systems in the Whitmore LBA Area, Carbon County, Utah" (Appendix 7-1A), Mayo and Associates concludes that "the stream channel in this area is underlain by approximately 2,000 feet of cover, which includes the entire thickness of relatively unfaulted and unfractured North Horn Formation, which is known to form an effective barrier to vertical groundwater migration (Mayo and Associates, 1998) and is known to contain hydrophyllic clays that swell when wetted to seal any fractures that may form. Therefore, the potential for the interception and diminution of surface water flows in Grassy Trail Creek as a result of mining induced subsidence is minimal." Mining related impacts to fish, wildlife and other hydrologic resources is expected to be correspondingly minimal.

731.700 Cross Sections and Maps

There is no flowing surface water within the permit area and no water supply intakes. Surface receiving waters are at least ten miles to the southwest where the ephemeral drainage system reaches Grassy Trail Creek near the Sunnyside Junction (junction of Highway 123 and State Road 6). Refer to Map 1-1 for the location of Grassy Trail Creek. All disturbed area runoff will flow into the sediment pond where it will be contained.

The location of the water monitoring well, the water supply pipeline from East Carbon and the water storage tanks to be used are shown on Map 5-5.

Water monitoring stations and water monitoring well DH 86-2 are shown on Map 7-6. Operational monitoring stations are depicted on Map 7-7 “Operational Monitoring Map”. Refer to Table 7-1 for a listing of the operational monitoring locations.

Map 5-5 shows the location of the proposed sediment pond.

Cross sections for the proposed sedimentation pond are presented on Map 7-4A “Sediment Pond Cross-Sections”.

731.800 Water Rights and Replacement

No surface coal mining and reclamation activities (strip mining) will occur in the affected permit area.

Mining should not have any impact on the existing water rights in and around the proposed mining area.

R645-301-732 SEDIMENT CONTROL MEASURES

732.100 Siltation structures will be constructed and maintained in accordance with the applicable regulations. Siltation structures will not be removed until authorized by the Division of Oil, Gas and Mining.

Alternative sediment control measures will be used in areas where the surface disturbance is minor and sediment control is expected to be restored fairly rapidly with revegetation. Alternate sediment controls will be used on the topsoil stockpile and test plot areas. At these locations diversion ditches will divert undisturbed area runoff away from the site. Silt fencing will be utilized to minimize siltation from the sites. The surface of the stockpile will be pocked and roughened to retain moisture and minimize runoff from the disturbed surface. The surface area will be revegetated to minimize surface erosion. The alternate sediment control area located in the right fork is 0.46 acres while the stockpile area for the left fork is 1.13 acres.

The other ASCA (alternate sediment control area) will be at the office and parking lot area below the mine yard facility area. This 1.37 acre area will be sloped to one end of the pad area where a sediment retention basin will be used for sediment control. In addition, the slopes and embankment of the office pad will be revegetated to control sedimentation and erosion.

732.200 The sedimentation pond has been designed in compliance with the appropriate regulations. Refer to Maps 7-4 and 7-4A for the sediment pond plan and cross-section details. The sediment pond will be reclaimed during reclamation of the mineyard facilities. Refer to Appendix 5-5 for the complete details of the reclamation plan.

732.300 Diversions will be constructed and maintained with respect to R645-301-742.100 and 742.300.

732.400 Road Drainage

Roads within the disturbed area will be designed and constructed to utilize standard designs for surface drainage control, culvert size and spacing and grade. Refer to Map 5-5, Surface Facility Map.

Drainage ditches and culverts have been designed to handle a 10 year, 24 hour storm event. The larger design capacity will also provide additional capacity above what is required by the regulations, for a greater margin of safety in the mineyard during operations.

Riprap will be placed around the inlet end of the culverts to a height of at least 6" above the required headwall for each culvert. The outlet of the main canyon bypass culvert will be equipped with adequately sized riprap to slow the outlet velocity and prevent erosion to the natural downstream channel.

Trash racks will be placed on all undisturbed bypass culvert inlets to prevent floating debris and rocks from plugging the culvert. The trash racks will be slanted 3/4 inch steel bars welded on six inch centers across the flared inlet structures of each culvert. The bars will be sloped from the front of the inlet up to the top of the culvert. Use of trash racks on the smaller culverts within the mine yard drainage system will be at the discretion of the operator and based on site specific conditions.

R645-301-733 IMPOUNDMENTS

733.100 General Plans

A sediment impoundment structure (sediment pond) is proposed for treatment of disturbed area runoff from the mineyard facility area. The pond will be located near the southern end of the mine yard (refer to Map 5-5) and has been designed to contain and treat drainage from the 10 year, 24 hour event. The associated conveyance structures, such as culverts and ditches, have been sized to convey drainage from the 10 year, 24 hour event into the sediment pond. Appendix 7-4 provides the detailed designs and calculations used to derive the pond capacity, ditch and culvert sizes.

733.110 The designs and calculations have been certified by a registered, professional engineer experience in the design and construction of sediment ponds.

733.120 Maps 7-4 and 7-4A depict the pond design in plan view and in cross-section. Calculations made in Appendix 7-4 are based on the design dimensions presented in the above-mention maps.

733.130 The sediment pond has been designed to contain runoff from the mineyard disturbed area as well as several contributing undisturbed drainage areas. The runoff and sediment yield have been calculated using a 10 year, 24 hour precipitation event. Because of the narrowness and steep gradient of the canyon at the downstream end of the mine yard facility area, the sediment pond has been designed to have two cells that will contain the total volume of the 10 year, 24 hour design event plus three years of sediment storage (using 0.1 acre-feet of sediment per disturbed acre). Sediment will be captured by both cells (A and B). The total sediment storage capacity of the sediment pond for a three year interval is 1.845 acre feet, however, the sediment will be cleaned out when the storage capacity reaches 60%. Sediment indicator stakes will be placed at various locations in both the upper and lower cells (A and B) so that a visual determination of the 60% level can be made.

The required volume for the sediment pond is calculated at 7.052 acre feet, including 3 years of sediment storage. The actual pond volume at the principal spillway is 7.669 acre-feet. Refer to Appendix 7-4 for the pond design calculations. Refer to Map 7-4 for the individual cell dimensions and features. The upper cell will be approximately 18.5' feet deep from the cell bottom to the crest of the embankment while cell B will be approximately 14' feet deep. Neither of the cells meet the size specifications that require them to be regulated by MSHA under 30 CFR 77.216(a).

The pond will provide a theoretical detention time of 24 hours. The upper cell (cell A) of the sediment pond will be constructed with an open channel spillway at a minimum depth of 1.5' below the top of the dam. The open-channel spillway will be constructed of grouted rip-rap or concrete, and will have a minimum 5' bottom width with 2h :1v side slopes. The lower cell (cell B) will be constructed with a combination of 2 spillways. The principal spillway will be a 36" C.M.P. culvert riser and oil skimmer. This spillway will overflow at an elevation at least 3' below the top of the dam. This spillway will discharge directly into the bypass culvert (UC-OO) which is located beneath the pond. In the unlikely event of failure of the principal spillway, the lower pond cell will also be equipped with a second (emergency) culvert spillway, consisting of a 36" C.M.P. culvert riser and oil skimmer, with a minimum depth of 2.0' below the top of the dam. This spillway will also flow directly into the undisturbed bypass culvert (UC-OO).

Discharge from the pond will be in accordance with the UPDES permit issued for the facility. Decanting the pond will be accomplished by using a portable submersible pump with an inverted inlet to decant the pond if necessary. A sample will be collected prior to decanting to determine if the water quality will meet the requirements of the UPDES permit.

UPDES sample point # 1 is located at the principal spillway of the sediment pond. (see Map 7-4). This sample point will be used if and when the pond fills to capacity and must be decanted. Access to this sampling point will be provided by a walkway which will be constructed from the crest of the pond embankment out to the primary spillway. This walkway will be substantially constructed of steel, with an expanded metal walk surface and adequate handrails. It will be attached to the steel structure of the primary spillway /oil skimmer structure. During discharge activities personnel in charge of the sampling will walk to the end of the walkway to collect samples

Decanting of this pond will be done manually using a small mobile gasoline powered pump. When used, the pump will be positioned on the spillway walkway, (see Map 7-4). The end of the suction hose will be equipped with a float so that the decanted water is sucked from the top layer of pond water which should contain less sediment. The discharge line of the pump will feed directly into the primary spillway. Mine personal will take samples at the discharge end of the pump line as it enters the principal spillway. Samples will be secured and analyzed in accordance with the approved UPDES permit.

UPDES sample point #2 is located at the culvert riser near the mine portals. This riser leads directly into the main bypass culvert. The riser will be 42" in diameter, large enough to allow access by mine personnel. The purpose of UPDES sample point #2 is to sample any water that may be discharged from the mine in the future. It is not known at this time if or when such discharge may be necessary. However, if mine discharge becomes necessary, a discharge line (most likely 6" to 8" diameter) would be installed in the return entries (to keep from freezing) and would exit the mine through the fan portal. From the fan it is a short distance over to the culvert where the line would discharge directly into the main bypass culvert riser the discharge line will be equipped with a small petcock value that will conveniently allow the operator to take a UPDES sample whenever water is being discharged from the mine. Samples will be secured and analyzed in accordance with the approved UPDES permit. Refer to Appendix 7-10 for the UPDES general permit.

Inlet ditches to the pond will be protected from erosion by using concrete, culverts or rip rap to convey drainage down to the water level.

The principal spillway in cell B will be a 36" cmp culvert fitted with an oil skimmer. This spillway will carry the peak flow from the 25 year, 6 hour event at a depth of 0.89' over the pipe.

The emergency spillway, located on cell B, will also be a 36" cmp culvert fitted with an oil skimmer. This spillway will be utilized, if necessary, to convey any flow in excess of the 25 year, 6 hour precipitation event out of the pond.

The sediment pond is a temporary feature. It will be removed during final reclamation of the mine site.

733.140 No previous mining has occurred under the sediment pond location, nor is mining proposed under that site. Therefore, there should be no effect on the sediment pond due to past or future mining activities.

The pond will be constructed according to design criteria listed in Appendix 7-4 under "Design and Construction Specifications For Sedimentation Pond". The sediment pond will be removed upon cessation of mining.

733.150 A structural stability analysis was performed on the pond embankment slopes by Agapito Associates, Inc. The results of their analysis are presented in Appendix 5-4.

The pond embankment (the east slope of the pond) will be keyed into bedrock or natural ground. The bedrock appears to be competent at this location with no visible faults or fractures that would impair the operation and stability of the pond.

733.160 A certified sediment and drainage control plan containing design details (Appendix 7-4) is presented in this permit application package.

733.200 Permanent and Temporary Impoundments

Maps and cross-sections for the sediment pond have been prepared and certified. Refer to Maps 7-4 and 7-4A. Details of the pond design are presented in Appendix 7-4.

The sediment pond will collect runoff from the disturbed area during mining operations. Because the pond is a temporary structure, it has been sized according to requirements for the 10 year, 24 hour storm event. The calculated required volume for this storm event is 7.052 acre-feet, which includes a volume for three years of sediment storage. The actual design volume for the pond is 7.669 acre-feet. The pond will have a principal and emergency spillway in cell B. The maximum pond volume will be 7.669 acre-feet at the principal spillway and the maximum height water could be impounded in either of the cells is 16.5 feet (to the principal spillway in cell A). The pond therefore does not meet the criteria for MSHA regulation.

In addition to the principal spillway, the pond's emergency spillway has also been designed to safely pass the peak flow from the 25 year, 6 hour precipitation event. Any discharge from this pond will meet the requirements of the UPDES permit for the facility.

No mining will occur underneath the sediment pond nor has any mining been done beneath this location in the past. The potential effect on the structure from subsidence of subsurface strata would be nonexistent.

This temporary impoundment will be constructed and maintained to comply with the appropriate requirements. No permanent impoundments are being proposed. Reclamation of the structure will be as presented in the reclamation portion of Chapters 5 and 7 and in Appendix 5-5, Construction and Reclamation Plan.

R645-301-734 DISCHARGE STRUCTURES

Discharge structures will be constructed and maintained to comply with R645-301-744. Refer to the discussion under R645-301-744.

R645-301-735 DISPOSAL OF EXCESS SPOIL

No areas are presently designated for disposal of excess spoil. No excess spoil is anticipated during the life of the mine.

R645-301-736 COAL MINE WASTE

No coal mine waste disposal areas are being planned in the mine yard. Any waste generated will be disposed of in an approved, permitted disposal site.

R645-301-737 NONCOAL MINE WASTE

Noncoal mine waste will be stored in dumpsters, or in a contained manner, in a designated portion of the disturbed area near the shop/warehouse. Final disposal of noncoal mine waste will be in an approved, waste disposal site and will comply with R645-301-747.

R645-301-738 TEMPORARY CASING AND SEALING OF WELLS

Sealing of the groundwater monitoring well and any future wells will comply with R645-301-748. Refer to R645-301-765 for the well abandonment plan. The groundwater monitoring well will be used for monitoring only and is locked in a closed position between sampling events.

R645-301-740 DESIGN CRITERIA AND PLANS

Site specific plans that incorporate design criteria for control of drainage from disturbed and undisturbed areas are presented below.

R645-301-742 SEDIMENT CONTROL MEASURES

Sediment control measures have been designed to prevent, to the extent possible, additional contributions of sediment to stream flow or runoff outside the permit area, to meet effluent limitations and to minimize erosion.

The most significant sediment control measure will be to collect all disturbed area runoff and divert it into a sediment pond designed for total containment of the 10 year, 24 hour precipitation event. Runoff from undisturbed areas above the mining site will be diverted, as much as possible, to reduce the amount of runoff to be treated by the sediment pond. Refer to Appendix 7-4 for the "West Ridge Mine Sedimentation and Drainage Control Plan" and Map 7-1 "Drainage Area Map " and Map 7-2 "Mine Site Drainage Map" for the mine site drainage calculations and diversion culvert specifications.

Additional measures to be taken may include: interim reclamation of disturbance, where practical, to reduce runoff and erosion; rip rapping or lining diversion ditches, where necessary, to reduce erosion; and using straw bales and check dams to control flow, sediment and erosion. A discussion of alternate sediment controls measures is presented in Appendix 7-4 for the ASCA areas (topsoil stockpile, test plots and office pad). Designs for the sediment controls will be according to information presented in Appendix 7-4 and Maps 5-5, 5-8, 7-1, and 7-4.

Snow removal activities at the mine site will attempt to stockpile any large amounts of snow in those snow storage site locations indicated on Map 7-2. The snow stockpile locations are primarily designed for storing snow clear from some of the larger pad areas. Snow will still be plowed to the side of roadways and small pad areas.

742.220 Minimizing contributions of suspended solids and sediment to streamflow or runoff outside the permit area will be accomplished by constructing a multiple cell sediment pond for sediment treatment and storage of runoff from the disturbed area. The sediment pond has been designed to provide adequate sediment storage and detention time for the 10 year, 24 hour precipitation event. The pond has a principal and emergency spillway in cell B which is designed to pass the peak flow from the design event as required by the regulations. The design of both the principal and emergency spillways will accommodate the peak flow of 23.71 cfs from a 25 year, 6 hour event.

Water will be decanted in accordance with the UPDES permit for the facility. A submersible pump will be used to decant the pond if needed.

The sediment in the pond cells will be removed when it reaches 60% of the maximum design sediment level in cells A and B of the pond. Two sediment markers will be installed at various locations in the bottom of the cells for evaluation of the sediment level. Refer to Map 7-4 for information regarding the sediment pond configuration. Refer to Appendix 7-4 for the "West Ridge Mine Sedimentation and Drainage Control Plan" for design calculations.

The sediment pond cell will be cleaned out upon reaching the 60% of the maximum sediment capacity. Clean out will be done during late fall or early winter, October-December, when the chance of thunderstorms is the lowest and the pond is dry. Decanting of the pond prior to cleanout will probably be unnecessary due to the arid nature of the climate. However, if decanting is necessary, the water will be allowed to settle for a minimum of 24 hours. The water will be drawn down as much as possible by pumping it into the adjacent cell.

Prior to sediment removal, samples will be taken from the sediment on the bottom to determine the depth of sediment as well as the nature of the material to be removed. Samples will be composited and analyzed according to Table 6 of DOGM's "Guidelines For Management Of Topsoil And Overburden For Underground And Surface Coal Mining".

The sediment pond does not meet the size criteria of MSHA 30 CFR 77.216(a).

The sediment pond has been designed with a primary and emergency spillway each capable of safely discharging the peak flow from the 25 year, 6 hour precipitation event. This should provide an additional measure of safety to prevent damage to the pond's integrity.

The construction site for the sediment pond will be cleared of all vegetation and debris prior to the removal of topsoil. Topsoil, if present, will be removed from the pond site and stockpiled in the topsoil storage area. In areas where fill is to be placed for the pond impoundment, natural ground will be removed for at least 12" below the base of the structure. Native material will be used when possible. The fill will be placed in lifts not to exceed 15" and compacted. Compaction of the fill material will be 95% or greater. Silt fencing and straw bales will be used to treat drainage from the site until the sediment pond embankment is constructed.

742.300 Diversions

General Requirements

Flow from undisturbed areas will be diverted away, where possible, from disturbed areas by means of temporary diversions (i.e. undisturbed drainage culverts). The diversions have been designed to minimize impacts to the hydrologic balance of the permit and adjacent areas.

All of the undisturbed drainage diversions (bypass culverts) have been sized, as a minimum, to meet the 100 year, 6 hour event for maximum protection of the mine yard area, sediment pond and undisturbed drainage below. The design incorporates structural stability and protection against flooding and damage to life and property. Designs for all diversions are presented in Appendix 7-4 and the structure locations depicted on Map 7-1. The map and plan have been certified by a registered, professional engineer.

The sediment pond has been designed and located such that if any of the temporary drainage structures (disturbed area culverts and ditches) within the disturbed area were to exceed their capacity, all drainage would still flow to and be treated by the sediment pond. Four culverts will convey drainage into the sediment pond. These inlets have been designed to pass the flow from a 10 year, 24 hour precipitation event in order to provide more capacity and an extra measure of protection.

Following completion of mining activities, the undisturbed drainage diversion culverts, which will bypass the undisturbed drainage past the disturbed area, will be removed and the natural channel restored. Restoration of the channel will seek to reestablish a natural appearance to the drainage channel while providing a suitable channel configuration. Refer to Appendix 5-5 for a detailed discussion of the reclamation plan for the C Canyon drainage channel.

Based on measurements taken during field investigations and baseline mapping in the mine yard area, it will be possible to restore the channel to a configuration similar to what exists at the present time (pre-disturbance). Refer to Map 5-1 which is the existing topography of the site. Refer to Map 5-9, Mine Site Reclamation, for the proposed channel alignment and configuration.

Vegetation surveys conducted during June and August of 1997 confirm that there is no riparian zone in the existing drainage channels. Refer to Appendix 3-1 in Chapter 3 for information regarding vegetation of the mine site area.

742.400 Road Drainage

Roads within the disturbed area will be designed and constructed to provide environmental protection and safety and will adequately provide for surface drainage control, sufficient culvert design and spacing.

The placement of the road will seek to minimize downstream sedimentation and disturbance to the road due to runoff. The road will be located on the most stable available surface.

Primary Roads

Drainage structures on the road within the mineyard will be designed and constructed to pass the peak runoff from a minimum of a 10 year, 24 hour precipitation event.

Culverts will be designed so as to avoid plugging, collapse or erosion at the inlets and outlets. Trash racks will be installed where deemed appropriate by the operator.

The culvert calculations for the C Canyon county road culvert located within the disturbed area are provided in Appendix 7-8 C Canyon Road Station 406+70 - Culvert Sizing. The culvert was sized for a 25 year storm using the UDOT Small Area Method, the same method used to size the other culverts on the C Canyon road as well.

Following mining activities, the channel will be completely restored by removing the mine yard pad fill and regrading slopes to approximate original contour. In topsoiled areas, the channel will be reestablished by removing the geotextile fabric once the pad fill has been removed. Below the geotextile will be the original channel materials in their original arrangement. The restored channel will merge with the undisturbed downstream drainage southwest of the mine office area. The gradient of the channel and the side slopes will be similar to the premining channel.

No riparian area exists along the present drainage channel. The proposed seed mix to be used for final reclamation will incorporate species that presently exist in and adjacent to the channel area. The seed will be applied to the regraded channel side slopes by hydroseeding or hand broadcasting and raking. Containerized plants would also be planted along specified portions of the reclaimed channel.

R645-301-743 IMPOUNDMENTS

The proposed sediment pond is less than the size criteria listed in MSHA, 30 CFR 77.216(a). It has been designed and certified according to R645-301-512. Since the impoundment (sediment pond) is a temporary structure, regulations require the principal and emergency spillway to be designed to safely pass the 25 year, 6 hour precipitation event.

The impoundment will be inspected as described under R645-301-514.300.

R645-301-744 DISCHARGE STRUCTURES

Discharge from the sediment pond and bypass culvert will be controlled by riprap energy dissipators below the outlet ends downstream from the culvert outlet. The calculations and design specifications for the spillway are presented in Appendix 7-4.

R645-301-745 DISPOSAL OF EXCESS SPOIL

No areas are presently designated for disposal of excess spoil. No excess spoil is anticipated during the life of the mine. Refer to the discussion in Chapter 5, section R645-301-553 under Spoil and Waste (553.200).

No valley fills or head-of-hollow fills are being proposed.

No durable rock fills are included in the operation plan.

R645-301-746 COAL MINE WASTE

No coal mine waste piles are being proposed.

R645-301-747 DISPOSAL OF NONCOAL MINE WASTE

Noncoal mine waste, including but not limited to grease, lubricants, paints, flammable liquids, garbage, machinery, lumber and other combustible materials generated during coal mining and reclamation operations will be placed and stored in a controlled manner at the designated location near the shop/warehouse, (see Map 5-5) within the disturbed area or in a state-approved solid waste disposal area. No noncoal waste will be permanently disposed of within the permit area. Dumpsters will be used for collection and disposal of trash.

Lubricants, solvents, and grease will be stored in a covered area with limited access to prevent accidental contact from machinery. The storage area will be in the vicinity of the shop/warehouse. Any leakage at the fuel storage site will be contained within concrete lined or steel containment structures. Surface runoff will be diverted away from the storage site. Should any uncontrolled discharge of oil or petroleum products occur within the general mine yard area, the sediment pond would act as a last line of defense for the containment of any such spills and prevent flow into the natural drainage system. A Spill Prevention Control and Countermeasure (SPCC) Plan will be posted at the shop/warehouse.

A dumpster will be placed in a convenient location for disposal of nonhazardous trash. Used/broken equipment will be stored within the storage area of the mine yard. As the entire storage area reports to the sediment pond, the exact location of storage will be left to the discretion of the operator as long as the storage of materials does not block ditches or roadways.

R645-301-748 CASING AND SEALING OF WELLS

The water monitoring well (DH86-2) will be cased, sealed or plugged to prevent acid or toxic drainage from entering ground or surface water, to minimize disturbance to the hydrologic balance and to ensure safety when no longer utilized.

Upon completion of monitoring activities, the groundwater monitoring well will be permanently sealed by filling the hole with cement to within two feet of the top of the hole. Two feet of compacted native material will be placed above the sealed hole and the area reseeded.

Any future water or monitoring wells will be abandoned in a similar manner.

R645-301-750 PERFORMANCE STANDARDS

All mining and reclamation operations will be conducted to minimize disturbances to the hydrologic balance within the permit and adjacent areas, to prevent material damage to the hydrologic balance outside the permit area and support approved postmining land uses.

R645-301-751 WATER QUALITY STANDARDS AND EFFLUENT LIMITATIONS

WEST RIDGE Resources, Inc. has obtained a UPDES discharge permit to cover any possible discharge from the sediment pond. Refer to Appendix 7-10.

R645-301-752 SEDIMENT CONTROL MEASURES

Sediment control measures will be located, maintained, constructed and reclaimed according to plans and designs given under R645-301-732, R645-301-742 and R645-301-760.

752.100 Siltation Structures and Diversions

Siltation structures and diversions will be located, maintained, constructed and reclaimed according to plans and designs given under R645-301-732, R645-301-742 and R645-301-763.

752.200 Road Drainage

Any roads within the disturbed area will be located, designed, reconstructed and maintained to control erosion, minimize contributions to stream flow, minimize diminution of the surface and ground water systems and refrain from significantly altering the normal flow of water in the drainage channel in accordance with R645-301-732.400, R645-301-742.400 and R645-301-762.

Drainage for the roads within the mine yard disturbed area has been addressed in Appendix 7-4 under culvert and ditch designs. The road configuration is presented on Map 5-5.

R645-301-753 IMPOUNDMENTS AND DISCHARGE STRUCTURES

Impoundments and discharge structures will be located, maintained, constructed and reclaimed to comply with R645-301-733, R645-301-734, R645-301-743, R645-301-745 and R645-301-760.

R645-301-754 DISPOSAL OF EXCESS SPOIL, COAL MINE WASTE AND NONCOAL MINE WASTE

Disposal for coal mine waste and noncoal mine waste will be located, maintained, constructed and reclaimed as described in R645-301-735, R645-301-736, R645-301-745, R645-301-746, R645-301-747 and R645-301-760.

R645-301-755 CASING AND SEALING OF WELLS

All wells will be managed to comply with R645-301-748 and R645-301-765. Water monitoring wells will be managed on a temporary basis according to R645-301-738

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R645-301-760 RECLAMATION

R645-301-761 GENERAL REQUIREMENTS

All temporary structures will be removed and reclaimed before bond release is sought. The restored channel will follow the grade, alignment and sinuosity of the original natural channel. Suitable riprap already existing in the stream channel will provide adequate protection against erosion, as demonstrated by the stability of the existing natural channel.

R645-301-762 ROADS

The access road is a Carbon County public road and will be left in place and maintained by Carbon County. A turnaround will be left at the end of the road.

R645-301-763 SILTATION STRUCTURES

Siltation structures will be maintained until removal is authorized by the Division and the disturbed area has been stabilized and revegetated.

When the sediment controls are removed, the land on which the siltation structures are located will be regraded and revegetated. Refer to Chapter 5 for the regrading plans of siltation structures and Chapter 3 regarding the revegetation plan for reclamation.

R645-301-764 STRUCTURE REMOVAL

Appendix 5-1 presents a detailed timetable and outline for the removal of all structures on the minesite area. Removal of the siltation structures will be contingent upon DOGM approval. The sediment pond will be removed in conjunction with the reclamation of the mine yard.

R645-301-765 PERMANENT CASING AND SEALING OF WELLS

Permanent closure of the monitoring well 86-2 will be in accordance with the requirements of "Administrative Rules for Water Well Drillers", July 15, 1987, State of Utah, Division of Water Rights.

The abandoned well will be filled to within two feet of the surface with Neat Cement conforming to ASTM standard C150, a cement grout consisting of equal parts of cement conforming to ASTM standard C150 and sand/aggregate with no more than 6 gallons of water per sack of cement or bentonite-based products specifically designed for permanent well abandonment.

The cement will be introduced at the bottom of the well and placed progressively upward to within two feet of the surface. The casing will be severed a minimum of 2 feet below the ground surface. A minimum of 2 feet of compacted native material will be placed above the abandoned well upon completion.

Within 30 days of the completion of well abandonment procedures, a report will be submitted to the state engineer by the responsible licensed driller giving data related to the abandonment of the well. The report shall be made on forms furnished by the state engineer and shall contain the information required, including but not limited to:

1) Name of licensed driller or other person(s) performing abandonment procedures,

2) Name of well owner at time of abandonment,

3) Address or location of well by section, township and range,

4) Abandonment materials, equipment and procedures used,

5) Water right or file number covering the well,

6) Final disposition of the well,

7) Date of completion.

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West Ridge Mine Reclamation Bond Estimate

Bonding Calculations

Direct Costs

Subtotal Demolition and Removal	$703,638.02	
Subtotal Backfilling and Grading	$489,479.68	
Subtotal Revegetation	$194,806.00	
Direct Costs in 2017 Dollars	**$1,387,923.70**	

Indirect Costs

Mob/Demob	$138,792.00	10.0%
Contingency	$69,396.00	5.0%
Engineering Redesign	$34,698.00	2.5%
Main Office Expense	$94,379.00	6.8%
Project Management Fee	$34,698.00	2.5%
Subtotal Indirect Costs 2017 Dollars	**$371,963.00**	**0.268**
Total Cost	**$1,759,886.70**	
Escalation factor		0.007
Number of years		4
Escalation	$49,797.00	
Total Reclamation Cost 2021 Dollars	**$1,809,683.70**	
Bond Amount (rounded to nearest $1,000) 2021 dollars	**$1,810,000.00**	
Bond Posted	$2,184,000.00	
Difference Between Posted Bond and Cost Estimate	**$374,000.00**	
Percent Difference	**20.66%**	

Note: The midterm review of this permit began in 2016. However, this bond estimate was not updated until 2017. Therefore, this estimate is based on 2017 unit costs published by RS Means (or others, as noted herein) but, at the request of the Utah Division of Oil, Gas and Mining, the 2016 escalation factor was used to project the bond amount over the term of the bond (to 2021 - a 5 year projection from the 2016 beginning of the midterm review).

West Ridge Mine Reclamation Bond Estimate

Demolition Cost Summary

Ref.	*Task*	*Description*	*Cost 2017*
		Shop Warehouse 01	$152,450
		Bathhouse 02	$35,330
		Administration Office 03	$28,127
		Powder Magazines 04	$550
		Overhead Conveyor 05	$10,470
		Conveyor Bents 06	$2,802
		Drive Unit 07	$3,149
		Discharge Structure 08	$6,094
		Bent Angle Bracing 09	$1,368
		Reclaim Conveyor Stringers 10	$25,362
		Crusher Building 11	$19,061
		Reclaim Tunnel Headwall 12	$3,383
		Loadout Conveyor 13	$1,741
		Loadout Conveyor Bent 14	$442
		Mine Fan 15	$23,787
		Ductwork Airlock 16	$13,813
		Motor Room 17	$1,821
		MCC 18	$1,606
		Portals 19	$39,074
		Rock Dust Tanks 20	$6,218
		Oil Grease Storage 21	$1,876
		Dumpster Bay 22	$5,429
		Monitoring Well 23	$3,215
		Hilfiker Wall 24	$13,905
		Guard Rail 25	$14,787
		Bypass Culvert 26	$133,749
		Culverts 27	$4,603
		Water Tanks 28	$6,397
		Reclaim Vaults 29	$11,874
		Reclaim Tunnel Semisphere 30	$14,783
		Escape Tunnel Vent 31	$1,322
		Truck Loadout 32	$6,035
		Substation Electrical 33	$50,190
		Powerline 69 KV 34	$367
		Powerline Yard Distribution 35	$428
		Pavement Truck Loadout 36	$13,993
		Pumphouse 37	$7,445
		Riprap 38	$12,037
		Storage Shed	$24,555
		Total	$703,638

UNIT COSTS

All unit costs obtained from RS Means 2017 Site Work and Landscape Costs or RS Means 2017 Heavy Construction costs, except as noted. RS Means costs include overhead and profit.

18" CMP removal	Culvert Demolition Cost	02 41 13.40 0160	3.90	LF	
18" culvert backfill	Backfill Trench Minimal Haul 2 1/4 CY	31 23 16 13 3080	2.50	LCY	
18" culvert excavation	Excavation Bulk Bank 2 CY (322BL)	31 23 16 42 0260	1.81	BCY	
24" CMP removal	Culvert Demolition Cost	02 41 13.40 0170	14.70	LF	
24" culvert backfill	Backfill Trench Minimal Haul 2 1/4 CY	31 23 16 13 3080	2.50	LCY	
24" culvert excavation	Excavation Bulk Bank 2 CY (322BL)	31 23 16 42 0260	1.81	BCY	
36" CMP removal	Culvert Demolition Cost	02 41 13.40 0180	17.65	LF	
36" culvert backfill	Backfill Trench Minimal Haul 2 1/4 CY	31 23 16 13 3080	2.50	LCY	
36" culvert excavation	Excavation Bulk Bank 2 CY (322BL)	31 23 16 42 0260	1.81	BCY	
48" CMP removal	Culvert Demolition Cost	02 41 13.40 0190	22.00	LF	
48" culvert backfill	Backfill Trench Minimal Haul 2 1/4 CY	31 23 16 13 3080	2.50	LCY	
48" culvert excavation	Excavation Bulk Bank 2 CY (322BL)	31 23 16 42 0260	1.81	BCY	
Concrete demolition, reinforcing <1% of xsec area	General Concrete Demolition Cost	03 05 05.10 0050	111.00	CY	
Concrete demolition, footings & foundation, 1'-6", reinf	Footings and foundation, 1'-6" thick, 3' wide, reinf	02 41 16 17 1080	19.64	LF	Unit cost increasd 10% for reinforcing (see 02 41 16.17 1200)
Concrete wall demolition, 8" thick, not reinforced	Guard rail demolition	02 41 16.17 2080	0.89	SF	
Concrete wall demolition, 12" thick, reinforced	Concrete wall demolition	02 41 16.17 2100	1.55	SF	Unit cost increasd 30% for reinforcing (see 02 41 16.17 2200 & 2220)
Concrete floor demolition, 4" thick, wire mesh reinf	Concrete floor demolition	02 41 16.17 0280	0.89	SF	
Concrete floor demolition, 6" thick, wire mesh reinf	Concrete floor demolition	02 41 16.17 0420	1.11	SF	
Concrete floor demolition, 8" thick, average reinforcing	Concrete floor demolition	02 41 16.17 2420	1.12	SF	Unit cost increasd 10% for reinforcing (see 02 41 16.17 2600)
Concrete floor demolition, 12" thick, average reinforcing	Concrete floor demolition	02 41 16.17 2500	1.57	SF	Unit cost increasd 10% for reinforcing (see 02 41 16.17 2600)
Electrical Demolition, #2 wire, from conduit	Electrical Demolition Cost	26 05 05.10 1910	30.50	CLF	
Steel tank removal, above ground, 30,000 gallon	Water storage tank demolition	13 05 05.75 0540	3275.00	EA	
Chain link fence removal 8'-10' high	Fence removal	02 41 13 60 1700	4.44	LF	
Laborer, general purpose	Common Laborer	01 31 13.20 0160	60.00	HR	Based on weekly burdened rate
Dozer, track-mounted, 80 HP	Dozer, 80 HP, with operator and spotter	Crew B-10L	1403.46	Day	
Dozer, track-mounted, 300 HP	Dozer, 300 HP, with operator and spotter	Crew B-10M	2978.00	Day	
Dozer, track-mounted, 410 HP	Dozer, 410 HP, with operator and spotter	Crew B-10X	3492.80	Day	
5,000 Gal Water Truck with crew	Water Truck	Crew B-9A	2041.01	Day	
Front End Loader, 10 CY capacity	Front End Loader, with operator and spotter	Crew B-14K	4434.40	Day	
Hydraulic excavator, 2 CY, with crew	Trackhoe with operator and spotter	Crew B-12C	2389.30	Day	
Hydraulic excavator, 2 CY (322BL)	Trackhoe, 2 CY capacity	31 23 16.42 0260	1.81	CY	
Hydraulic crane, 25 ton, with operator	Hydraulic crane	Crew A-3I	1669.28	Day	
Demolition debris, haul and off-site disposal	Demolition debris, off-site haul and disposal	Scamp	6.00	Ton	See Scamp estimate
Disposal on site	Disposal on site	02 41 16 17 4200	11.40	CY	
12 CY (16 Ton) Dump Truck, 1/2 mi. rd Trip	On-site Haul Cost	31 23 23.20 1014	3.74	CY	
Front End Loader 3 CY	Front End Loader 3 CY	31 23 16.42 1300	2.21	CY	
Power mulcher, large, hay 1" deep	Mulch equipment, materials, and labor	32 91 13.16 0350	55.50	MSF	
Hydroseeder (equipment and labor)	Hydroseeder	32 92 19.14 4600	22.00	MSF	Based on labor and equipment costs only (see seed costs below)
Portal seal site preparation crew	Portal seal site preparaton crew	Crew B-1	1464.50	Day	
Block wall, reinforced, 4" thick	Portal seal form	04 22 10.34 1500	8.50	SF	
JennChem - Labor	Mine seal installation	JennChem	265.00	HR	Based on 4 technicians and 1 supervisor (see JennChem estimate)
Seal Portals, materials	Portal sealing	JennChem	4320.00	EA.	See JennChem estimate
Machine placed rip-rap slope protection	Place Riprap	31 37 13 10 0100	65.00	LCY	
Mechanical equipment demolition, heavy	Mechnical equipment demolition	23 05 05 10 3600	1225.00	Ton	
Building demolition, mixed materials	Building Demolition, mixed	02 41 16 13 0100	0.40	CF	
Off Highway Rear Dump Truck, 65 Ton	Off highway truck with driver	Crew B-34H	2820.00	Day	
Pick-up Truck 4x4, 3/4 Ton, with driver	Pickup truck and driver	Crew A-3A	771.20	Day	
1.5-ton truck and driver	Light-haul crew	Crew A-2B	771.94	Day	
Concrete presure grouting, 1:2 cement/sand mix	Plug monitor well	31 43 13.13 0310	24.00	CF	
Building demolition, steel	Building Demolition, steel	02 41 16 13 0020	0.38	CF	
Demolition, interlocking segmental retaining wall	Hilficker retaining wall demolition	02 41 13.90 0900	2.21	SF	
Silt Fence, install maintain and remove	Silt fence	31 25 14.16 1000	1.96	LF	
West Ridge Douglas Fir/Juniper seed mix	Douglas Fir/Juniper reclamation seed mix	Great Basin Seed	640.00	AC	
West Ridge Douglas Fir/Maple seed mix	Douglas Fir/Maple reclamation seed mix	Great Basin Seed	611.00	AC	See prices in the attachment, as downloaded July 2017 from the Great Basin Seed web site
West Ridge Pinyon/Juniper seed mix	Pinyon/Juniper reclamation seed mix	Great Basin Seed	541.00	AC	
West Ridge Sagebrush/Grass seed mix	Sagebrush/Grass reclamation seed mix	Great Basin Seed	717.00	AC	
Serviceberry, containerized	Serviceberry	Lawyer Nursery	4.69	EA	
Douglas Fir, containerized	Dougals Fir	Lawyer Nursery	4.34	EA	Based on the attached seedling cost, plus $1.00 each shipping (UPS) and labor ($2.64 each, Means 32 93 43.10 0712)
Mountain Mahogany, containerized	Mountain Mahogany	Lawyer Nursery	4.84	EA	

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Shop Warehouse 01																			
		Structure's Demolition Cost	Building demolition, mixed materials	02 41 16 13 0100	0.40	CF	160	60	30								FT		288000	CF	$115,200.00
		Structure's Vol. Demolished																0.33	3520	CY	
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation and Disposal Cost All	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton								1			ton/CY		3520	ton	$21,120.00
		Disposal Cost Non Steel																			
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			**$136,320.00**
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost	Concrete floor demolition, 8" thick, average reinforcing	02 41 16.17 2420	1.12	SF	160	60	0.67								SF		9600	SF	$10,752.00
		Concrete's Vol. Demolished																1.3	310	CY	
		Loading Cost	Front End Loader 3 CY	31 23 16.42 1300	2.21	CY													310	CY	$685.00
		Transportation Cost	12 CY (16 Ton) Dump Truck, 1/2 mi. rd Trip	31 23 23.20 1014	3.74	CY													310	CY	$1,159.00
		Disposal Costs	Disposal on site	02 41 16 17 4200	11.40	CY													310	CY	$3,534.00
		Subtotal																			**$16,130.00**
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$152,450.00

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Bathhouse 02																			
		Structure's Demolition Cost	Building demolition, mixed materials	02 41 16 13 0100	0.40	CF	40	120	12								FT		57600	CF	$23,040.00
		Structure's Vol. Demolished																0.33	19008	CF	
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Transportation and Disposal Cost All	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton								1			ton/CY		704	ton	$4,224.00
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			**$27,264.00**
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost	Concrete floor demolition, 8" thick, average reinforcing	02 41 16.17 2420	1.12	SF	40	120	0.67								SF		4800	SF	$5,376.00
		Concrete's Vol. Demolished																1.3	155	CY	
		Loading Cost	Front End Loader 3 CY	31 23 16.42 1300	2.21	CY													155	CY	$343.00
		Transportation Cost	12 CY (16 Ton) Dump Truck, 1/2 mi. rd Trip	31 23 23.20 1014	3.74	CY													155	CY	$580.00
		Disposal Costs	Disposal on site	02 41 16 17 4200	11.40	CY													155	CY	$1,767.00
		Subtotal																			**$8,066.00**
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$35,330.00

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Administration Office 03																			
		Structure's Demolition Cost	Building demolition, mixed materials	02 41 16 13 0100	0.40	CF	40	70	18								FT		50400	CF	$20,160.00
		Structure's Vol. Demolished																0.33	16632	CF	
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Transportation and Disposal Cost All	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton								1			ton/CY		616	ton	$3,696.00
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			**$23,856.00**
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost	Concrete floor demolition, 6" thick, wire mesh reinf	02 41 16.17 0420	1.11	SF	40	70	0.5								SF		2800	SF	$3,108.00
		Concrete's Vol. Demolished																1.3	67	CY	
		Loading Cost	Front End Loader 3 CY	31 23 16.42 1300	2.21	CY													67	CY	$148.00
		Transportation Cost	12 CY (16 Ton) Dump Truck, 1/2 mi. rd Trip	31 23 23.20 1014	3.74	CY													67	CY	$251.00
		Disposal Costs	Disposal on site	02 41 16 17 4200	11.40	CY													67	CY	$764.00
		Subtotal																			**$4,271.00**
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$28,127.00

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Powder Magazines 04																			
		Structure's Demolition Cost	Building demolition, mixed materials	02 41 16 13 0100	0.40	CF	8	8	8								FT		512	CF	$205.00
		Structure's Vol. Demolished																0.33	6	CY	
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Transportation and Disposal Cost All	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton								1			ton/CY		6	ton	$36.00
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			**$241.00**
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost	Concrete floor demolition, 6" thick, wire mesh reinf	02 41 16.17 0420	1.11	SF	10	10	0.5							2	SF		200	SF	$222.00
		Concrete's Vol. Demolished																1.3	5.0	CY	
		Loading Cost	Front End Loader 3 CY	31 23 16.42 1300	2.21	CY													5.0	CY	$11.00
		Transportation Cost	12 CY (16 Ton) Dump Truck, 1/2 mi. rd Trip	31 23 23.20 1014	3.74	CY													5.0	CY	$19.00
		Disposal Costs	Disposal on site	02 41 16 17 4200	11.40	CY													5.0	CY	$57.00
		Subtotal																			**$309.00**
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$550.00

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Overhead Conveyor 05																			
		Structure's Demolition Cost	Building Demolition, steel	02 41 16 13 0020	0.38	CF	550	7	6								FT		23100	CF	$8,778.00
		Structure's Vol. Demolished																0.33	7623	CF	
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Transportation and Disposal Cost All	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton								1			ton/CY		282	ton	$1,692.00
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			**$10,470.00**
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$10,470.00

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Conveyor Bents 06																			
		Structure's Demolition Cost	Building Demolition, steel	02 41 16 13 0020	0.38	CF	50	15	1.5							4	FT		4500	CF	$1,710.00
		Structure's Vol. Demolished																0.33	1485	CF	
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Transportation and Disposal Cost All	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton								1			ton/CY		55	ton	$330.00
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			**$2,040.00**
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost	Concrete floor demolition, 12" thick, average reinforcing	02 41 16.17 2500	1.57	SF	4	20	1							4	SF		320	SF	$502.00
		Concrete's Vol. Demolished																1.3	15	CY	
		Loading Cost	Front End Loader 3 CY	31 23 16.42 1300	2.21	CY													15	CY	$33.00
		Transportation Cost	12 CY (16 Ton) Dump Truck, 1/2 mi. rd Trip	31 23 23.20 1014	3.74	CY													15	CY	$56.00
		Disposal Costs	Disposal on site	02 41 16 17 4200	11.40	CY													15	CY	$171.00
		Subtotal																			**$762.00**
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$2,802.00

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Drive Unit 07																			
		Structure's Demolition Cost	Building demolition, mixed materials	02 41 16 13 0100	0.40	CF	20	30	6								FT		3600	CF	$1,440.00
		Structure's Vol. Demolished																0.33	1188	CF	
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Transportation and Disposal Cost All	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton								1			ton/CY		44	ton	$264.00
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			**$1,704.00**
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost	Concrete floor demolition, 12" thick, average reinforcing	02 41 16.17 2500	1.57	SF	20	30	1								SF		600	SF	$942.00
		Concrete's Vol. Demolished																1.3	29	CY	
		Loading Cost	Front End Loader 3 CY	31 23 16.42 1300	2.21	CY													29	CY	$64.00
		Transportation Cost	12 CY (16 Ton) Dump Truck, 1/2 mi. rd Trip	31 23 23.20 1014	3.74	CY													29	CY	$108.00
		Disposal Costs	Disposal on site	02 41 16 17 4200	11.40	CY													29	CY	$331.00
		Subtotal																			**$1,445.00**
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$3,149.00

Ref.	*Task*	*Description*	*Materials*	*Means Reference Number*	*Unit Cost*	*Unit*	*Length*	*Width*	*Height*	*Diameter*	*Area*	*Volume*	*Weight*	*Density*	*Time*	*Number*	*Unit*	*Swell Factor*	*Quantity*	*Unit*	*Cost*
		Discharge Structure 08																			
		Structure's Demolition Cost	Building demolition, mixed materials	02 41 16 13 0100	0.40	CF	230	7	8								FT		12880	CF	$5,152.00
		Structure's Vol. Demolished																0.33	4250	CF	
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Transportation and Disposal Cost All	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton								1			ton/CY		157	ton	$942.00
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			**$6,094.00**
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$6,094.00

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Bent Angle Bracing 09																			
		Structure's Demolition Cost	Building Demolition, steel	02 41 16 13 0020	0.38	CF	70	20	2								FT		2800	CF	$1,064.00
		Structure's Vol. Demolished																0.33	34	CY	
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Transportation and Disposal Cost All	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton								1			ton/CY		34	ton	$204.00
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			**$1,268.00**
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost	Concrete floor demolition, 8" thick, average reinforcing	02 41 16.17 2420	1.12	SF	2	30	0.67								SF		60	SF	$67
		Concrete's Vol. Demolished																1.3	1.9	CY	
		Loading Cost	Front End Loader 3 CY	31 23 16.42 1300	2.21	CY													1.9	CY	$4.00
		Transportation Cost	12 CY (16 Ton) Dump Truck, 1/2 mi. rd Trip	31 23 23.20 1014	3.74	CY													1.9	CY	$7.00
		Disposal Costs	Disposal on site	02 41 16 17 4200	11.40	CY													1.9	CY	$22.00
		Subtotal																			**$100.20**
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$1,368.20

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Reclaim Conveyor Stringers 10																			
		Structure's Demolition Cost	Building demolition, mixed materials	02 41 16 13 0100	0.40	CF	320	5	3								FT		4800	CF	$1,920.00
		Structure's Vol. Demolished																0.33	59	CY	
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Transportation and Disposal Cost All	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton								1			ton/CY		59	ton	$354.00
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			**$2,274.00**
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost	Concrete floor demolition, 12" thick, average reinforcin	02 41 16.17 2500	1.57	SF	60	160	1								SF		9600	SF	$15,072.00
		Concrete's Vol. Demolished																1.3	462	CY	
		Loading Cost	Front End Loader 3 CY	31 23 16.42 1300	2.21	CY													462	CY	$1,021.00
		Transportation Cost	12 CY (16 Ton) Dump Truck, 1/2 mi. rd Trip	31 23 23.20 1014	3.74	CY													462	CY	$1,728.00
		Disposal Costs	Disposal on site	02 41 16 17 4200	11.40	CY													462	CY	$5,267.00
		Subtotal																			**$23,088.00**
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$25,362.00

Ref.	*Task*	*Description*	*Materials*	*Means Reference Number*	*Unit Cost*	*Unit*	*Length*	*Width*	*Height*	*Diameter*	*Area*	*Volume*	*Weight*	*Density*	*Time*	*Number*	*Unit*	*Swell Factor*	*Quantity*	*Unit*	*Cost*
		Crusher Building 11																			
		Structure's Demolition Cost	Building demolition, mixed materials	02 41 16 13 0100	0.40	CF	24	50	30								FT		36000	CF	$14,400.00
		Structure's Vol. Demolished																0.33	440	CY	
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Transportation and Disposal Cost All	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton								1			ton/CY		440	ton	$2,640.00
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			**$17,040.00**
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost	Concrete floor demolition, 8" thick, average reinforcing	02 41 16.17 2420	1.12	SF	24	50	0.67								SF		1200	SF	$1,344.00
		Concrete's Vol. Demolished																1.3	39	CY	
		Loading Cost	Front End Loader 3 CY	31 23 16.42 1300	2.21	CY													39	CY	$86.00
		Transportation Cost	12 CY (16 Ton) Dump Truck, 1/2 mi. rd Trip	31 23 23.20 1014	3.74	CY													39	CY	$146.00
		Disposal Costs	Disposal on site	02 41 16 17 4200	11.40	CY													39	CY	$445.00
		Subtotal																			**$2,021.00**
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$19,061.00

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Reclaim Tunnel Headwall 12																			
		Structure's Demolition Cost	Building demolition, mixed materials	02 41 16 13 0100	0.40	CF	20	15	15								FT		4500	CF	$1,800.00
		Structure's Vol. Demolished																0.33	55	CY	
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Transportation and Disposal Cost All	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton								1			ton/CY		55	ton	$330.00
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			**$2,130.00**
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Floor																			
		Concrete Demolition																			
		Demolition Cost	Concrete floor demolition, 12" thick, average reinforcin	02 41 16.17 2500	1.57	SF	20	15	1								SF		300	SF	$471.00
		Concrete's Vol. Demolished																1.3	14	CY	
		Loading Cost	Front End Loader 3 CY	31 23 16.42 1300	2.21	CY													14	CY	$31.00
		Transportation Cost	12 CY (16 Ton) Dump Truck, 1/2 mi. rd Trip	31 23 23.20 1014	3.74	CY													14	CY	$52.00
		Disposal Costs	Disposal on site	02 41 16 17 4200	11.40	CY													14	CY	$160.00
		Subtotal																			**$714.00**
		Wall's Demo. Cost																			
		Concrete Demolition																			
		Demolition Cost	Concrete wall demolition, 12" thick, reinforced	02 41 16.17 2100	1.55	SF	15	15	1								SF		225	SF	$349.00
		Concrete's Vol. Demolished																1.3	11	CY	
		Loading Cost	Front End Loader 3 CY	31 23 16.42 1300	2.21	CY													11	CY	$24.00
		Transportation Cost	12 CY (16 Ton) Dump Truck, 1/2 mi. rd Trip	31 23 23.20 1014	3.74	CY													11	CY	$41.00
		Disposal Costs	Disposal on site	02 41 16 17 4200	11.40	CY													11	CY	$125.00
		Subtotal																			**$539.00**
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$3,383.00

Ref.	*Task*	*Description*	*Materials*	*Means Reference Number*	*Unit Cost*	*Unit*	*Length*	*Width*	*Height*	*Diameter*	*Area*	*Volume*	*Weight*	*Density*	*Time*	*Number*	*Unit*	*Swell Factor*	*Quantity*	*Unit*	*Cost*
		Loadout Conveyor 13																			
		Structure's Demolition Cost	Building Demolition, steel	02 41 16 13 0020	0.38	CF	160	4	6								FT		3840	CF	$1,459.00
		Structure's Vol. Demolished																0.33	47	CY	
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Transportation and Disposal Cost All	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton								1			ton/CY		47	ton	$282.00
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			**$1,741.00**
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$1,741.00

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Loadout Conveyor Bent 14																			
		Structure's Demolition Cost	Building Demolition, steel	02 41 16 13 0020	0.38	CF	20	8	1.5								FT		240	CF	$91.00
		Structure's Vol. Demolished																0.33	9	CY	
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Transportation and Disposal Cost All	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton								1			ton/CY		9	ton	$54.00
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																		ton	
		Subtotal																			**$145.00**
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost	Concrete demolition, footings & foundation, 1'-6", reinf	02 41 16 17 1080	19.64	LF	12	4	1.5								LF		12	LF	$236.00
		Concrete's Vol. Demolished																1.3	3.5	CY	
		Loading Cost	Front End Loader 3 CY	31 23 16.42 1300	2.21	CY													3.5	CY	$8.00
		Transportation Cost	12 CY (16 Ton) Dump Truck, 1/2 mi. rd Trip	31 23 23.20 1014	3.74	CY													3.5	CY	$13.00
		Disposal Costs	Disposal on site	02 41 16 17 4200	11.40	CY													3.5	CY	$40.00
		Subtotal																			**$297.00**
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$442.00

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Mine Fan 15																			
		Structure's Demolition Cost	Building demolition, mixed materials	02 41 16 13 0100	0.40	CF	50	12	12								FT		7200	CF	$2,880.00
		Structure's Vol. Demolished																0.1	27	CY	
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Transportation and Disposal Cost All	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton								1			ton/CY		27	ton	$162.00
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			**$3,042.00**
		Mine Fan Demolition	Mechanical equipment demolition, heavy	23 05 05 10 3600	1225.00	Ton							15				ton		15	ton	$18,375.00
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs	Hydraulic crane, 25 ton, with operator	Crew A-3I	1669.28	Day									0.5		Day		0.5	Day	$834.64
		Transport and Disposal Costs	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton							15				ton		15	ton	$90.00
		Disposal Costs																			
		Subtotal																			**$19,299.64**
		Concrete Demolition																			
		Demolition Cost	Concrete floor demolition, 12" thick, average reinforcing	02 41 16.17 2500	1.57	SF	50	12	1								SF		600	SF	$942.00
		Concrete's Vol. Demolished																1.3	29	CY	
		Loading Cost	Front End Loader 3 CY	31 23 16.42 1300	2.21	CY													29	CY	$64.00
		Transportation Cost	12 CY (16 Ton) Dump Truck, 1/2 mi. rd Trip	31 23 23.20 1014	3.74	CY													29	CY	$108.00
		Disposal Costs	Disposal on site	02 41 16 17 4200	11.40	CY													29	CY	$331.00
		Subtotal																			**$1,445.00**
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$23,786.64

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Ductwork Airlock 16																			
		Structure's Demolition Cost	Building demolition, mixed materials	02 41 16 13 0100	0.40	CF	70	20	12								FT		16800	CF	$6,720.00
		Structure's Vol. Demolished																0.33	622	CY	
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Transportation and Disposal Cost All	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton								1			ton/CY		622	ton	$3,732.00
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			$10,452.00
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost	Concrete floor demolition, 12" thick, average reinforcin	02 41 16.17 2500	1.57	SF	70	20	1								SF		1400	SF	$2,198.00
		Concrete's Vol. Demolished																1.3	67	CY	
		Loading Cost	Front End Loader 3 CY	31 23 16.42 1300	2.21	CY													67	CY	$148.00
		Transportation Cost	12 CY (16 Ton) Dump Truck, 1/2 mi. rd Trip	31 23 23.20 1014	3.74	CY													67	CY	$251.00
		Disposal Costs	Disposal on site	02 41 16 17 4200	11.40	CY													67	CY	$764.00
		Subtotal																			$3,361.00
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$13,813.00

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Motor Room 17																			
		Structure's Demolition Cost	Building demolition, mixed materials	02 41 16 13 0100	0.40	CF	16	16	10								FT		2560	CF	$1,024.00
		Structure's Vol. Demolished																0.33	31	CY	
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Transportation and Disposal Cost All	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton								1			ton/CY		31	ton	$186.00
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			**$1,210.00**
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost	Concrete floor demolition, 12" thick, average reinforcin	02 41 16.17 2500	1.57	SF	16	16	1								SF		256	SF	$401.92
		Concrete's Vol. Demolished																1.3	12	CY	
		Loading Cost	Front End Loader 3 CY	31 23 16.42 1300	2.21	CY													12	CY	$27.00
		Transportation Cost	12 CY (16 Ton) Dump Truck, 1/2 mi. rd Trip	31 23 23.20 1014	3.74	CY													12	CY	$45.00
		Disposal Costs	Disposal on site	02 41 16 17 4200	11.40	CY													12	CY	$137.00
		Subtotal																			**$610.92**
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$1,820.92

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		MCC 18																			
		Structure's Demolition Cost	Building demolition, mixed materials	02 41 16 13 0100	0.40	CF	12	20	9								FT		2160	CF	$864.00
		Structure's Vol. Demolished																0.33	26	CY	
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Transportation and Disposal Cost All	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton								1			ton/CY		26	ton	$156.00
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			**$1,020.00**
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost	Concrete floor demolition, 12" thick, average reinforcin	02 41 16.17 2500	1.57	SF	12	20	1								SF		240	SF	$377.00
		Concrete's Vol. Demolished																1.3	12	CY	
		Loading Cost	Front End Loader 3 CY	31 23 16.42 1300	2.21	CY													12	CY	$27.00
		Transportation Cost	12 CY (16 Ton) Dump Truck, 1/2 mi. rd Trip	31 23 23.20 1014	3.74	CY													12	CY	$45.00
		Disposal Costs	Disposal on site	02 41 16 17 4200	11.40	CY													12	CY	$137.00
		Subtotal																			**$586.00**
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$1,606.00

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Portals 19																			
		Portal seal site preparation crew	Portal seal site preparation crew	Crew B-1	1464.50	Day									1	4	Day		4	Day	$5,858.00
		Block retaining walls (2 each seal)	Block wall, reinforced, 4" thick	04 22 10.34 1500	8.50	SF		20	8.6						344	4	SF		1376	SF	$11,696.00
		Seal Installation Labor	JennChem - Labor	JennChem	265.00	HR									4	4	HR		16	CY	$4,240.00
		Seal Materials	Seal Portals, materials	JennChem	4320.00	EA.									1	4	EA		4		$17,280.00
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Disposal Cost Non Steel																			
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			**$39,074.00**
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$39,074.00

Note: operator needs to list RS Means number and units.

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Rock Dust Tanks 20																			
		Structure's Demolition Cost	Building demolition, mixed materials	02 41 16 13 0100	0.40	CF			40	12						2	FT		9048	CF	$3,619.00
		Structure's Vol. Demolished																0.33	111	CY	
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Transportation and Disposal Cost All	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton								1			ton/CY		111	ton	$666.00
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			**$4,285.00**
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost	Concrete floor demolition, 12" thick, average reinforcin	02 41 16.17 2500	1.57	SF	20	40	1							1	EA		800	SF	$1,256.00
		Concrete's Vol. Demolished																1.3	39	CY	
		Loading Cost	Front End Loader 3 CY	31 23 16.42 1300	2.21	CY													39	CY	$86.00
		Transportation Cost	12 CY (16 Ton) Dump Truck, 1/2 mi. rd Trip	31 23 23.20 1014	3.74	CY													39	CY	$146.00
		Disposal Costs	Disposal on site	02 41 16 17 4200	11.40	CY													39	CY	$445.00
		Subtotal																			**$1,933.00**
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$6,218.00

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Oil Grease Storage 21																			
		Structure's Demolition Cost	Building demolition, mixed materials	02 41 16 13 0100	0.40	CF	10	30	10								FT		3000	CF	$1,200.00
		Structure's Vol. Demolished																0.33	37	CY	
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Transportation and Disposal Cost All	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton								1			ton/CY		37	ton	$222.00
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			**$1,422.00**
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost	Concrete floor demolition, 6" thick, wire mesh reinf	02 41 16.17 0420	1.11	SF	10	30	0.5								SF		300	SF	$333.00
		Concrete's Vol. Demolished																1.3	7	CY	
		Loading Cost	Front End Loader 3 CY	31 23 16.42 1300	2.21	CY													7	CY	$15.00
		Transportation Cost	12 CY (16 Ton) Dump Truck, 1/2 mi. rd Trip	31 23 23.20 1014	3.74	CY													7	CY	$26.00
		Disposal Costs	Disposal on site	02 41 16 17 4200	11.40	CY													7	CY	$80.00
		Subtotal																			**$454.00**
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$1,876.00

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Dumpster Bay 22																			
		Structure's Demolition Cost	Building demolition, mixed materials	02 41 16 13 0100	0.40	CF	30	40	6								FT		7200	CF	$2,880.00
		Structure's Vol. Demolished																0.33	88	CY	
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Transportation and Disposal Cost All	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton								1			ton/CY		88	ton	$528.00
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			**$3,408.00**
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost	Concrete floor demolition, 8" thick, average reinforcing	02 41 16.17 2420	1.12	SF	30	40	0.67								SF		1200	SF	$1,344.00
		Concrete's Vol. Demolished																1.3	39	CY	
		Loading Cost	Front End Loader 3 CY	31 23 16.42 1300	2.21	CY													39	CY	$86.00
		Transportation Cost	12 CY (16 Ton) Dump Truck, 1/2 mi. rd Trip	31 23 23.20 1014	3.74	CY													39	CY	$146.00
		Disposal Costs	Disposal on site	02 41 16 17 4200	11.40	CY													39	CY	$445.00
		Subtotal																			**$2,021.00**
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$5,429.00

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Monitoring Well 23																			
		Structure's Demolition Cost	Concrete presure grouting, 1:2 cement/sand mix	31 43 13.13 0310	24.00	CF			380	0.67						1	EA		134	CF	$3,215.00
		Structure's Vol. Demolished																			
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Disposal Cost Non Steel																			
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			**$3,215.00**
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$3,215.00

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Hilfiker Wall 24																			
		Structure's Demolition Cost	Demolition, interlocking segmental retaining wall	02 41 13.90 0900	2.21	SF	150	12	30								FT		4500	SF	$9,945.00
		Structure's Vol. Demolished																0.33	660	CY	
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Transportation and Disposal Cost All	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton								1			ton/CY		660	ton	$3,960.00
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			**$13,905.00**
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$13,905.00

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Guard Rail 25																			
		Structure's Demolition Cost																			
		Structure's Vol. Demolished																			
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Disposal Cost Non Steel																			
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost	Concrete wall demolition, 8" thick, not reinforced	02 41 16.17 2080	0.89	SF	3400	3	0.67								FT		10200	SF	$9,078.00
		Concrete's Vol. Demolished																1.3	329	CY	
		Loading Cost	Front End Loader 3 CY	31 23 16.42 1300	2.21	CY													329	CY	$727.00
		Transportation Cost	12 CY (16 Ton) Dump Truck, 1/2 mi. rd Trip	31 23 23.20 1014	3.74	CY													329	CY	$1,231.00
		Disposal Costs	Disposal on site	02 41 16 17 4200	11.40	CY													329	CY	$3,751.00
		Subtotal																			**$14,787.00**
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$14,787.00

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Bypass Culvert 26																			
		48" CMP removal	48" CMP removal	02 41 13.40 0190	22.00	LF	4314										ft		4314	LF	$94,908.00
		48" culvert backfill	48" culvert backfill	31 23 16 13 3080	2.50	LCY	4314	4	2	4							ft		3286	LCY	$8,215.00
		48" culvert excavation	48" culvert excavation	31 23 16 42 0260	1.81	BCY	4314	4	2								ft		1278	BCY	$2,314.00
		36" CMP removal	36" CMP removal	02 41 13.40 0180	17.65	LF	962										ft		962	LF	$16,979.00
		36" culvert backfill	36" culvert backfill	31 23 16 13 3080	2.50	LCY	962	3	2	3							ft		466	LCY	$1,164.00
		36" culvert excavation	36" culvert excavation	31 23 16 42 0260	1.81	BCY	962	3	2								ft		214	BCY	$387.00
		24" CMP removal	24" CMP removal	02 41 13.40 0170	14.70	LF	594										ft		594	LF	$8,732.00
		24" culvert backfill	24" culvert backfill	31 23 16 13 3080	2.50	LCY	594	2	2	2							ft		157	LCY	$393.00
		24" culvert excavation	24" culvert excavation	31 23 16 42 0260	1.81	BCY	594	2	2								ft		88	BCY	$159.00
		Subtotal																			**$133,251.00**
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Culvert Demolition																			
		48" CMP off-site disposal	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton								lb/ft		31	lb		67	Ton	$402.00
		36" CMP off-site disposal	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton								lb/ft		24	lb		12	Ton	$72.00
		24" CMP off-site disposal	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton								lb/ft		15	lb		4	Ton	$24.00
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			**$498.00**
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$133,749.00

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Culverts 27																			
		24" CMP removal	24" CMP removal	02 41 13.40 0170	14.70	LF	160										ft		160	LF	$2,352.00
		24" culvert backfill	24" culvert backfill	31 23 16 13 3080	2.50	LCY	160	2	2	2							ft		42	LCY	$106.00
		24" culvert excavation	24" culvert excavation	31 23 16 42 0260	1.81	BCY	160	2	2								ft		24	BCY	$43.00
		18" CMP removal	18" CMP removal	02 41 13.40 0160	3.90	LF	460										ft		460	LF	$1,794.00
		18" culvert backfill	18" culvert backfill	31 23 16 13 3080	2.50	LCY	460	1.5	2	1.5							ft		81	LCY	$203.00
		18" culvert excavation	18" culvert excavation	31 23 16 42 0260	1.81	BCY	460	1.5	2								ft		51	BCY	$93.00
		Subtotal																			**$4,591.00**
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Culvert Demolition																			
		24" CMP off-site disposal	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton								lb/ft		15	lb		1	Ton	$6.00
		18" CMP off-site disposal	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton								lb/ft		11.4	lb		1	Ton	$6.00
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			**$12.00**
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$4,603.00

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Water Tanks 28																			
		Structure's Demolition Cost	Steel tank removal, above ground, 30,000 gallon	13 05 05.75 0540	3275.00	EA		30	12							1	EA		1	EA	$3,275.00
		Structure's Vol. Demolished																			
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Transportation and Disposal Cost All	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton							6				tons		6	tons	$36.00
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			**$3,311.00**
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost	Concrete floor demolition, 12" thick, average reinforcin	02 41 16.17 2500	1.57	SF	16	40	1							2	SF		1280	SF	$2,010.00
		Concrete's Vol. Demolished																1.3	62	CY	
		Loading Cost	Front End Loader 3 CY	31 23 16.42 1300	2.21	CY													62	CY	$137.00
		Transportation Cost	12 CY (16 Ton) Dump Truck, 1/2 mi. rd Trip	31 23 23.20 1014	3.74	CY													62	CY	$232.00
		Disposal Costs	Disposal on site	02 41 16 17 4200	11.40	CY													62	CY	$707.00
		Subtotal																			**$3,086.00**
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$6,397.00

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Reclaim Vaults 29																			
		Structure's Demolition Cost	Building demolition, mixed materials	02 41 16 13 0100	0.40	CF	15	20	13								FT		3900	CF	$1,560.00
		Structure's Vol. Demolished																0.33	1287	CF	
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Transportation and Disposal Cost All	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton								1			ton/CY		48	ton	$288.00
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			**$1,848.00**
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost	Concrete demolition, reinforcing <1% of xsec area	03 05 05.10 0050	111.00	CY	15	30	1.5							3	FT		75	CY	$8,325.00
		Concrete's Vol. Demolished																1.3	98	CY	
		Loading Cost	Front End Loader 3 CY	31 23 16.42 1300	2.21	CY													98	CY	$217.00
		Transportation Cost	12 CY (16 Ton) Dump Truck, 1/2 mi. rd Trip	31 23 23.20 1014	3.74	CY													98	CY	$367.00
		Disposal Costs	Disposal on site	02 41 16 17 4200	11.40	CY													98	CY	$1,117.00
		Subtotal																			**$10,026.00**
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$11,874.00

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Reclaim Tunnel Semisphere 30																			
		Structure's Demolition Cost																			
		Structure's Vol. Demolished																			
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Disposal Cost Non Steel																			
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost	Concrete demolition, reinforcing <1% of xsec area	03 05 05.10 0050	111.00	CY	210	0.5		13							FT		79	CY	$8,769.00
		Concrete's Vol. Demolished																1.3	103	CY	
		Loading Cost	Front End Loader 3 CY	31 23 16.42 1300	2.21	CY													103	CY	$228.00
		Transportation Cost	12 CY (16 Ton) Dump Truck, 1/2 mi. rd Trip	31 23 23.20 1014	3.74	CY													103	CY	$385.00
		Disposal Costs	Disposal on site	02 41 16 17 4200	11.40	CY													103	CY	$1,174.00
		Subtotal																			**$10,556.00**
		Concrete Demolition																			
		Demolition Cost	Concrete floor demolition, 8" thick, average reinforcing	02 41 16.17 2420	1.12	SF	210	12	0.67								FT		2520	SF	$2,822.00
		Concrete's Vol. Demolished																1.3	81	CY	
		Loading Cost	Front End Loader 3 CY	31 23 16.42 1300	2.21	CY													81	CY	$179.00
		Transportation Cost	12 CY (16 Ton) Dump Truck, 1/2 mi. rd Trip	31 23 23.20 1014	3.74	CY													81	CY	$303.00
		Disposal Costs	Disposal on site	02 41 16 17 4200	11.40	CY													81	CY	$923.00
		Subtotal																			**$4,227.00**
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$14,783.00

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Escape Tunnel Vent 31																			
		Structure's Demolition Cost	Building demolition, mixed materials	02 41 16 13 0100	0.40	CF			250	3.5							FT		2405	CF	$962.00
		Structure's Vol. Demolished																0.33	794	CF	
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Transportation and Disposal Cost All	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton													60	CY	$360.00
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			**$1,322.00**
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$1,322.00

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Truck Loadout 32																			
		Structure's Demolition Cost	Building demolition, mixed materials	02 41 16 13 0100	0.40	CF	20	20	30								FT		12000	CF	$4,800.00
		Structure's Vol. Demolished																0.33	147	CY	
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Transportation and Disposal Cost All	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton													147	CY	$882.00
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			**$5,682.00**
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost	Concrete floor demolition, 12" thick, average reinforcin	02 41 16.17 2500	1.57	SF	20	20	1								FT		15	CY	$23.26
		Concrete's Vol. Demolished																1.3	19	CY	
		Loading Cost	Front End Loader 3 CY	31 23 16.42 1300	2.21	CY													19	CY	$42.00
		Transportation Cost	12 CY (16 Ton) Dump Truck, 1/2 mi. rd Trip	31 23 23.20 1014	3.74	CY													19	CY	$71.00
		Disposal Costs	Disposal on site	02 41 16 17 4200	11.40	CY													19	CY	$217.00
		Subtotal																			**$353.26**
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$6,035.26

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Substation Electrical 33																			
		Structure's Demolition Cost	Building demolition, mixed materials	02 41 16 13 0100	0.40	CF	50	100	20								FT		100000	CF	$40,000.00
		Structure's Vol. Demolished																0.33	1222	CY	
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Transportation and Disposal Cost All	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton													1222	CY	$7,332.00
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			**$47,332.00**
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost	Concrete floor demolition, 12" thick, average reinforcin	02 41 16.17 2500	1.57	SF	40	80	1								FT		119	CY	$186.00
		Concrete's Vol. Demolished																1.3	154	CY	
		Loading Cost	Front End Loader 3 CY	31 23 16.42 1300	2.21	CY													154	CY	$340.00
		Transportation Cost	12 CY (16 Ton) Dump Truck, 1/2 mi. rd Trip	31 23 23.20 1014	3.74	CY													154	CY	$576.00
		Disposal Costs	Disposal on site	02 41 16 17 4200	11.40	CY													154	CY	$1,756.00
		Subtotal																			**$2,858.00**
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$50,190.00

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Powerline 69KV 34																			
		Structure's Demolition Cost	Electrical Demolition, #2 wire, from conduit	26 05 05.10 1910	30.50	CLF	1200										LF		12	CLF	$366.00
		Structure's Vol. Demolished																			
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Transportation and Disposal Cost All	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton	1200							201			lb/MF		0.12	ton	$1.00
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			**$367.00**
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$367.00

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Powerline Yard Distribution 35																			
		Structure's Demolition Cost	Electrical Demolition, #2 wire, from conduit	26 05 05.10 1910	30.50	CLF	1400										LF		14	CLF	$427.00
		Structure's Vol. Demolished																			
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Transportation and Disposal Cost All	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton	1400							201			lb/MF		0.14	ton	$1.00
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																	0	ton	
		Subtotal																			**$428.00**
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$428.00

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Pavement Truck Loadout 36																			
		Structure's Demolition Cost																			
		Structure's Vol. Demolished																			
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Disposal Cost Non Steel																			
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost	Concrete floor demolition, 4" thick, wire mesh reinf	02 41 16.17 0280	0.89	SF	100	120	0.33								SF		12000	SF	$10,680.00
		Concrete's Vol. Demolished																1.3	191	CY	
		Loading Cost	Front End Loader 3 CY	31 23 16.42 1300	2.21	CY													191	CY	$422.00
		Transportation Cost	12 CY (16 Ton) Dump Truck, 1/2 mi. rd Trip	31 23 23.20 1014	3.74	CY													191	CY	$714.00
		Disposal Costs	Disposal on site	02 41 16 17 4200	11.40	CY													191	CY	$2,177.00
		Subtotal																			$13,993.00
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$13,993.00

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Pumphouse 37																			
		Structure's Demolition Cost	Building demolition, mixed materials	02 41 16 13 0100	0.40	CF	20	20	8								FT		3200	CF	$1,280.00
		Structure's Vol. Demolished																0.33	39	CY	
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Transportation and Disposal Cost All	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton													39	CY	$234.00
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			**$1,514.00**
		Equipment 's Disposal Cost	Chain link fence removal 8'-10' high	02 41 13 60 1700	4.44	LF	250										FT		250	FT	$1,110.00
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			**$1,110.00**
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Asphalt																			
		Asphalt Demolition																			
		Demolition Cost	Concrete demolition, reinforcing <1% of xsec area	03 05 05.10 0050	111.00	CY						31.48					CY		31	CY	$3,494.00
		Concrete's Vol. Demolished																1.3	41	CY	
		Loading Cost	Front End Loader 3 CY	31 23 16.42 1300	2.21	CY													41	CY	$90.00
		Transportation Cost	12 CY (16 Ton) Dump Truck, 1/2 mi. rd Trip	31 23 23.20 1014	3.74	CY													41	CY	$153.00
		Disposal Costs	Disposal on site	02 41 16 17 4200	11.40	CY													41	CY	$467.00
		Subtotal																			**$4,204.00**
		Concrete Demolition																			
		Demolition Cost	Concrete floor demolition, 6" thick, wire mesh reinf	02 41 16.17 0420	1.11	SF	20	20	0.5								SF		400	SF	444
		Concrete's Vol. Demolished																1.3	10	CY	
		Loading Cost	Front End Loader 3 CY	31 23 16.42 1300	2.21	CY													10	CY	22
		Transportation Cost	12 CY (16 Ton) Dump Truck, 1/2 mi. rd Trip	31 23 23.20 1014	3.74	CY													10	CY	37
		Disposal Costs	Disposal on site	02 41 16 17 4200	11.40	CY													10	CY	$114.00
		Subtotal																			**$617.00**
		Total																			$7,445.00

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	2233	**Riprap 38**																			
		Structure's Demolition Cost																			
		Structure's Vol. Demolished																			
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Disposal Cost Non Steel																			
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			
		Riprap									10						sq ft				
		Place Riprap	Machine placed rip-rap slope protection	31 37 13 10 0100	65.00	LCY	500										ft		185	CY	$12,037.00
		Subtotal																			**$12,037.00**
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$12,037.00

Ref.	Task	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Storage Sheed																			
		Structure's Demolition Cost	Building Demolition, steel	02 41 16 13 0020	0.38	CF	40	60	20			48000					CF		48000	CF	$18,240.00
		Structure's Vol. Demolished										1778					CY	0.33	587	CY	
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Transportation and Disposal Cost All	Demolition debris, haul and off-site disposal	Scamp	6.00	Ton						1778						0.33	587	CY	$3,520
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			$21,760.00
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost	Concrete floor demolition, 4" thick, wire mesh reinf	02 41 16.17 0280	0.89	SF	40	60	0.33			792					SF		2400	SF	$2,136.00
		Concrete's Vol. Demolished																1.3	38	CY	
		Loading Cost	Front End Loader 3 CY	31 23 16.42 1300	2.21	CY													38	CY	$84
		Transportation Cost	12 CY (16 Ton) Dump Truck, 1/2 mi. rd Trip	31 23 23.20 1014	3.74	CY													38	CY	$142
		Disposal Costs	Disposal on site	02 41 16 17 4200	11.40	CY													38	CY	$433
		Subtotal																			$2,795
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			$24,555.00

West Ridge Mine Reclamation Bond Estimate

Cost Summary

Earthwork Costs	Cost
Remove Cap Layer	$ 10,232
Remove Excess Pad Fill	$ 253,904
Remove Remaining Backfill	$ 56,558
Backfill Highwall	$ 2,389
Place Topsoil	$ 38,575
Expose Topsoil	$ 44,684
Establish Rubbleland Surface	$ 33,450
Pump House Regrading	$ 1,746
Support	$ 40,820
TOTAL	**$ 482,360**

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Remove Cap Layer

Ref.	Task	Description	Quantity	Units	Production Rate	Units	Production Time	Units	Materials/Equipment/Labor	Cost Reference RSMeans Ref #	Unit Cost	Units	Quantity	Cost
		988 G II ((6-13 1H2008)2005	4466	CY	727	CY/HR	6.1	HR	Front End Loader, 10 CY capacity	Crew B-14K	4434.40	Day	1	$4,434.40
		Off Highway Rear dump 65 ton		TON			6.1	HR	Off Highway Rear Dump Truck, 65 Ton	Crew B-34H	2820.00	Day	1	$2,820.00
		D8R Semi-U EROPS		CY			6.1	HR	Dozer, track-mounted, 300 HP	Crew B-10M	2978.00	Day	1	$2,978.00
		Subtotal												**$10,232.40**

Remove Excess Pad Fill

Ref.	Task	Description	Quantity	Units	Production Rate	Units	Production Time	Units	Materials/Equipment/Labor	Cost Reference RSMeans Ref #	Unit Cost	Units	Quantity	Cost
		Left Fork												
		6X4 70,000lbs 12-18 CY (20-11) (2nd2006)	13614	CY	380	CY/HR	35.8	HR	Off Highway Rear Dump Truck, 65 Ton	Crew B-34H	2820.00	Day	4	$11,280.00
		988G EROPS (9-34) (2nd2006) 2005							Front End Loader, 10 CY capacity	Crew B-14K	4434.40	Day	4	$17,737.60
		Right Fork												
		6X4 70,000lbs 12-18 CY (20-11) (2nd2006)	3916	CY	380	CY/HR	10.3	HR	Off Highway Rear Dump Truck, 65 Ton	Crew B-34H	2820.00	Day	1.5	$4,230.00
		988G EROPS (9-34) (2nd2006) 2005							Front End Loader, 10 CY capacity	Crew B-14K	4434.40	Day	1.5	$6,651.60
		Main Canyon												
		6X4 70,000lbs 12-18 CY (20-11) (2nd2006)	88829	CY	380	CY/HR	233.8	HR	Off Highway Rear Dump Truck, 65 Ton	Crew B-34H	2820.00	Day	29.5	$83,190.00
		988G EROPS (9-34) (2nd2006) 2005							Front End Loader, 10 CY capacity	Crew B-14K	4434.40	Day	29.5	$130,814.80
		Subtotal												**$253,904.00**

Remove Remaining Backfill

Ref.	Task	Description	Quantity	Units	Production Rate	Units	Production Time	Units	Materials/Equipment/Labor	Cost Reference RSMeans Ref #	Unit Cost	Units	Quantity	Cost
		Left Fork 21+50 to 23+00												
		988G EROPS	2857	CY	440	CY/HR	6.5	HR	Front End Loader, 10 CY capacity	Crew B-14K	4434.40	Day	1	$4,434.40
		Redistribution												
		988G EROPS	16604	CY	391.5	CY/HR	42.4	HR	Front End Loader, 10 CY capacity	Crew B-14K	4434.40	Day	5.5	$24,389.20
		Off Highway Rear Dump 65 ton	2857	CY					Off Highway Rear Dump Truck, 65 Ton	Crew B-34H	2820.00	Day	5.5	$15,510.00
		Right Fork Upper Canyon @35+00												
		D9R Semi-U EROPS 400HP	16604	CY	663	CY/HR	25	HR	Dozer, track-mounted, 410 HP	Crew B-10X	3492.80	Day	3.5	$12,224.80
		Subtotal												**$56,558.40**

Backfill Highwall

Ref.	Task	Description	Quantity	Units	Production Rate	Units	Production Time	Units	Materials/Equipment/Labor	Cost Reference RSMeans Ref #	Unit Cost	Units	Quantity	Cost
		CAT 324E 2CY bucket 30 sec cycle	1481	CY	240	CY/HR	6.2	HR	Hydraulic excavator, 2 CY, with crew	Crew B-12C	2389.30	Day	1	$2,389.30
		Subtotal												**$2,389.30**

Place Topsoil

Ref.	Task	Description	Quantity	Units	Production Rate	Units	Production Time	Units	Materials/Equipment/Labor	Cost Reference RSMeans Ref #	Unit Cost	Units	Quantity	Cost
		988G EROPS	6506	CY	220	CY/HR	29.6	HR	Front End Loader, 10 CY capacity	Crew B-14K	4434.40	Day	4	$17,737.60
		Off Highway Rear Dump 65 ton							Off Highway Rear Dump Truck, 65 Ton	Crew B-34H	2820.00	Day	4	$11,280.00
		CAT 324E 2 CY bucket 30 sec cycle							Hydraulic excavator, 2 CY, with crew	Crew B-12C	2389.30	Day	4	$9,557.20
		Subtotal												**$38,574.80**

Expose Topsoil

Ref.	Task	Description	Quantity	Units	Production Rate	Units	Production Time	Units	Materials/Equipment/Labor	Cost Reference RSMeans Ref #	Unit Cost	Units	Quantity	Cost
		Common Labors	3226	CY	40	CY/HR	80.7	HR	Laborer, general purpose	01 31 13.20 0160	60.00	HR	81	$4,860.00
		D3K2LGP 80 HP							Dozer, track-mounted, 80 HP	Crew B-10L	1403.46	Day	10.5	$14,736.33
		CAT 324E 2CY bucket 30 sec cycle							Hydraulic excavator, 2 CY, with crew	Crew B-12C	2389.30	Day	10.5	$25,087.65
		Subtotal												**$44,683.98**

Establish Rubbleland Surface

Ref.	Task	Description	Quantity	Units	Production Rate	Units	Production Time	Units	Materials/Equipment/Labor	Cost Reference RSMeans Ref #	Unit Cost	Units	Quantity	Cost
		CAT 324E 2CY bucket 30 sec cycle	4440	CY	40	CY/HR	111	HR	Hydraulic excavator, 2 CY, with c	Crew B-12C	2389.30	Day	14	$33,450.20
		Subtotal												**$33,450.20**

Pump House Regrading

Ref.	Task	Description	Quantity	Units	Production Rate	Units	Production Time	Units	Materials/Equipment/Labor	Cost Reference RSMeans Ref #	Unit Cost	Units	Quantity	Cost
		D9R Semi-U EROPS 400HP	1326	CY	663	CY/HR	2	HR	Dozer, track-mounted, 410 HP	Crew B-10X	3492.80	Day	0.5	$1,746.40
		Subtotal												**$1,746.40**

Support

Ref.	Task	Description	Quantity	Units	Production Rate	Units	Production Time	Units	Materials/Equipment/Labor	Cost Reference RSMeans Ref #	Unit Cost	Units	Quantity	Cost
		6,000 gal H2O truck Diesel (20-17) (2nd2006)					605.5	HR	5,000 Gal Water Truck with crew	Crew B-9A	2041.01	Day	20	$40,820.20
		Subtotal												**$40,820.20**

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Mine Site Revegetation Estimate																			
	Pinyon Juniper Community																			
	Mulch Material, Labor, and Equipment	Power mulcher, large, hay 1" deep	32 91 13.16 0350	55.50	MSF					13						AC		566	MSF	31413
	Seeding Material	West Ridge Pinyon/Juniper seed mix	Great Basin Seed	541.00	AC					13						AC		13	AC	7033
	Seeding Equipment and Labor	Hydroseeder (equipment and labor)	32 92 19.14 4600	22.00	MSF					13						AC		566	MSF	12452
	Pocking	Hydraulic excavator, 2 CY (322BL)	31 23 16.42 0260	1.81	CY						5200					CY		5200	CY	9412
	Douglas Fir Maple Community																			
	Mulch Material, Labor, and Equipment	Power mulcher, large, hay 1" deep	32 91 13.16 0350	55.50	MSF					10						AC		436	MSF	24198
	Seeding Material	West Ridge Douglas Fir/Maple seed mix	Great Basin Seed	611.00	AC					10						AC		10	AC	6110
	Seeding Equipment and Labor	Hydroseeder (equipment and labor)	32 92 19.14 4600	22.00	MSF					10						AC		436	MSF	9592
	Pocking	Hydraulic excavator, 2 CY (322BL)	31 23 16.42 0260	1.81	CY						4000					CY		4000	CY	7240
	Transplants	Serviceberry, containerized	Lawyer Nursery	4.69	EA					10					930	AC		930	EA	4362
	Transplants	Mountain Mahogany, containerized	Lawyer Nursery	4.84	EA					10					930	AC		930	EA	4501
	Douglas Fir Rocky Mountain Juniper																			
	Mulch Material, Labor, and Equipment	Power mulcher, large, hay 1" deep	32 91 13.16 0350	55.50	MSF					5						AC		218	MSF	12099
	Seeding Material	West Ridge Douglas Fir/Juniper seed mix	Great Basin Seed	640.00	AC					5						AC		5	AC	3200
	Seeding Equipment and Labor	Hydroseeder (equipment and labor)	32 92 19.14 4600	22.00	MSF					5						AC		218	MSF	4796
	Pocking	Hydraulic excavator, 2 CY (322BL)	31 23 16.42 0260	1.81	CY						2000					CY		2000	CY	3620
	Transplants	Douglas Fir, containerized	Lawyer Nursery	4.34	EA					5					1500	AC		1500	EA	6510
	Sagebrush Grass Community																			
	Mulch Material, Labor, and Equipment	Power mulcher, large, hay 1" deep	32 91 13.16 0350	55.50	MSF					1						AC		44	MSF	2442
	Seeding Material	West Ridge Sagebrush/Grass seed mix	Great Basin Seed	717.00	AC					1						AC		1	AC	717
	Seeding Equipment and Labor	Hydroseeder (equipment and labor)	32 92 19.14 4600	22.00	MSF					1						AC		44	MSF	968
	Pocking	Hydraulic excavator, 2 CY (322BL)	31 23 16.42 0260	1.81	CY						400					CY		400	CY	724
	Pumphouse																			
	Mulch Material, Labor, and Equipment	Power mulcher, large, hay 1" deep	32 91 13.16 0350	55.50	MSF					0.9						AC		39	MSF	2165
	Seeding Material	West Ridge Pinyon/Juniper seed mix	Great Basin Seed	541.00	AC					0.9						AC		0.9	AC	487
	Seeding Equipment and Labor	Hydroseeder (equipment and labor)	32 92 19.14 4600	22.00	MSF					0.9						AC		39	MSF	858
	Place Silt Fence	Silt fence, install maintain and remove	31 25 14.16 1000	1.96	LF	150										FT		150	FT	294
	Pocking	Hydraulic excavator, 2 CY (322BL)	31 23 16.42 0260	1.81	CY						360					CY		360	CY	652
	Subtotal																			**155,845**
	Mine Site																			
	Reseeding 25%																			38961
	Subtotal																			**38,961**
	Total																			**194,806**

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

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

Exhibit "A"

Appendix 5-14 to MRP

APPENDIX 5-14

BEAR CANYON GOB GAS VENT HOLE (GVH)

ATTACHMENTS

1)	Attachment 1	Bear Canyon GVH, a) Location b) Site Plan c) Cross-Sections d) Earthwork Volumes e) Reclamation Contours
2)	Attachment 2	Soils Survey, Bob Long, CPSS
3)	Attachment 3	Topsoil Storage Area
4)	Attachment 4	Vegetation Report, Mt. Nebo Scientific
5)	Attachment 5	2008 Raptor Survey, DWR
6)	Attachment 6	Archeology Surveys, Senco-Phenix
7)	Attachment 7	GVH Operational Drawings (Dave Canning)
8)	Attachment 8	Slope Stability Analysis, Blackhawk Engineering
9)	Attachment 9	SITLA Correspondence regarding Bear Canyon Road and GVH Facilities
10)	Attachment 10	Hydrology Report, Petersen Hydrologic LLC
11)	Attachment 11	Drainage Control Plan, Blackhawk Engineering
12)	Attachment 12	Tower (Centennial) GVH Bonding Calculations
13)	Attachment 13	Reclamation Seed Mixes
14)	Attachment 14	Spill Prevention, Control, and Countermeasure Plan (SPCC)
15)	Attachment 15	MSDS Sheets for Drilling Products
16)	Attachment 16	Updated T & E Species List (2008), Mt. Nebo Scientific
17)	Attachment 17	Updated GVH Bonding Information provided by the Division.

WEST RIDGE RESOURCES, INC.
BEAR CANYON GOB GAS VENT HOLE (GVH)

Due to the increasing levels of methane liberation within the West Ridge Mine workings the Company must immediately pursue gob gas ventilation. On September 26, 2008, MSHA wrote a letter stating, "degasification of the longwall gob area for Panel 13 will be required prior to commencement of longwall mining". Therefore, MSHA has determined that this action is necessary for the safety of the underground workforce. Under our current production projections, initial longwall mining in Panel 13 is scheduled for mid-November, 2008. Therefore, without rapid and immediate development of a gob gas vent hole, under the requirements of the MSHA dictate, planned longwall production from Panel 13 is in risk of being stopped. This would have very serious consequences for the company in terms of meeting existing power-supply contracts, and maintaining the workforce against potential layoffs.

Upon subsequent meeting, MSHA agreed that a gob gas vent hole (GVH) drilled from the surface in the Right Fork of Bear Canyon into gob from extracted Panel 8 will satisfy their requirement for gob degasification. Refer to Attachment 1 for the location of the GVH site within the permit area. The site of the GVH pad lies at the end of the Bear Canyon Road. This is an old existing road that was recently upgraded to provide better access to the GVH site. The GVH site will be located adjacent to the road in a narrow strip measuring approximately 35' wide x 300' long in the bottom of the canyon. Total disturbance associated with the site, including cutslopes, is about 0.24 acres. Another 0.1 acres will be involved at an off-site topsoil storage area located approximately 3300' down-canyon from the GVH site, which will also be located adjacent the Bear Canyon Road (see Attachment 1 for location). Thus, the GVH installation will involve a total increase of disturbed area of 0.34 acres.

The GVH site will contain three separate holes drilled at 45 degree angles to intercept the longwall cave area (gob) located below. The depth of cover at this site above the mine is approximately 380'. From the well heads the methane gas will be piped to four methane extractor units, each measuring approximately 14' wide x 50' long. Details of a typical extractor unit can be found in Attachment 7. The extractor units will be positioned in a linear arrangement along the narrow strip-pad located between the road and the canyon hillside. The GVH facility is expected to be operational for the remaining life of the West Ridge Mine, and will be reclaimed at the same time as the minesite in C Canyon. During the life of the operation the facility will require daily inspection and maintenance by mine personnel. Refer to Attachment 1 for a site plan of the Bear Canyon GVH facility, and Attachment 3 for the topsoil storage area. Because both the GVH site and the topsoil storage are to be located on SITLA land adjacent to the Bear Canyon road, SITLA has concurred with these facilities being located within 100' of the public use road (refer to Attachment 9).

It should be noted that the GVH installation proposed for West Ridge Mine is quite similar to the GVH installations presently permitted and operational nearby at the Company's sister Tower Mine (Andalex Resources, Inc., Centennial Project, C/007/019, Appendix X). The differences are that the West Ridge GVH is smaller (0.24 acres vs 1.0 acre, typical), it will involve more methane extractor units (four vs one or two), and topsoil will be stored off-site rather than on-site. The holes are also shallower (three each, totaling 1380' vs 2700'). Refer to Attachment 7 for photos of typical Tower GVH installations.

The following narrative is intended to give an overall description of the proposed GVH installation in terms related to the individual MRP chapters. Specific relevant information is included in each chapter, but this appendix supplies the total information in a common overview source. It should be noted that, unless specifically noted in this appendix, all elements of the plan amendment for the Bear Canyon GVH site are identical to those already approved for the C Canyon minesite regarding facility construction, final reclamation, and environmental protection issues. Detailed and general descriptions of the soils, biology, land use, geology and hydrology for the overall permit area, which includes the Bear Canyon GVH site, can be found in the appropriate chapters of the approved MRP. Pertinent consultant reports and surveys for the GVH site have been included in both the individual chapters and in this Appendix as well in order to facilitate review. All affected Maps have been updated to show the GVH site and, where appropriate, the topsoil storage area.

CHAPTER 1, LEGAL:

The GVH site, and associated topsoil storage area, is located on SITLA coal lease ML49287 in the extreme western part of the existing DOGM permit area. The GVH site is located in Section 3, T14S,R13E, NW1/4NE1/4SW1/4SE1/4, and involves 0.24 acres of disturbance. The topsoil storage area is located in Section 10, T14S, R13E, NW1/4SE1/4NW1/4NW1/4 and involves 0.1 acre of disturbance. All affected surface is owned by SITLA. Other than increasing the total disturbed area by 0.34 acres from 29.06 acres to 29.4 acres there are no changes in Chapter 1.

Right-of-entry for the GVH facilities is granted under the terms of SITLA coal lease ML49287. Concurrence for the specific surface use for the GVH installation and the topsoil storage area has been provided by SITLA (see Attachment 9). The correspondence states *"Section 8.1 of the lease agreement provides that the Lessee may use the surface estate to the extent reasonably necessary for the economic operation of the leasehold. Your request to construct a GVH and stockpile area ....appear to meet that criteria and are hereby granted approval to proceed by the Lessor."*

Refer to the Location Map in Attachment 1 for the location of the GVH site and the associated topsoil storage area.

Appendix 1-2 (Violation Information) has been updated.

There is no change in the Company Ownership and Control

CHAPTER 2, SOILS:

Before any excavation begins at the GVH site, all available topsoil will be salvaged. Bob Long, CPSS, of Long Resource Consultants, Inc., has conducted an Order 1 soils survey of the site. His report is included in Attachment 2. Soil profile field descriptions are included in Attachment 2 as well. Three test pits were dug in the hillside and the soil resources were measured and catalogued. There is a significant layer of soil material present, which will be salvaged and stored nearby for final reclamation. Due to its location in the bottom of the canyon, and the varying steepness of the sideslope, the thickness of the soil varies considerably over the site. Also, as is typical for the Book Cliff canyons, there are a number of large boulders lying on the surface, surrounded by pockets of topsoil. Based on the results of the survey, the average depth of topsoil at the site is about 16". The area of the GVH site, including both the pad and the adjacent cutslope, is approximately 0.24 acres. Therefore, according to the soils survey, at least 515 cu. yds., or 13,878 cu. ft. of topsoil should be salvaged from the site.

Soils samples were taken by Mr. Long and have been sent to the laboratory for analysis. Once the analysis results are obtained they will be submitted to the Division and inserted as part of Appendix 2-10. If laboratory analysis of the soils indicates a need for additives, fertilizers, or enhancement of other kinds, the Company commits to providing such at the time of final reclamation as determined by the Division . However, it is felt that this soil in its existing condition should be adequate for final reclamation because it appears to be well developed and of sufficient quantity. In fact, it is the identical same soil removed from the site which will be replaced at the time of reclamation. The Order 1 Soils Reports concludes that *"the potential for successfully reclaiming the Bear Canyon GVH location is good based on the estimated quality and quantity of topsoil that may be salvaged."*

The topsoil will be carefully removed using a trackhoe which can reach up the slope from the road surface below. Large boulders will be separated from the material, and the topsoil will then be loaded into rock-trucks and hauled off-site for storage. The storage site is located approximately 3300' down-canyon from the GVH site, in a flat area adjacent to the road. This storage area is located on SITLA surface and SITLA coal lease ML49287 (see Attachment 1 for location). The pile will be constructed with overall dimensions of approximately 100' long, 40' wide, and 8' high, with 2:1 sideslopes (see Attachment 3 for details of the pile configuration). The pile will be kept low to prevent unnecessary compaction, and to help maintain viable micro-organisms. Attachment 3 shows that a pile configuration with a capacity in excess of 700 cu. yds. can easily be stored at this site.

Upon completion of topsoil salvage, the storage pile will be pocked (roughened) and reseeded with a previously approved seed mix as shown in Table 3-3 included in Attachment 13 for ready reference. As an alternate, Attachment 13 also includes a seed mix which was used on the Crandall Canyon East Mountain drillhole reclamation project and is readily available, subject to Division concurrence of its use. A layer of wood straw will then be scattered over the surface. The pocking, re-seeding and wood straw are all measures to help minimize erosion, and promote a healthy interim re-vegetation until the time of final reclamation. A containment berm made of sub-soil material, and a siltation control structure (such as excelsior logs) will be installed around the perimeter of the pile to prevent erosional loss of topsoil material from the pile. A topsoil identification sign will be installed on the pile upon completion. An as-built drawing of the pile will be prepared and supplied to the Division, and a final assessment of the volume of salvaged material will be updated in the MRP.

During topsoil salvaging and stockpiling, the Company commits to having an monitor on site at all times. The purpose of this person will be to make sure that all topsoil resources are properly salvaged, to maintain accurate truck count of material, take photos, and generally make sure that the salvage and stockpiling operations are done according to the plan. The monitor will be someone familiar with topsoil salvaging and pre-approved by the Division.

CHAPTER 3, BIOLOGY:

The GVH site is located in the bottom of Bear Canyon at an elevation of 7200'. The site is located less than 6000 feet (straight-line) from the main surface facilities which are located one canyon over to the southeast in C Canyon, which also sits at an elevation of 7200'. Both canyons face in the same direction, i.e., to the northeast. The canyons are nearly identical in terms of elevation, lithology, orientation, exposure, rainfall, etc. Therefore, the vegetation at the Bear Canyon GVH site is basically identical to that found at the C Canyon minesite. The vegetation at the Bear Canyon site is classified as Douglas Fir/Maple Community. Much of the minesite in C Canyon is also identified as Douglas Fir/Maple Community. Dr. Patrick Collins of Mt. Nebo Scientific, conducted a vegetation survey of the GVH site and concluded that, given the similarities in the locales, the existing vegetation reference source for the mine in C Canyon is appropriate to represent the GVH site as well as a basis for determining final reclamation performance. According to the report, Dr Collinss is of the opinion that *"...the Douglas Fir/Maple Reference Area (1998) would be an appropriate area for revegetation success standards at the time of final reclamation....".* A copy of Dr. Collins' report is included in Attachment 4. Also refer to Appendix 3-1 for a description of the Dougas Fir/Maple Community nearby in C Canyon, and to Appendix 3-1A for a discussion of the existing Douglas Fir/Maple vegetation reference are in C Canyon.

The sensitive plant species Canyon Sweetvetch (Hydysarum occidentale var. canone) exists in Bear Canyon, as well as all other outward-facing Book Cliff canyons within the permit area, including C Canyon where the minesuite is located.. The Canyon Sweetvetch generally occurs in the canyon bottom in and adjacent to the stream channel. As a pro-active mitigation measure, however, West Ridge employees, working on species identification from Dr. Patrick Collins of Mt. Nebo Scientific, have collected a significant amount of Sweetvech seed from the surrounding area in September, 2008. This seed will be included in the seed mix for interim cutslope revegetation, and/or topsoil pile revegetation, if requested by the Division. A similar commitment was included previously in the MRP prior to the construction of the West Ridge Mine surface facilities in C Canyon, which occurs in R645-341.100, and is reprinted herein for ready reference:

> *Canyon sweetvetch seed was collected by Dr. Patrick Collins (Mount Nebo Scientific) in C Canyon in 1999 prior to construction of the minesite. This seed was later used to re-seed the topsoil pile. This constitutes the on-going field test to determine the viability of using canyon sweetvetch in the seed mix for final reclamation. Dr. Collins is presently monitoring the success of the sweetvetch population on the topsoil pile. If it appears that the sweetvetch is successful and can be added to the reclamation seed mix, seed will be collected from the topsoil population, as well as other populations in C Canyon and/or nearby canyons, at the time of final reclamation.*

At the location of the GVH site, Bear Canyon is an ephemeral stream, and there is no riparian habitat located at or near the GVH site. The GVH site is located close to the area where the depth of cover over the longwall panels is the shallowest within the permit area. As a result, this area has been an area of interest in previous MRP amendments, and a more detailed discussion of the biology and hydrology can be found in R645-301-322.100 of the approved MRP. It should be noted that the area has been now been completely undermined since November, 2006, and subsidence has stabilized at about 3'. No adverse affects to biologic or hydrologic resources has been observed. The area is subject to on-going hydrologic and subsidence monitoring under the presently approved MRP.

After the topsoil has been removed and the GVH pad area constructed, the new cutslopes will be prepared for interim reclamation. This will be done by pocking the newly exposed surface (roughening) and re-seeding with the previously approved interim seed mix as shown in Table 3-3 (reprinted in Attachment 13 for ready reference), or with an alternate seed mix approved by the Division subject to availability. (Attachment 13 includes a seed mix which was used on the Crandall Canyon East Mountain drillhole reclamation project and is readily available, subject to Division concurrence.) A layer of wood straw will then be scattered over the surface. The pocking, re-seeding and wood straw are all measures to help minimize erosion, and promote a healthy interim re-vegetation until the time of final reclamation.

On final reclamation, the pad area and cutslopes will be backfilled to approximate original contour, and topsoil will be re-applied to the reclaimed slope (see Attachment 1) The slope will be re-vegetated according to the same existing approved plan for the minesite in nearby Canyon, as specified in R645-301-341. For completeness, the reclamation plan elements are included herein as taken directly from the currently approved plan:

a) *Fill will be placed in the cut in 18" lifts until approximate original contour is achieved. The fill will be obtained from the adjacent pad fill.*

b) *A certified noxious weed-free alfalfa hay mulch will be blown over the topsoiled surface at a rate of 2000 pounds per acre. Fertilizer, if determined necessary by soil testing, would also be applied at this time.*

c) *The surface will be gouged with irregular depressions approximately 24" x 36" x 18" deep. This will also mix the hay into the upper portion of the soil surface.*

d) *The appropriate seed mix (Table 3-2B, for Douglas Fir/Maple Community) will be either broadcast by hand or hydroseeded on the area at the rate specified on the table. (Table 3-2B is reprinted in Attachment 13 for ready reference.)*

e) *A certified noxious weed-free straw mulch will be applied to the surface at a rate of 2000 pounds per acre and held to the surface with a wood fiber mulch and tackifier applied to the surface at a rate of 500 pounds per acre.*

The revegetation monitoring schedule for the Bear Canyon GVH site will be the same as for the minesite reclamation, and is reprinted in Table 3-4 in Attachment 13 for ready reference.

Revegetation success standards for the GVH site will be the same as for the C Canyon minesite, as presented in R645-341.250. The revegetation timetable for the GVH site will also be the same as the minesite, as presented in Table 3-1, reprinted in Attachment 13 for ready reference.

Due to the proximity of the GVH site to the minesite within the permit area, all threatened and endangered (T&E) species information applicable to the existing permit area in the MRP (mid-term review approved on July 7, 2008) is current and therefore applicable to the GVH site as well. Refer to Appendix 3-4 and 3-4A for current T&E information. There are no threatened or endangered species in the Bear Canyon GVH area (refer to Attachment 16 for current (2008) T&E information, provided by Mt. Nebo Scientific) Various species of concern during previous amendments, such as the Mexican Spotted Owl and the Yellow-Billed Cuckoo have been adequately addressed in the presently approved MRP and are not a factor. Dr. Collins has addressed the current status of T & E species in his report (see Attachment 4).

An annual raptor survey was conducted for the permit area, including Bear Canyon, by Division of Wildlife Resources (DWR) in the spring of 2008, and is included in Attachment 5. The survey shows no raptor nests in the Bear Canyon area, neither at the GVH site nor the topsoil storage area.

As shown on Maps 3-4A,3-4B and 3-4C, wildlife range for deer, elk, and antelope is basically the same at the GVH site as for the minesite, which is to be expected given their proximity and many similarities.

There will be no additional water consumption, nor disruption of flow, from the West Ridge Mine as a result of the GVH installation. Therefore, construction and operation of the GVH facility will have no affect on the Colorado River Endangered Fish Recovery Program.

CHAPTER 4, LAND USE:

There will be no changes in the current land use of the Bear Canyon area as a result of the construction and operation of the GVH units.

The site is located in the Bear Canyon grazing allotment, and no change in grazing activity will result from the GVH installation. (Refer to Map 4.1)

The GVH site is located at the site of previous coal exploration drilling done in the early 1950's.

The site is located at the end of the Bear Canyon Road. This is a pre-existing road constructed in the early 1950's, and is a public use road located on public land. The road has been upgraded to provide better year-around access to the GVH site. The improved road access will facilitate existing public uses of the area such as grazing management, big-game hunting, and other recreational pursuits, and on-going environmental monitoring associated with the West Ridge Mine operation. The road will be used on a daily basis by mine maintenance personnel.

It is SITLA's position that the Bear Canyon road will be left in place (i.e., not reclaimed) to facilitate grazing management, hunting and other recreational use, mineral development, and other public multiple use (refer to correspondence in Appendix 4-8 and Attachment 9 of Appendix 5-14)

Class 3 (intensive) cultural resources surveys have been completed for both the GVH site and the topsoil storage site by Senco-Phenix Archeological Consultants. These surveys conclude that, for both sites, *"no cultural resources were located and the potential for undetected remains is remote. A finding of no effect is appropriate and archeological clearance without stipulation is recommended."* Copies of these reports are included in Attachment 6, and will be transferred to the Confidential Binder after Division review.

Operational areas that are used by mobile equipment will be water sprayed to control fugitive dust. The application of water will be of sufficient frequency and quality to maintain the surface material in a damp/moist condition unless it is below freezing.

CHAPTER 5, ENGINEERING:

The GVH facility will consist of three drillholes, four methane extractor units, and interconnecting piping as shown on Attachment 1. Please note that the final arrangement of the holes and extractor units may change depending on the final site configuration, the size of the available drilling rig, and other variables. A detailed description of the drillhole installation, and the assembly and operation of the methane extractor units can be found in Attachment 7. 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 upper casing, but will not be grouted so that it can move with any additional subsidence.

Before construction starts identification signs will be posted at the site. These signs will list the company name as permit holder, the permit number, address and phone number. During the initial phase of construction, topsoil will be salvaged. Based on a recent Order 1 soils survey the current estimate of topsoil to be salvaged is approximately 515 cubic yds. (See Attachment 2). After the topsoil has been removed, the slope will be excavated back for a distance of about 20', leaving a 1:1 cutslope against the hillside. Based on current surveys it is estimated that about 1,357 total yds of material will be excavated from the bank. This includes the estimated 515 yds of topsoil, so the remaining amount of excavated material will be about 842 yds (see Cut Slope Excavation Volumes, Attachment 1 for details). Material excavated from the cutslope will be used to level off the area for the drillhole (for the drilling operation) and for the individual methane extractor units. Excess material may be used to raise the grade of the adjacent roadway. All fill areas will then be compacted for stability.

During the drilling phase of the GVH installation, the pad area will be used as an equipment lay-down area for drill steel, drill casing, drilling mud, concrete, etc. The pad will also be used to accommodate the mud pits needed during the drilling operation. The mud pit will measure approximately 30' long x 10' wide x 10' deep, and will be located immediately down-canyon, i.e., southwest of, the drillholes, as shown in Attachment 1. The pit will be lined with a 12 mil plastic liner, with a 20 mil felt underlayment. Based on the diameter and total combined length of the drillholes, and assuming a swell factor of 40% for the cuttings, the estimated volume of cuttings is 1283 cubic feet, or 47 yds. This would result in a total depth of cuttings remaining in the bottom of the pit of 4.28 ft. After the drillholes have been completed the remaining cuttings will be mixed with native material until it can be handled with heavy machinery. It will then be removed from the pit and hauled off-site to an approved disposal facility.. After the cuttings have been removed, the pit will be backfilled and eliminated. The site will then be cleaned up and fine-graded prior to installing the methane extractor units (see Attachments 1 and 7 for details).

After the cutslopes have been excavated, the slopes with be reclaimed (interim reclamation) by pocking, re-seeding and applying a layer of wood straw as described above. A disturbed area drainage ditch will be constructed along the toe of the cut. This ditch will be designed to handle the flow from the up-slope undisturbed area, the reclaimed cutslope, the drillpad, and the adjacent section of road. Runoff from the ditch will be routed through a series of sediment-control structures (silt fences, excelsior logs, etc.) to effectively remove sediment. (A more detailed description of the sediment control measures associated with the site can be found in the Chapter 7, Hydrology discussion below.)

A security fence may be installed around the perimeter of the pad between the facilities and the road.. The facilities will not encroach upon nor affect the road nor the road turn-around, and neither will public use of the road be affected. The Company will provide the Division with an as-built drawing of the facility upon completion of construction.

Operation of the GVH facility is expected to continue for the life of the West Ridge operation. Therefore, reclamation of the site will be done at the same time and under the same conditions as for the minesite surface facilities in C Canyon. However, if temporary cessation of mining operations occurs, the GVH well will continue to function.

Prior to final reclamation, all drillholes will be plugged and sealed in accordance with State and Federal regulations. The casings will be plugged at the bottom to hold the concrete. A lean concrete mixture will be poured into the casing until the concrete is within five (5) feet of the surface. At that time the casing will be cut off at ground level and the rest of the casing will be filled with lean concrete. The concrete will be allowed to harden before final reclamation is completed. There will be three drillholes installed and therefore plugged at reclamation. (This commitment is identical to the currenty approved plan for the Tower (Centennial, C/007/014) GVH reclamation plan.) Based on current projections the holes will be drilled at 45 degree angles into the mine, and will have individual depths (lengths) of 504', 376', and 502', for a combined total depth of 1382'. Using 9-5/8" casing for all holes, the volume of concrete needed to plug all three holes would be 26 cu. yds.

On final reclamation, the pad area and cutslopes will be backfilled to approximate original contour (see Reclamation Contours, Attachment 1). Fill material will be obtained from the adjacent roadway and leveling pads. This is the exact same material that was excavated from the cutslope during initial construction. The cutslope will be backfilled in 18"-24" lifts and compacted with rubber-tired vehiclesand/or vibratory mechanical equipment. The reclaimed slopes, at approximate original contour, will average about 1.5: 1, so slope stability will not be an issue. Because of the compaction in lifts, and the rocky nature of the backfill material (one and the same as the original native material), stability of the reclaimed slopes is sufficient to achieve approximate original contour and eliminate the potential for remnant cutslope exposures. A slope stability analysis prepared by Blackhaek Engineering concludes that *"calculations show safety factors well in excess of the required 1.3 for the reclaimed cut slopes of 1.5H:1V and up to 30' in height. This is not inconsistent with the natural conditions of the area, and will allow for complete reclamation of all cut slopes created by the emergency drilling pads."* (See Attachment 8 for the complete slope stability analysis report.) The slope will then be re-topsoiled and re-vegetated according to the same existing approved plan for the minesite in nearby Canyon, as specified in R645-301-341, and as described in the Chapter 3, Biology discussion above.

The amount of backfill material is estimated to be up to 842 cubic yards, and the amount of replaced topsoil is estimated at about 515 cubic yards. Total reclaimed area, including both pad and cutslopes will be approximately 0.24 acres. Because the cutslopes are only about 20' maximum high, all work, both backfilling and topsoil replacement, can easily be done from the existing adjacent road-pad surface, using trackhoes with sufficient boom reach. After the reclaimed slopes have been topsoiled and reseeded, a row of excelsior logs will be installed along the full length of the toe of the slope between the slope and the remaining road. The purpose of this row of excelsior logs is to control sediment of the site until the revegetation has become established.

For bonding information refer to Chapter 8 discussion below

CHAPTER 6, GEOLOGY:

The geology of the GVH site is essentially the same as at the West Ridge Mine surface facilities located nearby in C Canyon, as shown on Map 6-1. The primary difference is that the mine site is located in the upper part of the Blackhawk Formation where the Sunnyside coal seam outcrops, whereas the Bear Canyon GVH site is located stratigraphically about 384' above the coal seam within the part of the canyon where the Castle Gate Sandstone begins to outcrop. This results in the GVH site being situated in a narrow, ledgebound part of the canyon. The drillholes will reach down to near the top of the mined out coal seam horizon (see Attachment 7 for details). Because the coal seam in this area has been completely extracted by longwall mining, the GVH drillholes will penetrate through subsided and fractured strata. Based on previous subsidence monitoring the GVH site has subsided about 3 feet, but subsidence has now stabilized.

CHAPTER 7, HYDROLOGY:

The GVH site will be located on the opposite side of the road (southeast side) from the primary canyon drainage channel. Therefore, construction and operation of the GVH facility will have no affect on the natural canyon drainage. Because of the limited size of the site (0.24 acres) and the narrow configuration within the confines of the narrow ledges of the canyon, there is insufficient room to construct a sediment control pond. Therefore the company intends to employ a combination of alternate sediment control methods at the site. During the construction phase of the pad site, adequate rows of excelsior logs will be placed downgrade from the site to prevent construction sediment from entering the channel. Once the pad site is finished, which should take less than two weeks, a disturbed area drainage ditch will be constructed along the toe of the cut. This ditch will be designed to handle the flow from the up-slope undisturbed area, the reclaimed cutslope, the drillpad, and the adjacent section of road. This ditch will discharge into the natural drainage channel a short distance below the drillhole location. This ditch will be armored with adequately-sized rip-rap for its entire length. This rip-rap will decrease the potential for erosion in the ditch, and will also act initially as a siltation trap as a certain amount of sediment is allowed to settle into the rip-rap voids.

The total length of the drainage ditch will be approximately 350'. At 50' intervals along its length energy dissipaters will be installed in the ditch. These energy dissipaters will consist of excelsior logs laid in the ditch perpendicular to the flow direction, and anchored securely with stakes. These dissipaters will reduce the flow velocity to help reduce erosion, and will also serve as siltation filters to help remove sediment prior to reaching the natural channel. In addition, a terminal set of excelsior logs will be installed in the ditch immediately above the point where it discharges into the natural channel. The installation, consisting of four (4 ea.) closely-spaced rows of excelsior logs will serve primarily as sediment traps, rather than energy dissipaters. This set will be located conveniently close to the road to facilitate regular cleaning and maintenance. The sediment traps will be inspected routinely to make sure they are functioning properly. There will be mine personnel attending to the GVH units on a daily basis, and will be instructed to check the sediment traps on a regular basis, and especially after storm events. If they are in need of repair and/or cleaning such maintenance will be done immediately. Sediment cleaned from the traps will be hauled off-site and disposed of at an approved facility, such as the permitted Wildcat Loadout Coal Mine Refuse Disposal Site (DOGM permit C/007/033). All excelsior logs will be installed according to the manufacture's instructions.

Immediately after the cutslopes have been excavated to create the pad-site, the slopes will be pocked, and reseeded. A layer of woodstraw will then be spread over the reseeded slopes. This straw serves to not only provide microclimate conditions to encourage seed germination, it also absorbs some of the energy from falling raindrops, and therefore helps control erosion on the slopes until revegetation can become established. The pocking, which consists of irregular depressions measuring about 24" x 36" x 18" deep, helps revegetation by holding the seed and water in place, and thereby helps minimize erosion as well.

During the drilling phase of the GVH installation, the pad area will be used as an equipment lay-down area for drill steel, drill casing, drilling mud, concrete, etc. The pad will also be used to accommodate the mud pits needed during the drilling operation. The mud pit will measure approximately 30' long x 10' wide x 10' deep, and will be located immediately down-canyon, i.e., southwest of, the drillholes, as shown in Attachment 1. The pit will be lined with a 12 mil plastic liner, with a 20 mil felt underlayment. Based on the diameter and total combined length of the drillholes, and assuming a swell factor of 40% for the cuttings, the estimated volume of cuttings is 1283 cubic feet, or 47 yds. This would result in a total depth of cuttings remaining in the bottom of the pit of about 4.28 ft. After the drillholes have been completed the remaining cuttings will be mixed with native material until it can be handled with heavy machinery. It will then be removed from the pit and hauled off-site to an approved disposal facility. After the cuttings have been removed, the pit will be backfilled and eliminated. The site will then be cleaned up and fine-graded prior to installing the methane extractor units (see Attachments 1 and 7 for details). A period of approximately two weeks will be required to construct the drillpad and to drill the holes. During this time interim sediment control will be provided by several rows of excelsior logs installed at the lower end of the construction site. Sediment is not expected to be a problem because of the short construction time involved (approx. 2 weeks), the low probability of rainfall events in late November at this elevation, and the temporary installation of the excelsior logs.

After the site has been constructed the entire operational pad area, as well as the adjacent road area and turnaround, will be graveled from the channel crossing up to the end of the road . This gravel will consist of a crushed rock 1.5" x 0" road base material, laid down and then compacted to a tight surface. This graveled surface will also serve to reduce erosion on the pad (and adjacent road segment) and thereby decrease sedimentation to the natural drainage.

In summary, the site will be an alternate sediment control area. Sediment will be controlled by the following combination of treatment methods:

1) Armoring the entire length of the drainage ditch with rip-rap.

2) Installation of energy dissipaters within the ditch to slow the flow velocity.

3) Installation of set of sediment control excelsior logs in the ditch ahead of the discharge point.

4) Pocking and revegetating the cutslope, including a layer of protective wood straw.

5) Graveling the pad-site and adjacent roadway

Refer to the site plan in Attachment 1 for the location of the drainage diversion ditch, energy dissipaters, excelsior log siltation controls, and graveled area. See Attachment 11 for the drainage control calculations determined by Blackhawk Engineering. This report concludes that with *"....installation of the proposed sediment and erosion controls, there should be no adverse effects to the surface hydrology of this area."*

The GVH installation and operation should have no adverse affect on ground-water hydrology.

The GVH site is located close to the area where the depth of cover over the longwall panels is the shallowest within the permit area. As a result, this area has been an area of interest in previous MRP amendments, resulting in enhanced water monitoring and subsidence monitoring requirements both above and below the GVH site. A more detailed discussion of the area hydrology can be found in R645-301-322.100 of the approved MRP. It should be noted that this area has been now been completely undermined since November, 2006, subsidence has stabilized, and no adverse affects to underground or surface hydrologic resources have been observed. See Attachment 10, prepared by Petersen Hydrologic, for a discussion of the potential hydrologic affects from the GVH installation and operation. This report concludes that *"adverse impacts to the hydrologic balance resulting from the installation and operation of the Bear Canyon GVH system are not anticipated."* The probable hydrologic consequences (PHC) section of the MRP (645-301-738) has been updated to include a discussion of the Bear Canyon GVH installation.

During drilling operations, as well as during the remainder of the operational life of the GVH installation, noncoal mine waste will be stored in suitable containers, and then disposed of off-site at an approved waste disposal facility. Hydrocarbons, including Diesel fuel, gasoline, oil and grease, will be stored in the factory supplied containment mounted within the machinery. If any stand-alone storage tanks are used they will be equipped with built-in containment capable of holding the entire contents of the tank. Absorbent pads and bags of absorbent granules will be kept on hand during the drilling operation, and later during the GVH operation, to be used in case of a spill of oil, fuel or grease. Used absorbent material will be disposed of at an approved disposal facility. All operations will be subject to the current Spill Prevention Control and Countermeasure Plan (SPCC) for the West Ridge Mine currently on file with the Division, and included in Attachment 14 for ready reference.

Prior to final reclamation, all drillholes will be plugged and sealed in accordance with State and Federal regulations, as discussed in the Chapter 5 section above. Upon final reclamation, any portion of the gravel surface that is stained or contaminated in any way with hydrocarbons will be dug up and hauled off the site to an approved waste disposal facility. After removing any contaminated gravel, the pad area and cutslopes will then be backfilled to approximate original contour, using fill material obtained from the adjacent roadway and leveling pads, and covering up the diversion ditch and the remaining gravel in the process. The slopes will then be re-topsoiled. The surface will then be pocked and re-seeded with an approved seed mix as described in the Chapter 2 discussion. A layer of wood straw will also be spread over the reclaimed slopes to help minimize erosion, and promote vegetation growth. After the reclaimed slopes have been topsoiled and reseeded, a row of excelsior logs will be installed along the full length of the toe of the slope between the slope and the remaining road, as shown on the Reclamation Plan, Attachment 1. The purpose of this row of excelsior logs is to control sediment off the site until the revegetation has become established. These sediment control logs will remain in place until vegetation has been established adequate for Phase 2 bond release.

CHAPTER 8, BONDING:

Note: In the West Ridge Mine MRP C/007/041, the bonding discussion appears in Chapter 5, Engineering. Bonding is included in this Appendix 5-14 as a Chapter 8 item to make the discussion more clear.

To aid in the determination of the bonding requirements for the Bear Canyon GVH, the following information is provided:

1) Volume of topsoil to salvage, and later to respread (as per the Order 1 soils survey, Attachment 2) ....515 yds

2) Volume of cut material to be backfilled upon reclamation (based on on-site surveys, and 1.5:1 reclaimed slopes, per Attachment 1)..842 yds

3) Number of methane extractor units to remove..4 each

4) Drillhole to be plugged...........3 each, totaling 1380' deep, requiring 26yds of concrete

5) Total area of disturbance to be reclaimed and re-vegetated..........................0.24 acres

As a basis of comparison, the existing Tower GVH reclamation costs, as taken from the currently approved MRP C/007/019, are broken down on a per-hole basis as follows:

Demolition	Structure removal (one unit/ site)	$8,220
	Plugging (average 2700' hole)	$5,000
	Total Demolition	$8,220
Earthwork	Backfill/Grading (5000 yds/site)	$3265
	Topsoil replacement (1600 yds/site)	$1258
	Support	$330
	Total Earthwork	$4861
Reveg	(Assumes one acre site)	$3575
Total Direct Costs		$16,656
Indirect Costs (26.8%)		$4,464
Total Cost		$21,120
Escalation (0.012 x 4 years)		$1,032
Reclamation Cost		$22,120
Bond amount (rounded to nearest $1000)		$23,000

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It should be noted that the reclamation bonds for the most recent GVH installations at Tower Mine (Centennial Project, C/007/017, April, 2007) is $28,000. The allows an additional amount to reclaim the dedicated access roads leading to various pads. Complete details of the Tower GVH bonding calculations can be found in Appendix B of the Centennial Project Mining and Reclamation Plan on file with the Division. Relative pages from those calculations pertinent to the most recent Tower GVHs are included herein in Attachment 12 for ready reference.

In comparison to the West Ridge Bear Canyon GVH, the typical Tower GVH sites involve:

a) deeper holes to be plugged......................... (2700' vs 1380')
b) greater volume of topsoil to be replaced..... (1600 yds. vs 515 yds)
c) larger pad areas to be topsoiled................. (1.0 acre vs 0.24 acres)
d) greater backfill volume............................. (5000 yds. vs 842 yds.)

One the other hand, the West Ridge GVH has four units to dissemble vs one or two at Tower, and at the West Ridge GVH the topsoil must be hauled about 3300' back to the site whereas at Tower the topsoil is stockpiled on the site itself. On balance, it would appear that the reclamation bonding cost of the West Ridge GVH should reasonably be no greater than the Tower cost, especially since the actual Tower bonding amount is $28,000 per site rather than the calculated $23,000.

However, the most important consideration is the fact that the West Ridge Mine reclamation bond is presently posted at $2,117,000, while the reclamation cost escalated to 2011 is $1,735,000. Therefore West Ridge Resources presently has $382,000 excess bonding in place (22.2% difference) which should be more than adequate to cover the conservatively estimated reclamation cost of $28,000 for the Bear Canyon GVH site.

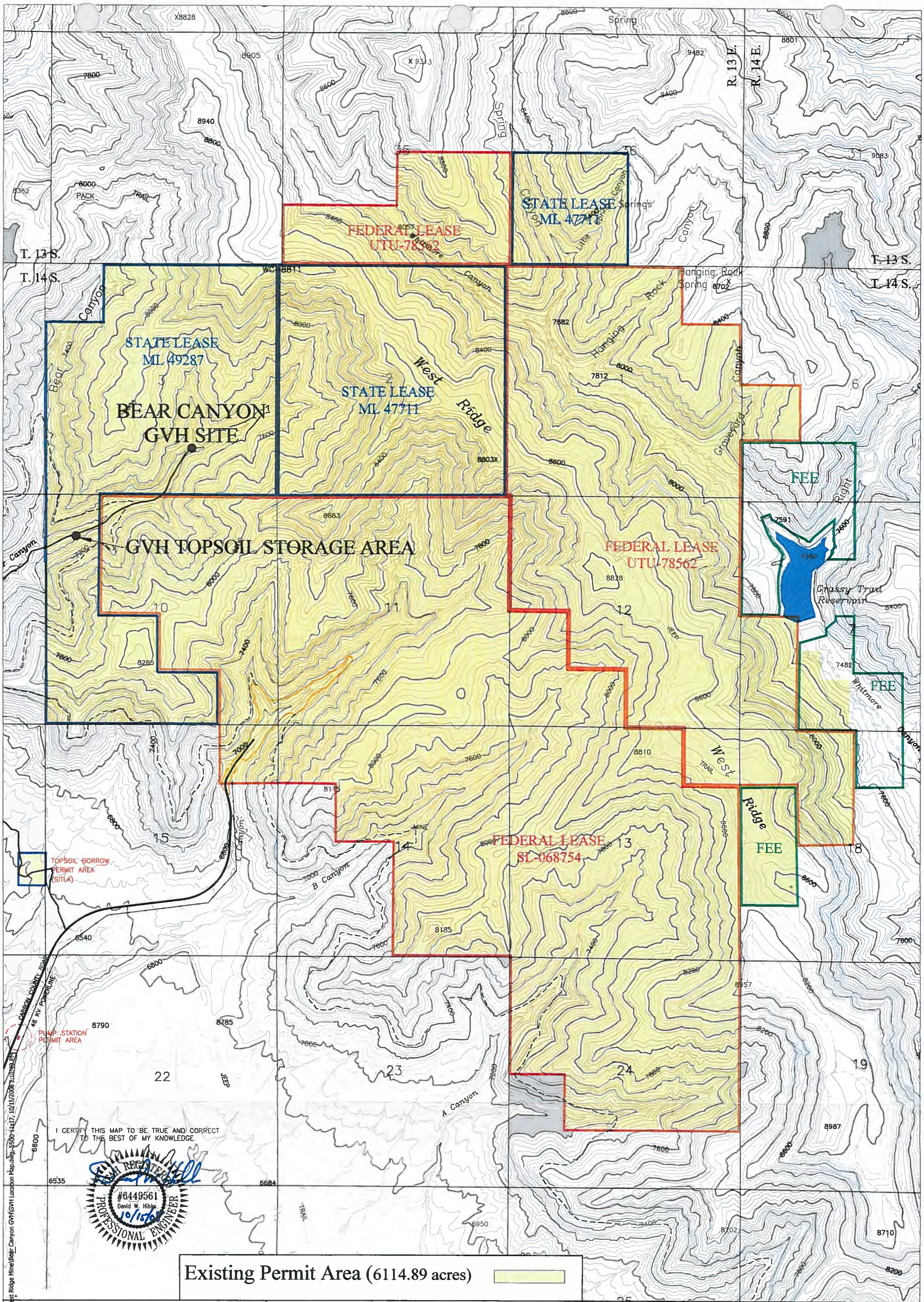
In the interest of time, West Ridge Resources is agreeable to using the $28,000 bonding amount currently accepted by the Division for the Tower GVH installations as sufficient for the West Ridge Bear Canyon GVH as well, subject to Division concurrence. This would increase the total (2011) West Ridge Mine bond obligation to $1,763,000 ($1,735,000 + $28,000), but would still leave a bonding surplus of $354,000 ($2,117,000 - $1,763,000).

Note : Updated bonding information reflecting the Bear Canyon GVH, as provided by the Division, is now included in Attachment 17.

ATTACHMENT 1

BEAR CANYON GVH SITE

a) LOCATION
b) PRE-EXISTING SITE
c) FACILITY SITE PLAN
d) TYPICAL CROSS-SECTIONS
e) CUTSLOPE EXCAVATION VOLUMES
f) RECLAMATION CONTOURS



WEST RIDGE MINE
Bear Canyon GVH Location Map

DATE: 10-15-08 REV: 1 ACAD REF: GVH Location Map

LEGEND:
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- GVH Site
- Outcrop

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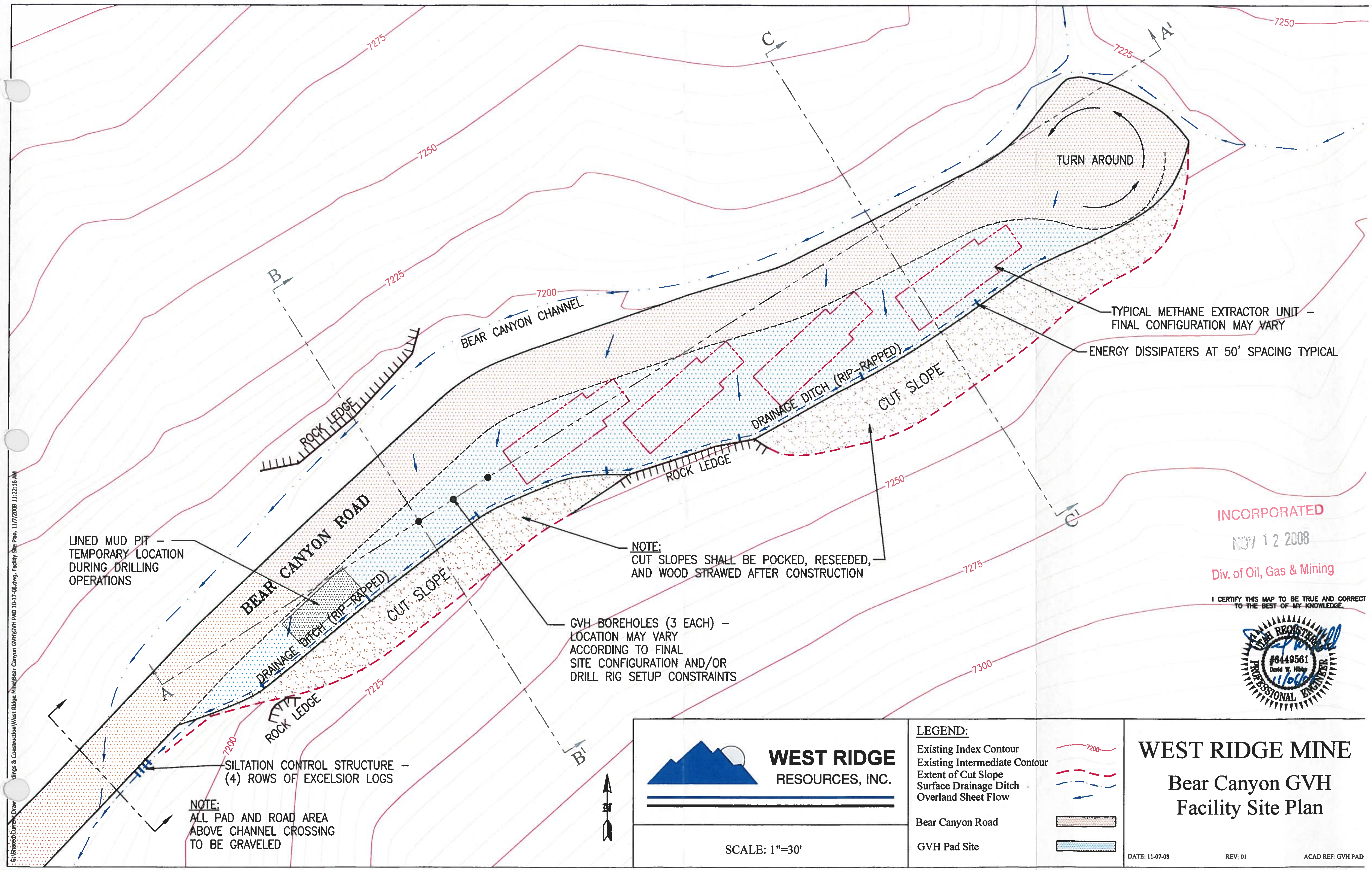
WEST RIDGE RESOURCES, INC.

SCALE: 1"=2000'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7275
7250
7225
7200
7300
A
A'
B
B'
C
C'
BEAR CANYON CHANNEL
BEAR CANYON ROAD
ROCK LEDGE
TURN AROUND
TYPICAL METHANE EXTRACTOR UNIT – FINAL CONFIGURATION MAY VARY
ENERGY DISSIPATERS AT 50' SPACING TYPICAL
DRAINAGE DITCH (RIP-RAPPED)
CUT SLOPE
LINED MUD PIT – TEMPORARY LOCATION DURING DRILLING OPERATIONS
NOTE: CUT SLOPES SHALL BE POCKED, RESEEDED, AND WOOD STRAWED AFTER CONSTRUCTION
GVH BOREHOLES (3 EACH) – LOCATION MAY VARY ACCORDING TO FINAL SITE CONFIGURATION AND/OR DRILL RIG SETUP CONSTRAINTS
SILTATION CONTROL STRUCTURE – (4) ROWS OF EXCELSIOR LOGS
NOTE: ALL PAD AND ROAD AREA ABOVE CHANNEL CROSSING TO BE GRAVELED
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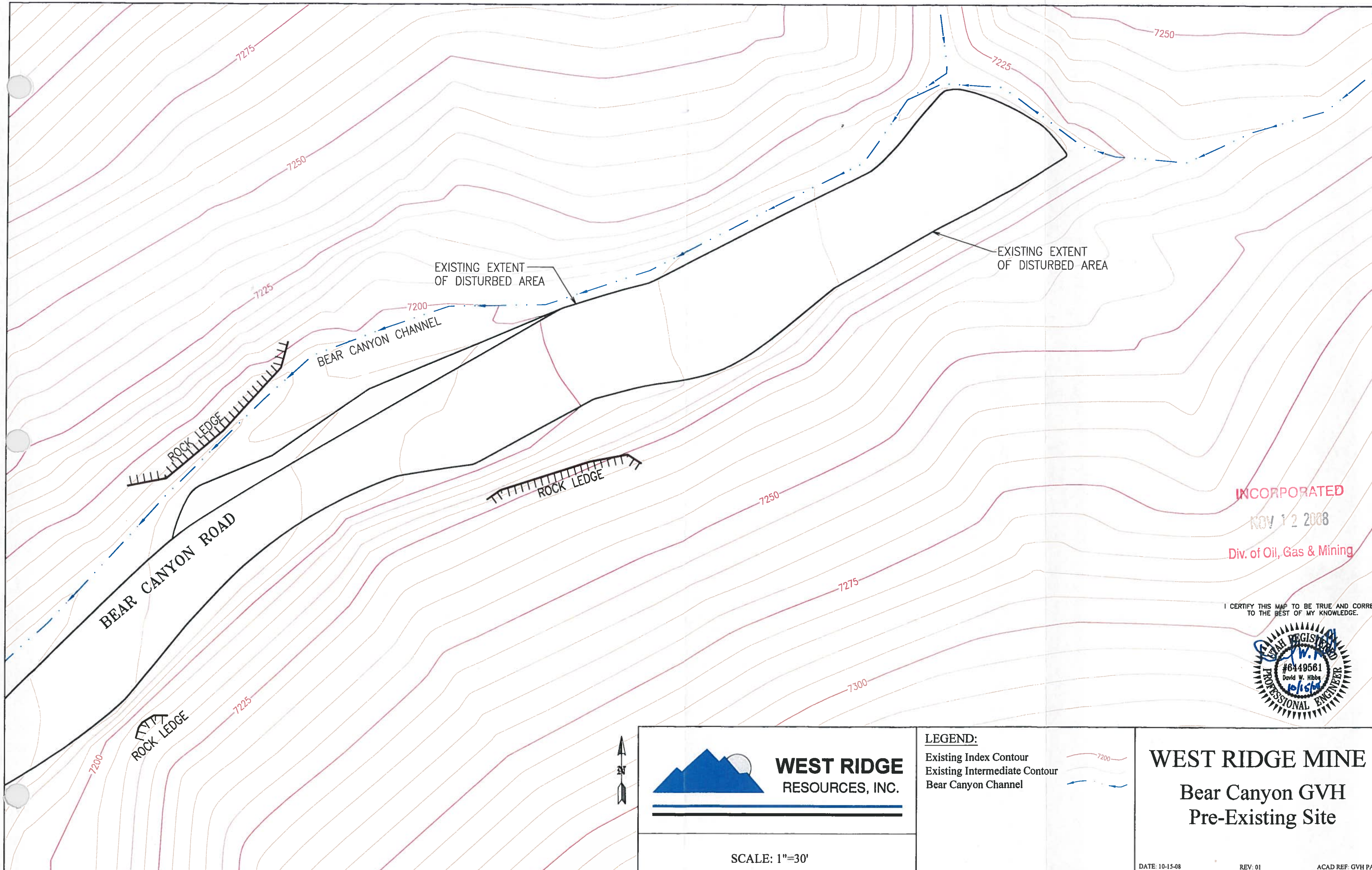
I CERTIFY THIS MAP TO BE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.
UTAH REGISTERED PROFESSIONAL ENGINEER #6449561 David W. Hibbs
WEST RIDGE RESOURCES, INC.
SCALE: 1"=30'
LEGEND:
Existing Index Contour
Existing Intermediate Contour
Extent of Cut Slope
Surface Drainage Ditch
Overland Sheet Flow
Bear Canyon Road
GVH Pad Site
WEST RIDGE MINE
Bear Canyon GVH
Facility Site Plan
DATE: 11-07-08
REV: 01
ACAD REF: GVH PAD



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NOV 12 2008
Div. of Oil, Gas & Mining

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

UTAH REGISTERED PROFESSIONAL ENGINEER #6449561 David W. Hibbs 10/15/08

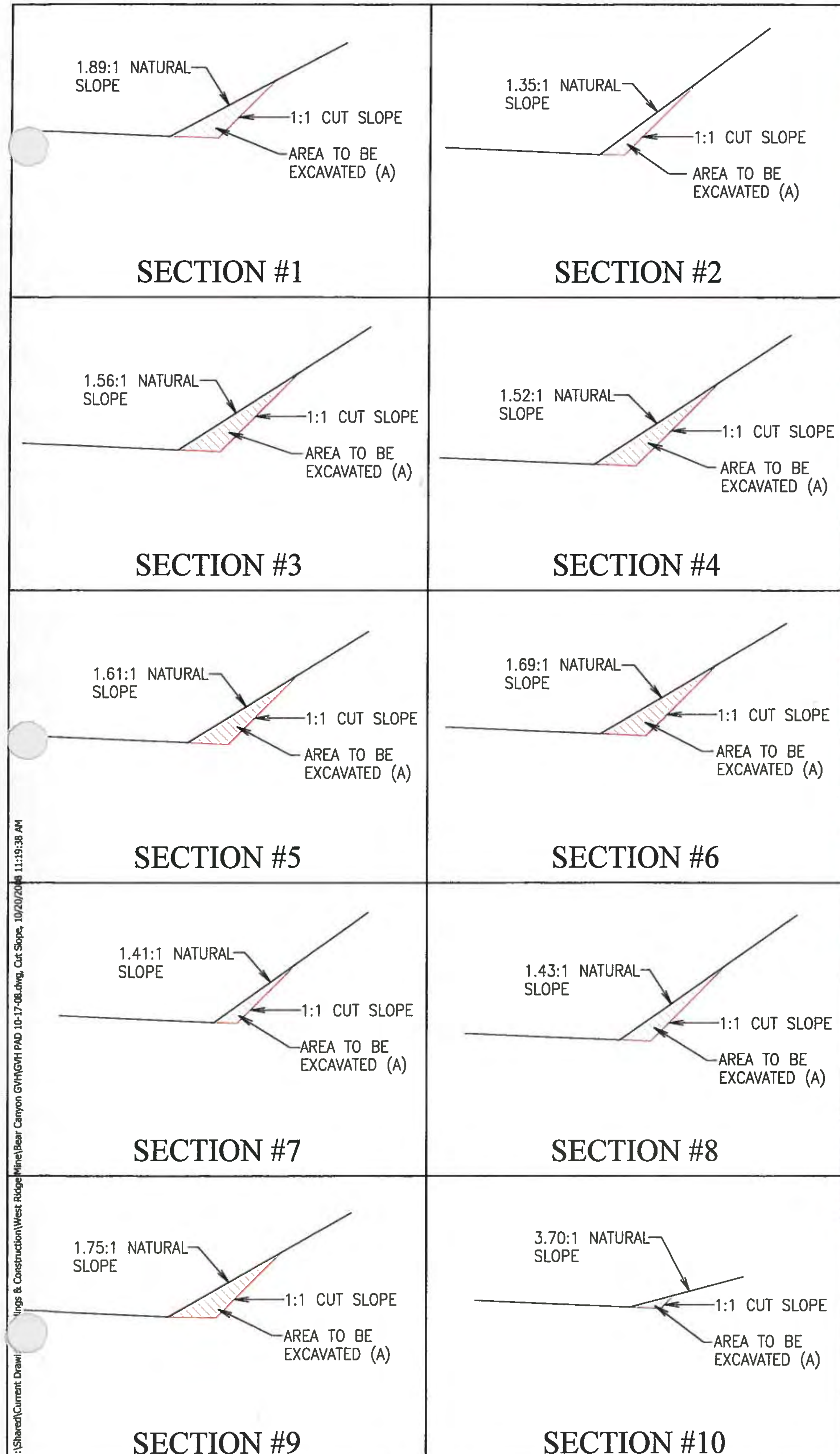
WEST RIDGE RESOURCES, INC.

SCALE: 1"=30'

LEGEND:
Existing Index Contour
Existing Intermediate Contour
Bear Canyon Channel

WEST RIDGE MINE
Bear Canyon GVH Pre-Existing Site

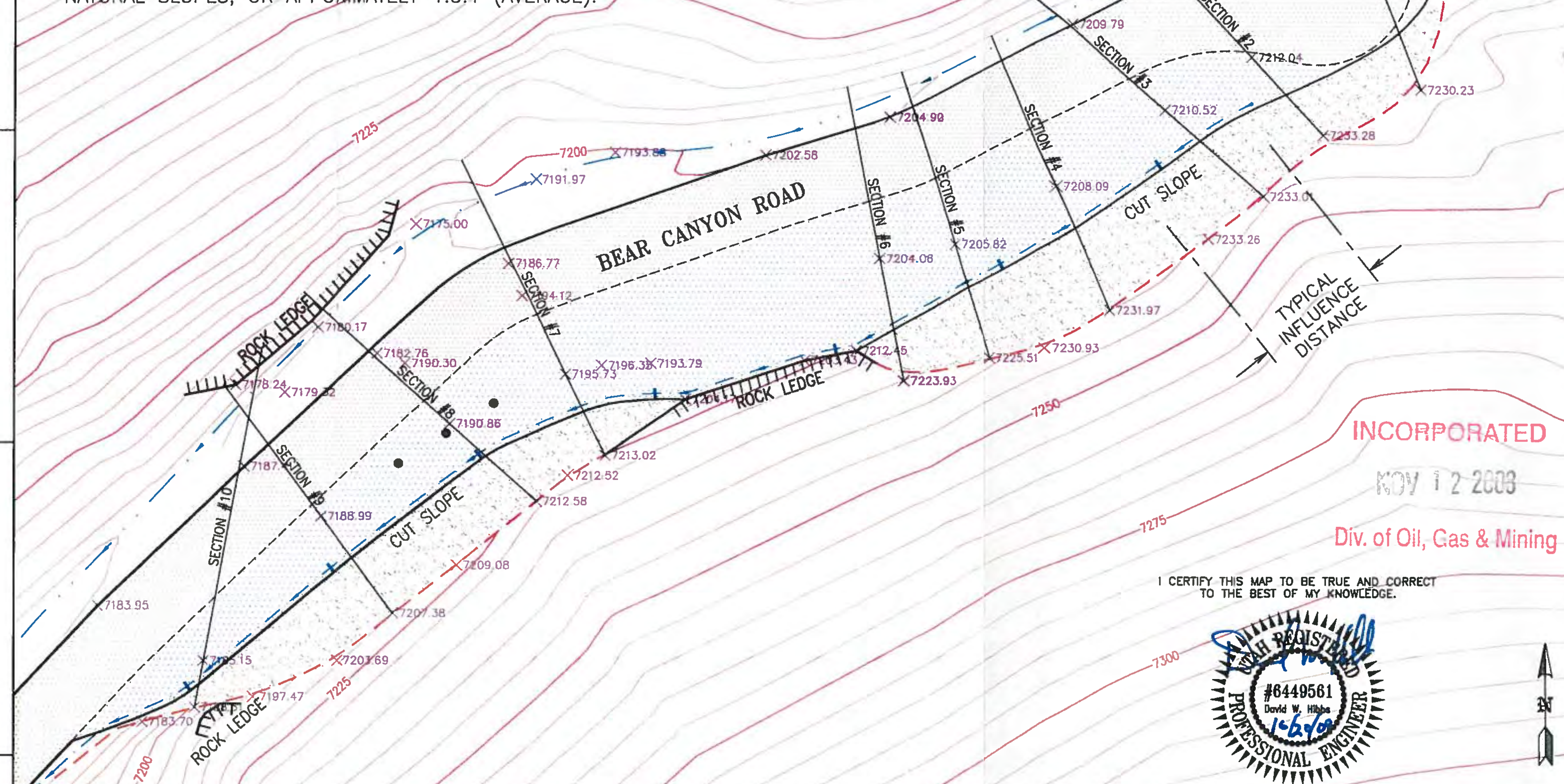
DATE: 10-15-08 REV: 01 ACAD REF: GVH PAD



EXCAVATION VOLUME TABULATION

SECTION NUMBER	AREA (A)	INFLUENCE DISTANCE (L)	VOLUME (cubic feet)	Volume (cubic yards)
SECTION #1	120 s.f.	32'	3,820 cu.ft.	142 cu.yds.
SECTION #2	80 s.f.	29'	2,320 cu.ft.	86 cu.yds.
SECTION #3	150 s.f.	35'	5,250 cu.ft.	194 cu.yds.
SECTION #4	152 s.f.	40'	6,080 cu.ft.	225 cu.yds.
SECTION #5	127 s.f.	28'	3,556 cu.ft.	132 cu.yds.
SECTION #6	146 s.f.	17'	2,482 cu.ft.	92 cu.yds.
SECTION #7	64 s.f.	26'	1,664 cu.ft.	62 cu.yds.
SECTION #8	104 s.f.	36'	3,744 cu.ft.	139 cu.yds.
SECTION #9	132 s.f.	52'	6,864 cu.ft.	254 cu.yds.
SECTION #10	18 s.f.	46'	828 cu.ft.	31 cu.yds.
TOTALS			36,608 cu.ft.	1,357 cu.yds.

NOTES:
1. ALL MEASUREMENTS AND VOLUMES ARE APPROXIMATE.
2. EXCAVATION VOLUMES INCLUDE APPROX. 515 CUBIC YARDS OF TOPSOIL.
3. THE RECLAIMED SLOPES WILL BE NEARLY IDENTICAL TO THE PRE-EXISTING NATURAL SLOPES, OR APPOXIMATELY 1.5:1 (AVERAGE).



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UTAH REGISTERED PROFESSIONAL ENGINEER #6449561 David W. Hibbs

WEST RIDGE RESOURCES, INC.

SCALE: 1"=40'

LEGEND:
- Existing Index Contour
- Existing Intermediate Contour
- Extent of Cut Slope
- Existing Bear Canyon Channel
- New Surface Drainage
- Bear Canyon Road
- GVH Pad Site

WEST RIDGE MINE
Cut Slope Excavation Volumes

DATE 10-20-08 | REV. 01 | ACAD REF: GVH PAD

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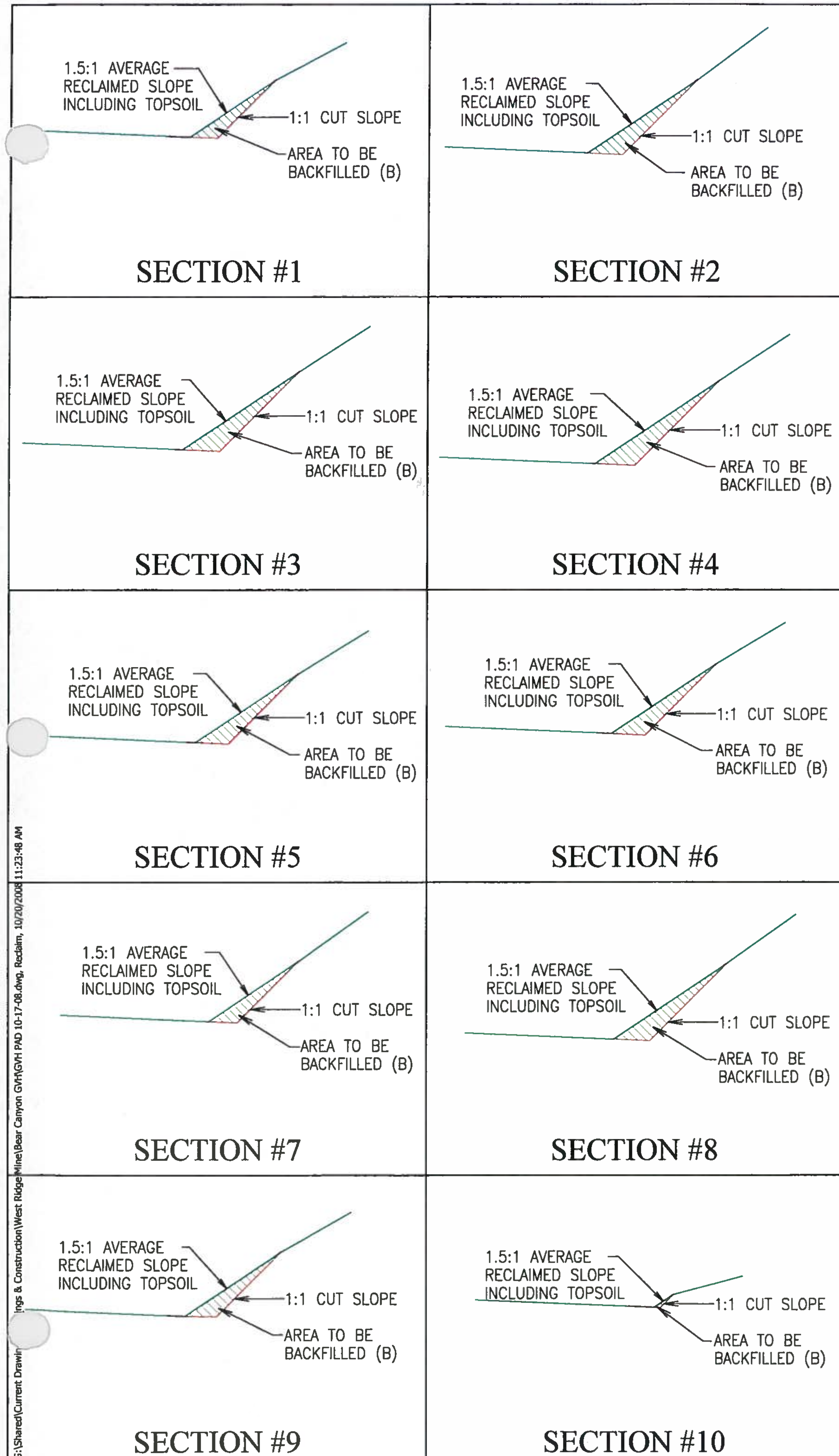
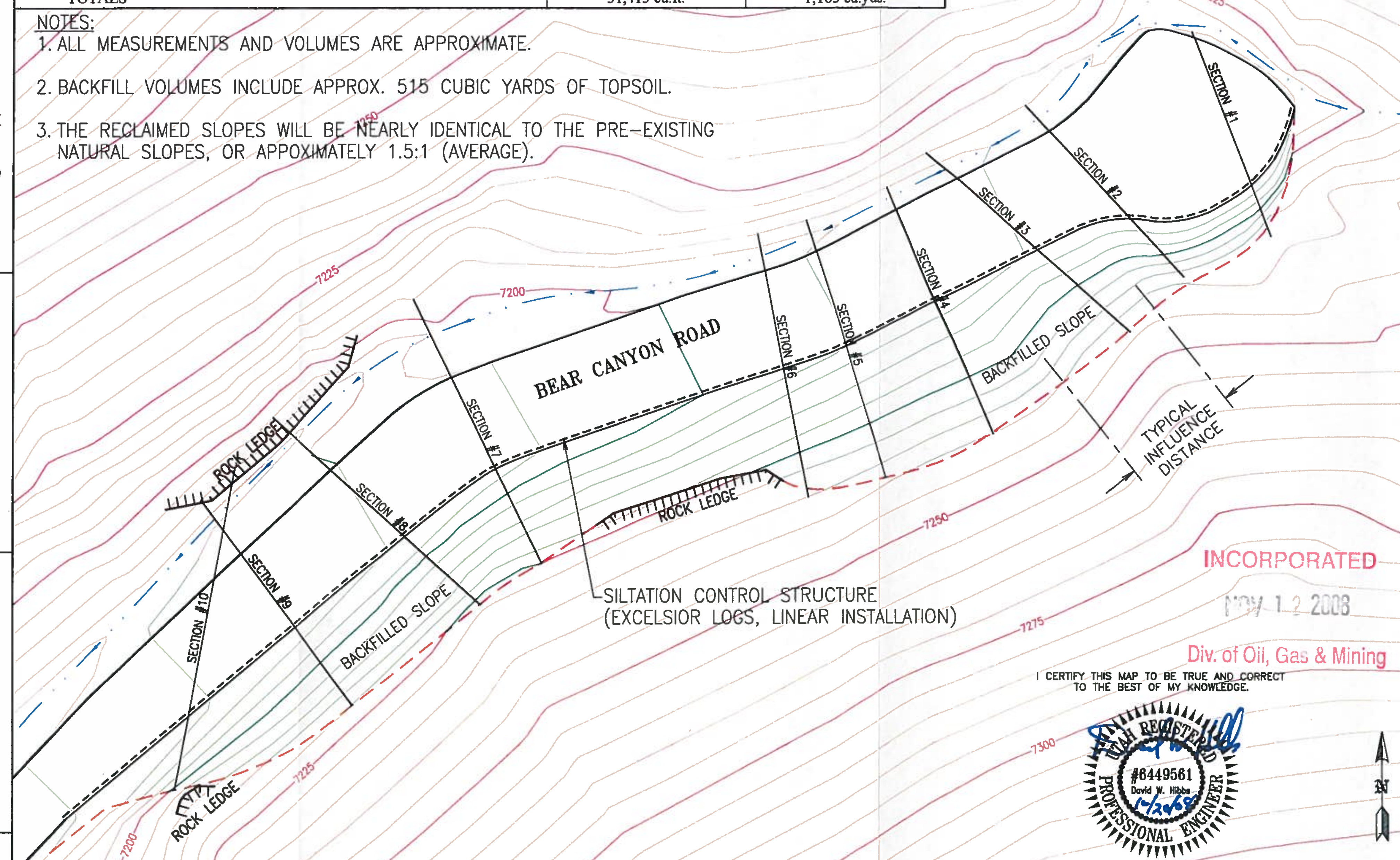


BACKFILL VOLUME TABULATION

SECTION NUMBER	BACKFILL AREA (B)	INFLUENCE DISTANCE (L)	VOLUME (cubic feet)	Volume (cubic yards)
SECTION #1	69 s.f.	32'	2,208 cu.ft.	82 cu.yds.
SECTION #2	114 s.f.	29'	3,306 cu.ft.	122 cu.yds.
SECTION #3	130 s.f.	35'	4,550 cu.ft.	169 cu.yds.
SECTION #4	146 s.f.	40'	5,840 cu.ft.	216 cu.yds.
SECTION #5	100 s.f.	28'	2,800 cu.ft.	104 cu.yds.
SECTION #6	103 s.f.	17'	1,751 cu.ft.	65 cu.yds.
SECTION #7	76 s.f.	26'	1,976 cu.ft.	72 cu.yds.
SECTION #8	120 s.f.	36'	4,320 cu.ft.	160 cu.yds.
SECTION #9	87 s.f.	52'	4,524 cu.ft.	168 cu.yds.
SECTION #10	3 s.f.	46'	138 cu.ft.	5 cu.yds.
TOTALS			31,413 cu.ft.	1,163 cu.yds.

NOTES:
1. ALL MEASUREMENTS AND VOLUMES ARE APPROXIMATE.
2. BACKFILL VOLUMES INCLUDE APPROX. 515 CUBIC YARDS OF TOPSOIL.
3. THE RECLAIMED SLOPES WILL BE NEARLY IDENTICAL TO THE PRE-EXISTING NATURAL SLOPES, OR APPOXIMATELY 1.5:1 (AVERAGE).



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

UTAH REGISTERED PROFESSIONAL ENGINEER #6449561 David W. Hibbs

WEST RIDGE RESOURCES, INC.

SCALE: 1"=40'

LEGEND:
- Existing Index Contour
- Existing Intermediate Contour
- Extent of Cut Slope
- Existing Bear Canyon Channel
- Siltation Control Structure
- Reclaimed Index Contour
- Reclaimed Intermediate Contour

WEST RIDGE MINE
Reclamation Plan with Backfill Volumes

DATE 10-20-08 REV 01 ACAD REF GVH PAD

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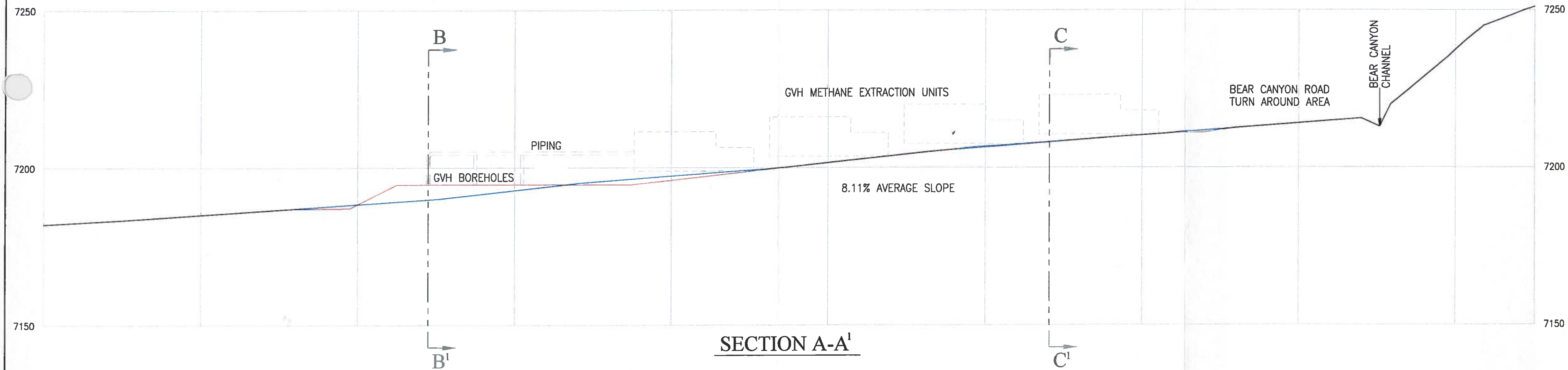
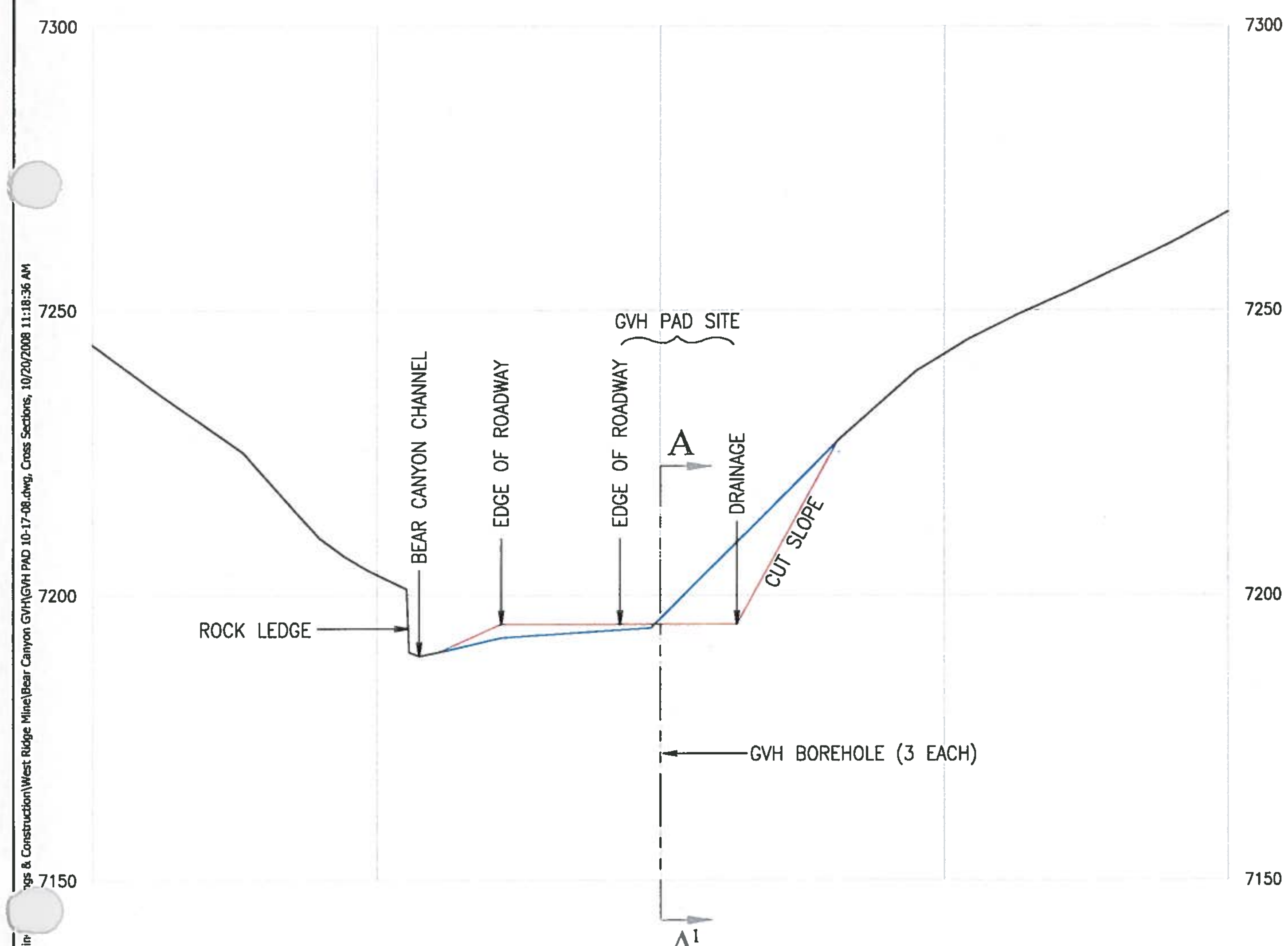
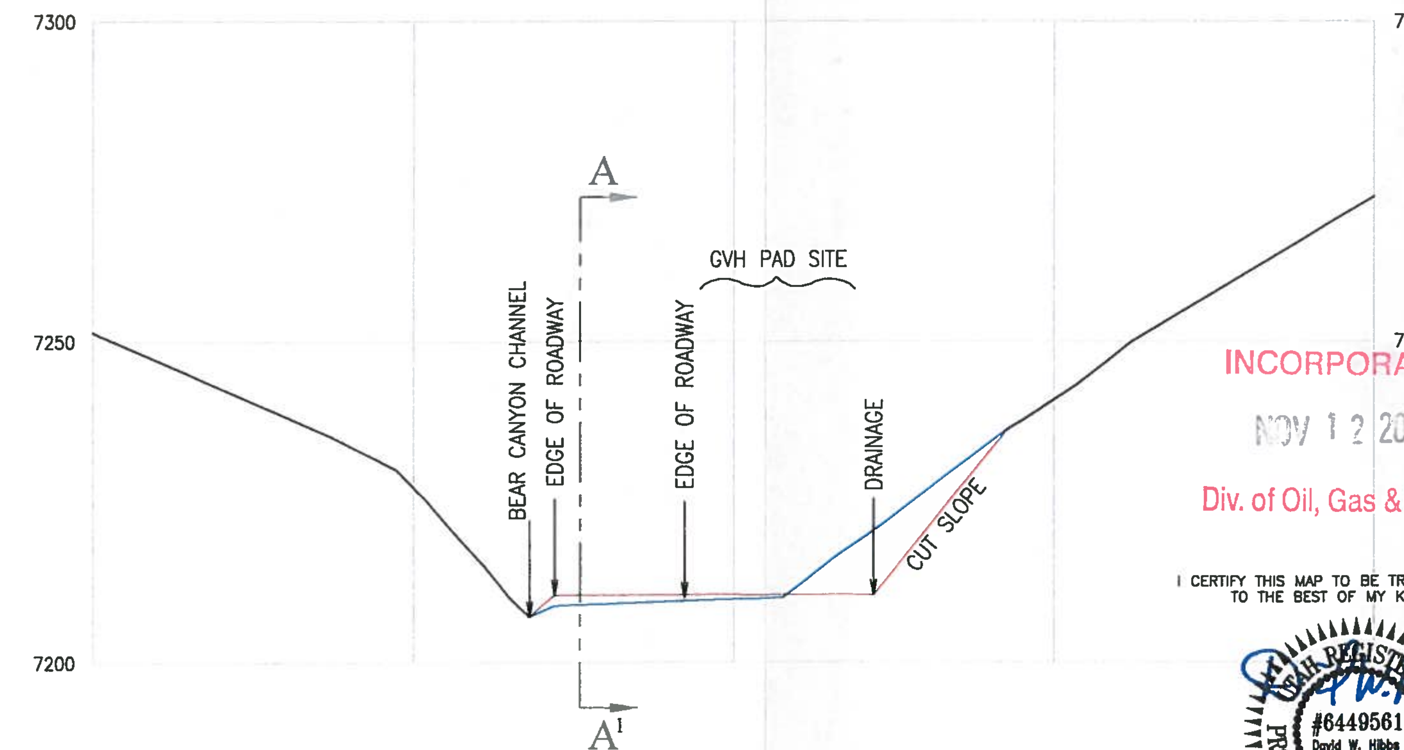


SECTION A-A1



SECTION B-B1



SECTION C-C1

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UTAH REGISTERED PROFESSIONAL ENGINEER #6449561 David W. Hibbs

WEST RIDGE RESOURCES, INC.

SCALE: 1"=30'

LEGEND:

Pre-construction Profile

Operational Profile

WEST RIDGE MINE

Bear Canyon GVH Typical Cross-Sections

DATE: 10-20-08 REV: 01 ACAD REF: GVH PAD

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ATTACHMENT 2

ORDER 1 SOILS SURVEY
LONG RESOURCE CONSULTANTS

Long Resource Consultants, Inc.
1960 W Deep Creek Road, Morgan, UT 84050-966, Office 801-829-6416, Cell 801-791-3447, Email lrcsoils@msn.com

Mr. Dave Shaver
Utah American Energy
West Ridge Mine
P.O. Box 1077
Price, Utah 84501

October 15, 2008

Dave,

Attached is the soils evaluation report for the Bear Canyon Gas Vent Hole location. It includes an assessment of existing soil conditions correlated to established soil series that are presently in use by the NRCS in either Carbon or Emery counties. An estimate of the potential topsoil salvage quantity is also included. All salvage operations should be closely monitored.

Thank you for the opportunity to conduct this soil resource evaluation for the Westridge Mine. Please contact me if you have any questions (801-791-3447).

Sincerely,

Robert E. Long, CPSS
President

Bear Canyon – Left Fork
Soils Evaluation

Gas Vent Hole

Location:	Easting	547580
	Northing	4387075
	Zone	12
	NAD	1983
	Township	14 South
	Range	13 East
	Section	3
	Meridian	Salt Lake
	USGS Quad: Mount Bartles, Utah	
Elevation:	7185 to 7240 feet	

Purpose of Soil Resource Assessment

The purpose of this soil resource assessment was to determine how closely the soils at the Bear Canyon Gas Vent Hole (GVH) site correlated with the Carbon County Soil Survey produced by the Natural Resource Conservation Service (NRCS, USDA 2007). Topsoil and subsoil salvage depths were estimated based on soil profile descriptions. Soil types vary across the site and monitoring should be part of the topsoil salvage operations.

The identification of hazardous or toxic materials was not part of this soil resource assessment.

Assessment Methods

This assessment was made by comparing the soil map unit delineated by the NRCS in the Carbon County Soil Survey with the soils actually identified at the site. Three soil profile descriptions were completed for the Bear Canyon GVH location using the Field *Book for Describing and Sampling Soils* (Schoeneberger, P.J., et. al., 2002).

The soil resource assessment was conducted by Robert E. Long, Certified Professional Soil Scientist (CPSS, No. 02346 ARCPACS) on October 7, 2008.

Taxonomic classification of the soil pedons was based on *Keys to Soil Taxonomy*, Tenth Edition (USDA 2006). The pedons were correlated to established soil series (USDA 2008) currently in use in Carbon and Emery Counties, Utah.

Soil colors were compared with color chips in the *Munsell Soil Color Charts* (Munsell 2000).

Soil pH was measured with field indicator dyes (phenol red and thymol blue).

Percent calcium carbonate was determined with a field calcimeter.

Digital photographs were taken at each soil profile location to document current conditions.

The *Soil Pit Location Map* was drawn to scale by Westridge mine staff. Elevations for each soil profile location were based on the soil map topographic lines. Soil area delineations were estimated in the field by visual observation of the cutbank.

Dominant vegetation was identified. A separate quantitative vegetation assessment is being prepared by Mt. Nebo Scientific.

Site locations were recorded with a Garmin GPSmap 60CSX in UTM, NAD 1983. The UTM location listed at the beginning of this report is for soil pit BC-GVH-02 which is located near the center of the Bear Canyon GVH evaluation area.

General Site Description

A soil resource evaluation was conducted at the Gas Vent Hole location in the right fork of Bear Canyon on October 7, 2008. The access road leading to the site had been upgraded just prior to the soils evaluation. The road upgrade exposed an 8 to 12 foot cutbank along the north side of the proposed GVH site. The Bear Canyon GVH location is 0.24 acres (*Soil Pit Location Map*).

The proposed GVH site is at the footslope of a very steep north-northwest facing mountain sideslope. Slopes on the GVH site range from 6 to 10 percent on the footslope and 25 to 40 percent above the footslope. Soils developed from alluvial and colluvial deposition.

Elevation at the site ranges from 7,185 to approximately 7,240 feet.

Estimated annual precipitation ranges from 20 to 35 inches based on the official soil series descriptions (USDA 2008).

Sandstone rock outcrops occur on the upslope perimeter and are shown on the *Soil Pit Location Map* as rock ledges.

NRCS Soil Map Unit

The south side of the right fork of Bear Canyon was delineated (NRCS 2007) as map unit 21 by the NRCS (Croydon loam, 8 to 30 percent slopes). Croydon soils are very deep with a thick mollic (dark) surface and an argillic horizon (Pachic Argicryoll, fine-loamy, mixed, superactive). Soils identified at the Bear Canyon GVH site were similar to Croydon, but they have calcic horizons and contain large amounts of subangular sandstone fragments. Descriptions of the soils identified at the Bear Canyon GVH site are in the *Topsoil Resource* section of this report.

The north side of the right fork of Bear Canyon was delineated (NRCS 2007) as map unit 84 (Podo – Rock outcrop complex, 50 to 70 percent slopes) by the NRCS. Disturbance is not anticipated on the north side of the right fork of Bear Canyon.

Soil Resource

Three soil pedons were evaluated along the access road cutbank. Soil pedon BC-GVH-01 was trimmed back with shovels, while pedons BC-GVH-02 and BC-GVH-03 were dug approximately 6 to 8 feet into the cutbank with a backhoe. Table 1 lists the taxonomic classification and correlated soil series for the described soil pedons. The location of each soil pedon is shown on the *Soil Pit Location map*.

Table 1. Taxonomic classification of Bear Canyon GVH soil profiles.

Pedon	Soil Series	Taxonomic Classification
1	Aagard skeletal taxadjunct	Calcic Pachic Argicryoll, loamy-skeletal, mixed, superactive
2	Northorn	Calcic Argicryoll, fine-loamy, mixed, superactive
3	Aagard	Calcic Pachic Argicryoll, fine-loamy, mixed, superactive

Coarse fragments ranging in size from gravels to stones and some boulders were observed in all three soil pedons. Percent, size, and location of sandstone fragments varied between and within the pits.

Each of the three soil pedons exhibited evidence of multiple episodes of alluvial and colluvial deposition. This determination was based on irregular changes in soil color, texture, carbonates, and rock fragments (size and percent).

Pedon BC-GVH-01 was located near the east end of the Bear Canyon GVH evaluation area, photos 1 through 3. This pedon is pachic with mollic soil colors extending to a depth of 17 inches. Rock fragments were approximately 40 percent in the surface 12 inches and none in the buried A horizon (2A, 12-17 inches). Rock fragment content below 17 inches ranged from 5 to 45 percent. Calcium carbonate percent increased significantly below 17 inches. The amount of calcium carbonate present in the soil met the requirements for a calcic horizon from 17 to 44 inches. This soil was correlated to a skeletal taxadjunct of the Aagard soil series.

Pedon BC-GVH-02 was located near the center of the Bear Canyon GVH evaluation area, photos 4 through 6. Mollic soil colors only extended to 12 inches in this pedon. Rock fragments ranged from 18 to 30 percent in the surface 12 inches; and from 10 to 70 percent below 12 inches. Calcium carbonate percent began to increase significantly at 12 inches. Two calcic horizons were present at 20 to 38 inches and from 51 to 84 inches. This soil was correlated to the Northorn soil series.

Pedon BC-GVH-03 was located near the west end of the Bear Canyon GVH evaluation area, photos 7 through 9. This pedon is pachic with mollic soil colors extending to a depth of 17 inches. Rock fragments were approximately 15 percent in the surface 17 inches; and ranged from 40 to 70 percent below 17 inches. Calcium carbonate percent ranged from 18 to 25 percent below 17 inches and met the requirements of a calcic horizon. This soil was correlated to the Aagard soil series.

Topsoil Salvage

The depth of topsoil salvage varies across the Bear Canyon GVH location. The GVH location was divided into three soil areas to describe the potential topsoil salvage depths. Table 2 illustrates the range of soil characteristics within each pedon that have an effect on topsoil suitability. The depth of suitable topsoil corresponds directly with the depth of mollic soil colors.

Large stones and boulders should be removed from the salvaged topsoil, as much as may be feasibly possible, during the salvage operations.

Table 2. Soil characteristics influencing topsoil suitability (Utah DOGM 2005).

Depth	Horizon	Mollic Soil Colors	pH[1]	$CaCO_3$ [2]	Rock Fragments[3]	Topsoil Salvage Depth	Topsoil Salvage Depth Determining Feature(s)
inches				%	%	inches	
BC-GVH-01							
2-0	Oi		Leaves, needles & twigs				
0-3	A1	Yes	7.6	6	40		
3-12	A2	Yes	7.6	11	40		
12-17	2A	Yes	7.9	8	0	17	
17-34	2Btk	No	8.4	16	45		Alkaline soil pH (>8.2), CaCO3% (>15), rock fragments (>35%).
34-44	3A	No	8.2	15	30		
44-56	3Bw	No	8.2	10	5		
56-84	4Bk	No	8.4	8	40		
BC-GVH-02							
2-0	Oi		Leaves, needles & twigs				
0-3	A	Yes	7.8	2	18		
3-12	Bt	Yes	7.9	8	30	12	
12-20	BC	No	8	12	40		Alkaline soil pH (>8.2), CaCO3% (>15), rock fragments (>35%).
20-38	2CA	No	8.1	19	10		
38-45	3Bk	No	8.2	15	70		
45-51	4A	Yes	7.9	5	10		
51-72	5Bk	No	8.4	15	70		
72-84	6C	No	8.1	9	15		
BC-GVH-03							
2-0	Oi		Leaves, needles & twigs				
0-4	A	Yes	7.6	3	15		
4-17	Bt	Yes	7.9	7	15	17	
17-30	BC	No	8.2	18	40		Alkaline soil pH (>8.2), CaCO3% (>15), rock fragments (>35%).
30-57	2CA	No	8.4	18	40		
57-90	3Bk	No	8.4	25	70		

1. Soil pH was measured with indicator dyes; good (6.2-8.2), fair (8.2-8.5), and poor (8.6-9.0).
2. Percent CaCO3 was measured with field calcimeter; good (<15%), fair (15-30%), and poor (>30%).
3. Percent rock fragments was estimated visually in the field; good (<35%), fair (35-65%), poor (>65%).

Topsoil suitability: Good Fair Poor

Table 3 lists the potential topsoil salvage depths and estimated quantities for the Bear Canyon GVH location. Topsoil depths may decrease as the slope increases. Topsoil salvage operations should be monitored by a Certified Professional Soil Scientist. The estimated total topsoil salvage quantity of 514.2 cubic yards will allow approximately 15 to 16 inches of topsoil to be spread evenly over the final graded surface of 0.24 acres.

Table 3. Potential topsoil salvage depths and estimated quantities by soil area and total GVH project location.

Soil Area	Soil Pedon	Potential Topsoil Depth[1]	Area[2]	Estimated Topsoil Quantity[3]
		inches	acres	cubic yards
A	1	17	0.08	182.8
B	2	12	0.05	80.7
C	3	17	0.11	251.4
Total			0.24	514.2

1. Potential topsoil salvage depth is based on depths observed in representative soil pedons evaluated in each soil area.
2. Area is based on acres measured by Westridge Mine staff and delineated on the *Soil Pit Location Map*.
3. Estimated topsoil salvage quantity is based on potential topsoil salvage depth and measured area.

Vegetation

The dominant vegetation community consists of an overstory of Douglas fir, bigtooth maple, and quaking aspen. The understory shrub community is dominated by mountain snowberry. The vegetation report written by Mt. Nebo Scientific contains a more detailed quantitative description of the site vegetation.

Reclamation Potential

The potential for successfully reclaiming the Bear Canyon GVH location is good based on the estimated quality and quantity of topsoil that may be salvaged.

Site Photos

Photo 1. Soil profile BC-GVH-01 located at the east end of the Bear Canyon GVH evaluation area. This soil was correlated to be a skeletal taxadjunct of the Aagard soil series (Calcic Pachic Argicryoll, loamy-skeletal, mixed, superactive).

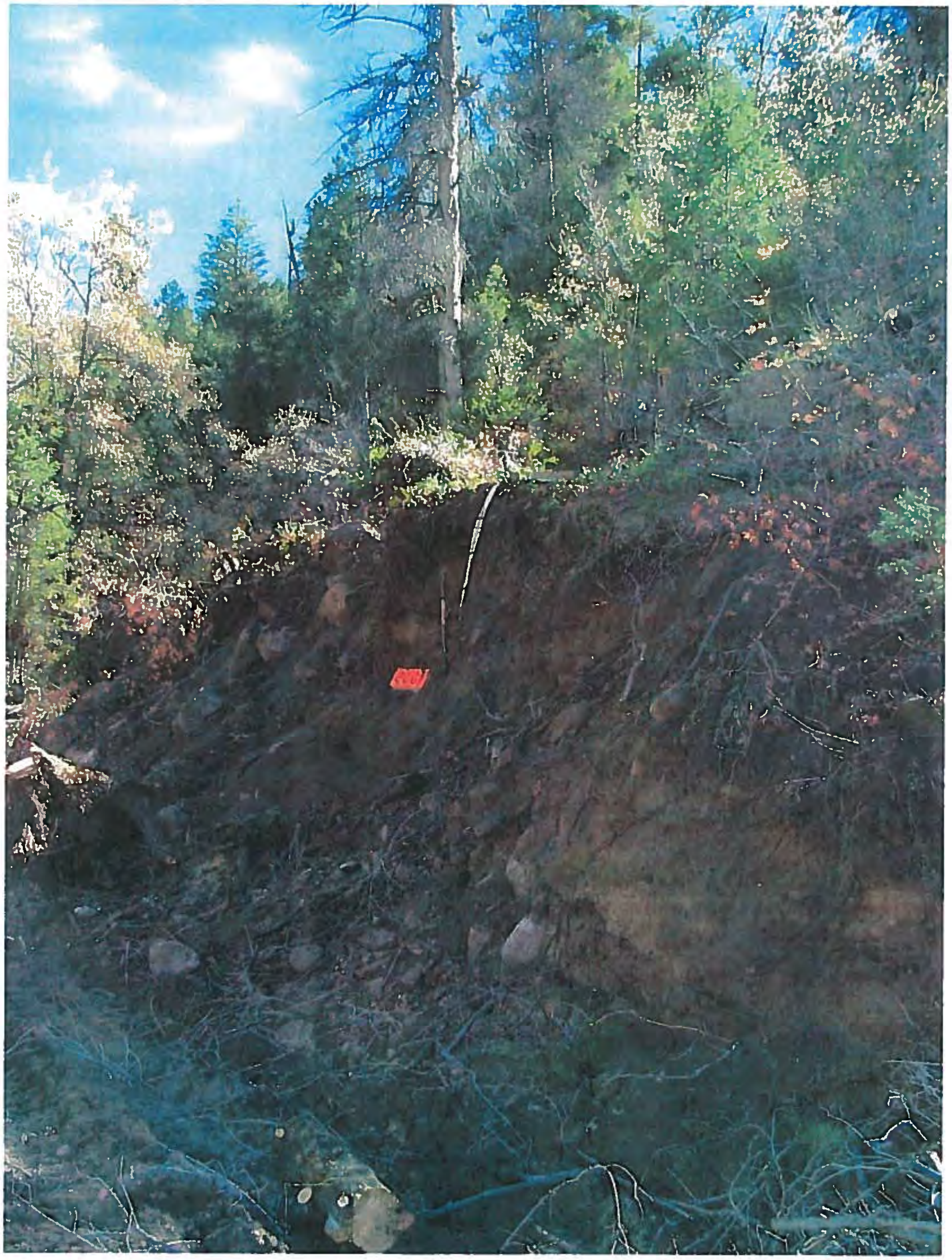

Photo 2. Location of soil profile BC-GVH-01 at east end of Bear Canyon soils evaluation area. Description was done in cutbank on convex knoll of mountain footslope.

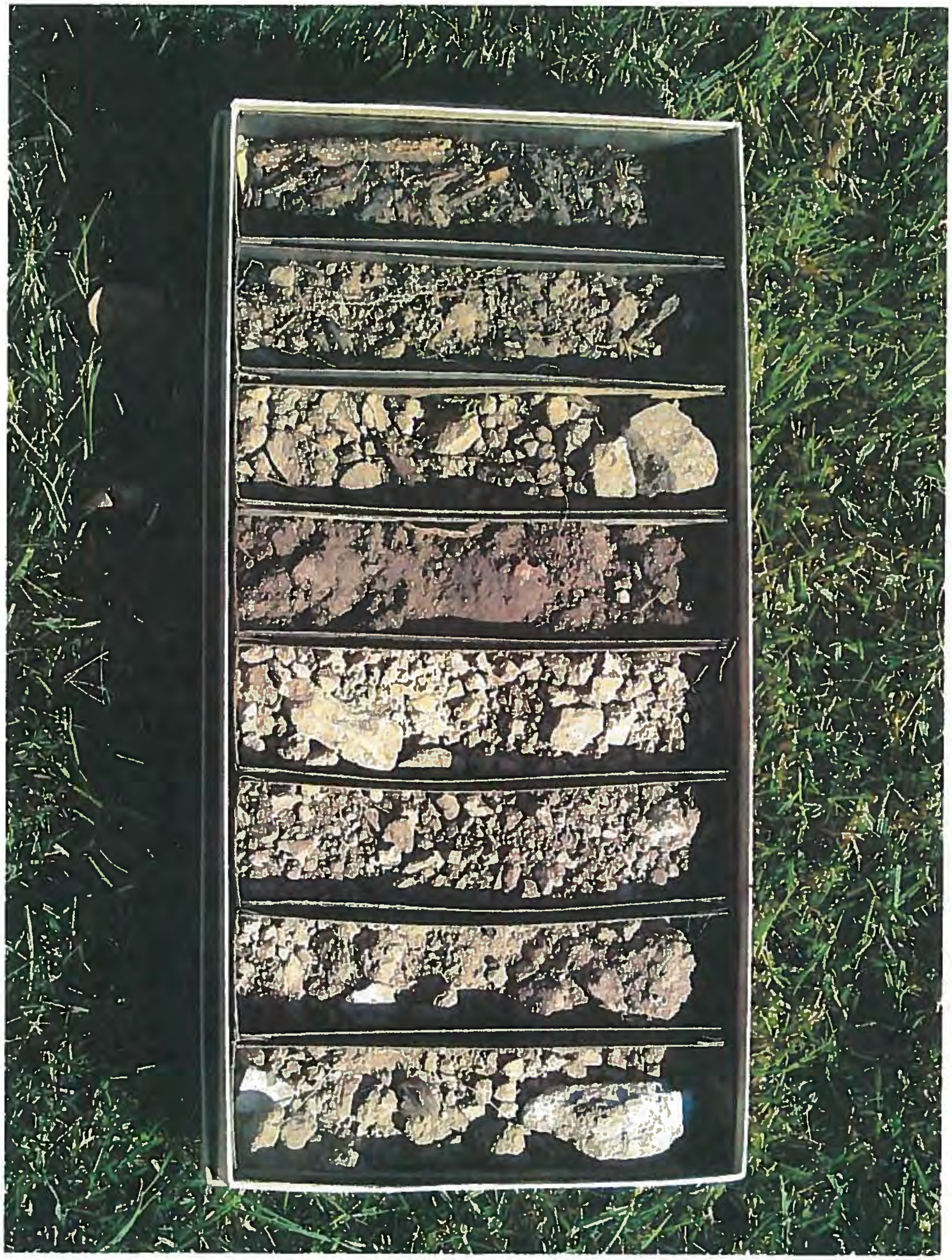

Photo 3.BC-GVH-01 pedon sample box. Top tray contains the Oi horizon (needles, leaves, and twigs). Potential topsoil salvage depth (0-17 inches) is limited to trays 2 (A1, 0-3 inches), 3 (A2, 3-12 inches), and 4 (2A, 12-17 inches) from top. The calcic horizon is contained in trays 5 (2Btk, 17-34 inches) and 6 (3A, 34-44 inches) from the top. Tray 8 (4Bk, 56-84 inches) has poor soil pH and poor percent rock fragments.

Photo 4. Soil profile BC-GVH-02 near center of Bear Canyon GVH evaluation area. Soil was correlated to Northorn series (Calcic Argicryolls, fine-loamy, mixed, superactive).

Photo 5. Location of soil profile BC-GVH-02 near center of Bear Canyon GVH soils evaluation area. Pit was on cutbank on concave mountain footslope near sandstone rock outcrop (at right in photo).

Photo 6. BC-GVH-02 soil pedon box. The Oi horizon is not displayed in box. Potential topsoil salvage depth is limited to the top trays 1 (A, 0-3 inches) and 2 (Bt, 3-12 inches) at the top of box. Soil material in tray 3 (BC, 12-20 inches) has 12 percent calcium carbonate with 40 percent rock fragments and was determined to not be suitable for topsoil salvage. The upper calcic horizon is contained in trays 4 (2CA, 20-38 inches) and 5 (3Bk, 38-45 inches) from the top. Tray 5 (4A, 45-51) inches contains a buried surface. The lower calcic horizon is in trays 7 (5Bk, 51-72 inches) and 8 (6C, 72-84 inches).

Photo 7. Soil profile BC-GVH-03 located near west end of Bear Canyon soils evaluation area. This soil was correlated to the Aagard series (Calcic Pachic Argicryoll, fine-loamy, mixed, superactive). Large boulders can be seen on the right next to the shovel and in the lower right.

Photo 8. Location of soil profile BC-GVH-03 on convex portion of a mountain footslope. This site is located between two sandstone outcrops (one is at left in photo).

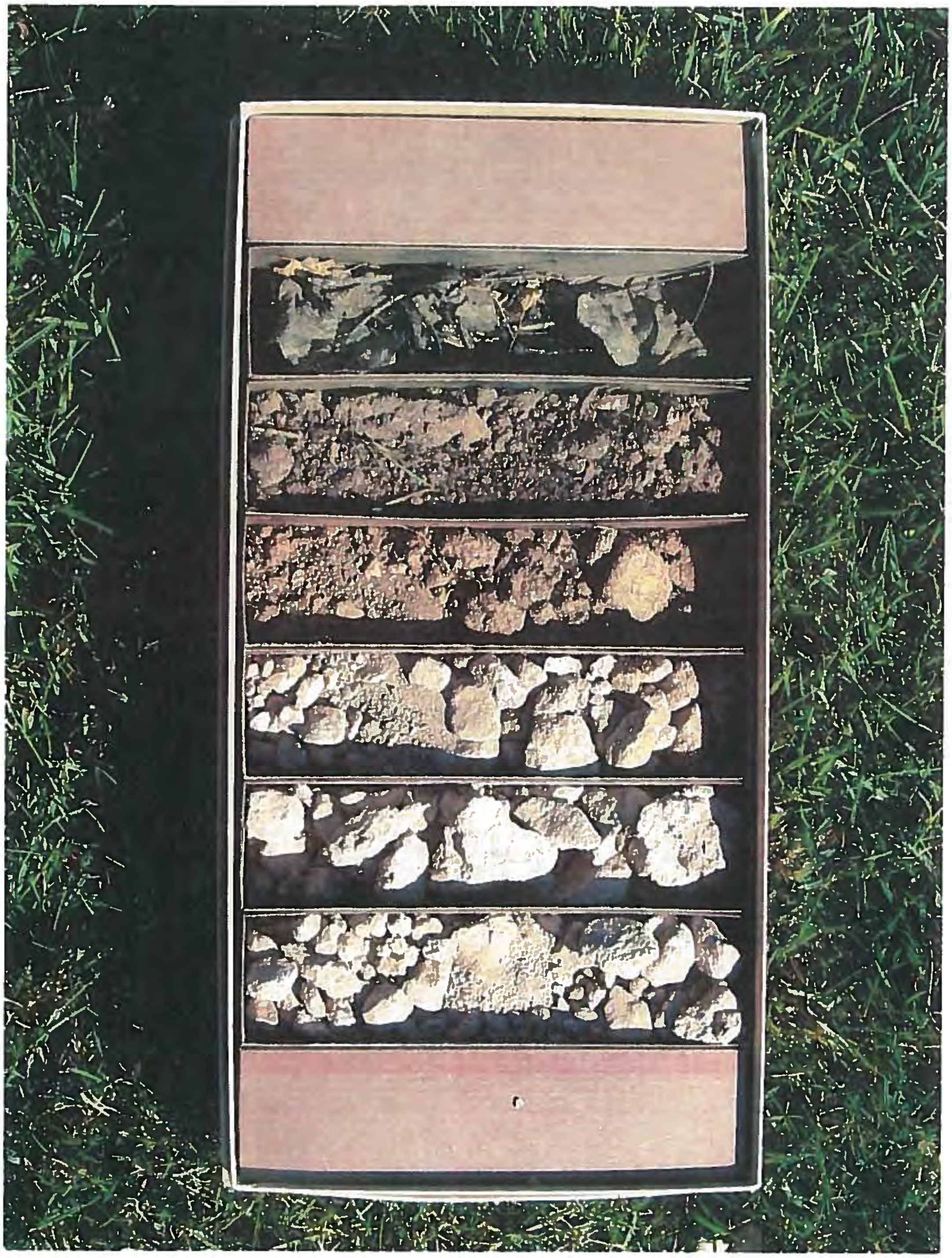

Photo 9. BC-GVH-03 soil pedon box. The Oi horizon (needles, leaves, and twigs) is in the top tray. Potential topsoil salvage depth is limited to trays 2 (A, 0-4 inches) and 3 (Bt, 4-17 inches) from the top. The calcic horizon is contained in trays 4 (BC, 17-30 inches), 5 (2CA, 30-57 inches), and 6 (3Bk, 57-90 inches) from the top. Soil texture in tray 6 is extremely stony loamy sand.

Literature Cited

Munsell Soil Color Charts, 2002.

Schoeneberger, P.J., Wysocki, D.A., Benham, E.C., and Broderson, W.D. (editors), 2002. Field Book for describing and sampling soils, Version 2.0. Natural Resource Conservation Service, National Soil Survey Center, Lincoln, NE.

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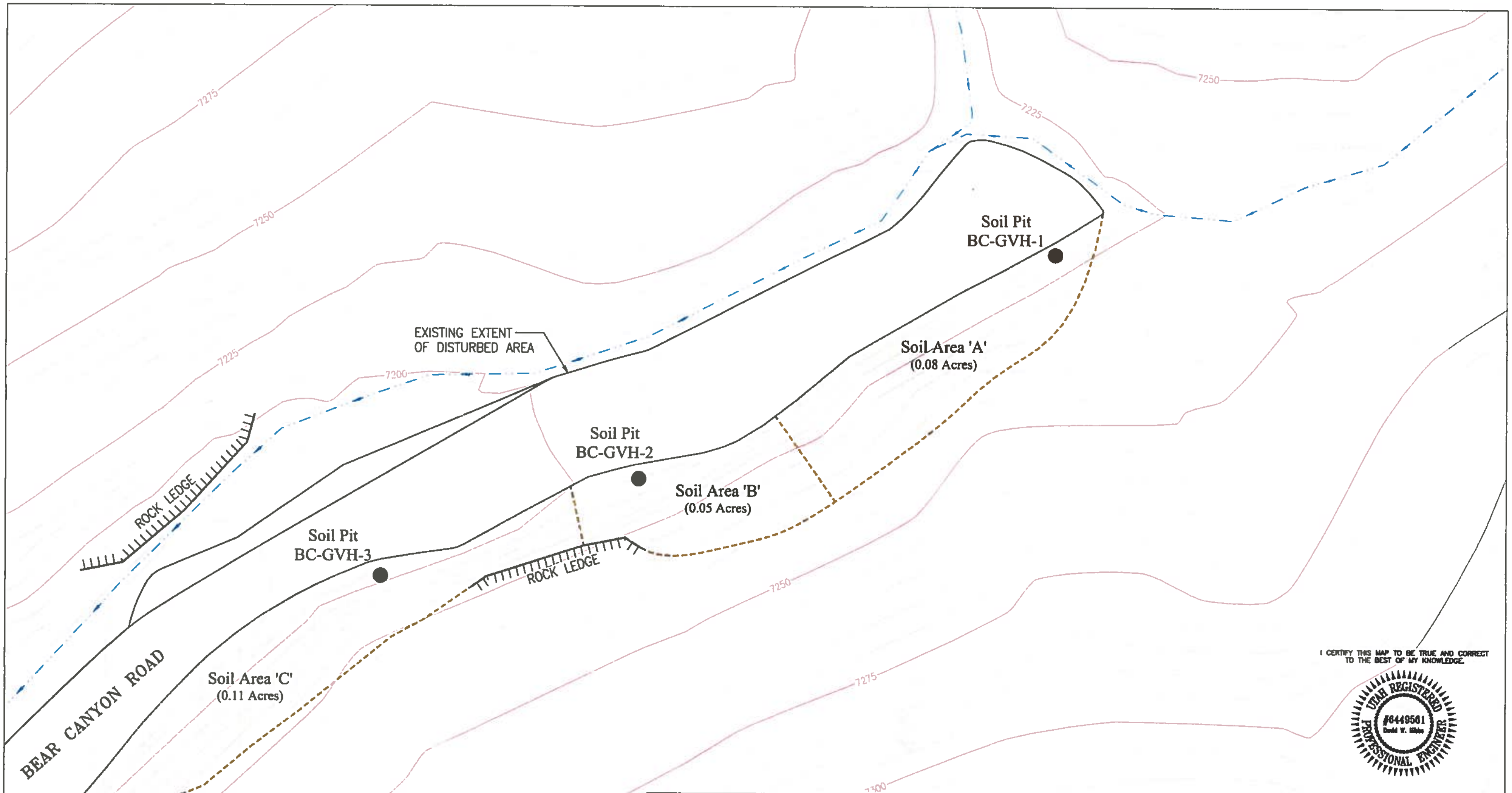
USDA – Natural Resource Conservation Service, 2008. Official Soil Series Descriptions (http://soils.usda.gov/technical/classification/osd/).

Utah Division of Oil, Gas, and Mining, October 2005. Guidelines for Management of Topsoil and Overburden.



WEST RIDGE MINE
Plate

Soil Pit Locations

DATE: 10-13-08 REV: 01 ACAD REF: SOIL PIT LOCATIONS

LEGEND:
Existing Index Contour
Existing Intermediate Contour
Existing Surface Drainage
Approx. New Disturbed Boundary

WEST RIDGE RESOURCES, INC.

SCALE: 1"=30'

USDA-NRCS **PEDON DESCRIPTION** PEDON ID #: BC-GVH-1 DRAFT 3/2002

Series or Component Name: Skeletal - Aagaard	Map Unit Symbol: A	Photo #:	Classification: Calcic Pachic Argicryoll Lo-skel, mix, super,	Soil Moist. Regime (Tax.): Ustic
Describer(s): Bob Long	Date: 10-7-08	Weather: clear	Temp.: Air: 56 Soil: Depth:	Latitude: ° ' " N Longitude: ° ' " W Datum: 1983
Location: Sec. 3 T. 14S R. 13E				
UTM: Zone: 12 / mE: 547614 / mN: 4387082	Topo Quad: Mt. Bartles UT	Site ID: Yr: State: County: Pedon #:	Soil Survey Area: Westridge	MLRA / LRU:
Transect: ID: Stop #: Interval:				
Landscape: Mo	Landform: Mo	Microfeature:	Anthro:	Elevation: 7215
Aspect: NNW 350	Slope (%): 8 40	Slope Complexity: Simple	Slope Shape: (Up & Dn / Across) Concave / convex	
Hillslope Profile Position: Footslope	Geom. Component: Lower 1/3	Microrelief:	Physio. Division:	Physio. Province:
Physio. Section:	State Physio. Area:	Local Physio. Area: Bear Canyon		
Drainage: Well	Flooding: No	Ponding: No	Soil Moisture Status: SM	Permeability: K_{sat}: mod slow
Land Cover / Use: Mixed Conifer Maple				
Parent Material: colluvium/residuum	Bedrock: Kind: Fract.: Hard.: Depth: sandstone	Lithostrat. Units: Group: Castlegate Formation: Member:		
Erosion: Kind: Degree: None	Runoff: mod slow	Surface Frag %: GR: — CB: — ST: 5 BD: 15 CN: — FL: — Kind:	Diagnostic Horz. / Prop.: Kind: Depth: Mollic 0-17" Argillic 17-34" Calcic-1 17-44" Calcic-2 56-84"	
P.S. Control Section: Depth Range: 17-34"	Ave. Clay %: 30	Ave. Rock Frag %: 45		

VEGETATION:

SYMBOL	COMMON NAME	
	Douglas Fir	
	Mtn Snowberry	
	Bigtooth maple	
	J. Aspen	

MISCELLANEOUS FIELD NOTES / SKETCH:

Component Name: Hagard-Skeletal **Map Unit Symbol:** A **Date:** 10-7-08

BC-GYH-1

	Obser. Method	Depth (in)	Horizon	Bnd	Matrix Color Dry	Matrix Color Moist	Texture	Rock Fragments Knd % / Rnd / Sz	Structure Grade Sz Type	Consistence Dry	Mst	Stk	Pls	Mottles % Sz Cn Col Mst Sp Loc
1	cut	2-0"	Oi	CS	Leaves needles + twigs									
2		0-3"	A1	CS	10YR 4/2	10YR 3/1	GRV L	GR 30 SAng SS; CB 10 SS	~~1 vfm sbk~~ 2 m gr	so	so	ss	sp	—
3		3-12"	A2	aw	10YR 4/3	10YR 3/2	GRV L	GR 30 SAng SS; CB 10 SS	2 fm sbk	sh	vfr	ss	sp	—
4		12-17"	2A	gs	10YR 3/2	10YR 2/1	L	—	2 fm sbk	sh	vfr	ss	sp	—
5		17-34"	2Btk	cw	10YR 6/3	10YR 5/3	GRV CL	GR 40 SAng SS; CB 3; ST 2	3 m sbk	h	fr	s	p	—
6		34-44"	3A	cs	10YR 5/3	10YR 4/2	GRV SCL	GR 25 SAng SS; CB 3; ST 2	2 f sbk	h	vfr	ss	sp	—
7		44-56"	3Bw	gs	10YR 5/3	10YR 4/3	SCL	GR 4 SAng SS; CB 1	1 fm sbk	sh	vfr	so	sp	—
8		56-84	4Bk		10YR 5/2	10YR 4/2	GRV SCL	GR 25; CB 10; ST 5	2 fm sbk	h	vfr	ss	sp	—
9														
10														

	Redoximorphic Features % Sz Cn Hd Sp Kd Loc Bd Col	Concentrations % Sz Cn Hd Sp Kd Loc Bd Col	Ped / V. Surface Features % Dst Cont Kd Loc Col	Roots Qty Sz Loc	Pores Qty Sz Shp	pH (meth)	Effer (agent)	Clay %	CCE	Notes
1	—	—				—				
2	—			3 vff 2 mc	3 vff 2 mc	7.6	NE	22 40	6	M
3	—			3 vff 2 mc	3 vff 2 mc	7.6	VS	22 40	11	M
4	—	—		3 vff 2 m1c	3 vff 2 mc	7.9	SL	24 30	8	M
5	—	15 CAC BRF / 5f 1-2 mm / CAM PF		3 vff 1 mc	3 vff 1 mc	8.4	ST	30 35	16	SM
6	—	10 CAC BRF 0-1 mm	—	3 vff 1 mc	3 vff 1 mc	8.2	SL	26 50	15	SM
7	—	2 CAC BRF 1-2 mm	—	3 vff 1 mc	3 vff 1 mc	8.2	SL	20 60	10	SM
8	—	40 CAC ARF 1-2 mm	—	3 vff 1 mc	3 vff 1 mc	8.4	ST	24 50	8	Dry
9										
10										

USDA-NRCS

PEDON DESCRIPTION

PEDON ID #: BGGVH-2 — DRAFT 3/2002

Series or Component Name: Northorn
Map Unit Symbol: B
Photo #:
Classification: Calcic Argicryolls fine-loamy, mix, super
Soil Moist. Regime (Tax.): Ustic

Describer(s): Bob Long
Date: 10-7-08
Weather: clear
Temp.: Air: 50 Soil: Depth:
Latitude: ° ' " N
Longitude: ° ' " W
Datum: 1983
Location: Sec. 3 T. 14S R. 13E

UTM: Zone: 12 / mE: 547580 / mN: 4387025
Topo Quad: Mt Bartles
Site ID: Yr: State: County: Pedon #:
Soil Survey Area: Westwide
MLRA / LRU:
Transect: ID: Stop #: Interval:

Landscape: Mo
Landform: Mo
Microfeature:
Anthro:
Elevation: 7205
Aspect: N 5
Slope (%): 24
Slope Complexity: Complex
Slope Shape: (Up & Dn / Across) concave / convex

Hillslope Profile Position: Footslope
Geom. Component: Lower 1/3
Microrelief:
Physio. Division:
Physio. Province:
Physio. Section:
State Physio. Area:
Local Physio. Area: Bear Canyon

Drainage: well
Flooding: No
Ponding: No
Soil Moisture Status: Sm -
Permeability: K_{sat}: mod
Land Cover / Use: Mixed Conifer

Parent Material: Alluvium over colluvium
Bedrock: Kind: Fract.: Hard.: Sandstone Depth:
Lithostrat. Units: Group: Castlegate Formation: Member:

Erosion: Kind: No Degree:
Runoff: Mod
Surface Frag %: GR: - CB: - ST: 5 BD: 10 CN: - FL: -
Kind:
Diagnostic Horz. / Prop.: Kind: Depth:
mollic 0-12"
argillic 3-12"
calcic-1 20-45"
calcic-2 51-72"

P.S. Control Section: Depth Range: 3-12"
Ave. Clay %: 26%
Ave. Rock Frag %: 30%

VEGETATION :

SYMBOL	COMMON NAME	
	Douglas fir	
	Aspen	
	Mtn snowberry	
	Bigtooth maple	

MISCELLANEOUS FIELD NOTES / SKETCH :

Topsoil 0-12"

North end of Rock outcrop

Component Name: Northern

Map Unit Symbol: B

Date: 10-2-08

BC-GVH-2

	Obser. Method	Depth (in)	Horizon	Bnd	Matrix Color Dry	Matrix Color Moist	Texture	Frag Knd,%	Rnd	Sz	Structure Grade	Sz	Type	Consistence Dry	Mst	Stk	Pls	Mottles % Sz Cn Col Mst Sp Loc
1	Pit	2-0"	Oi	as	Leaves, needles & twigs													
2	Pit	0-3"	A	as	10YR 4/3	10YR 3/2	ST SIL	GR 5 CB 3 ST 8		Sand SS	2 m sbk 2 f gr			sh	vfr	ss	sp	—
3	Pit	3-12"	Bt	cw	10YR 5/3	10YR 3/3	GR SCL	GR 20 CB 5 ST 5			2 m sbk			h	fr	ss	sp	—
4	Pit	12-20"	BC	as	10YR 6/3	10YR 5/3	GR SCL	GR 40			2 fm sbk			sh	vfr	so	po	—
5	Pit	20-38"	2CA	as	10YR 6/2	10YR 4/3	SL	GR 10			m			sh	vfr	so	po	—
6	Pit	38-45	3Bk	as	10YR 6/3	10YR 4/3	GRX SCL	GR 60 CB 10			m			h	vfr	ss	sp	—
7	Pit	45-51	4A	as	10YR 4/2	10YR 3/2	SiL	CB 10			2 m sbk			h	fr	s	sp	—
8	Pit	51-72	5Bk	cs	10YR 6/3	10YR 4/3	GRX CL	GR 50 CB 15 ST 5			2 m sbk			h	fr	s	p	—
9	Pit	72-84	6C		10YR 6/3	10YR 5/3	GR LS	GR 40 CB 5			SG			lo	lo	so	po	—
10																		

	Redoximorphic Features % Sz Cn Hd Sp Kd Loc Bd Col	Concentrations % Sz Cn Hd Sp Kd Loc Bd Col	Ped / V. Surface Features % Dst Cont Kd Loc Col	Roots Qty Sz Loc	Pores Qty Sz Shp	pH (meth)	Effer (agent)	Clay / Sand %	CCE	Notes
1										
2	—	—	—	2vff 2m1c	1vft	7.8	VS	20 / 20	2	
3	—	—	45 CLF PF/BR	3vf2f 1mc	1vft	7.9	VS	26 / 54	8	
4	—	40 CAC 1-3 mm BRF	—	2vff 1mc	2vfi	8.0	ST	22 / 50	12	
5	—	10 1-2 mm CAC ARF	—	2vff 1mc	2vfi	8.1	ST	14 / 55	19	1-2" A at 24"
6	—	70 1-2 mm CAC ARF	—	2vf 1f	1vft	8.2	VE	24 / 35	15	
7	—	—	—	1vff	2vfi	7.9	SL	24 / 15	5	
8	—	25 f CAM TH 70 1-4 mm CAC ARF	—	2vf 1f 1mc	1vft	8.4	VE	32 / 3C	15	
9	—	—	—	1vff	3vfi	8.1	ST	6 / 84	9	
10										

USDA-NRCS

PEDON DESCRIPTION

PEDON ID #: BC-6VH3 DRAFT 3/2002

Series or Component Name: Aagard
Map Unit Symbol: C
Photo #:
Classification: Calcic Pachic Argicryoll fine-loamy, mixed, super
Soil Moist. Regime (Tax.): USTIC

Describer(s): Bob Long
Date: 10-7-08
Weather: Clear
Temp.: Air: 48 **Soil:** **Depth:**
Latitude: ° ' " N **Longitude:** ° ' " W
Datum: 1983
Location: Sec. 3 T. 14S R. 13E

UTM: Zone: 12 / **mE:** 547545 / **mN:** 4387050
Topo Quad: Mt Bartles
Site ID: **Yr.** **State:** **County:** **Pedon #:**
Soil Survey Area: Westridge
MLRA / LRU:
Transect: ID: **Stop #:** **Interval:**

Landscape: Mo
Landform: Mo
Microfeature:
Anthro:
Elevation: 7195
Aspect: N 6°
Slope (%): 8
Slope Complexity: complex
Slope Shape: (Up & Dn / Across) Convex / convex

Hillslope Profile Position: Footslope
Geom. Component: Lower 1/3
Microrelief:
Physio. Division:
Physio. Province:
Physio. Section:
State Physio. Area:
Local Physio. Area: Bear Canyon

Drainage: Well
Flooding: No
Ponding: No
Soil Moisture Status: 0-17" moist 17-30" S.M
Permeability:
K_{sat}:
Land Cover / Use:

Parent Material: Colluvium
Bedrock: Kind: **Fract.:** **Hard.:** **Depth:** Sandstone
Lithostrat. Units: Group: **Formation:** **Member:** Castlegate

Erosion: Kind: **Degree:** None
Runoff: Mod
Surface Frag %: GR: – **CB:** – **ST:** 5 **BD:** 15 **CN:** **FL:**
Kind:
Diagnostic Horz. / Prop.: Kind: **Depth:** Mollic 0-17"; Argillic 4-30; Calcic 17-90"

P.S. Control Section: Depth Range: 4-24
Ave. Clay %: 25
Ave. Rock Frag %: 15

VEGETATION:

SYMBOL	COMMON NAME	
	Douglas Fir	
	Aspen	
	Rocky Mtn Juniper	
	Mtn Snowberry	
	Bigtooth maple	

MISCELLANEOUS FIELD NOTES / SKETCH:

Dry below 30"

Topsoil 0-30"

South end of Outcrop

calcic below 30"

% stony below 30"

BC - GVH - 3

Component Name: AAGARD | Map Unit Symbol: C | Date: 10-7-2008

	Obser. Method	Depth (in) (cm)	Horizon	Bnd	Matrix Color Dry	Matrix Color Moist	Texture	Fragments Knd,%	Rnd	Sz	Structure Grade	Sz	Type	Consistence Dry	Mst	Stk	Pls	Mottles % Sz Cn Col Mst Sp Loc
1	Pit	2-0"	Oi	as	leaves, needles, & twigs													—
2	Pit	0-4"	A1	cs	10YR 4/3	10YR 3/2	GR L	GR/10 ST 5	5-ang SS	0	1 f	m gr	sbk	sh	vfr	ss	sp	—
3	Pit	4-17"	Bt	cw	10YR 5/3	10YR 3/3	GR L	GR 10 CB 3 ST 2			2	m	sbk	sh	vfr	ss	sp	—
4	Pit	17-30"	Btk	cw	10YR 6/2	10YR 5/3	GRV SCL	GR 30 CB 3 ST 3			3	m	sbk	h	fr	ss	sp	—
5		30-57"	2Bk1	gs	10YR 6/3	10YR 5/4	STV CL	GR 10 CB 10 ST 20			3	m	sbk	h	fr	s	p	—
6		57-90"	3Bk2		10YR 7/3	10YR 6/3	STX SCL	GR 30 CB 10 ST 30			2	m	sbk	h	fr	ss	sp	—
7																		
8																		
9																		
10																		

	Redoximorphic Features % Sz Cn Hd Sp Kd Loc Bd Col	Concentrations % Sz Cn Hd Sp Kd Loc Bd Col	Ped / V. Surface Features % Dst Cont Kd Loc Col	Roots Qty-Sz Loc	Pores Qty-Sz-Shp	pH (meth)	Effer (agent)	Clay %	CCE	Notes
1	—	—								—
2	—	—	—	3vf2f 1mc	2vfi	7.6	NE	21 40	3	
3	—	—	40 CLF PF/BG	2vff 1mc	2vffi	7.9	VS	25 40	7	
4	—	40 CAC BRF 1-2mm	35 CLF BG	2vf 1f 2mc	1ft	8.2	ST	26 50	18	
5	—	50 mc CAM PF 40 CAC ARF 2-4mm	—	2vf 1fm	1vft	8.4	VE	30 30	18	
6	—	50 mc CAM PF 70 CAC ARF 2-4mm	—	1vff	1vft	8.4	VE	24 56	25	
7										
8										
9										
10										

Long Resource Consultants, Inc.
1960 W Deep Creek Road, Morgan, UT 84050-966, Office 801-829-6416, Cell 801-791-3447, Email lrcsoils@msn.com

Mr. Dave Shaver
Utah American Energy, Inc.
Westridge Mine
P.O. Box 1077
Price, UT 84501

Total Pages: 16

February 12, 2009

Dave,

Attached are the lab results for the Bear Canyon Gas Vent Hole (GVH) site. Lab analysis was completed by Energy Labs in Casper, Wyoming in accordance with the Utah Department of Oil, Gas, and Mining (UDOGM) *Guidelines for Management of Topsoil and Overburden* (2005), R645-301-200 Soils.

None of the sample analyses had unacceptable levels based on the DOGM *Guidelines for Management of Topsoil and Overburden* (2005). The following parameters had some sample results in the Fair or Poor categories.

- Saturation Percent – six samples had results in the *Poor* category ranging from 21.6 to 24.7% (DOGM lower limit for Good is 25.0%);

- Lime as $CaCO_3$ – thirteen of the nineteen samples had results in the *Fair* category ranging from 15.0 to 19.3 (DOGM *Fair* range is 15-30%);

- Soil pH – five samples had results in the *Fair* category (8.4 to 8.5) and six samples had results in the *Poor* category (8.7 to 9.0).

- Available Water Capacity (AWC) – fifteen of the nineteen samples had calculated available water capacity in the Fair range. This was primarily due to the high percentage of estimated rock fragments in the soil.

The following samples had results for some parameters in either the *Fair* or *Poor* categories.

BC-GVH-1

- 0 to 12 inches: pH was *Fair* (8.3) and AWC was *Fair* (0.07 in/in). This soil was salvaged for topsoil with the overlying organic horizon.

- 12 to 17 inches: lime as $CaCO_3$ was *Fair* (15.0%). This soil was salvaged as topsoil.

- <u>17 to 34 inches</u>: saturation percent (23.7%) was *Poor,* pH (8.6) was *Poor* lime as $CaCO_3$ was *Fair* (18.6%), and AWC was fair (0.06 in/in). Very limited amounts of this material may have been salvaged as topsoil.

- <u>34 to 44 inches</u>: saturation percent (24.7%) was *Poor,* pH (8.7) was *Poor* lime as $CaCO_3$ was *Fair* (18.2%), and AWC was *Fair* (0.07 in/in). This material was not salvaged as topsoil.

- <u>44 to 56 inches</u>: lime as $CaCO_3$ was *Fair* (16.9%) and AWC was *Fair* (0.09 in/in). This material was not salvaged as topsoil.

- <u>56 to 84 inches</u>: pH (8.3) was *Fair* , lime as $CaCO_3$ was *Fair* (18.6%), and AWC was Fair (0.07 on/in). This material was not salvaged as topsoil.

<u>BC-GVH-2</u>

- <u>0 to 3 inches</u>: all parameters listed as *Good*. This soil was salvaged as topsoil with overlying organic horizon.

- <u>3 to 12 inches</u>: lime as $CaCO_3$ was *Fair* (17.2%) and AWC was *Fair* (0.06 in/in).This soil was salvaged as topsoil.

- <u>12 to 20 inches</u>: saturation percent was *Poor* (24.6%), lime as $CaCO_3$ was *Fair* (17.4%), pH was *Fair* (8.5), and AWC was *Fair* (0.07 in/in). Limited amounts of this soil were salvaged as topsoil.

- <u>20 to 38 inches</u>: AWC was *Fair* (0.09 in/in). Limited amounts of this soil may have been salvaged as topsoil.

- <u>38 to 45 inches</u>: lime as CaCO3 was *Fair* (17.6%), pH was *Poor* (8.6), and AWC was *Fair* (0.05 in/in). This material was not salvaged as topsoil.

- <u>45 to 51 inches</u>: all parameters listed as *Good*. This soil was not salvaged as topsoil due to the poorer quality material overlying this horizon.

- <u>51 to 72 inches</u>: lime as CaCO3 was *Fair* (18.0%), pH was *Fair* (8.4), and AWC was *Fair* (0.06 in/in). This material was not salvaged as topsoil.

- <u>72 to 84 inches</u>: lime as CaCO3 was *Fair* (17.6%), pH was *Poor* (8.8), and AWC was *Fair* (0.07 in/in). This material was not salvaged as topsoil.

<u>BC-GVH-3</u>

- <u>0 to 4 inches</u>: all parameters listed as *Good*. This soil was salvaged as topsoil with overlying organic horizon.

- <u>4 to 17 inches</u>: AWC was *Fair* (0.09 in/in). This soil was salvaged as topsoil.

- 17 to 30 inches: lime as CaCO3 was *Fair* (18.4%), pH was *Poor* (8.6), and AWC was *Fair* (0.06 in/in). Very limited amounts of this material may have been salvaged as topsoil, but the majority was not salvaged as topsoil.

- 30 to 57 inches: saturation percent was Poor (21.6%), lime as CaCO3 was *Fair* (19.3%), pH was *Fair* (8.5), and AWC was *Fair* (0.06 in/in). This material was not salvaged as topsoil.

- 57 to 90 inches: saturation percent was Poor (22.7%), lime as CaCO3 was *Fair* (19.3%), pH was *Poor* (8.6), and AWC was *Fair* (0.05 in/in). This material was not salvaged as topsoil.

Attached with this summary are the original lab analysis results from Energy Labs in Casper, Wyoming and a spreadsheet highlighting the results according the Utah DOGM guidelines.

Sincerely,

Robert E. Long, CPSS
President

Bear Canyon - Gas Vent Hole (GVH)
Topsoil Analysis

February 12, 2009
Samples Collected: October 7, 2008
Analysis Completion Date: December 26, 2008

Project Sample ID	Depth	EC SatPaste	Saturation SatPaste	Lime as $CaCO_3$	pH SatPaste	NO_3 Soluble	Ca SatPaste	Mg SatPaste
	inches	mmhos/cm	%	%	s.u.	mg/kg-dry	meq/L	meq/L
BC-GVH-1	0-12	0.59	30.0	14.8	8.3	1.9	4.9	1.0
BC-GVH-1	12-17	0.47	34.3	15.0	8.1	1.3	4.1	0.7
BC-GVH-1	17-34	0.32	23.7	18.6	8.6	<1.0	2.2	0.6
BC-GVH-1	34-44	0.34	24.7	18.2	8.7	<1.0	2.0	0.9
BC-GVH-1	44-56	0.53	32.1	16.9	8.0	1.1	1.9	1.0
BC-GVH-1	56-84	0.37	31.3	15.4	8.3	1.4	2.3	1.5
BC-GVH-2	0-3	1.08	59.9	3.6	7.0	2.4	9.4	2.9
BC-GVH-2	3-12	0.49	29.8	17.2	8.2	<1.0	4.3	0.9
BC-GVH-2	12-20	0.29	24.6	17.4	8.5	<1.0	2.4	0.5
BC-GVH-2	20-38	0.42	27.8	12.4	8.2	1.1	3.4	1.0
BC-GVH-2	38-45	0.25	31.1	17.6	8.6	<1.0	2.0	0.6
BC-GVH-2	45-51	0.32	30.0	5.8	8.2	1.2	2.4	1.0
BC-GVH-2	51-72	0.33	26.4	18.0	8.4	1.1	2.5	1.1
BC-GVH-2	72-84	0.21	22.0	17.8	8.8	<1.0	1.5	0.7
BC-GVH-3	0-4	0.82	38.8	2.2	7.4	1.1	6.8	1.8
BC-GVH-3	4-17	0.22	30.9	7.8	7.8	1.2	1.8	0.4
BC-GVH-3	17-30	0.28	29.3	18.4	8.6	<1.0	2.3	0.4
BC-GVH-3	30-57	0.48	21.6	19.3	8.5	1.2	4.1	0.9
BC-GVH-3	57-90	0.20	22.7	19.3	8.6	<1.0	1.6	0.4

DOGM Suitability

Good	Fair	Poor	Unacceptable

Bear Canyon - Gas Vent I Bear Canyon - Gas Vent Hole (GVH) February 12, 2009

Topsoil Analysis Topsoil Analysis Samples Collected: October 7, 2008

Analysis Completion Date: December 26, 2008

Project Sample ID	Depth	K SatPaste	Na SatPaste	SAR	Very Fine Sand	Sand	Silt	Clay
	inches	meq/L	meq/L		%	%	%	%
BC-GVH-1	0-12	0.3	0.1	0.08	6	54	28	18
BC-GVH-1	12-17	0.2	0.09	0.06	13	50	24	26
BC-GVH-1	17-34	0.2	0.1	0.12	9	52	30	18
BC-GVH-1	34-44	0.2	0.4	0.34	8	58	20	22
BC-GVH-1	44-56	0.2	0.1	0.11	4	60	20	20
BC-GVH-1	56-84	0.3	0.3	0.21	10	49	27	24
BC-GVH-2	0-3	0.6	0.2	0.06	16	42	36	22
BC-GVH-2	3-12	0.2	0.2	0.10	9	68	14	18
BC-GVH-2	12-20	0.1	0.08	0.07	6	64	20	16
BC-GVH-2	20-38	0.2	0.2	0.10	11	58	22	20
BC-GVH-2	38-45	0.2	0.2	0.14	7	60	22	18
BC-GVH-2	45-51	0.1	0.1	0.08	12	44	30	26
BC-GVH-2	51-72	0.1	0.2	0.14	10	50	26	24
BC-GVH-2	72-84	0.09	0.3	0.31	10	70	14	16
BC-GVH-3	0-4	0.8	0.2	0.07	<1	22	56	22
BC-GVH-3	4-17	0.1	0.2	0.16	4	52	22	26
BC-GVH-3	17-30	0.2	0.2	0.18	7	62	20	18
BC-GVH-3	30-57	0.3	0.1	0.09	5	60	20	20
BC-GVH-3	57-90	0.08	0.2	0.24	4	58	20	22

DOGM Suitability	Good	Fair	Poor	Unacceptable

Bear Canyon - Gas Vent Bear Canyon - Gas Vent Hole (GVH) February 12, 2009
Topsoil Analysis Topsoil Analysis Samples Collected: October 7, 2008
Analysis Completion Date: December 26, 2008

Project Sample ID	Depth	Texture	K NH_4OAc	P Olsen-$NAHCO_3$	Organic Matter	Available Water Capacity	K Factor Calculated
	inches		meq/100g	mg/kg-dry	%	inches/inch	
BC-GVH-1	0-12	SL	0.82	14	3.7	0.07	0.12
BC-GVH-1	12-17	SCL	0.54	15	3.3	0.12	0.24
BC-GVH-1	17-34	L	0.35	6	0.9	0.06	0.32
BC-GVH-1	34-44	SCL	0.36	14	1.6	0.07	0.23
BC-GVH-1	44-56	SL SCL	0.40	8	1.9	0.09	0.16
BC-GVH-1	56-84	SCL	0.62	6	2.2	0.07	0.27
BC-GVH-2	0-3	L	0.66	26	8.0	0.13	0.20
BC-GVH-2	3-12	SL	0.22	19	1.4	0.06	0.16
BC-GVH-2	12-20	SL	0.22	15	1.2	0.05	0.19
BC-GVH-2	20-38	SL SCL	0.35	9	1.9	0.09	0.21
BC-GVH-2	38-45	SL	0.26	5	0.6	0.05	0.21
BC-GVH-2	45-51	L	0.45	6	3.2	0.12	0.27
BC-GVH-2	51-72	SCL	0.31	5	1.7	0.06	0.27
BC-GVH-2	72-84	SL	0.21	5	0.6	0.07	0.08
BC-GVH-3	0-4	SiL	1.2	20	5.9	0.16	0.18
BC-GVH-3	4-17	SCL	0.51	13	1.6	0.09	0.21
BC-GVH-3	17-30	SL	0.26	7	0.7	0.06	0.19
BC-GVH-3	30-57	SL SCL	0.23	5	0.3	0.06	0.18
BC-GVH-3	57-90	SCL	0.21	<5	0.5	0.05	0.22

DOGM Suitability	Good	Fair	Poor	Unacceptable

ENERGY LABORATORIES
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ANALYTICAL SUMMARY REPORT

December 26, 2008

Long Resource Consultants Inc
1960 W Deep Creek Rd
Morgan, UT 84050

Workorder No.: C08110437 Quote ID: C2967 - Westridge Soil Samples

Project Name: Westridge - Bear Canyon GVH

Energy Laboratories, Inc. received the following 19 samples for Long Resource Consultants Inc on 11/10/2008 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C08110437-001	BC-GVH-1 [0-12]	10/07/08 00:00	11/10/08	Soil	Cations, NH4OAc Extractable Cations, Saturated Paste Saturated Paste Electrical Conductivity Metals, NaHCO3 Extractable Lime as CaCO3 Nitrate+Nitrite as N, KCL Extract Organic Carbon Saturation Percentage Saturated Paste pH KCL Soil Extract Lime Percentage NaHCO3 Soil Extract NH4AC Soil Extraction Particle Size Analysis / Texture Prep Saturated Paste Total Organic Carbon Prep Particle Size Analysis / Texture Sodium Adsorption Ratio in Soil
C08110437-002	BC-GVH-1 [12-17]	10/07/08 00:00	11/10/08	Soil	Same As Above
C08110437-003	BC-GVH-1 [17-34]	10/07/08 00:00	11/10/08	Soil	Same As Above
C08110437-004	BC-GVH-1 [34-44]	10/07/08 00:00	11/10/08	Soil	Same As Above
C08110437-005	BC-GVH-1 [44-56]	10/07/08 00:00	11/10/08	Soil	Same As Above
C08110437-006	BC-GVH-1 [56-84]	10/07/08 00:00	11/10/08	Soil	Same As Above
C08110437-007	BC-GVH-2 [0-3]	10/07/08 00:00	11/10/08	Soil	Same As Above
C08110437-008	BC-GVH-2 [3-12]	10/07/08 00:00	11/10/08	Soil	Same As Above
C08110437-009	BC-GVH-2 [12-20]	10/07/08 00:00	11/10/08	Soil	Same As Above
C08110437-010	BC-GVH-2 [20-38]	10/07/08 00:00	11/10/08	Soil	Same As Above
C08110437-011	BC-GVH-2 [38-45]	10/07/08 00:00	11/10/08	Soil	Same As Above
C08110437-012	BC-GVH-2 [45-51]	10/07/08 00:00	11/10/08	Soil	Same As Above
C08110437-013	BC-GVH-2 [51-72]	10/07/08 00:00	11/10/08	Soil	Same As Above
C08110437-014	BC-GVH-2 [72-84]	10/07/08 00:00	11/10/08	Soil	Same As Above
C08110437-015	BC-GVH-3 [0-4]	10/07/08 00:00	11/10/08	Soil	Same As Above
C08110437-016	BC-GVH-3 [4-17]	10/07/08 00:00	11/10/08	Soil	Same As Above
C08110437-017	BC-GVH-3 [17-30]	10/07/08 00:00	11/10/08	Soil	Same As Above
C08110437-018	BC-GVH-3 [30-57]	10/07/08 00:00	11/10/08	Soil	Same As Above

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ANALYTICAL SUMMARY REPORT

C08110437-019	BC-GVH-3 [57-90]	10/07/08 00:00 11/10/08	Soil	Same As Above

As appropriate, any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

If you have any questions regarding these tests results, please call.

Report Approved By: Stephanie Waldrop

INCORPORATED
FEB 26 2009
Div. of Oil, Gas & Mining

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LABORATORY ANALYTICAL REPORT

Client: Long Resource Consultants Inc
Project: Westridge - Bear Canyon GVH
Workorder: C08110437

Report Date: 12/26/08
Date Received: 11/10/08

	Analysis		EC SatPst	Saturation SatPst	Lime as CaCO3	pH SatPst	NO3 Soluble	Ca SatPst	Mg SatPst	K SatPst	Na SatPst	SAR	Very Fine Sand	Sand	Silt
		Units	mmhos/cm	%	%	s_u_	mg/kg-dry	meq/L	meq/L	meq/L	meq/L	unitless	%	%	%
Sample ID	Client Sample ID	Depth	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results
C08110437-001	BC-GVH-1	0-12	0.59	30.0	14.8	8.3	1.9	4.9	1	0.3	0.1	0.08	6	54	28
C08110437-002	BC-GVH-1	12-17	0.47	34.3	15.0	8.1	1.3	4.1	0.7	0.2	0.09	0.06	13	50	24
C08110437-003	BC-GVH-1	17-34	0.32	23.7	18.6	8.6	< 1.0	2.2	0.6	0.2	0.1	0.12	9	52	30
C08110437-004	BC-GVH-1	34-44	0.34	24.7	18.2	8.7	< 1.0	2.0	0.9	0.2	0.4	0.34	8	58	20
C08110437-005	BC-GVH-1	44-56	0.53	32.1	16.9	8.0	1.1	1.9	1.0	0.2	0.1	0.11	4	60	20
C08110437-006	BC-GVH-1	56-84	0.37	31.3	15.4	8.3	1.4	2.3	1.5	0.3	0.3	0.21	10	49	27
C08110437-007	BC-GVH-2	0-3	1.08	59.9	3.6	7.0	2.4	9.4	2.9	0.6	0.2	0.06	16	42	36
C08110437-008	BC-GVH-2	3-12	0.49	29.8	17.2	8.2	< 1.0	4.3	0.9	0.2	0.2	0.10	9	68	14
C08110437-009	BC-GVH-2	12-20	0.29	24.6	17.4	8.5	< 1.0	2.4	0.5	0.1	0.08	0.07	6	64	20
C08110437-010	BC-GVH-2	20-38	0.42	27.8	12.4	8.2	1.1	3.4	1	0.2	0.2	0.10	11	58	22
C08110437-011	BC-GVH-2	38-45	0.25	31.1	17.6	8.6	< 1.0	2.0	0.6	0.2	0.2	0.14	7	60	22
C08110437-012	BC-GVH-2	45-51	0.32	30.0	5.8	8.2	1.2	2.4	1	0.1	0.1	0.08	12	44	30
C08110437-013	BC-GVH-2	51-72	0.33	26.4	18.0	8.4	1.1	2.5	1.1	0.1	0.2	0.14	10	50	26
C08110437-014	BC-GVH-2	72-84	0.21	22.0	17.8	8.8	< 1.0	1.5	0.7	0.09	0.3	0.31	10	70	14
C08110437-015	BC-GVH-3	0-4	0.82	38.8	2.2	7.4	1.1	6.8	1.8	0.8	0.2	0.07	< 1	22	56
C08110437-016	BC-GVH-3	4-17	0.22	30.9	7.8	7.8	1.2	1.8	0.4	0.1	0.2	0.16	4	52	22
C08110437-017	BC-GVH-3	17-30	0.28	29.3	18.4	8.6	< 1.0	2.3	0.4	0.2	0.2	0.18	7	62	20
C08110437-018	BC-GVH-3	30-57	0.48	21.6	19.3	8.5	1.2	4.1	0.9	0.3	0.1	0.09	5	60	20
C08110437-019	BC-GVH-3	57-90	0.20	22.7	19.3	8.6	< 1.0	1.6	0.4	0.08	0.2	0.24	4	58	20

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LABORATORY ANALYTICAL REPORT

Client: Long Resource Consultants Inc
Project: Westridge - Bear Canyon GVH
Workorder: C08110437

Report Date: 12/26/08
Date Received: 11/10/08

	Analysis		Clay	Texture	K NH4OAc	P, Olsen-NAHCO3	Organic Matter
	Units		%		meq/100g	mg/kg-dry	%
Sample ID	Client Sample ID	Depth	Results	Results	Results	Results	Results
C08110437-001	BC-GVH-1	0-12	18	SL	0.82	14	3.7
C08110437-002	BC-GVH-1	12-17	26	SCL	0.54	15	3.3
C08110437-003	BC-GVH-1	17-34	18	L	0.35	6	0.9
C08110437-004	BC-GVH-1	34-44	22	SCL	0.36	14	1.6
C08110437-005	BC-GVH-1	44-56	20	SL SCL	0.40	8	1.9
C08110437-006	BC-GVH-1	56-84	24	SCL	0.62	6	2.2
C08110437-007	BC-GVH-2	0-3	22	L	0.66	26	8.0
C08110437-008	BC-GVH-2	3-12	18	SL	0.22	19	1.4
C08110437-009	BC-GVH-2	12-20	16	SL	0.22	15	1.2
C08110437-010	BC-GVH-2	20-38	20	SL SCL	0.35	9	1.9
C08110437-011	BC-GVH-2	38-45	18	SL	0.26	5	0.6
C08110437-012	BC-GVH-2	45-51	26	L	0.45	6	3.2
C08110437-013	BC-GVH-2	51-72	24	SCL	0.31	5	1.7
C08110437-014	BC-GVH-2	72-84	16	SL	0.21	5	0.6
C08110437-015	BC-GVH-3	0-4	22	SiL	1.2	20	5.9
C08110437-016	BC-GVH-3	4-17	26	SCL	0.51	13	1.6
C08110437-017	BC-GVH-3	17-30	18	SL	0.26	7	0.7
C08110437-018	BC-GVH-3	30-57	20	SL SCL	0.23	5	0.3
C08110437-019	BC-GVH-3	57-90	22	SCL	0.21	< 5	0.5

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QA/QC Summary Report

Client: Long Resource Consultants Inc
Project: Westridge - Bear Canyon GVH

Report Date: 12/26/08
Work Order: C08110437

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: ASA15-5								Batch: 20594	
Sample ID: C08110437-019ADUP	Sample Duplicate				Run: PSA_081121A			11/21/08 10:28	
Sand	58.0	%	1.0				0	20	
Silt	20.0	%	1.0				0	20	
Clay	22.0	%	1.0				0	20	
Sample ID: LCS-20594	Laboratory Control Sample				Run: PSA_081121A			11/21/08 10:28	
Sand	94.0	%	1.0	97	85	115			
Method: ASA29-3								Batch: 20648	
Sample ID: MBLK-1	Method Blank				Run: HACH DR3000_081124A			11/24/08 06:43	
Organic Carbon, Total (TOC)	0.09	%	0.02						
Organic Matter, Total (TOM)	0.2	%	0.03						
Sample ID: LCS-2	Laboratory Control Sample				Run: HACH DR3000_081124A			11/24/08 06:43	
Organic Carbon, Total (TOC)	1.5	%	0.10	98	70	120			
Organic Matter, Total (TOM)	2.6	%	0.17	95	70	120			
Sample ID: C08110437-004ADUP	Sample Duplicate				Run: HACH DR3000_081124A			11/24/08 06:45	
Organic Carbon, Total (TOC)	0.90	%	0.10				5.4	20	
Organic Matter, Total (TOM)	1.6	%	0.17				5.4	20	
Method: ASA29-3								Batch: 20649	
Sample ID: C08110712-004ADUP	Sample Duplicate				Run: HACH DR3000_081124A			11/24/08 06:48	
Organic Carbon, Total (TOC)	0.40	%	0.10				2.5	20	
Organic Matter, Total (TOM)	0.69	%	0.17				2.5	20	
Sample ID: MBLK-44	Method Blank				Run: HACH DR3000_081124A			11/24/08 06:48	
Organic Carbon, Total (TOC)	0.06	%	0.02						
Organic Matter, Total (TOM)	0.1	%	0.03						
Sample ID: LCS-45	Laboratory Control Sample				Run: HACH DR3000_081124A			11/24/08 06:48	
Organic Carbon, Total (TOC)	1.5	%	0.10	98	70	120			
Organic Matter, Total (TOM)	2.6	%	0.17	95	70	120			
Method: ASAM10-3								Batch: 20583	
Sample ID: LCS-20583	Laboratory Control Sample				Run: COND1-C_081119A			11/19/08 12:59	
Conductivity, paste extract	3.48	mmhos/cm	0.010	112	70	130			
Sample ID: C08110437-004ADUP	Sample Duplicate				Run: COND1-C_081119A			11/19/08 13:06	
Conductivity, paste extract	0.345	mmhos/cm	0.010				0	20	

Qualifiers:

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QA/QC Summary Report

Client: Long Resource Consultants Inc
Project: Westridge - Bear Canyon GVH

Report Date: 12/26/08
Work Order: C08110437

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: ASAM10-3									Batch: 20584
Sample ID: LCS-20584	Laboratory Control Sample				Run: COND1-C_081119B				11/19/08 13:08
Conductivity, paste extract	2.69	mmhos/cm	0.010	87	70	130			
Sample ID: C08110437-019ADUP	Sample Duplicate				Run: COND1-C_081119B				11/19/08 13:14
Conductivity, paste extract	0.202	mmhos/cm	0.010				0.5	20	
Method: ASAM10-3.2									Batch: 20583
Sample ID: LCS-20583	Laboratory Control Sample				Run: COND1-C_081119A				11/19/08 12:59
pH, sat. paste	2.2	s.u.	0.10	93	80	120			
Sample ID: C08110437-004ADUP	Sample Duplicate				Run: COND1-C_081119A				11/19/08 13:06
pH, sat. paste	8.7	s.u.	0.10				0.2	20	
Method: ASAM10-3.2									Batch: 20584
Sample ID: LCS-20584	Laboratory Control Sample				Run: COND1-C_081119B				11/19/08 13:08
pH, sat. paste	2.3	s.u.	0.10	100	80	120			
Sample ID: C08110437-019ADUP	Sample Duplicate				Run: COND1-C_081119B				11/19/08 13:14
pH, sat. paste	8.6	s.u.	0.10				0.1	20	
Method: E353.2									Batch: 20573
Sample ID: MB-20573	Method Blank				Run: TECHNICON_081125A				11/25/08 12:43
Nitrogen, Nitrate+Nitrite as N	0.9	mg/kg-dry	0.3						
Sample ID: LCS-20573	Laboratory Control Sample				Run: TECHNICON_081125A				11/25/08 12:45
Nitrogen, Nitrate+Nitrite as N	21.8	mg/kg-dry	1.0	125	75	125			
Sample ID: C08110437-019AMS	Sample Matrix Spike				Run: TECHNICON_081125A				11/25/08 13:40
Nitrogen, Nitrate+Nitrite as N	20.9	mg/kg-dry	1.0	120	80	120			
Sample ID: C08110437-019AMSD	Sample Matrix Spike				Run: TECHNICON_081125A				11/25/08 13:43
Nitrogen, Nitrate+Nitrite as N	21.0	mg/kg-dry	1.0	121	80	120			S
Method: SW6010B									Batch: 20576
Sample ID: MB-20576	Method Blank				Run: ICP2-C_081203A				12/03/08 15:12
Phosphorus	3	mg/kg-dry	1						
Sample ID: LCS-20576	Laboratory Control Sample				Run: ICP2-C_081203A				12/03/08 15:16
Phosphorus	39.1	mg/kg-dry	5.0	146	70	130			S
Sample ID: C08110437-019ADUP	Sample Duplicate				Run: ICP2-C_081203A				12/03/08 17:45
Phosphorus	ND	mg/kg-dry	28	-19			0	20	S

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QA/QC Summary Report

Client: Long Resource Consultants Inc
Project: Westridge - Bear Canyon GVH

Report Date: 12/26/08
Work Order: C08110437

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6020									Batch: 20577
Sample ID: MB-20577	Method Blank				Run: ICPMS4-C_081202A				12/02/08 17:37
Potassium	2	mg/kg	0.10						
Sample ID: LCS-20577	Laboratory Control Sample				Run: ICPMS4-C_081202A				12/02/08 17:43
Potassium	59	mg/kg	10	30	50	150			S
Sample ID: C08110437-019ADUP	Sample Duplicate				Run: ICPMS4-C_081202A				12/02/08 22:52
Potassium	81	mg/kg	10				5.8	20	
Method: SW6020									Batch: 20583
Sample ID: MB-20583	Method Blank				Run: ICPMS4-C_081129A				11/29/08 13:44
Calcium	ND	mg/L	0.006						
Magnesium	0.004	mg/L	0.0005						
Potassium	0.01	mg/L	0.010						
Sodium	0.02	mg/L	0.006						
Sample ID: LCS-20583	Laboratory Control Sample				Run: ICPMS4-C_081129A				11/29/08 13:50
Calcium	58.7	mg/L	1.0	117	85	115			S
Magnesium	53.2	mg/L	1.0	106	85	115			
Potassium	55.4	mg/L	1.0	111	85	115			
Sodium	53.9	mg/L	1.0	108	85	115			
Sample ID: C08110437-004ADUP	Sample Duplicate				Run: ICPMS4-C_081129A				11/29/08 17:14
Calcium	38.7	mg/L	1.0				2	30	
Magnesium	10.2	mg/L	1.0				1.8	30	
Potassium	8.56	mg/L	1.0				2.2	30	
Sodium	9.39	mg/L	1.0				0.3	30	

Qualifiers:

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QA/QC Summary Report

Client: Long Resource Consultants Inc
Project: Westridge - Bear Canyon GVH

Report Date: 12/26/08
Work Order: C08110437

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6020									Batch: 20584
Sample ID: MB-20584	Method Blank				Run: ICPMS4-C_081201A				12/01/08 20:23
Calcium	0.01	mg/L	0.006						
Magnesium	0.002	mg/L	0.0005						
Potassium	0.02	mg/L	0.010						
Sodium	0.006	mg/L	0.006						
Sample ID: LCS-20584	Laboratory Control Sample				Run: ICPMS4-C_081201A				12/01/08 20:30
Calcium	43.3	mg/L	1.0	86	85	115			
Magnesium	41.4	mg/L	1.0	83	85	115			S
Potassium	42.7	mg/L	1.0	85	85	115			
Sodium	42.0	mg/L	1.0	84	85	115			S
Sample ID: C08110437-005AMS4	Sample Matrix Spike				Run: ICPMS4-C_081201A				12/01/08 20:44
Calcium	50.4	mg/L	1.0	97	75	125			
Magnesium	25.2	mg/L	1.0	101	75	125			
Potassium	19.8	mg/L	1.0	106	75	125			
Sodium	15.7	mg/L	1.0	102	75	125			
Sample ID: C08110437-005AMSD4	Sample Matrix Spike Duplicate				Run: ICPMS4-C_081201A				12/01/08 20:51
Calcium	50.5	mg/L	1.0	98	75	125	0.2	20	
Magnesium	25.7	mg/L	1.0	105	75	125	2.1	20	
Potassium	19.9	mg/L	1.0	106	75	125	0.3	20	
Sodium	16.2	mg/L	1.0	105	75	125	2.7	20	
Sample ID: C08110437-019ADUP	Sample Duplicate				Run: ICPMS4-C_081201A				12/01/08 23:34
Calcium	32.7	mg/L	1.0				0.8	30	
Magnesium	4.88	mg/L	1.0				1.2	30	
Potassium	3.01	mg/L	1.0				2.5	30	
Sodium	5.54	mg/L	1.0				0.7	30	
Method: USDA23c									Batch: 20619
Sample ID: LCS-20619	Laboratory Control Sample				Run: ORION 3 STAR PH_081120B				11/20/08 13:01
Lime as CaCO3	2.70	%	0.10	108	70	120			
Sample ID: MB-20619	Method Blank				Run: ORION 3 STAR PH_081120B				11/20/08 13:01
Lime as CaCO3	ND	%	0.1						
Sample ID: C08110437-019ADUP	Sample Duplicate				Run: ORION 3 STAR PH_081120B				11/20/08 13:44
Lime as CaCO3	18.2	%	0.10				6	20	

Qualifiers:

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ND - Not detected at the reporting limit.

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QA/QC Summary Report

Client: Long Resource Consultants Inc
Project: Westridge - Bear Canyon GVH

Report Date: 12/26/08
Work Order: C08110437

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: USDA27a									Batch: R111193
Sample ID: LCS-20583	Laboratory Control Sample				Run: SARTORIUS_081119A				11/18/08 10:21
Saturation Percentage	50.6	%	0.10	101	80	120			
Sample ID: C08110437-004ADUP	Sample Duplicate				Run: SARTORIUS_081119A				11/18/08 10:25
Saturation Percentage	25.2	%	0.10				2	20	
Method: USDA27a									Batch: R111195
Sample ID: LCS-20584	Laboratory Control Sample				Run: SARTORIUS_081118E				11/18/08 10:27
Saturation Percentage	50.1	%	0.10	100	80	120			
Sample ID: C08110437-019ADUP	Sample Duplicate				Run: SARTORIUS_081118E				11/18/08 10:30
Saturation Percentage	24.1	%	0.10				6	20	

Qualifiers:

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CLIENT: Long Resource Consultants Inc
Project: Westridge - Bear Canyon GVH
Sample Delivery Group: C08110437

Date: 26-Dec-08

CASE NARRATIVE

Key to Texture Results:
C = Clay
SiC = Silty Clay
SiCL = Silty Clay Loam
SC = Sandy Clay
SCL = Sandy Clay Loam
CL = Clay Loam
Si = Silt
SiL = Silt Loam
L = Loam
S = Sand
LS = Loamy Sand
SL = Sandy Loam

ORIGINAL SAMPLE SUBMITTAL(S)
All original sample submittals have been returned with the data package.

SAMPLE TEMPERATURE COMPLIANCE: 4°C (±2°C)
Temperature of samples received may not be considered properly preserved by accepted standards. Samples that are hand delivered immediately after collection shall be considered acceptable if there is evidence that the chilling process has begun.

GROSS ALPHA ANALYSIS
Method 900.0 for gross alpha and gross beta is intended as a drinking water method for low TDS waters. Data provided by this method for non potable waters should be viewed as inconsistent.

SOIL/SOLID SAMPLES
All samples reported on an as received basis unless otherwise indicated.

ATRAZINE, SIMAZINE AND PCB ANALYSIS USING EPA 505
Data for Atrazine and Simazine are reported from EPA 525.2, not from EPA 505. Data reported by ELI using EPA method 505 reflects the results for seven individual Aroclors. When the results for all seven are ND (not detected), the sample meets EPA compliance criteria for PCB monitoring.

SUBCONTRACTING ANALYSIS
Subcontracting of sample analyses to an outside laboratory may be required. If so, ENERGY LABORATORIES will utilize its branch laboratories or qualified contract laboratories for this service. Any such laboratories will be indicated within the Laboratory Analytical Report.

BRANCH LABORATORY LOCATIONS
eli-b - Energy Laboratories, Inc. - Billings, MT
eli-g - Energy Laboratories, Inc. - Gillette, WY
eli-h - Energy Laboratories, Inc. - Helena, MT
eli-r - Energy Laboratories, Inc. - Rapid City, SD
eli-t - Energy Laboratories, Inc. - College Station, TX

CERTFICATIONS:
USEPA: WY00002; FL-DOH NELAC: E87641; California: 02118CA
Oregon: WY200001; Utah: 3072350515; Virginia: 00057; Washington: C1903

ISO 17025 DISCLAIMER:
The results of this Analytical Report relate only to the items submitted for analysis.

ENERGY LABORATORIES, INC. - CASPER,WY certifies that certain method selections contained in this report meet requirements as set forth by the above accrediting authorities. Some results requested by the client may not be covered under these certifications. All analysis data to be submitted for regulatory enforcement should be certified in the sample state of origin. Please verify ELI's certification coverage by visiting www.energylab.com

ELI appreciates the opportunity to provide you with this analytical service. For additional information and services visit our web page www.energylab.com.

THIS IS THE FINAL PAGE OF THE LABORATORY ANALYTICAL REPORT

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QA/QC Summary Report

Client: Long Resource Consultants Inc
Project: Westridge - Bear Canyon GVH

Report Date: 12/26/08
Work Order: C08110437

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6020									Batch: 20584
Sample ID: MB-20584	Method Blank				Run: ICPMS4-C_081201A				12/01/08 20:23
Calcium	0.01	mg/L	0.006						
Magnesium	0.002	mg/L	0.0005						
Potassium	0.02	mg/L	0.010						
Sodium	0.006	mg/L	0.006						
Sample ID: LCS-20584	Laboratory Control Sample				Run: ICPMS4-C_081201A				12/01/08 20:30
Calcium	43.3	mg/L	1.0	86	85	115			
Magnesium	41.4	mg/L	1.0	83	85	115			S
Potassium	42.7	mg/L	1.0	85	85	115			
Sodium	42.0	mg/L	1.0	84	85	115			S
Sample ID: C08110437-005AMS4	Sample Matrix Spike				Run: ICPMS4-C_081201A				12/01/08 20:44
Calcium	50.4	mg/L	1.0	97	75	125			
Magnesium	25.2	mg/L	1.0	101	75	125			
Potassium	19.8	mg/L	1.0	106	75	125			
Sodium	15.7	mg/L	1 0	102	75	125			
Sample ID: C08110437-005AMSD4	Sample Matrix Spike Duplicate				Run: ICPMS4-C_081201A				12/01/08 20:51
Calcium	50.5	mg/L	1.0	98	75	125	0.2	20	
Magnesium	25.7	mg/L	1.0	105	75	125	2.1	20	
Potassium	19.9	mg/L	1.0	106	75	125	0.3	20	
Sodium	16.2	mg/L	1.0	105	75	125	2.7	20	
Sample ID: C08110437-019ADUP	Sample Duplicate				Run: ICPMS4-C_081201A				12/01/08 23:34
Calcium	32.7	mg/L	1.0				0.8	30	
Magnesium	4.88	mg/L	1.0				1.2	30	
Potassium	3.01	mg/L	1.0				2.5	30	
Sodium	5.54	mg/L	1.0				0.7	30	
Method: USDA23c									Batch: 20619
Sample ID: LCS-20619	Laboratory Control Sample				Run: ORION 3 STAR PH_081120B				11/20/08 13:01
Lime as CaCO3	2.70	%	0.10	108	70	120			
Sample ID: MB-20619	Method Blank				Run: ORION 3 STAR PH_081120B				11/20/08 13:01
Lime as CaCO3	ND	%	0.1						
Sample ID: C08110437-019ADUP	Sample Duplicate				Run: ORION 3 STAR PH_081120B				11/20/08 13:44
Lime as CaCO3	18.2	%	0.10				6	20	

Qualifiers:

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S - Spike recovery outside of advisory limits.

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QA/QC Summary Report

Client: Long Resource Consultants Inc
Project: Westridge - Bear Canyon GVH

Report Date: 12/26/08
Work Order: C08110437

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: USDA27a								Batch: R111193	
Sample ID: LCS-20583	Laboratory Control Sample				Run: SARTORIUS_081119A			11/18/08 10:21	
Saturation Percentage	50.6	%	0.10	101	80	120			
Sample ID: C08110437-004ADUP	Sample Duplicate				Run: SARTORIUS_081119A			11/18/08 10:25	
Saturation Percentage	25.2	%	0.10				2	20	
Method: USDA27a								Batch: R111195	
Sample ID: LCS-20584	Laboratory Control Sample				Run: SARTORIUS_081118E			11/18/08 10:27	
Saturation Percentage	50.1	%	0.10	100	80	120			
Sample ID: C08110437-019ADUP	Sample Duplicate				Run: SARTORIUS_081118E			11/18/08 10:30	
Saturation Percentage	24.1	%	0.10				6	20	

Qualifiers:

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ND - Not detected at the reporting limit.

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CLIENT: Long Resource Consultants Inc
Project: Westridge - Bear Canyon GVH
Sample Delivery Group: C08110437

Date: 26-Dec-08

CASE NARRATIVE

Key to Texture Results:
C = Clay
SiC = Silty Clay
SiCL = Silty Clay Loam
SC = Sandy Clay
SCL = Sandy Clay Loam
CL = Clay Loam
Si = Silt
SiL = Silt Loam
L = Loam
S = Sand
LS = Loamy Sand
SL = Sandy Loam

ORIGINAL SAMPLE SUBMITTAL(S)
All original sample submittals have been returned with the data package.

SAMPLE TEMPERATURE COMPLIANCE: 4°C (±2°C)
Temperature of samples received may not be considered properly preserved by accepted standards. Samples that are hand delivered immediately after collection shall be considered acceptable if there is evidence that the chilling process has begun.

GROSS ALPHA ANALYSIS
Method 900.0 for gross alpha and gross beta is intended as a drinking water method for low TDS waters. Data provided by this method for non potable waters should be viewed as inconsistent.

SOIL/SOLID SAMPLES
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ATRAZINE, SIMAZINE AND PCB ANALYSIS USING EPA 505
Data for Atrazine and Simazine are reported from EPA 525.2, not from EPA 505. Data reported by ELI using EPA method 505 reflects the results for seven individual Aroclors. When the results for all seven are ND (not detected), the sample meets EPA compliance criteria for PCB monitoring.

SUBCONTRACTING ANALYSIS
Subcontracting of sample analyses to an outside laboratory may be required. If so, ENERGY LABORATORIES will utilize its branch laboratories or qualified contract laboratories for this service. Any such laboratories will be indicated within the Laboratory Analytical Report.

BRANCH LABORATORY LOCATIONS
eli-b - Energy Laboratories, Inc. - Billings, MT
eli-g - Energy Laboratories, Inc. - Gillette, WY
eli-h - Energy Laboratories, Inc. - Helena, MT
eli-r - Energy Laboratories, Inc. - Rapid City, SD
eli-t - Energy Laboratories, Inc. - College Station, TX

CERTFICATIONS:
USEPA: WY00002; FL-DOH NELAC: E87641; California: 02118CA
Oregon: WY200001; Utah: 3072350515; Virginia: 00057; Washington: C1903

ISO 17025 DISCLAIMER:
The results of this Analytical Report relate only to the items submitted for analysis.

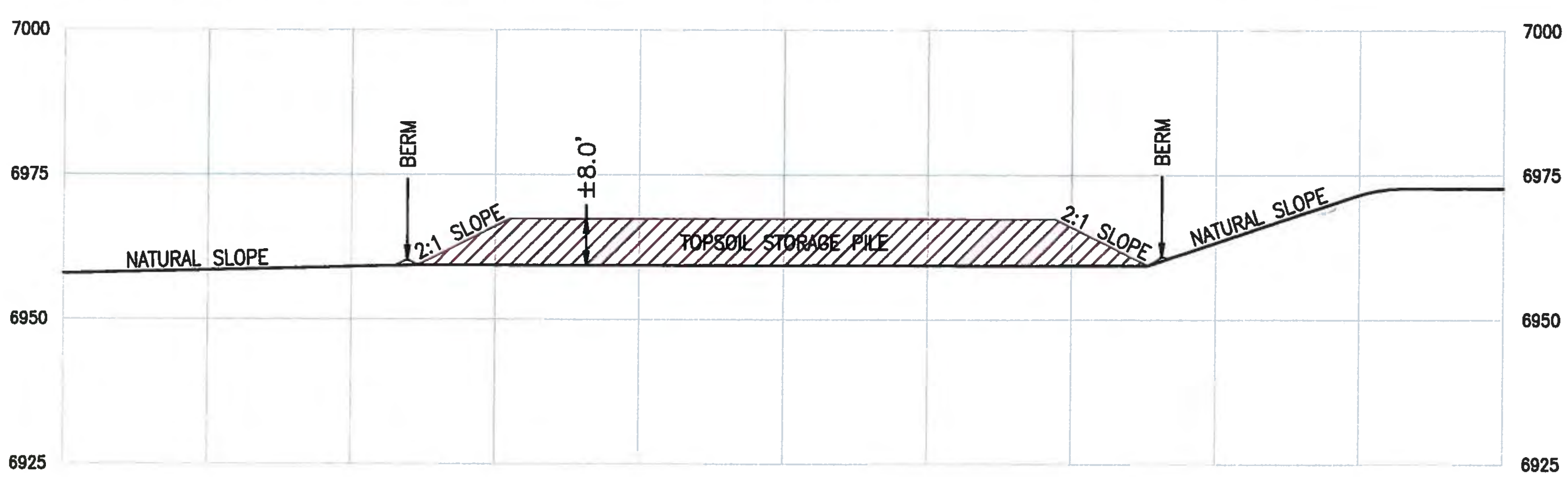
ENERGY LABORATORIES, INC. - CASPER,WY certifies that certain method selections contained in this report meet requirements as set forth by the above accrediting authorities. Some results requested by the client may not be covered under these certifications. All analysis data to be submitted for regulatory enforcement should be certified in the sample state of origin. Please verify ELI's certification coverage by visiting www.energylab.com

ELI appreciates the opportunity to provide you with this analytical service. For additional information and services visit our web page www.energylab.com.

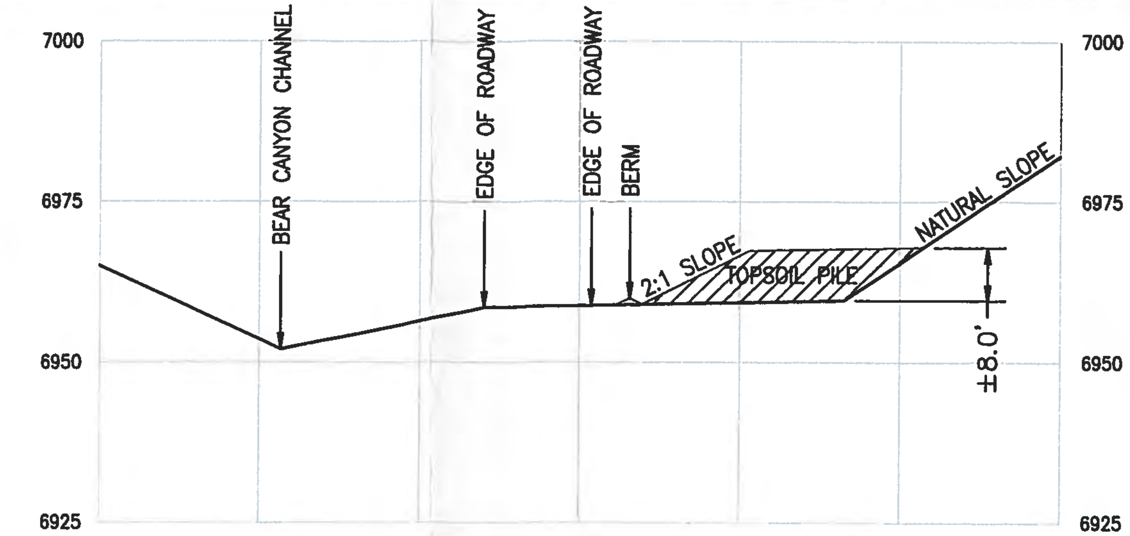
THIS IS THE FINAL PAGE OF THE LABORATORY ANALYTICAL REPORT

ATTACHMENT 3

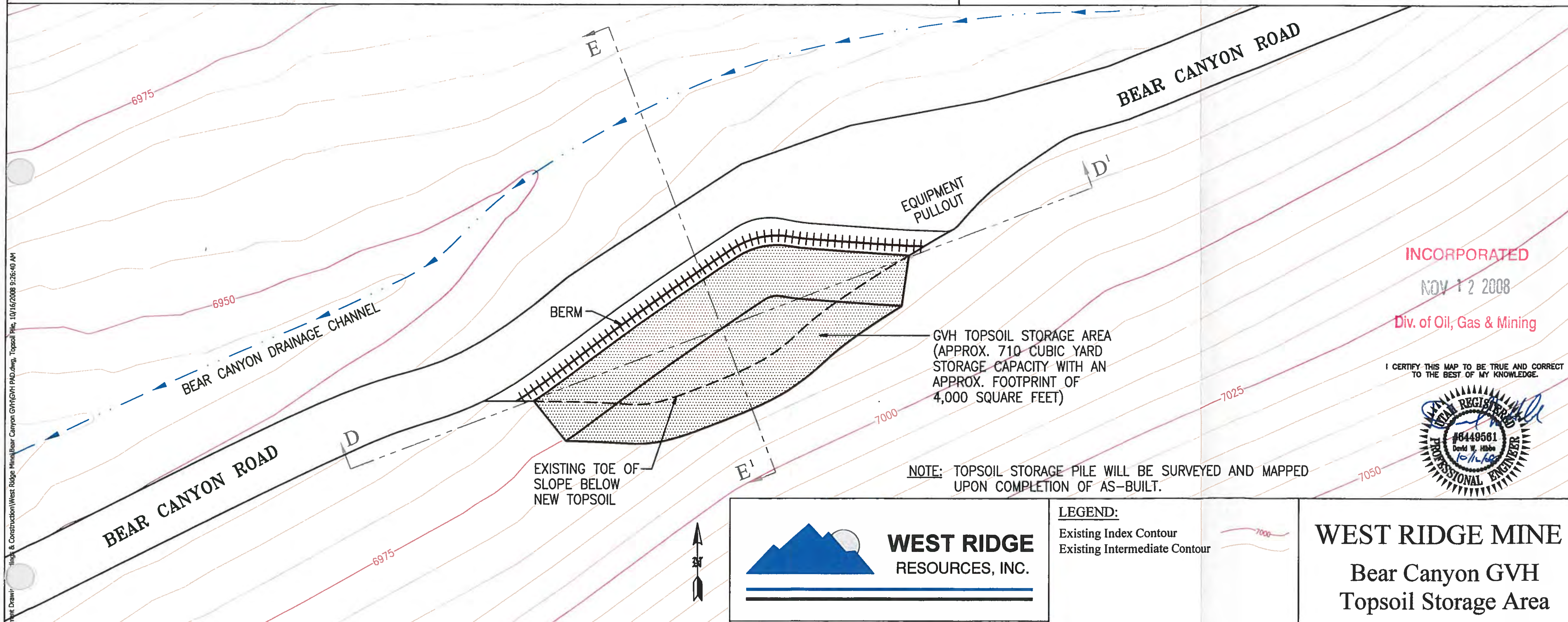
TOPSOIL STORAGE AREA



SECTION D-D[1]



SECTION E-E[1]



NOTE: TOPSOIL STORAGE PILE WILL BE SURVEYED AND MAPPED UPON COMPLETION OF AS-BUILT.

INCORPORATED
NOV 12 2008
Div. of Oil, Gas & Mining

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

UTAH REGISTERED PROFESSIONAL ENGINEER #6449561 David W. Hibbs 10/16/08

TOPSOIL STORAGE AREA PLAN

WEST RIDGE RESOURCES, INC.

SCALE: 1"=30'

LEGEND:
Existing Index Contour
Existing Intermediate Contour

WEST RIDGE MINE
Bear Canyon GVH
Topsoil Storage Area

DATE 10-16-08 REV: 01 ACAD REF GVH PAD

ATTACHMENT 4

VEGETATION REPORT
MT. NEBO SCIENTIFIC

MT NEBO SCIENTIFIC, INC.
research & consulting

HAPPY HALLOWEEN

October 15, 2008

Dave Shaver
ANDALEX RESOURCES
P.O. Box 902
Price, Utah 84501

Dear Dave:

Enclosed please find one bound copy of the following report for the West Ridge Mine.

**Vegetation of the
GVH Site in
Bear Canyon,
Book Cliffs, Utah**

**For the
West Ridge Mine,
Carbon County, Utah**

An electronic file of the report was also submitted in an email to you previously. Please call if you have questions or comments.

Sincerely,

(Transmitted Electronically)

Patrick D. Collins, Ph.D.
Biologist/Environmental Consultant

Enclosures

330 East 400 South, Ste. 6, P.O. Box 337, Springville, Utah 84663
(801) 489-6937, (fax) 489-6779

Vegetation of the GVH Site in Bear Canyon, Book Cliffs, Utah

For the West Ridge Mine, Carbon County, Utah

Right Fork of Bear Canyon

Prepared by

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

Patrick D. Collins, Ph.D.

for

ANDALEX RESOURCES
Post Office Box 902
Price, Utah 84501

October 2008

TABLE OF CONTENTS

INTRODUCTION

Operations at the West Ridge Mine has found it necessary to construct a gas vent hole (GVH) as a safety measure to continue mining activities in their underground coal mine. The proposed GVH site is located in the right (east) fork of Bear Canyon within the Book Cliffs plateau in Carbon County, Utah. The site is less than one-quarter acre in size (0.24 acre).

This report provides the results from quantitative sampling the plant community that will be disturbed as a result of the drilling activities necessary to construct the GVH. The native plant community that will be disturbed is a Douglas Fir/ Maple community. This report also provides data from a "reference area" that could be used for future revegetation success standards following final reclamation of the site. Results from threatened, endangered and sensitive plant survey as well as a vegetation and sample location map of the area have also been provided herein.

METHODS

Methodologies used for this study were performed in accordance with the guidelines supplied by the State of Utah, Division of Oil, Gas and Mining (DOGM). Quantitative and qualitative data were recorded within the plant communities proposed GVH site on September 24, 2008. The reference area proposed for this site was sampled in the growing season of 1998.

Sampling Design and Transect/Quadrat Placement

Transect lines for vegetation sampling were placed randomly within the boundaries of the proposed disturbed and reference areas. The transect placement technique was employed with the goal to adequately sample a representative subset of the entire site. Once the transects were established, quadrat locations for sampling were chosen using random numbers from the transect lines with the objective to record data without preconceived bias.

Cover and Composition

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

Woody Species Density

Density of woody plant species for the proposed disturbed and reference areas were estimated using the point-quarter method. In this method, random points were placed on the sample sites and measured into four quarters. The distances to the nearest woody plant species were then recorded in each quarter. The average point-to-individual distance was equal to the square root of the mean area per individual. The number of individuals per acre was the end results of the calculations.

Sample Size & Adequacy

Sampling adequacy for cover and density was attempted by using the formula given below.

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

where,

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

Statistical Analyses

Student's t-tests were employed to compare the total living cover and total woody species density of each proposed disturbed GVH site with its reference area.

Photographs

Color photographs of the sample areas were taken at the time of sampling and have been submitted with this report.

Threatened & Endangered Plant Species

Prior to recording quantitative data on the plant communities, a sensitive plant species survey was conducted. To initiate the study, appropriate agencies had been consulted and other sources were reviewed (sensitive species files at *Mt. Nebo Scientific, Inc.*) for potential plant species that are known to be rare, endemic, threatened, endangered or otherwise sensitive in the study area.

Raw Data

The raw data for cover and density have been summarized on a spreadsheet and is available upon request.

RESULTS

Proposed Disturbed Douglas Fir/Maple Community

The plant community proposed for disturbance by construction of the GVH site is that of a

Douglas Fir/Maple community. Dominants, and equally represented in the understory cover estimates, were Douglas fir (*Pseudotsuga menziesii*) and bigtooth maple (*Acer grandidentatum*). These tree species also dominated the overstory cover. Grasses and forbs played a relatively minor role in the plant cover of the community. For a list of all species present in the sample quadrats along with their cover and frequency values, refer to Table 1.

The total living cover including overstory and understory cover of the proposed disturbed Douglas Fir/Maple community was estimated at 82.25 %; 46.00% of this value was comprised of understory and 36.25% was from overstory cover (Table 2-A). The understory composition consisted of 91.74% woody species (Table 2-B).

Woody species density was also sampled at the site. As shown on Table 3, the total density of the area was 2,254 individuals per acre and was dominated by Douglas fir, bigtooth maple and Rocky Mountain juniper (*Juniperus scopulorum*).

<u>Douglas Fir/Maple Reference Area</u> ("New")

A Douglas Fir/Maple plant community was sampled in 1998 and was established as a reference area to be used for future revegetation success standards for specific areas at the West Ridge mine site following final reclamation. This reference area was called "new" because there was another Douglas Fir/Maple Reference area established earlier, but because it was necessary to later disturb this reference area due to changes to the surface facilities of the mine site, the "new" reference area was later established.

Cover and frequency by species are shown on Table 4. Overstory dominant species by cover and frequency were bigtooth maple and Douglas fir. The most common understory woody species were bigtooth maple, mountain lover *(Pachistima myrsinites*) and Oregon grape (*Mahonia repens*). Most common forbs were aster (*Aster* sp.) and pinnate tansy mustard (*Descurainia pinnata*). Finally, the most common grasses by cover and frequency were muttongrass (*Poa fendleriana*) and smooth brome (*Bromus inermis*).

The mean total living cover of this community was estimated to be 63.63%, 31.38% of which was overstory and 32.25% was understory cover (Table 5-A). Trees and shrubs were the dominant lifeform of the understory species and comprised 61.57% of the cover, whereas, forbs and grasses comprised 25.33% and 13.11%, respectively (Table 5-B).

Woody species density measurements resulted in 2,256 individuals per acre (Table 6). The dominant woody species by density were bigtooth maple, mountain lover and Douglas fir.

<u>Threatened, Endangered & Sensitive Plants</u>

A threatened, endangered and sensitive plant survey was conducted at the GVH site. A small population of the sensitive plant species called canon sweetvetch (*Hedysarum occidentalis* var. *canone*) was located at the site and will likely be disturbed by the proposed construction activities.

DISCUSSION

Statistical analyses were employed to compare the cover and woody species density of the proposed disturbed GVH site in Bear Canyon with the reference area. The total living cover, or overstory and understory cover combined, was significantly greater in the area proposed for disturbance when compared to the Douglas Fir/Maple Reference Area (Figure 1). Interestingly, the woody species densities of the two areas were nearly identical; a Student's t-test analysis reflects this similarity by showing a t-value of -0.005 (Figure 2).

Because there was a significant difference in the cover values of the two areas, there are some options and considerations for establishment for standards of revegetation success for the GVH site in Bear Canyon. One idea is that the West Ridge Mine operator could have another reference area sampled later and compared to the GVH site. Next, representatives from DOGM and the West Ridge Mine could agree that the proposed reference area would be appropriate for final revegetation success standards, even though the cover value is less than that of the area proposed for disturbance.

The author of this report favors the later scenario. I believe the Douglas Fir/Maple Reference Area (1998) would be an appropriate area for revegetation success standards at the time of final reclamation for the following reasons.

1. Because the GVH site was quite small (0.24 acres), sample quadrats were placed relatively close to each other as compared to larger sample areas. This meant localized "patches" for the cover of plants were weighted higher in this sample area. When larger areas are sampled using random methods, distances between quadrats are greater, differences from these isolated patches are minimized, and variability between quadrats usually reflect a sample mean closer to the true mean for the entire plant community.

2. Several areas with this same plant community have been sampled previously in the West Ridge Mine area, all of which had cover values closer the Douglas Fir/Maple Reference Area (1998). A summary of these results have been provided in Table 7 below.

Table 7: A comparison of mean percent total living cover value in several Douglas Fir/Maple plant communities near the West Ridge Mine site.

	PERCENT TOTAL LIVING COVER
Proposed Disturbed Douglas Fir/Maple Community (1997)	55.50
Douglas Fir/Maple Reference Area (1997)	65.75
Douglas Fir/Maple Community "New" Reference Area (1998)	63.63
Proposed Disturbed Douglas Fir/Maple Community in Bear Canyon's Left Fork (2008)	69.75
Proposed Disturbed Douglas Fir/Maple Community for Bear Canyon GVH Site (2008)	82.25

SUMMARY

A small area has been chosen for construction of a gas vent or GVH site for the West Ridge Mine as a safety measure for underground mining conditions. Construction of this site will result in disturbance to a native plant community, a Douglas Fir/Maple community. A reference area to represent future revegetation success standards for this same plant community had already been established prior to any surface disturbance for construction of the mine facility (1997-98). This same reference area has been proposed to be used for the revegetation standard for the GVH site in Bear Canyon with final approval required by biologists from the State of Utah, Division of Oil, Gas & Mining.

SUMMARY TABLES
&
FIGURES

Table 1. West Ridge Mine: Proposed Disturbed Bear Canyon GVH Site.
Total Cover, Standard Deviation and Frequency by Species (2008).

Douglas Fir / Maple Community	Mean Percent	Standard Deviation	Percent Frequency
OVERSTORY			
Acer grandidentatum	9.25	19.38	20.00
Juniperus scopulorum	4.50	13.59	10.00
Populus tremuloides	5.75	14.94	15.00
Pseudotsuga menziesii	16.75	22.38	40.00
UNDERSTORY			
TREES & SHRUBS			
Acer glabrum	0.75	2.38	10.00
Acer grandidentatum	10.50	16.35	40.00
Juniperus scopulorum	8.75	14.39	30.00
Pachistima myrsinites	4.50	8.79	30.00
Populus tremuloides	1.75	5.76	10.00
Pseudotsuga menziesii	10.50	13.31	45.00
Purshia tridentata	1.00	4.36	5.00
Symphoricarpos oreophilus	4.50	8.50	30.00
FORBS			
Apocynum canabinum	0.25	1.09	5.00
Fragaria vesca	0.25	1.09	5.00
Hedysarum occidentalis canone	0.75	3.27	5.00
Solidago sp.	1.50	4.77	10.00
GRASSES			
Bromus carinatus	1.00	2.55	15.00

Table 2. West Ridge Mine: Proposed Disturbed Bear Canyon GVH Site. Total Cover, Standard Deviation and Sample Size (2008).

Douglas Fir/ Maple Community	Mean Percent	Standard Deviation	Sample Size
A. TOTAL COVER			
Overstory (O)	36.25	19.74	20
Understory (U)	46.00	14.37	20
Litter	26.00	20.16	20
Bareground	10.25	7.98	20
Rock	17.75	13.65	20
O + U	82.25	16.69	20
B. % COMPOSITION			
% COMPOSITION			
Trees & Shrubs	91.74	14.20	20
Forbs	5.94	14.10	20
Grasses	2.32	5.53	20

Table 3. West Ridge Mine: Proposed Disturbed Bear Canyon GVH Site Woody Species Densities (2008).

Douglas Fir/ Maple Community Species	Individuals Per Acre
Acer glabrum	197.21
Acer grandidentatum	422.59
Cercocarpus montanus	28.17
Juniperus scopulorum	338.07
Pseudotsuga menziesii	760.66
Pachistima myrsinites	225.38
Populus tremuloides	28.17
Purshia tridentata	28.17
Ribes cereum	28.17
Rosa woodsii	28.17
Symphoricarpos oreophilus	169.03
Sambucus caerulea	
TOTAL	2253.80

Table 4. West Ridge Mine: Reference Area. Total Cover, Standard Deviation and Frequency by Species (1998).

Douglas Fir/ Maple Community Reference Area (New)	Mean Percent	Standard Deviation	Percent Frequency
OVERSTORY COVER			
Acer grandidentatum	15.88	21.30	50.00
Juniperus scopulorum	1.38	6.22	5.00
Pseudotsuga menziesii	14.13	20.67	45.00
UNDERSTORY COVER			
TREES & SHRUBS			
Acer grandidentatum	6.18	11.30	47.50
Juniperus scopulorum	1.30	2.90	20.00
Mahonia repens	3.33	5.82	40.00
Pachistima myrsinites	5.73	11.04	35.00
Pseudotsuga menziesii	1.95	6.19	6.00
Symphoricarpos oreophilus	1.43	3.35	20.00
FORBS			
Antennaria parvifolia	0.25	1.09	5.00
Artemisia dracunculus	0.88	3.33	10.00
Aster sp.	3.13	7.65	30.00
Circium sp.	0.13	0.78	2.50
Descurania pinnata	1.78	7.12	10.00
Erigeron engelmannii	0.25	1.09	5.00
Erysimum asperum	0.13	0.78	2.50
Fragaria vesca	0.38	1.73	5.00
Mitella stauropetala	0.05	0.31	2.50
Senecio pudicus	0.15	0.79	5.00
Smilacina racemosa	0.33	1.03	10.00
Stellaria jamesiana	0.03	0.16	2.50
Taraxicum officinale	0.13	0.78	2.50
Thalictrum fendleri	0.13	0.78	2.50
Viola adunca	0.13	0.78	2.50
GRASSES			
Bromus inermis	1.25	5.67	7.50
Poa fendleriana	2.90	4.15	45.00
Poa pratensis	0.38	1.73	5.00

Table 5. West Ridge Mine: Reference Area. Total Cover, Standard Deviation and Sample Size (1998).

Douglas Fir/ Maple Community Reference Area (New)			
	Mean Percent	Standard Deviation	Sample Size
A. TOTAL COVER			
Overstory Cover (O)	31.38	25.69	40
Understory Cover (U)	32.25	19.27	40
Cryptogams	0.25	1.09	40
Litter	18.20	12.80	40
Bareground	8.20	9.39	40
Rock	9.73	9.67	40
O+U	63.63	13.51	40
B. % COMPOSITION			
Trees & Shrubs	61.57	33.67	40
Forbs	25.33	29.49	40
Grasses	13.11	19.14	40

Table 6. West Ridge Mine: Reference Area. Woody Species Densities (1998).

Douglas Fir/ Maple Community Reference Area (New)	
Species	Individuals Per Acre
Acer grandidentatum	874.13
Cercocarpus ledifolius	28.20
Juniperus scopulorum	141.00
Juniperus osteosperma	14.10
Pseudotsuga menziesii	310.18
Pachistima myrsinites	549.86
Rosa woodsii	14.10
Symphoricarpos oreophilus	296.08
Sambucus caerulea	28.20
TOTAL	2255.83

Figure 1. A statistical comparison (Student's t-tests) of the **total living cover** between the proposed disturbed GVH site and the reference area.

	$\bar{x}$	s	n	t	df	SL
Bear Canyon GVH						
Proposed Disturbed:	82.25	16.69	20			
DF/M Reference Area:	63.63	13.51	40			
t-test				4.648	58	$p<0.01$

$\bar{x}$ = mean
s = standard deviation
n = sample size
t = Student's t-value
df = degrees of freedom
p = probability
SL= Significance Level
N.S.=Non-Significant
DF/M = Douglas Fir/Maple

Figure 2. A statistical comparison (Student's t-tests) of the **woody species density** between the proposed disturbed GVH site and the reference area.

	$\bar{x}$	s	n	t	df	SL
Bear Canyon GVH						
Proposed Disturbed:	2253.80	853.56				
DF/M Reference Area:		2255.83	1548.09			
t-test				-0.005	58	N.S.

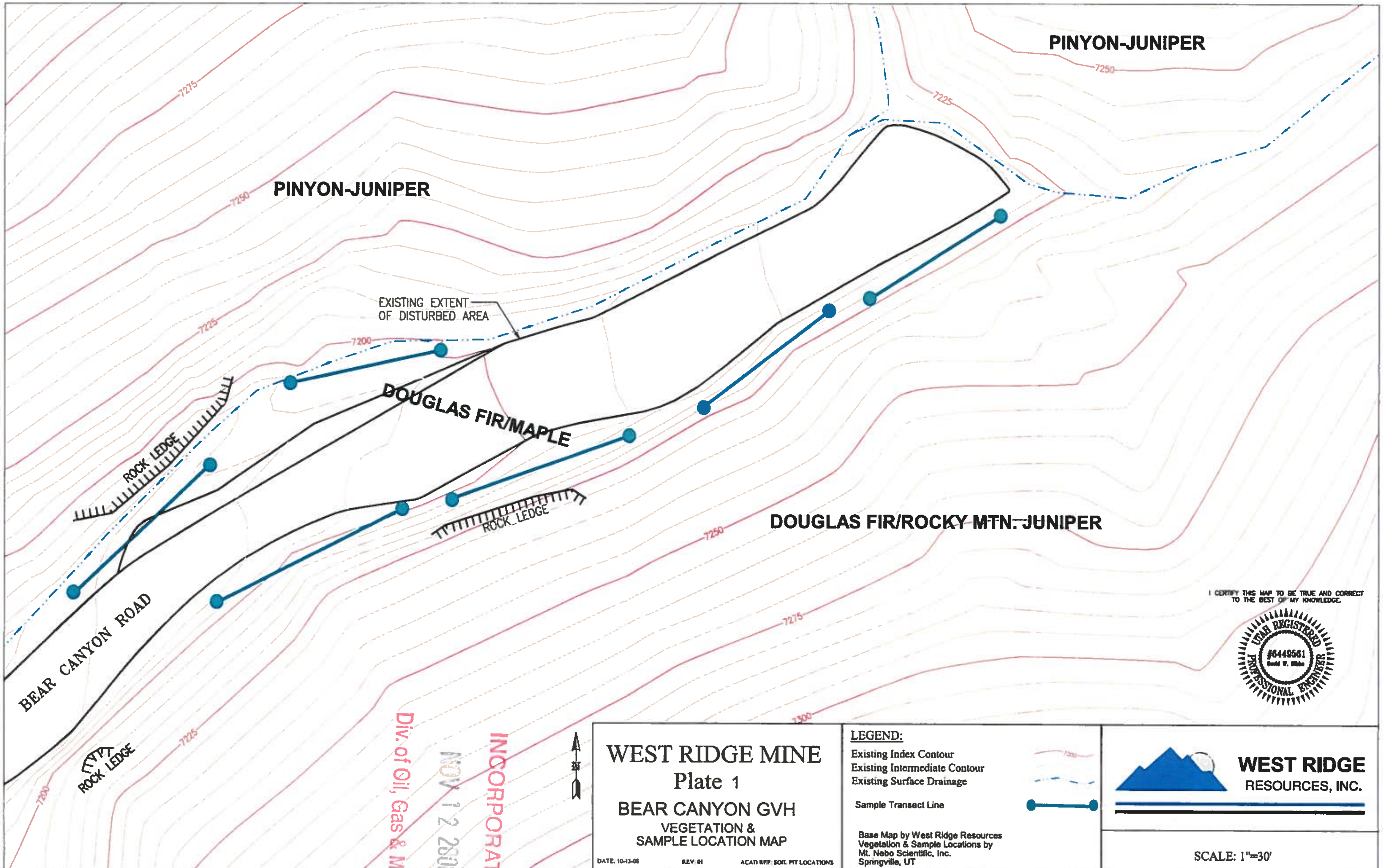
$\bar{x}$ = mean
s = standard deviation
n = sample size
t = Student's t-value
df = degrees of freedom
n/a = not applicable
p = probability
SL= Significance Level
N.S.=Non-Significant
DF/M = Douglas Fir/Maple

COLOR PHOTOGRAPHS
OF THE
SAMPLE AREAS


Bear Canyon GVH: Proposed Disturbed Douglas Fir/Maple Community


Douglas Fir/Maple Reference Area

VEGETATION &
SAMPLE LOCATION MAP


PINYON-JUNIPER
PINYON-JUNIPER
DOUGLAS FIR/MAPLE
DOUGLAS FIR/ROCKY MTN.-JUNIPER
EXISTING EXTENT OF DISTURBED AREA
ROCK LEDGE
ROCK LEDGE
ROCK LEDGE
BEAR CANYON ROAD
7200
7225
7250
7275
7300
I CERTIFY THIS MAP TO BE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.
UTAH REGISTERED PROFESSIONAL ENGINEER
#6449561
WEST RIDGE MINE
Plate 1
BEAR CANYON GVH
VEGETATION & SAMPLE LOCATION MAP
DATE: 10-13-08
REV: 01
LEGEND:
Existing Index Contour
Existing Intermediate Contour
Existing Surface Drainage
Sample Transect Line
Base Map by West Ridge Resources
Vegetation & Sample Locations by Mt. Nebo Scientific, Inc. Springville, UT
WEST RIDGE
RESOURCES, INC.
SCALE: 1"=30'

ATTACHMENT 5

2008 RAPTOR SURVEY
DWR

CONFIDENTIAL INFORMATION

(See Confidential Binder)

ATTACHMENT 6

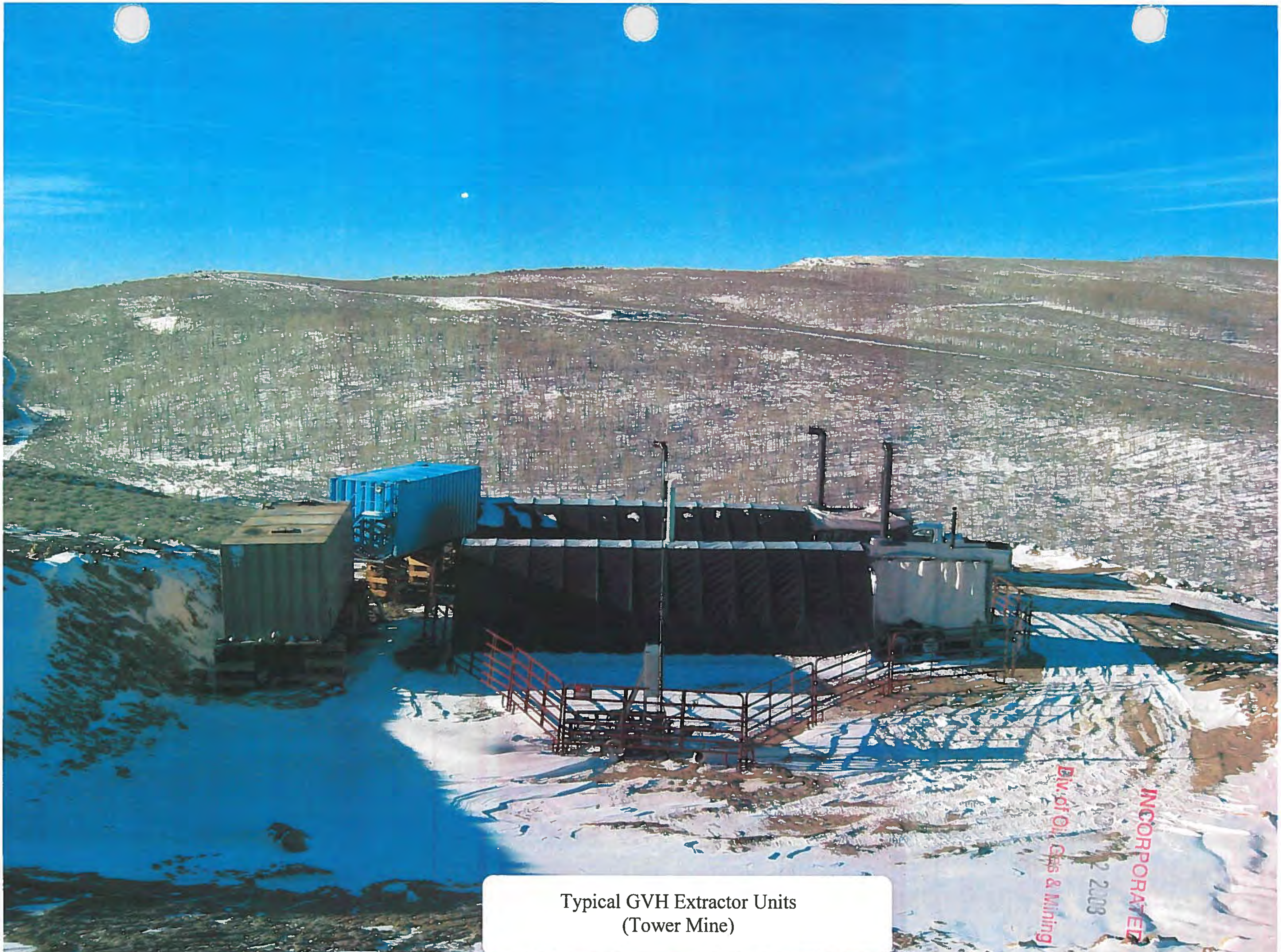
CULTURAL RESOURCES SURVEYS
GVH SITE AND TOPSOIL STORAGE AREA
SENCO-PHENIX ARCHEOLOGICAL

CONFIDENTIAL INFORMATION

(See Confidential Binder)

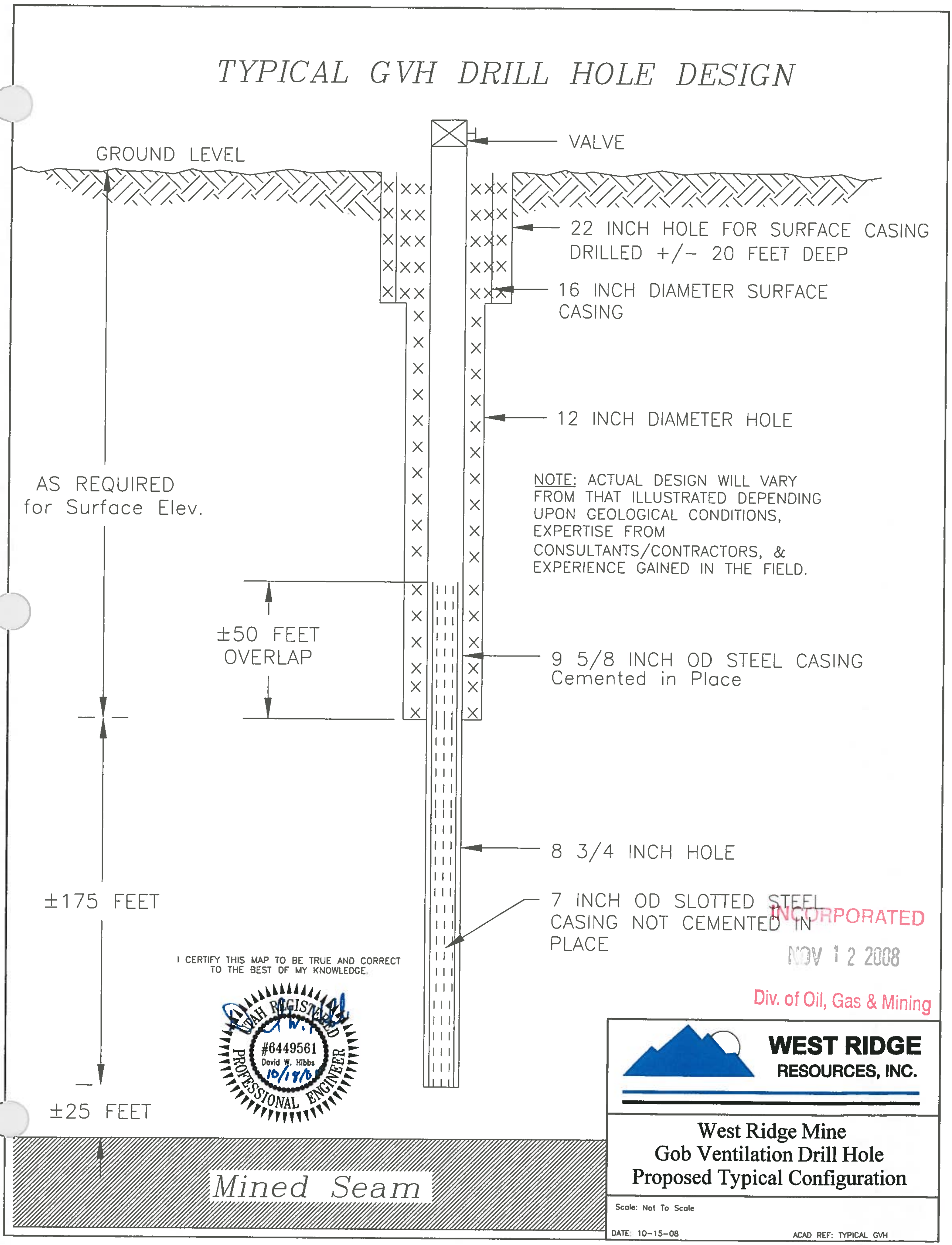
ATTACHMENT 7

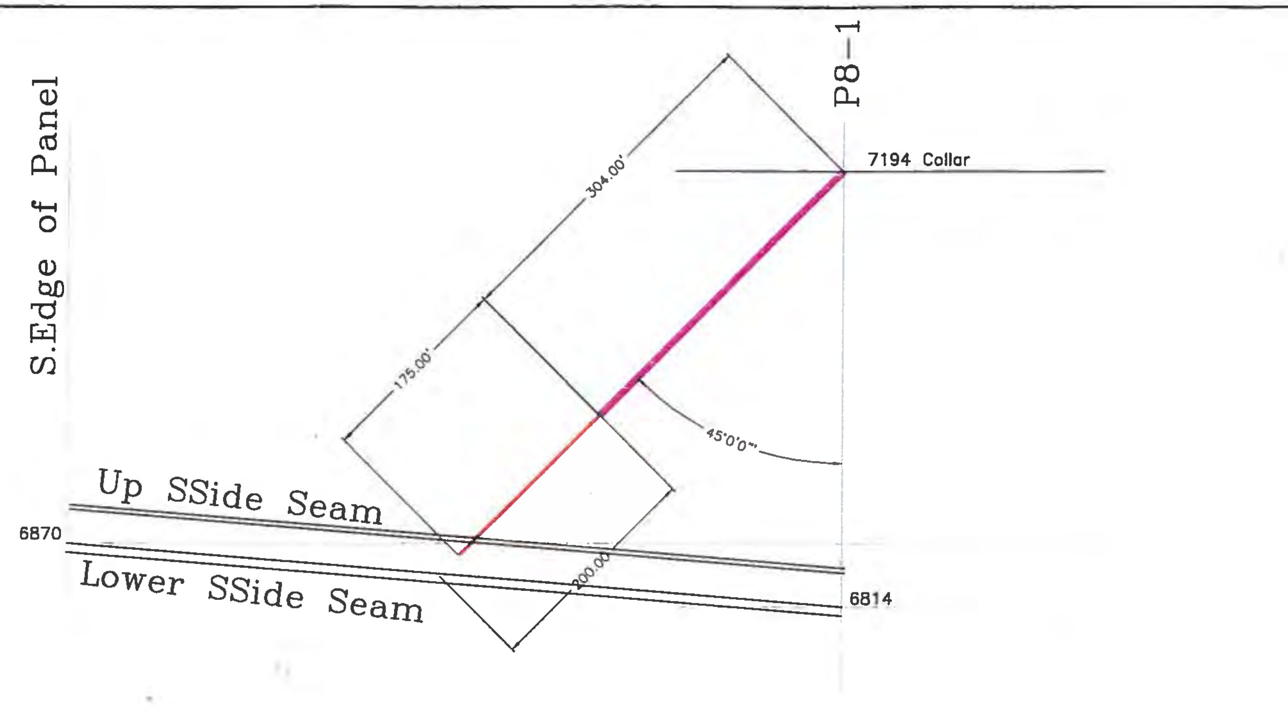
GVH OPERATIONAL DRAWINGS



Typical GVH Extractor Units
(Tower Mine)

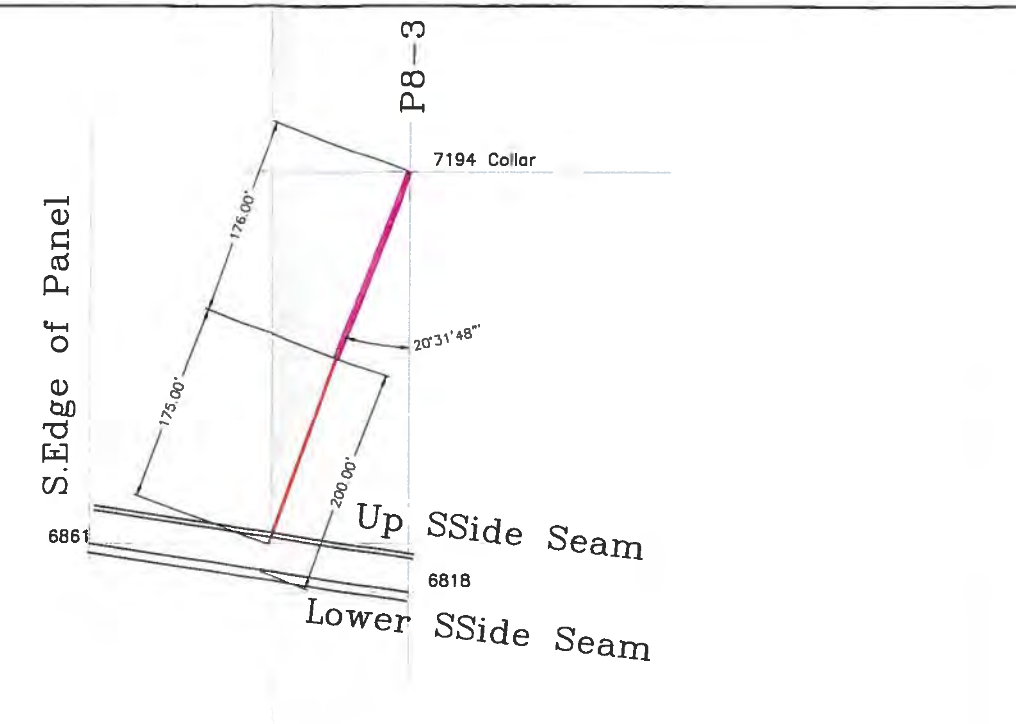
Typical GVH Extractor Units
(Tower Mine)


TYPICAL GVH DRILL HOLE DESIGN
VALVE
GROUND LEVEL
22 INCH HOLE FOR SURFACE CASING DRILLED +/- 20 FEET DEEP
16 INCH DIAMETER SURFACE CASING
12 INCH DIAMETER HOLE
AS REQUIRED for Surface Elev.
NOTE: ACTUAL DESIGN WILL VARY FROM THAT ILLUSTRATED DEPENDING UPON GEOLOGICAL CONDITIONS, EXPERTISE FROM CONSULTANTS/CONTRACTORS, & EXPERIENCE GAINED IN THE FIELD.
±50 FEET OVERLAP
9 5/8 INCH OD STEEL CASING Cemented in Place
8 3/4 INCH HOLE
±175 FEET
7 INCH OD SLOTTED STEEL CASING NOT CEMENTED IN PLACE
I CERTIFY THIS MAP TO BE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.
UTAH REGISTERED PROFESSIONAL ENGINEER
#6449561
David W. Hibbs
±25 FEET
Mined Seam
INCORPORATED
NOV 1 2 2008
Div. of Oil, Gas & Mining
WEST RIDGE RESOURCES, INC.
West Ridge Mine
Gob Ventilation Drill Hole
Proposed Typical Configuration
Scale: Not To Scale
DATE: 10-15-08
ACAD REF: TYPICAL GVH

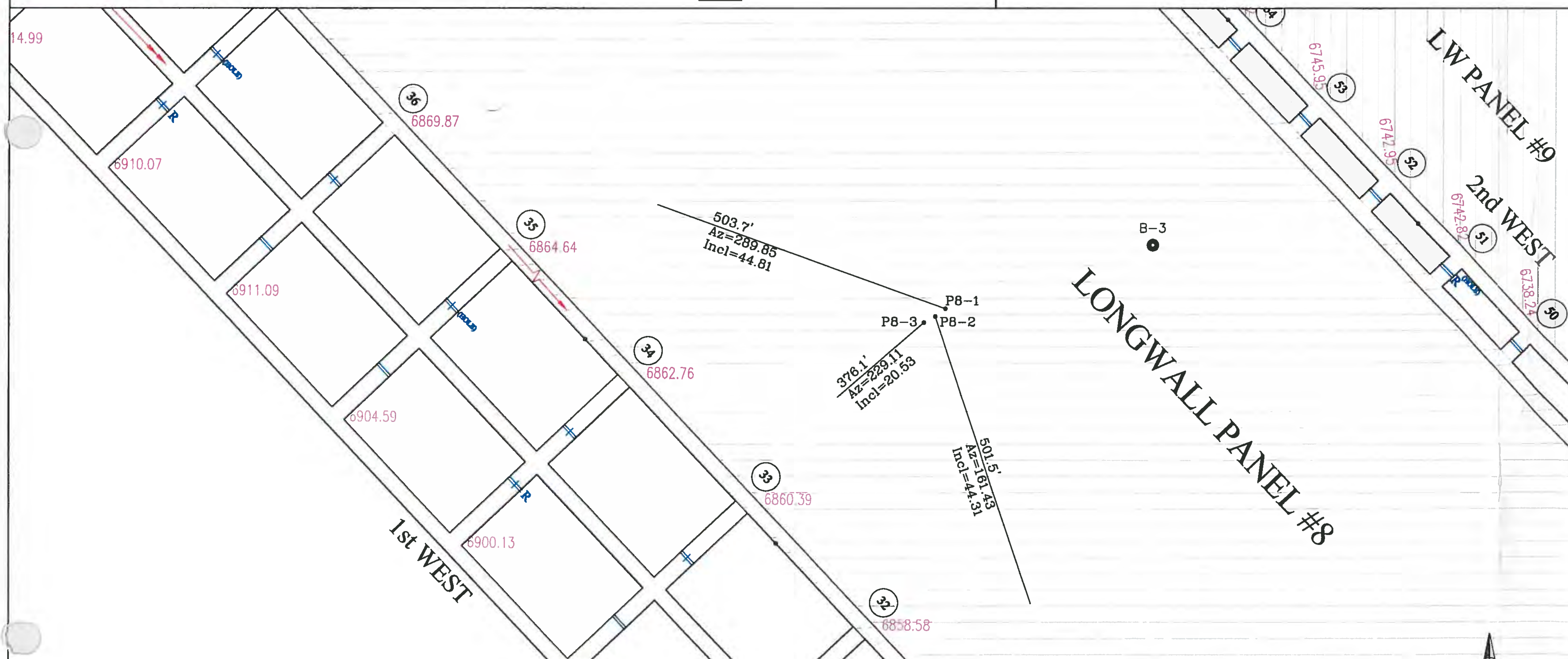


BOREHOLE P8-1

NOTE: BOREHOLE P8-2 IS SIMILAR.



BOREHOLE P8-3



BOREHOLE / PARTIAL MINE PLAN

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

UTAH REGISTERED PROFESSIONAL ENGINEER #6449561 David W. Hibbs

INCORPORATED

NOV 12 2008

Div. of Oil, Gas & Mining

WEST RIDGE RESOURCES, INC.

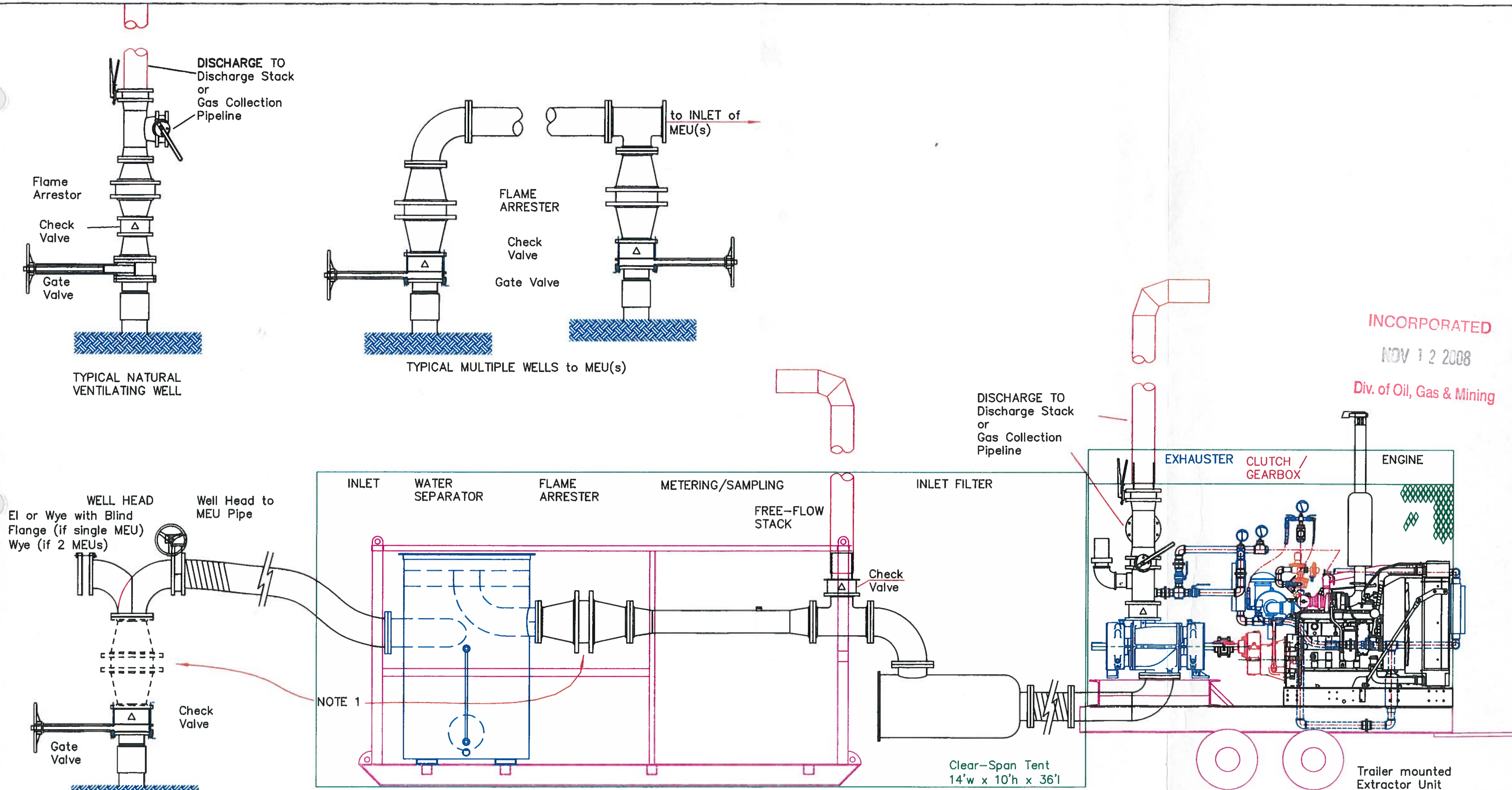
SCALE: 1"=30'

WEST RIDGE MINE

Bear Canyon GVH

Borehole Plan and Details

DATE 10-15-08 REV 01 ACAD REF GVH P-8-3



NOTE 1
For single well connected to single/multiple MEUs, Flame Arrester may be located on well or MEUs

INCORPORATED
NOV 1 2 2008
Div. of Oil, Gas & Mining

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

UTAH REGISTERED PROFESSIONAL ENGINEER
#6449561
David W. Hibbs
10/15/08

WEST RIDGE
RESOURCES, INC.

WEST RIDGE MINE
Gob Gas Vent Hole Methane Extractor Unit

SCALE: NONE

DATE: 10-15-08 REV: 01 ACAD REF: GVH Piping

ATTACHMENT 8

SLOPE STABILITY ANALYSIS
BLACKHAWK ENGINEERING

STABILITY ANALYSIS
FOR
BEAR CANYON GVH DRILLING

CUT SLOPE RECLAMATION
WEST RIDGE MINE

UTAH REGISTERED PROFESSIONAL ENGINEER
#154168
DAN W. GUY
10/15/08

PREPARED BY: **DAN W. GUY, P.E.**
BLACKHAWK ENGINEERING, INC.
OCTOBER 2008

Introduction:

This report is an evaluation of the expected factors of safety based on the proposed cut slope reclamation on the Bear Canyon GVH Drill Pad. The reclaimed section was evaluated at a slope of 1.5H:1V and the expected slope height of 23' to ensure a minimum factor of safety of 1.30 could be achieved. An additional calculation was run on a slope height of 30' to allow for any variance in actual cut slope heights.

Procedure:

Soil characteristics for the reclaimed area have been estimated based on similar soils which have been sampled and analyzed for stability at the West Ridge Mine. The parameters were taken directly from Appendix 5-9, "Alternate Highwall Area Reclamation Using a Smaller Verical Angle Slope", West Ridge Mine.

Both sites are in the Blackhawk Formation with very similar characteristics.

Calculations:

Stability calculations were performed using the Hoek Method from Rock Slope Engineering. Under this method, stability projections can be made using soil characteristics such as density, cohesion and internal friction angle, as well as proposed slope height. This information can then be plotted on the provided circular failure charts to determine factors of safety for both Dry and Saturated Conditions.

The Hoeck Method for stability analyses was selected for the following reasons:

This method provides for a "worst-case" scenario by using a circular failure prediction based on the total height of the slope.

The proposed reclaimed slopes are comparable to other reclaimed slopes in this area that have been designed, approved and successfully reclaimed based on the Hoeck Method of stability analyses.

As mentioned above, the density, cohesion and internal friction angle of the proposed backfill material were taken from West Ridge Mine soil samples taken in similar conditions.

Slope heights and angles were taken from the cross-sections included in this submittal. These numbers were then applied to the equations on the Circular Failure Charts No. 1 and No. 5 to determine the Static Safety Factor for Dry and Saturated Conditions, respectively (Figures 1 and 2). It should be noted that the cut slope height of 23' and reclaimed slope angle of 1.5H:1V (33.69°) represent the probable "worst-case" scenario of the cut slope reclamation. This is shown on the attached Figure 3, "Cut Slope Reclamation – Typical Section". A calculation was also run on a cut slope height of 30' in case the height may vary slightly.

Based on the proposed soil characteristics and slope angles, a factor of safety of 2.83 for saturated conditions and 3.60 for dry conditions can be achieved for the proposed slopes of 1.5H:1V (33.69°) up to 23' in height. A factor of safety of 2.40 for saturated conditions and 3.17 for dry conditions can be achieved for the same slope at a height of 30'.

Summary:

Calculations show safety factors well in excess of the required 1.30 can be achieved for reclaimed cut slopes of 1.5H:1V (33.69°) and up to 30' in height. This is not inconsistent with the natural conditions of the area, and will allow for complete reclamation of all cut slopes created by the emergency drilling pads.

TABLE 1
CALCULATION SUMMARY

			Proposed
Slope Height (H)	-	23'	30'
Slope Angle	-	33.69° (1.5H:1V)	33.69° (1.5H:1V)
Safety Factor (Dry)	-	3.60	3.17
Safety Factor (Saturated)	-	2.83	2.40

*Density (γ) = 121.6 pcf
*Cohesion (c) = 771.7 psf
*Internal Friction Angle (φ) = 38.4°

*Taken from Appendix 5-9, "Alternate Highwall Area Reclamation Using a Smaller Vertical Angle slope", West Ridge Mine.

FIGURES

C=Cohesion–psf

Y=Density–pcf

H=Slope Height–ft.

ϕ=Internal Friction Angle

(DRYCONDITIONS)

CIRCULAR FAILURE CHART NUMBER 1

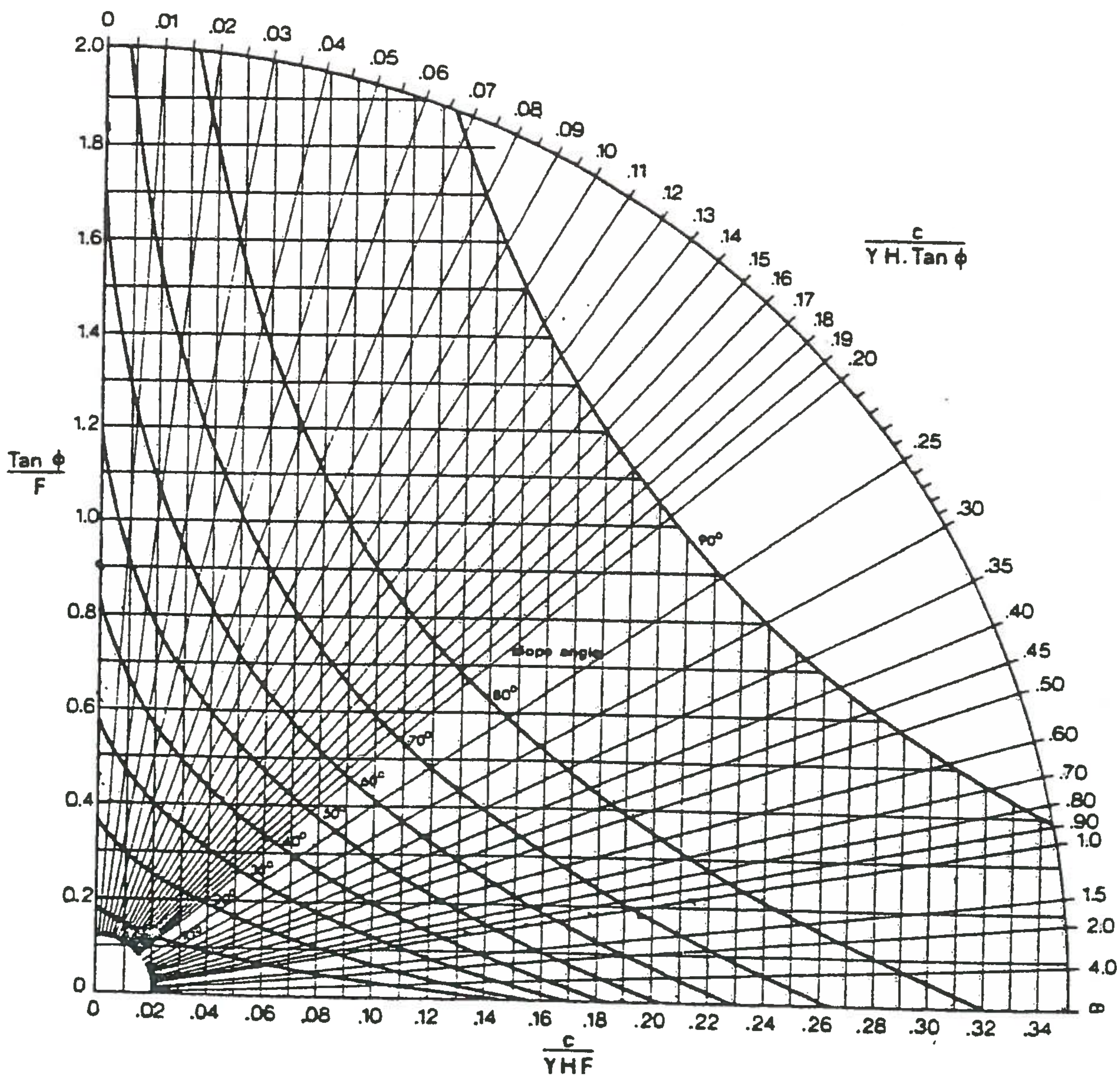


Figure 1

C=Cohesion–psf

Y=Density–pcf

H=Slope Height–ft.

Φ=Internal Friction Angle

(SATURATED CONDITIONS)

CIRCULAR FAILURE CHART NUMBER 5

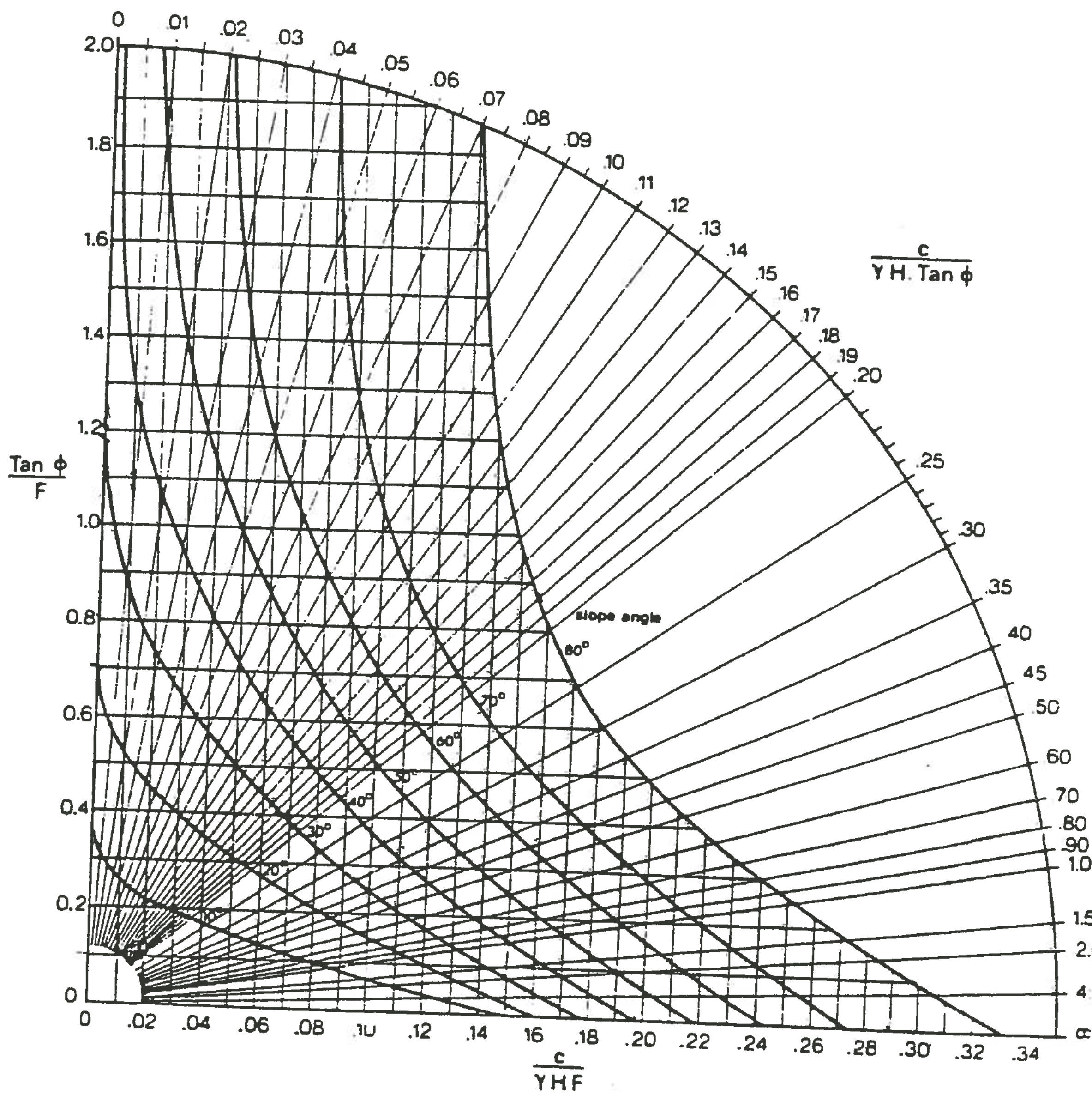
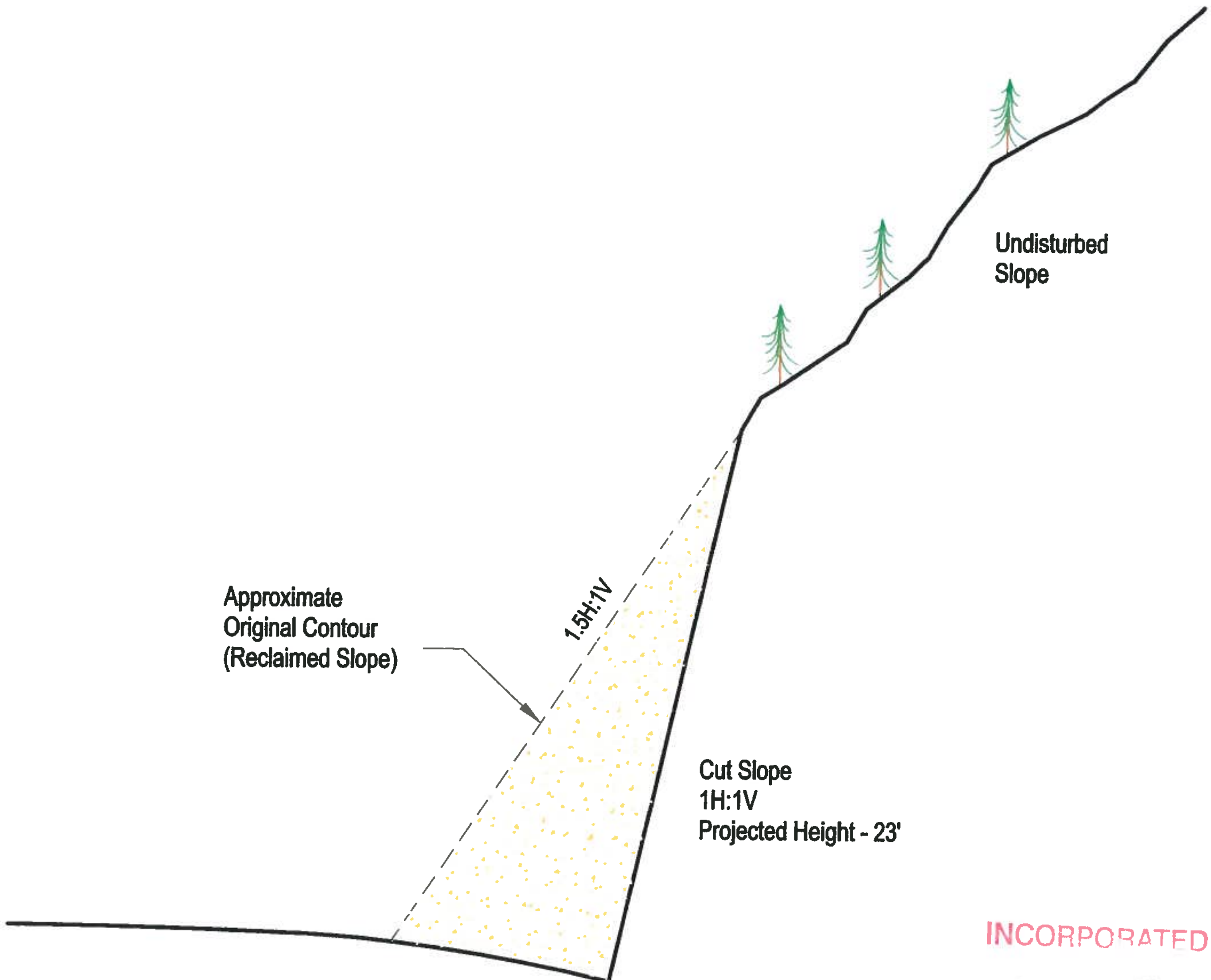


Figure 2



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UTAH REGISTERED PROFESSIONAL ENGINEER
#154168
DAN W. GUY
10/15/08

TYPICAL SECTION

BEAR CANYON HYDROLOGY
WEST RIDGE MINE
CUT SLOPE RECLAMATION
FIGURE 3

BLACKHAWK ENGINEERING, INC.

ATTACHMENT 9

SITLA CORRESPONDENCE

Shaver, Dave

From: John Blake [jblake@utah.gov]
Sent: Wednesday, October 15, 2008 8:42 AM
To: Shaver, Dave
Cc: Daron Haddock; Tom Faddies
Subject: Re: West Ridge Mine, GVH installlation, ML 49287

Dear Mr. Shaver,

The Trust Lands Administration received fee simple title to the lands described below in your E-mail through the 1998 Utah Schools and Federal Land Exchange Act, P.L. 105-335. Andalex Resources, Inc. and Intermountain Power Agency obtained coal lease ML 49287 covering the subject lands on April 1, 2004. West Ridge Resources is the operator of the leasehold estate.

Section 8.1 of the lease agreement provides that the Lessee may use the surface estate to the extent reasonably necessary for the economic operation of the leasehold. Your request to construct a GVH and stockpile area as described below in your E-mail appear to meet that criteria and are hereby granted approval to proceed by the Lessor. This approval applies only to the specific operations described below in Sections 3 and 10, T14S, R13E, SLB&M. Any other permits, access, rights of way or operations upon or across any other lands as may be necessary to achieve such operations shall be the sole responsibility of the Lessee.

I note that the lands within ML 49287 are not presently under lease for oil and gas. Andalex Resources, Inc. is hereby given approval from the Trust Lands Administration to vent non-economic quantities of methane gas from the leasehold estate pursuant to the proposed operations in an environmentally sound and safe manner. In the event that venting of the methane gas becomes economical then Andalex Resources, Inc. must obtain oil & gas rights and pay royalties the Trust Lands Administration upon such gas production. Non-economical venting of the gases, however, does not require the payment of royalties.

Thank you for your notification.

John T. Blake
Trust Lands Administration.

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>>> "Shaver, Dave" <dshaver@coalsource.com> 10/14/2008 5:37 PM >>>
Dear Mr. Blake

As you are aware, West Ridge Resources is pursuing plans to permit and construct a gob gas vent hole (GVH) installation in the Right Fork of Bear Canyon over the worked out longwall cave area of the West Ridge Mine. This installation is required by MSHA as a safety concern for the underground workforce, due to the high rate of methane liberation from the longwall panel. Toward this end we are presently engaged in an emergency permitting submittal with DOGM for this installation. The purpose of this email is to obtain SITLA concurrence for our proposal.
The GVH installation is to be located on SITLA coal lease ML 49287 in NW1/4NE1/4SW1/4SE1/4 of Section 3, T14S, R13E. It will occupy an area of about 0.25 acres in a narrow strip immediately adjacent to the Bear Canyon Road. Associated with the installation will be a topsoil storage area, also located on ML 49287, in NW1/4SE1/4NW1/4NW1/4 of Section 10, T14S, R13E. It will occupy an area of about 0.1 acres. It also will be located immediately adjacent to the Bear Canyon Road. As you know, the Bear Canyon Road is an existing public road. Attached is a map showing the location of the proposed facilities. Please note that the affected surface area is owned by SITLA. We request your concurrence with this proposal in terms of lease surface activities, and in terms of mine-related facilities located within 100' of a public road. Please note that the methane gas will be vented to atmosphere, and we make no claims to associated gas rights. Our only purpose is to liberate the methane from the underground works for safety sake, as mandated by MSHA.
Also be advised that the GVH installation, and topsoil storage, will be permitted, constructed, operated, bonded and reclaimed under a SMCRA permit amendment to be approved

and issued by DOGM. Please call me if you have questions or comments. Your expedient review of this request is appreciated.

Dave Shaver
Project Engineer, Agent
West Ridge Resources, Inc.
435-888-4017

State of Utah
School & Institutional
Trust Lands Administration

Jon M Huntsman, Jr.
Governor

Kevin S. Carter
Director

675 East 500 South, Suite 500
Salt Lake City, UT 84102-2818
801-538-5100
801-355-0922 (Fax)
www.trustlands.com

Wednesday, October 22, 2008

Dave Shaver, Project Engineer/Agent
West Ridge Resources, Inc.
P.O. Box 910
East Carbon, Utah 84520-0910

RE: Bear Canyon Road Status, West Ridge Mine C0070041, lease ML 49827

Dear Mr. Shaver:

In response to your request regarding the status of the Bear Canyon road and upgrades to that road from the intersection of the C Canyon road up to the site proposed for the gob vent hole installation in the Right Fork of Bear Canyon.

Federal right-of-way U 01756 was issued on 9/3/1951 as a tramroad and was constructed and used in the 1950's for oil & gas and coal lease activities. See attached BLM Plat. SITLA is the surface owner and maintains jurisdiction over portions of that road which are on Trust Lands including portions of T 14S R13 E Sections 3, 10, and 16. SITLA maintains this public road for multiple land use including oil and gas leasing, coal and other minerals, industrial use and grazing.

SITLA approved the upgrading of the Bear Canyon road by West Ridge on September 17, 2008 in anticipation of the construction of a gob vent hole installation on Section 3, immediately adjacent to the existing road. SITLA maintains jurisdiction over the use, maintenance and upgrading of this road on Trust Lands. Such activities within this existing public road are not considered by SITLA to be surface coal mining activities subject to permitting by DOGM.

Any upgrades to the road or maintenance performed on the road will remain under the jurisdiction of SITLA regardless of the duration or use by West Ridge. The existing road will remain in place and under SITLA's jurisdiction to support other land use activities even following the use and eventual reclamation of the gob vent hole installation.

SITLA concurs that the gob vent hole installation facility is a coal mine related surface activity and should be under DOGM permit requirements. The existing road however will remain as a public use road where it exists on Trust Lands.

Please let us know if you have any other questions or concerns regarding use of the Bear Canyon road or construction of the gob gas vent hole installation.

Sincerely,

/S/

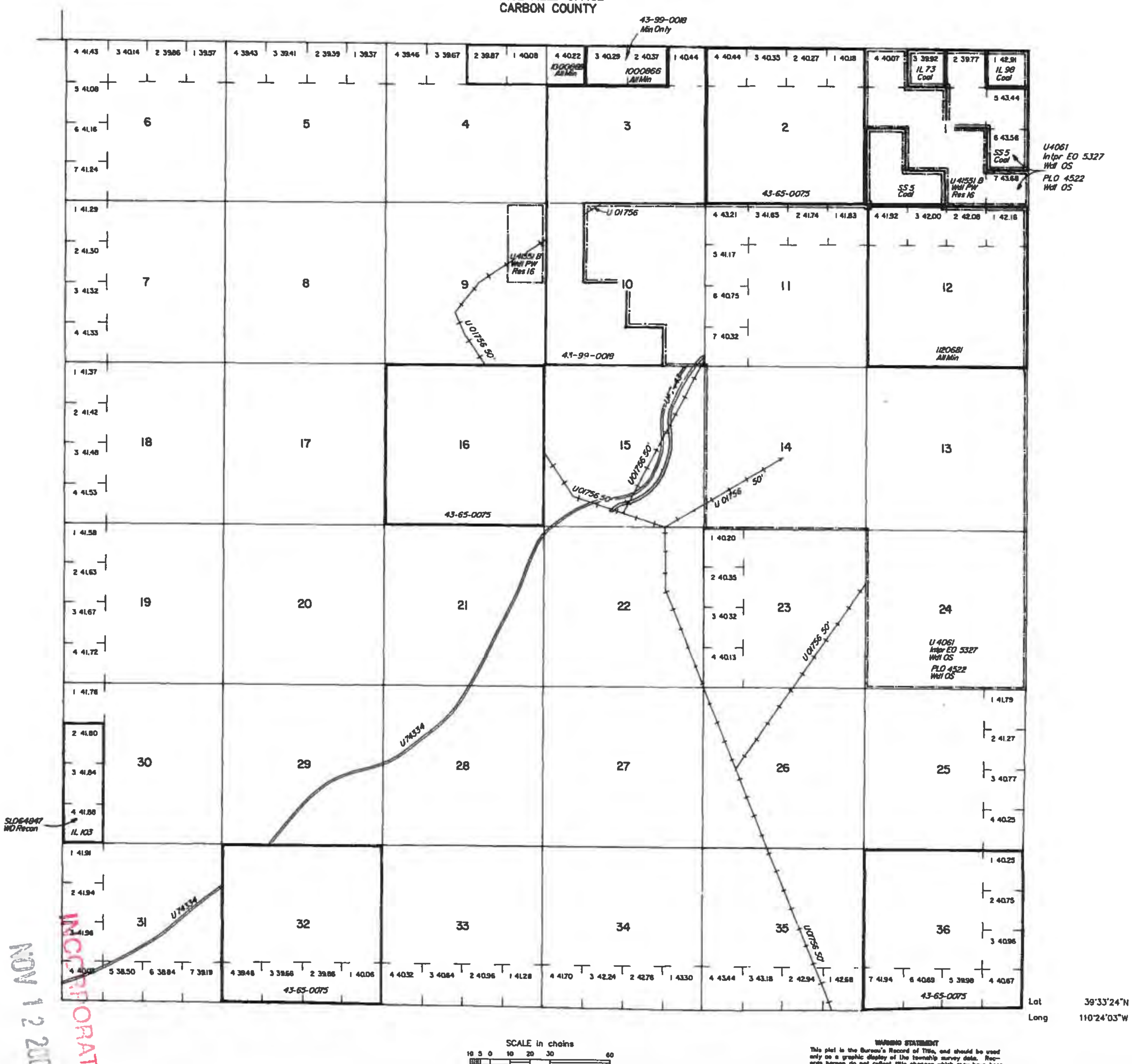
J. Randall Harden
Minerals Resource Specialist

CC: Tom Faddies, John Blake, Daron Haddock (DOGM)

TOWNSHIP 14 SOUTH RANGE 13 [EA]ST OF THE SALT LAKE MERIDIAN, UTAH

PRICE FIELD OFFICE
CARBON COUNTY

STATUS OF PUBLIC DOMAIN
LAND AND MINERAL TITLES



INDEX TO SEGREGATED TRACTS				
RESURVEY	ORIGINAL SURVEY			
TRACT NO	T	R	SEC	SUBDIVISION

FOR ORDERS AFFECTING DISPOSAL OR USE OF UNIDENTIFIED LANDS WITHDRAWN FOR CLASSIFICATION, MINERALS, WATER AND/OR OTHER PUBLIC PURPOSES, REFER TO INDEX OF MISCELLANEOUS DOCUMENTS.

WARNING STATEMENT
This plat is the Bureau's Record of Title, and should be used only as a graphic display of the township survey data. Records hereon do not reflect title changes which may have been effected by lateral movements of rivers or other bodies of water. Refer to the cadastral surveys for official survey information.

CURRENT TO		
7-12-2007	PV	VJ
	OG	

T 14 S
R 13 E

Shaver, Dave

From: Randy Harden [randyharden@utah.gov]
Sent: Thursday, November 06, 2008 3:40 PM
To: Shaver, Dave; Daron Haddock
Cc: Chris Fausett; John Blake; Tom Faddies; Tom Mitchell
Subject: Bear Canyon Road
Attachments: Randy Harden.vcf

Daron/Dave,

As per our discussions, Dave Shaver will be submitting an application for an easement with Trust Lands for the Bear Canyon Road up to the gob vent hole. That easement will be assigned to Carbon County % Andalex Resources. Chris Fausett will be coordinating the easement and Trust Lands is willing to accept the assignment of the easement to the county.

Hopefully, the assignment of the lease can stipulated in the approval of the amendment so that there are no delays in drilling the necessary gob gas vent holes as required by MSHA to continue mining operations at West Ridge.

Thanks,

Randy Harden

ATTACHMENT 10

HYDROLOGY REPORT
PETERSEN HYDROLOGIC

PH

PETERSEN HYDROLOGIC, LLC

15 October 2008

Mr. Dave Shaver
West Ridge Resources, Inc.
P.O. Box 902
Price, Utah 84501

Dave,

At your request, we have evaluated the probable hydrologic consequences relating to the proposed installation and operation of the West Ridge Panel 8 gob gas vent holes (GVH) in Bear Canyon. We are providing this letter report to present the findings of a hydrogeologic investigation we have performed in this regard and to describe the probable hydrologic consequences of the GVH drilling and operational activities.

This report includes the following sections:

- Methods of Study
- Physical setting
- Geologic Setting
- Hydrologic Conditions
- Probable Hydrologic Consequences
- References Cited

2695 N. 600 E. LEHI, UTAH 84043 (801) 766-4006

Methods of Study

On 7 October 2008 we made a site visit to the GVH drilling site in the right fork of Bear Canyon. During this visit we examined the Bear Canyon surface-water systems adjacent to the GVH drilling site. The stream channel characteristics and the shallow alluvial and colluvial sediments in the canyon were observed. The geologic and hydrogeologic conditions at the drilling site and adjacent areas were observed and photographed.

Information regarding proposed GVH drilling plans and pertinent hydrogeologic reports and maps were obtained and reviewed as part of this investigation.

Physical Setting

The GVH area is situated in the right fork of Bear Canyon in the southwest quarter of the southeast quarter of Section 3, Township 14 South, Range 13 East, in Carbon County, Utah. The Bear Canyon GVH area overlies the previously mined Panel 8 longwall panel at the West Ridge Mine and is designed to vent gasses from the longwall gob area in the underground coal mine workings for mine safety purposes. The venting of the gas will occur through drill holes advanced from the land surface in Bear Canyon to the underlying mine gob area. The underground mine workings are separated from the overlying land surface in Bear Canyon by approximately 380 feet of overburden (Personal communication, Dave Shaver, 2008). Current plans call for the installation of three drillholes at the GVH site. Based on current plans the holes will be drilled at 45 degree angles into the mine, and will have individual depths (lengths) of 504, 376, and 502 feet.

Geologic Setting

The land surface in Bear Canyon at the GVH site is underlain by sandstone bedrock of the Cretaceous Castlegate Sandstone formation. In some areas, the bedrock is directly exposed at the land surface, while in other areas relatively thin deposits of alluvium, colluvium, and soil are present.

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The stream channel substrate in the right fork of Bear Canyon Creek near the GVH exists either directly on Castlegate Sandstone bedrock or on thin deposits of alluvium overlying the sandstone bedrock.

The rock strata comprising the overburden between the Panel 8 mine workings and the land surface in Bear Canyon near the GVH consists of rocks of the Castlegate Sandstone and the Cretaceous Blackhawk Formation. The Castlegate Sandstone consists predominantly of lenticular fluvial sandstones interbedded with minor siltstone or claystone layers. The Blackhawk Formation in the region consists of interbedded sandstones, siltstones, claystones and coal deposits. The bedrock strata locally dip at approximately three to eight degrees to the northeast. Major faulting has not been observed in the GVH area (Mayo and Associates, 1997).

Hydrologic Conditions

Groundwater and surface-water systems in the West Ridge Mine permit and adjacent area have previously been characterized by Mayo and Associates (1997). During the 7 October 2008 site visit to the GVH area, no springs or seeps were observed. Wetness in the near-surface unconsolidated sediments in the vicinity of the GVH was likewise not observed, which suggests a lack of appreciable groundwater baseflow discharge locally. Because the GVH location is near the up-dip ends of the Castlegate and Blackhawk geologic formations (which have been truncated by the erosional Book Cliffs escarpment), regional, long-flowpath type groundwater systems are likely not present in the area.

In previous spring and seep surveys in the area, no springs or seeps were identified in either the Castlegate Sandstone or the Blackhawk Formation in the vicinity of the GVH drill sites (Mayo and Associates, 1997). It should be noted that two seeps discharging at less than 1 gallon per minute each were previously identified in the two upper forks of the right fork of Bear Canyon Creek above the GVH area (S-27 and S-28; Mayo and Associates, 1997). However, these seeps discharge from the Price River Formation topographically and stratigraphically above the drilling area and thus are not of concern in this investigation.

The right fork of Bear Canyon Creek appears to be an ephemeral drainage (Mayo and Associates, 1997). No discharge was present in the drainage during the 7 October 2008 site visit. The complete absence of flow in the creek in areas where the stream channel sits directly on clean bedrock surfaces demonstrates that there is at present no appreciable alluvial groundwater system associated with Bear Canyon Creek in the vicinity of the GVH area.

Probable Hydrologic Consequences

Adverse impacts to the hydrologic balance resulting from the installation and operation of the Bear Canyon GVH system are not anticipated. The basis for this conclusion is summarized below.

The gob vent holes will be constructed in a manner that minimizes the potential for adverse impacts to groundwater and surface-water resources and the hydrologic balance in the area. The proposed construction designs for the GVH holes include a nominal 20 foot length of 16-inch non-perforated steel surface casing that will be cemented in place. The surface casings will isolate the wells from surface-water, soil moisture, and any shallow groundwater potentially present in the upper 20 feet and will prevent shallow water from entering the GVH wells. From approximately 20 to 200 feet below the surface, the proposed well construction plans call for the placement of 9.625-inch non-perforated steel casing that will be cemented into place. The cemented steel well casing will isolate groundwaters that may be present in bedrock groundwater systems in the upper 200 feet from the GVH wells and prevent the inflow of groundwater into the wells.

Proposed construction plans call for the lower approximately 150 feet of the GVH wells to be cased with 8.75-inch slotted steel casing that will be left open to the rock strata and will not be cemented. The purpose of the slotted steel casing is to allow the drainage of gob gasses into the well bore in the fractured rock strata overlying the Panel 8 gob. While there is the potential for drainage of some Blackhawk Formation groundwater into the GVH holes in the 150 feet interval overlying the longwall gob, the potential for appreciable or sustained groundwater drainage through these wells is minimal. This is because 1) groundwater systems in the Blackhawk Formation occur in hydraulically isolated groundwater partitions that are not in hydraulic communication with adjacent groundwater partitions, which limits the amount of groundwater that could potentially be drained, 2) the GVH holes are situated near the up-dip ends (outcrop locations) of the Castlegate Sandstone and Blackhawk Formation which limits groundwater recharge potential and the potential for the interception of regional groundwater systems, and 3) the 150-foot interval of the Blackhawk Formation overlying the gob area was likely intensely fractured as a result of the longwall mining prior to the construction of the wells which would likely have drained the groundwater partitions immediately overlying the gob area at the time of mining. For these reasons, the potential for drainage of appreciable groundwater or surface-water resources through the GVH drill holes is considered low.

The potential for detrimental impacts to the ephemeral Bear Canyon Creek drainage or any associated alluvial groundwater systems is considered remote. As discussed above, appreciable baseflow alluvial groundwater systems were not identified near the GVH location during the 7 October 2008 visit. Additionally, because the GVH well bores will be hydraulically isolated from the upper approximately 200 feet, the potential for impacts to water quality in the drainage are unlikely The implementation of appropriate sediment control management practices will minimize the potential for increased sediment yield from the GVH site during the construction and operational phases of the GVH system.

Prior to final reclamation, all drillholes will be plugged and sealed in accordance with State and Federal regulations. The casings will be plugged at the bottom to hold the concrete. A lean concrete mixture will be poured into the casing until the concrete is within five feet of the surface. At that time the casing will be cut off at ground level and the rest of the casing will be filled with lean concrete. The concrete will be allowed to harden before final reclamation is completed. In this manner, the potential for any long-term impacts to the hydrologic balance resulting from the GVH system will be minimized.

References Cited

Mayo and Associates, 1997, Investigation of surface-water and groundwater systems in the West Ridge Area, Carbon County, Utah: unpublished consulting report, 80 p.

Please feel free to contact me should you have any questions in this regard.

Sincerely,

LICENSED PROFESSIONAL GEOLOGIST
ERIK CARL PETERSEN
No. 5373615-2250
STATE OF UTAH

Erik C. Petersen, P.G.
Principal Hydrogeologist
Utah PG #5373615-2250

ATTACHMENT 11

DRAINAGE CONTROL PLAN
BLACKHAWK ENGINEERING

DRAINAGE CONTROL PLAN
FOR
GOB GAS VENT HOLE SITE

BEAR CANYON
WEST RIDGE MINE

INCORPORATED

NOV 1 2 2008

Div. of Oil, Gas & Mining

UTAH REGISTERED PROFESSIONAL ENGINEER
#154168
DAN W. GUY
10/20/08

PREPARED BY: **DAN W. GUY, P.E.**
BLACKHAWK ENGINEERING, INC.
OCTOBER 2008

DRAINAGE CONTROL PLAN
GOB GAS VENT HOLE SITE

I. Introduction

This report will provide the drainage control plan and calculations for the proposed gob gas vent hole site in Bear Canyon, above the East Ridge Mine. The parameters used in the calculations (i.e. rainfall, runoff curve number, etc.) were taken directly from Appendix 7-4, "West Ridge Mine Sedimentation and Drainage Control Plan (As Constructed)". Drainage area and slopes were measured directly from the maps provided with the proposal.

General Plan

The proposed drill pad and blower location is a very small area located just south of the existing public road in Bear Canyon. The new disturbance is proposed to be approximately 0.246 acres. Due to the extremely small surface area and limited space for a sediment pond, this site will be treated as an Alternate Sediment Control Area (ASCA). The majority of the natural runoff above the site is diverted around and north of the turnaround and road through an existing ditch. This report will discuss only the drainage that will actually be affected by the new construction.

It is proposed to first remove the topsoil from the proposed disturbed area and store it in a protected location elsewhere in the canyon. The proposed drill pad and blower location site will then be constructed. Due to the narrow canyon, the pad areas will be created by cutting into the existing hillside, creating a small cut slope along the south side of the pad. Runoff from above and on the pad areas will be collected in an adequately sized cut ditch at the toe of the cut slope. The pad and existing road will also be sloped toward this ditch. All runoff from the pad and road area will then flow into the ditch, through a series of excelsior logs place at 50' intervals as energy dissipaters, through a final set of 4 closely-spaced excelsior logs for sediment control and then into the natural channel below the site. The entire drainage ditch will be rip-rapped for added protection. The average slope of the drainage ditch is approximately 8.11%; however, the slope does steepen at the lower end of the pad to approximately 11.17%. Rip-rap sizing is based on the expected flow velocities in this steepest, worst-case section of the ditch. Rip-rap sizing is based on the Rip-Rap Chart, Figure 2 in Appendix 7-4 of the West Ridge MRP. The cut slopes will be pocked and reseeded and covered with woodstraw, and the pad and road areas will be graveled. This will further enhance the erosion protection on the site.

Calculations

Runoff calculations and ditch sizing were calculated using the computer program "Office of Surface Mining Watershed Model", Storm Version 6.20 by Gary E. McIntosh. Runoff curve numbers and rip-rap sizing were taken from Appendix 7-4. Drainage areas and slopes were measured directly from the enclosed maps. All calculations are based on the 10 year-24 hour precipitation event for this area.

The following are the specific parameters used for the runoff calculations at this site:

10 year-24 hour precipitation	=	2.00"
Runoff Curve Number (Undisturbed)	=	64
Runoff Curve Number (Disturbed)	=	90
Undisturbed Runoff Area	=	2.790 ac.
Undisturbed Runoff Slope	=	60.45%
Existing Road Area	=	0.305 ac.
New Disturbed Area	=	0.246 ac.
Disturbed Runoff Slope	=	8.11%
Manning's n for Ditch	=	0.035
Average Ditch Slope	=	8.11%
Maximum Ditch Slope	=	11.17%

Peak flows were calculated for the undisturbed slope drainage to the pad area and for the pad and road area. These flows were added together for a total peak flow to be routed through the ditch. Calculations are included in Attachment A of this report.

The following are the results of the calculations:

Peak Flow - Undisturbed	=	0.06 cfs
Peak Flow - Disturbed	=	0.53 cfs
Peak Flow - Total	=	0.59 cfs
Average Ditch Flow Depth	=	0.42 ft.
Average Ditch Flow Velocity	=	3.39 fps
Maximum Ditch Flow Depth	=	0.39 ft.
Maximum Ditch Flow Velocity	=	3.82 fps

Proposed Construction

Based on the calculated peak flow runoff for this site, the following proposed hydrologic controls will provide adequate protection:

1. Ditch Size - Triangular/Minimum 12" depth
2. Rip-Rap Size – 3" D_{50}/Minimum 6" Depth
3. Velocity Control – Excelsior Logs – 50' spacing along Ditch
4. Sediment Control - Excelsior Logs - 4 Rows Minimum 5' apart

It is proposed to construct a triangular shaped ditch with maximum average of 1:1 slopes and minimum depth of 12" along the base of the cut slope along the entire length of the disturbed area. The entire ditch will be armored with 3" Minimum D50 rip-rap. Excelsior logs will also be placed at 50' intervals along the ditch as energy dissipaters. The lower end of the ditch will pass through a series of at least 4 rows of excelsior logs for velocity and sediment control, and then to the natural channel below the site. Excelsior logs will be installed per manufactures recommendations.

Conclusion:

Due to the small size of the site and installation of the proposed sediment and erosion controls, there should be no adverse effects to the surface hydrology of this area.

ATTACHMENT A

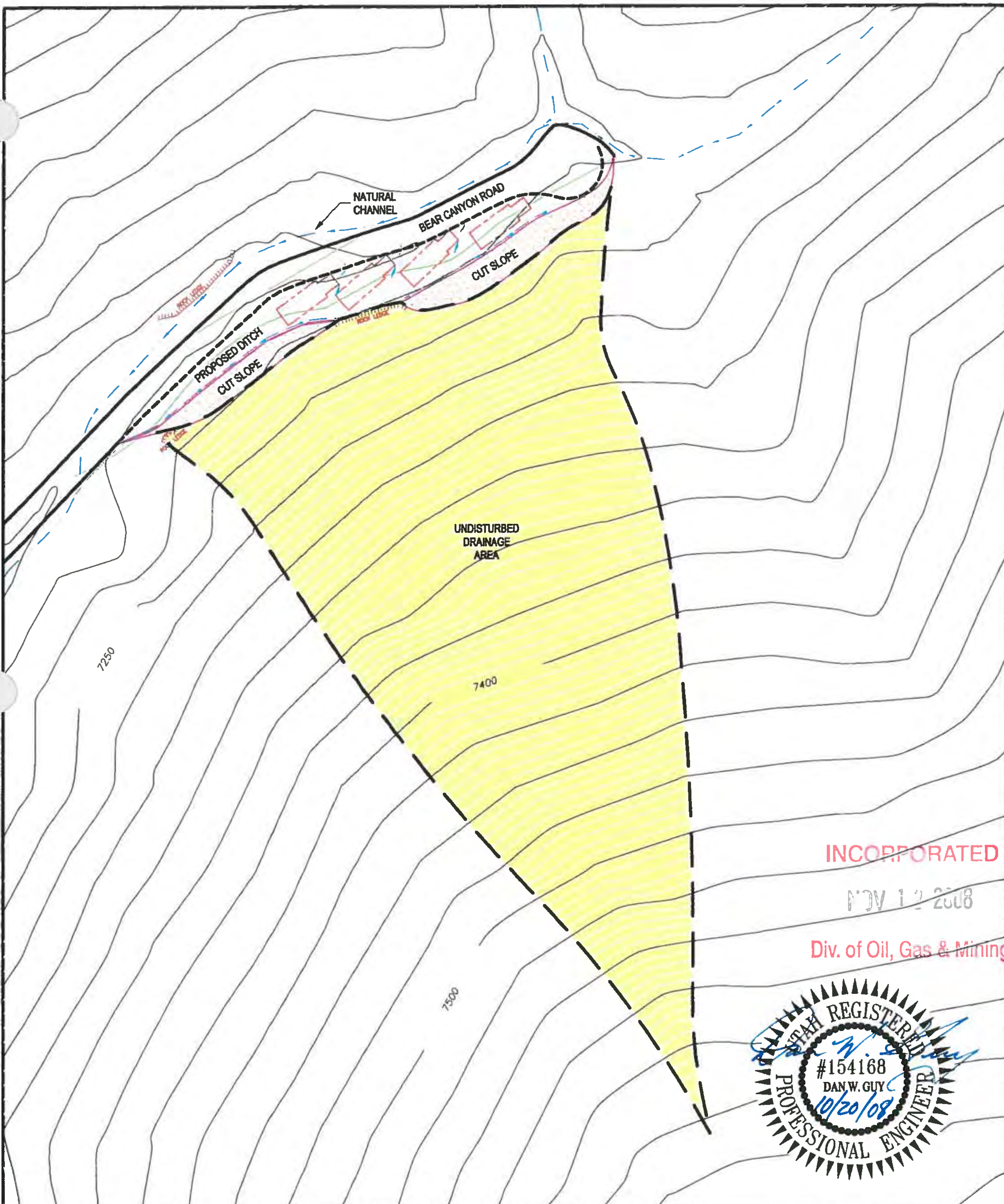
HYDROLOGY CALCULATIONS

```
Project Title           = WEST RIDGE GVH UNDIST 10/24
WATERSHED HYDROGRAPH
     Inflow into structure #  1
     Structure type:          Null

-- Watershed data for watershed # 1
    Curve number                 =    64.0
    Area                         =     2.8 acres
    Hydraulic length             =  670.00 Feet
    Elevation change             =   405.0 feet.
    Concentration time           =    0.09 hours
    Concentration time type = SCS Upland Curves
    Unit hydrograph type         = Forested

-- Total Area              =      2.8 acres

-- Storm data
    Total precipitation   =     2.0 inches
    Storm type            = SCS Type 2 storm, 24 hour storm
    Peak Discharge        =    0.06 cfs
    Discharge volume      =    0.03 acre ft
```

```
Project Title              = WEST RIDGE GVH DIST 10/24
WATERSHED HYDROGRAPH
     Inflow into structure #  1
     Structure type:           Null

-- Watershed data for watershed # 1
     Curve number                =    90.0
     Area                        =     0.6 acres
     Hydraulic length            =  370.00 Feet
     Elevation change            =    30.0 feet.
     Concentration time          =    0.04 hours
     Concentration time type = SCS Upland Curves
     Unit hydrograph type        = Disturbed

-- Total Area               =     0.6 acres

-- Storm data
     Total precipitation   =      2.0 inches
     Storm type            = SCS Type 2 storm, 24 hour storm
     Peak Discharge        =    0.53 cfs
     Discharge volume      =    0.05 acre ft
```

```
Title of run: WEST RIDGE GVH AVG.
   Solving for................= Depth Normal
Triangle
   Flow depth (ft)............=    0.42
   First Side slope...........=     1.0
   Second Side slope..........=     1.0
   Slope of diversion.........=  0.0811
   Manning"s n................=   0.035
   CFS........................=    0.59
   Cross section area (sqft)..=    0.17
   Hydrualic radius...........=    0.15
   fps........................=    3.39
   Froude number..............=    1.55
```

```
Title of run: WEST RIDGE GVH MAX.
   Solving for................= Depth Normal
Triangle
   Flow depth (ft)............=    0.39
   First Side slope...........=     1.0
   Second Side slope..........=     1.0
   Slope of diversion.........=  0.1117
   Manning"s n................=   0.035
   CFS........................=    0.59
   Cross section area (sqft)..=    0.15
   Hydrualic radius...........=    0.14
   fps........................=    3.82
   Froude number..............=    1.80
```



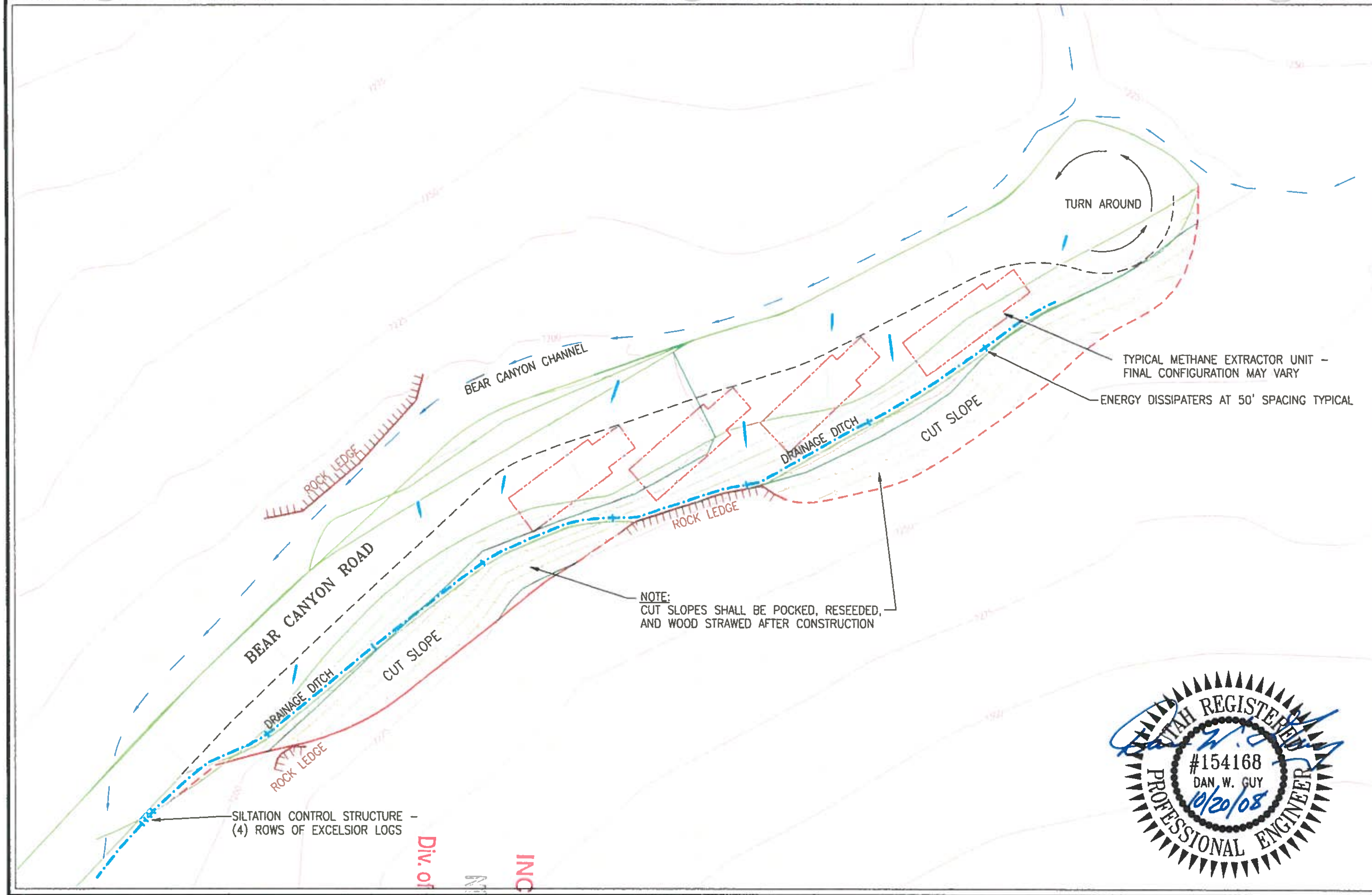
STATE OF UTAH REGISTERED PROFESSIONAL ENGINEER #154168 DAN W. GUY 10/20/08

N

SCALE: 1" = 100'

BEAR CANYON HYDROLOGY
WEST RIDGE MINE
UNDISTURBED DRAINAGE AREA
FIGURE 1

BLACKHAWK ENGINEERING, INC.



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NOTE:
ALL PAD AND ROAD AREA
ABOVE CHANNEL CROSSING
TO BE GRAVELED

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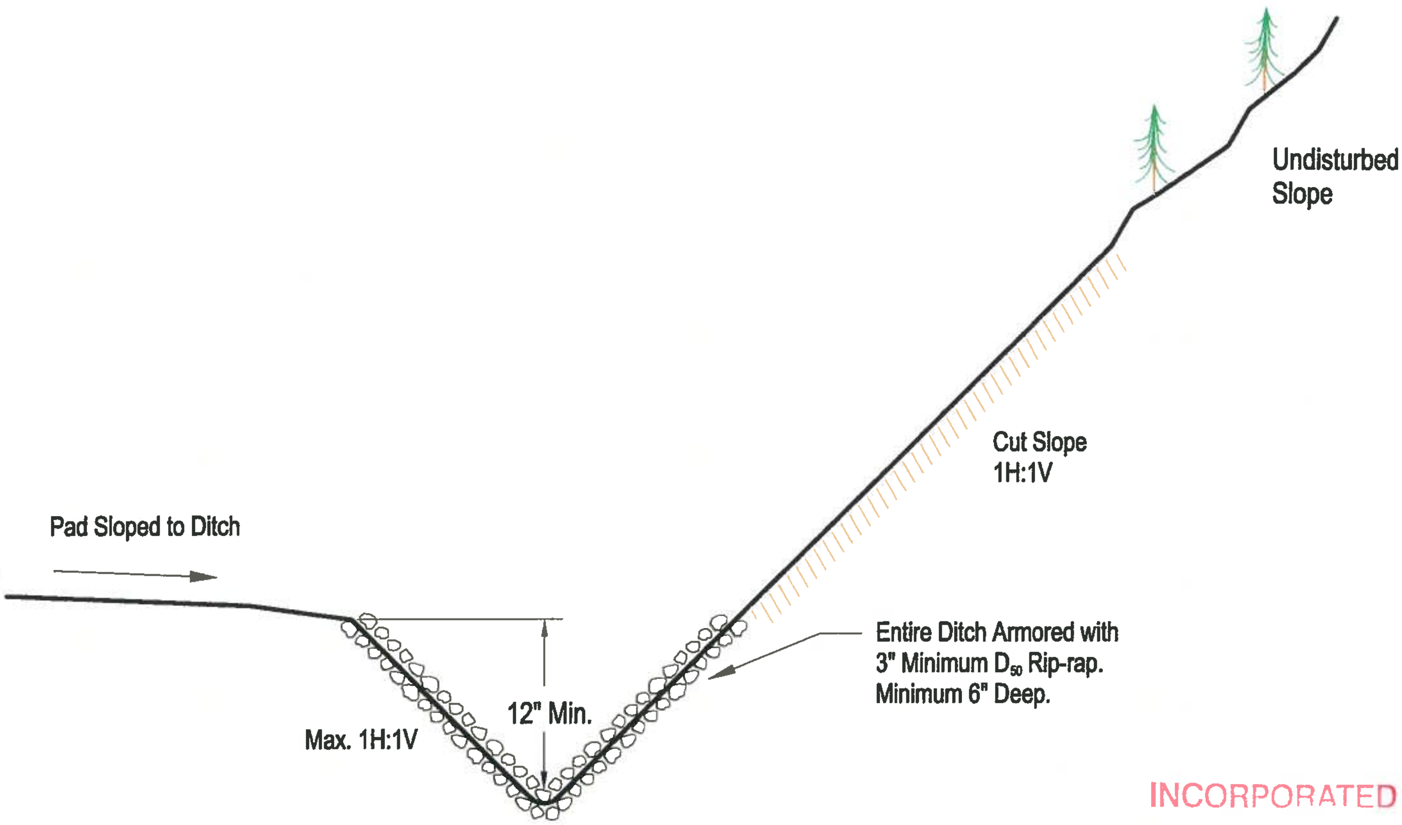
BEAR CANYON HYDROLOGY
WEST RIDGE MINE
DRAINAGE PLAN
FIGURE 2

BLACKHAWK ENGINEERING, INC.



INCORPORATED

NOV 1 2 2008

Div. of Oil, Gas & Mining

TYPICAL SECTION

UTAH REGISTERED PROFESSIONAL ENGINEER #154168 DAN W. GUY 10/20/08

NOTE:

Ditch Side Slopes may vary - Average Side Slopes will not exceed 1H:1V.

BEAR CANYON GVH
WEST RIDGE MINE
DRAINAGE DITCH
FIGURE 3

BLACKHAWK ENGINEERING, INC.

ATTACHMENT 12

TOWER (CENTENNIAL) GVH
C/007/019
BONDING CALCULATIONS

Current Tower Bond

Cenntennial Project C/007/019 | Bond Amount | Revised April 2007

Bonding Calculations
Centennial Mine C/007/019

Bond Summary

Direct Costs		
Subtotal Demolition and Removal	$371,538.00	
Subtotal Backfilling and Grading	$426,800.00	
Subtotal Revegetation	$210,074.00	
Direct Costs	$1,008,412.00	
Indirect Costs		
Mob/Demob	$100,841.00	10.0%
Contingency	$50,421.00	5.0%
Engineering Redesign	$25,210.00	2.5%
Main Office Expense	$68,572.00	6.8%
Project Mainagement Fee	$25,210.00	2.5%
Subtotal Indirect Costs	$270,254.00	26.8%
Total Cost	$1,278,666.00	
Escalation factor		0.012
Number of years		4
Escalation	$62,490.00	
Reclamation Cost	$1,341,156.00	
Bond Amount (rounded to nearest $1,000) 2009 Dollars	$1,341,000.00	
Bond Posted	$1,520,000.00	
Difference Between Cost Estimate and Bond	-$179,000.00	
Percent Difference	13.35%	

Task ID	Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
2359		Gob Vent Well 10 thru 17																			
		7A is a redrill																			
		Structure's Demolition Cost	Mechanical equipment heavy	15055 300 3600	805	/ton							4			8	tons		32	tons	25760
		Plug Well	Plug Well	AML3	5000	EA.										8	EA		8	EA	40000
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Disposal Cost Non Steel																			
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			65760
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			65760

Tower GVH
Demolition

Task ID		Equipment Cost	Hourly Operating Costs	Equipment Overhead	Operator's Hourly Wage Rate	Hourly Cost	Number of Men or Eq.	Total Eq. & Lab. Costs	Units	Quantity	Units	Production Rate	Units	Equip. + Labor Time/Dis.	Units	Cost
	Gob Hole 10 thru 17															
	Grading 5,000 CY per hole															
	Grading															
	Backfill and rough grade pond, canyon and bench areas															
	D7R Series II (9-55) (2nd2004)	10566	41.1	0.1	52	163.24	1	163.24	$/HR	40000	CY	250	CY/HR	160	HR	26118
	Subtotal															26118
	Topsoil 1,600 CY per hole															
	Haul and spread topsoil															
	D7R Series II (9-55) (2nd2004)	13720	53.4	0.1	52	196.49	1	196.49	$/HR	12800	CY	250	CY/HR	51.2	HR	10060
	Subtotal															10060
	Support Personel															
	4,000 gal H2O truck Diesel (20-16) (2N04)	3350	19.85	0.1	42	84.77	1	84.77	$/HR					32	HR	2713
	Subtotal															2713
	Total															38891

Tower GVH Earthwork

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MAY 11 2007
Div. of Oil, Gas & Mining

Printed 4/26/2007

File Earthnew.xls and Worksheet GobHole10thru17

Ref.	Description	Materials
	Gob Holes New	
	Ground Preparation	
	Gouging/Pocking	Excavation Bulk Bank 2 CY (322BL)
	Assume vol = area(18.1 AC) x 1 ft.	
	Seed for hydromulch	Seed Mix for Centennial Drainage
	Hydroseed application	Hydro Spreader (equip. & labor) B-81 80MSI
	Mulch material	Hay 1" material only 029105000250
	Hydroseed application	Hydro Spreader (equip. & labor) B-81
	Subtotal	
	Reseeding	
	Assume 25% reseeding rate	
	Subtotal	
	Total	

Tower GVH
Reveg

Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area
M023154240260	1.7	/CY					
Centennial 001	447.7	$/AC					8
Reveg002	19.13	/MSF					8
Reveg001	68	/MSF					8
Reveg005	19.13	/MSF					8

Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit
3200					CY		3200	CY
					AC		8	AC
					AC		348	MSF
					AC		8	AC
					AC		348	MSF

Cost
5440
3582
6657
544
6657
22880
5720
5720
28600

Current West Ridge Bond

West Ridge Mine C/007/041 Task 2233 Bond Amount Revised April 2007

Bonding Calculations

Direct Costs

Subtotal Demolition and Removal	$303,444.00	
Subtotal Backfilling and Grading	$777,302.00	
Subtotal Revegetation	$142,999.00	
Direct Costs	$1,223,745.00	
Indirect Costs		
Mob/Demob	$122,375.00	10.0%
Contingency	$61,187.00	5.0%
Engineering Redesign	$30,594.00	2.5%
Main Office Expense	$83,215.00	6.8%
Project Mainagement Fee	$30,594.00	2.5%
Subtotal Indirect Costs	$327,965.00	26.8%
Total Cost	$1,551,710.00	
Escalation factor		0.038
Number of years		3
Escalation	$183,702.00	
Reclamation Cost	$1,735,412.00	
Bond Amount (rounded to nearest $1,000) 2011 Dollars	$1,735,000.00	
Bond Posted 2004	$2,117,000.00	
Difference Between Cost Estimate and Bond	$382,000.00	
Percent Difference	22.02%	

ATTACHMENT 13

RECLAMATION SEED MIXES

TABLE 3-1
REVEGETATION TIMETABLE

Refer to Table 5-1, Reclamation Time Table - West Ridge Mine for details of entire reclamation schedule.

YEAR 1	BEGIN	END
Reseed/ mulch	following regrading	October 31

YEAR 2 - 4	BEGIN	END
Perform Maintenance Work On Site	as needed	
Perform Annual Qualitative Vegetation Monitoring	June	June
Perform Quantitative Vegetation Monitoring During Second & Third Years	June	August

YEAR 5 - 10	BEGIN	END
Perform Quantitative Vegetation Monitoring During Fifth, Ninth and Tenth Years	June	August
Obtain Bond Release	September	

TABLE 3-2B

MINESITE RECLAMATION -FINAL RECLAMATION
SPECIES LIST AND SEEDING RATE
SEED MIXTURE FOR THE DOUGLAS FIR/MAPLE COMMUNITY

RATE SCIENTIFIC NAME	COMMON NAME	BROADCAST #PLS LBS/ACRE
GRASSES		
Elymus trachycaulus	Slender Wheatgrass	2.0
Elymus lanceolatus	Thickspike Wheatgrass	2.0
Elymus spicatus	Bluebunch Wheatgrass	3.0
Poa pratensis	Kentucky Bluegrass	0.2
Stipa comata	Needle-and-thread	2.0
Poa fendleriana	Muttongrass	0.3
Stipa hymenoides	Indian ricegrass	2.0
FORBS		
Achillea millefolium	Yarrow	0.1
Aster chilensis	Pacific Aster	0.1
Geranium viscosissimum	Sticky Geranium	1.0
Hedysarum boreale	Northern Sweetvetch	1.5
Hedysarum occidentale var. canone	Canyon Sweetvetch	0.0*
Linum lewisii	Lewis Flax	1.0

TABLE 3-2B (CONTINUED)

TREES/SHRUBS		
Acer glabrum	Rocky Mountain Maple	2.5
Prunus virginiana	Chokecherry	2.0
Rhus trilobata	Squawbush	1.0
Symphoricarpos oreophilus	Snowberry	0.5
	TOTAL	212

The following would be planted as five gallon containerized plants along the reclaimed channel. The plants would be spaced about five feet apart along each side.

Amelanchier alnifolia	Serviceberry
Cercocarpus ledifolius	Mountain Mahogany

* To be determined by future field tests and on-site seed availability.

TABLE 3-3

MINESITE RECLAMATION -INTERIM RECLAMATION SPECIES LIST AND SEEDING RATE INTERIM REVEGETATION SEED MIXTURE FOR TEMPORARY DISTURBANCE AT THE MINESITE

SCIENTIFIC NAME	COMMON NAME	BROADCAST RATE #PLS LBS/ACRE
GRASSES		
Elymus lanceolatus	Thickspike Wheatgrass	4.5
Elymus smithii	Western Wheatgrass	5.0
Poa pratensis	Kentucky Bluegrass	0.4
Stipa hymenoides	Indian Ricegrass	4.0
Elymus spicatus	Bluebunch Wheatgrass	6.0
FORBS		
Achillea millefolium	Yarrow	0.1
Artemisia ludoviciana*	Louisiana sage	0.1
Hedysarum occidentale var. canone	Canyon Sweetvetch	0.0**
	TOTAL	20.1

* Subject to availability

**Hedysarum occidentale var. canone (Canyon Sweetvetch) will be seeded on the topsoil stockpile only as an interim revegetation measure and to propagate seed. The seeding rate would be determined by future field tests and on-site seed availability.

TABLE 3-4

REVEGETATION MONITORING SCHEDULE

QUALITATIVE OBSERVATIONS

TYPE OF REVEGETATION	YEAR 1	2	3	4	5	6	7	8	9	10
Permanent Revegetation	X	X	X	X	X	X	X	X	X	X
Interim Stabilization	X	X	X	X	X	X	X	X	X	X
Test Plots/Field Trials	X	X	X	X	X	X	X	X	X	X

QUANTITATIVE OBSERVATIONS

PARAMETER	YEAR 1	2	3	4	5	6	7	8	9	10
Cover		X	X		X				X	X
Frequency		X	X		X				X	X
Woody Plant Density		X		X				X	X	X
Productivity:										
Test Plots					X					X
All Other Revegetation								X	X	X

East Mtn Drillhole Reclamation
Alternate Seed Mix

Final Seed Mix

Seed Mix for Crandall mine Drill Pads and roads

Revisited September 14, 2007

Species	Variety	Common Name	Pounds/ Acre (PLS)	seeds/lbs	seeds/acre	Seeds/ft^2
Bromus marginatus	var. Garnet	Mountain Brome	2.5	90,000.00	225000.0	5.2
Elymus trachycaulus ssp. Traychycaulus	var. Primar	Slender Wheatgrass	2	159,000.00	318000.0	7.3
Dactylis glomerata	var. Paiute	Dryland Orchardgrass	2	654,000.00	1308000.0	30.0
Poa alpina		Alpine Bluegrass	1	1,000,000.00	1000000.0	23.0
Elymus lanceolatus ssp. Lanceolatus	var. Critana	Thickspike Wheatgrass	2	154,000.00	308000.0	7.1
Phleum pratense		Timothy	1	1,300,000.00	1300000	29.84
Festuca rubra		Red Fescue	1	500,000.00	500,000.00	11.48
Festuca trachyphylla		Hard Fescue	1	565,000.00	565,000.00	12.97
Secale cereale		Cereal Rye	9	18,000.00	162,000.00	3.72
Triticum aestivum x Secale cereale	QuickGuard Sterile Triticale	Triticale	10	13,000.00	130,000.00	2.98
Heliiomris multiflora		Showey Goldeneye	0.25	1,055,000.00	263,750.00	6.05
Vicia americana		American vetch	0.5	33,000.00	16,500.00	0.38
Artemisia ludoviciana		Prairie sage	0.1	4,500,000.00	450,000.00	10.33
Achillea millefolium	var. occidentalis	Westren yarrow	0.2	2,770,000.00	554000.0	12.7
Total			**32.55**		**7100250.0**	**163.0**

ATTACHMENT 14

SPILL PREVENTION, CONTROL, AND COUNTERMEASURE PLAN (SPCC)

SPILL PREVENTION, CONTROL, AND COUNTERMEASURE PLAN (SPCC)

WEST RIDGE
RESOURCES, INC.

WEST RIDGE MINE

794 North C Canyon Road
East Carbon, Utah 84520
Telephone: (435) 888-4000 Fax: (435) 888-4002

September 20, 2004

SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN (SPCC)
40CFR112.7

Being a Professional Engineer, licensed and practicing in the State of Utah, I have reviewed West Ridge Resources, Inc.'s Spill Prevention Control and Counter Measure Plan (SPCC) date 20 September 2004 and attest that it has been prepared in accordance with 40 CFR Part 112.7 and prudent engineering practices.

UTAH REGISTERED PROFESSIONAL ENGINEER
#191488
JOHN CHRISTOPHER LEWIS
9-20-04

WEST RIDGE MINE
SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN
40 CFR 112.7

The following Spill Prevention Control and Countermeasure Plan is written in accordance with the guidelines of 40 CFR 112.7 for the West Ridge Mine, Carbon County, Utah. The proposed mine facility is to be located approximately 6 miles northeast of East Carbon City, Utah, in Township 14 South, Range 13 East, portions of Sections 10,11,14 and 15, for a total of approximately 29 acres. Surface facilities have been constructed to support underground coal mining activities conducted by West Ridge Resources, Inc. This plan shall apply to surface fuel and lubricant storage areas within the proposed mine yard.

REGULATORY REQUIREMENTS:

40 CFR 112.7 (a)

The facility has not experienced any spill events in the past.

40 CFR 112.7 (b)

Gasoline and diesel storage tanks will be located within the mine facility area near the building area, as shown o Map 5-5. Gasoline and diesel will be stored in surface storage tanks of a maximum 2,000 gallons each. The tanks will be constructed and recommended for fuel storage use. Visual observations will be made on the tanks for signs of deterioration and leakage. The fuel will be utilized for mine related equipment.

Fuel storage tanks will be situated so that if one of the tanks were to leak or rupture, the contents of the largest tank would be contained within a concrete or steel enclosure.

Five gallon containers of oil and grease will also be stored in the mine yard area. These containers will be stored within a fire resistant area to keep rain and snow off the containers and prevent accidental contact form moving equipment. Containers will be stored on a concrete slab or other impermeable surface capable of containing spillage to prevent soil contamination in the event of a spill or leak.

Although the storage tanks will be designed for storage of petroleum products and will be tested prior to being put into service, the possibility exists that a tank could leak or rupture. If discharge occurred, contents for the tank (up to 2,000 gallons) would be contained within the storage areas. Immediate action would be taken to remove the spilled fuel from the storage site and properly dispose of if it at a treatment facility.

Spillage from the oil and grease storage site would also be contained at the site within an impervious containment structure. If necessary, absorbent materials will be used to contain the spill.

40 CFR 112.7 (c)

A discussed in (b) above, enclosure and containment at the storage site will act as a primary measure of control. Should the enclosure leak, rupture or otherwise be rendered inadequate, runoff from the enclosure site would flow to the sediment pond as secondary measure containment. The sediment pond has been designed to contain runoff from the yard area and is constructed at the south end of the mine yard. All drainage from the mine yard will flow to and be contained within the pond. The sediment pond would be used only as a secondary line of defense. Efforts will be made to prevent spills from reaching the pond through primary containment and rapid remedial response using absorbent material.

The sediment pond is designed to contain all runoff, from the mine site area, as a result of a 10 year-24 hour precipitation event. Should a significant runoff event occur, water would be held in the pond until suspended solids had settled (or a minimum of 24 hours) then, if it met quality requirements of the UPDES discharge permit issued for the facility, would be decanted into the natural drainage channel. Water held in the pond would not be discharged unless it met the standard for quality under the UPDES discharge permit issued for the facility. The primary spillway of the sediment pond will be equipped with am oil skimmer to prevent any oil or grease from discharging into the natural drainage.

The sediment pond has been designed in accordance with State regulations and guidelines. Runoff from the disturbed area, plus adjacent undiverted drainage areas, will be contained within the pond. Design calculations for the pond also include a storage volume for three years of sediment accumulation from contributing areas. A maximum of 60 percent of this storage volume will be utilized. Sediment will be cleaned out of the pond upon reaching the 60 percent level, thus restoring 100% of the sediment volume.

Ditches within the mine yard have been designed and constructed to divert water away from natural channels and convey the flow to the sediment pond. The ditches have been sized to handle the flow of a 10 year-24 hour precipitation event.

The approximate distance to any flowing stream is about 8.5 miles to the Price River. Grassy Trail Creek would be the closest receiving water and this creek only experiences intermittent flows during runoff events.

Absorbent material would be kept on-hand at the warehouse to control spills.

40 CFR 112.7 (d)

A description of proposed structures to control and contain accidental discharges is presented in (c) above.

40 CFR 112.7 (e)

Drainage from the mine site will be routed to the sediment pond for containment as described above in 112.7(c). The conveyance system, composed of ditches and culverts, has been deigned to operate efficiently by gravity flow of drainage.

Bulk oil will no be stored in tanks at the mine site. However, in the event a tank containing diesel or gasoline ruptured and was contained by the sediment pond, the stored material will be pumped out into a tanker truck disposed of at a commercial treatment facility.

There will be no buried petroleum storage tanks at the mine site.

INSPECTION AND RECORDS

All storage tanks containing petroleum products will be inspected visually on a daily basis.

Storage containment facilities will be inspected visually on a weekly basis.

Ditches and culverts will be inspected visually on a weekly basis.

The sediment pond will be inspected visually on a weekly basis.

Should any leak or spill be detected, action will be taken to immediately stabilize conditions and initiate remedial action.

SECURITY

Access to the storage locations at the mine site will be restricted. Locks will be placed on all dispensing devices to prevent unauthorized discharge.

PERSONNEL, TRAINING AND SPILL PREVENTION PROCEDURES

Employees at the mine site will receive training regarding the proper use and operation of the storage sites and sediment pond. Spill prevention briefings will be incorporated into weekly safety and training meetings held with the employees at the site. Employees will be instructed in how to respond to emergency situations at the facility.

SPCC PLAN SUMMARY

- Fuel will be contained in steel construction storage tanks that are built, designed and approved for the storage of petroleum products. The tanks will be tested prior to their use as a precaution against leaks.

- Primary containment of any leakage from the fuel storage tanks will be provided at the storage tank location. Primary containment will consist of concrete alls or a steel liner sufficient to contain the contents of the largest storage tank. Total containment at the site will be considered a first line of defense. Absorbent materials will be used, where necessary, to minimize impact of any leak or spill.

- The storage location for oil and grease will be fire-resistant and have an impermeable floor to prevent subsurface contamination and sides to contain spillage within the storage site.

- Should the primary containment structures fail, drainage from the storage locations will be routed to and contained by the sediment pond. The sediment pond will be considered only as a secondary line of defense.

- Diversionary structures will be constructed at the mine sit to divert and convey a spill, in the event of an emergency, into the sediment pond. Storage in the sediment pond would preclude any discharge into natural drainage ways.

- Should a spill event occur, all oil/ fuel collected and contained within the sediment pond will be removed from the pond and disposed in an approved manner.

- The sediment pond will have sufficient capacity to contain run-off from the 10 year-24 hour precipitation event in the area as well as the maximum amount of oil/fuel stored in the largest tank on-site. The principal spillway of the sediment pond will be equipped with an oil skimmer.

- Visual inspection of all storage tanks will be conducted by a designed person on a routine basis. This inspection will also include an evaluation of the foundation supporting the tank.

- Storage tank valves that permit outward flow of the tank contents will be locked in a closed position when in a non-operating mode.

- The loading/unloading connections of all storage tanks will be securely capped.

- All personnel will be instructed in the operation and maintenance of the storage equipment to prevent discharge from the tanks.

- This plan will be posted at the site.

EMERGENCY REPORTING PROCEDURES:

In the event of a spill, the Mine Superintendent or other mine personnel will contact the following personnel:

Person	Office Number	Home Number
Gary Gray	435/888-4015	637-3119
John Lewis	435/888-4016	613-0195

In the absence of the above personnel, the following person should be contacted:

Person	Office Number	Home Number
Darrel Leonard	435/888-4043	888-6639
Laine Adair	435/888-4000	472-3132

Reports on the spill be made to the EPA and the State of Utah at the following phone numbers:

Agency	Office Number
U.S. Environmental Protection Agency (EPA)	303/293-1788 or 800/424-8802 (24 hour)
Utah Bureau of Water Pollution Control	801/538/6146
Utah Division of Oil, Gas and Mining	801/538-5340
Utah Department of Health (24 hr Oil Spill Reporting Center)	801/538-6333

ATTACHMENT 15

MSDS SHEETS FOR DRILLING PRODUCTS

NL BAROID DRILLING FLUIDS,INC. -- QUICK-FOAM -- 9390-01-409-2597
==================== Product Identification ====================

Product ID:QUICK-FOAM
MSDS Date:11/01/1995
FSC:9390
NIIN:01-409-2597
MSDS Number: CCSYH
=== Responsible Party ===
Company Name:NL BAROID DRILLING FLUIDS,INC.
Address:3000 N SAM HOUSTON PKY E
Box:1675
City:HOUSTON
State:TX
ZIP:77251
Country:US
Info Phone Num:713-987
Emergency Phone Num:713-987-4000
Preparer's Name:ENVIRONMENTAL SERVICES
CAGE:20064
=== Contractor Identification ===
Company Name:BAROID DRILLING FLUIDS,INC.
Address:3000 N SAM HOUSTON PKY E
Box:1675
City:HOUSTON
State:TX
ZIP:77251
Country:US
Phone:713-987-4000/713-987-5900
CAGE:20064

============= Composition/Information on Ingredients =============

Ingred Name:ISOPROPYL ALCOHOL (SARA 313)
CAS:67-63-0
RTECS #:NT8050000
Fraction by Wt: 15%
Other REC Limits:NONE RECOMMENDED
OSHA PEL:400 PPM
ACGIH TLV:400 PPM/500STEL;9596

Ingred Name:ETHYL ALCOHOL (ETHANOL)
CAS:64-17-5
RTECS #:KQ6300000
Fraction by Wt: 5%
Other REC Limits:NONE RECOMMENDED
OSHA PEL:1000 PPM
ACGIH TLV:1000 PPM; 9596

==================== Hazards Identification ====================

LD50 LC50 Mixture:ORAL LD50 (RAT) IS NOT DETERMINED.
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:EYES-SEVERELY IRRITATING UPON CONTACT. MAU INJURE EYE TISSUE IF NOT REMOVED PROMPTLY. SKIN-FREQUENT OR PROLONGED CONTACT MAY IRRITATE AND CAUSE DERMATITIS, IRRITATING. INHALATION-HIGH VAPOR CONCENTRAT IONS ARE IRRITATING TO EYES AND RESPIRATORY TRACT. INGESTION-LOW ORDER OF TOXICITY.
Explanation of Carcinogenicity:NOT ON NTP, IARC OR OSHA LIST.
Effects of Overexposure:INHALATION-MAY CAUSE HEADACHES AND DIZZINESS.
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

======================= First Aid Measures =======================

First Aid:EYE-IMMEDIATELY FLUSH EYES WITH LARGE AMOUNTS OF WATER FOR 15 MIN. GET PROMPT MEDICAL ATTENTION. SKIN-FLUSH WITH LARGE AMOUNTS OF WATER. USE SOAP. IF IRRITATION PERSISTS, SEEK MEDICAL ATTENTION. INHAL ATION-REMOVE PERSON FROM EXPOSURE, ADMINISTER ARTIFICIAL RESPIRATION IF BREATHING HAS STOPPED. KEEP AT REST. CALL FOR PROMPT MEDICAL ATTENTION. INGESTION-IF CONSCIOUS, GIVE WATER & INDUCE VOMITING.

===================== Fire Fighting Measures =====================

Flash Point Method:PMCC
Flash Point:74.0F,23.3C
Extinguishing Media:ALCOHOL TYPE FOAM OR DRY CHEMICAL. USE WATER SPRAY TO COOL FIRE EXPOSED SURFACES.
Fire Fighting Procedures:RESPIRATORY AND EYE PROTECTION REQUIRED FOR FIRE FIGHTING PERSONNEL.
Unusual Fire/Explosion Hazard:FLAMMABLE LIQUID, CAN RELEASE VAPORS THAT FORM FLAMMABLE MIXTURES AT TEMPERATURES AT OR ABOVE THE FLASHPOINT.

================== Accidental Release Measures ==================

Spill Release Procedures:ELIMINATE SOURCES OF IGNITION. PICK UP WITH SUITABLE NONCOMBUSTIBLE ABSORBENT. PREVENT LIQUID FROM ENTERING WATERWAYS. CONSULT AN EXPERT ON DISPOSAL OF RECOVERED MATERIAL.

====================== Handling and Storage ======================

Handling and Storage Precautions:STORE IN COOL AND WELL VENTILATED AREA, SEPERATE FROM OXIDIZING AGENTS.
Other Precautions:"EMPTY" CONTAINERS RETAIN PRODUCT RESIDUE AND CAN BE DANGEROUS. DO NOT PRESSURIZE, CUT, WELD, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

============= Exposure Controls/Personal Protection =============

Respiratory Protection:IF CONCENTRATIONS EXCEED TLV, USE A NIOSH APPROVED CHEMICAL CARTRIDGE RESPIRATOR.
Ventilation:MECHANICAL, GENERAL, ROOM VENTILATION TO MAINTAIN TLV.
Protective Gloves:CHEMICAL RESISTANT.
Eye Protection:GOGGLES OR SAFETY GLASSES W/SIDE SHIELD.
Other Protective Equipment:EYEWASH SHOWER, LONG SLEEVES.
Work Hygienic Practices:WASH THROUGHLY AFTER HANDLING.
Supplemental Safety and Health
QUICK-FOAM ID MODERATELY TOXIC TO FISH. DO NOT USE, SPILL OR DISCARD WHERE IT MAY LEACH, SPILL OR RUN OFF INTO WATERWAYS. KEEP AWAY FROM FLAMES OR SPARKS. EMPTY DRUMS SHOULD BE COMPLETELY DRAINED, PRO PERLY BUNGED AND PROMPTLY RETURNED TO ADRUM RECONDITIONER OR PROPERLY DISPOSED OF.

================== Physical/Chemical Properties ==================

HCC:F3
Boiling Pt:B.P. Text:NA
Melt/Freeze Pt:=-23.3C, -10.F
Decomp Temp:Decomp Text:NA
Vapor Pres:NA
Vapor Density:NA
Spec Gravity:1.02
pH:7.3-.8
Viscosity:NA

Evaporation Rate & Reference:NA
Solubility in Water:SOLUBLE
Appearance and Odor:LIGHT AMBER LIQUID, ALCOHOL ODOR.
Percent Volatiles by Volume:ND
Corrosion Rate:ND

================= Stability and Reactivity Data =================

Stability Indicator/Materials to Avoid:YES
STRONG OXIDIZING AGENTS.
Stability Condition to Avoid:NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomposition Products:SHORT CHAIN HYDROCARBONS, CARBON MONOXIDE, CARBON DIOZIDE.

==================== Disposal Considerations ====================

Waste Disposal Methods:DISPOSE OF IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS.

HALLIBURTON

MATERIAL SAFETY DATA SHEET

Product Trade Name: **EZ-MUD®**

Revision Date: 16-Feb-2004

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Trade Name: EZ-MUD®
Synonyms: None
Chemical Family: Blend
Application: Shale Inhibitor

Manufacturer/Supplier
Baroid Drilling Fluids
a Product Service Line of Halliburton Energy Services, Inc.
P.O. Box 1675
Houston, TX 77251
Telephone: (281) 871-4000
Emergency Telephone: (800) 666-9260 or (713) 676-3000

Prepared By
Chemical Compliance
Telephone: 1-580-251-4335

2. COMPOSITION/INFORMATION ON INGREDIENTS

SUBSTANCE	CAS Number	PERCENT	ACGIH TLV-TWA	OSHA PEL-TWA
Hydrotreated light petroleum distillate	64742-47-8	10 - 30%	Not applicable	Not applicable

3. HAZARDS IDENTIFICATION

Hazard Overview
May cause eye, skin, and respiratory irritation. May cause headache, dizziness, and other central nervous system effects. May be harmful if swallowed.

4. FIRST AID MEASURES

Inhalation
If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult give oxygen. Get medical attention.

Skin
Wash with soap and water. Get medical attention if irritation persists. Remove contaminated shoes and discard.

Eyes
In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

Ingestion
Get medical attention! If vomiting occurs, keep head lower than hips to prevent aspiration.

Notes to Physician
Not Applicable

5. FIRE FIGHTING MEASURES

Flash Point/Range (F):	> 200**Min:** > 200
Flash Point/Range (C):	Not Determined**Min:** > 93
Flash Point Method:	PMCC
Autoignition Temperature (F):	> 392
Autoignition Temperature (C):	> 200
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined

Fire Extinguishing Media Water fog, carbon dioxide, foam, dry chemical.

Special Exposure Hazards Decomposition in fire may produce toxic gases. Use water spray to cool fire exposed surfaces.

Special Protective Equipment for Fire-Fighters Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

NFPA Ratings: Health 2, Flammability 1, Reactivity 0
HMIS Ratings: Flammability 1, Reactivity 0, Health 2

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures Use appropriate protective equipment.

Environmental Precautionary Measures Prevent from entering sewers, waterways, or low areas.

Procedure for Cleaning / Absorption Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Scoop up and remove.

7. HANDLING AND STORAGE

Handling Precautions Avoid contact with eyes, skin, or clothing. Avoid breathing vapors. Wash hands after use. Launder contaminated clothing before reuse.

Storage Information Store away from oxidizers. Keep container closed when not in use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls A well ventilated area to control dust levels. Local exhaust ventilation should be used in areas without good cross ventilation.

Respiratory Protection Organic vapor respirator with a dust/mist filter. In high concentrations, supplied air respirator or a self-contained breathing apparatus.

Hand Protection Impervious rubber gloves.

Skin Protection Rubber apron.

Eye Protection Chemical goggles; also wear a face shield if splashing hazard exists.

Other Precautions Eyewash fountains and safety showers must be easily accessible.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Color:	White to gray
Odor:	Mild hydrocarbon
pH:	6-8

Specific Gravity @ 20 C (Water=1):	1.0
Density @ 20 C (lbs./gallon):	8.3
Bulk Density @ 20 C (lbs/ft3):	Not Determined
Boiling Point/Range (F):	347
Boiling Point/Range (C):	175
Freezing Point/Range (F):	Not Determined
Freezing Point/Range (C):	Not Determined
Vapor Pressure @ 20 C (mmHg):	0.002
Vapor Density (Air=1):	Not Determined
Percent Volatiles:	~ 70
Evaporation Rate (Butyl Acetate=1):	< 1
Solubility in Water (g/100ml):	Partially soluble
Solubility in Solvents (g/100ml):	Not Determined
VOCs (lbs./gallon):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistrokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined

10. STABILITY AND REACTIVITY

Stability Data:	Stable
Hazardous Polymerization:	Will Not Occur
Conditions to Avoid	Keep away from heat, sparks and flame.
Incompatibility (Materials to Avoid)	Strong oxidizers.
Hazardous Decomposition Products	Ammonia. Oxides of nitrogen. Carbon monoxide and carbon dioxide.
Additional Guidelines	Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure	Eye or skin contact, inhalation.
Inhalation	May cause respiratory irritation. May cause central nervous system depression including headache, dizziness, drowsiness, incoordination, slowed reaction time, slurred speech, giddiness and unconsciousness.
Skin Contact	May cause skin irritation.
Eye Contact	May cause severe eye irritation.
Ingestion	Aspiration into the lungs may cause chemical pneumonitis including coughing, difficulty breathing, wheezing, coughing up blood and pneumonia, which can be fatal. May cause central nervous system depression including headache, dizziness, drowsiness, muscular weakness, incoordination, slowed reaction time, fatigue blurred vision, slurred speech, giddiness, tremors and convulsions.
Aggravated Medical Conditions	Lung disorders.
Chronic Effects/Carcinogenicity	No data available to indicate product or components present at greater than 1% are chronic health hazards.
Other Information	None known.

Toxicity Tests

Oral Toxicity:	Not determined
Dermal Toxicity:	Not determined
Inhalation Toxicity:	Not determined
Primary Irritation Effect:	Not determined
Carcinogenicity	Not determined
Genotoxicity:	Not determined
Reproductive / Developmental Toxicity:	Not determined

12. ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air)	Not determined
Persistence/Degradability	BOD(28 Day): 40% of COD
Bio-accumulation	Not Determined

Ecotoxicological Information

Acute Fish Toxicity:	TLM96: >1000 mg/l (Pimephales promelas)
Acute Crustaceans Toxicity:	TLM48: 98 mg/l (Acartia tonsa)
Acute Algae Toxicity:	EC50: 16.70 mg/l (Skeletonema costatum)

Chemical Fate Information	Not determined
Other Information	Not applicable

13. DISPOSAL CONSIDERATIONS

Disposal Method	Disposal should be made in accordance with federal, state, and local regulations.
Contaminated Packaging	If empty container retains product residues, all label precautions must be observed. Store away from ignition sources. Transport with all closures in place. Return for reuse or disposal according to national or local regulations.

14. TRANSPORT INFORMATION

Land Transportation

DOT
Not restricted

Canadian TDG
Not restricted

ADR Not restricted

Air Transportation

ICAO/IATA
Not restricted

Sea Transportation

IMDG
Not restricted

Other Shipping Information

Labels: None

15. REGULATORY INFORMATION

US Regulations

US TSCA Inventory	All components listed on inventory.
EPA SARA Title III Extremely Hazardous Substances	Not applicable
EPA SARA (311,312) Hazard Class	Acute Health Hazard
EPA SARA (313) Chemicals	This product does not contain a toxic chemical for routine annual "Toxic Chemical Release Reporting" under Section 313 (40 CFR 372).
EPA CERCLA/Superfund Reportable Spill Quantity For This Product	Not applicable.
EPA RCRA Hazardous Waste Classification	If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.
California Proposition 65	All components listed do not apply to the California Proposition 65 Regulation.
MA Right-to-Know Law	Does not apply.
NJ Right-to-Know Law	Does not apply.
PA Right-to-Know Law	Does not apply.

Canadian Regulations

Canadian DSL Inventory	All components listed on inventory.
WHMIS Hazard Class	D2B Toxic Materials

16. OTHER INFORMATION

The following sections have been revised since the last issue of this MSDS
Not applicable

Additional Information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Material Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.

Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

END OF MSDS

ATTACHMENT 16

UPDATED T&E SPECIES LIST (2011)
MT. NEBO SCIENTIFIC

MT NEBO SCIENTIFIC, INC.
research & consulting

VIA: E-Mail April 26, 2011

Dave Shaver
WEST RIDGE MINE
Post Office Box 910
East Carbon, Utah 84520

RE: T&E Species at the Bear Canyon GVH Site

Dear Mr. Shaver:

Because Carbon County's inventory of federally listed threatened, endangered and candidate species has been updated since the report below was written, Ingrid Campbell, a biologist from the State of Utah, Division of Oil, Gas & Mining (DOGM), requested that the information also be updated for the Bear Canyon GVH site. Attached is a revised table with the requested updated information.

Additional information regarding sensitive species can be found in the *MT. NEBO SCIENTIFIC, inc.* report called:

Vegetation of the
GVH Site in
Bear Canyon,
Book Cliffs, Utah

for the
West Ridge Mine,
Carbon County, Utah
(October 2008)

Please call me if you have any questions or comments

Sincerely,

Patrick D. Collins, Ph.D.
Biologist

330 East 400 South, Ste. 6, P.O. Box 337, Springville, Utah 84663
(801) 489-6937, (fax) 489-6779

Attachment
Letter Report to D. Shaver
April 26, 2011

Federally listed threatened, endangered & candidate species in Carbon County, Utah and notes regarding potential impacts as a result of the Bear Canyon GVH site.

(Revised: April 26, 2011)

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 March 28, 2011).

Scientific Name	Common Name	Status*	Site-Specific Notes
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. The gray wolf can live in many habitats, but there will be no impacts to this species as a result of the Bear Canyon GVH site.
Centrocercus urophasianus	Greater sage-grouse	C	Greater sage-grouse inhabit the sagebrush zone in Utah's mountain valleys and foothills. The proposed disturbance is situated in a Douglas Fir/Maple plant community. No leks are known in the immediate area. There should be no impacts to this species as a result of the Bear Canyon GVH site.
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 Bear Canyon 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 the Bear Canyon GVH site.

INCORPORATED
MAY 03 2011
Div. of Oil, Gas & Mining

Federally listed threatened, endangered & candidate species in Carbon County, Utah and notes regarding potential impacts as a result of the Bear Canyon GVH site.

(Revised: April 26, 2011)

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 March 28, 2011).

Gila elegans	Bonytail	E	The bonytail is a very rare minnow originally native to the Colorado River system. These rivers do not occur in Bear Canyon 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 the Bear Canyon GVH site.
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 area. There should be no impacts to this species as a result of the Bear Canyon GVH site.
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 Bear Canyon 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 the Bear Canyon GVH site.

Federally listed threatened, endangered & candidate species in Carbon County, Utah and notes regarding potential impacts as a result of the Bear Canyon GVH site.

(Revised: April 26, 2011)

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 March 28, 2011).

Sclerocactus wetlandicus	Uinta Basin hookless cactus	T	*Sclerocactus wetlandicus (aka S. glaucus)* generally occurs on cobblely, gravelly, or rocky surfaces on river terrace deposits along the White and Green Rivers of Utah. *S. 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. These plant communities nor habitats associate with them occur in the study area, therefore, there should be no impacts to this species as a result of the Bear Canyon GVH site.
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 Bear Canyon 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 the Bear Canyon GVH site.

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

ATTACHMENT 17

UPDATED BONDING INFORMATION PROVIDED BY DIVISION

Exhibit "B"

Appendix 5-14A to MRP

APPENDIX 5-14A

ADDENDUM TO BEAR CANYON GVH
for
GVH 4 and GVH 5

APPENDIX 5-14A
ADDENDUM TO BEAR CANYON GVH for GVH 4 and GVH 5
APRIL, 2011

ATTACHMENTS:

ATTACHMENT 1	BEAR CANYON GVH LOCATION MAP
ATTACHMENT 2	BEAR CANYON GVH SITE
ATTACHMENT 3	GVH 5 SITE PLAN DRAWINGS
	3A... PRE-CONSTRUCTION
	3B....DURING DRILLING
	3C....AS-CONSTRUCTED
ATTACHMENT 4	GVH 5 CROSS SECTION DRAWING
ATTACHMENT 5	GVH4-GVH5 DRILL HOLE DETAILS
ATTACHMENT 6	SITLA LETTER OF CONCURRENCE
ATTACHMENT 7	GEOTEXTILE DATA
ATTACHMENT 8	2010 RAPTOR SURVEY INFORMATION
ATTACHMENT 9	ARCHEOLOGY CORRESPONDENCE
ATTACHMENT 10	CARBON COUNTY ROAD CONCURRENCE
ATTACHMENT 11	BEAR CANYON GVH TOPSOIL PILE , AS-BUILT DRAWING
ATTACHMENT 12	PRE-CONSTRUCTION PHOTOS OF GVH 5 SITE
ATTACHMENT 13	EXISTING GVH BONDING INFORMATION (APRIL,2011)

INTRODUCTION:

On November 12, 2008, the Division approved the installation of three gob gas vent holes (GVH holes) in Bear Canyon as described in Appendix 5-14. Since that time, the company has mined four complete longwall panels, opening up much more gob area, and significantly increasing the volume of methane gas liberated from the gob. In order to ensure the safety of the underground workforce and to continue to meet existing coal-supply contract, the company now needs to enhance the capacity of the Bear Canyon GVH operation, and proposes to install two additional GVH wells at the site. GVH 4 would be located within the existing GVH pad which is located at the end of the Bear Canyon Road. This road is part of the Carbon County road system. The second well, GVH 5, would be located about 400' down-canyon from the existing pad, in a small area adjacent to and on the down-hill side of the existing roadway. Refer to Attachment 1 of this appendix for the location of the GVH 5 site. In reviewing the following proposal for GVH holes 4 and 5, please note that all applicable provisions of the currently approved Appendix 5-14 relating to the existing GVH installation will apply also to the new ones as well.

CHAPTER 1, LEGAL:

GVH 4 is located in Section 3, T14S, R13E, NE1/4SW1/4SE1/4. GVH 5 is located nearby in Section 3, T14S, R13E, SW1/4SW1/4SE1/4. Both sites are located on SITLA coal lease ML49287. All affected surface is owned by SITLA. Other than increasing the total disturbed area by 0.02 acres from 30.97 acres to 30.99 acres there are no changes in Chapter 1. Both sites are located on SITLA coal lease ML49287, as shown on Map 1-0/1-1.

Right-of-entry for the GVH facilities is granted under the terms of SITLA coal lease ML49287. Initial concurrence for the specific surface use of the area for the existing GVH installation and the topsoil storage area has been provided by SITLA (see Attachment 9 of Appendix 5-14). SITLA has also provided subsequent concurrence for the new GVH wells (refer to Attachment 6 of this appendix). The correspondence states, *"The Trust Lands Administration approves West Ridge Mine's request to drill two additional GVH in the areas described below, upon lands leased under coal lease ML-49287, but subject to lessee compliance with all applicable state laws and regulations."*

Refer to Attachment 2 of this appendix for a more detailed location map of the proposed GVH installation.

CHAPTER 2, SOIL:

Prior to installation of the existing GVH pad, the area was subject to an Order 1 soils survey completed by Bob Long, CPSS, of Long Resource Consultants, Inc. (Refer to Attachment 2 of Appendix 5-14 for details). Due to proximity, the soils in the pullout area of proposed GVH 5 are similar. Much of the pull-out area has been previously disturbed as a result of the recent updrade of the adjacent roadway. Even the small remaining undisturbed area is overlain by large boulder which would make topsoil salvage problematic. Based upon on-site inspection of the topsoil resources at the site (see photos in Attachment 12 of this appendix), along with Division specialist, it has been determined that the best means of protecting the existing topsoil is to leave it in place and cover it with a geotextile fabric prior to backfilling. Then, upon final reclamation, the backfill material will be removed, the geotextile material will be pealed off to expose the in-place topsoil in its present condition. In essence, the topsoil is stored in-situ. This same method of topsoil protection has been approved and implemented in much of the area of the main mine-site surface facility in nearby C Canyon. This practice is described in detail in Chapters 2 and 5 of this MRP. The company proposes to use the same (or equivalent) type of geotextile material, which is fully described in Appendix 5-5 of the approved reclamation plan for the West Ridge Mine. For ease of reference the pertinent page of Appendix 5-5 which describes this geotextile material is included in Attachment 7 of this appendix.

It should be noted that even with the in-place topsoil protected with the geo-textile material, if at the time of final reclamation addition topsoil is needed, there is a sufficient amount of topsoil already salvaged and stockpiled to accommodate this possibility. At the time of construction of the existing pad (autumn, 2008) there was 19,000 cu. ft. of topsoil salvaged and stockpiled. This compares to the original estimate of 14,000 cu. ft. estimated in the Order 1 survey. Therefore, the additional 5000 cu. ft. will provide plenty to augment any possible future topsoiling situation at the reclamation site of GVH 5. The as-built drawing of the existing topsoil pile in included in Attachment 11 of this appendix.

CHAPTER 3, BIOLOGY:

Due to the proximity of the GVH site to the minesite within the permit area, all threatened and endangered (T&E) species information applicable to the existing permit area in the MRP (Permit renewal, April 1, 2009) is current and therefore applicable to the GVH 5 site as well. Refer to Appendix 3-4 and 3-4A for current T&E information. There are no threatened or endangered species in the Bear Canyon GVH area (refer to Attachment 16 of Appendix 5-14 for current T&E information, provided by Mt. Nebo Scientific). Various species of concern during previous amendments, such as the Mexican Spotted Owl and the Yellow-Billed Cuckoo have been adequately addressed in the presently approved MRP and are not a factor. Dr. Collins has addressed the current status of T & E species in his report (see Attachment 4 of Appendix 5-14).

In 2010, the annual raptor survey was completed which included the Bear Canyon area. The survey shows no raptor concerns in the GVH area. Refer to Attachment 8 of this appendix for the 2010 survey.

Prior to installation of the existing GVH pad, the area was subject to an on-site vegetation survey completed by Dr. Patrick Collins of Mt. Nebo Scientific. (Refer to Attachment 4 of Appendix 5-14 for details). Due to proximity, the vegetation in the pullout area of proposed GVH 5 is similar. As noted earlier, much of the pullout area has already been disturbed from the previous road construction. Based on the current proposed plan, construction of the pullout area can be done with little if any disturbance to the existing vegetation below or on either side of the site (see photos in Attachment 12 of this appendix).

CHAPTER 4, LAND USE:

There will be no changes in the current land use of the Bear Canyon area as a result of the construction and operation of the GVH units. The site is located in the Bear Canyon grazing allotment, and no change in grazing activity will result from the GVH installation. (Refer to Map 4-1)

Prior to installation of the existing GVH pad, the area was subject to an on-site cultural resource survey completed by Senco Phenix Archeological Consultants. (Refer to Attachment 6 of Appendix 5-14 for details). Based on this survey, archeological clearance has been recommended (refer to Attachment 9 of this appendix).

GVH 4 will be located within the existing GVH pad which was approved by the Division on November 12, 2008. This pad is located at the end of the Bear Canyon Road which is part of the Carbon County D Road System. GVH 5 will be located about 400' south (down-canyon) of the existing GVH pad in a narrow widened area (pullout) immediately adjacent to the county road (see photos in Attachment 12 of this appendix). Permission has been granted by Carbon County to:

a) allow possible blockage of the road for several days during the period of drilling of the lower well (GVH 5).
b) allow the pipeline segment to be laid along the outside of the the road, and
c) allow the installation of the GVH wells within 100' of the road.

Correspondence regarding these matters can be found in Attachment 10 of this appendix.

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 construction.

The site of GVH 5 is a small linear area located between the road and the main drainage of Bear Canyon. As shown in the photos (see Attachment 12 of this appendix), the drill site is basically what is now the berm and outer slope-bank of the existing access road. The downslope extent of the site is defined by a ring of naturally occurring boulders, along with several other boulders located there as a result of subsequent improvement of the Bear Canyon Road during the initial GVH construction. This area will be backfilled to form essentially an extension of the out-slope shoulder of the road, or what could be referred to as a widened pull-out (see Drawing 3A of Attachment 3 and Attachment 4 of this appendix). The existing boulder ring will be augmented with additional boulders placed to form an armored outslope. The interior of the pull-out will then be backfilled with a compacted (approx. 90%) granular borrow material. The average depth of fill, as depicted on Attachment 4 of this appendix, is shallow, only about 4' thick, so stability is not an issue, especially since the outslope is constructed of large boulders interlocked during placement. When completed, the pull-out surface will occupy a small lenticular area measuring about 15' wide by 70' long, involving less than 0.02 acres of new disturbance, off the side of the existing road. Much of this area has already been disturbed as a result of upgrading the adjacent roadway. A layer of drainrock gravel will be placed on the surface of the pullout pad for additional structural integrity and for erosion control. The total volumeof imported material (boulders, granular borrow and drain-rock gravel) is less than 60 cubic yards.

The additional boulders used in constructing the boulder ring outslope will be obtained locally from a commercial borrow site located near the mouth of the canyon. Likewise, the granular borrow used to construct the interior of the pullout will come from the same source. Therefore, there will be no additional disturbance within the permit area associated with acquisition of construction materials.

During the drilling of GVH 5 a pre-fabricated metal mud-pit will be used. This pit will consist of a baffled steel trough measuring 4' wide x 12' long x 4' deep, installed adjacent to the drill hole collar (see Drawing 3B in Attachment 3 of this appendix). This steel trough will prevent any leakage of the drilling mud (foaming agent) during the drilling process, and will be removed from the site immediately after completion of the hole.

After the hole is completed, a flame arrester will be installed at the well collar. This arrester will be identical to the ones being used in the existing GVH installation, as shown in the photos in Attachment 12 of this appendix. However, unlike the upper installation, the roadside installation (GVH 5) will not include any additional blower (exhauster) apparatus. Instead, a 12' low-pressure pipeline will connect the well to one of the existing blower (extractor) units located above. This pipeline will be about 400' long and will be laid on the surface along the outside slope (bank) of the road up to the existing blower units. A set of concrete barricades (jersey barriers) will then be installed along the side of the road in the vicinity of the GVH 5 wellsite pullout area to provide protection to the exposed drill collar/flame arrester (see Drawing 3C of Attachment 3 of this appendix).

GVH 4 will be drilled from the existing GVH pad, and will be plumbed directly into one of the existing blower units. There will be no new surface disturbance associated with this hole.

GVH 4 will be drilled 584' on a 45 degree angle to the entry below. GVH 5 will be a vertical hole drilled 274' deep to intersect the bleeder entry below. Both holes will be drilled at 12.75" diameter, with a 9.63" inner casing. The space between the outside of the hole and the casing will be grouted with concrete. The well collars will consist of a 20' casing, installed down to a depth sufficient to penetrate the unconsolidated material at the surface. For the purpose of backfilling the holes with concrete during final reclamation, the volume of the GVH 4 hole is 4.4 cubic yards, and the volume of the GVH 5 hole is 6.6 cubic yards. See Attachment 5 of this appendix for additional drilling details.

<u>RECLAMATION:</u> Prior to final reclamation, all surface apparatus will be disassembled and removed. The drillholes will then be plugged and sealed in accordance with State and

Federal regulations. An expandable plug will be installed at the bottom of the hole, (above the mine working or at the intersection of the inner slotted casing and the outer casing), and the entire length of drillhole will then be filled with concrete to the surface. The pullout area associated with GVH 5 will be reclaimed to approximate original contour by removing the imported backfill material and boulders. Refer to Attachment 3A and Attachment 4 of this appendix for the approximate original contour of site GVH 5. The backfill material will be removed down to the geotextile underlayment, which will the be carefully removed to re-expose the in-situ topsoil underneath. This native topsoil will be scarified and re-seeded with the same seed mix as approved for the upper GVH site. All backfill material removed from the pullout area during final reclamation will be hauled off-site and disposed of at an approved facility. All elements of the approved reclamation plan for the GVH site will be as specified in detail in Appendix 5-14

CHAPTER 6, GEOLOGY:

The geology of the Bear Canyon GVH area is addressed in Appendix 5-14

CHAPTER 7, HYDROLOGY:

The GVH 5 pullout area (adjacent to the road) will be located next to the main drainage of Bear canyon, which is an ephemeral drainage. As with the existing GVH pad area, construction of the GVH 5 pullout area will be done as an Alternate Sediment Control Area (ASCA). Prior to any construction, a stream buffer sign will be placed at a suitable location between the drainage channel and the edge of the construction zone (i.e., below the existing boulder ring, described previously).

Prior to construction of the pull-out, a double row of excelsior logs will be installed below the existing boulder ring and the bottom of the adjacent drainage. These logs will serve as the primary sediment control structure during construction, and will be placed around the entire toe of the boulder outslope. After the excelsior logs have been installed the boulder outslope will be constructed to the full height of the pull-out. Before the interior of the pull-out is backfilled, the remaining area will be covered with a goetextile material to protect the in-place topsoil. This fabric will extend up the inner face of the boulder outslope prior to backfilling. The boulder outslope will provide significant sediment control to the adjacent drainage. The geotextile underlayment will also provide additional sediment control by preventing any of the backfill material from getting through the boulders to the exterior of the outslope.

After the interior of the pullout has be backfilled, and prior to the drilling operation, the surface area will be covered with a layer of drain-rock gravel to provide additional erosion protection. A ring of excelsior logs then be will be placed around the outside perimeter of the pullout. The pullout will be graded away from the road so that all surface drainage will be directed to the sediment control logs for treatment. These sediment logs will remain in place after the drilling is completed to provided permanent sediment control for the pullout. It should be noted that the pullout area will be graded away from the road such that no surface drainage from the pad will run onto the adjacent roadway.

During the drilling operation, the drilling mud will be contained and re-circulated from within a pre-fabricated steel mud-pit. This will be a box made of steel plate measuring about 4' wide x 12' long x 4' deep. There will be no discharge of drilling fluid or drilling cuttings to the surroundings. If the mud-pit fills up during the drilling operations, the cuttings will be clreaned from the box and disposed of at an approved facility off-site. Upon completion of drilling operations, the steel mud-pit and its contents will be removed from the site and disposed of in an approved manner. The depression left from removal of the pit will then be backfilled and graveled.

In summary, surface ASCA sediment control will be accomplished by the following methods:

1) Installation of a double row of excelsior log sediment fence between the pullout and the Bear Canyon drainage channel prior to construction.
2) Installation of a boulder outslope (i.e., rip-rap) to form the outer bank of the pullout area.
3) Use of a geotextile material between the boulder outslope and the inner granular fill material to prevent transmigration of the finer material through the outslope.
4) Placing a layer of drainrock gravel over the entire surface of the completed pullout pad.
5) Installation of a double row of excelsior logs around the outer perimeter of the pullout area upon final construction.
6) Sloping of the pullout pad area away from the roadway and toward the perimeter sediment control device (excelsior log).
7) Separating the roadway from the pullout pad with a continuous row of concrete jersey barriers to prevent road runoff from entering the pullout area. (The roadway is already graded toward the inslope ditch in this area.)

The drilling fluids (drilling mud/foaming agent) used in drilling GVH 4 and 5 will be the same as used previously during the drilling of GVH holes 1, 2 and 3. The MSDS sheets for these fluids can be found in Attachment 15 of Appendix 5-14. During drilling operations, as well as during the remainder of the operational life of the GVH installation, noncoal mine waste will be stored in suitable containers, and then disposed of off-site at an approved waste disposal facility. Hydrocarbons, including Diesel fuel, gasoline, oil and grease, will be stored in the factory supplied containment mounted within the machinery. If any stand-alone storage tanks are used they will be equipped with built-in containment capable of holding the entire contents of the tank. Absorbent pads and bags of absorbent granules will be kept on hand during the drilling operation, and later during the GVH operation, to be used in case of a spill of oil, fuel or grease. Used absorbent material will be disposed of at an approved disposal facility. All operations will be subject to the current Spill Prevention Control and Countermeasure Plan (SPCC) for the West Ridge Mine currently on file with the Division, and included in Attachment 14 of Appendix 5-14.

As mention previously, the space between the outside of the drillhole and the inner casing will be grouted with concrete. This will prevent the interception or re-routing of any surface or ground-water through the well into the mine workings below.

CHAPTER 8, BONDING:

There are no new surface facilities associated with GVH 4, since it is built on the pre-existing pad and will tie into the existing blower units. Therefore, final reclamation for GVH 4 should consist of removing the flame arrester and 20' of connecting piping, and backfilling the drillhole with concrete. All earthwork and revegetation costs are already included in the existing bond calculations. Reclamation of GVH 5 will consist of removing the flame arrester and 400' of unburied pipeline, backfilling of the drillhole with concrete, regrading of the pullout area to approximate original contour, and revegetation. The following calculations are based on currently approved bonding amounts taken from the existing Bear Canyon GVH installation.

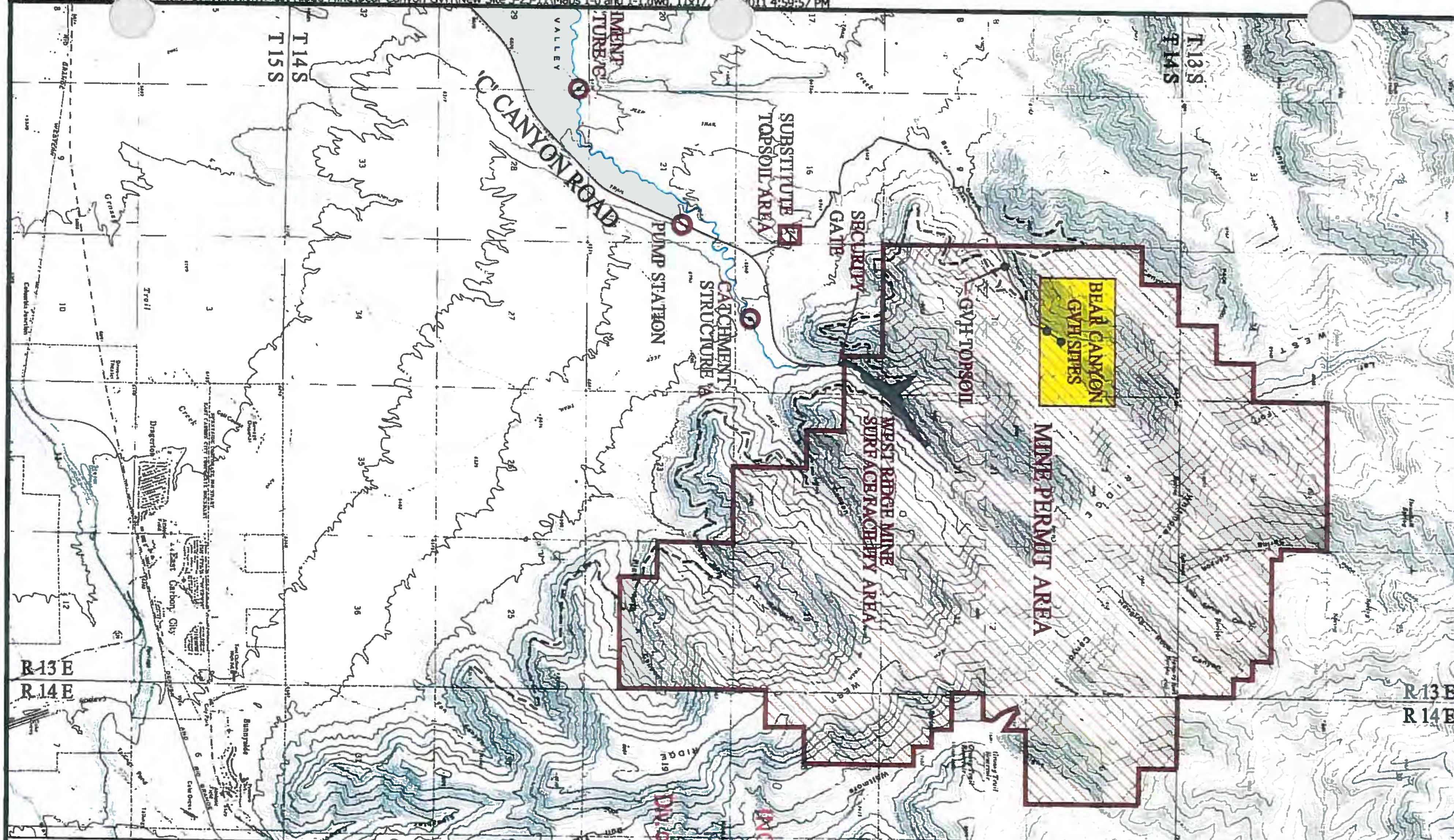
1) Mechanical equipment:	(\$805/ton) x(4 ton ea) x (two units) = \$3,220	\$3,220
2) Plug well:	(\$5000 each) x (two wells) = \$10,000	\$10,000
3) Earthwork:	half of existing GVH grading costs, for removal of 60 yds of backfill material = Estimated, ½ x \$2143 = \$1,072	\$1,072
4) Revegetation	half of existing GVH revegetation costs = ½ x \$2461 = \$1,232	<u>\$1,232</u>
Total Reclamation Cost		\$15,524

At present (April 6, 2011), the posted bond amount for the West Ridge Mine is $2,184,000, and the reclamation cost (determined by the Division) is $1,998,000. This leaves a difference between the current reclamation cost estimate and the current bond of $218,000, or 9.98%. This excess bonding currently in place is therefore sufficient to cover the final reclamation costs of GVH 4 and GVH 5. For ease of reference, the currently approved (April, 2011) bonding information for the existing GVH installation is presented in Attachment 13 of this appendix.

ATTACHMENT 1

BEAR CANYON GVH LOCATION MAP

G:\Current Drawings\Buildings & Construction\West Ridge Mine\Bear Canyon GVH\New Site 3-25-11\Maps 1-0 and 1-1.dwg, 11x17, 2011 4:59:57 PM



ATTACHMENT 1
WEST RIDGE MINE
BEAR CANYON
GVH LOCATION MAP

DATE. 4-11-11 REV. 1

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

N

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

UTAH REGISTERED PROFESSIONAL ENGINEER #6449561 David W. Hibbs 4/11/11

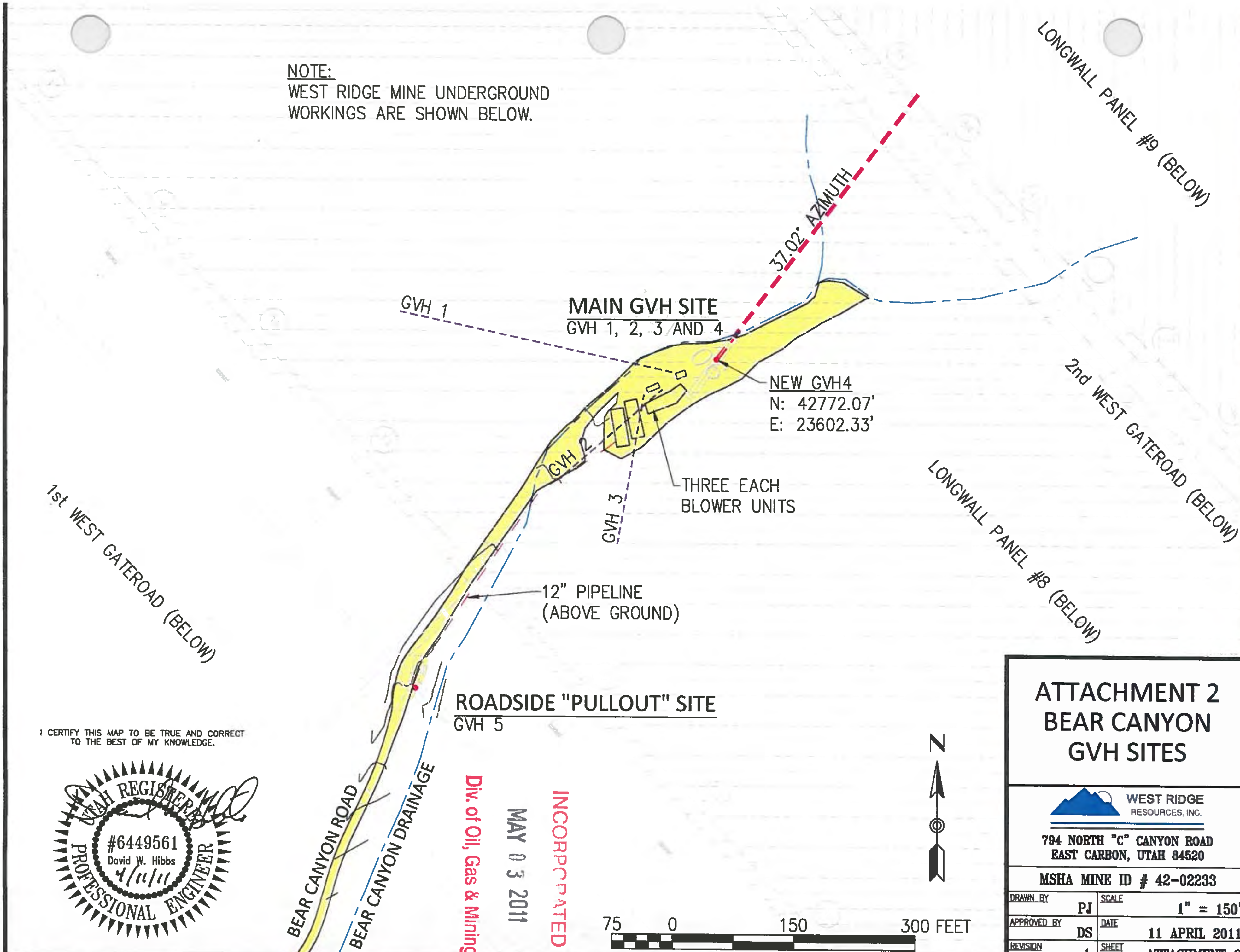
INCORPORATED
MAY 03 2011
Div. of Oil, Gas & Mining

WEST RIDGE RESOURCES, INC.

SCALE: 1"=5000'

ATTACHMENT 2

BEAR CANYON GVH SITE



INCORPORATED
MAY 0 3 2011
Div. of Oil, Gas & Mining

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

UTAH REGISTERED PROFESSIONAL ENGINEER
#6449561
David W. Hibbs
4/11/11

ATTACHMENT 2
BEAR CANYON GVH SITES

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

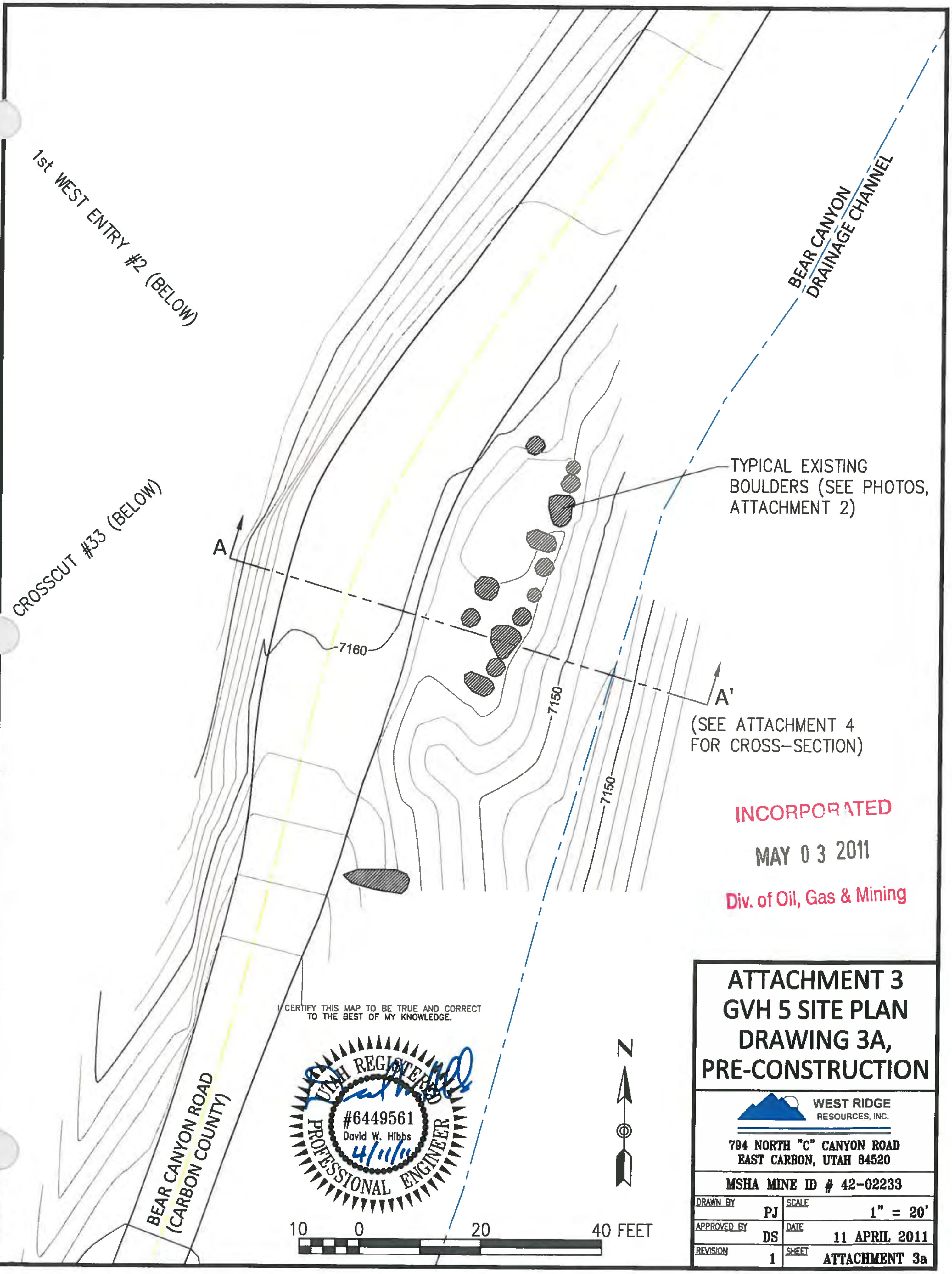
MSHA MINE ID # 42-02233

DRAWN BY	PJ	SCALE	1" = 150'
APPROVED BY	DS	DATE	11 APRIL 2011
REVISION	1	SHEET	ATTACHMENT 2

G:\Current Drawings\Buildings & Construction\West Ridge Mine\Bear Canyon GVH\New Site 3-25-11\Bear Canyon Site 2.dwg, Pad 1, 4/11/2011 4:31:47 PM

ATTACHMENT 3

GVH 5 SITE PLAN DRAWINGS



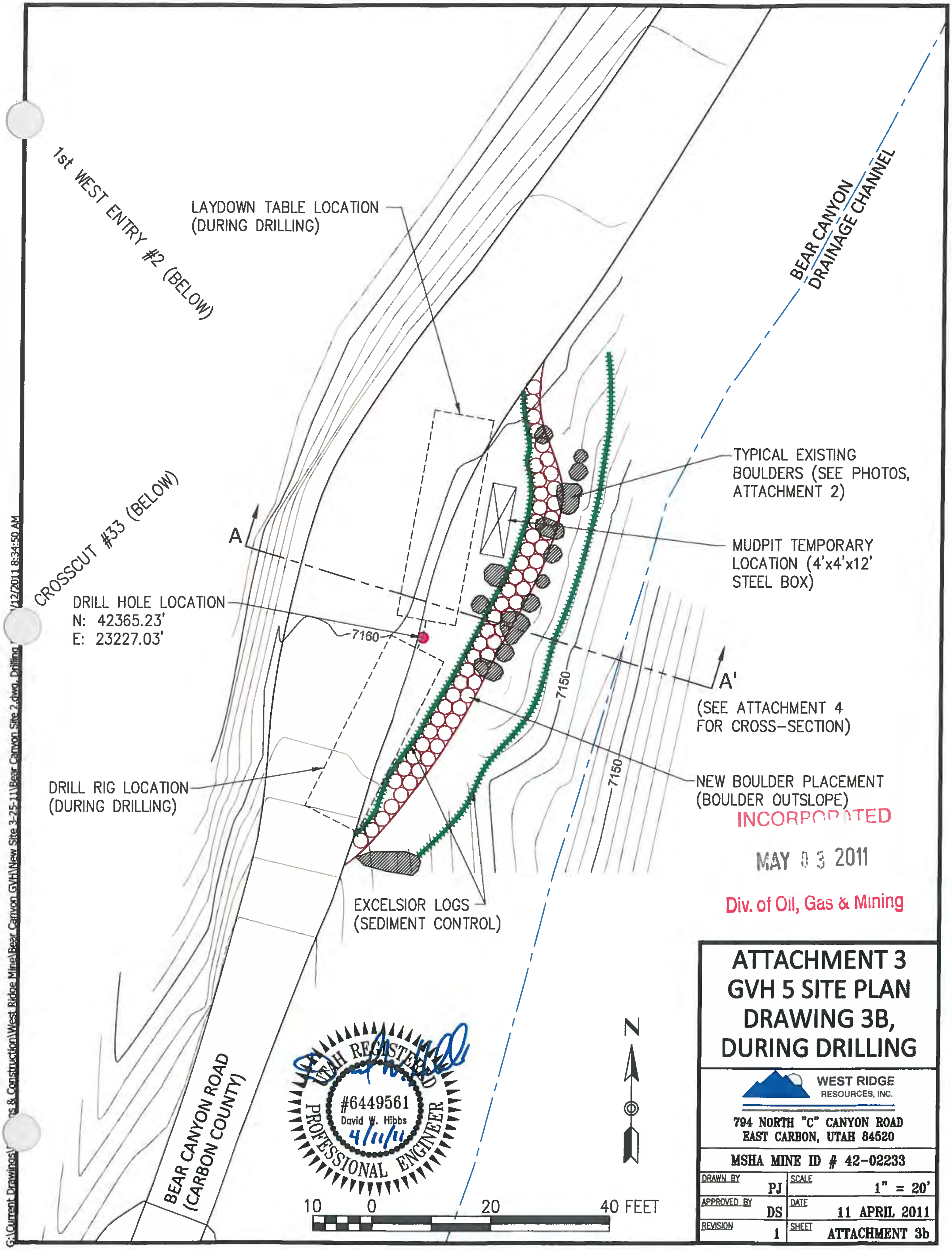
ATTACHMENT 3
GVH 5 SITE PLAN
DRAWING 3A, PRE-CONSTRUCTION

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	DS	DATE	11 APRIL 2011
REVISION	1	SHEET	ATTACHMENT 3a



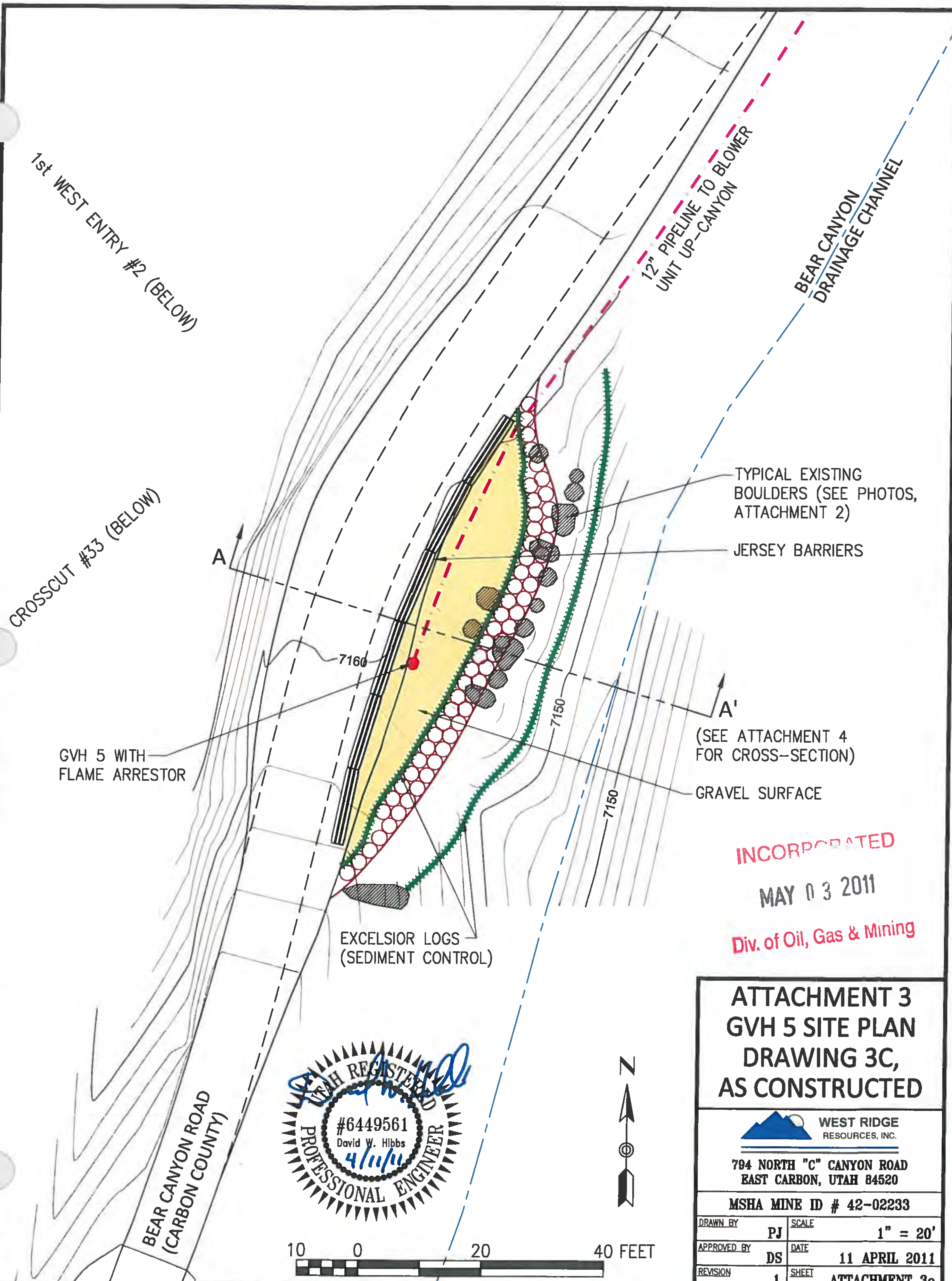
ATTACHMENT 3
GVH 5 SITE PLAN
DRAWING 3B, DURING DRILLING

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	DS	DATE	11 APRIL 2011
REVISION	1	SHEET	ATTACHMENT 3b



ATTACHMENT 3
GVH 5 SITE PLAN DRAWING 3C, AS CONSTRUCTED

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

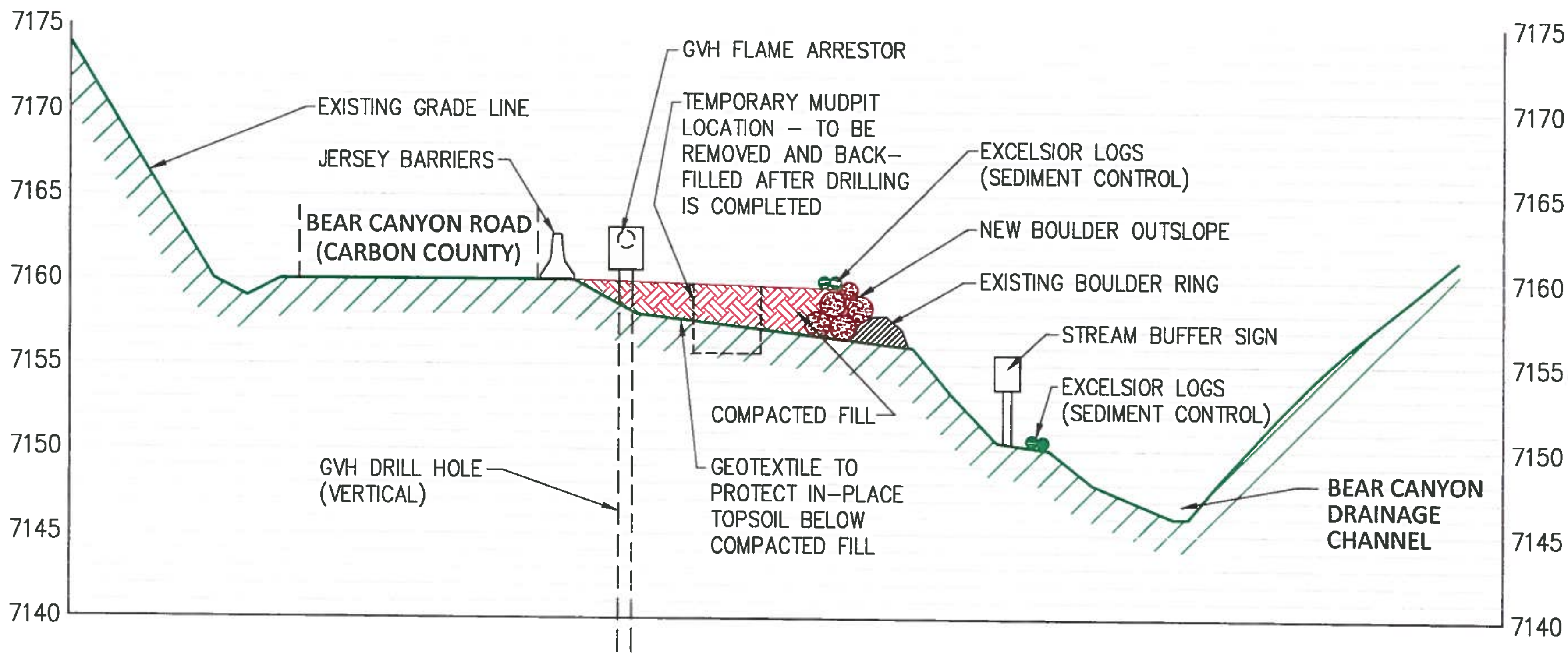
MSHA MINE ID # 42-02233

DRAWN BY: PJ	SCALE: 1" = 20'
APPROVED BY: DS	DATE: 11 APRIL 2011
REVISION: 1	SHEET: ATTACHMENT 3c

G:\Current Drawings\...s & Construction\West Ridge Mine\Bear Canyon GVH\New Site 3-25-11\Bear Canyon Site 2.dwg, As-cons... Pad 2, 4/12/2011 8:35:05 AM

ATTACHMENT 4

GVH 5 CROSS-SECTION DRAWING



ATTACHMENT 4
GVH 5 SITE CROSS-SECTION

WEST RIDGE RESOURCES, INC.

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

MSHA MINE ID # 42-02233

DRAWN BY	PJ	SCALE	1" = 10'
APPROVED BY	DS	DATE	11 APRIL 2011
REVISION	1	SHEET	ATTACHMENT 4

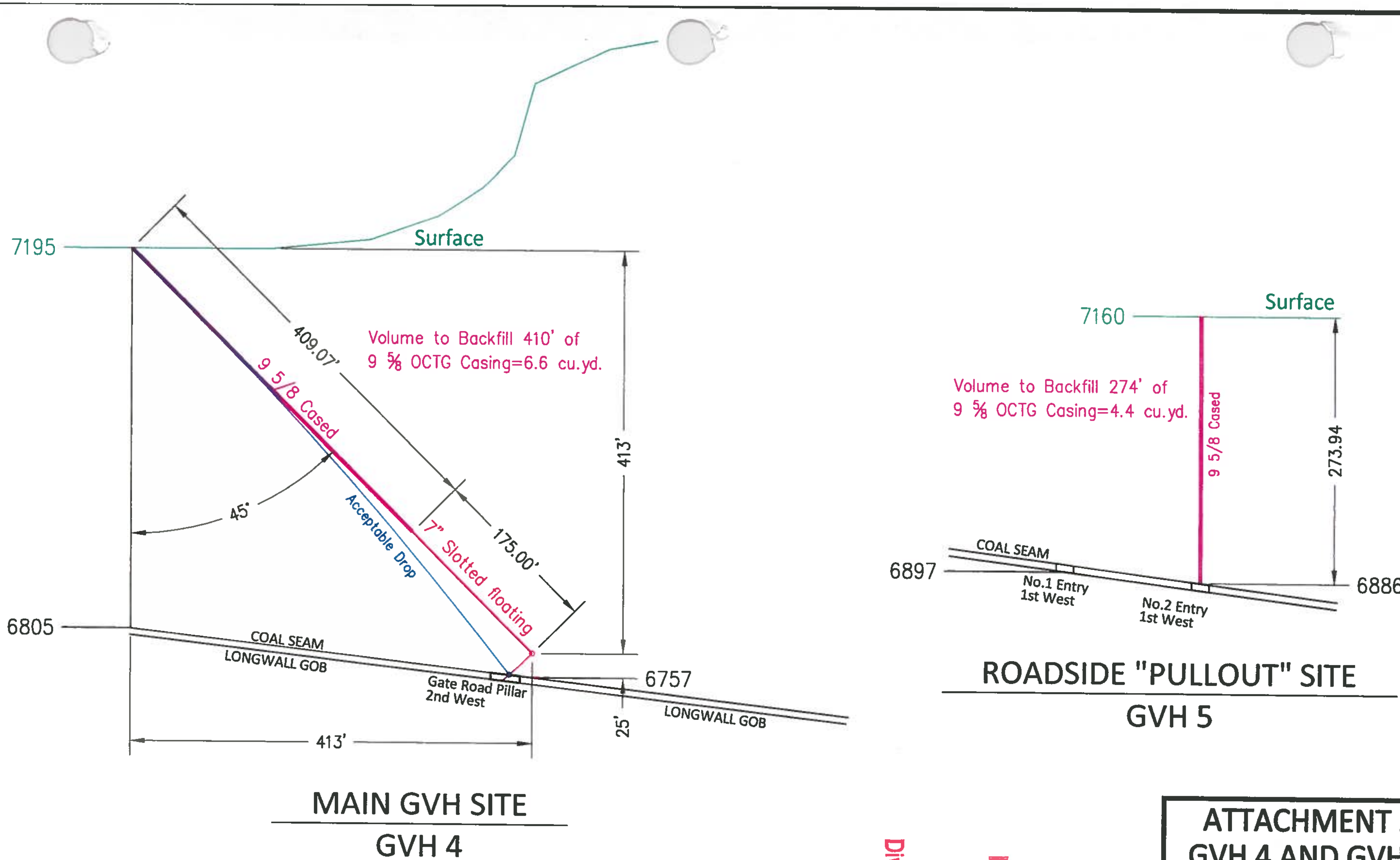
I CERTIFY THIS MAP TO BE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

UTAH REGISTERED PROFESSIONAL ENGINEER #6449561 David W. Hibbs 4/11/11

G:\Current Drawings\Buildings & Construction\West Ridge Mine\Bear Canyon GVH\New Site 3-25-11\Bear Canyon Site 2.dwg, Pad 2 Section, 4/11/2011 3:31:00 PM

ATTACHMENT 5

GVH 4- GVH 5 DRILL HOLE DETAILS



MAIN GVH SITE

GVH 4

ROADSIDE "PULLOUT" SITE

GVH 5

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

UTAH REGISTERED PROFESSIONAL ENGINEER #6449561 David W. Hibbs 4/11/11

N

75 0 150 300 FEET

ATTACHMENT 5 GVH 4 AND GVH 5 DRILL HOLE DETAILS

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

MSHA MINE ID # 42-02233

DRAWN BY	PJ	SCALE	1" = 150'
APPROVED BY	DS	DATE	11 APRIL 2011
REVISION	1	SHEET	ATTACHMENT 5

G:\Current Drawings\Buildings & Construction\West Ridge Mine\Bear Canyon GVH\New Site 3-25-11\Bear Canyon Site 2.dwg, Drill Hole Details, 4/11/2011 2:32:22 PM

ATTACHMENT 6

SITLA LETTER OF CONCURRENCE

Shaver, Dave

From: John Blake [jblake@utah.gov]
Sent: Thursday, April 07, 2011 4:06 PM
To: Shaver, Dave
Subject: Re: Additional Bear Canyon GVH

Dear Mr. Shaver,

The Trust Lands Administration approves West Ridge Mine's request to drill two additional GVH in the areas described below, upon lands leased under coal lease ML 49287, but subject to lessees compliance with all applicable state laws and regulations. The terms and conditions of ML 49297 require the lessee to comply with DOGM regulations in all operations involving the leased lands. Please send me a map of the proposed GVH locations and designated drill hole numbers after the holes are completed. Thank you.

John T. Blake
Trust Land Specialist
SITLA

>>> "Shaver, Dave" <dshaver@coalsource.com> 4/7/2011 3:01 PM >>>
Dear Mr. Blake:

As you are aware, the West Ridge Mine is presently operating several gob gas vent holes (GVH) from a common site in Bear Canyon in the SE1/4 of Section 3, T14S, R13E. This site is located on SITLA lease ML-49287 (surface and mineral), held by West Ridge Resources, Inc. Due to increased methane levels in the underground mine workings, the company now needs to drill two additional GVH holes at the site. One hole would be located on the same pad as the existing holes. The second hole would be located about 400' down-canyon at a small area immediately adjacent to the existing access road. This second hole will be drilled from a pullout alongside the road and will involve less that 0.02 acres of new disturbance. We are presently preparing an amendment to the DOGM permit for approval of this site. The purpose of this email is to provide proper notification to SITLA for this proposal, and to obtain any requisite concurrence from your office. If DOGM permitting allows, we would hope to drill these GVH wells as soon as possible. Please note that SITLA provided similar concurrence for the initial GVH installation in an email from your office on October 15, 2008. We appreciate your consideration of this matter.

Dave Shaver
Project Manager
West Ridge Resources, Inc.

INCORPORATED
MAY 03 2011
Div. of Oil, Gas & Mining

ATTACHMENT 7

GEOTEXTILE DATA

(During final reclamation the fill material and geotextile will be removed to re-expose the existing topsoil). By using the geotextile, the existing topsoil located along the channel and the side slopes can be left in place below the pad fills. Leaving the soil intact and in-place will maintain the soil cohesiveness. Roots will be left intact to help promote soil stability and minimize the potential for erosion. The soil horizons will remain intact to help promote faster revegetation of the slopes at the time of final reclamation.

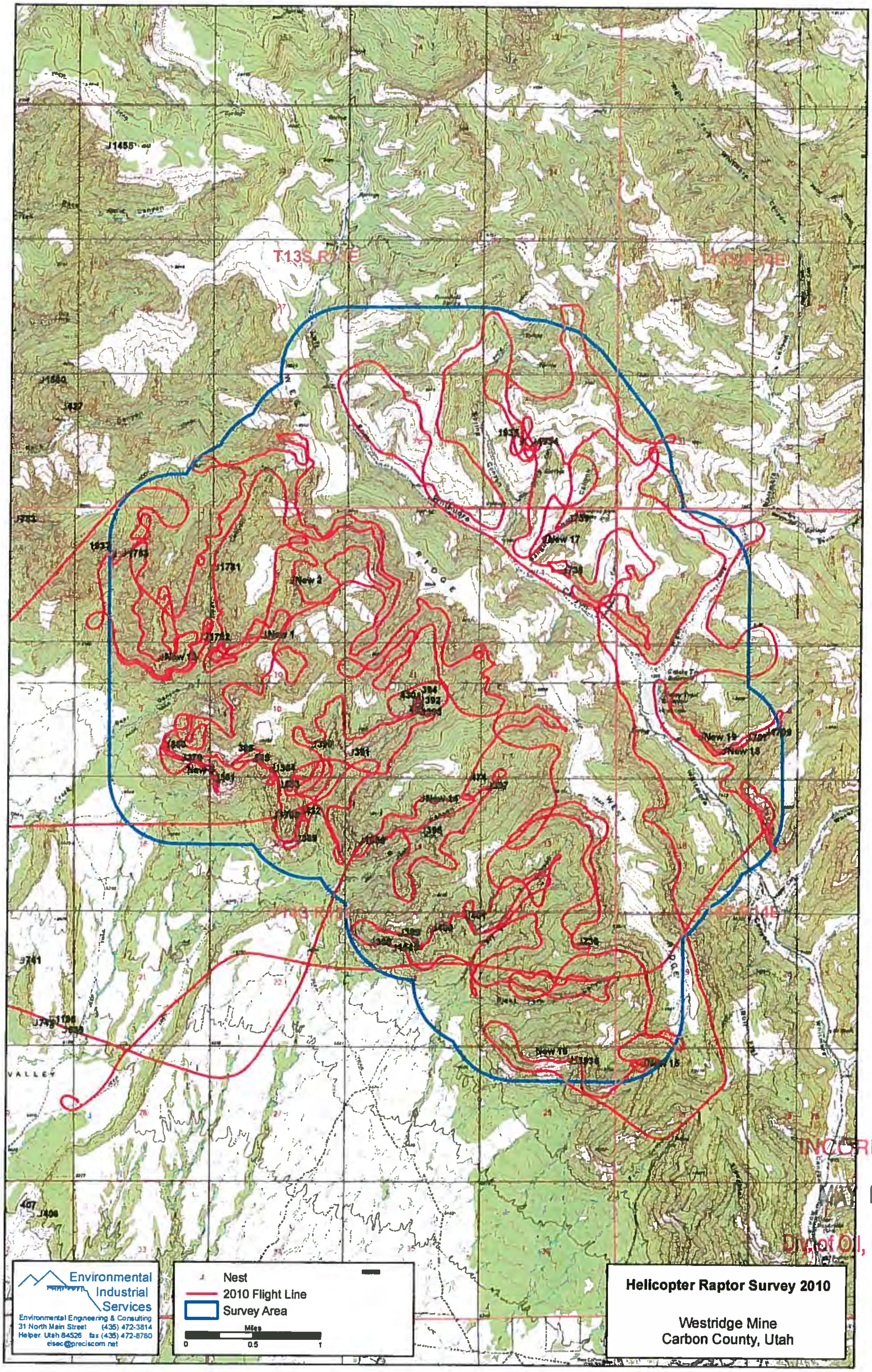
The geotextile fabric will have the following minimum properties:

MECHANICAL PROPERTIES		UNITS
Grab Tensile Strength		
ASTM D 4632		
MD @ Ultimate	0.89 (200)	kN (lbs)
CMD @ Ultimate	0.89 (200)	kN (lbs)
MD/CMD Elongation @ Ultimate		15 %
Mullen Burst Strength		
ASTM D 3786	2756 (400)	kPa (psi)
Trapezoidal Tear Strength		
ASTM D 4533	0.33 (75)	kN (lbs)
Puncture Strength		
ASTM D 4833	0.40 (90)	kN (lbs)
UV Resistance after 500 hrs.		
ASTM D 4355	70	% Strength
HYDRAULIC PROPERTIES		
Apparent Opening Size		
ASTM D 4751	0.300 (50)	mm(US sieve)
Permittivity	0.05	sec-1

This type of geotextile was chosen because of its strength characteristics and its longevity. According to the manufacturer's representatives the strength of the geotextile is not affected by moisture, or contact with earthen materials. In a buried condition away from the harmful exposure to ultraviolet radiation, the geotextile is expected to retain essentially all of its original strength even after 20 years of service. In fact, the geotextile is manufactured specifically for such permanent, long life situations such as under highways, railroad grades, dams and other similar applications. Care will be taken to ensure that the geotextile is properly overlapped and secured at the edges to provide total areal coverage in accordance with manufacturers recommended installation instructions.

ATTACHMENT 8

2010 RAPTOR SURVEY DATA



Helicopter Raptor Survey 2010

Westridge Mine
Carbon County, Utah

OBJECTID	NEST	UTM_NAD	UTM_NAD	QUAD	COMPANY	Date_10	SurType_1	Observe_By
924	379	546265	4385377	Sunnyside	WestRidge	05/10/10	Helicopter	EIS
918	380	546069	4385538	Sunnyside	WestRidge	05/10/10	Helicopter	EIS
926	381	546663	4385145	Sunnyside	WestRidge	05/10/10	Helicopter	EIS
925	382	546375	4385386	Sunnyside	WestRidge	05/10/10	Helicopter	EIS
930	383	547432	4385063	Sunnyside	WestRidge	05/10/10	Helicopter	EIS
929	384	547379	4385261	Sunnyside	WestRidge	05/10/10	Helicopter	EIS
928	385	547335	4385277	Sunnyside	WestRidge	05/10/10	Helicopter	EIS
927	386	547141	4385394	Sunnyside	WestRidge	05/10/10	Helicopter	EIS
931	390	547823	4385551	Sunnyside	WestRidge	05/10/10	Helicopter	EIS
938	392	549103	4386082	Sunnyside	WestRidge	05/10/10	Helicopter	EIS
939	393	549117	4385942	Sunnyside	WestRidge	05/10/10	Helicopter	EIS
936	394	549062	4386117	Mount Bartles	WestRidge	05/10/10	Helicopter	EIS
940	395	549133	4384526	Sunnyside	WestRidge	05/10/10	Helicopter	EIS
944	397	549922	4385062	Sunnyside	WestRidge	05/10/10	Helicopter	EIS
933	398	548545	4383184	Sunnyside	WestRidge	05/10/10	Helicopter	EIS
934	399	548882	4383299	Sunnyside	WestRidge	05/10/10	Helicopter	EIS
941	400	549273	4383357	Sunnyside	WestRidge	05/10/10	Helicopter	EIS
942	401	549672	4383505	Sunnyside	WestRidge	05/10/10	Helicopter	EIS
937	430	549071	4386040	Sunnyside	WestRidge	05/10/10	Helicopter	EIS
935	431	549023	4386068	Sunnyside	WestRidge	05/10/10	Helicopter	EIS
947	432	547685	4384748	Sunnyside	WestRidge	05/10/10	Helicopter	EIS
952	472	549061	4386116	Mount Bartles	WestRidge	05/10/10	Helicopter	EIS
943	474	549918	4385061	Sunnyside	WestRidge	05/10/10	Helicopter	EIS
919	736	551018	4383204	Sunnyside	WestRidge	05/10/10	Helicopter	EIS

954	737	553012	4385660	Sunnyside	WestRidge	05/10/10	Helicopter	EIS
532	738	550788	4387649	Mount Bartles	WestRidge	05/10/10	Helicopter	EIS
530	739	550854	4388269	Mount Bartles	WestRidge	05/10/10	Helicopter	EIS
932	1056	548396	4384397	Sunnyside	WestRidge	05/10/10	Helicopter	EIS
1379	1545	548800	4383122	Sunnyside	WestRidge	05/10/10	Helicopter	EIS
1378	1708	547367	4384697	Sunnyside	WestRidge	05/10/10	Helicopter	EIS
1377	1709	553232	4385725	Sunnyside	WestRidge	05/10/10	Helicopter	EIS
1376	1781	546642.9	4387663	Mount Bartles	WestRidge	05/10/10	Helicopter	EIS
1375	1782	546519.7	4386828	Mount Bartles	WestRidge	05/10/10	Helicopter	EIS
1374	1783	545537.5	4387820	Mount Bartles	Westridge	05/10/10	Helicopter	EIS
	1935	550261	4389188	Mount Bartles	WestRidge	05/10/10	Helicopter	EIS
	1936	550971	4381776	Mount Bartles	WestRidge	05/10/10	Helicopter	EIS
	1937	545417	4387809	Mount Bartles	WestRidge	05/10/10	Helicopter	EIS
	New 1	547218	4386862	Mount Bartels	Westridge	05/10/10	Helicopter	EIS
	New 13	545988	4386588	Sunnyside	Westridge	05/10/10	Helicopter	EIS
	New 14	549118	4384904	Sunnyside	Westridge	05/10/10	Helicopter	EIS
	New 15	551793	4381759	Sunnyside	Westridge	05/10/10	Helicopter	EIS
	New 16	550921	4381793	Sunnyside	Westridge	05/10/10	Helicopter	EIS
	New 17	550545	4388022	Mount Bart	WestRidge	05/10/10	Helicopter	EIS
	New 18	552718	4385493	Sunnyside	WestRidge	05/10/10	Helicopter	EIS
	New 19	552443	4385661	Sunnyside	WestRidge	05/10/10	Helicopter	EIS
	New 2	547541	4387511	Mount Bart	Westridge	05/10/10	Helicopter	EIS

New 3	546673	4385129	Sunnyside	Westridge	05/10/10	Helicopter EIS

SPECIES	RENT_SPE	TYPE	ELEVATION	Exposure	Status_10	EGGS	YNG	AGE
Golden Eagle		Cliff	7450	S	Inactive			
Falcon		Cliff	0	SW	Inactive			
Golden Eagle		Cliff	7350	S	Tended			
Golden Eagle		Cliff	7550	S	Inactive			
Golden Eagle	Peregrine	Cliff	7800	W	Active			
Golden Eagle		Cliff	7800	S	Inactive			
Golden Eagle		Cliff	7800	S	Inactive			
Golden Eagle		Cliff	7800	SW	Inactive			
Golden Eagle		Cliff	7500	N	Inactive			
Golden Eagle		Cliff	0		Not Found			
Golden Eagle		Cliff	7500	S	Inactive			
Golden Eagle		Cliff	0		Not Found			
Golden Eagle		Cliff	7350	SE	Tended			
Golden Eagle		Cliff	7500	E	Inactive			
Golden Eagle		Cliff	7500	S	Inactive			
Golden Eagle		Cliff	7800	S	Inactive			
Golden Eagle		Cliff	7800	S	Inactive			
Golden Eagle		Cliff	7650	SW	Inactive			
Golden Eagle		Cliff	7350	S	Inactive			
Golden Eagle		Cliff	7500		Not Found			
Red-tailed Hawk		Cliff	7500	E	Inactive			
Golden Eagle		Cliff	0		Not Found			
Golden Eagle		Cliff	7450	S	Not Found			
Falcon		Cliff	8550	S	Not Found			

Red-tailed Hawk	Cliff	7850 SE	Inactive
Red-tailed Hawk	Cliff	8200 S	Not Found
Great Horned Owl	Cliff	8200 NE	Active
Golden Eagle	Cliff	7750 SE	Inactive
Golden Eagle	Cliff	7350 S	Inactive
Raven	Cliff	0	Not Found
Great Horned Owl	Cliff	7800 S	Not Found
Red-tailed Hawk	Cliff	7300 SW	Inactive
Raven	Cliff	0 SE	Inactive
Peregrine Falcon	Cliff	0	Not Found
Golden Eagle	Cliff	8900 W	Inactive
Golden Eagle	Cliff	7500 S	Inactive
Peregrine Falcon	Cliff	7550 E	Inactive
Golden Eagle	Cliff	7400 E	Inactive
Raven	Cliff	7850 S	Inactive
Raven	Cliff	7750 S	Inactive
Golden Eagle	Cliff	7893 SW	Active
Golden Eagle	Cliff	7712 S	Inactive
Red-tailed Hawk	Cliff	8249 SE	Inactive
Raven	Cliff	7940 SW	Inactive
Raven	Cliff	7930 SW	Inactive
Red-tailed Hawk	Cliff	7500 E	Inactive

Golden Eagle	Cliff	8000 S	Inactive

Photo_Nam	Nest_Cond	Comments	Status_09	STATUS08	STATUS07
	Fair		Inactive	Inactive	Inactive
			Not Found	Inactive	Inactive
	Good	2-3 Nests	Tended	Inactive	Inactive
	Poor		Not Found	Inactive	Tended
	Dilapidated		Dilapidated	Inactive	Not Found
	Dilapidated		Dilapidated	Inactive	Tended
	Dilapidated		Dilapidated	Inactive	Inactive
	Dilapidated	Filled with (	Not Found	Inactive	Not Found
	Dilapidated		Dilapidated	Inactive	Active
				Inactive	Inactive
	Fair		Dilapidated	Inactive	Inactive
			Not Found	Inactive	Not Found
	Good	Lots of gre	Tended	Inactive	Active
	Dilapidated		Inactive	Not Found	Inactive
	Dilapidated		Inactive	Inactive	Inactive
	Dilapidated		Inactive	Inactive	Inactive
	Dilapidated		Inactive	Inactive	Inactive
	Poor		Inactive	Inactive	Inactive
	Good		Inactive	Not Found	Not Surveyed
			Not Found	Not Found	Not Found
	Good		Inactive	Not Found	Active
			Not Found	Not Survey	Not Surveyed
			Not Found	Not Found	Inactive
			Not Found	Inactive	Inactive

Dilapidated	Possible G	Inactive	Not Survey	Inactive
		Not Found	Not Found	Inactive
Good		Not Found	Not Found	Inactive
Good	Tended las	Inactive	Inactive	Not Found
Good		Inactive	Inactive	Inactive
			Not Survey	Inactive
		Not Found	Not Survey	Active
Good		Active	Inactive	
Poor			Active	
		Not Found	Active	
Poor	Likely pack	Inactive	Not Surveyed	
Good		Inactive	Not Surveyed	
		Inactive	Not Surveyed	
Fair	Fairly new attempt, couple years old			
Good				
Poor				
Good	3 Nests			
Good				
Poor				
Good				
Good				
Poor				

Poor

ATTACHMENT 9

ARCHEOLOGY CORRESPONDENCE

April 7, 2011

Mr. Kenny Wintch
Lead Archeologist
SITLA
675 East, 500 South, Suite 500
SLC, UT 84102-2818

Re: Archeological Clearance for West Ridge Mine Gob Vent Hole (ML 49287)

Dear Kenny:

I would like to request archeological clearance for construction of a Gob Vent Hole (GVH) on SITLA land for West Ridge Mine. The area in question is a 10-15 foot wide area along an existing road and within a very narrow canyon adjacent to the seasonally flooding Right Fork of Bear Canyon Creek. The proposed project is located in the SE/SW ¼ of Section 3, T14S, R13E, Carbon County. The proposed project is shown on the enclosed 7.5' Quad: Mt. Bartles, Utah (1972).

The project area is along an intermittent branch of the Bear Creek drainage at an elevation of 7400 feet. The general topography is extremely rugged with huge boulders and rock ledges lining the perimeter of the narrow canyon. Soils are light tan sandy clay loam with gravels and boulders. Vegetation is the Ponderosa Pine community. In addition to Ponderosa Pine, trees included Douglas fir, Rocky Mountain Maple, and Rocky Mountain Juniper. In the canyon bottom, understory vegetation included sagebrush, rabbit brush, bitterbrush and various grasses and forbs. During the multiple surveys, there was very little evidence of deer, elk or cattle utilizing the dry canyon. On the days of the surveys, only chipmunks and birds were observed. The lack of permanent water and the potential for devastating washouts from heavy storms makes the canyon un-appealing for game or human habitation or use.

The project is recommended for clearance without a Class III walkover survey for the following reasons:

- The area has been disturbed by road construction.

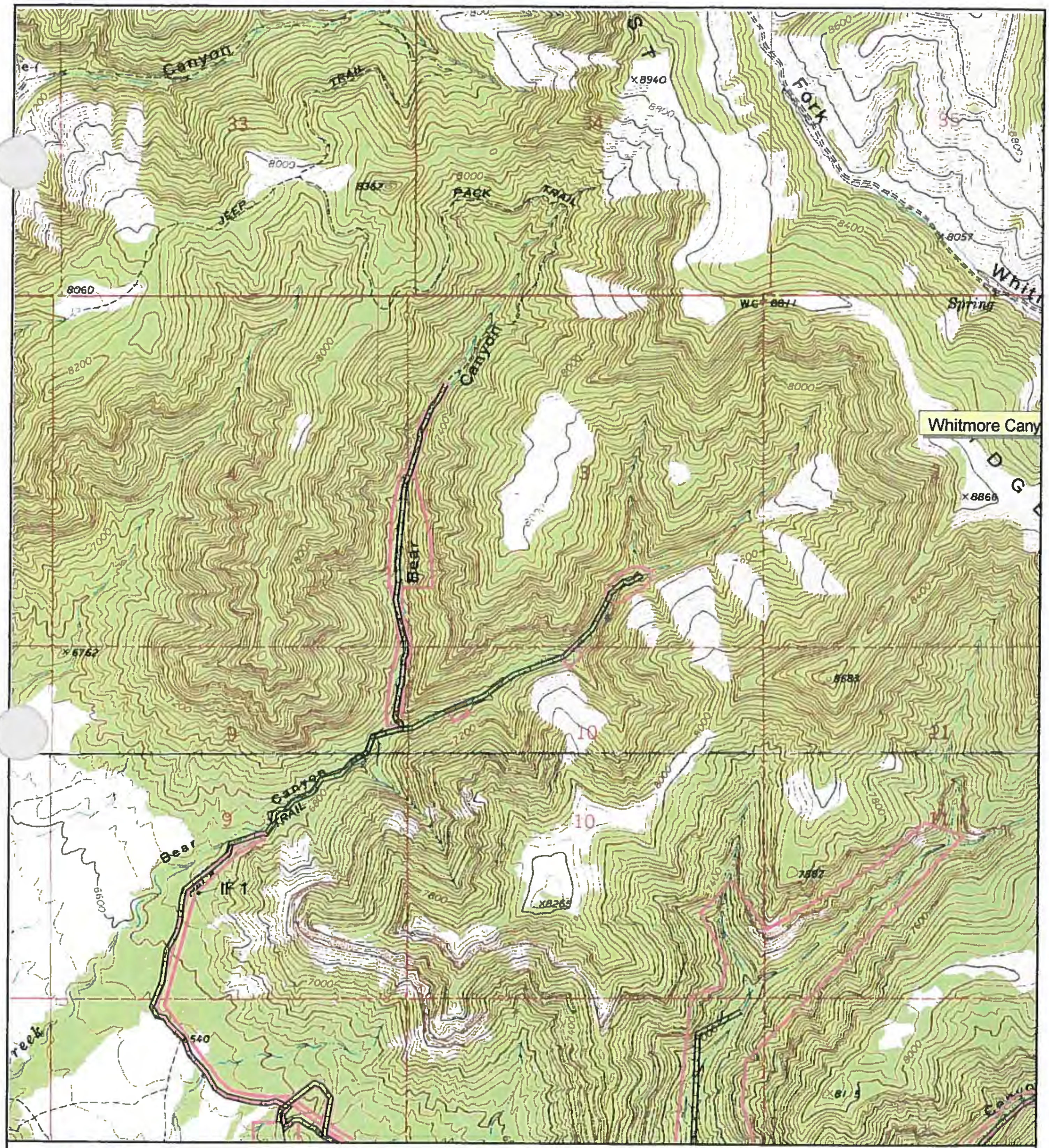
- The Right Fork of Bear Canyon Creek is an intermittent stream that floods the bottom of the valley after spring runoff.
- We actually walked the area to get from one project to another and no cultural resources were observed although it was not recorded as a formal survey.
- We have several Class III surveys in and near the proposed GVH and no cultural resources were located. (08-737, 08-871, 08-909)
- In addition, our work and the work of Neilson and others for the West Ridge Mine discovered no significant cultural resources in the surrounding sections.

In summary we recommend archeological clearance for the GVH without a class III inventory.

Sincerely,

John A Senulis
Principal Investigator

cc: Shaver, West Ridge Mine



N

Scale 1:24,000
1"= 2,000'

Current Survey

Previous Survey

Eligible Sites

Ineligible Sites

SENCO-PHENIX

INCORPORATED
MAY 03 2011
Div. of Oil, Gas & Mining

ATTACHMENT 10

CARBON COUNTY ROAD CORRESPONDENCE

Carbon County

Utah's Castle Country

Encroachment Permit

By acceptance under the terms and conditions outlined in this Permit Application, accompanying signed Maintenance Agreement and any other terms or conditions hereby attached to this document, Carbon County does hereby allow:

Signature: Effective Date: Apr 6, 2011
Representing: West Ridge Resources
Address: PO BOX 910
East Carbon City UT 84520
Telephone # Email Address: dshaver@coalsource.com
435 888 4017

The right to utilize the surface for commercial purposes, excavate in an or around or place structures into Carbon County system roads under the allowances granted in this ***Annual Blanket Permit*** under the authority of Ordnance #378, PASSED, ADOPTED, and ORDERED PUBLISHED the 16^{th} day of November, 2005 by the CARBON COUNTY BOARD OF COMMISSIONERS.

Signed Brad M Court Date April, 06-2011

This permit expires on: One year from effective date.

Acceptance by the Supervisor means once signed, undertaking by the Permittee is guaranteeing the completion of any improvements or construction proposed therein, in conformance to the specifications and terms set forth by the Supervisor and or contained in the application or additional attached documents. This permit creates an agreement that upon failure to do so, the County or other competent contractor assigned to do so by the County may complete the same to its satisfaction and charge the costs thereof to the Applicant.

A Class 1 Encroachment means encroachments on County roadways by connections of residential driveways or private or other roadways, parking areas, or other structures affecting or altering the shoulder of the Existing County Roadway, or by installation of cattle guards.

A Class 2 Encroachment means grading, construction, reconstruction, surfacing or resurfacing, alignment or realignment, excavation, boring or jetting, obstruction, removal of materials, vibroseising, Heavy Haulage, as defined in the ordinance or disproportionate use exceeding the normal function or use of County roads for commercial purposes, including extraordinary use

A Class 3 Encroachment means excavating, boring, jetting, cutting of pavement or other disturbance by utilities within County road right-of-way for the purpose of installing, repairing or maintaining cables, pipelines, or other Utility structures buried within the roadway or right-of-way

An annual Blanket Permit means an Encroachment Permit issued for a period of one calendar year, *based upon a written plan*, to Applicant (s) who, of necessity, may make numerous Encroachment Permits. The Annual Blanket Permit is designed to alleviate the necessity of securing a performance and completion bond for each Encroachment Permit.

Applicant is required to supply Maps, plats or engineering drawings displaying the current locations in pertinent views of Utility lines within the County right-of-way to be affected by the proposed Encroachment and the proposed alignment of any new or replacement Lines or pipelines for which the Permit is requested. Applicant is also required to supply a waiver for all liability for damage to its Lines by the County or by other utilities whose existing Lines are located within the vicinity of the proposed new or replacement line
Each Applicant, as a condition of the release of the bond is required to notify blue stakes according to proper procedure, and provide acceptable g.p.s. location information to the Carbon County GIS department sufficient to maintain Utility and drainage mapping current.

Carbon County
Utah's Castle Country

Class 3 Encroachment Permit Application

*Encroachments by utilities for the installation repair and maintenance of cables, pipelines or other Utility structures located in the road right-of-way.

Application Approved :( ) No (✓) Yes By: [signature] **Application Fee:** ____________

All applications shall be accompanied by a non-refundable application fee in the amount set forth in the most current Fee Schedule.

****If Refused, Reason for refusal:**

*****Annual Blanket Permit: ( ) No; ( ) Yes;** ***Attach Written Plan and Conditions***

Name: West Ridge Resources, Inc **Telephone #** 435 888 4017

Address: PO Box 910
East Carbon City UT 84520

Business Representing: **Telephone #**

Address

Location of the proposed Encroachment. (Please give address if possible GIS Coordinates are also acceptable for open lands locations) See attached documents

******Supply Maps, plats or engineering drawings:**

Describe the proposed Encroachment:
Refer to attached letter

Purpose and Scope:

Dimensions of materials to be used:

Will Begin: Spring 2011 **Expect to be completed:** Spring 2011

Does Applicant propose to use fungicide, pesticide, herbicide or any chemical or other road surface treatment? (✓) No ( ) Yes: (***Applicant will supply MSDS sheet with application and comply with manufacturer application requirements.***)

Type of treatment:

Application Rate and Method of application:

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Div. of Oil, Gas & Mining

Supervisor remarks or additional information: (Attach additional information if needed.)

Bond Requirement amount and copy:
*******Released Date:**

Liability Insurance Company:
Policy #
(Attach copy of the policy)

Signed: _______________ **Title:** Project Manager

Representing: West Ridge Resources **Date:** 4/6/2011

PLEASE READ:

Acceptance of this application by the Supervisor means once signed, undertaking by the Applicant, now Permittee is guaranteeing the completion of any improvements or construction proposed therein, in conformance to the specifications set forth by the Supervisor and or contained in this application. This application creates an agreement that upon failure to do so, the County or other competent contractor assigned to do so by the County may complete the same to its satisfaction and charge the costs thereof to the Applicant.

*A Class 3 Encroachment means excavating, boring, jetting, cutting of pavement or other disturbance by utilities within County road right-of-way for the purpose of installing, repairing or maintaining cables, pipelines, or other Utility structures buried within the roadway or right-of-way

**The Supervisor shall within five (5) to ten (10) working days either grant the application or deny it. The Supervisor shall, when needed confer with Planning and Zoning and any other affected agencies during preliminary phases of the review of this application. If he denies the application, he shall return it to the Applicant and set forth in writing attached thereto his reasons for doing so. The Applicant may submit an amended application at any time thereafter

***An annual Blanket Permit means an Encroachment Permit issued for a period of one calendar year, *based upon a written plan*, to Applicants who, of necessity, may make numerous Encroachment Permits. The Annual Blanket Permit is designed to alleviate the necessity of securing a performance and completion bond for each Encroachment Permit.

****Applicant is required to supply Maps, plats or engineering drawings displaying the current locations in pertinent views of Utility lines within the County right-of-way to be affected by the proposed Encroachment and the proposed alignment of any new or replacement Lines or pipelines for which the Permit is requested. Applicant is also required to supply a waiver for all liability for damage to its Lines by the County or by other utilities whose existing Lines are located within the vicinity of the proposed new or replacement line

*****Each Applicant, as a condition of the release of the bond is required to notify blue stakes according to proper procedure, and provide acceptable g.p.s. location information to the Carbon County GIS department sufficient to maintain Utility and drainage mapping current.

WEST RIDGE
RESOURCES, INC.

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

Rex Sacco, Director
Carbon County Public Lands Department
120 East Main Street
Price, Utah 84501

April 4, 2011

Re: West Ridge Mine
Bear Canyon GVH Well

Dear Mr. Sacco:

The West Ridge Mine currently operates a set of three gob gas vent holes (GVH wells) located on a common pad in Bear Canyon, situated in the SE1/4 of Section 3, T14S, R13E. This GVH site is located at the end of the Bear Canyon Road, which is part of the Carbon County road system. The purpose of these GVH wells is to vent methane gas from the underground mine workings. This venting is necessary for the safety of the miners and to allow the company to continue to meet contractual production requirements. .

Due to increasing levels of methane encountered in the mine we now need to install two more GVH wells in Bear Canyon as soon as possible. One of these wells would be located adjacent to the existing wells on the pad at the end of the road. A second hole needs to be drilled approximately 400' down canyon from the existing pad in order to intersect one of the underground mine bleeder entries. This well would be drilled within a small leveled-off area measuring about 10'-15' wide by 60' long, located immediately adjacent to the road. Once the well has been drilled, a flame arrester would be installed at the collar, and a 12" low-pressure pipeline would then need to be extended from the well, running along the outer bank of the road, approximately 400' up to the blower units located at the existing pad site. A row of jersey barriers would be placed along the side of the road in the vicinity of the well collar for protection. If permitting conditions allow, we would like to begin drilling operations within the next several weeks to coincide with the up-coming longwall move.

may RLS

Because of the narrowness of this well site in the bottom of then canyon, the hole will have to be drilled from the roadway. This ~~would~~ involve blocking the road with the drill rig for a period of about two or three days. However, the only users of the road above the site is the aforementioned West Ridge mine GVH pad, which could be accessed by company maintenance personnel on foot during the short drilling period. Also, there is a suitable turn-around facility immediately below the site for the public to turn around during the blockage. At this time of year the amount of public usage of the road is minimal.

R18
possible

The purpose of this letter is to request the following permission from Carbon County:

1) to allow blockage of this road for several days during the period of drilling of the lower well,
2) to allow the pipeline segment to be laid along the outside edge of the road, and
3) to allow the installation of the GVH wells within 100' of the road.

Please note that right-of-entry for the installation of the GVH well and the connecting pipeline is provided under the authority of the our existing state (SITLA) coal lease (surface and mineral), ML-49287. Also please note that final installation of the GVH and the connecting pipeline would not be within the roadway, but would be located adjacent to it on the downhill side..

Attached is a map of the existing and proposed GVH facility, and several photos depicting the area of interest. If Carbon County is in agreement with this request please indicate so by signing in the space provided below. We appreciate your consideration of this matter. If you have questions or comments please contact me at (435) 888-4017.

Sincerely,

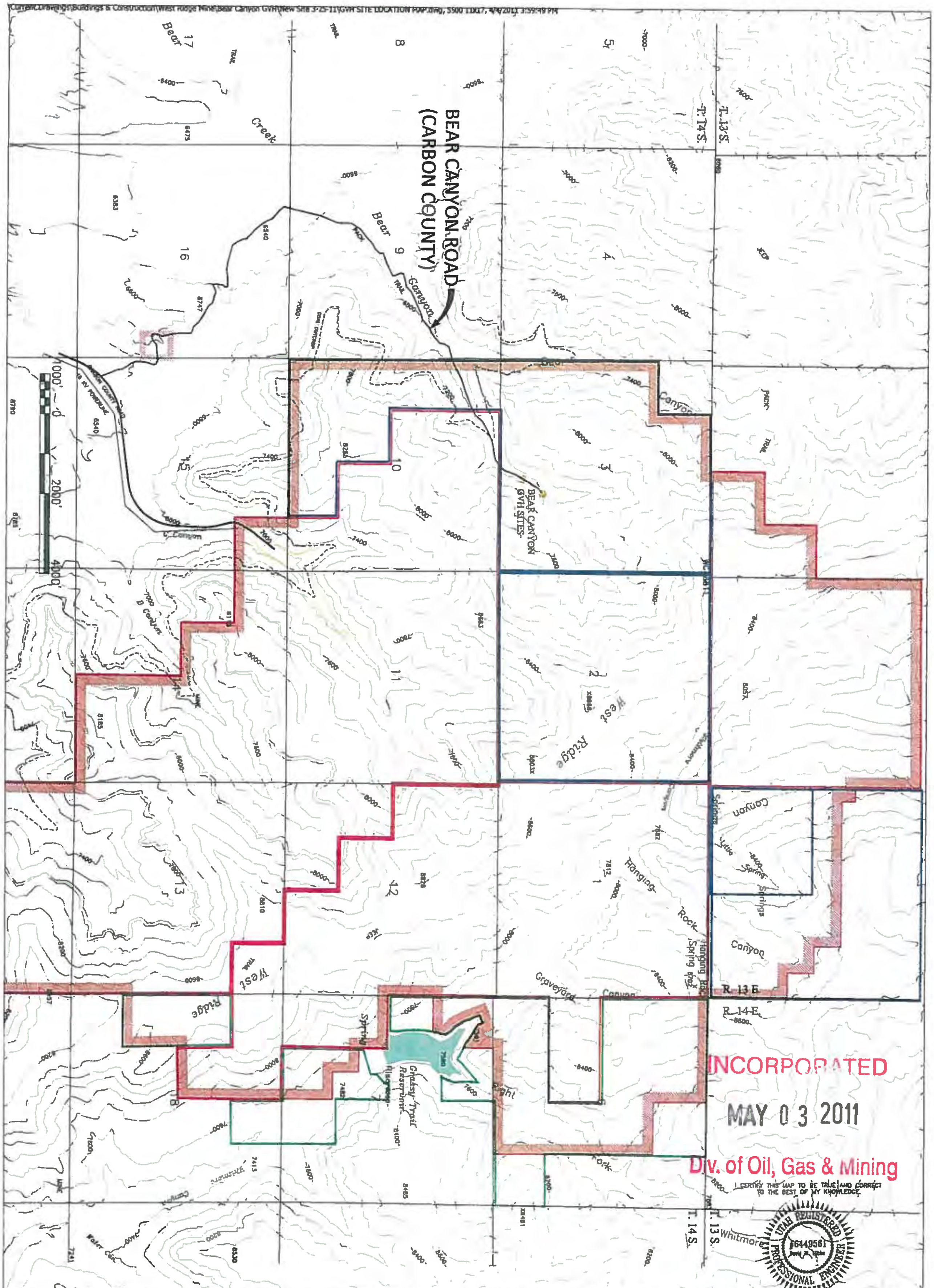
David Shaver
Project Manager

Agreed to by Carbon County:

name: Rex L Sacco

title: Roads Adminis

date: 4-6-2011



WEST RIDGE MINE
BEAR CANYON
GVH SITE

LEGEND:

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

WEST RIDGE
RESOURCES, INC.

ATE: 4-04-11 REV: 1 ACAD REF: GVH SITE LOCATION MAP

SCALE: 1"=2000'

ATTACHMENT 11

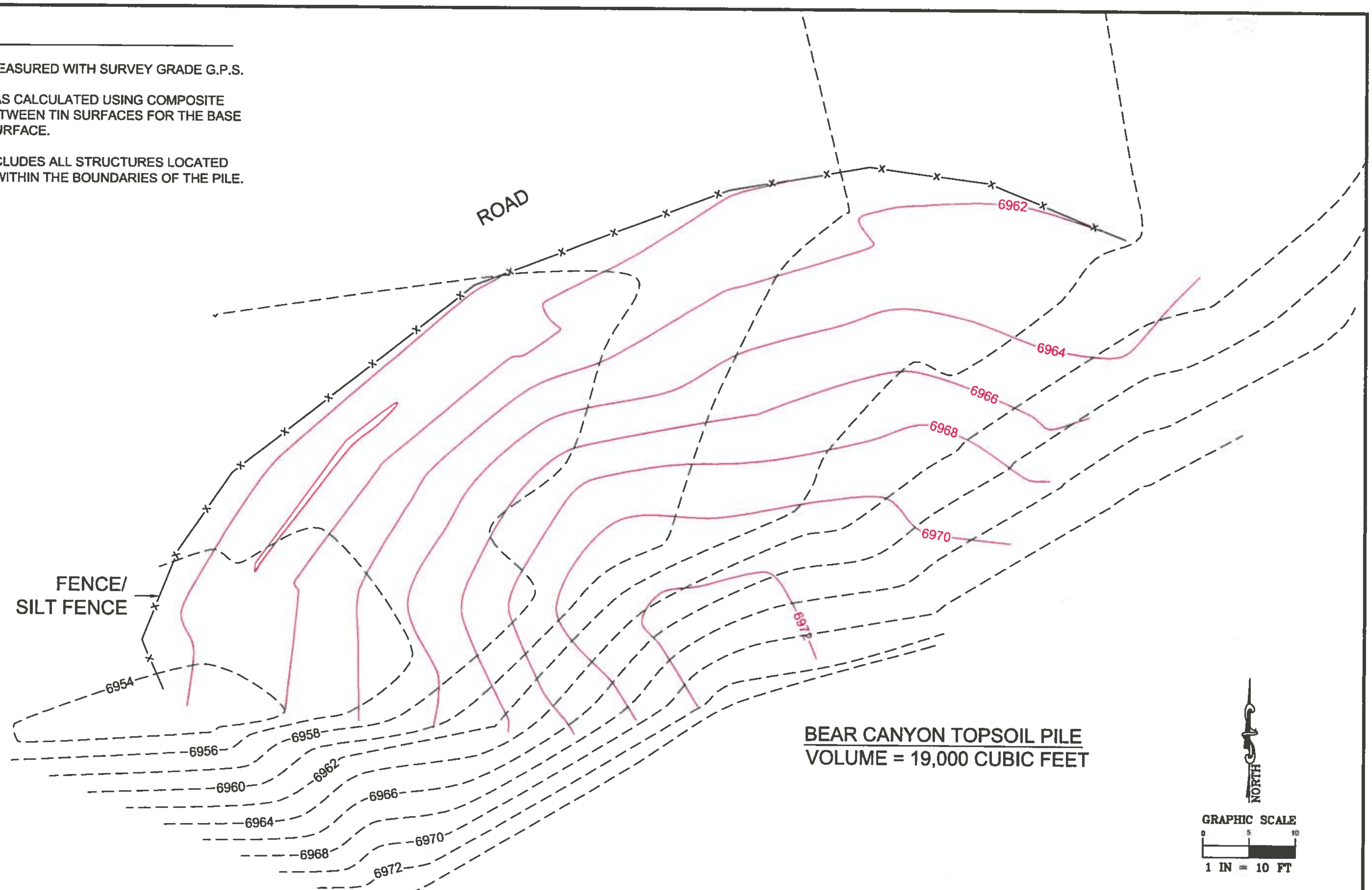
BEAR CANYON GVH TOPSOIL PILE
AS-BUILT DRAWING

NOTES:

PILE WAS MEASURED WITH SURVEY GRADE G.P.S.

VOLUME WAS CALCULATED USING COMPOSITE METHOD BETWEEN TIN SURFACES FOR THE BASE AND PILE SURFACE.

VOLUME INCLUDES ALL STRUCTURES LOCATED UNDER OR WITHIN THE BOUNDARIES OF THE PILE.



BEAR CANYON TOPSOIL PILE
VOLUME = 19,000 CUBIC FEET

LEGEND

— — —	BASE SURFACE 2' CONTOUR
———	TOPSOIL PILE 2' CONTOUR
—x—x—	FENCE

DRAWING RECORD:

NO.	DATE	DESCRIPTION	BY
1	01-17-09	PLOTTED FOR REVIEW	M.C.W.

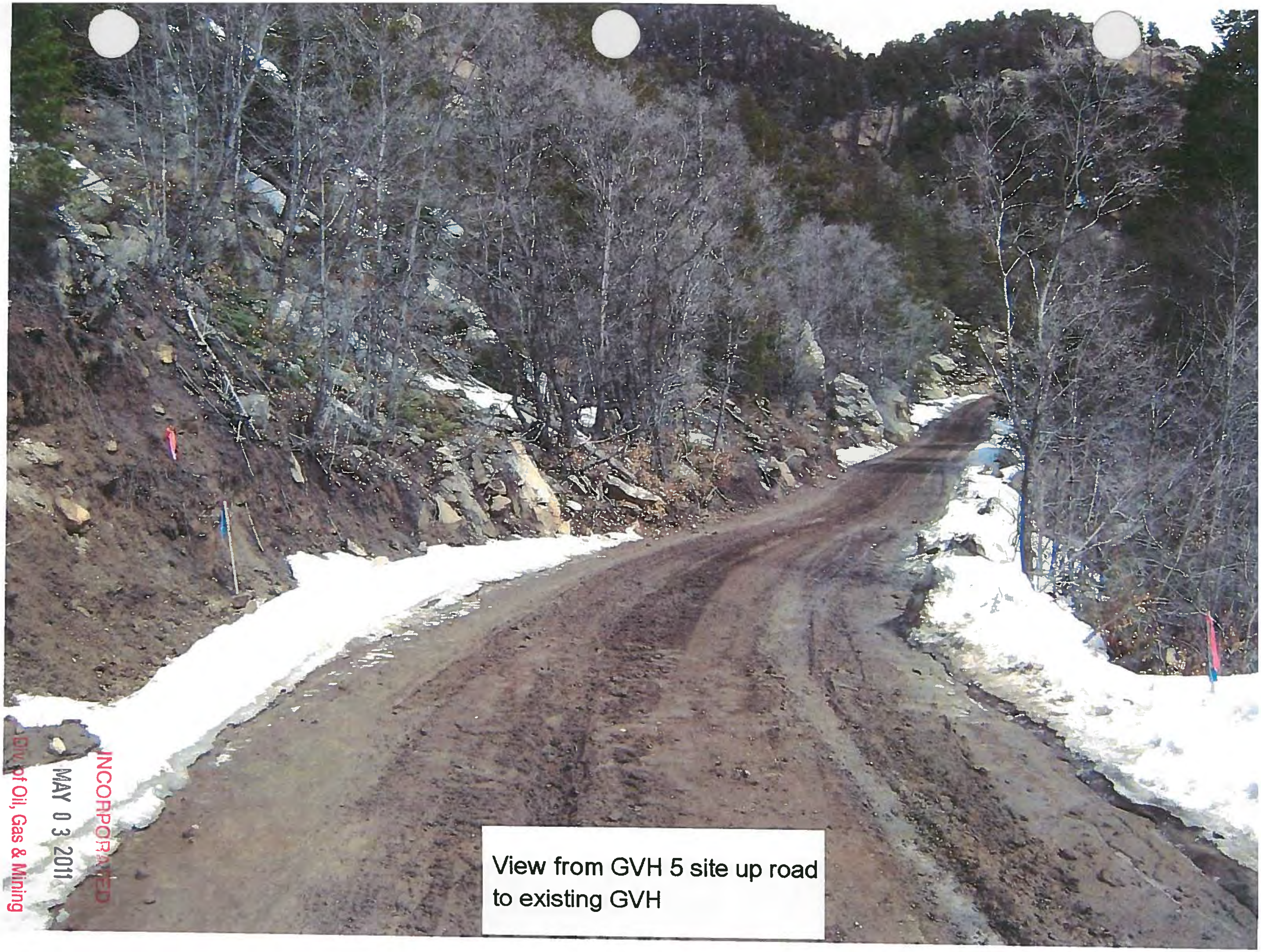
WARE SURVEYING, L.L.C.
Phone: 435-613-1266
Email: waresurveying@emerytelcom.net
1344 North 1000 West
Price, Utah 84501

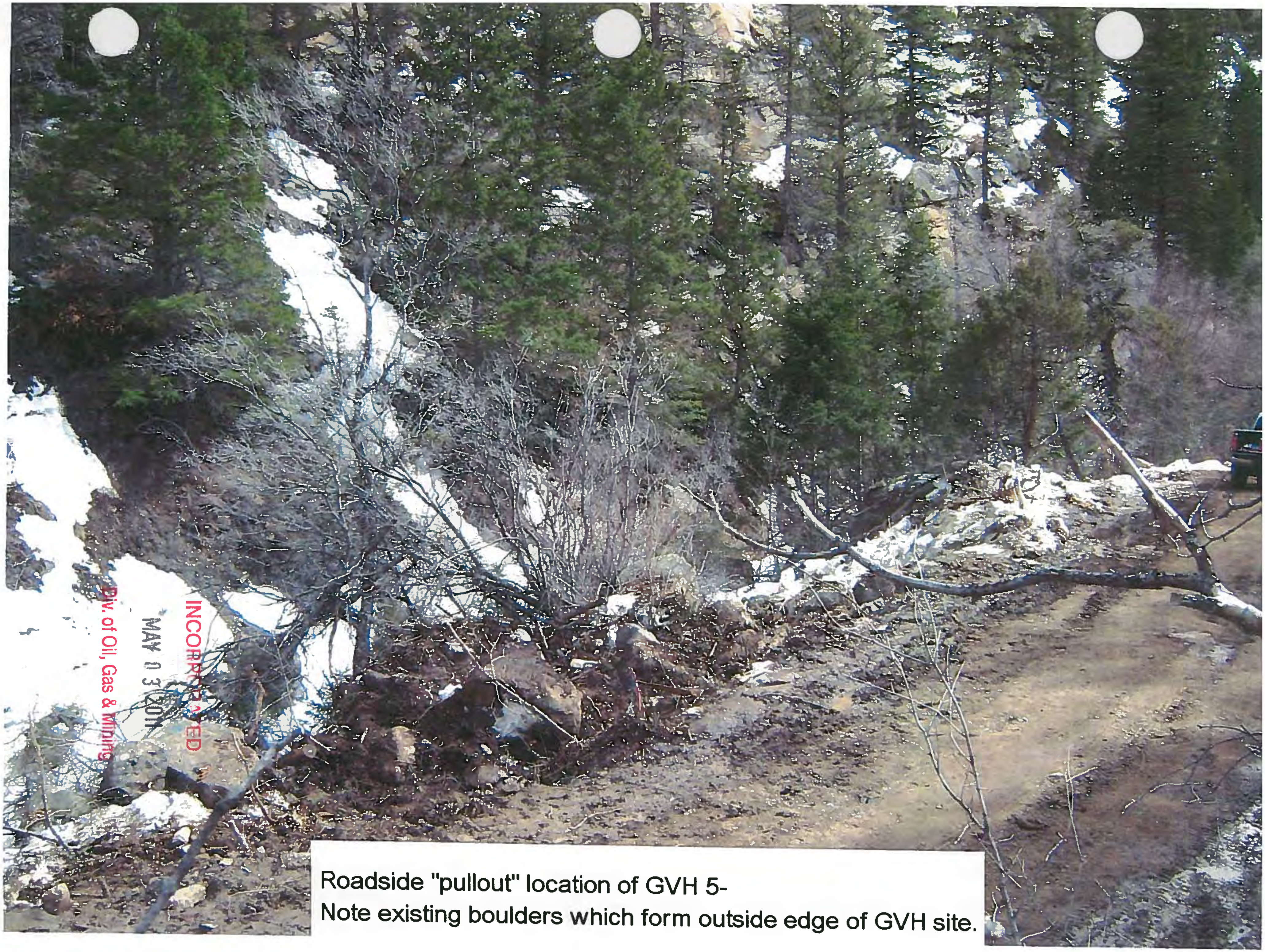
ATTACHMENT 12

PRE-CONSTRUCTION PHOTOS OF GVH 5 SITE

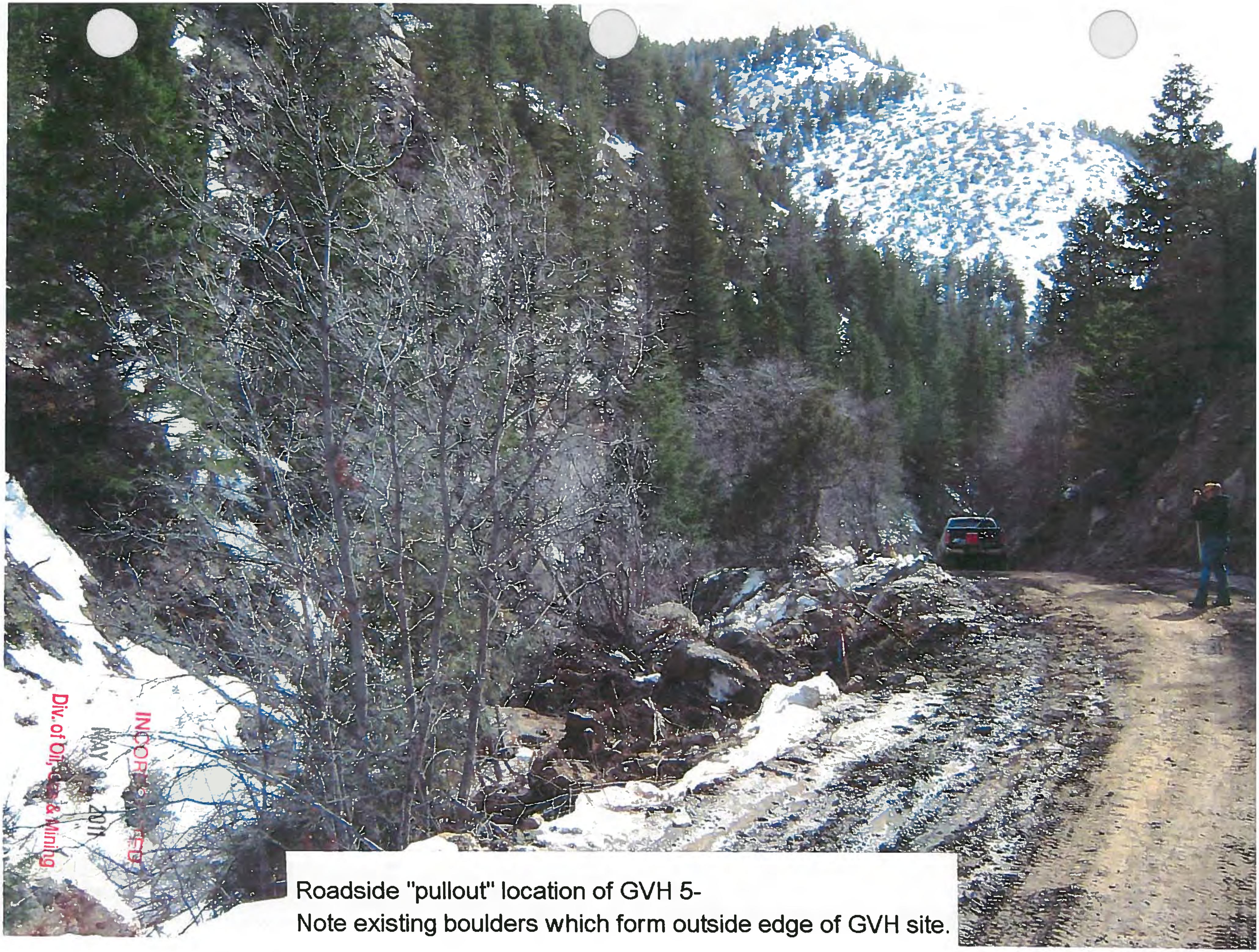
Existing GVH pad and facilites -
Noted red flame arrester connecting pipeline

View from existing GVH pad
down road to GVH 5 site (beside pickup truck)

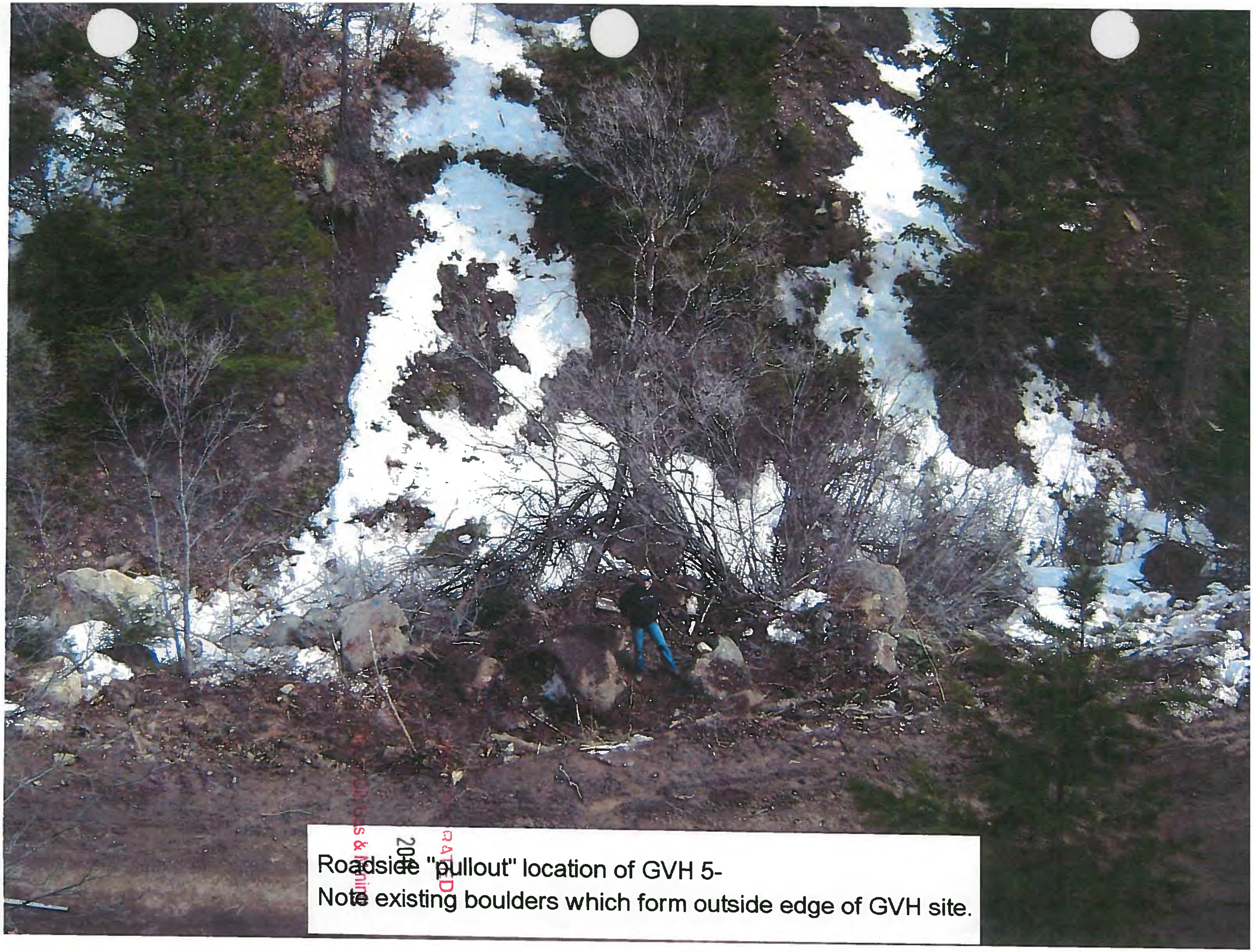

View from GVH 5 site up road
to existing GVH



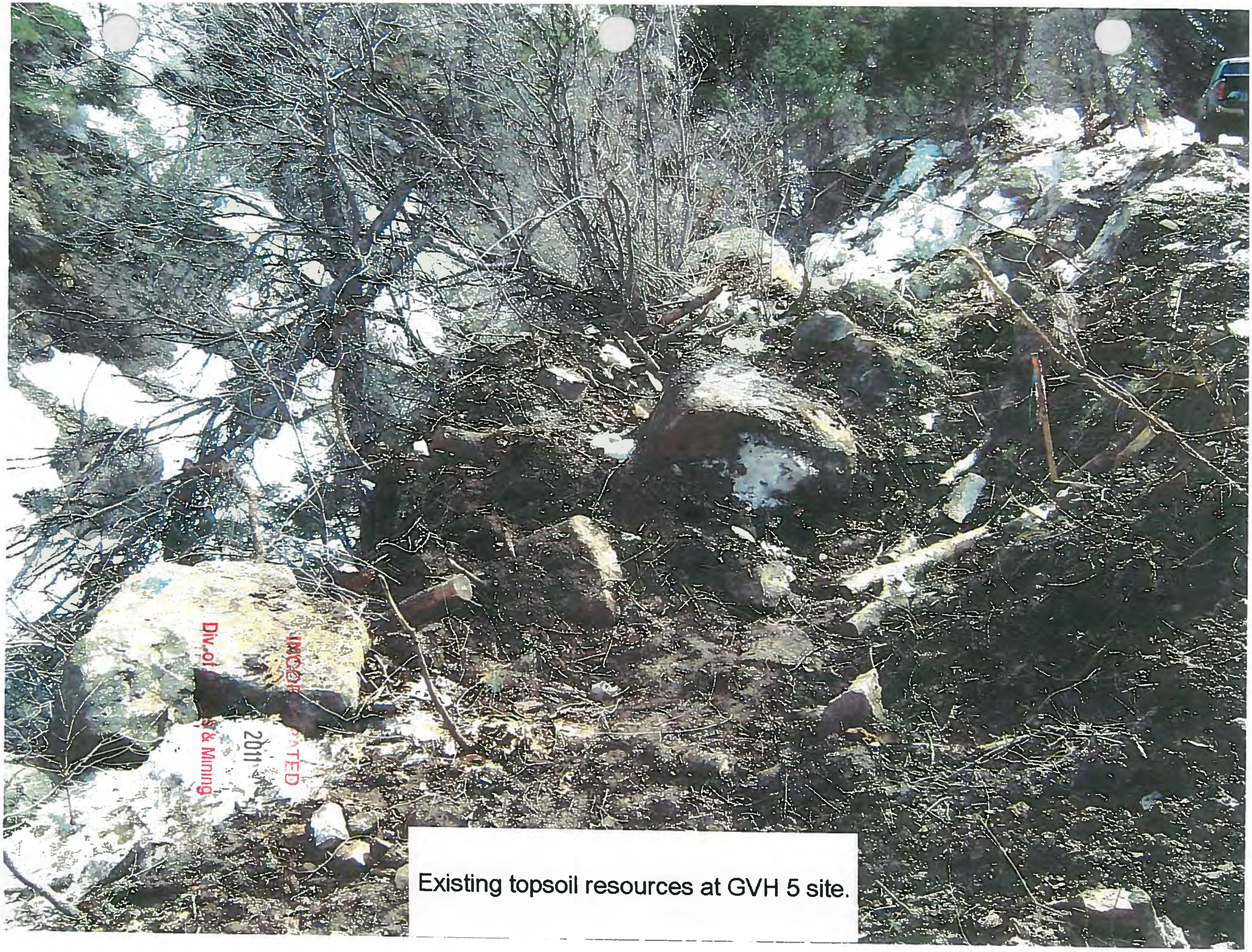
Roadside "pullout" location of GVH 5-
Note existing boulders which form outside edge of GVH site.



Roadside "pullout" location of GVH 5-
Note existing boulders which form outside edge of GVH site.


Roadside "pullout" location of GVH 5-
Note existing boulders which form outside edge of GVH site.

Roadside location of GVH 5 -
site showing 15' measuring rod for scale



Existing topsoil resources at GVH 5 site.

Attachment 13

~~APPENDIX 13~~

EXISTING GVH BONDING INFORMATION
(APRIL, 2011)

West Ridge Mine
Task ID # 3309

Bond Amount

Revised October 2008

6/29/2009

Bonding Calculations

Direct Costs

Subtotal Demolition and Removal	$3,830.00	
Subtotal Backfilling and Grading	$16,608.00	
Subtotal Revegetation	$4,506.00	
Direct Costs	$24,944.00	
Indirect Costs		
Mob/Demob	$2,494.00	10.0%
Contingency	$1,247.00	5.0%
Engineering Redesign	$623.00	2.5%
Main Office Expense	$1,696.00	6.8%
Project Mainagement Fee	$623.00	2.5%
Subtotal Indirect Costs	$6,685.00	26.8%
Total Cost 2009	$31,628.00	
Number of years		5
Escalation factor		0.013
Escalation		
Total Mine	$ 1,997,628.00 including TID # 3309	
Reclamation Cost (rounded to nearest $ 1,000) 2013 Dollars	$1,998,000.00	
Posted Bond Amount 3/31/2009	$2,184,000.00	
Difference Between Cost Estimate and Bond	$218,000.00	
Percent Difference	9.98%	

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Task ID	Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
		Gob Gas Vent Hole																			
		Structure's Demolition Cost	Mechanical equipment heavy	15055 300 3600	805	/ton							4			8	tons		32	tons	25760
		Structure's Vol. Demolished	Plug Well	AML3	5000	EA.										3	EA		3	EA	15000
		Rubble's Weight (exclude steel)																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Non Steel Truck																			
		Transportation Cost Non Steel Drive																			
		Disposal Cost Non Steel																			
		Steel's Weight																			
		Truck's Capacity																			
		Haulage																			
		Transportation Cost Steel Truck																			
		Transportation Cost Steel Truck Drive																			
		Disposal Cost Steel																			
		Subtotal																			40760
		Equipment 's Disposal Cost																			
		Dismantling Cost																			
		Equipment 's Vol. Demolished																			
		Loading Costs																			
		Transport Costs																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Concrete Demolition																			
		Demolition Cost																			
		Concrete's Vol. Demolished																			
		Loading Cost																			
		Transportation Cost																			
		Disposal Costs																			
		Subtotal																			
		Total																			40760

Demolition

	Equipment Cost	Hourly Operating Costs	Equipment Overhead	Operator's Hourly Wage Rate	Hourly Cost	Number of Men or Eq.	Total Eq. & Lab. Costs	Units	Quantity	Units	Production Rate	Units	Equip. + Labor Time/Dis.	Units	Cost
Gob Hole															
Grading															
Backfill and rough grade															
D7N DS Series II (9-51) (2nd 2007)	11530	55.05	0.1	60.1	192.72	1	192.72	$/HR	842	CY	250	CY/HR	3.4	HR	655
Topsoil															
988G EROPS (9-34) (2nd2006) 2005	15505	77.35	0.1	57.85	239.84	1	239.84	$/HR	515	CY	220	CY/HR	2.3	HR	552
6X4 70,000lbs 12-18 CY (20-15) (2nd2006)	3795	41.9	0.1	45.65	115.46	2	230.92	$/HR					2.3	HR	531
D7N DS Series II (9-51) (2nd 2007)	11530	55.05	0.1	60.1	192.72	1	192.72	$/HR	515	CY	250	CY/HR	2.1	HR	405
Subtotal															2143

Earthwork

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Main Site																			
	Pumphouse																			
	Gob Hole Vent																			188315
																				5633
																				2461
	Pocking	Excavation Bulk Bank 2 CY (322BL)	31 23 16 42 0260	1.54	/CY															
											340					CY		340	CY	
	Total																			196409

Reveg

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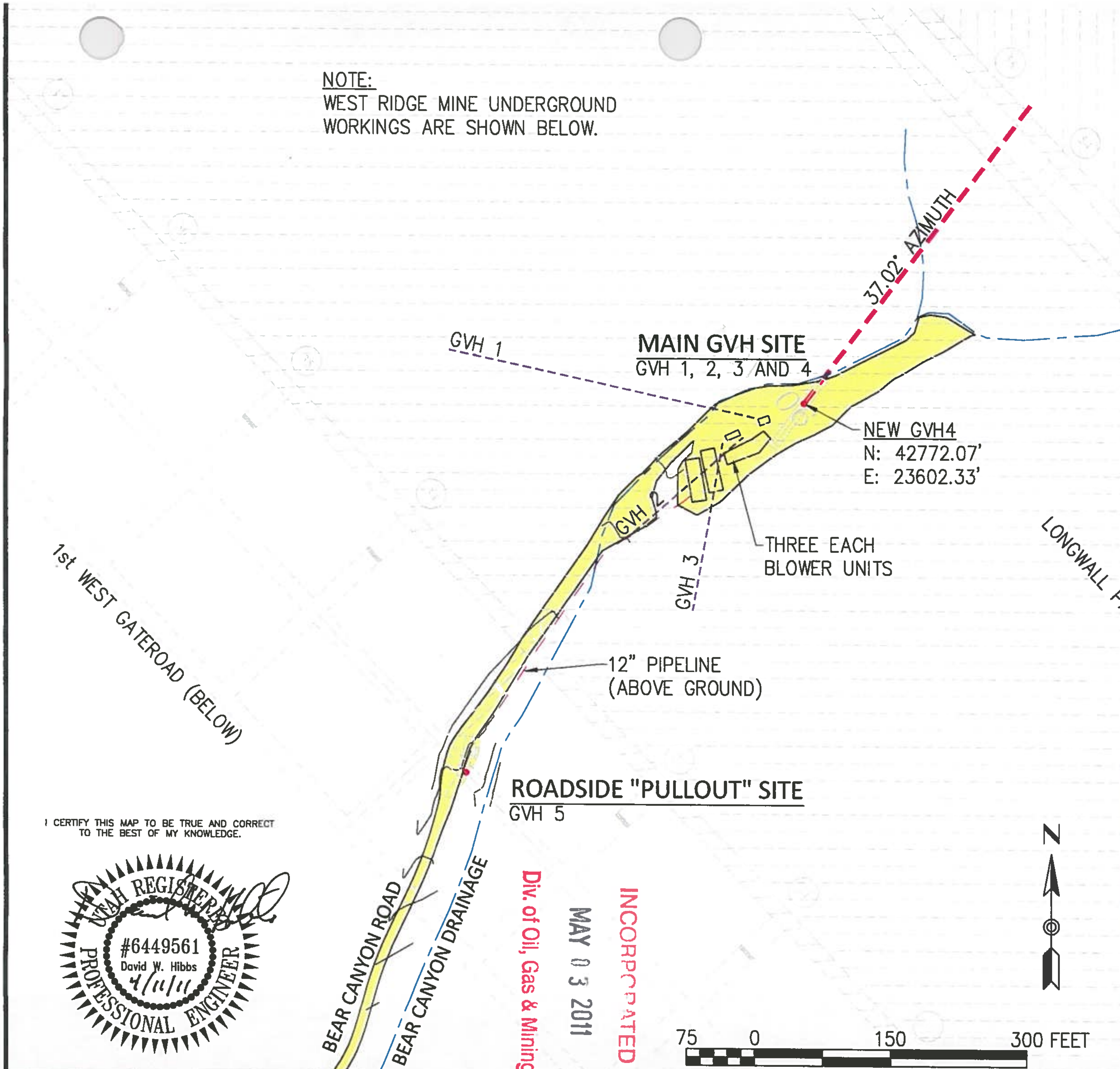
MAY 0 3 2011
Div. of Oil, Gas & Mining

INCORPORATED
Div. of Oil, Gas & Mining

Exhibit "C"

GVH Lands within MRP Permit Boundary



ATTACHMENT 2
BEAR CANYON GVH SITES

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

MSHA MINE ID # 42-02233

DRAWN BY	PJ	SCALE	1" = 150'
APPROVED BY	DS	DATE	11 APRIL 2011
REVISION	1	SHEET	ATTACHMENT 2

G:\Current Drawings\Buildings & Construction\West Ridge Mine\Bear Canyon GVH\New Site 3-25-11\Bear Canyon Site 2.dwg, Pad 1, 4/11/2011 4:31:47 PM

Exhibit "D"

SITLA Methane Lease

State of Utah
School & Institutional
Trust Lands Administration

Gary R. Herbert
Governor

Spencer J. Cox
Lieutenant Governor

David Ure
Director

675 East 500 South, Suite 500
Salt Lake City, UT 84102-2813
801-538-5100
801-355-0922 (Fax)
www.trustlands.utah.gov

October 6, 2016

Global Carbon Strategies Corporation
1524 East 8th Avenue
Denver, Colorado 80218

Dear Lessee:

RE: ML 53402-OBA – Oil, Gas, and Associated Hydrocarbons

We are herewith enclosing the above-numbered executed lease for your files.

If you have any further questions, please contact this office.

Yours very truly,

Aly Hale

Aly Hale
Research Analyst

ah

Enclosure

Board Approval Date (office use only): 08/18/2016

MINERAL LEASE NO. 53402-OBA

GRANT: SCH: 1281.24
MULT: 881.10

UTAH STATE LIMITED LEASE FOR METHANE

THIS LIMITED LEASE FOR METHANE (the "Lease") is entered into effective the 1st day of September, 2016, (the "Effective Date"), by and between the STATE OF UTAH, acting by and through the SCHOOL AND INSTITUTIONAL TRUST LANDS ADMINISTRATION, 675 East 500 South, Suite 500, Salt Lake City, Utah 84102, (hereinafter "Lessor"), and

Global Carbon Strategies Corporation
1524 East 8th Avenue
Denver, Colorado 80218

having a business address as shown above (hereinafter "Lessee", whether one or more).

WITNESSETH:

That the State of Utah, as Lessor, in consideration of the rentals, royalties, and other financial consideration required to be paid by Lessee, and the covenants of Lessee set forth below, does hereby GRANT AND LEASE to Lessee the right and privilege to obtain access to and capture, extract, gather, produce, remove, ventilate, and destroy coal mine methane (the "Leased Substances," as hereinafter defined) from the following described lands located in Carbon County, State of Utah, (the "Leased Premises"):

T13S, R13E, SLB&M
Sec. 36: All 640 SCH

T14S, R13E, SLB&M
Sec. 2: Lots 1(40.18), 2(40.27), 3(40.35), 4(40.44)
S½N½, S½ [All] 641.24 SCH

T14S, R13E, SLB&M
Sec. 3: Lots 1(40.44), 2(40.37), 3(40.29)
S½N½, S½ [Lots aka N½NE¼, NE¼NW¼] 601.10 MULT

T14S, R13E, SLB&M
Sec. 10: W½NW¼, SW¼, SW¼SE¼ 280 MULT

containing 2,162.34 acres, more or less,

together with the right and privilege, as conditioned herein, to construct and maintain on the surface estate of the following described lands ("Surface Estate") gob vent holes, ("GVHs," as hereinafter described), coal mine methane extraction facilities ("Extraction Facilities," as hereinafter defined), roads, buildings, communication lines, gathering lines, pipelines, tanks, pumping and compression stations, and any other structures or improvements to the extent necessary to capture, extract, gather, produce, remove, ventilate, and destroy the Leased Substances:

T14S, R13E, SLB&M
Sec. 3: NE1/4SW1/4SE1/4, SW1/4SW1/4SE1/4 [Within] as more particularly described in the map attached as Exhibit "A"

Together with the nonexclusive right to use existing rights of way or access that Lessor may have to obtain ingress and egress to and from the Surface Estate and Leased Premises.

This Lease is subject to, and Lessee hereby agrees to and accepts, the following covenants, terms, and conditions:

1. DEFINITIONS.

1.1 Leased Substances. Leased Substances means gases containing methane and other hydrocarbons emitted, liberated, or released from the mined coal seam roof and floor, strata overlying and underlying the lower Sunnyside coal seam, gob areas, coal pillars, barriers, and waste rock in the underground workings, airways and ventilations systems, portals, roadways stations, and sealed areas of the West Ridge Coal Mine that are owned by Lessor. As used in this Lease, Leased Substances includes substances that may be described as coalbed methane, coalmine methane, mine methane, and abandoned mine methane.

1.2 GVHs. GVHs or gob vent holes means the five (5) existing vertical boreholes, which are located on the Surface Estate and were drilled into the gob area within underground Panel 8 in the southwest corner of the West Ridge Coal Mine.

1.3 Extraction Facilities. Extraction Facilities means the equipment described on Exhibit "B" attached hereto and incorporated herein by reference, as well as the above-described GVHs, a flare, a gas pipeline, metering, communication, and fire suppression equipment, security fencing, and other equipment necessary to capture, extract, gather, produce, remove, ventilate, and destroy the Leased Substances.

2. TERM OF LEASE; RELINQUISHMENT.

2.1 Primary Term. This Lease, unless terminated at an earlier date as hereinafter provided, is granted for a primary term of five (5) years commencing on the Effective Date.

2.2 Extension beyond Primary Term. Subject to Lessee's compliance with the other provisions of this Lease, this Lease shall remain in effect beyond the primary term for so long thereafter as Lessee is engaged in diligent operations.

2.3 Diligent Operations. Diligent operations means Lessee will continue to capture, extract, gather, produce, remove, ventilate, and destroy Leased Substances, and pay Lessor royalties (as described below), with a cessation of no more than ninety (90) consecutive days or a cumulative period of no more than one-hundred eighty (180) days during any lease year after the primary term. Upon and after expiration of the primary term, where Lessee holds the lease by approved diligent operations, Lessor may review and determine as of each anniversary of the Effective Date whether Lessee is engaged in diligent operations sufficient to maintain this Lease in effect.

2.4 Relinquishment. Lessee may relinquish this Lease at any time by filing a written notice of relinquishment with Lessor, subject to Lessor's right to disapprove any relinquishment if Lessee has failed to pay all rentals, royalties, and other amounts due and owing to Lessor, if the Lease is otherwise not in good standing. Relinquishment shall not relieve Lessee from any continuing obligations to the extent provided in Paragraph 10.2 of this Lease.

3. ANNUAL RENTAL PAYMENT. Lessee shall pay annually on the Effective Date of the Lease a rental payment of Five Thousand Dollars ($5,000.00). The annual rental payment may be credited towards royalty payments as they accrue for that lease year. Failure to pay the annual rental payment for a period of one month from the date such rent is due, and upon expiration of a written notice from Lessor to Lessee requiring performance within thirty (30) days of the written notice, shall constitute a default and entitle Lessor to forfeit Lessee's interest in the Lease and to take other legal remedies available at law.

4. ROYALTIES.

4.1 Royalty Payment. Lessee shall pay Lessor a royalty payment, free of all costs and expense, of twelve and one-half cents (12.5¢) for every one million British thermal units ("MMBtus") of Leased Substances delivered to the flare and destroyed in the Extraction Facilities ("Qualifying Methane Volume," which will be expressed in MMBtus). At the end of each calendar month, the Qualifying Methane Volume will be determined by Lessee based on meter measurements taken at the collection point for the flare. All measuring devices shall be tamper-proof.

4.2 Reporting and Payment. Based on the Qualifying Methane Volume destroyed at the flare each month, Lessee will pay Lessor a royalty payment using the rate in Section 4.1 above before the end of the next succeeding calendar month. Royalty payments will be accompanied by a verified statement, in a form approved by Lessor, stating the Qualifying Methane Volume, the method and manner of calculating the royalty, and the measurement, if any, of Leased Substances produced but not delivered to the flare and consumed or destroyed in the Extraction Facilities, as well as any other information reasonably required by Lessor. To confirm the Qualifying Methane Volume, Lessee will provide to Lessor a third party verification report for each period in which carbon allowances, credits, or offsets are produced and verified from Lessee's flare operations. Lessee shall maintain all records pertaining to Qualifying Methane Volume and the calculation of royalties for a period of at least seven years after the date to which the documents pertain.

5. RESERVATIONS TO LESSOR. Lessor hereby excepts and reserves from the operation of this Lease the following rights and privileges:

5.1 Rights-of-Way and Easements. Lessor reserves the right to establish rights-of-way and easements upon, through, and across the Leased Premises and the Surface Estate, under terms and conditions that will not unreasonably interfere with operations under this Lease, for roads, pipelines, electric transmission lines, transportation and utility corridors, and any other purposes deemed reasonably necessary by Lessor.

5.2 Other Mineral Leases; Multiple Mineral Development. Lessor reserves the right to enter into mineral leases and agreements with third parties covering minerals other than the Leased Substances, under terms and conditions that will not unreasonably interfere with operations under this Lease. Lessor agrees that during the term of this Lease, Lessor will not enter into any lease or other business agreement that grants or leases any rights or interests in the Leased Substances to a third party, other than the rights previously granted under coal leases existing prior to the Effective Date of this Lease. Lessor further reserves the right to impose reasonable stipulations upon operations under this Lease to permit multiple mineral development of the Leased Premises.

5.3 Use and Disposal of Surface Lands. To the extent that Lessor owns the surface lands above the Leased Premises, not including the Surface Estate and subject to the rights granted to Lessee pursuant to this Lease in Paragraph 7.1, Lessor reserves the right to use, lease, sell, or otherwise dispose of the surface of the Leased Premises. Lessor reserves the right to charge for, negotiate and coordinate with other surface owners, land management agencies or governmental agencies regarding mitigation or impact fees and shall coordinate the collection and expenditure of such fees, if any, that are imposed or collected. Notwithstanding any other provision of this Lease, Lessor reserves the right to permit third parties to undertake surface activities associated with seismic, geophysical, and geochemical exploration for oil and gas (such activities being considered by Lessor to be a surface use) without compensation or other obligation to Lessee so long as such activities do not damage or unreasonably interfere with Lessee's operations.

5.4 Rights Not Expressly Granted. Lessor further reserves all rights and privileges of every kind and nature, except as specifically granted in this Lease.

6. LEASE OPERATIONS.

6.1 Plan of Operations. At least thirty (30) days prior to commencing operations on the Leased Premises and Surface Estate, Lessee must submit to Lessor for its approval a plan of operations and reclamation. Lessee may not commence operations until Lessor has approved its plan of operations. Lessor may condition its consent to the plan of operations upon Lessee's agreement to comply with reasonable measures for the prevention of waste, protection of mineral and surface resources, protection of cultural resources, reclamation, and other measures deemed necessary by Lessor. Lessee must also obtain all necessary approvals for its operations from the Utah Division of Oil, Gas & Mining ("UDOGM"), the Utah Department of Environmental Quality ("DEQ"), or any successor regulatory agency, prior to commencing any operations on the Leased Premises and the Surface Estate. Lessee must provide Lessor with proof of the approval of its operations by UDOGM and DEQ.

6.2 Compliance with Applicable Law. Lessee, shall comply with all applicable federal, state and local statutes, regulations, and ordinances, whether now in effect or enacted in the future, including without limitation the rules and regulations of UDOGM and DEQ, statutes and regulations governing the management of school and institutional trust lands, applicable statutes and regulations relating to safety and health, and applicable statutes, regulations and ordinances relating to public health, pollution control, management of hazardous substances, cultural resources, and environmental protection.

6.3 Prudent Operator. Lessee shall exercise reasonable diligence in conducting operations on the Leased Premises and Surface Estate. Lessee shall conduct its operations as a prudent operator in accordance with standard industry methods and practices, having due regard for the protection of the interests and future operations of the West Ridge Coal Mine, Lessor's interest with respect to the Leased Premises and Surface Estate, and the health and safety of workers and employees and such other practices that are recognized within the industry.

6.4 Completion of Operations; Reclamation. Upon completion of Lessee's operations authorized under this Lease, Lessee shall plug all GVH wellbores located on the Leased Premises and Surface Estate in accordance with UDOGM rules and standard industry practice, and reclaim all surface disturbances relating to such operations as prescribed by Lessor and UDOGM. All Extraction Facilities, equipment, and material not removed from the Leased Premises within ninety (90) days of completion of Lessee's operations shall be deemed abandoned, and Lessor may remove or cause to be removed said equipment and material and sold to Lessor's account.

6.5 Cultural Resources. Prior to commencing any new surface disturbing operations or any operations that have the potential to affect historic properties, Lessee shall complete an addendum to the existing cultural resource inventory prepared for the Surface Estate in accordance with applicable laws and regulations, or otherwise provide evidence of compliance with *Utah Administrative Code* R850-60. Lessee shall provide such cultural resource compliance materials to Lessor prior to the approval of Lessee's plan of operations. Lessor will review all cultural resource compliance materials provided by Lessee, and may approve, condition or deny its consent to new surface disturbing operations based upon impacts to cultural resources. Lessor may require Lessee to complete appropriate cultural resources mitigation measures as a condition of approval of the plan of operations.

7. USE OF SURFACE ESTATE. Lessee may use and occupy the Surface Estate for all purposes reasonably necessary to capture, extract, gather, produce, remove, ventilate, and destroy the Leased Substances in compliance with its plan of operations and all applicable laws, rules, regulations, permits and approvals. Lessee may not use the Surface Estate prior to complying with the requirements of Paragraph 6.1. Such surface uses shall be exercised subject to the rights reserved to Lessor as provided in Section 5, and without unreasonable interference with the rights of any prior or subsequent lessee of Lessor. Lessee may not use surface lands overlying the Leased Premises other than the Surface Estate.

8. BONDING. Before commencing operations on the Leased Premises and Surface Estate, Lessee shall execute and post with Lessor a surety bond or other financial guarantee in the amount of Fifteen Thousand Dollars ($15,000.00) to guarantee Lessee's performance of all covenants and obligations under this Lease. Lessor may in its reasonable discretion require Lessee to furnish additional bonding for assuring compliance with the terms of this Lease upon thirty (30) days written notice.

10. DEFAULT.

10.1 Notice of Default; Termination. Upon Lessee's violation of or failure to comply with any of the terms, conditions or covenants set forth in this Lease, Lessor shall notify the then-current Lessee of such default by registered or certified mail, return receipt requested, at the last address for Lessee set forth in Lessor's files. Lessee shall then have thirty (30) days, or such longer period as may be granted in writing by Lessor, to either cure the default or request a hearing pursuant to the Lessor's administrative adjudication rules. In the event Lessee fails to cure the default or request a hearing within the specified time period, Lessor may cancel this Lease without further notice to or appeal by Lessee. Failure to timely pay rentals or royalties is not a breach of covenants but rather a failure of condition and shall cause the Lease to expire pursuant to its own terms.

10.2 Effect of Termination. The termination of this Lease for any reason, whether through expiration, cancellation or relinquishment, shall not limit the rights of the State of Utah to recover any royalties and/or damages for which Lessee may be liable, to recover on any bond on file, or to seek injunctive relief to enjoin continuing violations of the Lease terms. No remedy or election under this Lease shall be deemed exclusive, but shall, whenever possible, be cumulative with all other remedies available under this Lease, at law or in equity. Lessee shall surrender the Leased Premised upon termination; however, the obligations of Lessee with respect to plugging of abandoned wells, reclamation, indemnification and other continuing covenants imposed by this Lease shall survive the termination.

11. RIGHT OF ACCESS; RECORDS.

11.1 Reporting; Records. Lessee shall timely provide UDOGM, the Utah Department of Environmental Quality, and all other governmental agencies with oversight authority, the data, reports, and other information related to produced and destroyed methane that is required by such agency. Lessee shall provide a copy of the same upon request by Lessor.

11.2 Inspection; Audit. Lessor's employees and authorized agents shall have the right to enter the Leased Premises to examine, inspect, survey and take measurements for the purposes of verifying the Qualifying Methane Volume amounts, the total volume of Leased Substances or project emissions produced during Lessee's methane destruction operations on the Leased Premises, and other proper lease operations. Upon reasonable notice to Lessee, Lessor's employees and authorized agents shall further have the right to audit, examine and copy (at Lessor's expense) all documents related to Lessee's efforts to capture, extract, gather, produce, remove, ventilate, and destroy coal mine methane including, but not limited to the records related to determining Qualifying Methane Volume and the calculation of royalties. Lessor's employees and authorized agents shall have the right to audit, examine and copy such records whether they are located on the Leased Premises or elsewhere. Lessee shall furnish all conveniences necessary for any inspections or audits; provided, however, that such inspections or audits shall be conducted in a manner that is in conformance with all applicable safety regulations and does not unreasonably interfere with Lessee's operations.

12. ASSIGNMENT OR SUBLEASE; OTHER AGREEMENTS.

12.1 Consent Required. Lessee shall not assign or sublease this Lease in whole or in part, or otherwise assign or convey any rights or privileges granted by this Lease, without the prior written consent of Lessor. Any assignment, sublease or other conveyance made without prior written consent of Lessor shall be void and have no legal effect unless and until approved in writing by Lessor. Exercise of any right with respect to the Leased Premises in violation of this provision shall constitute a default under this Lease.

12.2 Limitation on Other Agreements. Lessee shall not enter into any agreement limiting, restricting, prorating, or otherwise affecting the natural production of Leased Substances from the Leased Premises in any way or in any event without the prior written consent of Lessor.

13. MISCELLANEOUS PROVISIONS.

13.1 No Warranty of Title. Lessor does not warrant title nor represent that no one will dispute the title asserted by Lessor to the Surface Estate and Leased Premises including, without limitation, any rights Lessor may have to capture, extract, gather, produce, remove, ventilate, and destroy the Leased Substances. It is expressly agreed that Lessee shall not be entitled to any refund for any rentals and royalties paid under the Lease in the event of title failure, nor shall Lessor be liable to Lessee for any alleged deficiency in title to the mineral estate. If any third party claims any rights to the Leased Substances, Lessee will have the right to place all royalty payments due Lessor in an interest-bearing trust account, pending a final resolution of the third party's claim. If Lessor owns an interest less than all of the Leased Substances, the royalties provided herein shall be paid to Lessor in the proportion which Lessor's interest bears to the entire volume of Leased Substances.

13.2 Notices. All notices herein provided to be given or which may be given by either party to the other, except as otherwise provided by law, shall be deemed to have been fully given when made in writing and deposited in the United States mail, postage prepaid, and addressed to the last known address of the parties. Lessee's address set forth above shall be conclusively deemed to be correct unless Lessor has received written notice of change of address from Lessee.

13.3 Indemnity. Lessee shall indemnify and hold Lessor harmless for, from and against each and every claim, demand, liability, loss, cost, damage and expense, including, without limitation, attorneys' fees and court costs, arising in any way out of Lessee's occupation and use of the Leased Premises and Surface Estate, including without limitation claims for death, personal injury, property damage, environmental damage or remediation, royalty disputes, unpaid wages and benefits. Lessee further agrees to indemnify and hold Lessor harmless for, from and against all claims, demands, liabilities, damages and penalties arising out of any failure of Lessee to comply with any of Lessee's obligations under this Lease, including without limitation attorneys' fees and court costs.

13.4 Interest. Interest shall accrue and be payable on all obligations arising under this Lease at such rate as may be set from time to time by rule enacted by Lessor. Interest shall accrue and be payable, without necessity of demand, from the date each such obligation shall arise. The accrual and payment of interest does not constitute a waiver or satisfaction of any penalty that may apply under the Lessor's Rules.

13.5 Governing Law: Consent to Suit; Jurisdiction. This Lease shall be governed by the laws of the State of Utah. Lessor and Lessee agree that all disputes arising out of this Lease shall be litigated only in the Third Judicial District Court for Salt Lake County, Utah. Lessee shall not bring any action against Lessor without exhaustion of available administrative remedies and compliance with applicable requirements of the Utah Governmental Immunity Act. Service of process in any such action is hereby agreed to be sufficient if sent by certified mail to Lessee at the last known address appearing in Lessor's records.

13.6 Attorneys' Fees. In the event Lessor institutes and prevails in any administrative or judicial proceeding for breach of this agreement, Lessor shall be entitled to collect its reasonable attorneys' fees and costs from Lessee.

13.7 No Waiver. No waiver of the breach of any provision of this Lease shall be construed as a waiver of any preceding or succeeding breach of the same or any other provision of this Lease, nor shall the acceptance of rentals or royalties by Lessor during any period of time in which Lessee is in default be deemed to be a waiver of such breach.

13.8 Severability. The invalidity of any provision of this Lease, as determined by a court of competent jurisdiction, shall in no way affect the validity of any other provision hereof.

13.9 Entire Lease. This Lease, together with any attached stipulations, sets forth the entire agreement between Lessor and Lessee with respect to the subject matter of this Lease. No subsequent alteration or amendment to this Lease shall be binding upon Lessor and Lessee unless in writing and signed by both parties.

13.10 Binding Effect. This Lease shall be binding upon, and shall inure to the benefit of the parties to it and their respective legal representative, successors, and assigns.

13.11 Certification. Lessee certifies that by signing this Lease, it is qualified to do business in the State of Utah and is not in default under the laws of the State of Utah relative to qualification to do business within the state or not in default of any previous obligation with the Lessor.

13.12 Assignment of Interest from Mine Operator. Within 120 days of the Effective Date of this Lease, Lessee will provide Lessor with a copy of the written assignment between Lessee and operator of the West Ridge Coal Mine. The assignment must provide Lessee with an assignment of the mine operator's rights, interests, duties, and obligations in and to the Surface Estate, Leased Substances, GVHs, and Extraction Facilities.

IN WITNESS WHEREOF, the parties have executed this Lease as of the Effective Date.

THE STATE OF UTAH, acting by and through the SCHOOL AND INSTITUTIONAL TRUST LANDS ADMINISTRATION ("LESSOR")

DAVID URE, DIRECTOR

By: LaVonne J. Garrison

LAVONNE J. GARRISON
ASSISTANT DIRECTOR/OIL & GAS

APPROVED AS TO FORM:

SEAN D. REYES
ATTORNEY GENERAL

By: ______________________

Special Assistant Attorney General

Form Approved: August 18, 2016

LESSEE: GLOBAL CARBON STRATEGIES CORPORATION

By: Alan Kennedy

Its: Vice President

STATE OF UTAH)
:
COUNTY OF SALT LAKE)

The foregoing instrument was acknowledged before me this 5th day of October 2016, by LaVonne J. Garrison in her capacity as Assistant Director/Oil and Gas of the School and Institutional Trust Lands Administration.

ALYSON HALE
Notary Public State of Utah
My Comm. Exp: June 18, 2019
Comm. Number: 683597

Alyson Hale
Notary Public

STATE OF __________)
:
COUNTY OF __________)

The foregoing instrument was acknowledged before me this _____ day of __________ 20___, by __________, in his/her capacity as __________ of the Lessee.

____
Notary Public

STATE OF Utah)
:
COUNTY OF Salt Lake)

The foregoing instrument was acknowledged before me this 30 day of September 2016, by Collon C. Kennedy, Lessee., Global Carbon Strategies Corporation

Sarah Nielsen
Notary Public

SARAH NIELSEN
Notary Public State of Utah
My Commission Expires on:
September 14, 2019
Comm. Number: 684886

EXHIBIT A

GVH SITE

G:\Current Drawings\Buildings & Construction\West Ridge Mine\Bear Canyon GVH\New Site 3-25-11\Bear Canyon Site 2.dwg, Pad 1, 4/11/2011 4:31:47 PM

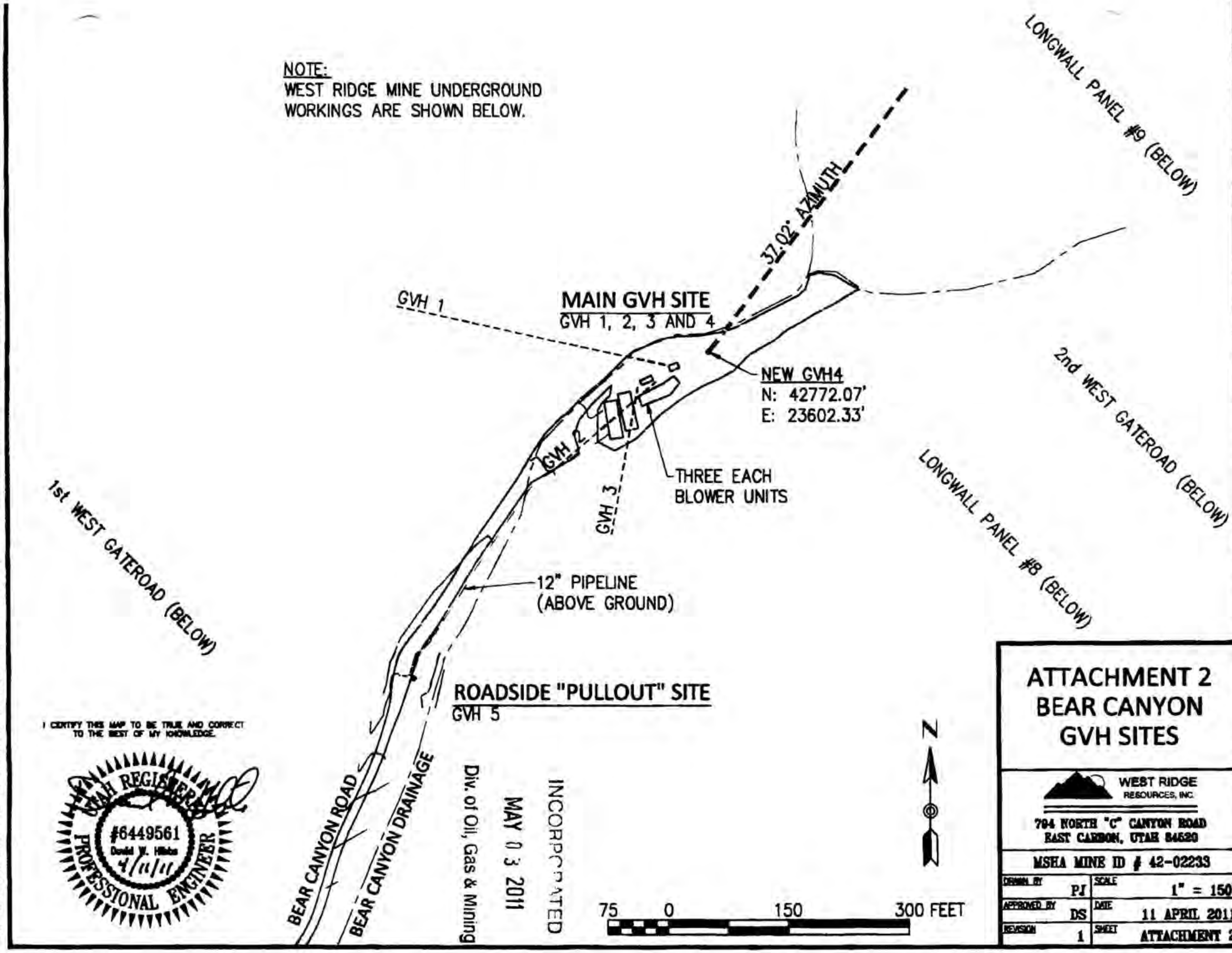


EXHIBIT "B"
EXTRACTION FACILITIES

I. Historic West Ridge Mine's Extraction Facilities:

9 5/8 to 10" Flange Adapter
10" SS Gate Valve
10" Check Valve
10" fabricated Wye
10" Gear Actuated Butterfly Valves
10" flex hose w/ flange ends x 12'
10" long sweep 90° Els
10" Flame Arrestors
10" x 8" Adapters
8" x 10' Metering Spool
Verabar Flow Meter
Monitoring PLC
Control Panels w/Methanometer
10" x 8" Adapters
10" x 8" Tee
8" Check Valves
Vent Stack Adapters
Fiberglass Vent Stacks
10" long sweep 90° Els
10" Inlet Filter
10" 150# ss Gasket
10" 150# Blind Flange
14'w 10'h 36' long Tents (4)
7/8 x 4 3/4 Stud w/ nut
Gasket
GVHs (locations depicted on plat) (5)
Leveling Base
Support Frame
Viper 60-80 Air Compressor
Methane Extractor Units (MEUs) (operating) (4)
Methane Extractor Unit (spare)
Air Diaphragm Pump
Hose & ftg kit

II. Additional Equipment:

Additional equipment and infrastructure required by Lessee for flare operations will likely include, among other things, the following:

Enclosed Ground Flare
Steel Flare Shell AssemblyFlanged Inlet Nozzel
Flame Arrester
Butterfly Value w/SS Disc & Stem w/Pneumatically Controlled
Safety Shutoff Actuator
Nitrogen Regulator and Rack
Steel Bellows Type Flex Connector
Weather Shield at Top of Flare
Heat Screen Around Flare (as needed)
Thermocouples
Self-Checking Flame Safeguard Sensors
Flare Purge System with Air Blower and Verification Pressure Switch
Propane Gas Pilot System; Pilot Igniter
Burner System
Thermal Mass Flow Meter
Gas Analyzer
Pressure and Temperature Gauges
Control Panel
Satellite Modem and Communications System
Gas Pipeline from MEUs to Flare
GVH Site Security Fencing

Exhibit “E”

Form of Assignment and Assumption Agreement

WHEN RECORDED, RETURN TO:

Collon Kennedy
Vice President
Global Carbon Strategies Corporation
743 Horizon Court, Suite 383
Grand Junction, Colorado 81506

DRAFT
ASSIGNMENT AND ASSUMPTION AGREEMENT

THIS ASSIGNMENT AND ASSUMPTION AGREEMENT ("Assignment") is made and entered into effective this _____ day of _______, 2017 ("Effective Date"), by and between **West Ridge Resources, Inc**., a Utah corporation, and ANDALEX Resources, Inc., a Delaware corporation, with offices at 794 North "C" Canyon Road, P.O. Box 910, East Carbon, Utah 84520 (collectively, "**Assignor**"), and **Global Carbon Strategies Corporation**, a Colorado corporation authorized to transact business in Utah, with offices at 743 Horizon Court, Suite 383, Grand Junction, Colorado 81506 ("**Assignee**"). Assignor and Assignee may hereinafter be referred to individually as a "Party" and collectively as the "Parties."

W I T N E S S E T H:

WHEREAS, the Parties entered into a Mine Methane Extraction Asset Sale and Purchase Agreement, effective the _______ day of _______ 2017 ("Asset Sale Agreement"), in which Assignor agreed to assign, sell, and transfer to Assignee ownership and control of certain assets used to extract and destroy coal mine methane and other hydrocarbons ("CMM") produced from the West Ridge Coal Mine ("Mine") in Carbon County, Utah, which assets and operations are known as Assignor's "GVH Project."

WHEREAS, the term coal mine methane ("CMM") is more particularly described as meaning all coal bed methane, coal mine methane, gob gas, and all associated natural gas and other hydrocarbons of whatever quality or quantity within, produced, or emitted, liberated, or released during mining, dewatering, and post-mining operations from the lower Sunnyside coal seam and other proximate coal seams or any related or associated host rock material or strata, gob areas, sealed areas, coal pillars, barriers, and waste rock piles in, above, below, or which accumulate in the Mine's underground workings, airways and ventilation systems, voids, portals, roadways, stations, and sealed areas.

WHEREAS, the GVH Project is located in Section 3 NW1/4NE1/4SW1/4SE1/4, Township 14 South, Range 13 East, Carbon County, Utah ("Site") on land subject to Utah State Coal Lease M.L No. 49287 held by Assignor and Utah State Limited Methane Lease No. 53402 – OBA held by Assignee.

WHEREAS, Assignor's rights (express and implied) and duties with respect to the GVH Project include, among other things, certain agreements, federal and state coal leases (collectively, "Mine's Coal Leases"), permits, and other approvals granting Assignor the right to drill for, capture, remove, use, vent, and destroy CMM released in the Mine, which are further described on **Exhibit "A"** attached hereto and incorporated herein by this reference (collectively, **"Subject Property"**).

WHEREAS, Assignee has agreed to assume, discharge, and perform certain duties, obligations, and liabilities of Assignor relating to the GVH Project as further described herein.

NOW THEREFORE, for Ten Dollars ($10.00) and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Parties agree as follows:

1. On the terms and conditions set forth herein, Assignor, on behalf of itself and its affiliates, hereby assigns, sells, delivers, and transfers to Assignee AS IS, WHERE IS", without representations or warranties of title, but free and clear of all causes of action, claims, liens, liabilities, and encumbrances arising by, through, or under Assignor, ownership and control of Assignor's rights, title, interests, duties, and obligations in and to the Subject Property described on Exhibit "A."

2. Assignor's aforementioned assignment and transfer of the Subject Property to Assignee is expressly subject to the reservation of certain rights relating to the extraction of CMM from the Mine during active mining operations as further provided in the Asset Sale Agreement and a Subordination Agreement executed by the Parties as of the Effective Date hereof. It is further agreed by the Parties that the Subject Property does not include any and all other rights, duties, and obligations Assignor may have with respect to the Mine as further provided in the Asset Sales Agreement.

3. As part of the consideration for this Assignment, Assignee hereby assumes and agrees to discharge and perform certain of Assignor's obligations and liabilities relating to the GVH Project as further provided in the Asset Sale Agreement.

4. At the request of either Party, the Parties shall execute and provide any other documents and instruments necessary to complete the transfer of the Subject Property pursuant to this Assignment.

5. This Assignment is executed and delivered pursuant to, and is subject to and governed by, the terms and provisions of the Asset Sale Agreement. However, in the event of an irreconcilable conflict between the terms and conditions of this Assignment and the Asset Sale Agreement, the terms and conditions of this Assignment shall govern and control. A copy of the Asset Sale Agreement is available for inspection during regular business hours at Assignee's office at the address set forth above upon three (3) days prior written notice.

IN WITNESS WHEREOF, the Parties have executed this Assignment as of the Effective Date.

ASSIGNOR:	**ASSIGNEE:**
West Ridge Resources, Inc.	**Global Carbon Strategies Corporation**
By:________________________________	By:________________________________
Name:______________________________	Name:______________________________
Title:______________________________	Title:______________________________

ANDALEX Resources, Inc.

By:________________________________

Name:______________________________

Title:______________________________

STATE OF ____________________)
) ss.
COUNTY of ___________________)

The foregoing instrument was acknowledged before me this ______ day of ______ ______, 2017, by ____________________________, the ____________________ of West Ridge Resources, Inc.

My Commission Expires: ______________________________________ NOTARY PUBLIC

____

STATE OF ____________________)
) ss.
COUNTY of ___________________)

The foregoing instrument was acknowledged before me this _____ day of ______ ______, 2017, by ___________________________, the ____________________ of Global Carbon Strategies Corporation.

____

My Commission Expires: NOTARY PUBLIC

____

STATE OF ____________________)
) ss.
COUNTY of ___________________)

The foregoing instrument was acknowledged before me this _____ day of ______ ______, 2017, by ___________________________, the ____________________ of ANDALEX Resources, Inc.

____

My Commission Expires: NOTARY PUBLIC

____

<u>EXHIBIT A</u>
TO
ASSIGNMENT AND ASSUMPTION AGREEMENT (ASSIGNMENT)
BETWEEN
WEST RIDGE RESOURCES, INC. AND
ANDALEX RESOURCES, INC. (COLLECTIVELY, ASSIGNOR)
AND
GLOBAL CARBON STRATEGIES CORPORATION (ASSIGNEE)

<u>Subject Property Description</u>

The limited rights (express and implied), title, leasehold, and interests held by Assignor in the Mine's Coal Leases to drill for, capture, remove, use, vent, and destroy CMM produced from the Mine's underground workings, and certain permits, approvals, leases, and other agreements authorizing Assignor to construct and operate the GVH Project located in Section 3 NW1/4NE1/4SW1/4SE1/4, Township 14 South, Range 13 East, Carbon County, Utah ("Site") on land subject to Utah State Coal Lease M.L No. 49287 held by Assignor and Utah State Limited Methane Lease No. 53402 – OBA held by Assignee, more particularly described as follows:

- **Mine's Coal Leases**
  <u>Federal Coal Leases</u>

  - Lease No. SL – 068754, effective as of June 1, 1951, as amended and modified on September 1, 1998, covering the following described land in Carbon County, Utah:

    <u>Tract 1:</u>
    <u>T. 14S., R. 13 E., SLM, Utah</u>
    Sec. 10: NE, N2SE, E2NW;
    Sec. 11: All;
    Sec. 12: S2SW, NWSW;
    Sec. 13: S2, NW, S2NE, NWNE;
    Sec. 14: E2, NW, N2NW; SENW;
    Sec 24: N2, N2SE, NESW.

    containing a total of 2,570.67 acres, more or less in Carbon County, Utah.

    <u>Tract 2:</u>
    <u>T. 14S., R. 13 E., SLM, Utah</u>
    Sec. 10: SESE;
    Sec. 15: NENE.

    containing a total of 80 acres, more or less in Carbon County, Utah.

  - Lease No. UTU 78562, dated effective as of February 1, 2002, as modified June 10, 2011, covering the following described tracts of land located in Carbon County, Utah:

Tract 1:

T. 13S, R. 13 E., SLM, Utah
Sec. 35: S2SW4, SE4;

T. 14S., R. 13 E., SLM, Utah
Sec. 1: Lots 2-7, SW4NE4, S2NW4, W2SE4, SW4;
Sec. 12: Lots 1-4, S2N2, NE4SW4, SE4;
Sec. 13: NE4NE4;

T. 14S., R. 14 E., SLM, Utah
Sec. 6: Lot 6;
Sec. 7: Lots 3-4;
Sec. 18: Lot 1, E2NW4;

Tract 2:

T. 13S, R. 13 E., SLM, Utah
Sec. 34: NE4SE4, S2SE4;
Sec. 35: N2, N2SW4;

T. 14S, R. 13 E., SLM, Utah
Sec. 1: Lot 1;

T. 14S, R. 14 E., SLM, Utah
Sec. 6: NE4SW4.

Tract 3:

T. 13S, R. 14 E., SLM, Utah
Sec. 31: Lot 4, S2SE4SW4, NE4SE4SW4, SE4NW4SE4SW4, W2SW4SE4, S2SE4SW4SE4, S2S2SE4SE4;

T. 14S, R. 14 E., SLM, Utah
Sec. 5: Lot 4, W2W2SW4NW4, SW4NW4SW4, W2NW4NW4SW4, W2SW4SW4;
Sec. 6: NE4SE4;
Sec. 8: W2NW4NW4, W2SE4NW4NW4, SW4NE4NW4NW4, W2SW4NW4, W2E2SW4NW4, W2NW4SW4, SW4SW4;
Sec. 17: N2NW4NW4NW4.

containing a total of 2,605.49 acres, more or less, in Carbon County, Utah.

State of Utah Coal Leases

- Lease No. 47711-OBA, dated April 1, 2003, covering the following described tracts of land:

    T. 14S., R. 13 E., SLB&M
    Sec. 2: LOTS 1(40.18), 2(40.27), 3(40.35), 4(40.44), S2N2, S2

    T. 13., R. 13 E., SLB&M
    Sec. 36: SW4

  containing 801.24 acres, more or less.

- Lease No. 49287-OBA, dated April 1, 2004, covering the following described tract of land:

    T14S, R13E, SLB&M
    Sec. 3: Lots 1(40.44), 2(40.37), 3(40.29), S2N2, S2 [Lots AKA N2NE4, NE4NW4]
    Sec. 10: W2NW4, SW4, SW4SE4

  containing 881.10 acres, more or less.

- Lease No. 51744-OBA, dated June 1, 2010, covering the following described tract of land:

    T13S, R13E, SLB&M.
    Sec. 36: N2, SE4

  containing 480.00 acres, more or less.

- **GVH Project Permits**

1. Partial Assignment of Permit No. C/007/0041, GVH Project, Appendix 5-14, Appendix 5-14A. The Permit authorizes the surface disturbance of three (3) acres, more or less, and the drilling of five (5) GVH holes and CMM production operations at the Site. Grantor's rights to operate the GVH Project and duties to reclaim the Site provided in the Permit are hereby conveyed and transferred to Grantee. Transfer is subject to approval of the Utah Division of Oil, Gas & Mining (DOGM) and does not affect any other portion of West Ridge Coal Mine ("Mine") Permit No. C/007/0041 which remains in Grantor.

GVHs Nos. 1 thru 3 are generally described in Appendix 5-14, dated November 12, 2008, attached to the West Ridge Coal Mine's ("Mine") Mining and Reclamation Plan ("MRP") issued by the Utah Division of Oil, Gas, and Mining ("DOGM"). GVHs Nos. 4 and 5 are generally described in Appendix 5-14A, dated May 3, 2011, to the MRP issued by DOGM.

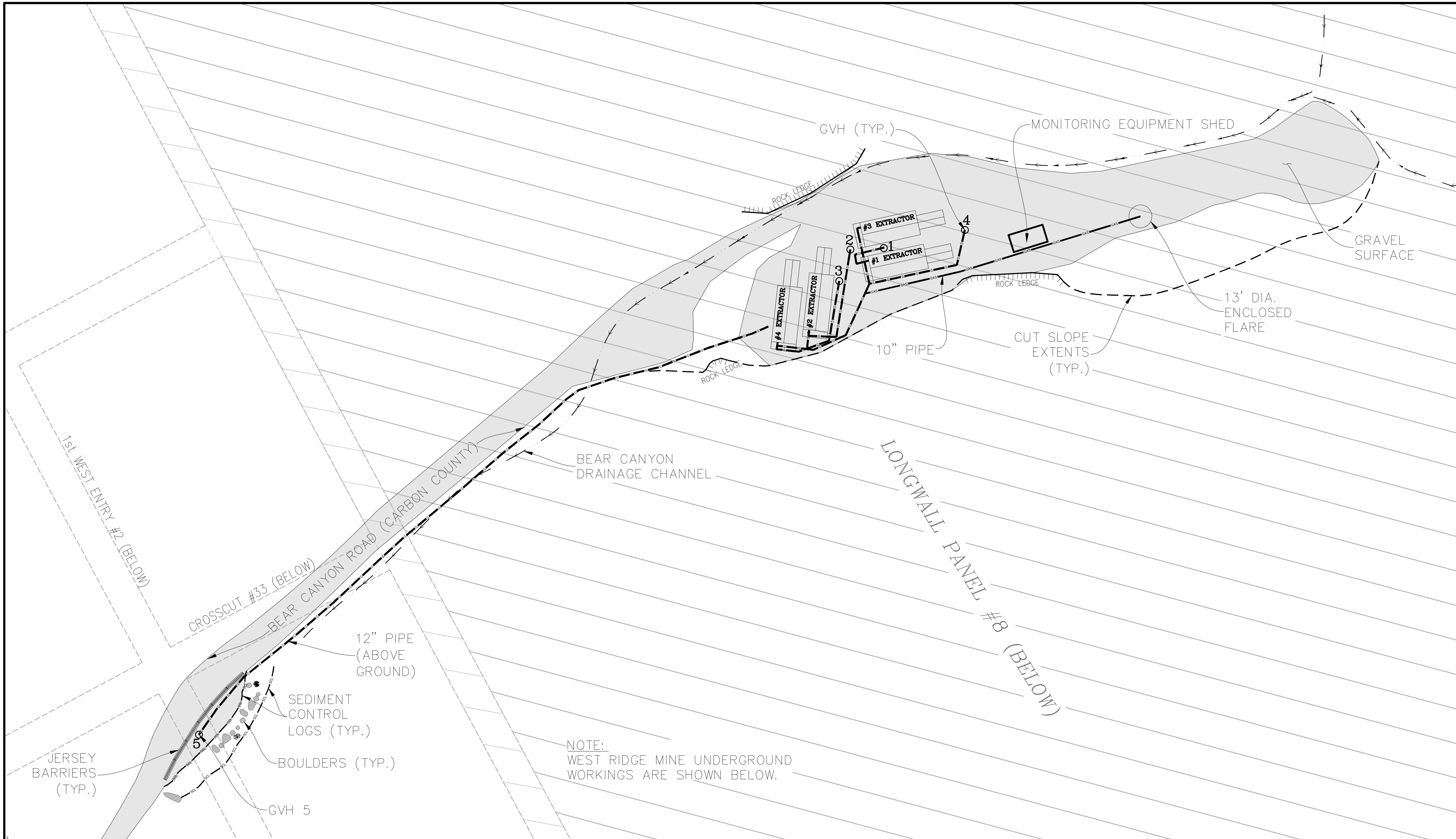
Attachments 2 and 5 to Appendix 5-14A depict the general locations or orientations of each of the five (5) GVHs. Copies of Appendices 5-14 and 5-14A are available for inspection at Grantee's office.

2. Air Quality Approval Order (Degas Engines). The Mine's Approval Order, dated February 13, 2013, (DAQE-AN121670001-13) (AO), as administratively amended, including the portion of the AO related to four (4) degasification engines (Emission Units 046, 74, 253, and 614) permitted to operate at the GVH Project Site. Transfer is subject to approval of the Utah Division of Air Quality.

The portion of the AO covering all other mining operations and equipment at the Mine remains in Grantor.

Exhibit "F"

ER Project Preliminary Site Plan



REVISIONS

NO.	DATE	DESCRIPTION	BY

S:\PROJECTS\1628 Ruby Canyon Engineering\001 Bear Canyon\Design\1628-001.dwg [Site Exhibit]

SCALE

50 0 25 50

(IN FEET)

Exhibit drawn by River City Consultants, Inc.

GCS
GLOBAL CARBON STRATEGIES

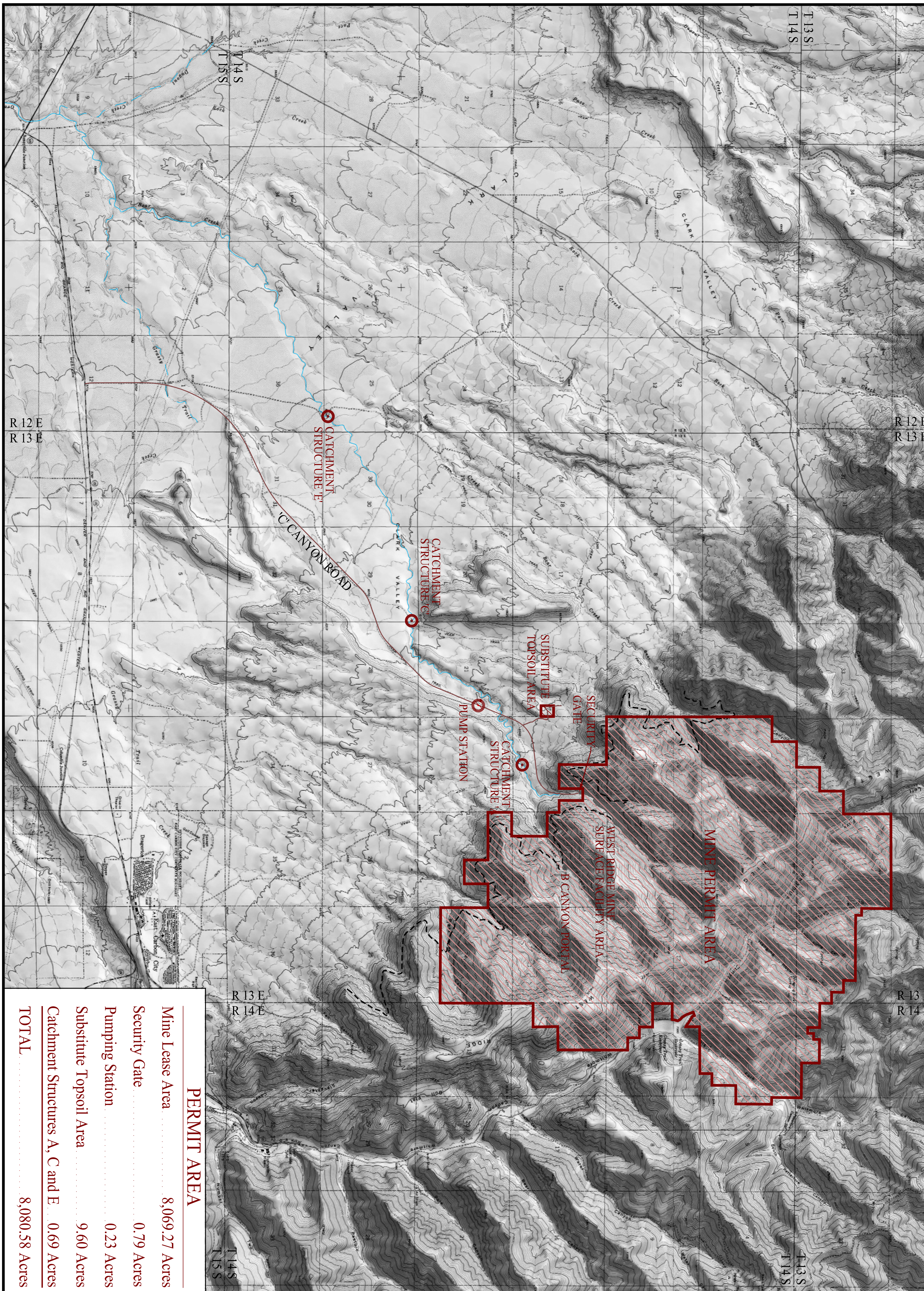
Bear Canyon Mine Methane Project

Preliminary Facility Site Plan

-CONFIDENTIAL-

DRAWN BY: nmr	HORZ SCALE: 1" = 50'	DATE: 29.Mar.2017	EX1
CHECKED BY:	VERT SCALE: N/A	SHEET SIZE: 11 x 17	

G:\Current Drawings\MRP Maps\West Ridge\Remove GVH Holes from Permit\Maps 1-0 and 1-1 Rev 20.dwg, 11x17, 5/8/2017 1:54:17 PM, 1:1



PERMIT AREA

Mine Lease Area	8,069.27 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	8,080.58 Acres

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

DATE: 5-08-2017 REV: 20 ACAD REF: Maps 1-0 and 1-1 Rev 20

LEGEND:
Lease Areas
Surface Facility Area
Outcrop

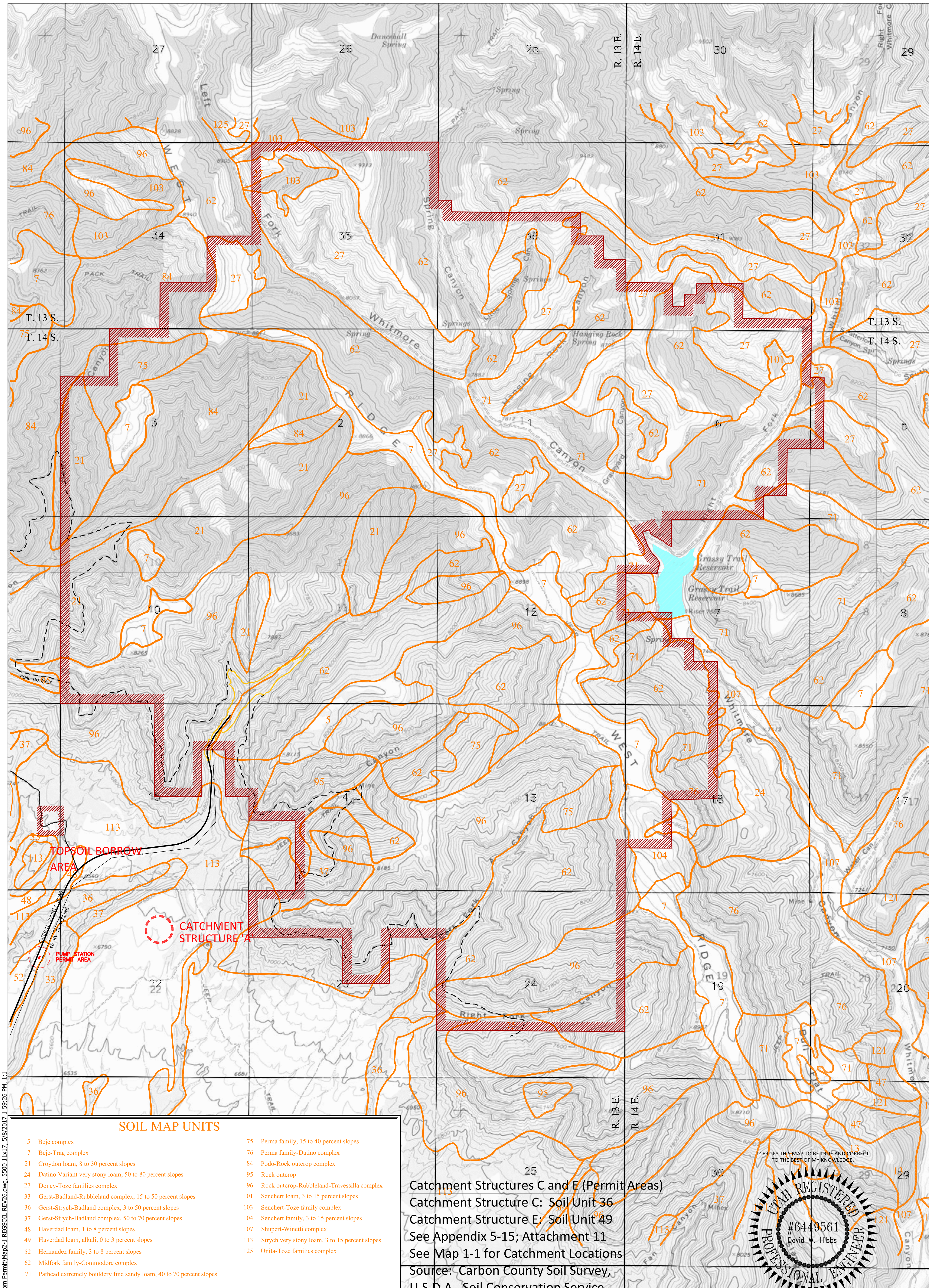
N

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

UTAH REGISTERED PROFESSIONAL ENGINEER
#6449561
David W. Hibbs

WEST RIDGE
RESOURCES, INC.

SCALE: 1"=5000'



WEST RIDGE MINE

Map 2-1

Regional Soil Map

DATE: 5-08-2017 REV: 26 ACAD REF: MAP2-1 REGSOIL REV26

LEGEND:

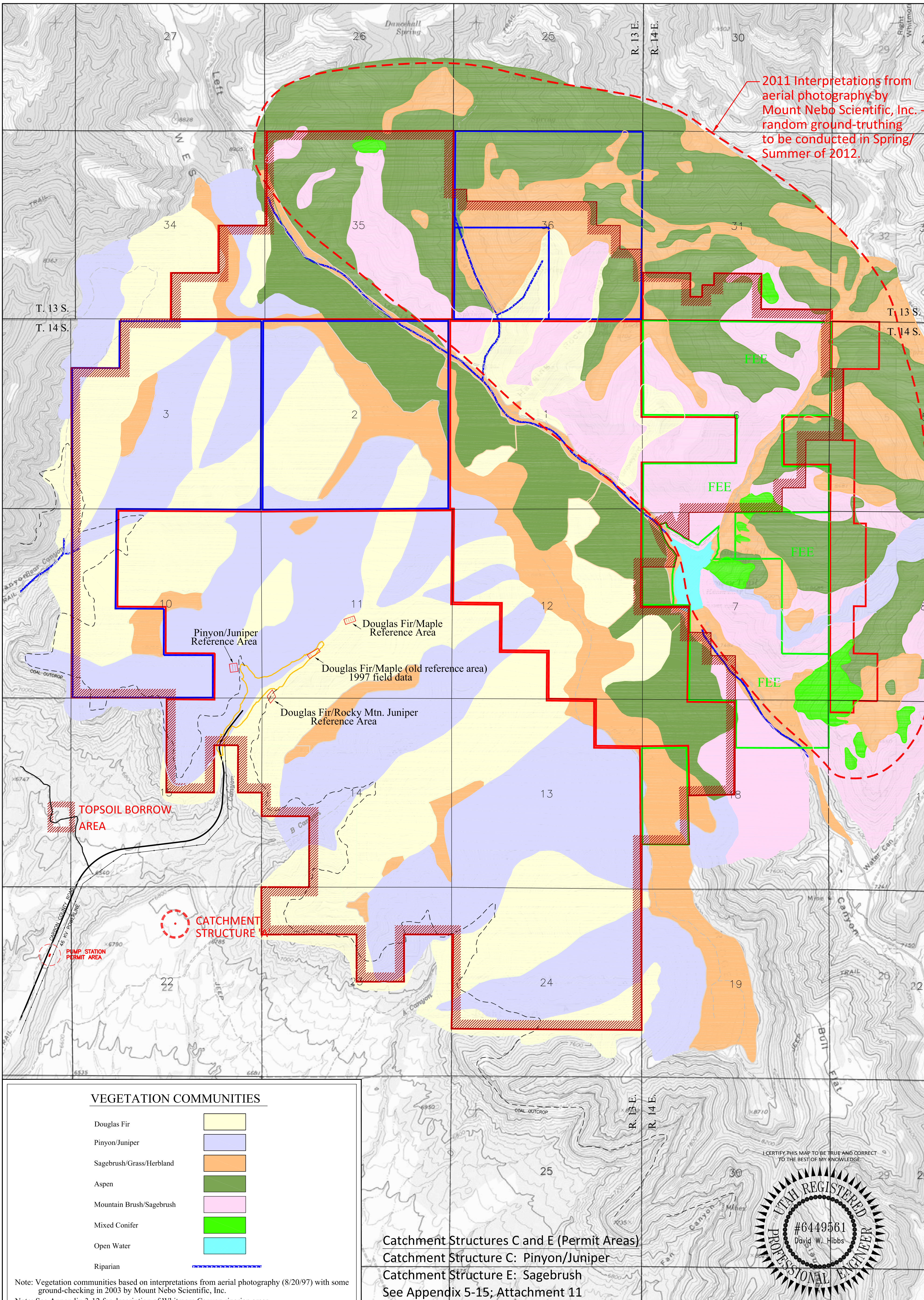
- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- Soil Mapping Boundary
- Soil Map Number 113

N

WEST RIDGE RESOURCES, INC.

SCALE: 1"=2500'

G:\Current Drawings\MRP Maps\West Ridge\Remove GVH Holes from Permit\Map2-1 REGSOIL REV26.dwg, 5500 11x17, 5/8/2017 1:59:26 PM, 1:1



VEGETATION COMMUNITIES

- Douglas Fir
- Pinyon/Juniper
- Sagebrush/Grass/Herbland
- Aspen
- Mountain Brush/Sagebrush
- Mixed Conifer
- Open Water
- Riparian

Note: Vegetation communities based on interpretations from aerial photography (8/20/97) with some ground-checking in 2003 by Mount Nebo Scientific, Inc.
Note: See Appendix 3-12 for description of Whitmore Canyon riparian areas.

WEST RIDGE MINE
Map 3-1
General Vegetation Communities

DATE: 5-08-2017 REV: 31 ACAD REF: MAP3-1 GENVEG REV31

LEGEND:
- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- Outcrop

N

WEST RIDGE RESOURCES, INC.

SCALE: 1"=2500'

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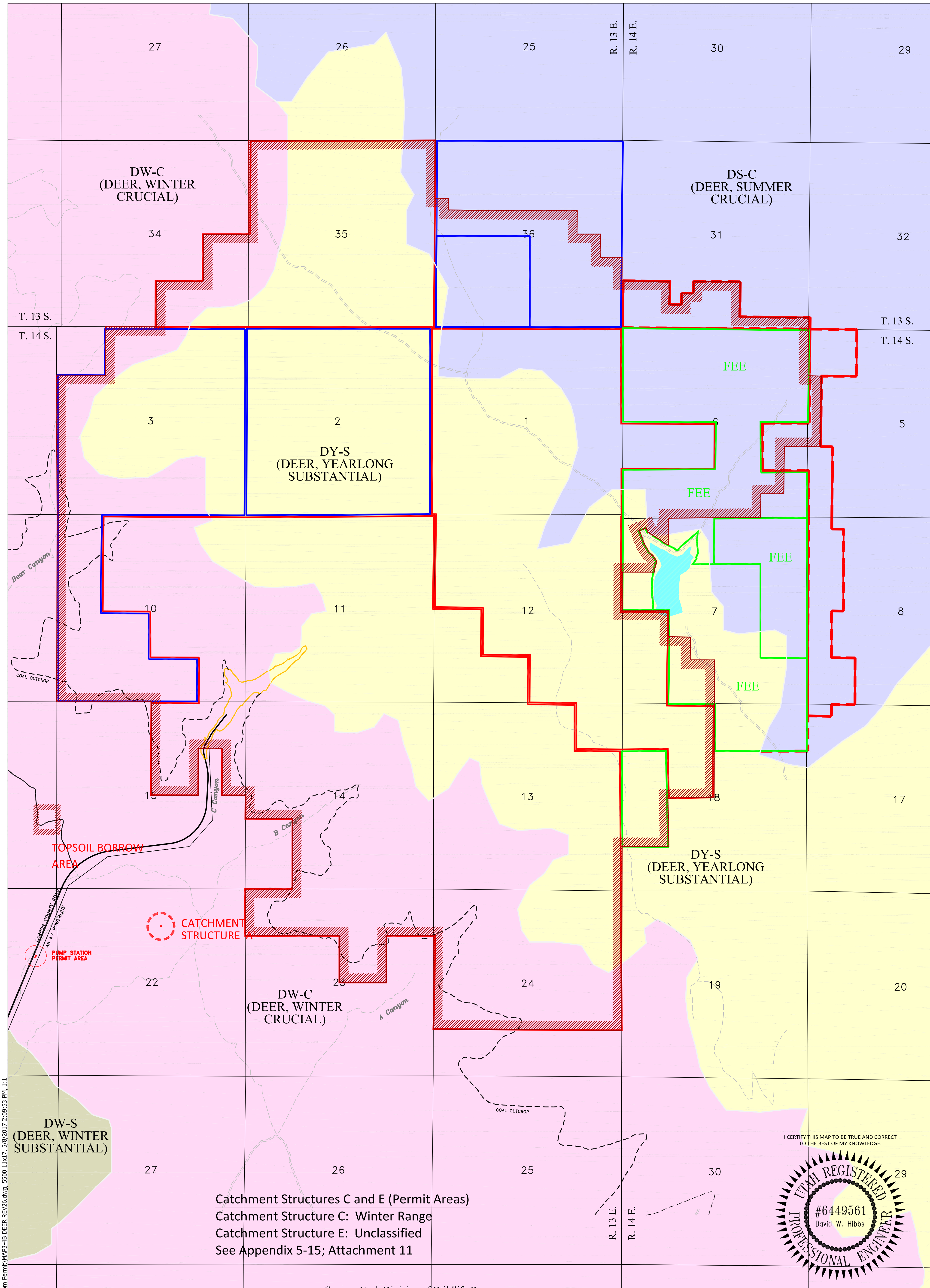


WEST RIDGE MINE

Map 3-4B

Wildlife Map - Deer Range

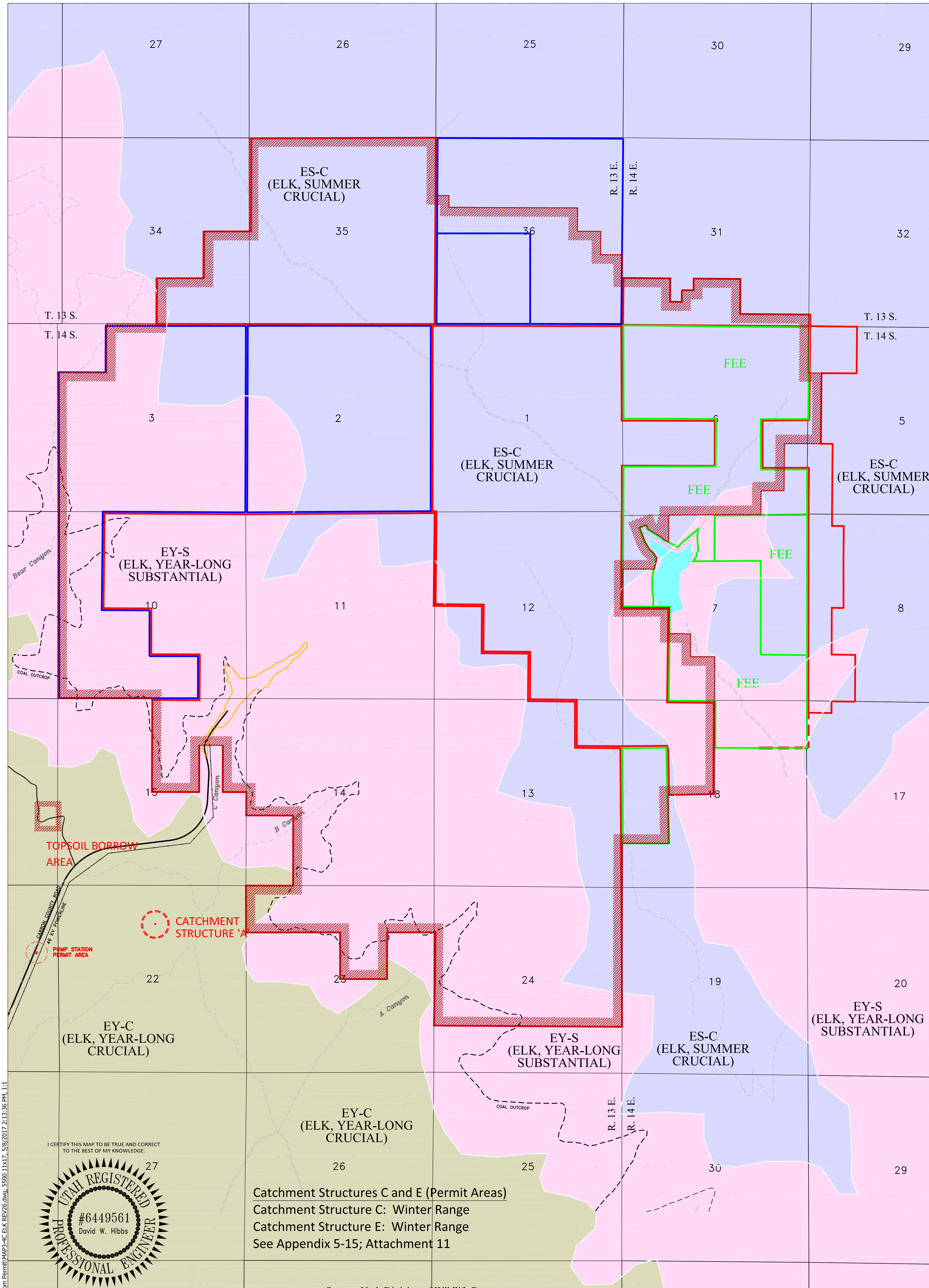
DATE: 5-08-2017 REV: 26 ACAD REF: MAP3-4B DEER REV26

LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Private Fee
- Surface Facility Area
- DW-S
- DW-C
- DS-C
- DY-S

WEST RIDGE RESOURCES, INC.

SCALE: 1"=2500'



WEST RIDGE MINE

Map 3-4C

Wildlife Map - Elk Range

DATE: 5-08-2017 REV: 26 ACAD REF: MAP 3-4C ELK REV26

Permit Boundary
Federal Lease
State Lease
Private Fee
Surface Facility Area

EY-C
ES-C
EY-S

N

WEST RIDGE
RESOURCES, INC.

SCALE: 1"=2500'

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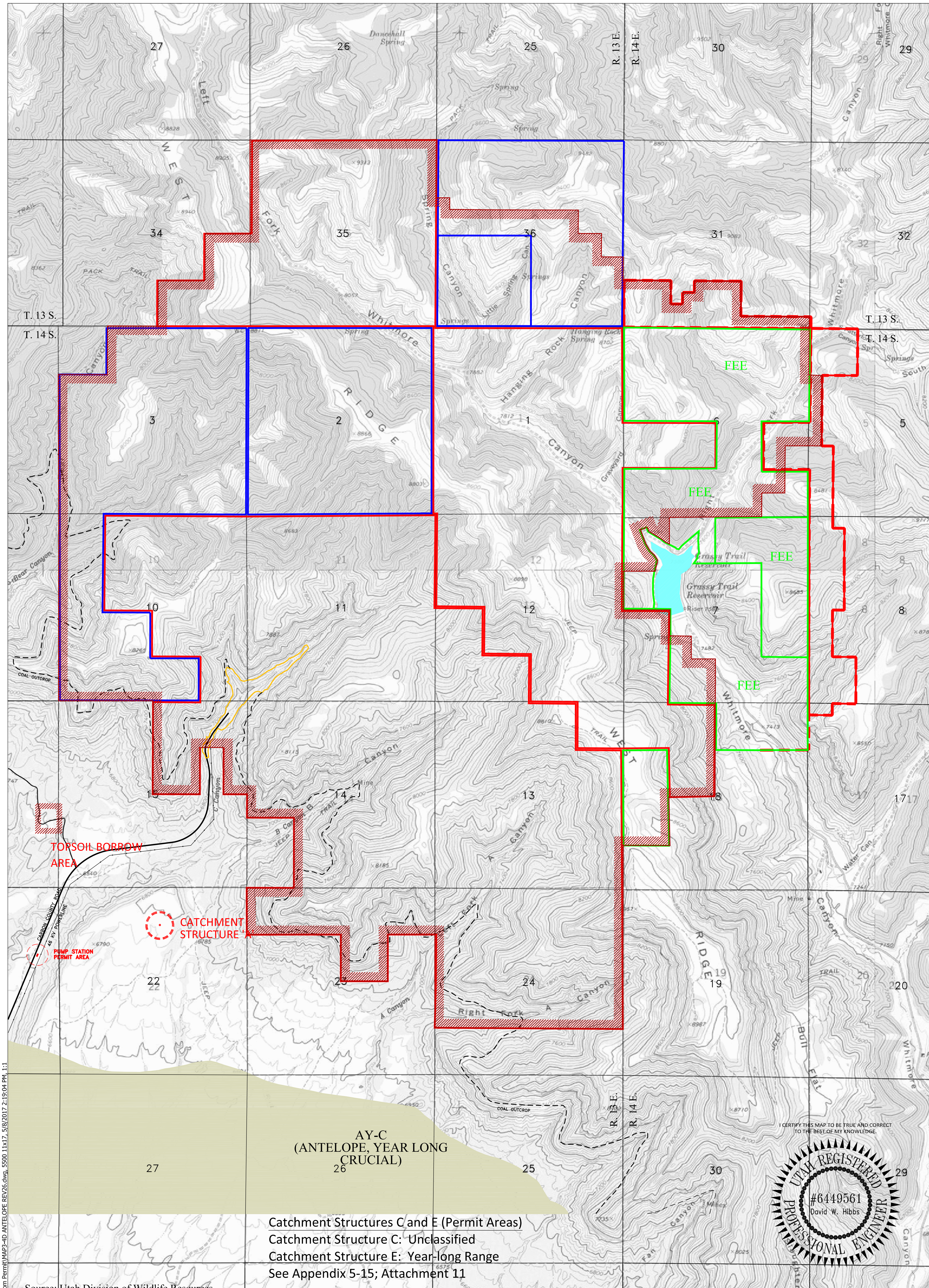

WEST RIDGE MINE

Map 3-4D

Wildlife Map - Antelope Range

DATE: 5-08-2017 REV: 26 ACAD REF: MAP3-4D ANTELOPE REV26

LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Private Fee
- Surface Facility Area
- AY-H

N

WEST RIDGE RESOURCES, INC.

SCALE: 1"=2500'

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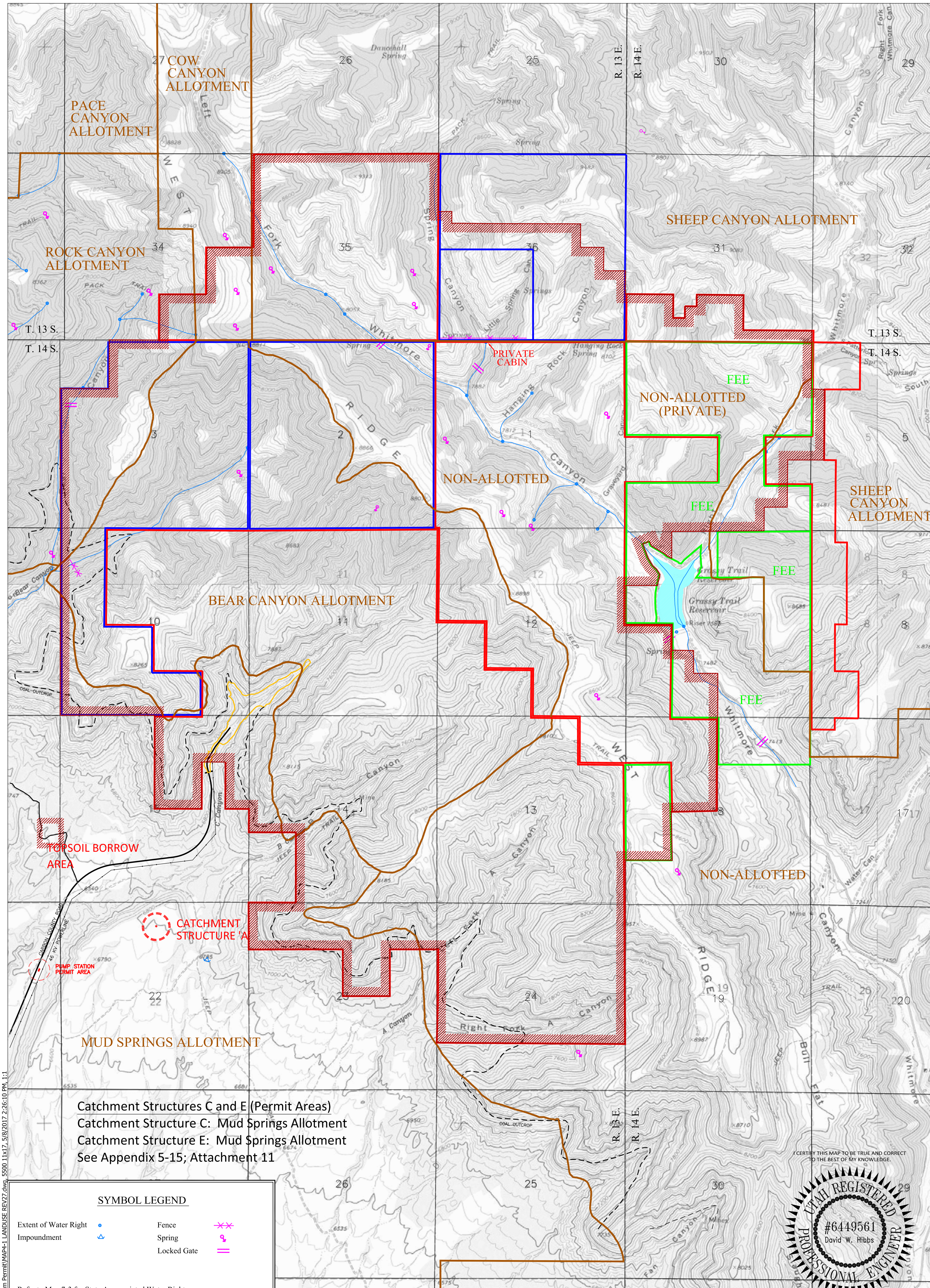


WEST RIDGE MINE

Map 4-1

Existing Land Use

DATE: 5-08-2017 REV: 27 ACAD REF: MAP4-1 LANDUSE REV27

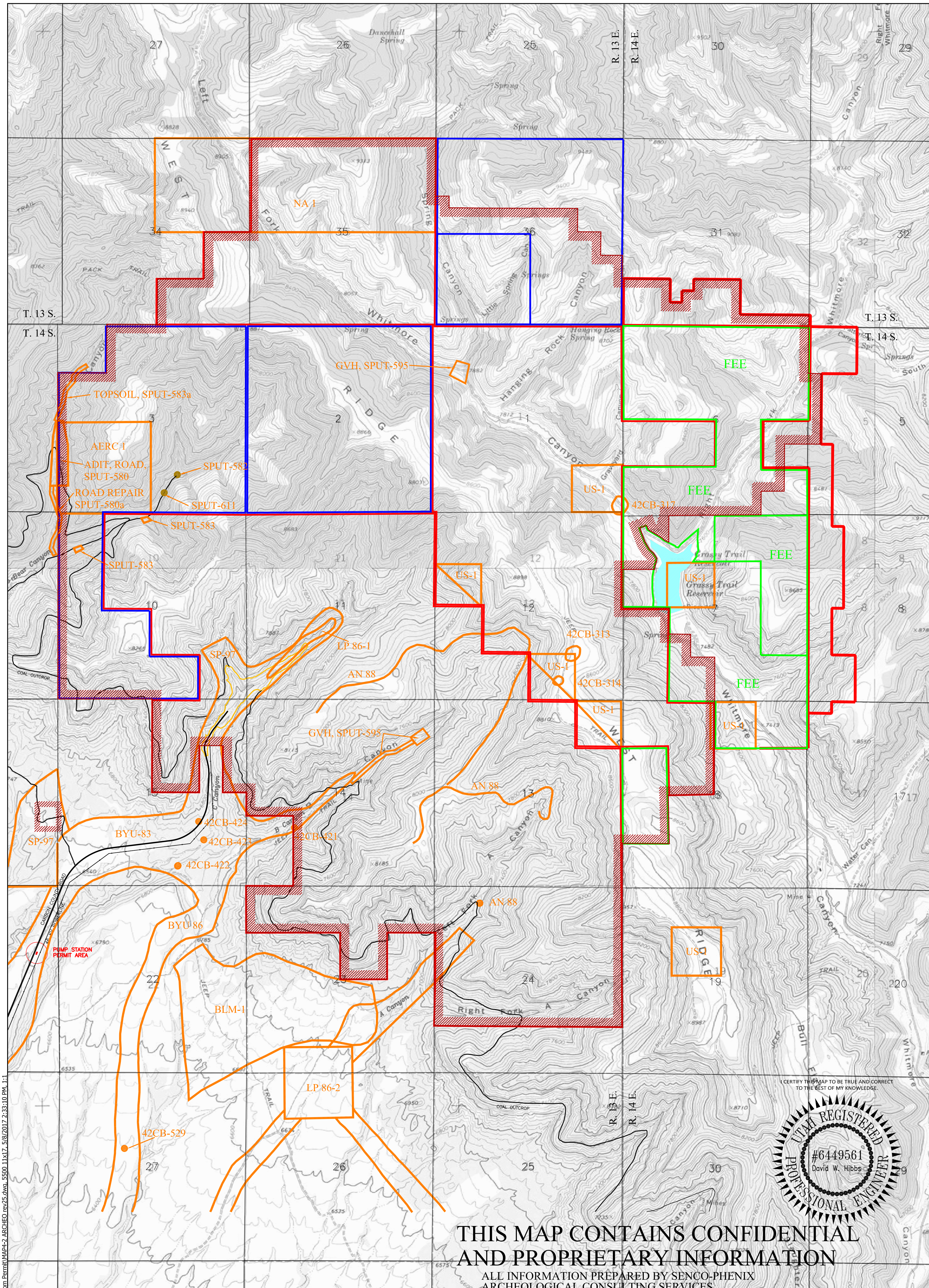
LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- Grazing Allotment Boundary

N

WEST RIDGE RESOURCES, INC.

SCALE: 1"=2500'



WEST RIDGE MINE

Map 4-2

Archeology Map

DATE: 5-08-2017 REV: 25 ACAD REF: MAP4-2 ARCHEO REV25

LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Private Fee
- Surface Facility Area
- Survey Denotation — LP 86-2
- Block Survey Boundary
- Linear Survey
- Archeological Site — 42CB-422

N

WEST RIDGE RESOURCES, INC.

SCALE: 1"=2500'

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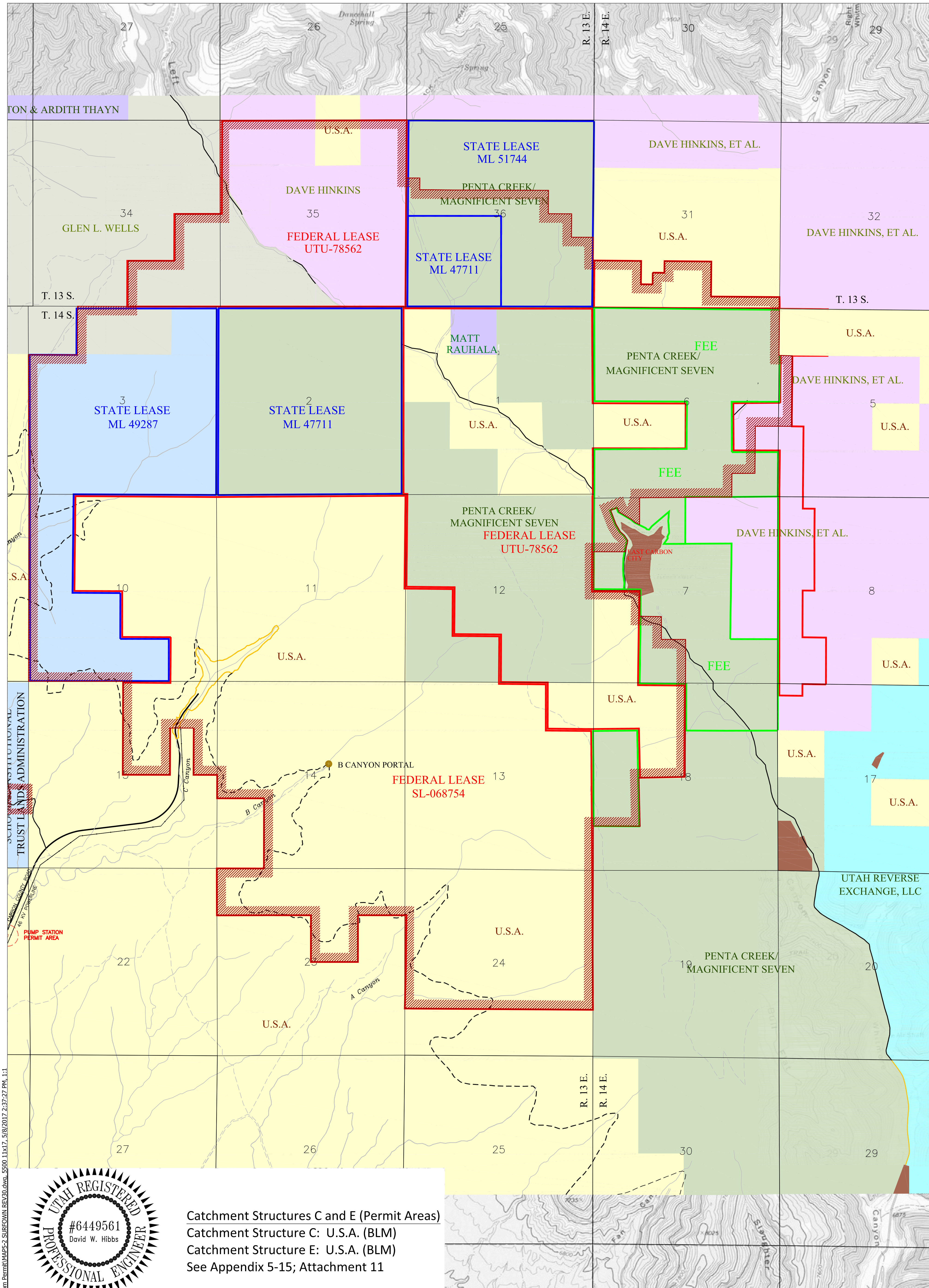


WEST RIDGE MINE
Map 5-2
Surface Ownership Map

DATE: 5-08-2017 REV: 30 ACAD REF: MAP5-2 SURFOWN REV30

LEGEND:

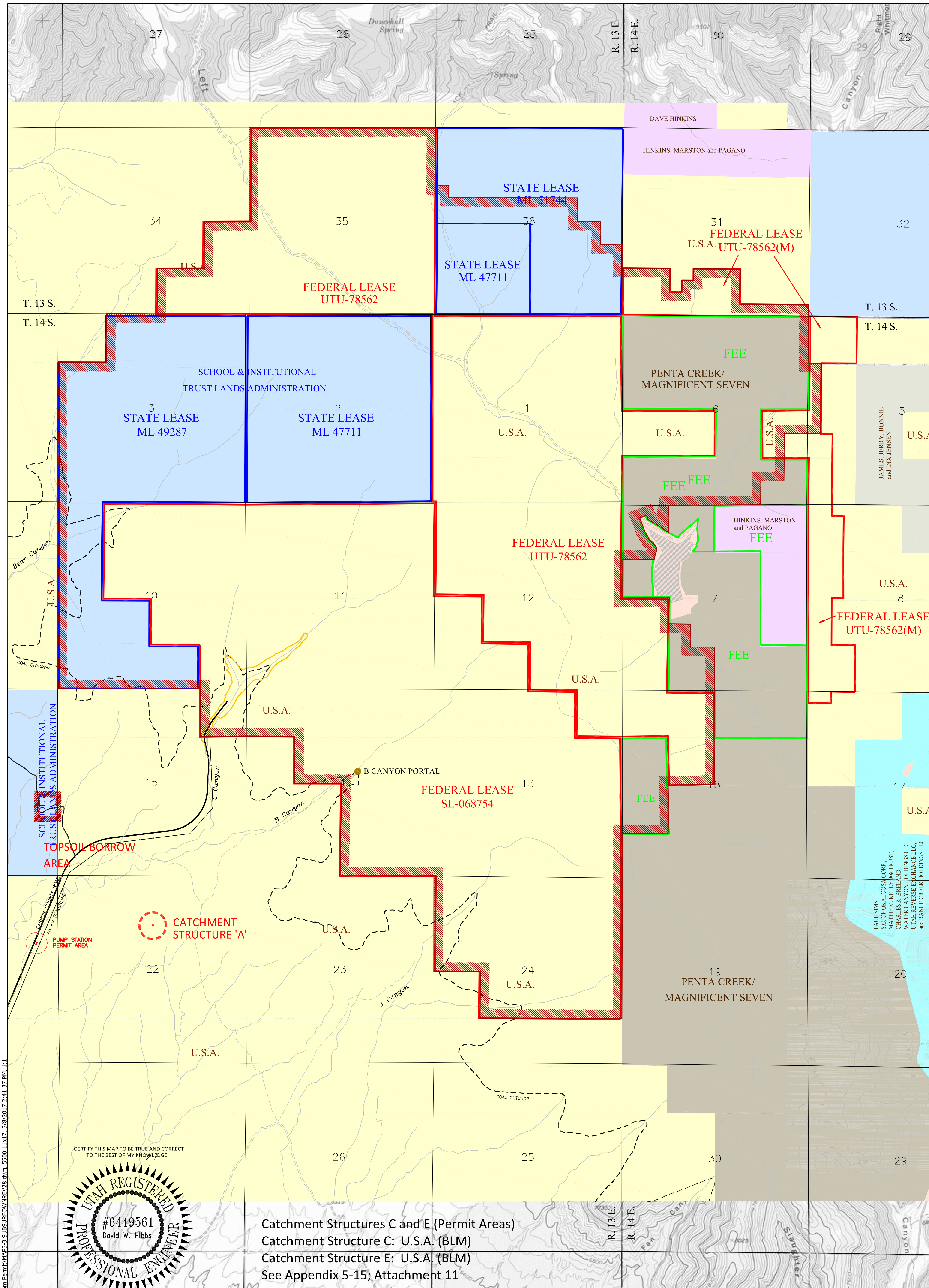
Permit Boundary
Federal Lease
State Lease
Penta Creek Fee
Surface Facility Area
Outcrop

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

N

WEST RIDGE RESOURCES, INC.

SCALE: 1"=2500'



WEST RIDGE MINE

Map 5-3

Sub-surface Ownership Map

DATE: 5-08-2017 REV: 28 ACAD REF: MAP5-3 SUBSURFOWNREV28

LEGEND:

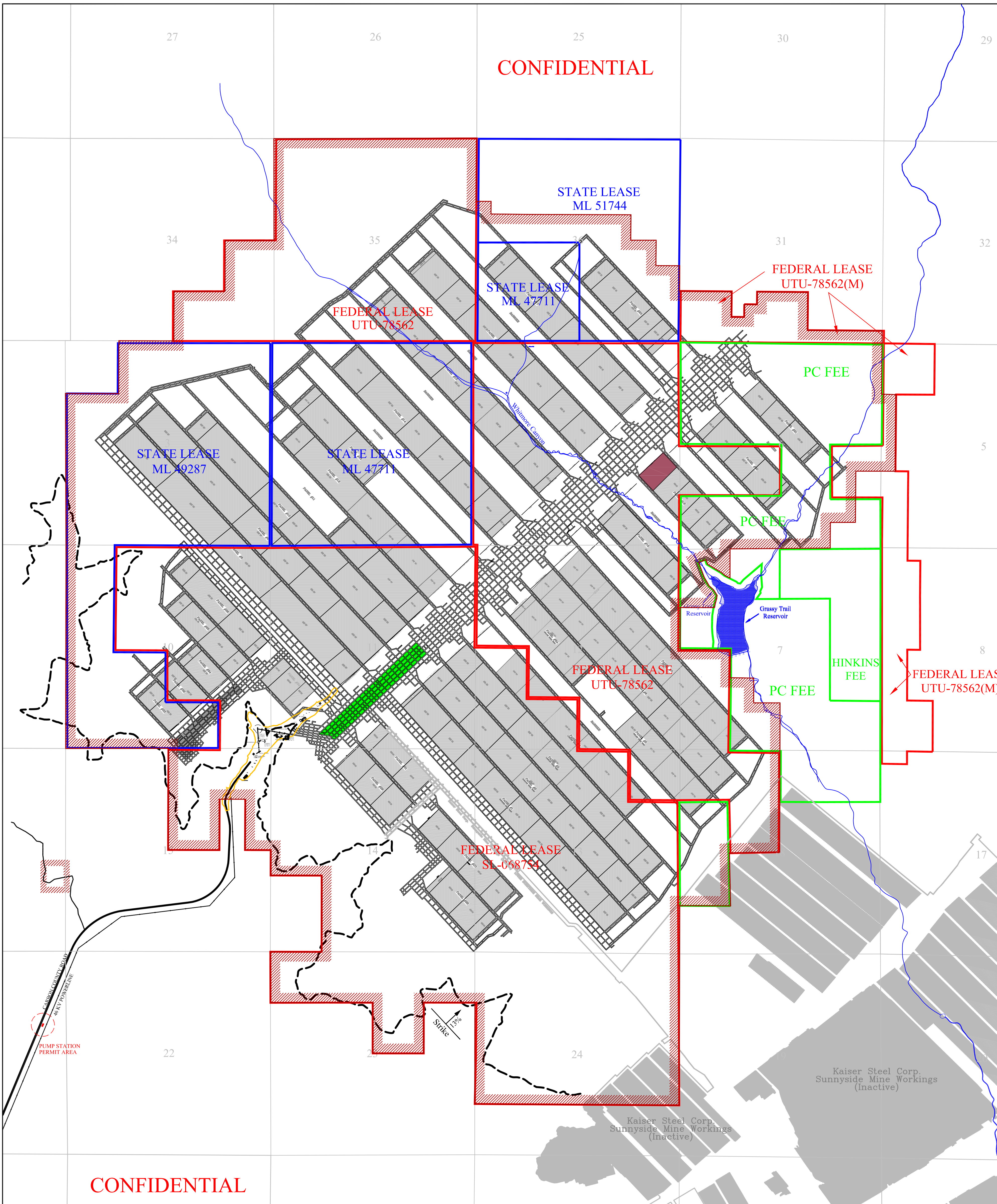
- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- Outcrop

- 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.

SCALE: 1"=2500'

G:\Current Drawings\MRP Maps\West Ridge\Remove GVH Holes from Permit\MAP5-3 SUBSURFOWNREV28.dwg, 5500 11x17, 5/8/2017 2:41:37 PM, 1:1



YEAR KEY:

FUTURE

Mined Area

NOTE:
Mine projections are subject to change depending on conditions encountered in the underground mine workings.
Actual mine works are shown as of May 8, 2017.
Mine projections depicted in the fringe areas beyond the existing permit area are speculative and based on future reserve acquisitions.
No mining will be conducted in these areas unless those reserves are acquired in the future and permitted according to federal, state, and local permitting requirements.
West Ridge Resources acknowledges that permission to mine within the permit boundary does not imply permission to mine beyond the permit boundary.

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

UTAH REGISTERED PROFESSIONAL ENGINEER
#6449561
David W. Hibbs

CONFIDENTIAL

WEST RIDGE MINE
Map 5-4A
Mining Projections

DATE: 5-08-2017 REV: 27 ACAD REF: MAP 5-4A TIMING REV27

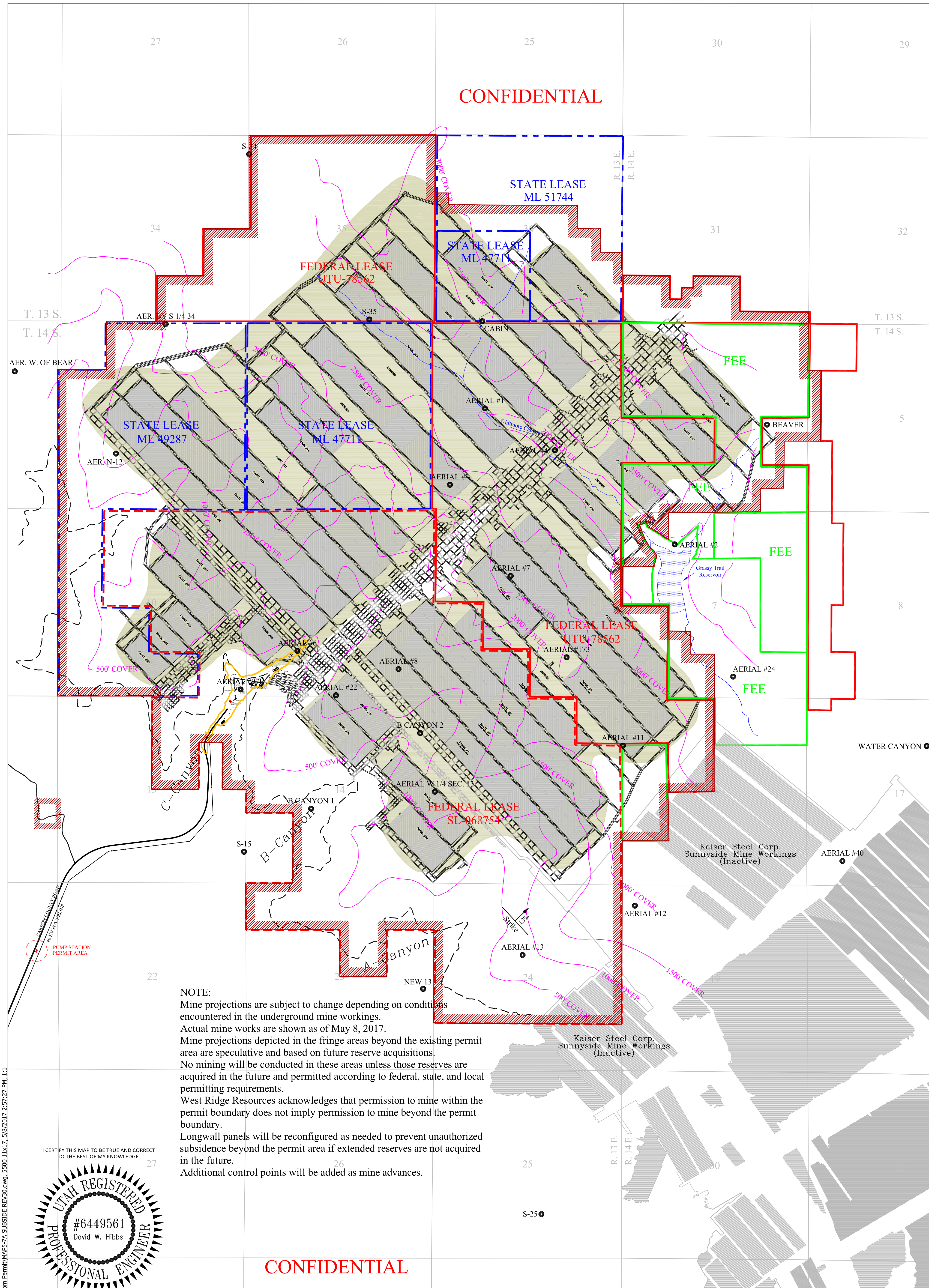
LEGEND:
Permit Boundary
Federal Lease
State Lease
Private Fee
Surface Facility Area
Outcrop

N

WEST RIDGE
RESOURCES, INC.

SCALE: 1"=2500'

G:\Current Drawings\MRP Maps\West Ridge\Remove GVH Holes from Permit\MAP 5-4A TIMING REV27.dwg, 5500 11x17, 5/8/2017 2:52:05 PM, 1:1



NOTE:
Mine projections are subject to change depending on conditions encountered in the underground mine workings.
Actual mine works are shown as of May 8, 2017.
Mine projections depicted in the fringe areas beyond the existing permit area are speculative and based on future reserve acquisitions.
No mining will be conducted in these areas unless those reserves are acquired in the future and permitted according to federal, state, and local permitting requirements.
West Ridge Resources acknowledges that permission to mine within the permit boundary does not imply permission to mine beyond the permit boundary.
Longwall panels will be reconfigured as needed to prevent unauthorized subsidence beyond the permit area if extended reserves are not acquired in the future.
Additional control points will be added as mine advances.

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

UTAH REGISTERED PROFESSIONAL ENGINEER
#6449561
David W. Hibbs

G:\Current Drawings\MRP Maps\West Ridge\Remove GVH Holes from Permit\MAP5-7A SUBSIDE REV30.dwg, 5500 11x17, 5/8/2017 2:57:27 PM, 1:1

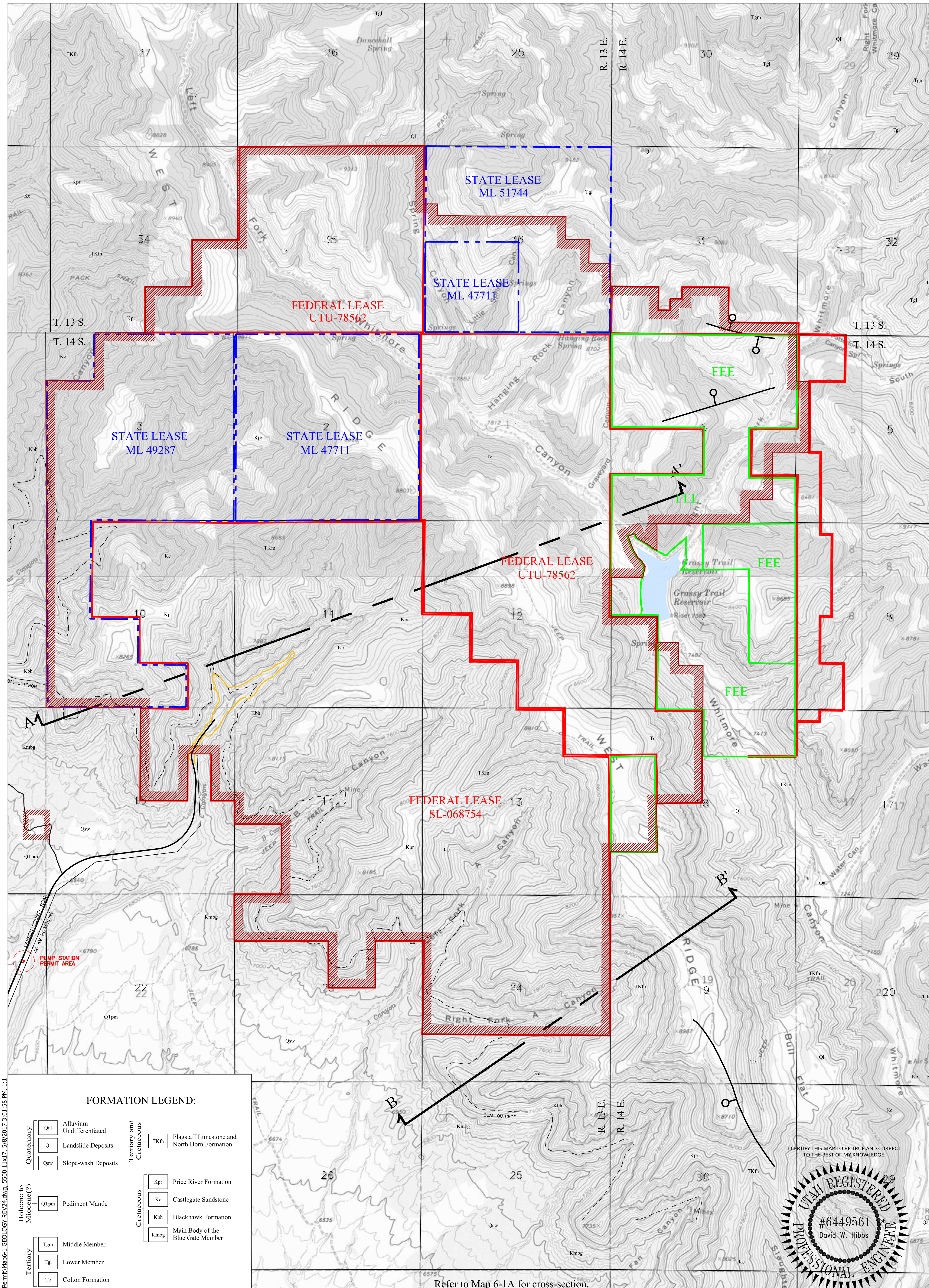
WEST RIDGE MINE
Map 5-7
Subsidence Map

DATE: 5-08-2017 REV: 30 ACAD REF: MAP5-7A SUBSIDE REV30

LEGEND:
Permit Boundary
Federal Lease
State Lease
Private Fee
Surface Facility Area
Outcrop
Cover
Drill Hole
Possible Subsidence Area
Existing Photogammetric Control Points

WEST RIDGE RESOURCES, INC.

SCALE: 1"=2500'



WEST RIDGE MINE

Map 6-1

Regional Geology Map

DATE: 5-08-2017 REV: 24 ACAD REF: MAP6-1 GEOLOGY REV24

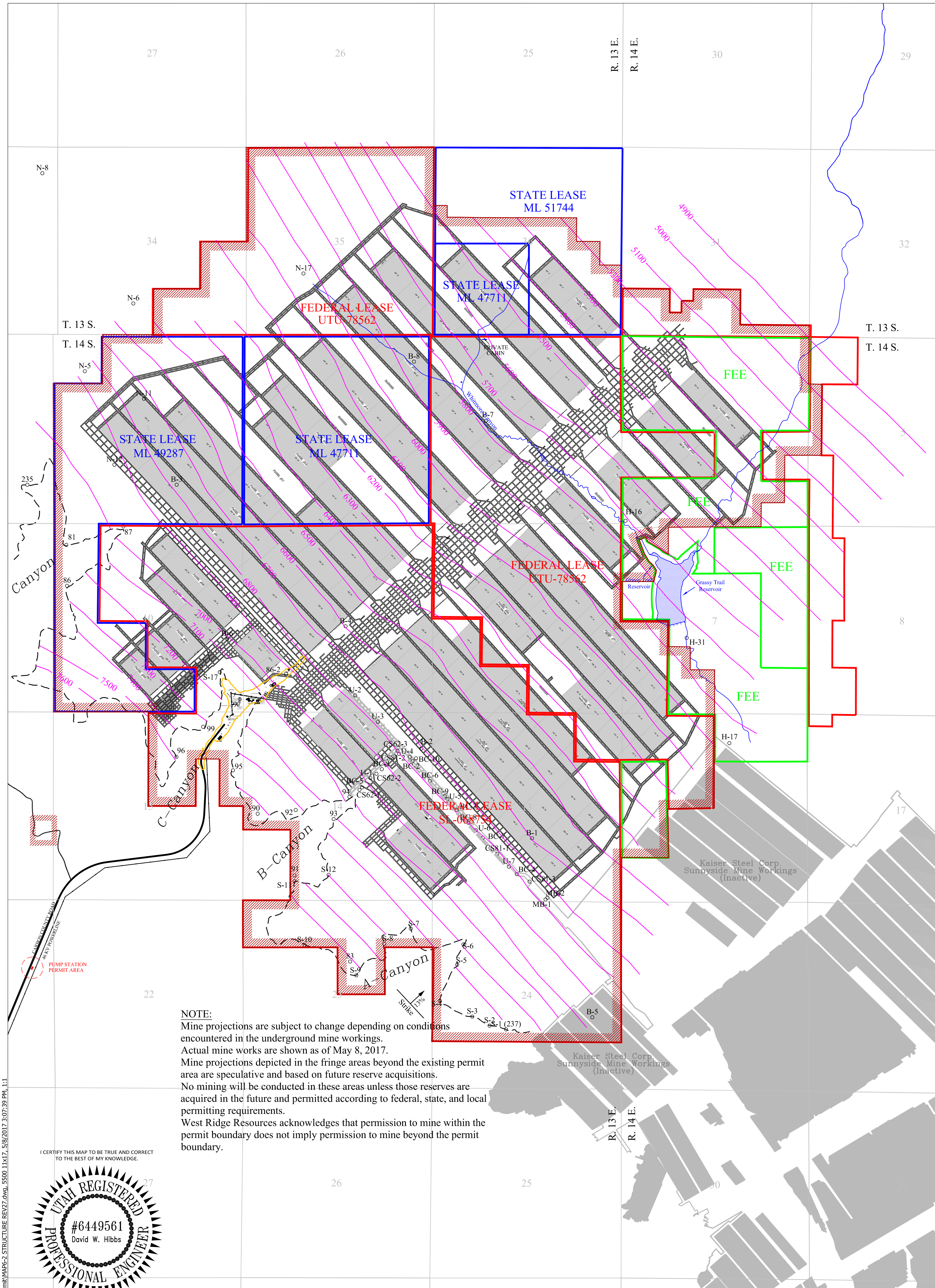
LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- Fault

N

WEST RIDGE RESOURCES, INC.

SCALE: 1"=2500'



NOTE:
Mine projections are subject to change depending on conditions encountered in the underground mine workings.
Actual mine works are shown as of May 8, 2017.
Mine projections depicted in the fringe areas beyond the existing permit area are speculative and based on future reserve acquisitions.
No mining will be conducted in these areas unless those reserves are acquired in the future and permitted according to federal, state, and local permitting requirements.
West Ridge Resources acknowledges that permission to mine within the permit boundary does not imply permission to mine beyond the permit boundary.

WEST RIDGE MINE

Map 6-2

Coal Seam Structure Map

DATE: 5-08-2017 REV: 27 ACAD REF: MAP6-2 STRUCTURE REV27

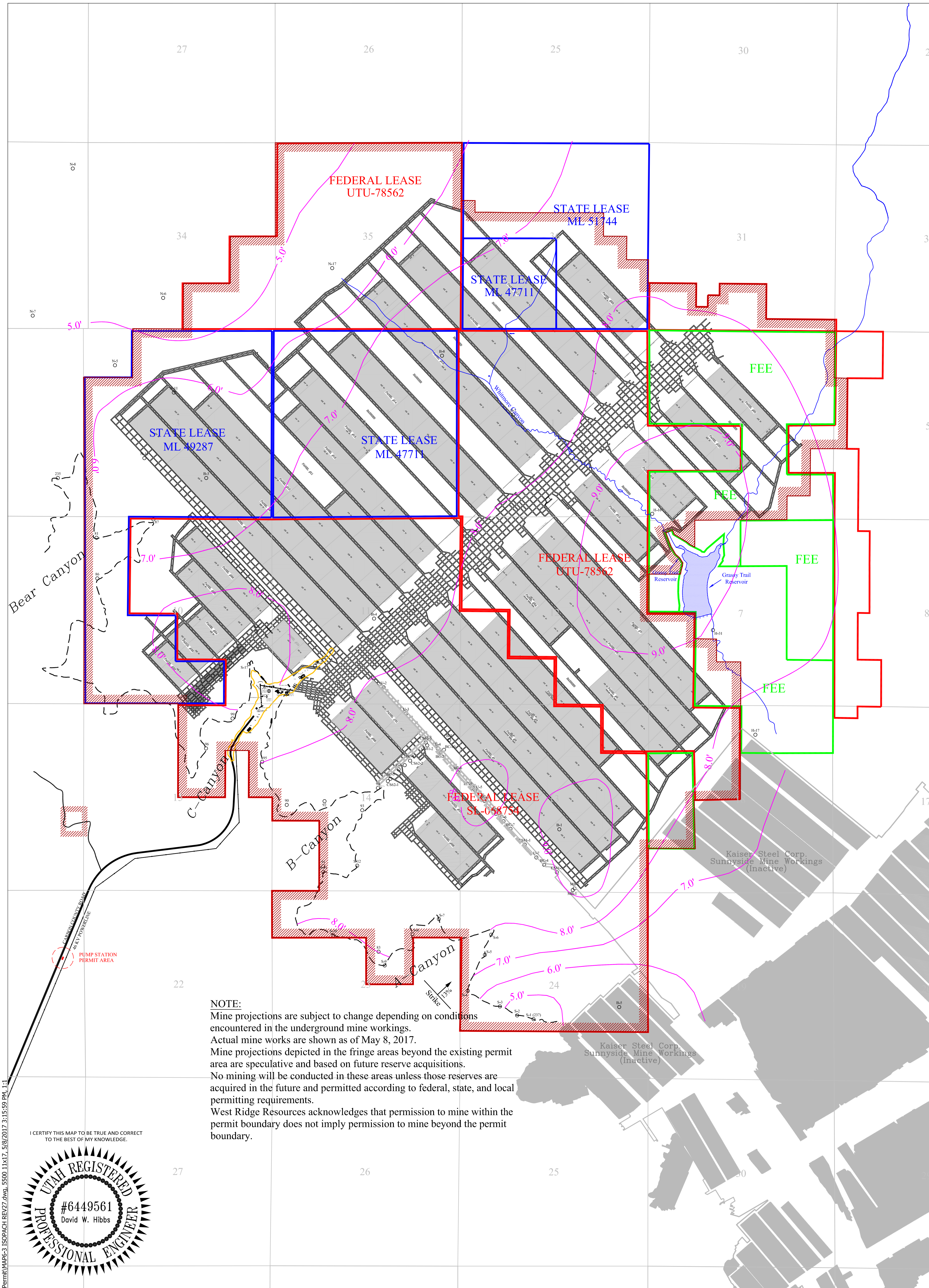
LEGEND:
- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- Outcrop
- Structure Contour (Base of Lower Sunnyside Seam)
- Drill Hole/Channel Samples S-7

N

WEST RIDGE RESOURCES, INC.

SCALE: 1"=2500'

G:\Current Drawings\MRP Maps\West Ridge\Remove GVH Holes from Permit\MAP6-2 STRUCTURE REV27.dwg, 5500 11x17, 5/8/2017 3:07:39 PM, 1:1



NOTE:
Mine projections are subject to change depending on conditions encountered in the underground mine workings.
Actual mine works are shown as of May 8, 2017.
Mine projections depicted in the fringe areas beyond the existing permit area are speculative and based on future reserve acquisitions.
No mining will be conducted in these areas unless those reserves are acquired in the future and permitted according to federal, state, and local permitting requirements.
West Ridge Resources acknowledges that permission to mine within the permit boundary does not imply permission to mine beyond the permit boundary.

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

UTAH REGISTERED PROFESSIONAL ENGINEER
#6449561
David W. Hibbs

G:\Current Drawings\MRP Maps\West Ridge\Remove GVH Holes from Permit\MAP6-3 ISOPACH REV27.dwg, 5500 11x17, 5/8/2017 3:15:59 PM, 1:1

WEST RIDGE MINE

Map 6-3

Lower Sunnyside Coal Seam Isopach Map

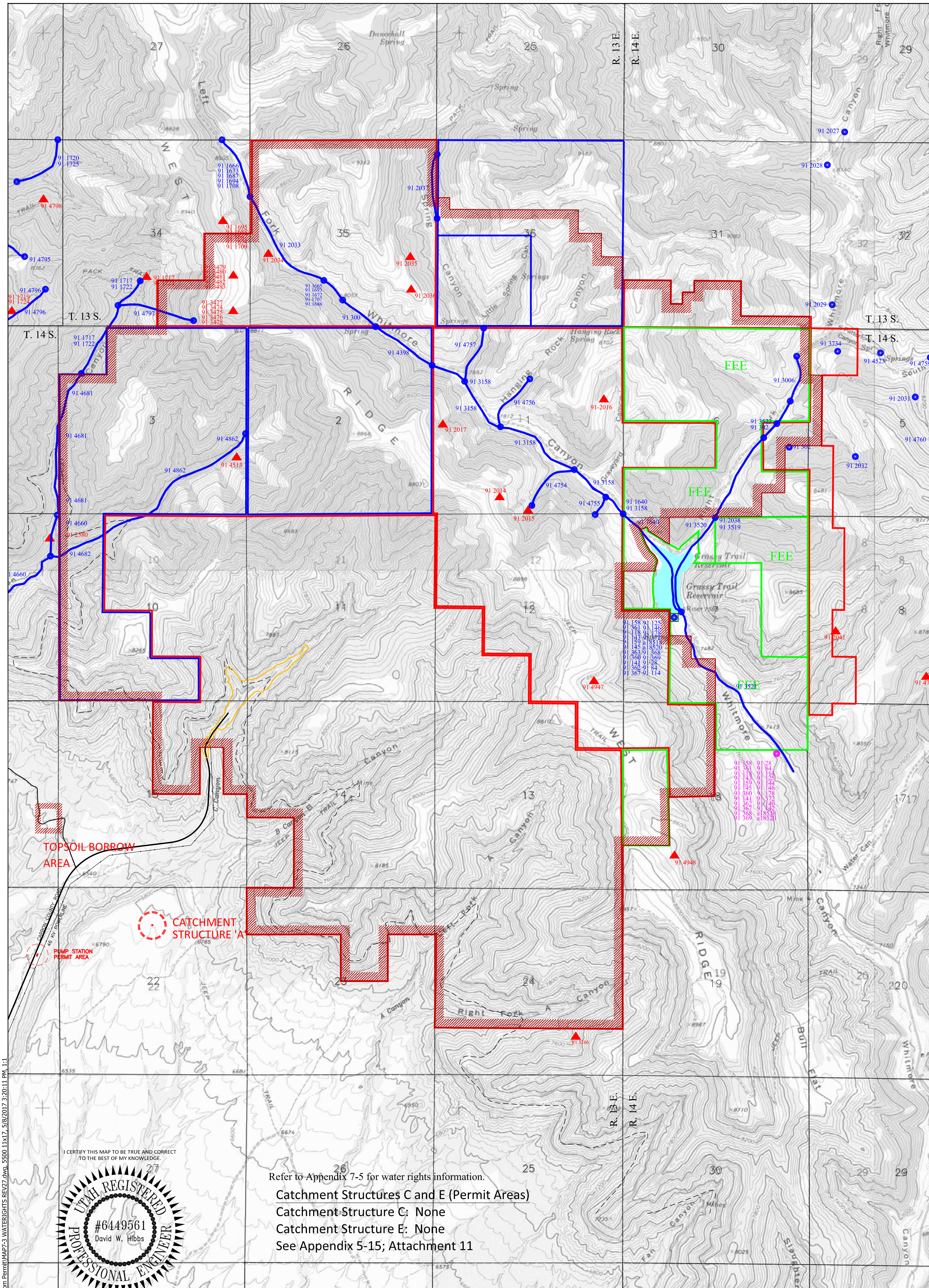
DATE: 5-08-2017 REV: 27 ACAD REF: MAP6-3 ISOPACH REV27

LEGEND:
- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- Outcrop
- Coal Isopachs
- Drill Hole/Channel Samples S-7

N

WEST RIDGE
RESOURCES, INC.

SCALE: 1"=2500'



WEST RIDGE MINE

Map 7-3

Water Rights

DATE: 5-08-2017 REV: 27 ACAD REF: MAP7-3 WATERIGHTS REV27

LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Water Right:
  - Point to Point (91 363)
  - Spring (91 363)
- Ground Water Right (91 363)
- Municipal Water System Intake

WEST RIDGE RESOURCES, INC.

SCALE: 1"=2500'

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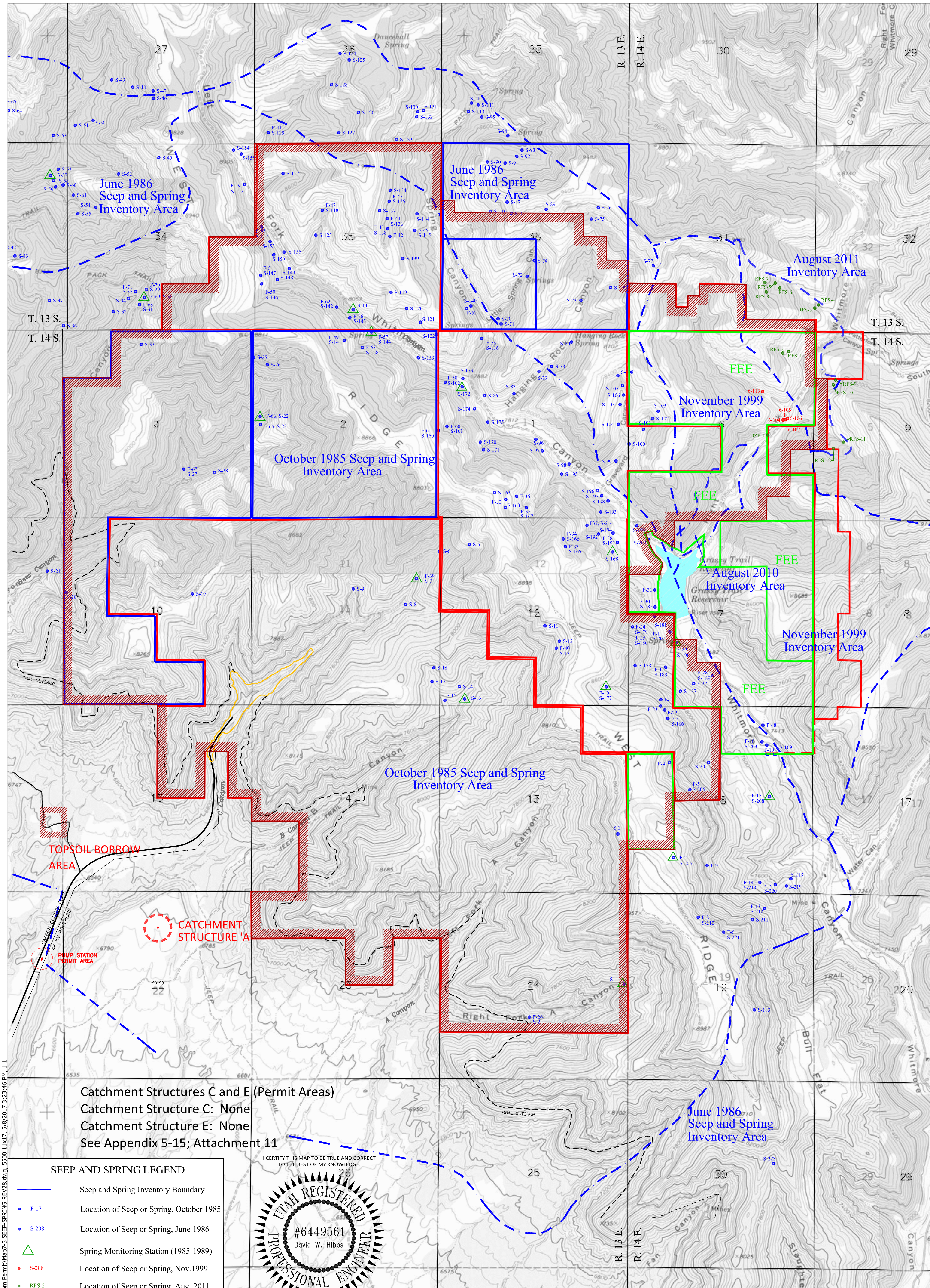


WEST RIDGE MINE

Map 7-5

Seep/Spring Survey Map

DATE: 5-08-2017 REV: 28 ACAD REF: MAP7-5 SEEP-SPRING REV28

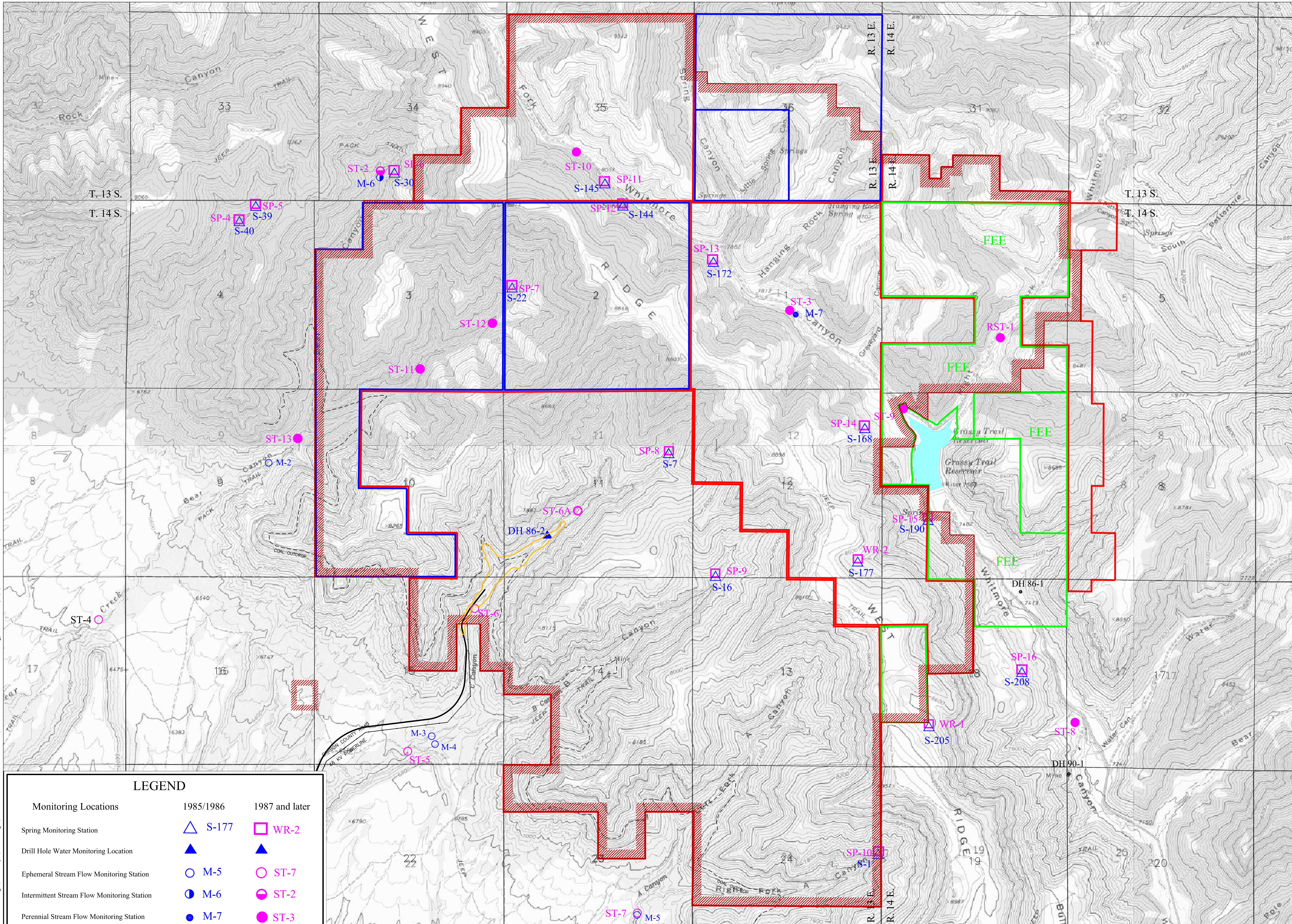
LEGEND:

Permit Boundary	
Federal Lease	
State Lease	
Penta Creek Fee	
Surface Facility Area	

N

WEST RIDGE
RESOURCES, INC.

SCALE: 1"=2500'



WEST RIDGE
RESOURCES, INC.

SCALE: 1"=2500'

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

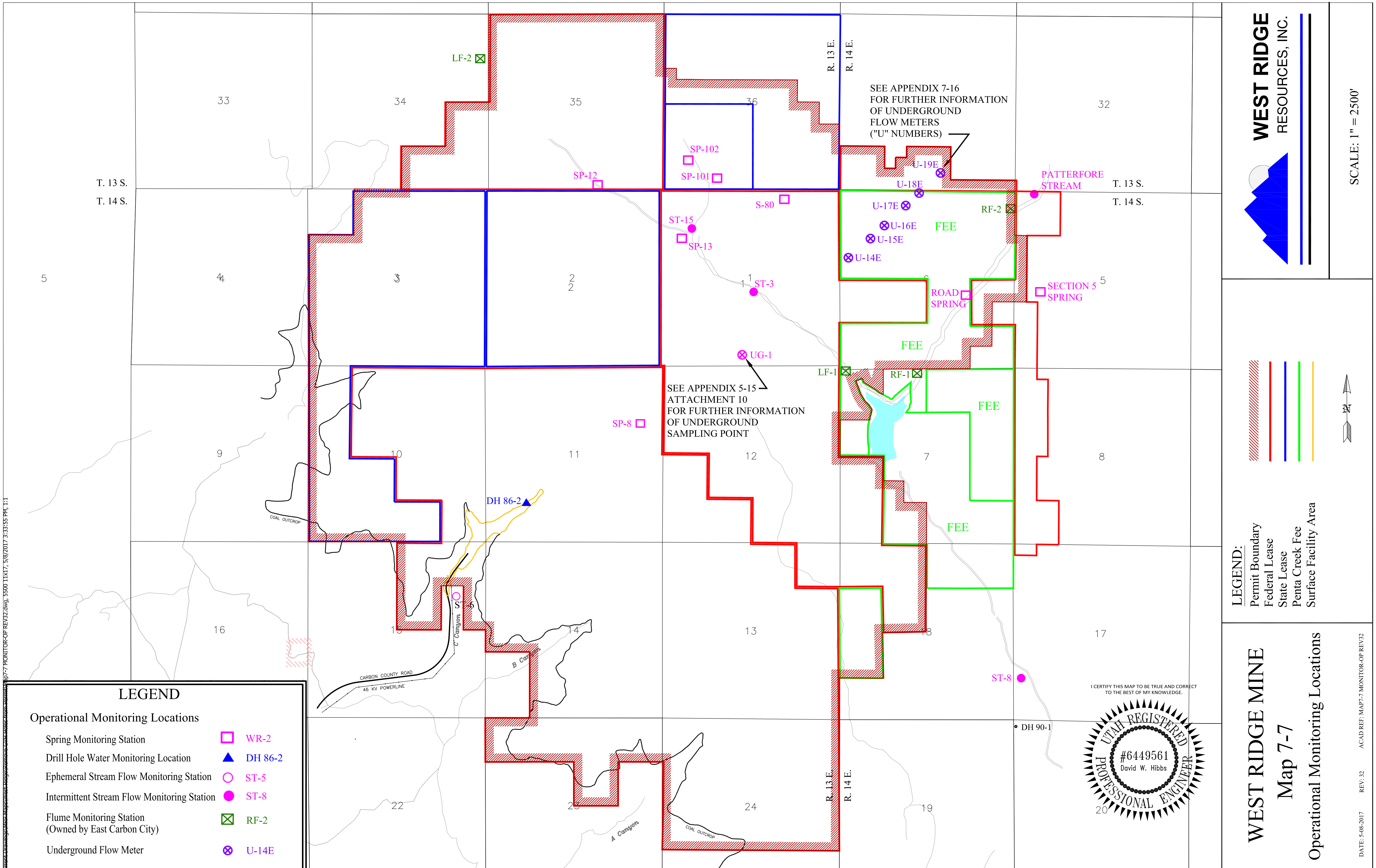
UTAH REGISTERED PROFESSIONAL ENGINEER #6449561 David W. Hibbs

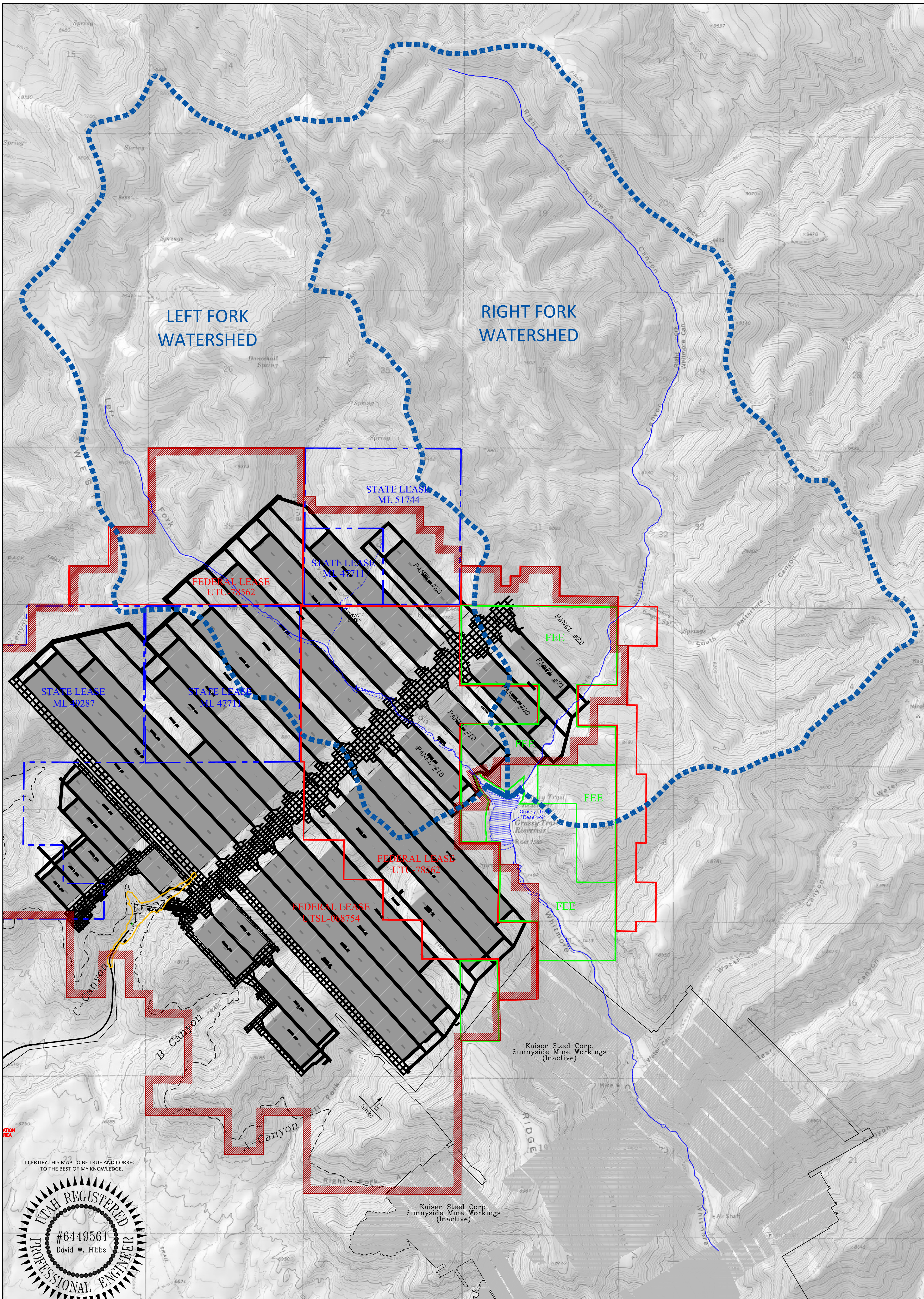
LEGEND:
Permit Boundary
Federal Lease
State Lease
Penta Creek Fee
Surface Facility Area

N

WEST RIDGE MINE
Map 7-6
Hydrologic Monitoring Map
(Historical Monitoring Locations)

DATE: 5-08-2017 REV: 29 ACAD REF: MAP7-6 MONITOR-HIS REV29


WEST RIDGE RESOURCES, INC.
SCALE: 1" = 2500'
LEGEND:
Permit Boundary
Federal Lease
State Lease
Penta Creek Fee
Surface Facility Area
WEST RIDGE MINE
Map 7-7
Operational Monitoring Locations
ACAD REF: MAP7-7 MONITOR-OP REV32
REV: 32
DATE: 5-08-2017
I CERTIFY THIS MAP TO BE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.
UTAH REGISTERED PROFESSIONAL ENGINEER
#6449561
David W. Hibbs
LEGEND
Operational Monitoring Locations
Spring Monitoring Station WR-2
Drill Hole Water Monitoring Location DH 86-2
Ephemeral Stream Flow Monitoring Station ST-5
Intermittent Stream Flow Monitoring Station ST-8
Flume Monitoring Station (Owned by East Carbon City) RF-2
Underground Flow Meter U-14E
SEE APPENDIX 7-16 FOR FURTHER INFORMATION OF UNDERGROUND FLOW METERS ("U" NUMBERS)
SEE APPENDIX 5-15 ATTACHMENT 10 FOR FURTHER INFORMATION OF UNDERGROUND SAMPLING POINT
T. 13 S.
T. 14 S.
R. 13 E.
R. 14 E.
LF-2
LF-1
RF-1
RF-2
SP-102
SP-101
SP-12
SP-13
SP-8
S-80
ST-15
ST-3
ST-5
ST-8
UG-1
U-19E
U-18E
U-17E
U-16E
U-15E
U-14E
PATTERFORE STREAM
ROAD SPRING
SECTION 5 SPRING
FEE
DH 86-2
DH 90-1
COAL OUTCROP
CARBON COUNTY ROAD
46 KV POWERLINE
C Canyon
B Canyon
A Canyon
33
34
35
36
32
5
4
3
2
1
6
9
10
11
12
7
8
16
15
14
13
18
17
22
23
24
19
20



WEST RIDGE MINE

Map 7-8

Whitmore Canyon Watershed Map

DATE: 5-08-2017 REV: 5 ACAD REF: MAP7-8 WATERSHED MAP REV5

LEGEND:

Permit Boundary
Federal Lease
State Lease
Private Fee
Surface Facility Area
Outcrop
Watershed Boundary

N

WEST RIDGE
RESOURCES, INC.

SCALE: 1"=3000'