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#4

WEST RIDGE MINE
007/041

MINING AND RECLAMATION PLAN REVISION

TO INCLUDE STATE LEASES
ML47711 & ML49287

SUBMITTAL OF CLEAN COPIES
(APPROVED VERSION)

SUBMITTED: SEPTEMBER 9, 2005

~WEST RIDGE MINE - PERMIT APPLICATION PACKAGE~

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MAP 1-1	Location Map	1" = 4000'

R645-301-100 PERMIT APPLICATION REQUIREMENTS: GENERAL CONTENTS

SCOPE

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

R645-301-112 IDENTIFICATION OF INTERESTS

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

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

WEST RIDGE Resources, Inc.
P.O. Box 1077
Price, Utah 84501
(435) 888-4000
Samuel C. Quigley - Vice President of Western Operations

Employer Identification Number: 87-0585129

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

Gary E. Gray
WEST RIDGE Resources, Inc.
P.O. Box 1077
Price, Utah 84501

(435) 888-4000

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

112.300 The person's name, address, and employer identification number for each person who owns or controls the applicant is listed below.

Ownership and Control

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. WEST RIDGE Resources, Inc. is the operating agent for the WEST RIDGE PROJECT. ANDALEX Resources, Inc. and the Intermountain Power Agency (I.P.A.) are tenants in common (co-owners) of the WEST RIDGE PROJECT, each having an undivided 50% ownership interest in the PROJECT. ANDALEX Resources, Inc. is a Delaware corporation and Intermountain Power Agency is a political subdivision of the State of Utah. All leases associated with the WEST RIDGE Mine are owned jointly (undivided 50% ownership) by ANDALEX Resources, Inc. and Intermountain Power Agency.

1) WEST RIDGE RESOURCES, INC. (permittee, operator)

OFFICERS	TITLE	DATE POSITION WAS ASSUMED
Peter B. Green	Chairman of Board of Directors	01/09/95
Douglas H. Smith	President	01/09/95
John Bradshaw	Vice President Finance & Treasurer	01/09/95
Samuel C. Quigley	Vice President Operations	01/09/95

DIRECTORS	TITLE	DATE POSITION WAS ASSUMED
Peter B. Green	Director	12/13/94
Ronald C. Beedie	Director	12/13/94
Douglas H. Smith	Director	12/13/94

The address for the above officers and directors is:

WEST RIDGE Resources, Inc.
45 West 10000 South, Suite 401
Sandy, Utah 84070
(801) 568-8900

2) INTERMOUNTAIN POWER AGENCY (Tenant in Common)

OFFICERS	TITLE	MONTH/YEAR POSITION WAS ASSUMED
Ray Farrell	Chairman, Board of Directors	12/98
R. Leon Bowler	Vice-Chairman, Board of Directors	12/84
Ted L. Olson	Secretary	1/02
Clifford C. Michaelis	Treasurer	1/90

DIRECTORS	TITLE	MONTH/YEAR POSITION WAS ASSUMED
R. Leon Bowler	Director	6/77
Ray Farrell	Director	12/79
Clifford C. Michaelis	Director	1/88
Ted L. Olson	Director	1/90
Russell F. Fjeldsted	Director	1/92
Walter Meacham	Director	1/99
Gary O. Merrill	Director	1/02

The address and telephone number for the above officers and directors is:

Intermountain Power Agency
480 East 6400 South, Suite 200
Murray, Utah
(801) 262-8807

Name and address of IPA's general manager:

Reed T. Searle
Intermountain Power Agency
480 East 6400 South, Suite 200
Murray, Utah 84107
Telephone (801)262-8807
Assumed position September, 1989

Resident Agent for IPA:

Mark Buchi
Holme, Roberts, and Owen
111 East Broadway, Suite 1100
Salt Lake City, Utah 84111
Assumed position January, 1988

IPA Designated representative to the Crandall Canyon Project and West Ridge Project Management Boards:

Eric J. Tharp
Operating Agent
Los Angeles Department of Water & Power
111 North Hope Street, Room 1263
Los Angeles, California 90012-2694
Telephone (213)367-0286

Principle Shareholders of IPA:

IPA has no shareholders. IPA is a political subdivision of the State of Utah created under the Interlocal Cooperation Act, Title II, Chapter 13, Utah code Ann. 1953, as amended, and as such, has not issued stock.

3) ANDALEX RESOURCES, INC. (Tenant in Common)

Officers:

Peter B. Green, Chief Executive Officer and Chairman
"Overbay" 106 Pitt"s Bay Road
Pembroke, HM 11
Bermuda
Assumed this Position : 05-11-90

Douglas H. Smith, President
45 West 10000 South, Suite 401
Sandy, Utah 84070
Assumed this Position: 03-07-94

John Bradshaw, Vice President (Finance), Secretary
45 West 10000 South, Suite 401
Sandy, Utah 84070
Assumed this Position: 02-05-90

Samuel C. Quigley, Vice President (Operations)
45 West 10000 South, Suite 401
Sandy, Utah 84070
Assumed this Position: 02-24-95

Directors:

Peter Green (Chairman)
"Overbay" 106 Pitt"s Bay Road
Pembroke, HM 11
Bermuda
Assumed this Position : 01-05-88

Ronald C. Beedie
2 Manse Road
Roslin, Midlothian,
Scotland EH259LF
Assumed this Position: 01-05-88

Douglas H. Smith
45 West 10000 South, Suite 401
Sandy, Utah 84070
Assumed this Position: 03-07-94

Alexander Harold Samuel Mitchell Green
"Overbay" 106 Pitt"s Bay Road
Pembroke, HM 11
Bermuda
Assumed this Position : 01-11-02

The address for ANDALEX RESOURCES, Inc. is:

ANDALEX Resources, Inc.
45 West 10000 South, Suite 401
Sandy, Utah 84070
Employer ID No. 61-0931325

Stockholder: Andalex Hungary, Ltd.
Vaci ut 18
1132 Budapest, Hungary
Assumed this Position: 12-28-00
Percentage of Ownership: 100%

Other names under which ANDALEX Resources, Inc. is or has operated in the United States within the last five years preceding the date of this application are listed below:

ANDALEX Resources, Inc., Tower Division
ANDALEX Resources, Inc., Cimarron Division
AMCA Coal Leasing, Inc.
ANDALEX Resources, Inc., Little Creek Division
GENWAL Resources, Inc.

4) **ANDALEX HUNGARY, LTD.**

Directors:

Ian Buchanan
66 Merrion Square
Dublin 2
Ireland
Assumed this Position: 12-28-00

Katalin Csokasi
Terez Krt 28
1066 Budapest
Hungary
Assumed this Position: 12-28-00

Marriana Fodor
Kolozsvari u 38
1255 Budapest
Hungary
Assumed this Position: 12-28-00

Stockholder:

Andalex Investments BV
MeesPierson Trust, Aert van Nesstraat 45
P.O. Box 548
3000 AM Rotterdam
Netherlands
Assumed this Position: 12-28-00
Percentage of Ownership: 100%

5) **ANDALEX INVESTMENTS BV**

Directors:

MeesPierson Trust BV
Attn: Robert Stroeve
Blaak 16, P.O. Box 548
3000 AM Rotterham, Netherlands
Assumed this Position: Business Entity

Ian Buchanan
66 Merrion Square
Dublin 2
Ireland
Assumed this Position: 04-08-91

Stockholders:

Misland (Cyprus) Investments Limited
1st Floor, Lazaros Centre

Office 101-102
9 Arch Makarios Avenue
Lamaca, Cyprus P.C. 6017
Assumed this Position: 10-14-03
Percentage of Ownership: 99.9%

A&A Investments Ltd.
"Overbay" 106 Pitt"s Bay Road
Pembroke, HM 11
Bermuda
Assumed this Position : 01-19-01
Percentage of Ownership: 0.1%

6) **MISLAND (CYPRUS) INVESTMENTS LIMITED**

Directors:

Ian Buchanan
66 Marrion Square
Dublin 2
Ireland
Assumed this Position:
10-14-03

Peter Rochow
66 Marrion Square
Dublin 2
Ireland
Assumed this Position:
10-14-03

Chrysanthi Coucouni
1st Floor, Lazaros Centre
Office 101-102
9 Arch Makarios Avenue
Lamaca, Cyprus P.C. 6017
Assumed this Position:
10-14-03

Tasos Coucouni
1st Floor, Lazaros Centre
Office 101-102
9 Arch Makarios Avenue
Lamaca, Cyprus P.C. 6017
Assumed this Position:
10-14-03

Loulla Kyriakou
1st Floor, Lazaros Centre
Office 101-102
9 Arch Makarios Avenue
Lamaca, Cyprus P.C. 6017
Assumed this Position:
10-14-03

Stockholder:

A&A Investments Ltd.
"Overbay" 106 Pitt"s Bay Road
Pembroke, HM 11
Bermuda

Assumed this Position : 10-14-03
Percentage of Ownership: 100%

7) **A&A INVESTMENTS LTD.**

Directors:

Peter Green
"Overbay" 106 Pitt"s Bay Road
Pembroke, HM 11
Bermuda
Assumed this Position : 11-29-96

Ian Buchanan
66 Marrion Square
Dublin 2
Ireland
Assumed this Position: 08-14-97

RolfLuthie
"Overbay" 106 Pitt"s Bay Road
Pembroke, HM 11
Bermuda
Assumed this Position : 03-01-01

Stockholder:

Mitchell Green Family Trust
"Overbay" 106 Pitt"s Bay Road
Pembroke, HM 11
Bermuda
Assumed this Position : 01-25-98
Percentage of Ownership: 100%

8) **MITCHELL GREEN FAMILY TRUST**

Trustee:

Mitchell Green Private Trust Company Ltd.
"Overbay" 106 Pitt"s Bay Road
Pembroke, HM 11
Bermuda
Assumed this Position : 06-25-98
Percentage of Ownership: 100%

9) **MITCHELL GREEN PRIVATE TRUST COMPANY, LTD.**

Directors:

Peter Green
"Overbay" 106 Pitt"s Bay Road
Pembroke, HM 11
Bermuda
Assumed this Position : 06-25-98
Ronald C. Beedie
2 Manse Road
Roslin, Midlothian,
Scotland EH259LF
Assumed this Position: 06-25-98

Ian Buchanan
66 Merrion Square
Dublin 2
Ireland
Assumed this Position: 06-25-98

Henry Christensen, III
125 Broad Street
New York, New York 10004-2498
Assumed this Position: 06-25-98

112.340 Each additional name and identifying number under which the person owns or controls, or previously owned or controlled, a coal mining and reclamation operation in the United States within five years preceding the date of the application;

ANDALEX Resources, Inc., Tower Division
Centennial Mine (1)
Wildcat Loadout (1)
ANDALEX Resources, Inc., Cimarron Division(1)
ANDALEX Resources, Inc., Little Creek Division(1)
AMCA Coal Leasing, Inc.(1)
GENWAL Resources, Inc.(2)

(1) Ownership: 100% ANDALEX Resources, Inc.
(2) Ownership: 50 % ANDALEX Resources, Inc., 50% Intermountain Power Agency

IPA is currently engaged in the reclamation of the Horse Canyon Mine, under permit ACT/007/013, located in Emery County, Utah and was previously associated with the Wellington Preparation Plant prior to the sale of IPA's holdings to NEICO in Jan. 1995.

Permit numbers, regulatory authority and the dates of issuance are attached as Appendix 1-5.

112.350 The application number or other identifier of, and the regulatory authority for, any other pending coal mine operation permit application filed by the person in any State of the United States.

There are no pending coal mining and reclamation operation permit applications in the United States.

112.410 Name, address, identifying numbers, including employer identification number, Federal or State permit number and MSHA number, the date of issuance of the MSHA number, and the regulatory authority;

The employer identification number is: 87-0585129

MSHA number 42-02233 was issued on March 12, 1999.

A list of current and previous coal mining permits held by ANDALEX and it's affiliates is included in Appendix 1-5 "Current and Previous Coal Mining Permits". This list includes the Federal or State permit number and MSHA number, the date of issuance of the MSHA number, and the regulatory authority for other coal mining and reclamation operations owned by ANDALEX.

112.420 Ownership or control relationship to the applicant, including percentage of ownership and location in organizational structure.

Information regarding ownership or control relationship to the applicant is presented in Appendix 1-7.

112.500 Names and addresses of each legal or equitable owner of record of the surface and mineral property to be mined, each holder of record of any leasehold interest in the property to be mined, and any purchaser or record under a real estate contract for the property to be mined.

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

Dave 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 lease SL-068754 and UTU 78562 is provided in Appendix 1-4, lease ML 47711 and ML 49287 in Appendix 1-16, and the Penta Creek fee lease in Appendix 1-14.

112.600 Names and addresses of owners of record of all property (surface and subsurface) contiguous to any part of the permit area.

Same as listed in 112.500 with the following additions:

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

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

112.700 The MSHA numbers for all mine associated structures that require MSHA approval.

MSHA Identification Number: MSHA number 42-02233 was issued on March 12, 1999.

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 listed in Appendix 1-2 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 4,297.01 acres of federal coal (2,650.67 acres leased under SL-068754 and 1646.34 acres leased under UTU 78562) in the Book Cliffs coal field (refer to Map 5-4A). WEST RIDGE currently holds 1682.34 acres of state coal (801.24 acres under ML 47711 and 881.10 under ML 49287. WEST RIDGE also holds a 382.08 acre lease on contiguous private (fee) coal lands located along the eastern side of the mineable reserve (see Appendix 1-14). Within this fee lease 124.92 acres are included in the permit area. These leases are not the subject of any pending litigation. 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."

The substitute topsoil borrow area, which is also included within the permit area, is located on lands administered by the State of 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. (See Appendix 1-4)

Coal lease SL-068754-U-01215 was modified by the BLM. Refer to Appendix 1-9 for the coal lease modification.

The permit area consists of federal coal leases SL-068754-U-01215 and UTU 78562 (4297.01 acres as described in Table1-1) state coal leases ML-47711 and ML-49287 (1,682.34 acres as described in Table 1-2A), the Penta Creek fee lease (124.92 acres as described in Table 1-2B). The permit area also includes a special use state surface lease (9.6 acres as described in Table I-2A). The two areas are not contiguous however. The 9.6 acre state surface lease is for a possible topsoil borrow site if it is needed at the time of final reclamation. This permit area also includes a 0.23 acre right-of-way issued by the BLM for a water pumping station (refer to Appendix 1-12). The permit area also includes a 0.79 acre area along the Carbon County C Canyon Road down to and including the security gate (refer to Appendix 1-13). The total permit area is 6,114.89 acres. Refer to Map 1-1 for the permit area location. Refer to Table 1-4 for the legal description of the permit area.

WEST RIDGE Resources has hired R, B &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 will involve collection of additional data from newly-installed accelerometers, subsidence monitoring stations, and piezometers in the area around the dam. This study is being conducted with input from BLM, DOGM, Division of Dam Safety, and East Carbon City. Stipulation 17 of Federal Lease UTU-78562 states the following:

> *"17. SEISMIC STIPULATION: Mining operations shall be conducted in a manner to prevent seismic events that would cause damage to surface or subsurface structures such as: power lines or mine pillars and other structures such as Grassy Trail Reservoir and/or create hazardous conditions such as landslides.*
>
> *The Lessee shall: (1) Provide a seismic risk assessment of the Grassy Trail Reservoir to the AO prior to mining in the lease. (2) Prior to mining in the lease, the Lessee shall provide a plan to monitor the Reservoir and the steps necessary to mitigate any damage created by the lessee. These plans shall be updated by the Lessee as deemed necessary by the AO.*
>
> *The AO will either approve or may prescribe the mining methods used, the amount of coal recovered or determine the corrective measures necessary to*

assure protection of surface or subsurface structures and resources. The Lessee is and will remain liable for any and all damages or hazardous conditions resulting from the mining operations under the lease."
(Refer to Appendix 1-4)

In the most recent R2P2 approval (see Appendix 5-3A), BLM approved longwall mining in panel #6. Development of the tail-gate entries for panel #7 is also approved. However, the R2P2 states, *"Longwall mining of Panel 7 is not approved at this time. Approval of Panel 7 will be contingent on receipt of final seismic analysis report(s), updated data from the on-going monitoring, and receipt of BLM of adequate contingency plan(s) addressing mitigating steps."* Therefore, WEST RIDGE Resources acknowledges that Division approval of the Incidental Boundary Change for the Penta Creek fee lease is only for first mining of the tail-gate entries for panel 7 and that approval of longwall mining (i.e. full extraction mining) in panel 7 will not be issued until the seismic analysis is completed, the conditions of Lease Stipulation 17 have been complied with to the satisfaction of BLM and the Division, and R2P2 approval of full extraction of panel 7 has been granted by BLM. When the seismic analysis report is finalized WEST RIDGE Resources will apply to the Division for an amended MRP based on the conclusions of the report and BLM concurrence thereof. At that time, the seismicity analysis report will be added to the MRP as Appendix 5-9.

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

TABLE 1-1
FEDERAL COAL LEASE PROPERTIES

LEASE SERIAL NUMBER	DATE ISSUED	LEASE ACREAGE	LEGAL DESCRIPTION+	ASSIGNMENT
SL-068754-U-01215	3-27-97	2,570.67	T 14 S, R 13 E Note 1 Section 10: NE¼, N½SE¼, E½NW¼ Section 11: All Section 12: S½SW¼, NW¼SW¼ Section 13: NW¼,, S½, S½NE¼, NW¼NE¼ Section 14: E½, N½NW¼, SE¼NW¼ Section 24: N½SE¼, N½, NE¼SW¼	See
SL-068754 (Lease Modification)	9/1/98	80.0	T 14 S, R 13 E Section 10: SE¼ SE¼ Section 15: NE¼ NE¼	
UTU-78562	12/12/01	1,646.34	T 13 S, R13 E Section 35: SE¼, S½ SW¼ T 14 S, R 13 E Section 1: Lots 2-7 S½NW¼, SW¼, W ½SE¼, SW¼ NE¼ Section 12: Lots 1-4 S½ N½, SE¼, NE¼ SW¼ Section 13: NE¼ NE¼ T 14 S, R 14 E Section 6: Lot 6 Section 7: Lots 3 and 4 Section 18: Lot 1 E½ NW¼	

TOTAL FEDERAL LEASE ACREAGE - 4,297.01

+ Utah State legal description utilizing Salt Lake Base and Meridian.
Note 1: Coal lease assigned from The Standard Oil Company to AMCA Coal Leasing on March 27, 1997.

TABLE I-2A
STATE COAL LEASE PROPERTIES*

LEASE SERIAL NUMBER	DATE ISSUED	LEASE ACREAGE	LEGAL DESCRIPTION+
ML 47711	04/01/2003	641.24	T 14 S, R 13 E Sec. 2: Lots 1-4, S½N½, S½ (all)
		160.0	T 13 S, R 13 E Sec. 36: SW¼
TOTAL		**801.24**	
ML 49287	04/01/2004	881.10	T 14 S, R 13 E Section 3: Lots 1-3, S½ N ½, S½ Section 10: W½ NW¼, SW¼, SW¼SE¼
TOTAL		**881.10**	

STATE SURFACE LEASE

SPECIAL USE LEASE

LEASE NUMBER	DATE ISSUED	LEASE ACREAGE	LEGAL DESCRIPTION+
Special Use Lease Agreement #1163		9.6	T 14 S, R 13 E Sec. 16: (9.6 acres within the NE¼SE¼)
TOTAL		**9.6**	
TOTAL STATE		**1691.94**	

+ Utah State legal description utilizing the Salt Lake Base and Meridian.

TABLE I-2B
PENTA CREEK FEE LEASE PROPERTY
ACQUIRED JANUARY 1, 2003

LEGAL DESCRIPTION (TOTAL LEASE)		ACREAGE
T 14 S, R 14 E S.L.B.& M		
Section 6:	Lot 7, SE¼SW¼	76.56
Section 7:	Lot 1*, Lot 2*, NE¼NW¼,* E½SW¼,* SW¼SE¼	190.60
Section 18:	Lots2, Lot 3, NW¼NE¼	114.92

Less and excepting from the portion of the above legal subdivisions in Section 7 (marked with *), 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.

Total Penta Creek Fee Lease:	**382.08**

LEGAL DESCRIPTION (PERMIT AREA ONLY)		ACREAGE
T 14 S, R 14 E S.L.B.& M		
Section 7:	SE¼SW¼, SW¼NE¼SW¼	50.00
Section 18:	Lot 2, Lot 3	74.92
Total Penta Creek Fee Lease Within Permit Area:		**124.92**

Table 1-3
Surface Ownership of Permit Area

T(S)/R(E)	Section	BLM	Penta Creek	Hinkins	Wells	Rauhala	SITLA	Total
13/13	35	-	-	148.16	91.84	-	-	240.0
13/13	36	-	160	-	-	-	-	160
14/13	1	283.75	285.77	-	-	39.92	-	609.44
14/13	2	-	641.24	-	-	-	-	641.24
14/13	3	-	-	-	80.66	-	520.44	601.10
14/13	10	360	-	-	-	-	280	640
14/13	11	650.87	-	-	-	-	-	650.87
14/13	12	-	648.96	-	-	-	-	648.96
14/13	13	640	-	-	-	-	-	640
14/13	14	440	-	-	-	-	-	440
14/13	15	40.79	-	-	-	-	-	40.79
14/13	16	-	-	-	-	-	9.6	9.6
14/13	21	0.23	-	-	-	-	-	0.23
14/13	24	440	-	-	-	-	-	440
14/14	6	36.41	-	-	-	-	-	36.41
14/14	7	74.08	50.00	-	-	-	-	124.08
14/14	18	117.25	74.92	-	-	-	-	192.17
		3083.38	1860.89	148.16	172.5	39.92	810.04	6114.89

TABLE 1-4
LEGAL DESCRIPTION OF PERMIT AREA

PARCEL	ACREAGE	LEGAL DESCRIPTION
FEDERAL LEASE SL-068754-U-01215	2,570.67	T 14 S, R 13 E
		Section 10: NE¼, N½SE¼, E½NW¼
		Section 11: All
		Section 12: S½SW¼, NW¼SW¼
		Section 13: NW¼,, S½, S½NE¼, NW¼NE¼
		Section 14: E½, N½NW¼, SE¼NW¼
		Section 24: N½SE¼, N½, NE¼SW¼
FEDERAL LEASE SL-068754 (Lease Modification)	80.0	T 14 S, R 13 E
		Section 10: SE¼ SE¼
		Section 15: NE¼ NE¼
FEDERAL LEASE UTU-78562	1,646.34	T 13 S, R13 E
		Section 35: SE¼, S½ SW¼
		T 14 S, R 13 E
		Section 1: Lots 2-7 S½NW¼, SW¼, W ½SE¼, SW¼ NE¼
		Section 12: Lots 1-4 S½ N½, SE¼, NE¼ SW¼
		Section 13: NE¼ NE¼
		T 14 S, R 14 E
		Section 6: Lot 6
		Section 7: Lots 3 and 4
		Section 18: Lot 1 E½ NW¼

TABLE 1-4 (CONTINUED)
LEGAL DESCRIPTION OF PERMIT AREA

PARCEL	ACREAGE	LEGAL DESCRIPTION
STATE LEASE ML 47711	801.24	T 14 S, R 13 E Section 2: Lots 1 thru 4, S½N½, S½ T 13 S, R 13 E Section 36: SW¼
STATE LEASE ML 49287	881.10	T 14 S, R 13 E Section 3: Lots 1,2,3, S½N½, S½ Section 10: W½NW¼, SW¼, SW¼SE¼
PENTA CREEK FEE LEASE	124.92	T 14 S, R 14 E Section 7: SE¼SW¼,* SW¼NE¼SW¼* Section 18: Lots 2, 3
PUMPING STATION (BLM R.O.W. UTU-77120	0.23	T 14 S, R 13 E Section 21: NE¼NE¼
TOPSOIL SALVAGE AREA (SITLA special use agreement #1163)	9.6	T 14 S, R 13 E Section 16: NE¼SE¼
SECURITY GATE (Carbon County authorization)	0.79	T 14 S, R 13 E Section 15: NW¼SE¼NE¼
TOTAL PERMIT AREA	6114.89	

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.

Approximately 6,114.89 acres are within the permit boundary. Of this acreage, about 25 acres will be utilized for surface facilities and structures. The proposed surface facilities should be capable of supporting the life of the mine operations as presented in this permit application.

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

For laboratory analyses, such as Appendix 7-2 and 7-3, the company performing the analyses as well as the date of the analyses, is presented on the laboratory report rather than the cover page.
A list of consultants and their appended reports is contained in Appendix 1-6, Consultation and Coordination. Sources used in the preparation of the permit application are referenced in Appendix 1-3. References in all chapters are keyed to this main reference list.

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

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

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

The total of all the previously disturbed areas within the proposed 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.

AFFIDAVIT OF PUBLICATION

STATE OF UTAH)

ss.

County of Carbon,)

I, Ken Larson, on oath, say that I am the Publisher of the Sun Advocate, a twice-weekly newspaper of general circulation, published at Price, State a true copy of which is hereto attached, was published in the full issue of such newspaper for 4 (Four) publication was on the 5th day of May, 2005, and that the last publication of such notice was in the issue of such newspaper dated the 26th day of May, 2005.

Ken G. Larson

Ken G Larson - Publisher

Subscribed and sworn to before me this 26th day of May, 2005.

Linda Thayn

Notary Public My commission expires January 10, 2007 Residing at Price, Utah

Publication fee, $ 366.08

LINDA THAYN
NOTARY PUBLIC • STATE of UTAH
845 EAST MAIN
PRICE, UTAH 84501
COMM. EXPIRES 1-10-2007

PUBLIC NOTICE

WESTRIDGE Resources, Inc., P.O. Box 1077, Price, Utah 84501 has filed a complex application with the Division of Oil, Gas and Mining for a revision to the existing Coal Mining and Reclamation Permit C/007/041, for the West Ridge Mine, located at C Canyon, approximately 6 miles north of East Canyon City, Utah. The revision proposes the addition of State Coal Leases ML-47701 and ML-49287, which entails the extension of underground workings, with no additional disturbance. The combined lease area is 1682.34 acres, more or less, and is delineated on the Sunnyside U.S.G.S 7 1/2 minute topographic map as follows:

T 13 S, R 13 E, SLB&M, Utah — Section 36: SW1/4

T 14 S, R 13 E, SLB&M, Utah — Section 2: Lots 1 thru 4, S1/2 N1/2, S1/2
Section 3: Lots 1 thru 3, S1/2N1/2, S1/2
Section 10: W1/2NW1/4, SW1/4, SW1/4SW1/4SE1/4

A copy of the application is available for pubic inspection at the following locations:

Division of Oil, Gas and Mining
1594 W. North Temple, Suite 1210
Salt Lake City, Utah 84114-5801

Carbon County Courthouse
120 East Main
Price, Utah 84501

Written comments, objections or requests for informal conference on the applications may be submitted within 30 days to:

Utah Coal Program
Division of Oil, Gas and Mining
1594 W. North Temple, Suite 1210
Salt Lake City, Utah 84114-5801

Published in the Sun Advocate May 5, 12, 19 and 26, 2005.

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, including the addition of State Lease ML-47711 and ML-49287, and the Penta Creek Incidental Boundary Change, 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

Gary E Gray engineer/agent **Signed - Name - Position - Date**
Gary E Gray 7/21/05

Subscribed and sworn to before me this 21 day of July, 2005

Rada J Rogers
Notary Public

My commission Expires: 10/2, 2006

RADA J. ROGERS
NOTARY PUBLIC • STATE of UTAH
2150 N LUNDY LANE
CLEVELAND, UT 84518
COMM. EXPIRES 10-2-2006

Attest: STATE OF Utah) ss:
COUNTY OF Carbon)

CENTENNIAL MINES
PERMIT NUMBER 007/019

DOGM VIOLATIONS 2001 THROUGH FEBRUARY 2005

VIOLATION/ CESSATION NO.	DATE ISSUED	ABATEMENT DATE	VIOLATION DESCRIPTION
NO4-49-2-1	1/24/04	3/25/04	Failure to maintain disturbed diversion DD-4 and culvert.

WESTRIDGE MINE
PERMIT NUMBER 007/041

DOGM VIOLATIONS 2001 THROUGH OCTOBER FEBRUARY 2005

VIOLATION/ CESSATION NO.	DATE ISSUED	ABATEMENT DATE	VIOLATION DESCRIPTION
NO2-49-2-1	11/19/02	2/18/02	Diverting mine water through channels and culverts and storing in sediment pond. Abated with submittal of permit change allowing use.
NO2-49-1-1	2/19/02	5/20/02	Failure to maintain or construct diversions according to approved MRP. Abated with the completion of a permit change approval and construction measures.
NO4-49-1-1	1/22/04	1/22/04	Failure to request permit renewal 120 prior to permit expiration. Abated with submittal of permit renewal application.
NO5-39-1-1	4/6/05	4/15/05	Failure to submit 4th quarter water monitoring data via EDI.

CRANDALL CANYON MINE
PERMIT NUMBER 015/032

DOGM VIOLATIONS 2001 THROUGH FEBRUARY 2005

VIOLATION/ CESSATION NO.	DATE ISSUED	ABATEMENT DATE	VIOLATION DESCRIPTION
NO3-49-2-1	7/30/03	8/20/03	Failure to submit surface blast plan pf more than 5 pounds. Abated with submittal and approval of plan.
NO3-49-1-1	1/8/03	4/15/03	Failure to request permit renewal 120 days prior to permit expiration. Abated with submittal of permit renewal application.
NO4-49-4-1	8/19/04	8/23/04	Employee Parking in Forest Service trail-head. Vehicle removed from trail-head.
N04-49-5-1	9/8/04	9/13/04	Failure to control non-coal waste. Non-coal waste was picked up and stored in appropriate area.

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R645-301-300 CHAPTER 3

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.

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 was conducted by Mt. Nebo Scientific, Inc. during the growing season of 2002. This report is included in 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. The plant communities located within the Penta Creek fee area includes Aspen, Sagebrush/Grass, Mountain Brush and Riparian. Mining in the area is more than 2000' deep and will therefore have no impact to surface vegetation.

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.

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.

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. An updated (May 2004) list for Carbon County is included in Appendix 3-4A. None of the listed species occurs within the permit 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. An updated of threatened, endangered and candidate species is included in Appendix 3-4A.

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. An updated raptor survey (June 17, 2004) has been included in Appendix 3-2A as well.

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.

On April 16, 2004 DWR and EIS conducted an additional spotted owl survey over the project area, including the expanded areas of the state leases and the fee lease. Based on this survey they re-confirmed their earlier conclusions that there is insufficient potential habitat in the permit area. (Refer to Appendix 3-9A)

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 (including the Penta Creek fee lease) in Whitmore Canyon located northeast of West Ridge. Riparian areas exist along Grassy Trail Creek in this area, as depicted on Map 3-1. The riparian habitat along Grassy Trail Creek is described in detail in Appendix 3-12. 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. An updated raptor survey (June 17, 2004) has been included in Appendix 3-2A.

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.

R645-301-358 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 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 (including the Penta Creek fee lease) in Whitmore Canyon located northeast of West Ridge. Riparian areas exist along Grassy Trail Creek in this area, as depicted on Map 3-1. The riparian habitat along Grassy Trail Creek is described in detail in Appendix 3-12. Wildlife wintering areas are depicted on Maps 3-4B, 3-4C and 3-4D.

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.

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R645-301-520 OPERATION PLAN

R645-301-521 GENERAL

WEST RIDGE Resources, Inc. holds federal coal leases SL-068754 and UTU-75862, state lease ML 47711 and ML 49287 and the Penta Creek fee lease, totaling 6361.43 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, will consist of one longwall and two continuous miner sections. The mining sequence for the first five year term 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 and ML49287 and the Penta Creek fee lease, totaling 6,114.89 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 and 5-3A 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 State Leases ML-47711 and ML-59287 (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 and the approved R2P2 will not allow full extraction longwall mining in panel #7 until a seismic analysis report is completed and BLM determines that seismic/subsidence effects of longwall mining on the Grassy Trail dam and reservoir have been satisfactorily addressed. This study is ongoing and will be added to the MRP upon its completion.

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

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.

Longwall panel layout may change depending on conditions encountered in the underground workings. As longwall mining approaches Grass Trail Reservoir, existing ongoing subsidence monitoring information will be used to determine the actual angle of draw and subsidence ratio specific to this area. Based on this empirical information the underground workings will be designed to ensure that the reservoir is not adversely affected by mining activity.

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 has hired R, B &G Engineering to prepare a study of the risk

to the Grassy Trail dam and reservoir from seismisity and subsidence associated with longwall mining in the West Ridge Mine. This study will involve collection of additional data from newly-installed accelerometers, subsidence monitoring stations, and piezometers in the area around the dam. This study is being conducted with input from BLM, DOGM, Division of Dam Safety, and East Carbon City. Stipulation 17 of federal lease UTU-78562 states the following:

"17. SEISMIC STIPULATION: Mining operations shall be conducted in a manner to prevent seismic events that would cause damage to surface or subsurface structures such as: power lines or mine pillars and other structures such as Grassy Trail Reservoir and/or create hazardous conditions such as landslides.

The Lessee shall: (1) Provide a seismic risk assessment of the Grassy Trail Reservoir to the AO prior to mining in the lease. (2) Prior to mining in the lease, the Lessee shall provide a plan to monitor the Reservoir and the steps necessary to mitigate any damage created by the lessee. These plans shall be updated by the Lessee as deemed necessary by the AO.

The AO will either approve or may prescribe the mining methods used, the amount of coal recovered or determine the corrective measures necessary to assure protection of surface or subsurface structures and resources. The Lessee is and will remain liable for any and all damages or hazardous conditions resulting from the mining operations under the lease."
(Refer to Appendix 1-4)

In the most recent R2P2 approval (see appendix 5-3A), BLM approved longwall mining in panel #6. Development of the tail-gate entries for panel #7 is also approved. However, the R2P2 states, *"Longwall mining of Panel 7 is not approved at this time. Approval of Panel 7 will be contingent on receipt of final seismic analysis report(s), updated data from the on-going monitoring, and receipt of BLM of adequate contingency plan(s) addressing mitigating steps."* Therefore, WEST RIDGE Resources acknowledges that Division approval of the Incidental Boundary Change for the Penta Creek fee lease is only for first mining of the tail-gate entries for panel 7 and that approval of longwall mining (i.e. full extraction mining) in panel 7 will not be issued until the seismic analysis is completed, the conditions of Lease Stipulation 17 have been complied with to the satisfaction of BLM and the Division, and R2P2 approval of full extraction of panel 7 has been granted by BLM. When the seismic analysis report is finalized it will be added to the MRP as Appendix 5-9.

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.

APPENDIX 5-3A

AMENDED R2P2 APPROVAL LETTER (BLM)

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 will be discussed in a seismic analysis report presently being prepared. This report will be added to the MRP in the future as Appendix 5-9. Longwall mining will not be permitted in the area of Grassy Trail reservoir until approved in the R2P2 by the BLM based on the conclusions of the pending seismic analysis report.

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.

CHAPTER 7
R645-301-700 HYDROLOGY

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.

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 summarized below.

Groundwater Resources

A spring and seep survey of the West Ridge area was conducted in 1985-86 by Kaiser Coal Corporation (1986). 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.

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.

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).

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). 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"). 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, Personnal 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.

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 tow 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)2dad-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. This report contains 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 will be discussed in a seismic analysis report presently being prepared. This report will analyze the potential effect of longwall mining on Grassy Trail dam and reservoir. This report will be added to the MRP in the future as Appendix 5-9. Longwall mining will not be permitted in the area of Grassy Trail reservoir until approved in the R2P2 by the BLM based on the conclusions of the pending seismic analysis report.

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.

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). The PHC will be updated, if needed, following the collection and analyses of information gathered during the 1998 field season.

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 will occur 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 that is encountered by mining operations will likely be old, meaning that recharge occurred thousands of years in the past. 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. These groundwater systems are not in active hydraulic communication with the surface and have limited areal and vertical extent. Mining could dewater some of these systems if they are intercepted during mining operations. Because of the limited spatial extent of these systems, discharge from these isolated groundwater systems will cease soon after interception by mine workings.

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.

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.

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. 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. 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.

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.

728.332 Impacts to important water quality parameters

WEST RIDGE Resources, Inc. anticipates that at some time it may be necessary to discharge water from its proposed mine into the C Canyon drainage. The distance from the proposed 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 unlikely that the above-ground flow of discharge water will persist to the confluence with Grassy Trail Creek. 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. Therefore, there will most likely be no impacts to important water quality parameters in Grassy Trail Creek from proposed mining operations because mine discharge water will likely not reach the creek. However, if mine discharge water were to persist in the stream channel to the confluence with Grassy Trail Creek, the volume of discharge water entering the creek will be only a fraction of that which discharged from the mine.

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 WEST RIDGE Resources, Inc.'s proposed new mine will likely be similar to discharge 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 low anticipated volume of mine discharge water which will flow into Grassy Trail Creek, and 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 relatively small quantities of mine discharge water (if any) which will flow into the creek, important water quality parameters in Grassy Trail Creek, such as sodium, sulfate, and bicarbonate will not be significantly increased.

Most of the water from any potential discharge from WEST RIDGE Resources, Inc.'s proposed new mine will infiltrate into the alluvial sediments in Clark Valley near the Book Cliffs escarpment. This will result 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 may result 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 WEST RIDGE Resources, Inc.'s proposed coal 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.

728.333 Flooding or streamflow alteration

WEST RIDGE Resources, Inc. anticipates that at some time it may be necessary to discharge water from its proposed mine into the C Canyon drainage. The discharge point will be 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 WEST RIDGE Resources, Inc.'s proposed 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. 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. Thus, although short-term increases in mine discharge rates will likely occur, the long-term average will probably be in the range of 300 to 400 gpm if water is encountered.

A discharge of 300 to 400 gpm will not 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 WEST RIDGE Resources, Inc.'s proposed mine. The mine discharge will easily be contained within the inner stream channel, which should be stable. Additionally, if a constant, relatively small 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.

728.334 Groundwater and surface water availability

Mining in the permit area 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. 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. 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.

728.400

The hydrology and geology of the area around Grassy Trail reservoir will be discussed in a seismic analysis report presently being prepared. This report will analyze the potential effect of longwall mining on Grassy Trail dam and reservoir. This report will be added to the MRP in the future as Appendix 5-9. Longwall mining will not be permitted in the area of Grassy Trail reservoir until approved in the R2P2 by the BLM based on the conclusions of the pending seismic analysis report.

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 surface-water and groundwater monitoring sites are indicated on Map 7-6. Hydrologic monitoring protocols, sampling frequencies, and sampling sites are described in Table 7-1 through 7-6. 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.*

Operational field and laboratory parameters will be measured for the first two years of mine operation; after this time, if sampling has adequately characterized the

hydrology in the area, a request will be made to reduce monitoring to field parameters and one operational analytical sample collected during low flow (August or September). 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 (in progress) and two years of operational laboratory data. (The first year of field data was collected in 1985-1986. Two additional years of monitoring are being conducted in 1997 and 1998). Thereafter, continued monitoring for laboratory parameters would probably not enhance the scientific understanding of hydrologic systems in the mine permit area. However, in order to identify mining-related impacts to the discharge and chemical characteristics of streams and springs in the permit and adjacent area, monitoring of field parameters will continue during mine operation. If field parameters (pH, specific conductance, and temperature) at any sampling site deviate significantly from historical values, monitoring of operational laboratory water quality will resume at that site. 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.

WEST RIDGE Resources, Inc. believes that discontinuance of laboratory parameters after two years of operation will be approvable for two reasons. First, there are no mechanisms whereby the chemical composition of springs and streams that are above the mine workings can be adversely impacted by mining activities. Second, this type of groundwater monitoring program has been approved for the Alkali Creek and Dugout Canyon tracts at the Soldier Creek Mine, 10 miles north of the West Ridge area.

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.

Baseline monitoring will be performed on the specified monitoring sites until construction of the mine and mine facilities begins. Once construction is initiated, the operational monitoring schedule will be utilized. Monitoring 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 will be monitored.

Stream site ST-3 is located below the confluence with Hanging Rock Canyon and is upstream of the permit area. Stream site ST-8 is located just above the confluence with Water Canyon, downstream of the permit area. Two additional monitoring sites will be established on upper Grassy Trail Creek. One site (ST-10) will be located immediately above the northern permit boundary. The other (ST-9) will be located on upper Grassy Trail Creek at the inlet to Grassy Trail Reservoir. These two monitoring sites are intended to monitor for potential impacts from the undermining of upper Grassy Trail Creek.

On the west side of West Ridge, five stations will be monitored 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 will be visual observation of the channel for flowing water. ST-5 will have a crest gauge and automatic sampler while ST-6A, ST-6 and ST-7 will consist of a crest gauge and bottle samplers. The samplers will be checked after precipitation events. Stream monitoring stations, used for baseline collection and proposed for operational monitoring beginning in 1999, are equipped as follows:

ST-4 No monitoring equipment is 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.

ST-5 This location contains the ISCO automatic sampler and a crest gage. The crest gage is a steel pipe concreted into the channel bottom. The pipe has a hole near the bottom so that water can rise in the pipe and record the maximum flow height on a stick inside of the pipe. This station monitors 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. No drainage has been recorded in C Canyon.

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 are cemented in the channel at each location. The bottles consist of one liter plastic bottles which are strapped to the pipe at specific heights. The bottle cap has two copper tubes which would allow a sample to fill the bottle when the flow height reaches the inlet level. The crest gages have not recorded any flow in the channel in 1997 or 1998 even though the rain gage in C Canyon has recorded 1-2" precipitation events.

ST-7 A crest gage and sampler bottles are located in the A Canyon drainage. It measures the maximum height of the flow down the A Canyon drainage as well as collecting a sample should the flow height reach the bottle inlet.

Sites ST-5, ST-6, ST-6A, and ST-7 all have crest gauges installed. Calculated flows, based on the crest gauge measurement and the channel configuration will be included in the surface water monitoring data.

If it becomes necessary to discharge water from the proposed mine, this water will discharge into the ephemeral C Canyon drainage. Discharge water will be subject to monthly monitoring stipulated by a UPDES permit. Because the monitoring required under the UPDES permit is more stringent and more frequent than that proposed in this permit application, discharge samples will be collected from the UPDES discharge monitoring point rather than at the drainage monitoring station.

Springs

Eight springs in the permit and adjacent areas will be monitored. 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 7-6. One spring (SP-8) discharges in the upper drainage of C Canyon. Hanging Rock Spring (S-80) is located near the northwest 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. SP-8 will be monitored according to the operational schedule beginning in 1999.

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.

Table 7-1 Hydrologic monitoring protocols and locations

MONITORING PROTOCOLS

Discharge and water level measurements

Protocol	Applies to	Parameter	Frequency
A	Streams	discharge	quarterly
B	Springs	discharge	quarterly
C	Monitoring wells	water level	quarterly

Water quality

Protocol	Applies to	Parameters	Table	Frequency
1	Streams	operational field and laboratory for two years, then field only with DOGM concurrence	7-2	*quarterly
2	Springs	operational field and laboratory for two years, then field only with DOGM concurrence	7-3	quarterly
3	Monitoring wells	operational field and laboratory for two years, then field only with DOGM concurrence	7-3	quarterly

*samplers will be checked following precipitation events

MONITORING LOCATIONS

Site	Protocols	Comments
Streams		
ST-3	A,1	Grassy Trail Creek upstream of permit area
ST-4	A,1	Bear Creek downstream of permit area (Note 1)
ST-5*	A,1	B and C Canyon downstream of permit area
ST-6A*	A,1	C Canyon upstream of mine site area
ST-6*	A,1	C Canyon downstream of mine site area
ST-7*	A,1	A Canyon downstream of permit area
ST-8	A,1	Grassy Trail Creek downstream of permit area
ST-9	A,1	Grassy Trail Creek at Grassy Trail Reservoir inlet
ST-10	A,1	Grassy Trail Creek above permit area
ST-11	A,1	Bear Canyon Shallow Point (Note 2)
ST-12	A,1	Bear Canyon Falls (Note 3)
ST-13	A,1	Bear Canyon Below Forks
ST-15	A,1	Spring Canyon Stream (Note 4)
Springs		
SP-12	B,2	Colton Fm. upper Whitmore Canyon
SP-13	B,2	Colton Fm. upper Whitmore Canyon
SP-15	B,2	Colton Fm. near Grassy Trail Reservoir
WR-1	B,2	Colton Fm. on West Ridge

WR-2	B,2	Colton Fm. on West Ridge
SP-16	B,2	North Horn Fm. in Whitmore Canyon
SP-8	B,2	North Horn Fm. in C Canyon
SP-101	B,2	Little Spring Bottom (Note 5)
SP-102	B,2	Spring Canyon Hillside (Note 5)
S-80	B,2	Hanging Rock Spring
Wells		
DH86-2	C-3	Sunnyside Sandstone in C Canyon

Note 1: ST-4 was discontinued in the third quarter of 2005 and replaced with ST-13.

Note 2: ST-11 will be monitored monthly from May 15 through September 15 as long as flow is present during the flow season of 2005 and 2006 and quarterly throughout the remainder of the year. Thereafter, monitoring will be done on a quarterly basis.

Note 3: ST-12 will be monitored twice a year (late spring/early summer and late summer/early fall) during 2005 and 2006. Based on the results of this monitoring, the plan will be reassessed to determine if this site should be included in the permanent monitoring plan.

Note 4: ST-15 will be monitored for baseline data for the first two years (starting third quarter 2005) according to the surface water monitoring parameters outlined in Table 7-2.

Note 5: SP-101 and SP-102 will be monitored for baseline data for the first two years (starting third quarter 2005) according to the ground water monitoring parameters outlined in Table 7-3.

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	
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 (dissolved)	mg/l
Iron (total)	mg/l
Magnesium (dissolved)	mg/l
Manganese (dissolved)	mg/l
Manganese (total)	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	%

* For those sites with crest gauges

TABLE 1 - WATER RIGHTS
T. 14 S. R. 13 E. Section 1

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
91-4757	.0000	.00	Spring Canyon Water Uses: Stockwatering, other USA Bureau of Land Management Moab Dist. P.O. Box 670 Moab, UT 84532	Priority Date: 00/00/1869			X		X		X	
91-2016	.0110	.00	Unnamed Spring Water Uses: Frank Liddell P.O. Box 106 Wellington, UT 84542	Priority Date: 00/00/1869			X		X		X	
91-4756	.0000	.00	Hanging Rock Canyon Water Uses: Stockwatering, other USA Bureau of Land Management Moab Dist. P.O. Box 970 Moab, UT 84532	Priority Date: 00/00/1869			X		X		X	
91-2017	.0110	.00	Unnamed Spring Water Uses: Frank Liddell P.O. Box 106 Wellington, UT 84542	Priority Date: 00/00/1869			X		X		X	

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
91-4754	.0000	.00	Unnamed Trib. Left Fork Whitmore Water Uses: Stockwatering, other USA Bureau of Land Management Moab Dist. P.O. Box 970 Moab, UT 84532	Priority Date: 00/00/1869			X		X		X	
91-4756	.0000	.00	Hanging Rock Canyon Water Uses: Stockwatering, other USA Bureau of Land Management Moab Dist. P.O. Box 970 Moab, UT 84532	Priority Date: 00/00/1869			X		X		X	
91-3158	.0000	.00	Left Fork Grassy Trail Creek Water Uses: Stockwatering, other USA Bureau of Land Management P.O. Box 45155 Salt Lake City, UT 84145	Priority Date: 00/00/1869			X		X		X	
91-4755	.0000	.00	Graveyard Canyon Water Uses: Stockwatering, other USA Bureau of Land Management Moab Dist. P.O. Box 970 Moab, UT 84532	Priority Date: 00/00/1869			X		X		X	
91-2014	.0110	.00	Unnamed Spring Water Uses: Frank Liddell P.O. Box 106 Wellington, UT 84542	Priority Date: 00/00/1869			X		X		X	

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
91-2015	.0110	.00	Unnamed Spring Water Uses: Frank Liddell P.O. Box 106 Wellington, UT 84542	Priority Date: 00/00/1869			X		X		X	
91-4754	.0000	.00	Unnamed Trib. Left Fork Whitmore Water Uses: Stockwatering, other USA Bureau of Land Management Moab Dist. P.O. Box 970 Moab, UT 84532	Priority Date: 00/00/1869			X		X		X	

TABLE 1 - WATER RIGHTS
T. 14 S. R. 13 E. Section 2

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
91-4398	.0000	.00	Left Fork Grassy Trail Creek Water Uses: Stockwatering State of Utah School & Institutional Trust Lands Salt Lake City, UT 84180	Priority Date: 00/00/1869			X		X		X	
91-3158	.0000	.00	Left Fork Grassy Trail Creek Water Uses: Stockwatering USA Bureau of Land Management P.O. Box 45155 Salt Lake City, UT 84145	Priority Date: 00/00/1869			X		X		X	

TABLE 1 - WATER RIGHTS
T. 14 S. R. 13 E. Section 3

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
91-1717	.0000	.00	Bear Canyon Spring Stream Water Uses: Glen Wells Ralph Stevenson P.O. Box 52 Wellington, UT 84542	Priority Date: 00/00/1869			X		X		X	
91-1722	.0000	.00	Bear Canyon Spring Stream Water Uses: Glen Wells Ralph Stevenson P.O. Box 52 Wellington, UT 84542	Priority Date: 00/00/1869			X		X		X	
91-4681	.0000	.00	Bear Creek Water Uses: Stockwatering, other State of Utah School & Institutional Trust Lands Salt Lake City, UT 84180	Priority Date: 00/00/1869			X		X		X	
91-4513	.0150	.00	Mels Spring Water Uses: Stockwatering, other State of Utah School & Institutional Trust Lands Salt Lake City, UT 84180	Priority Date: 00/00/1869			X		X		X	

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
91-4682	.0000	.00	Unnamed Trib. To Bear Creek Water Uses: Stockwatering, other State of Utah School & Institutional Trust Lands Salt Lake City, UT 84180	Priority Date: 00/00/1869			X		X		X	

TABLE 1 - WATER RIGHTS
T. 14 S. R. 13 E. Section 4

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
91-4681	.0000	.00	Bear Creek Water Uses: Stockwatering, other State of Utah School & Institutional Trust Lands Salt Lake City, UT 84180	Priority Date: 00/00/1869			X		X		X	

TABLE 1 - WATER RIGHTS
T. 14 S. R. 13 E. Section 9

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
91-2580	.0060	.00	Bear Canyon Spring Water Uses: USA Bureau of Land Management P.O. Box 45155 Salt Lake City, UT 84145	Priority Date: 00/00/1869			X		X		X	
91-4660	.0000	.00	Bear Creek Water Uses: Stockwatering, other USA Bureau of Land Management Moab Dist. P.O. Box 970 Moab, UT 84532	Priority Date: 00/00/1869			X		X		X	
91-4682	.0000	.00	Unnamed tributary to Bear Creek Water Uses: Stockwatering, other State of Utah School & Institutional Trust Lands Salt Lake City, UT 84180	Priority Date: 00/00/1869			X		X		X	

TABLE 1 - WATER RIGHTS
T. 14 S. R. 13 E. Section 10 & 11

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
			No Water Rights									

TABLE 1 - WATER RIGHTS
T. 14 S. R. 13 E. Section 12

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
91-140	.0000	50.00	Grassy Trail Creek Water Uses: Irrigation, Domestic East Carbon City East Carbon, UT 84520	2824 S 1166 W from NE cnr Priority Date: 12/18/1943			X		X			
91-142	.0000	50.00	Grassy Trail Creek Water Uses: Irrigation, Domestic East Carbon City East Carbon, UT 84520	2824 S 1166 W from NE cnr Priority Date: 12/18/1943			X		X			
91-144	.0000	33.33	Grassy Trail Creek Water Uses: Irrigation, Domestic East Carbon City East Carbon, UT 84520	2824 S 1166 W from NE cnr Priority Date: 12/18/1943			X		X			
91-4947	.0090	.00	Unnamed Spring Water Uses: Stockwatering Sunnyside Coal Co. 1113 Spruce Street Boulder, CO 80302	500 N 800 W from SE cnr Priority Date: 00/00/1869			X		X			

TABLE 1 - WATER RIGHTS
T. 14 S. R. 13 E. Section 13, 14, 15, 16, 22 & 23

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
			No Water Rights									

TABLE 1 - WATER RIGHTS
T. 14 S. R. 13 E. Section 24

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
91-3266	.0000	.00	Unnamed Stream Water Uses: Stockwatering George Orfanakis Price, UT 84501	Priority Date: 00/00/1902			X		X		X	

TABLE 1 - WATER RIGHTS
T. 13 S. R. 13 E. Section 33

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
91-1720	.0000	.00	Unnamed Stream Water Uses: Stockwatering Glen Wells Ralph Steverson P.O. Box 52 Wellington, UT 84542	Priority Date: 00/00/1869			X		X		X	
91-1725	.0000	.00	Unnamed Stream Water Uses: Glen Wells Ralph Steverson P.O. Box 52 Wellington, UT 84542	Priority Date: 00/00/1869			X		X		X	
91-4795	.0000	.00	Unnamed Stream Water Uses: Stockwatering Victor Sacco Spring Glen, UT	Priority Date; 00/00/1869			X		X		X	
91-4796	.0000	.00	Unnamed Stream Water Uses: Stockwatering Victor Sacco Spring Glen, UT	Priority Date; 00/00/1869			X		X		X	

TABLE 1 - WATER RIGHTS
T. 13 S. R. 13 E. Section 34

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
91-2023	.0000	.00	Spring Stream Water Use: Jay Pagano Wellington, UT 84542	Priority Date: 00/00/1869			X		X		X	
91-1666	.0000	.00	Spring Stream Water Use: W. Lavon & Marianne W. Day Castle Dale, UT	Priority Date: 00/00/1869			X		X		X	
91-1673	.0000	.00	Spring Stream Water Use: W. Lavon & Marianne W. Day Castle Dale, UT	Priority Date: 00/00/1869			X		X		X	
91-1687	.0000	.00	Spring Stream Water Use: W. Lavon & Marianne W. Day Castle Dale, UT	Priority Date: 00/00/1869			X		X		X	
91-1694	.0000	.00	Spring Stream Water Use: W. Lavon & Marianne W. Day Castle Dale, UT	Priority Date: 00/00/1869			X		X		X	

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
91-1708	.0000	.00	Spring Stream Water Use: W. Lavon & Marianne W. Day Castle Dale, UT	Priority Date: 00/00/1869			X		X		X	
91-1695	.0110	.00	Unnamed Spring Water Use: W. Lavon & Marianne W. Day Castle Dale, UT	Priority Date: 00/00/1869			X		X		X	
91-1688	.0110	.00	Unnamed Spring Water Use: W. Lavon & Marianne W. Day Castle Dale, UT	Priority Date: 00/00/1869			X		X		X	
91-1667	.0110	.00	Unnamed Spring Water Use: W. Lavon & Marianne W. Day Castle Dale, UT	Priority Date: 00/00/1869			X		X		X	
91-1674	.0110	.00	Unnamed Spring Water Use: W. Lavon & Marianne W. Day Castle Dale, UT	Priority Date: 00/00/1869			X		X		X	
91-1709	.0110	.00	Unnamed Spring Water Use: W. Lavon & Marianne W. Day Castle Dale, UT	Priority Date: 00/00/1869			X		X		X	

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
91-3479	.0110	.00	Unnamed Spring Water Use: W. Lavon & Marianne W. Day Castle Dale, UT	Priority Date: 00/00/1869			X		X		X	
91-3480	.0110	.00	Unnamed Spring Water Use: W. Lavon & Marianne W. Day Castle Dale, UT	Priority Date: 00/00/1869			X		X		X	
91-3481	.0110	.00	Unnamed Spring Water Use: W. Lavon & Marianne W. Day Castle Dale, UT	Priority Date: 00/00/1869			X		X		X	
91-3482	.0110	.00	Unnamed Spring Water Use: W. Lavon & Marianne W. Day Castle Dale, UT	Priority Date: 00/00/1869			X		X		X	
91-3483	.0110	.00	Unnamed Spring Water Use: W. Lavon & Marianne W. Day Castle Dale, UT	Priority Date: 00/00/1869			X		X		X	
91-1717	.0000	.00	Bear Canyon Spring Stream Water Use: Glen Wells Ralph Stevenson P.O. Box 52 Wellington, UT 84542	Priority Date: 00/00/1869			X		X		X	

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
91-1722	.0000	.00	Bear Canyon Spring Stream Water Use: Glen Wells Ralph Stevenson P.O. Box 52 Wellington, UT 84542	Priority Date: 00/00/1869			X		X		X	
91-3477	.0110	.00	Unnamed Spring Water Use: W. Lavon & Marianne W. Day Castle Dale, UT	Priority Date: 00/00/1869			X		X		X	
91-3474	.0110	.00	Unnamed Spring Water Use: W. Lavon & Marianne W. Day Castle Dale, UT	Priority Date: 00/00/1869			X		X		X	
91-3475	.0110	.00	Unnamed Spring Water Use: W. Lavon & Marianne W. Day Castle Dale, UT	Priority Date: 00/00/1869			X		X		X	
91-3476	.0110	.00	Unnamed Spring Water Use: W. Lavon & Marianne W. Day Castle Dale, UT	Priority Date: 00/00/1869			X		X		X	
91-3478	.0110	.00	Unnamed Spring Water Use: W. Lavon & Marianne W. Day Castle Dale, UT	Priority Date: 00/00/1869			X		X		X	

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
91-4797	.0000	.00	Unnamed Stream Water Use: Stockwatering Glen Wells Ralph Stevenson P.O. Box 52 Wellington, UT 84542	Priority Date: 00/00/1869			X		X		X	

TABLE 1 - WATER RIGHTS
T. 13 S. R. 13 E. Section 35

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
91-2037	.0000	.00	Spring Canyon Creek Water Use: Jay Pagano Wellington, UT 84542	Priority Date: 00/00/1869			X		X		X	
91-2033	.0000	.00	Left Fork of Grassy Trail Creek Water Use: Jay Pagano Wellington, UT 84542	Priority Date: 00/00/1869			X		X		X	
91-2034	.0110	.00	Unnamed Spring Water Use: Jay Pagano Wellington, UT 84542	Priority Date: 00/00/1869			X		X		X	
91-2036	.0110	.00	Unnamed Spring Water Use: Jay Pagano Wellington, UT 84542	Priority Date: 00/00/1869			X		X		X	
91-300	.0000	.00	Left Fork of Whitmore Canyon Water Use: Jay Pagano Wellington, UT 84542	Priority Date: 00/00/1869			X		X		X	

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
91-1665	.0000	.00	Left Fork Whitmore Canyon Creek Water Use: Jay Pagano Wellington, UT 84542	Priority Date: 00/00/1869			X		X		X	
91-1672	.0000	.00	Left Fork Whitmore Canyon Creek Water Use: W. Lavon & Marianne W. Day Castle Dale, UT	Priority Date: 00/00/1869			X		X		X	
91-1686	.0000	.00	Left Fork Whitmore Canyon Creek Water Use: W. Lavon & Marianne W. Day Castle Dale, UT	Priority Date: 00/00/1869			X		X		X	
91-1693	.0000	.00	Left Fork Whitmore Canyon Creek Water Use: W. Lavon & Marianne W. Day Castle Dale, UT	Priority Date: 00/00/1869			X		X		X	
91-1707	.0000	.00	Left Fork Whitmore Canyon Creek Water Use: W. Lavon & Marianne W. Day Castle Dale, UT	Priority Date: 00/00/1869			X		X		X	

TABLE 1 - WATER RIGHTS
T. 13 S. R. 13 E. Section 36

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
			No Water Rights									

TABLE 1 - WATER RIGHTS
T. 14 S. R. 14 E. Section 6

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
			No Water Rights									

TABLE 1 - WATER RIGHTS
T. 14 S. R. 14 E. Section 7

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
91-2038	.0000	.00	Grassy Trail Creek Water Use: Jay Pagano Wellington, UT 84542	Priority Date: 00/00/1869			X		X		X	
91-3520	.0000	.00	Grassy Trail Creek Water Use: Magnificent Seven LLC Penta Creek LLC 136 S. Main Suite 1000 Salt Lake City, UT 84101	Priority Date: 00/00/1869			X		X		X	
91-3521	.0000	.00	Grassy Trail Creek Water Use: Magnificent Seven LLC Penta Creek LLC 136 S. Main Suite 1000 Salt Lake City, UT 84101	Priority Date: 00/00/1869			X		X		X	
91-158	.0000	65.00	Grassy Trail Creek Water Use: Irrigation, Domestic, Municipal, Mining Sunnyside Cogeneration Associates P.O. Box 58078 Salt Lake City, UT 84158	2824 S 1166 W from N4 cnr Priority Date: 08/19/1947			X		X			

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
91-361	.5000	.00	Grassy Trail Creek Water Use: Domestic, Municipal, Mining Sunnyside Cogeneration Associates P.O. Box 58078 Salt Lake City, UT 84158	2824 S 1166 W from N4 cnr Priority Date: 00/00/1878			X		X			
91-118	5.0000	.00	Grassy Trail Creek Water Use: Domestic, Municipal, Mining Sunnyside Cogeneration Associates P.O. Box 58078 Salt Lake City, UT 84158	2824 S 1166 W from N4 cnr Priority Date: 11/05/1937			X		X			
91-143	.0000	16.670	Grassy Trail Creek Water Use: Irrigation, Domestic, Municipal, Mining Sunnyside Cogeneration Associates P.O. Box 58078 Salt Lake City, UT 84158	2824 S 1166 W from N4 cnr Priority Date: 12/18/1943			X		X			

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
91-159	5.0000	.00	Grassy Trail Creek Water Use: Irrigation, Domestic, Municipal, Mining Sunnyside Cogeneration Associates P.O. Box 58078 Salt Lake City, UT 84158	2824 S 1166 W from N4 cnr Priority Date: 09/24/1947			X		X			
91-145	.0000	16.67	Grassy Trail Creek Water Use: Irrigation, Domestic, Municipal, Mining Sunnyside Cogeneration Associates P.O. Box 58078 Salt Lake City, UT 84158	2824 S 1166 W from N4 cnr Priority Date: 12/18/1943			X		X			
91-363	1.5000	.00	Grassy Trail Creek Water Uses: Irrigation, Domestic, Municipal, Mining East Carbon City East Carbon, UT 84520	2824 S 1166 W from NE cnr Priority Date: 00/00/1878			X		X			
91-360	2.0000	.00	Grassy Trail Creek Water Uses: Domestic, Municipal, Mining East Carbon City East Carbon, UT 84520	2824 S 1166 W from NE cnr Priority Date: 00/00/1878			X		X			

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
91-141	5.0000	.00	Grassy Trail Creek Water Uses: Domestic, Municipal, Mining East Carbon City East Carbon, UT 84520	2824 S 1166 W from NE cnr Priority Date: 12/18/1943			X		X			
91-362	1.0000	.00	Grassy Trail Creek Water Uses: Irrigation, Domestic, Municipal, Mining Sunnyside City, UT 84539	2824 S 1166 W from NE cnr Priority Date: 00/00/1878			X		X			
91-367	.8750	.00	Grassy Trail Creek Water Uses: Domestic, Municipal, Mining Sunnyside City, UT 84539	2824 S 1166 W from NE cnr Priority Date: 00/00/1888			X		X			
91-368	.6250	.00	Grassy Trail Creek Water Uses: Domestic, Municipal, Mining East Carbon City East Carbon, UT 84520	2824 S 1166 W from NE cnr Priority Date: 00/00/1888			X		X			
91-369	.2500	.00	Grassy Trail Creek Water Uses: Domestic, Municipal, Mining East Carbon City East Carbon, UT 84520	2824 S 1166 W from NE cnr Priority Date: 00/00/1888			X		X			

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
91-28	2.2000	.00	Grassy Trail Creek Water Uses: Domestic, Municipal, Mining East Carbon City East Carbon, UT 84520	2824 S 1166 W from NE cnr Priority Date: 06/10/1913			X		X			
91-84	2.0000	.00	Grassy Trail Creek Water Uses: Domestic, Municipal, Mining East Carbon City East Carbon, UT 84520	2824 S 1166 W from NE cnr Priority Date: 01/31/1924			X		X			
91-114	1.8000	.00	Grassy Trail Creek Water Uses: Domestic, Municipal, Mining East Carbon City East Carbon, UT 84520	2824 S 1166 W from NE cnr Priority Date: 07/05/1935			X		X			
91-125	5.0000	.00	Grassy Trail Creek Water Uses: Domestic, Municipal, Mining East Carbon City East Carbon, UT 84520	2824 S 1166 W from NE cnr Priority Date: 01/12/1940			X		X			
91-146	.0000	33.33	Grassy Trail Creek Water Uses: Domestic, Municipal, Mining East Carbon City East Carbon, UT 84520	2824 S 1166 W from NE cnr Priority Date: 12/18/1943			X		X			

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
91-178	.0000	916.00	Grassy Trail Creek Water Uses: Domestic, Municipal, Mining East Carbon City East Carbon, UT 84520	2824 S 1166 W from NE cnr Priority Date: 12/19/1951			X		X			
91-372	5.5750	.00	Grassy Trail Creek Water Use: Irrigation, Domestic, Municipal, Mining Sunnyside Cogeneration Associates P.O. Box 58078 Salt Lake City, UT 84158	2824 S 1166 W from N4 cnr Priority Date: 00/00/1885			X		X			
a18518	.5000	.00	Grassy Trail Creek Water Use: Irrigation, Domestic, Municipal, Mining Sunnyside Cogeneration Associates P.O. Box 58078 Salt Lake City, UT 84158	2824 S 1166 W from N4 cnr Priority Date: 00/00/1878			X		X			
a18520	5.5750	.00	Grassy Trail Creek Water Use: Irrigation, Domestic, Municipal, Mining Sunnyside Cogeneration Associates P.O. Box 58078 Salt Lake City, UT 84158	2824 S 1166 W from N4 cnr Priority Date: 00/00/1885			X		X			

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
91-1640	.0000	.00	Left Fork Grassy Trail Creek Water Use: Magnificent Seven LLC Penta Creek LLC 136 S. Main, Suite 1000 Salt Lake City, UT 84101	Priority Date: 00/00/1869			X		X			

TABLE 1 - WATER RIGHTS
T. 14 S. R. 14 E. Section 18

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
91-158	.0000	65.00	Grassy Trail Creek Water Use: Irrigation, Domestic, Municipal, Mining Sunnyside Cogeneration Associates P.O. Box 58078 Salt Lake City, UT 84158	1163 S 644 W from NE cnr Priority Date: 08/19/1947			X		X			
91-361	.5000	.00	Grassy Trail Creek Water Use: Irrigation, Domestic, Municipal, Mining Sunnyside Cogeneration Associates P.O. Box 58078 Salt Lake City, UT 84158	1163 S 644 W from NE cnr Priority Date: 00/00/1878			X		X			
91-118	5.0000	.00	Grassy Trail Creek Water Use: Irrigation, Domestic, Municipal, Mining Sunnyside Cogeneration Associates P.O. Box 58078 Salt Lake City, UT 84158	1163 S 644 W from NE cnr Priority Date: 11/05/1937			X		X			

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
91-143	.0000	16.67	Grassy Trail Creek Water Use: Irrigation, Domestic, Municipal, Mining Sunnyside Cogeneration Associates P.O. Box 58078 Salt Lake City, UT 84158	1163 S 644 W from NE cnr Priority Date: 12/18/1943			X		X			
91-159	5.0000	.00	Grassy Trail Creek Water Use: Irrigation, Domestic, Municipal, Mining Sunnyside Cogeneration Associates P.O. Box 58078 Salt Lake City, UT 84158	1163 S 644 W from NE cnr Priority Date: 09/24/1947			X		X			
91-145	.0000	16.67	Grassy Trail Creek Water Use: Irrigation, Domestic, Municipal, Mining Sunnyside Cogeneration Associates P.O. Box 58078 Salt Lake City, UT 84158	1163 S 644 W from NE cnr Priority Date: 12/18/1943			X		X			
91-360	2.0000	.00	Grassy Trail Creek Water Uses: Domestic, Municipal, Mining East Carbon City East Carbon, UT 84520	1163 S 644 W from NE cnr Priority Date: 00/00/1878			X		X			

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
91-141	5.0000	.00	Grassy Trail Creek Water Use: Domestic East Carbon City East Carbon, UT 84520	1163 S 644 W from NE cnr Priority Date: 12/18/1943			X		X			
91-362	1.0000	.00	Grassy Trail Creek Water Use: Irrigation, Domestic, Municipal, Mining Sunnyside City, UT 84539	1163 S 644 W from NE cnr Priority Date: 00/00/1878			X		X			
91-367	.8750	.00	Grassy Trail Creek Water Use: Irrigation, Domestic, Municipal, Mining Sunnyside City, UT 84539	1163 S 644 W from NE cnr Priority Date: 00/00/1888			X		X			
91-368	.6250	.00	Grassy Trail Creek Water Uses: Domestic, Municipal, Mining East Carbon City East Carbon, UT 84520	1163 S 644 W from NE cnr Priority Date: 00/00/1888			X		X			
91-369	.2500	.00	Grassy Trail Creek Water Uses: Domestic, Municipal, Mining East Carbon City East Carbon, UT 84520	1163 S 644 W from NE cnr Priority Date: 00/00/1888			X		X			

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
91-28	2.2000	.00	Grassy Trail Creek Water Uses: Domestic, Municipal, Mining East Carbon City East Carbon, UT 84520	1163 S 644 W from NE cnr Priority Date: 06/10/1913			X		X			
91-84	2.0000	.00	Grassy Trail Creek Water Uses: Domestic, Municipal, Mining East Carbon City East Carbon, UT 84520	1163 S 644 W from NE cnr Priority Date: 01/31/1924			X		X			
91-114	1.8000	.00	Grassy Trail Creek Water Uses: Domestic, Municipal, Mining East Carbon City East Carbon, UT 84520	1163 S 644 W from NE cnr Priority Date: 07/05/1935			X		X			
91-125	5.0000	.00	Grassy Trail Creek Water Uses: Domestic, Municipal, Mining East Carbon City East Carbon, UT 84520	1163 S 644 W from NE cnr Priority Date: 02/13/1940			X		X			
91-144	.0000	33.33	Grassy Trail Creek Water Uses: Municipal East Carbon City East Carbon, UT 84520	1163 S 644 W from NE cnr Priority Date: 12/18/1943			X		X			

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
91-146	.0000	33.33	Grassy Trail Creek Water Uses: Domestic, Municipal, Mining East Carbon City East Carbon, UT 84520	1163 S 644 W from NE cnr Priority Date: 12/18/1943			X		X			
91-178	.0000	916.00	Grassy Trail Creek Water Uses: Domestic, Mining East Carbon City East Carbon, UT 84520	1163 S 644 W from NE cnr Priority Date: 12/19/1951			X		X			
91-372	5.5750	.00	Grassy Trail Creek Water Use: Irrigation, Domestic, Municipal, Mining Sunnyside Cogeneration Associates P.O. Box 58078 Salt Lake City, UT 84158	1163 S 644 W from NE cnr Priority Date: 00/00/1885			X		X			
91-140	.0000	50.00	Grassy Trail Creek Water Uses: Irrigation, Domestic East Carbon City East Carbon, UT 84520	1163 S 644 W from NE cnr Priority Date: 12/18/1943			X					X
91-142	.0000	50.00	Grassy Trail Creek Water Uses: Irrigation, Domestic East Carbon City East Carbon, UT 84520	1163 S 644 W from NE cnr Priority Date: 12/18/1943			X					X

Water Right Number	Quantity CFS	Quantity or AC-FT	Source Description	Point of Diversion Description	UNN	APP	PER	TER	SUR	UGW	PTP	RED
a18518	.5000	.00	Grassy Trail Creek Water Use: Irrigation, Municipal, Mining, Power, other Sunnyside Cogeneration Associates P.O. Box 58078 Salt Lake City, UT 84158	1163 S 644 W from NE cnr Priority Date: 00/00/1885		X			X			
a18520	5.5750	.00	Grassy Trail Creek Water Use: Irrigation, Municipal, Mining, Power, other Sunnyside Cogeneration Associates P.O. Box 58078 Salt Lake City, UT 84158	1163 S 644 W from NE cnr Priority Date: 00/00/1885		X			X			
91-4948	.0090	.00	Unnamed Spring Water Use: Stockwatering Sunnyside Coal Company 1113 Spruce Street Boulder, CO 80302	1020 N 1490 E from SW cnr Priority Date: 00/00/1869			X		X			

LIST OF ABBREVIATIONS

UNN	Unapproved water right application
PER	Perfected water right
SUR	Surface water right
PTP	Point to point right
APP	Approved water right application
TER	Terminated water right
UGW	Underground water right
RED	Point of Rediversion

STATE LEASE
ML 47711

FEDERAL LEASE
UTU-78562

STATE LEASE
ML 49287

STATE LEASE
ML 47711

FEDERAL LEASE
UTU-78562

FEDERAL LEASE
SL-068754

FEE

FEE

FEE

TOPSOIL BORROW
PERMIT AREA
(SITLA)

PUMP STATION
PERMIT AREA

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

UTAH REGISTERED
#191488
PROFESSIONAL ENGINEER

JOHN CHRISTOPHER LEWIS, P.E. NO. 191488

Existing Permit Area (6114.89 acres)

WEST RIDGE MINE
Map 1-0
Permit Map

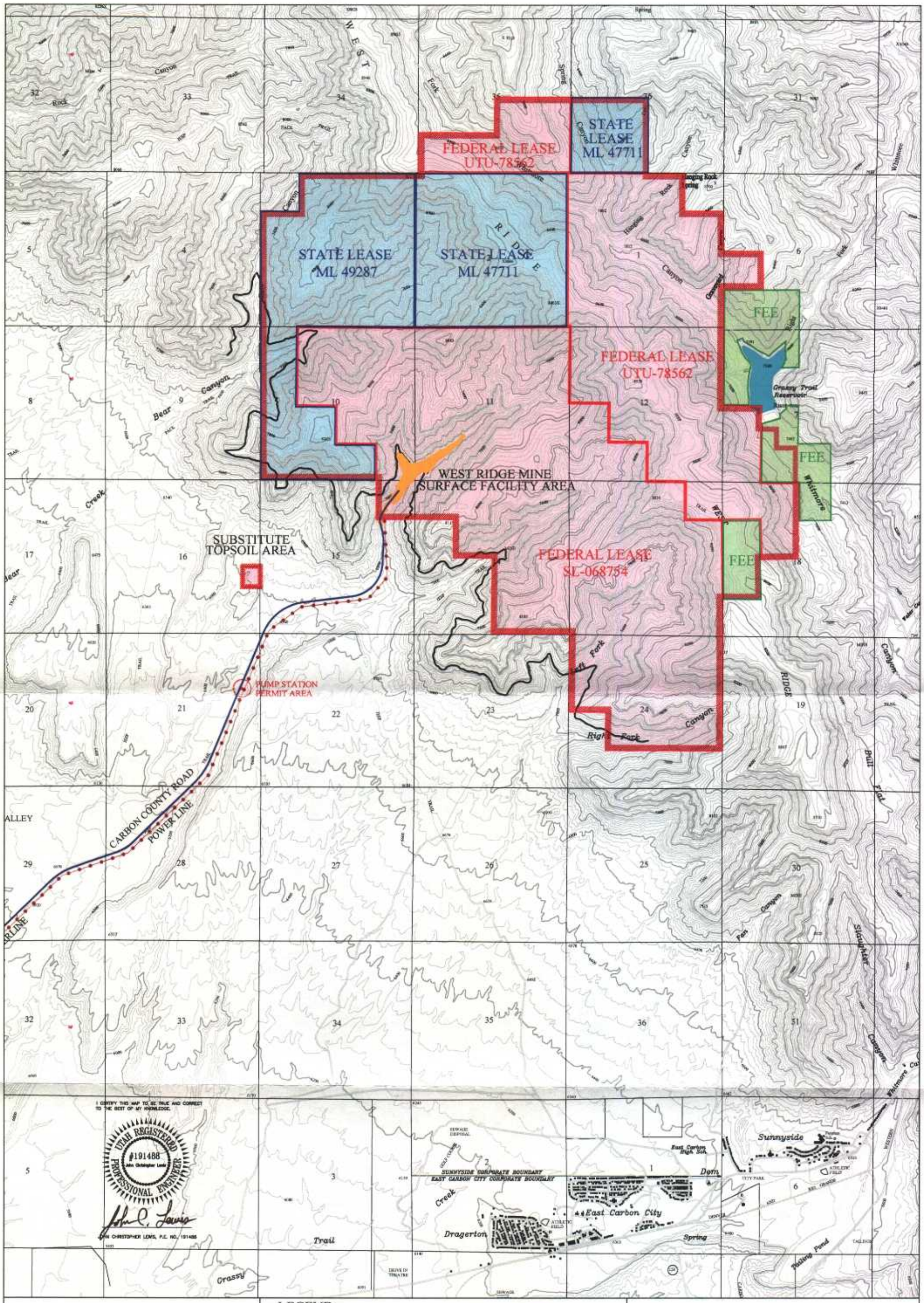
DATE: 09-02-05 REV: 2 ACAD REF: MAP1-0 PERMITMAP

LEGEND:
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- Outcrop

RECEIVED
SEP 22 2005
DIV. OF OIL, GAS & MINING

WEST RIDGE
RESOURCES, INC.

SCALE: 1"=2000'



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

UTAH REGISTERED #191488 PROFESSIONAL ENGINEER

JOHN CHRISTOPHER LEWIS, P.E. NO. 191488

WEST RIDGE MINE

Map 1-1

Location Map

DATE: 09-02-05 REV: 9 ACAD REF: MAP1-1 LOCATION

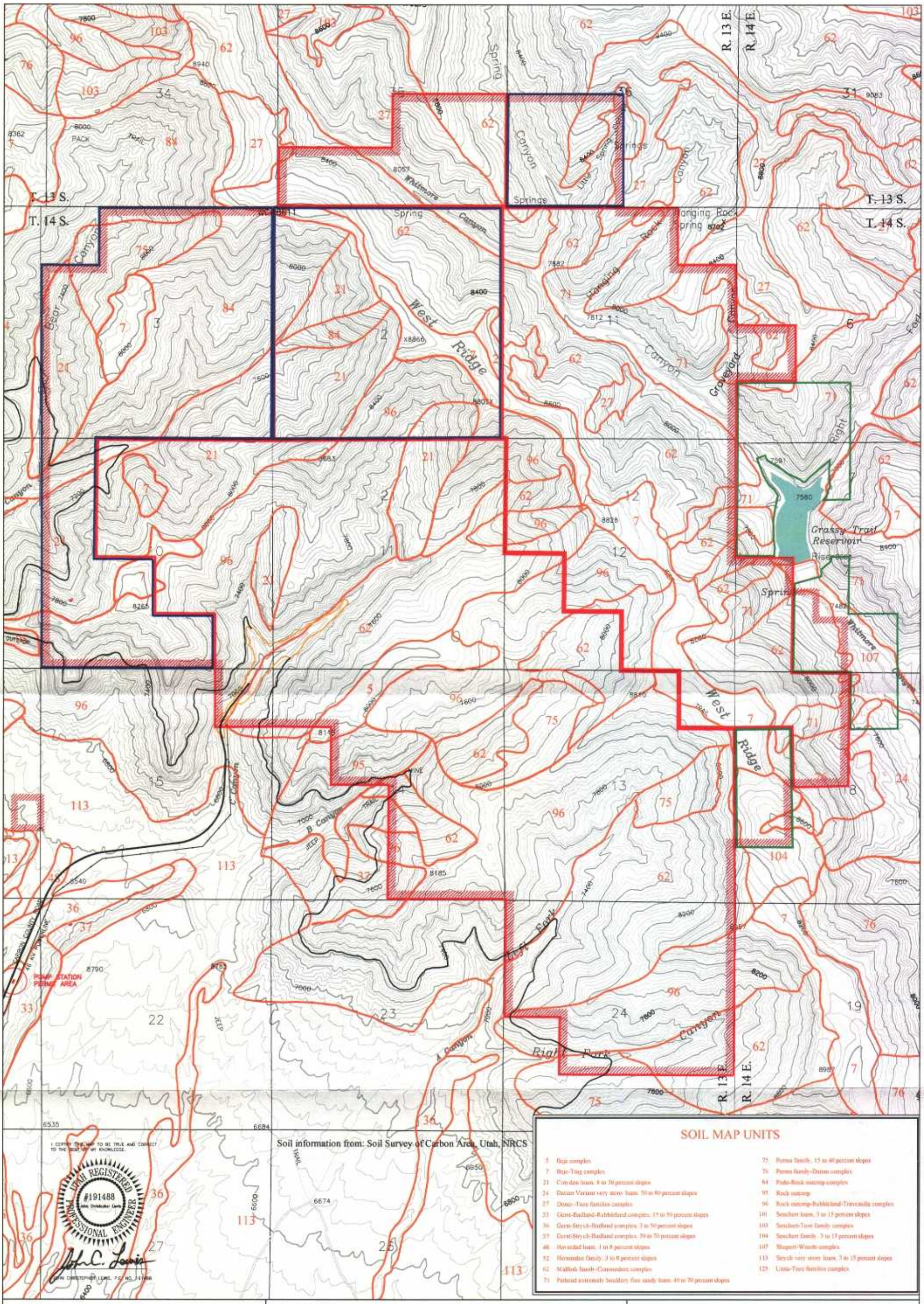
LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- Outcrop
- Power Line

RECEIVED
SEP 22 2005
DIV. OF OIL, GAS & MINING

WEST RIDGE RESOURCES, INC.

SCALE: 1"=3000'



WEST RIDGE MINE
Map 2-1
Regional Soil Map

LEGEND:
- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- Soil Mapping Boundary
- Soil Map Number (113)

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SCALE: 1"=2000'

DATE: 09-02-05 REV: 8 ACAD REF: MAP2-1 REGSOIL

T. 13 S.
T. 14 S.
R. 13 E.
R. 14 E.

Pinyon/Juniper Reference Area

Douglas Fir/Maple Reference Area

Douglas Fir/Maple (old reference area) 1997 field data

Douglas Fir/Rocky Mtn. Juniper Reference Area

PUMP STATION PERMIT AREA

VEGETATION COMMUNITIES

- Douglas Fir
- Pinyon/Juniper
- Sagebrush/Grass/Herbland
- Aspen
- Mountain Brush/Sagebrush
- 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.

UTAH REGISTERED #191488 PROFESSIONAL ENGINEER
CHRISTOPHER LOWE, P.E. NO. 191488

WEST RIDGE MINE
Map 3-1
General Vegetation Communities

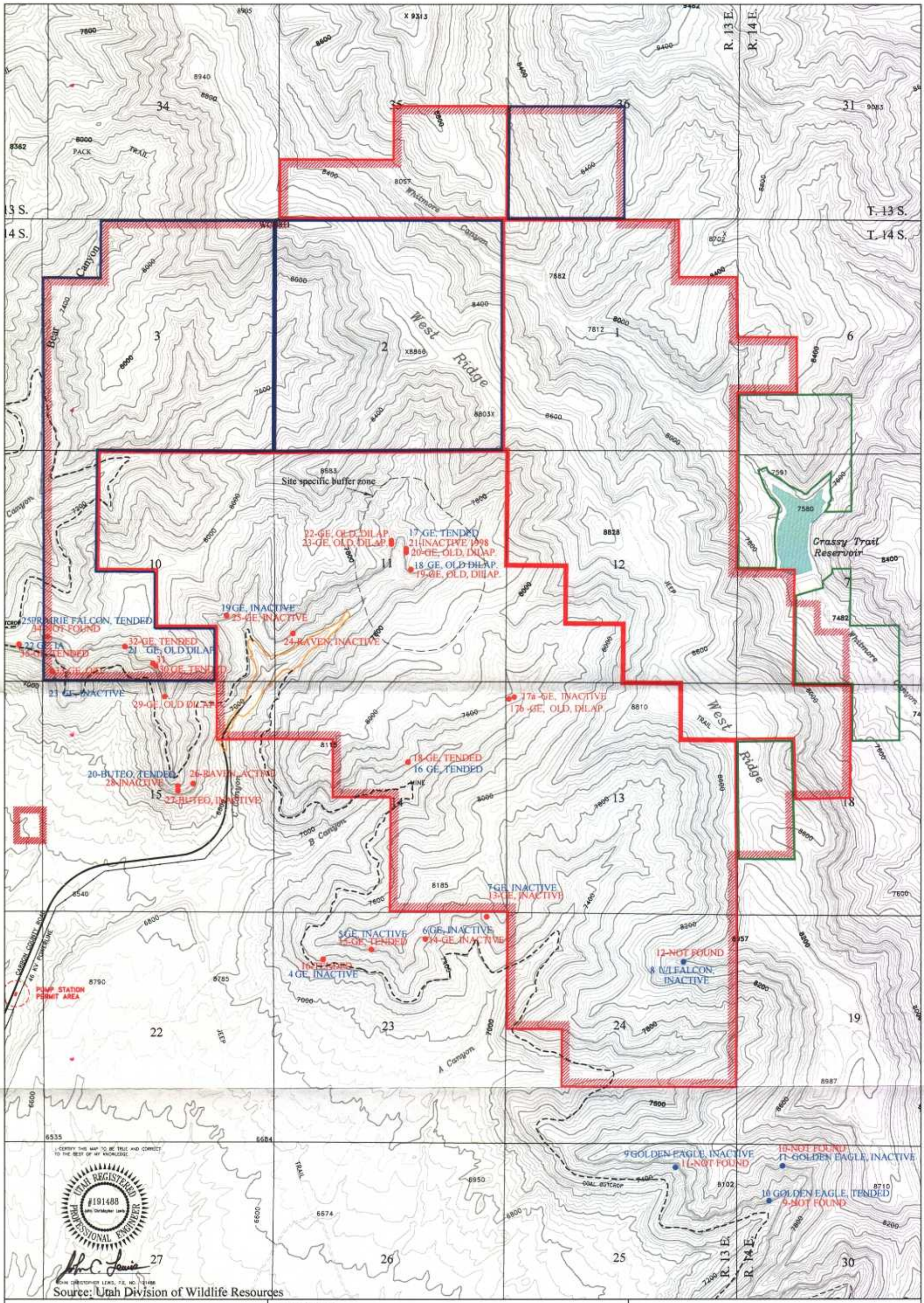
DATE: 09-02-05 REV: 12 ACAD REF: MAP3-1 GENVEG

LEGEND:
- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- Outcrop

RECEIVED
SEP 22 2005
DIV. OF OIL, GAS & MINING

WEST RIDGE RESOURCES, INC.

SCALE: 1"=2000'



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UTAH REGISTERED #191488 PROFESSIONAL ENGINEER

JOHN CHRISTOPHER LEWIS, P.E. NO. 191488

Source: Utah Division of Wildlife Resources

WEST RIDGE MINE

Map 3-4A

Wildlife Map - Raptor Survey

DATE: 09-02-05 REV: 9 ACAD REF: MAP3-4A RAPTOR

LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- Outcrop
- Raptor Nest - 1997 Survey
- Raptor Nest - 1998 Survey

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WEST RIDGE RESOURCES, INC.

SCALE: 1"=2000'

DS-C
(DEER, SUMMER
CRITICAL)

DS-C
(DEER, SUMMER
CRITICAL)

DW-H
(DEER, WINTER
HIGH PRIORITY)

DW-H
(DEER, WINTER
HIGH PRIORITY)

DW-C
(DEER, WINTER
CRITICAL)

DS-C
(DEER, SUMMER
CRITICAL)

T. 13 S.
T. 14 S.
R. 13 E.
R. 14 E.

West Ridge
West Ridge
Bear Canyon
Whitmore Canyon
Grassy Trail Reservoir
PACK TRAIL
JEEP TRAIL
COAL OUTCROP
MINE
OUTCROP
CARBON COUNTY ROAD
46 KV POWERLINE
PUMP STATION PERMIT AREA

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

UTAH REGISTERED #191488 PROFESSIONAL ENGINEER

JOHN CHRISTOPHER LEWIS, P.E. NO. 191488

Source: Utah Division of Wildlife Resources

WEST RIDGE MINE

Map 3-4B

Wildlife Map - Deer Range

DATE: 09-02-05 REV: 9 ACAD REF: MAP3-4B DEER

LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- DW-C
- DW-H
- DS-C

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SCALE: 1"=2000'

EY-H
(ELK, YEAR LONG
HIGH VALUE)

EW-H
(ELK, WINTER
HIGH VALUE)

EW-S
(ELK, WINTER
SUBSTANTIAL)

R. 13 E.
R. 14 E.
T. 13 S.
T. 14 S.

West Ridge
Whitmore Canyon
Bear Canyon
A Canyon
B Canyon
C Canyon
Grassy Trail Reservoir
PACK TRAIL
JEEP TRAIL
COAL OUTCROP
PUMP STATION PERMIT AREA
46 KV POWERLINE
CARBON COUNTY ROAD

Source: Utah Division of Wildlife Resources

WEST RIDGE MINE

Map 3-4C

Wildlife Map - Elk Range

DATE: 09-02-05 REV: 9 ACAD REF: MAP 3-4C ELK

Permit Boundary
Federal Lease
State Lease
Penta Creek Fee
Surface Facility Area
EW-S
EY-H
EW-H

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RESOURCES, INC.

SCALE: 1"=2000'

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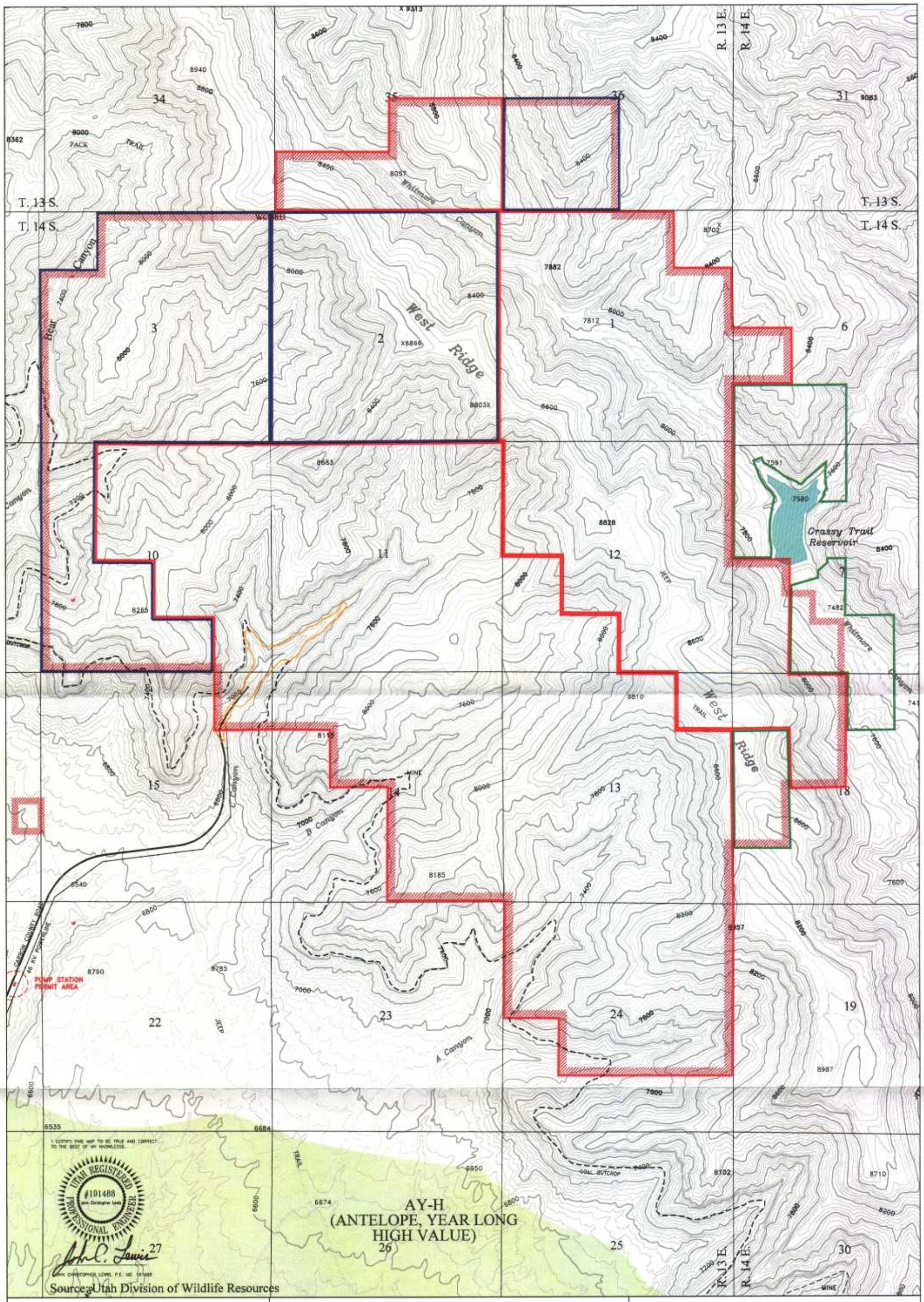

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Source: Utah Division of Wildlife Resources

WEST RIDGE MINE

Map 3-4D

Wildlife Map - Antelope Range

DATE: 09-02-05 REV: 9 ACAD REF: MAP3-4D ANTELOPE

LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- AY-H

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SCALE: 1"=2000'

COW CANYON ALLOTMENT

ROCK CANYON ALLOTMENT

SHEEP CANYON ALLOTMENT

PRIVATE CABIN

NON-ALLOTTED

SHEEP CANYON ALTMT

BEAR CANYON ALLOTMENT

MUD SPRINGS ALLOTMENT

GRASSY TRAIL ALLOTMENT

R. 13 E.

R. 14 E.

T. 13 S.

T. 14 S.

Crassy Trail Reservoir

PUMP STATION PERMIT AREA

SYMBOL LEGEND

Extent of Water Right	•	Fence	×-×-×
Impoundment	△	Spring	
		Locked Gate	=

Refer to Map 7-3 for State Appropriated Water Rights

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JOHN C-RISTOPHER LEWIS, P.E. NO. 191488

WEST RIDGE MINE

Map 4-1

Existing Land Use

DATE: 09-02-05 REV: 10 ACAD REF: MAP4-1 LANDUSE

LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- Grazing Allotment Boundary

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SCALE: 1"=2000'

WEST RIDGE MINE

Map 4-2

Archeology Map

DATE: 09-02-05 REV: 9 ACAD REF: MAP4-2 ARCHEO

LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- Survey Denotation
- Block Survey Boundary
- Linear Survey
- Archeological Site

LP 86-2

42CB-422

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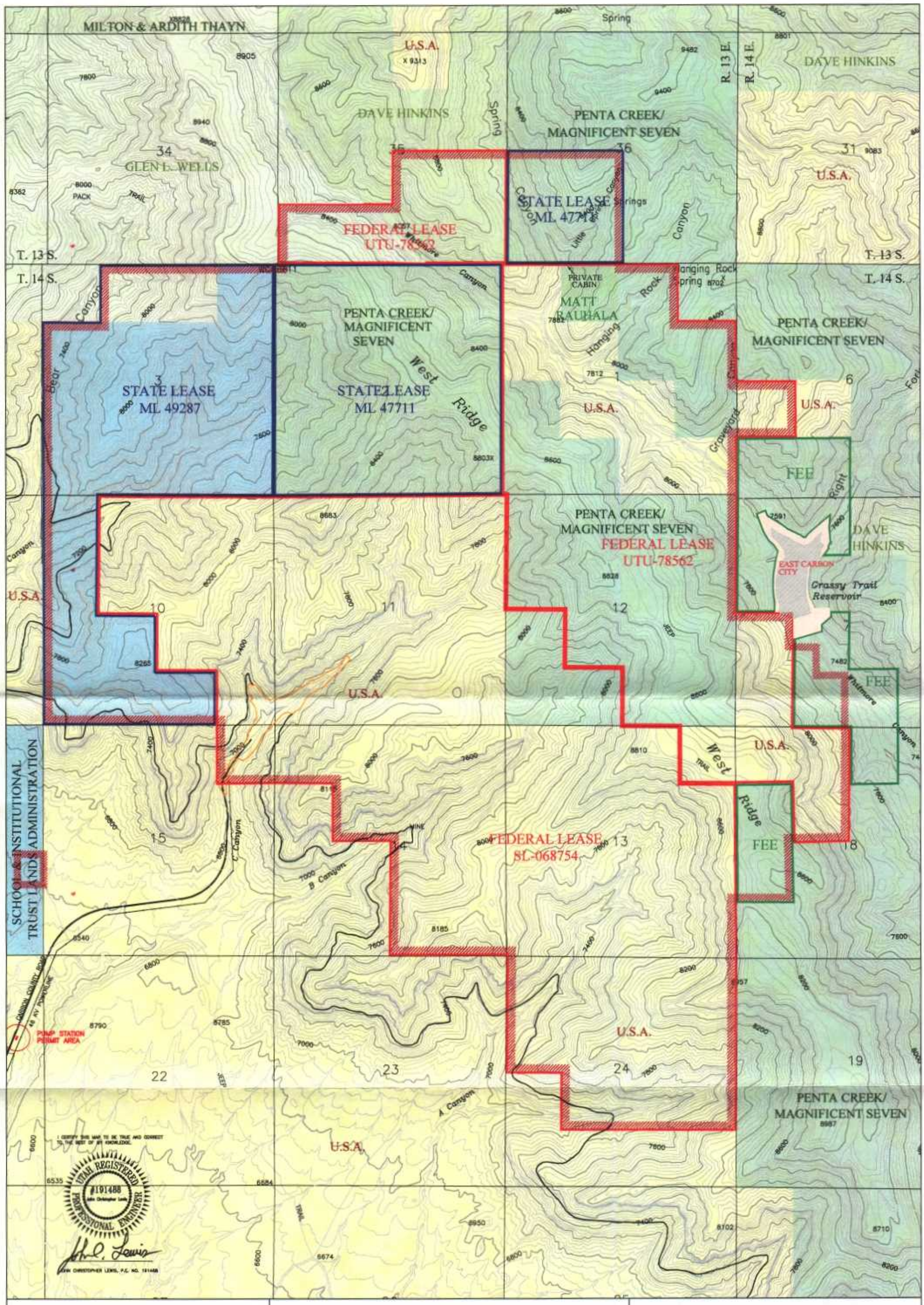
THIS MAP CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION

ALL INFORMATION PREPARED BY SENCO-PHENIX ARCHEOLOGICAL CONSULTING SERVICES

WEST RIDGE RESOURCES, INC.

SCALE: 1"=2000'



WEST RIDGE MINE

Map 5-2

Surface Ownership Map

DATE: 09-02-05 REV: 10 ACAD REF: MAPS-2 SURFOWN

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DIVISION OF OIL, GAS & MINING

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
- Glen L. Wells
- Matt Rauhala
- Milton & Ardith Thayn
- East Carbon City

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UTAH REGISTERED #191488 PROFESSIONAL ENGINEER
JOHN CHRISTOPHER LEWIS, P.E. NO. 191488

WEST RIDGE RESOURCES, INC.

SCALE: 1"=2000'

WEST RIDGE MINE

Map 5-3

Sub-surface Ownership Map

DATE: 09-02-05 REV: 10 ACAD REF: MAP5-3 SUBSURFOWN

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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
- East Carbon City

N

WEST RIDGE RESOURCES, INC.

SCALE: 1"=2000'

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JOHN CHRISTOPHER LEWIS, P.E. NO. 191488

STATE LEASE
ML 47711

FEDERAL LEASE
UTU-78562

STATE LEASE
ML 49287

STATE LEASE
ML 47711

FEE

FEDERAL LEASE
UTU-78562

FEE

FEE

FEDERAL LEASE
SL-068754

Panel 1
Panel 2
Panel 3
Panel 4
Panel 5
Panel 5A
Panel 6
Panel 7
Panel 8
Panel 9
Panel 10
Panel 11
Panel 12
Panel 13
Panel 14
Panel 15
Panel 16
Panel 17
Panel 18
Panel 19
Panel 20
Panel 21
Panel 22
Panel 23
Panel 24
Panel 25
Panel 26
Panel 27
Panel 28
Panel 29
Panel 30
Panel 31

2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2017 2018 2018

Mined Area

Grassy Trail Reservoir

Kaiser Steel Corp.
Sunnyside Mine Workings
(Inactive)

Kaiser Steel Corp.
Sunnyside Mine Workings
(Inactive)

Strike
13%

CARBON COUNTY ROAD
46 KV POWERLINE

PUMP STATION
PERMIT AREA

NOTE:

Mine projections are subject to change depending on conditions encountered in the underground mine workings.

Actual mine works are shown as of March 01, 2005.

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 mining will not be conducted within panel 7 until stipulation 17 of Federal Lease U-78562 has been complied with and approved by the BLM.

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

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WEST RIDGE MINE

Map 5-4A

Mining Projections

DATE: 09-02-05 REV: 9 ACAD REF: WRTIMEA

LEGEND:

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

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WEST RIDGE
RESOURCES, INC.

SCALE: 1"=2000'

Note: Economic minability of this area to be determined upon development of 1st Left entries and other future evaluation of the area.

STATE LEASE ML 47711

FEDERAL LEASE U-78562

STATE LEASE ML 49287

STATE LEASE ML 47711

FEDERAL LEASE U-78562

FEE

FEE

FEE

FEDERAL LEASE SL-068764

Grassy Trail Reservoir

Panel 1
Panel 2
Panel 3
Panel 4
Panel 5
Panel 5A
Panel 6
Panel 7
Panel 8
Panel 9
Panel 10
Panel 11
Panel 12
Panel 13
Panel 14
Panel 15
Panel 16
Panel 17
Panel 18
Panel 19
Panel 20
Panel 21
Panel 22
Panel 23
Panel 24
Panel 25
Panel 26
Panel 27
Panel 28
Panel 29
Panel 30
Panel 31

Fault

Proposed Property Line

5.0'
6.0'
7.0'
8.0'
9.0'

C-Canyon

B-Canyon

A-Canyon

Strike

15%

Carbon County Road

46 KV Powerline

PUMP STATION PERMIT AREA

Kaiser Steel Corp. Sunnyside Mine Workings (Inactive)

Kaiser Steel Corp. Sunnyside Mine Workings (Inactive)

2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

Mined Area

NOTE:
Mine projections and barrier pillar location(s) are subject to change depending on conditions encountered in the underground mine workings.
Actual mine works are shown as of March 01, 2005.
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 mining will not be conducted within panel 7 until stipulation 17 of Federal Lease U-78562 has been complied with and approved by the BLM.

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JOHN CHRISTOPHER LEWIS, P.E. NO. 191488

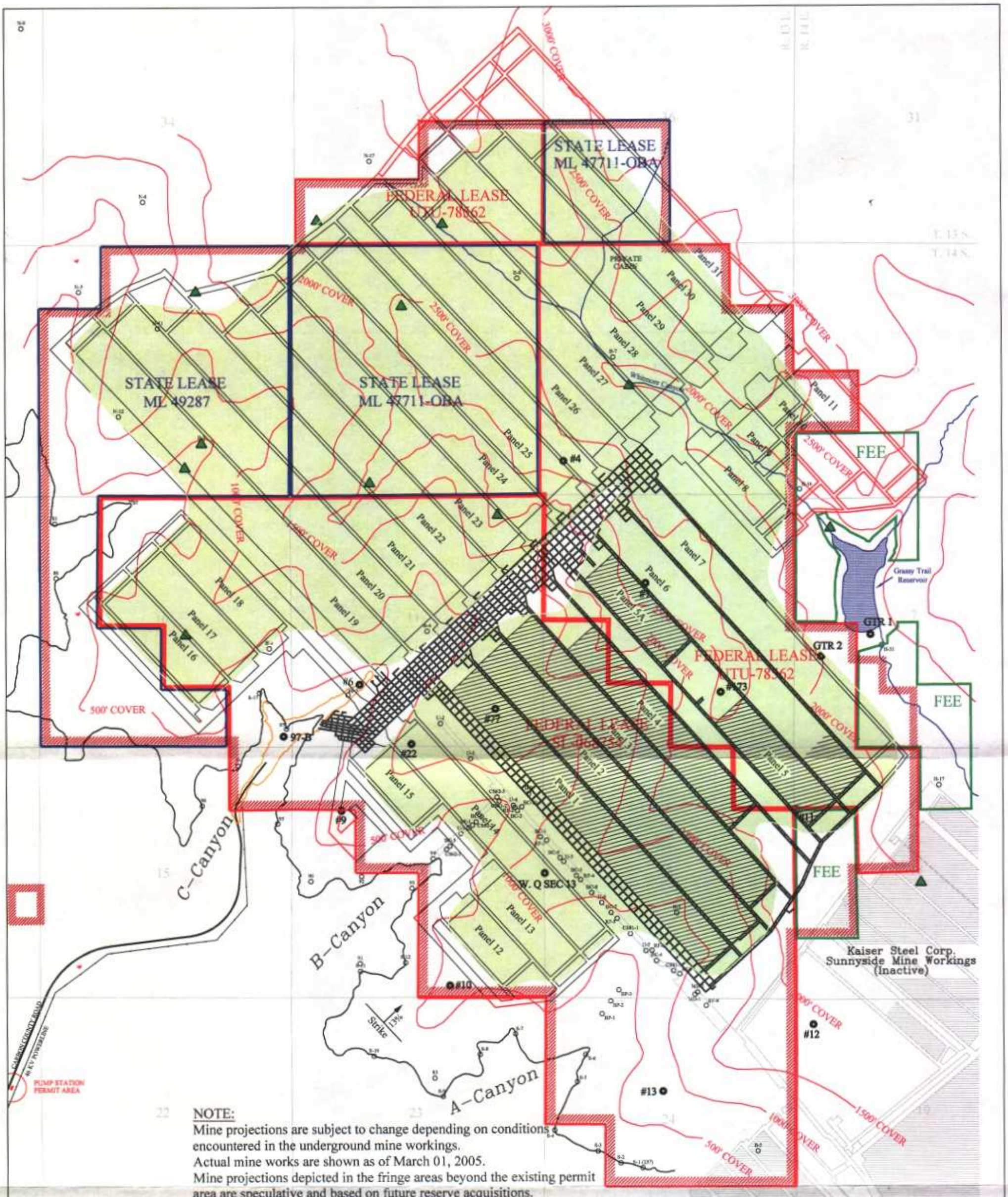
WEST RIDGE MINE
Map 5-4B
Mining Projections (Extended Reserves)

DATE: 09-02-05 REV: 9 ACAD REF: WRTIMEBSITLA APPROVE

LEGEND:
- Permit Boundary
- Federal Lease
- State Lease (ML 49287)
- Penta Creek Fee
- Surface Facility Area
- Outcrop

WEST RIDGE RESOURCES, INC.

SCALE: 1"=2000'



NOTE:

Mine projections are subject to change depending on conditions encountered in the underground mine workings.

Actual mine works are shown as of March 01, 2005.

Mine projections depicted in the fringe areas beyond the existing permit area are speculative and based on future reserve acquisitions.

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Longwall mining will not be conducted within panel 7 until stipulation 17 of Federal Lease U-78562 has been complied with and approved by the BLM.

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.

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JOHN CHRISTOPHER LEWIS, P.E. NO. 191488

WEST RIDGE MINE

Map 5-7

Subsidence Map

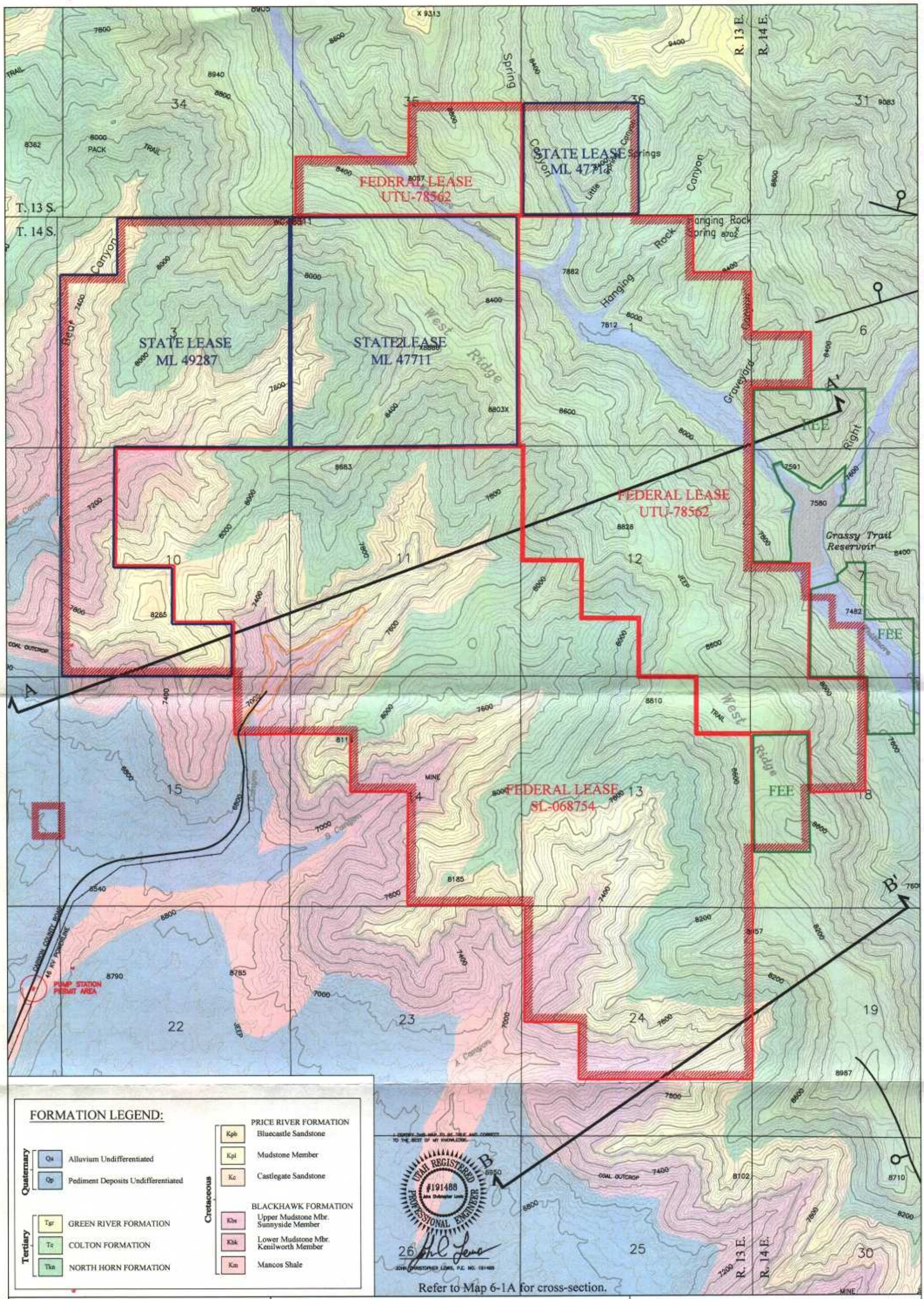
DATE: 09-02-05 REV: 11 ACAD REF: MAP5-7A SUBSIDE

LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- Outcrop
- Cover
- Drill Hole
- Possible Subsidence Area
- Existing Photogammetric Control Points
- Future Photogammetric Control Points

WEST RIDGE RESOURCES, INC.

SCALE: 1"=2000'



WEST RIDGE MINE

Map 6-1

Regional Geology Map

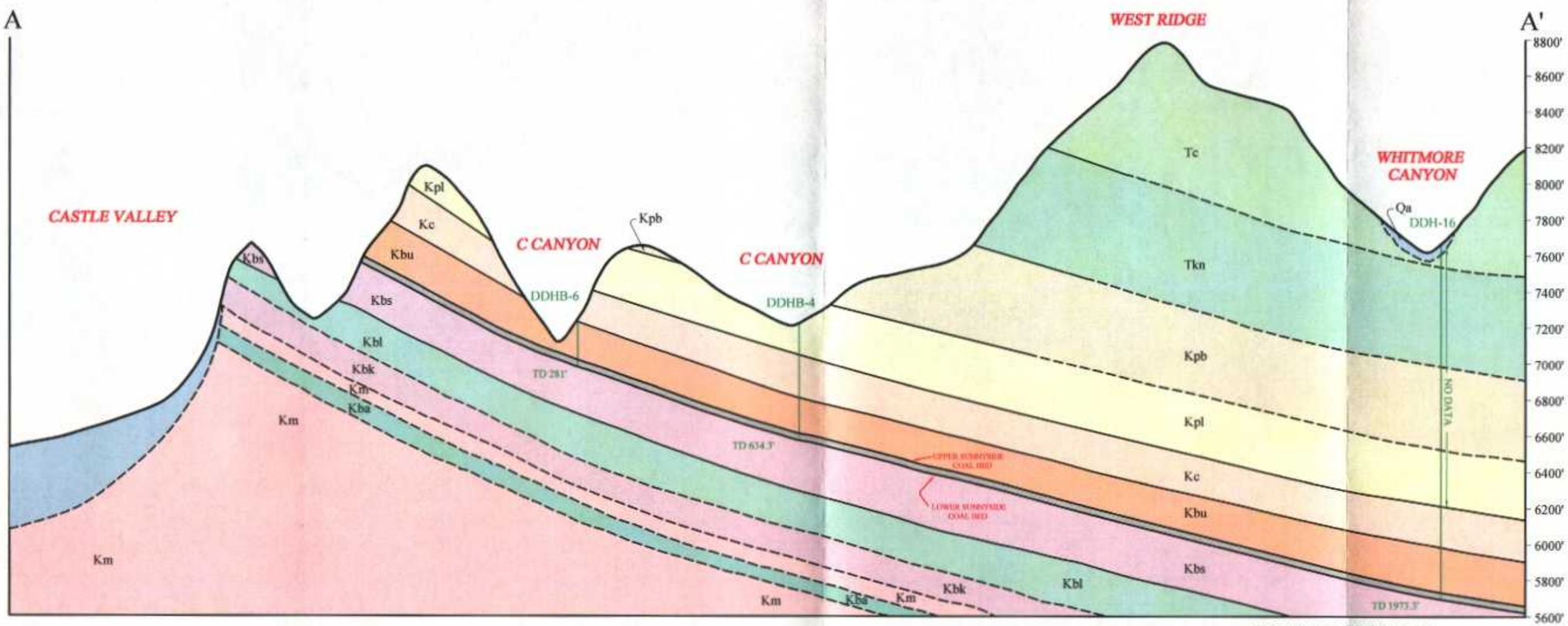
DATE: 09-02-05 REV: 8 ACAD REF: MAP6-1 GEOLOGY

LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- Fault

WEST RIDGE RESOURCES, INC.

SCALE: 1"=2000'



HORIZONTAL SCALE: 1"=700'

LEGEND:

Contact (Dashed where inferred)

DDHB-6 / TD 281' — Drill Hole Location

Quaternary

- Qa — Alluvium Undifferentiated
- Qp — Pediment Deposits Undifferentiated

Tertiary

- Tgr — GREEN RIVER FORMATION
- Tc — COLTON FORMATION
- Tkn — NORTH HORN FORMATION

Cretaceous

- Kpb — PRICE RIVER FORMATION, Bluecastle Sandstone
- Kpl — Mudstone Member
- Kc — Castlegate Sandstone
- Kbu — BLACK HAWK FORMATION, Upper Mudstone Member
- Kbs — Sunnyside Member
- Kbl — Lower Mudstone Member
- Kbk — Kenilworth Member
- Kha — Aberdeen Member
- Km — Mancos Shale

Note: Refer to Map 6-1 for cross-section index.

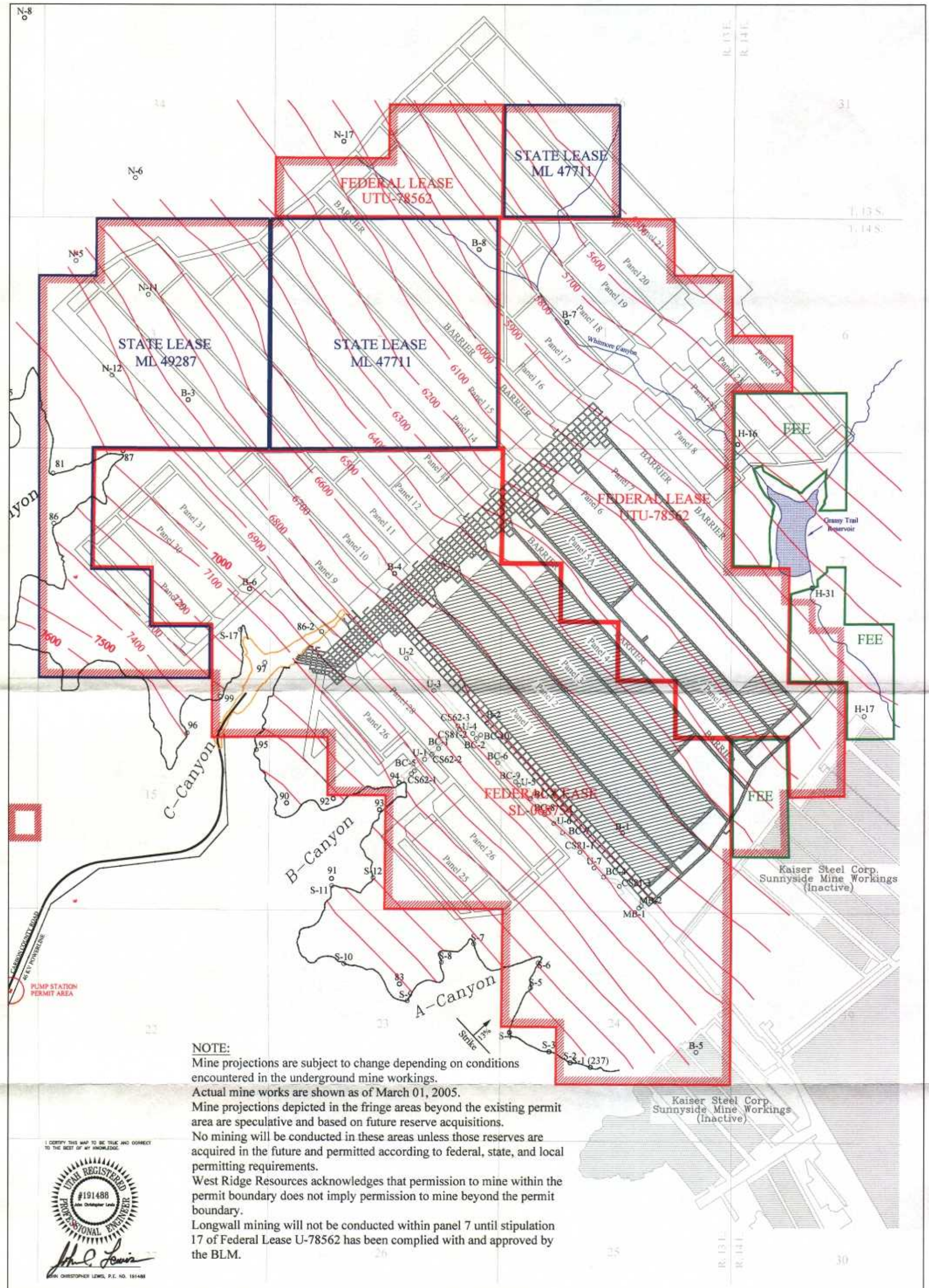
WEST RIDGE RESOURCES, INC.

I CERTIFY THAT I AM TO BE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE. John Christopher Lewis, P.E. No. 191488

REGISTERED PROFESSIONAL ENGINEER #191488 UTAH

WEST RIDGE MINE
Map 6-1A
Geologic Cross-Section A-A'

DATE 10-02-05 REV-3 ACAD REF MAPS-1A GEO-X



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West Ridge Resources acknowledges that permission to mine within the permit boundary does not imply permission to mine beyond the permit boundary.

Longwall mining will not be conducted within panel 7 until stipulation 17 of Federal Lease U-78562 has been complied with and approved by the BLM.

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UTAH REGISTERED #191488 PROFESSIONAL ENGINEER John Christopher Lewis

JOHN CHRISTOPHER LEWIS, P.E. NO. 191488

WEST RIDGE MINE

Map 6-2

Coal Seam Structure Map

DATE: 09-02-05 REV: 10 ACAD REF: MAP6-2 STRUCTURE

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

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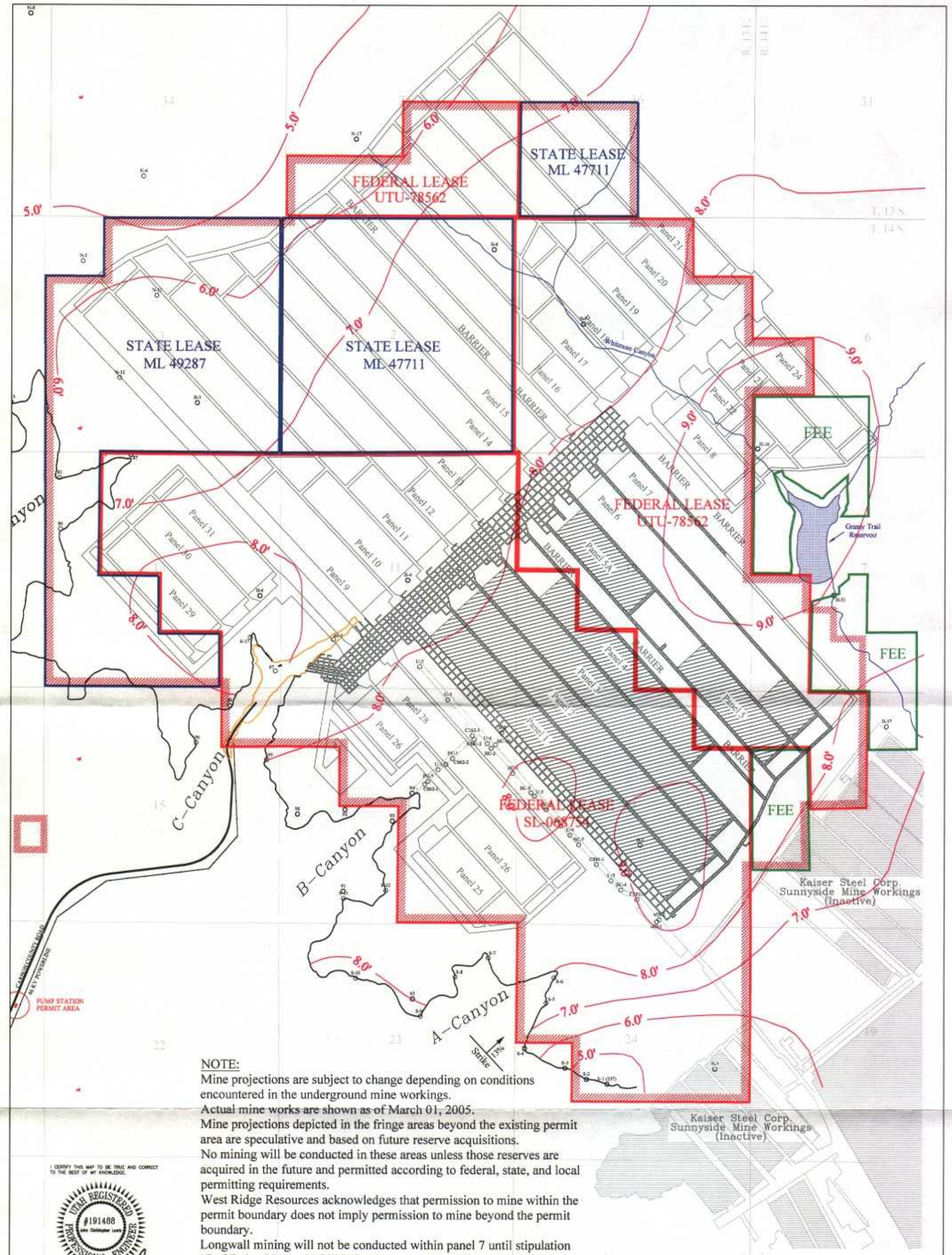
SCALE: 1"=2000'



NOTE:

Mine projections are subject to change depending on conditions encountered in the underground mine workings.

Actual mine works are shown as of March 01, 2005.

Mine projections depicted in the fringe areas beyond the existing permit area are speculative and based on future reserve acquisitions.

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West Ridge Resources acknowledges that permission to mine within the permit boundary does not imply permission to mine beyond the permit boundary.

Longwall mining will not be conducted within panel 7 until stipulation 17 of Federal Lease U-78562 has been complied with and approved by the BLM.

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WEST RIDGE MINE

Map 6-3

Lower Sunnyside Coal Seam Isopach Map

DATE: 09-02-05 REV: 10 ACAD REF: MAP6-3 ISOPACH

LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area
- Outcrop
- Coal Isopachs
- Drill Hole/Channel Samples

WEST RIDGE RESOURCES, INC.

SCALE: 1"=2000'

Refer to Appendix 7-5 for water rights information.

WEST RIDGE MINE

Map 7-3

Water Rights

DATE: 09-02-85 REV: 10 ACAD REF: MAP7-3 WATERIGHTS

LEGEND:

- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Water Right:
  - Point to Point
  - Spring
- Ground Water Right
- Municipal Water System Intake

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WEST RIDGE
RESOURCES, INC.

SCALE: 1"=2000'

June 1986
Seep and Spring
Inventory Area

October 1985 Seep and Spring
Inventory Area

June 1986
Seep and Spring
Inventory Area

October 1985 Seep and Spring
Inventory Area

June 1986
Seep and Spring
Inventory Area

R. 13 E.
R. 14 E.
T. 13 S.
T. 14 S.

SEEP AND SPRING LEGEND

- Seep and Spring Inventory Boundary
- F-17 — Location of Seep or Spring, October 1985
- S-208 — Location of Seep or Spring, June 1986
- △ — Spring Monitoring Station (1985-1989)

UTAH REGISTERED PROFESSIONAL ENGINEER #191488

WEST RIDGE MINE

Map 7-5

Seep/Spring Survey Map

DATE: 09-02-05 REV: 10 ACAD REF: MAP7-5 SEEP-SPRING

LEGEND:
- Permit Boundary
- Federal Lease
- State Lease
- Penta Creek Fee
- Surface Facility Area

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SCALE: 1"=2000'

WEST RIDGE RESOURCES, INC.

SCALE: 1"=2000'

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LEGEND:

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

WEST RIDGE MINE

Map 7-6

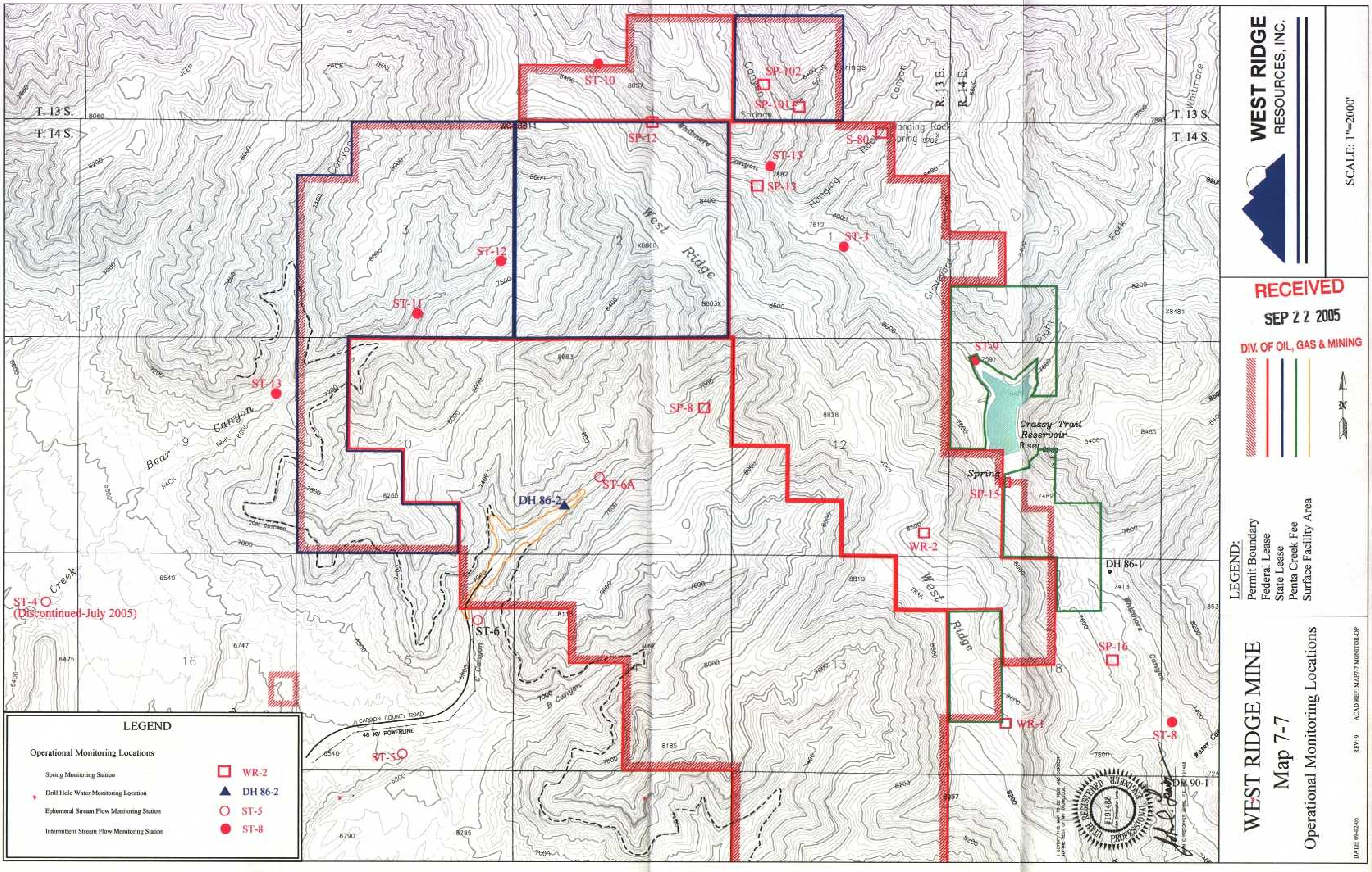
Hydrologic Monitoring Map

(Historical Monitoring Locations)

DATE: 09-02-05 REV: 11 ACAD REF: MAP7-6 MONITOR-HIS

LEGEND

Monitoring Locations	1985/1986	1987 and later
Spring Monitoring Station	△ S-177	□ WR-2
Drill Hole Water Monitoring Location	▲	▲
Ephemeral Stream Flow Monitoring Station	○ M-5	○ ST-7
Intermittent Stream Flow Monitoring Station	◑ M-6	⊖ ST-2
Perennial Stream Flow Monitoring Station	● M-7	● ST-3



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SCALE: 1"=2000'
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DIV. OF OIL, GAS & MINING
LEGEND:
Permit Boundary
Federal Lease
State Lease
Penta Creek Fee
Surface Facility Area
WEST RIDGE MINE
Map 7-7
Operational Monitoring Locations
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
T. 13 S.
T. 14 S.
R. 13 E.
R. 14 E.
ST-10
SP-102
SP-101
SP-12
S-80
Hanging Rock Spring
ST-15
SP-13
ST-3
ST-12
ST-11
ST-13
ST-9
Grassy Trail Reservoir
SP-8
SP-15
ST-6A
DH 86-2
WR-2
DH 86-1
ST-4
(Discontinued-July 2005)
ST-6
SP-16
WR-1
ST-8
ST-5
DH 90-1
West Ridge
Bear Canyon
Whitmore Canyon
C Canyon
B Canyon
CARBON COUNTY ROAD
46 KV POWERLINE