SUMMIT MINERALS, INC.

NO. 1 COAL MINE RECLAMATION PLAN

PRO/043/001

Summit Minerals, Inc.

221 West 2100 South

Salt Lake City, Utah 84115

(801) 486-1861

8/7.41 - curator only

8/7.42 " " "

8/7.50

8/7.53

8

SUMMIT MINERALS, INC.

221 West 2100 South
Salt Lake City, Utah 84115
(801) 486-1861

April 20, 1987

Mr. Lowell P. Braxton, Administrator
State of Utah - Division of Oil, Gas, and Mining
3 Triad Center, Suite 350
355 West North Temple
Salt Lake City, Utah 84180-1203

RE: Response to Technical Deficiencies, Summit No. 1 Mine Reclamation Plan, PRO/043/001, Summit County, Utah

Dear Mr. Braxton:

Please find enclosed seven (7) copies of Summit Minerals' response to deficiencies noted in the referenced plan. Each package contains eight (8) pages for inclusion into your copies of the Reclamation Plan.

I believe that, generally, you and your staff will find these responses adequate. As we have already discussed, the response to UMC 817.132 may require some revision of the bond estimate. If that be the case, please have Randy Harden contact me for making the appropriate adjustments. Should it be necessary, I anticipate having no problem with adjusting the bond amount through permit stipulations.

Sincerely,
SUMMIT MINERALS, INC.

Barbara A. Filas
Engineer

BAF:b

enclosure

cc: J. Higgins w/o enc.

SUMMIT MINERALS, INC.
RESPONSE TO TECHNICAL DEFICIENCIES
Summit No. 1 Mine
PRO/043/001
Summit County, Utah

April 16, 1987

UMC 817.11 Signs and Markers - SCL

Page 784.11-1 has been revised to address use of signs and markers on site.

UMC 817.23 Topsoil: Storage - JSL

Page one (1) of the Revegetation Appendix has been revised to delete references to topsoil stockpiles.

UMC 817.25 Topsoil: Nutrients and Soil Amendments - JSL

The application of alfalfa both as a nitrogen fertilizer and as a mulch is included in the bond estimate. It is the Applicant's opinion that by bonding for product use, he has firmly committed to the use of those products. Equipment requirements for application are detailed on pages RP-18 and RP-19. The bond amount is included on RP-20 and the assumptions used in developing that amount are detailed on RP-21.

UMC 817.50 Hydrologic Balance: Underground Mine Entry and Access Discharge - DD

Page 784.14-4 has been revised to further discuss potential water discharges from the abandoned underground workings.

UMC 817.52 Hydrologic Balance: Surface and Groundwater Monitoring - RS

Page 783.16-19 has been revised to define the magnesium parameter for the last graph on the page.

Page 784.14-2 has been revised to add settleable and dissolved solids to the parameter list.

Page 784.14-3 has been revised to add language which commits to checking the single state sampler following each precipitation event where runoff is expected to occur.

Page 784.14-3 has been revised to include suspended solids to, and delete dissolved solids from, the parameter list.

UMC 817.103 Backfilling and Grading: Covering Coal and Acid- and Toxic-Forming Material - JSL

Page RP-1 of the Reclamation Plan and Bond Estimate Appendix has been revised to reflect four (4) feet of cover over coal waste materials.

UMC 817.121 Subsidence Control: General Requirements - DD

Underground coal mining activities are not a part of this plan, and past underground excavation was done by other owners and operators. It is the Applicant's position that this section does not apply. Because representatives of the Applicant will be on site periodically during the bond release period, the Applicant agrees to, as a good will measure, monitor and repair subsidence affects during the bond release period. The Applicant has included a discussion to this effect on page 784.20.

UMC 817.132 Cessation of Operations: Permanent - LK

Pursuant to this Technical Deficiency, the Applicant provided surface owners with the letters attached. A response on behalf of F.J. Boyer, et. al. is also attached. No response was received on behalf of the estate of J.L. Boyer.

In the letter from F.J. Boyer, et. al., they have indicated a desire for the building to be left following reclamation activities. Realistically, it is more simple for the Applicant to bond to reclaim these structures during reclamation activities. We have provided the surface owners the option of retaining the buildings for their benefit only. The Applicant has no problem with increasing the bond estimate to include the demolition and removal of these structures.

It should be noted that there are at least five easements known to exist over the access road which connects to the road parallelling the Mountain Fuel pipeline. As such, the Applicant feels it inappropriate to propose to reclaim the existing roadway. In reference to the letter from F.J. Boyer, et. al., the law is very clear that a surface owner cannot preclude a mineral owner access to his mineral estate. Regarding abandoned mines, as is the case in this application, Section 40-10-27 of the Utah Code allows the Board the authority to order reclamation without surface owner consent (see Dianne R. Nielson's 11/21/86 letter to C. VanDrunen).

Regarding the statements on post-mining land use in the letter from F.J. Boyer, et. al., it appears obvious that a land use designation of "farming" or cropland and "residential" are inappropriate "...with respect to adjacent lands" according to UMC 700.5 definitions.

Current zoning (AG-1) provides for one dwelling per 40 acres, which effectively precludes a residential development. A post-mining land use designation of "residential" would require considerable changes in zoning classifications and a significant development of the culinary water supply.

A designation of "cropland" requires a firm written commitment from the surface owner that the land will be actively managed as cropland following bond release. Because of the extremely cobbly soil, the lack of available water, the fact that this property has not historically been used as cropland, and that the surface owners are only seasonal dwellers in the area, a "cropland" use designation certainly appears inappropriate.

To date, there have been no measures taken to preclude wildlife from using the surface, and there are none proposed under this plan. As such, a "wildlife habitat" land use designation is appropriate. Because a "grazing" use includes provisions for occasional hay production and ranching operations, it appears to meet the "farming...uses as is the case with respect to adjacent lands" indicated in the Boyer letter. Grazing and wildlife habitat are believed to be the pre-mining land use of this surface.

SUMMIT MINERALS, INC.

221 West 2100 South
Salt Lake City, Utah 84115
(801) 486-1861

March 23, 1987

Ms. Fern J. Boyer
5030 San Lomond Avenue
Ogden, Utah 84404

Dear Ms. Boyer:

Summit Minerals, Inc. has assumed full responsibility for surface reclamation which was or will be disturbed pursuant to coal mining activities at the Blackhawk Mine site. This reclamation responsibility is detailed in our Mining and Reclamation Plan, which was submitted to the State of Utah - Division of Oil, Gas, and Mining. This plan is now being reviewed by Division staff.

Current plans for the surface reclamation do not include the demolition and disposal of the two buildings and the bridge which spans Chalk Creek. The surface reclamation activities also do not include the reclamation of the access road. All other disturbances on the site which were made pursuant to coal mining activities will be suitably reclaimed at the appropriate time.

It is my understanding that you and your family wanted to keep the building located on your property after mining activities are terminated to be used to support future ranching operations. Should you elect to have the road and building removed during reclamation activities, Summit Minerals will simply change the proposed plan to reflect your desire.

In order for the Division to approve our plan to leave this structure after mining and reclamation activities are terminated, we need written documentation from you stating that the building and road are suitable for, and will facilitate your intended post-mining land use.

If you do wish to have the structure and road left after mining activities are terminated, Summit Minerals, Inc. will be happy to provide you with uncontested title to those structures at that time.

I have included a letter of a nature which will facilitate Division approval of the reclamation plan. You may wish to sign this letter, or use it as a guide in drafting your own letter. It is solely for the purpose of establishing post-

mining responsibility for the building and access road on your property. It in no way will be misconstrued as right-of-entry authorization for mining activities.

If you do not respond to this letter by April 15, 1987, I will assume that you do not want the structure and road left and will modify our reclamation plan accordingly. Please contact Barbara Filas at 486-1861 if you have any questions or problems.

Sincerely,
SUMMIT MINERALS, INC.

John Higgins
President

JH/BAF:b

Enclosure

cc: B.A. Filas

SUMMIT MINERALS INC.

221 West 2100 South
Salt Lake City, Utah 84115
(801) 486-1861

March 23, 1987

Mr. Tom V. Boyer
Chalk Creek Road
Coalville, Utah 84017

Dear Mr. Boyer:

Summit Minerals, Inc. has assumed full responsibility for surface reclamation which was or will be disturbed pursuant to coal mining activities at the Blackhawk Mine site. This reclamation responsibility is detailed in our Mining and Reclamation Plan, which was submitted to the State of Utah - Division of Oil, Gas, and Mining. This plan is now being reviewed by Division staff.

Current plans for the surface reclamation do not include the demolition and disposal of the two buildings and the bridge which spans Chalk Creek. The surface reclamation activities also do not include the reclamation of the access road. All other disturbances on the site which were made pursuant to coal mining activities will be suitably reclaimed at the appropriate time.

It is my understanding that you are the heir of the J.L. Boyer estate, and as such you own the surface where the bridge and north building are located. Should you elect to have the access road, building, and bridge removed after mining operations are terminated, Summit Minerals will simply change the proposed plan to reflect your desire.

In order for the Division to approve our plan to leave these structures after mining and reclamation activities are terminated, we need written documentation from you stating that the building, bridge, and road are suitable for, and will facilitate your intended post-mining land use.

If you do wish to have the structures and road left after mining activities are terminated, Summit Minerals, Inc. will be happy to provide you with uncontested title to those structures at that time.

I have included a letter of a nature which will facilitate Division approval of the reclamation plan. You may wish to sign this letter, or use it as a guide in drafting your own letter. It is solely for the purpose of establishing post-

mining responsibility for the building, bridge, and access road on your property. It in no way will be misconstrued as right-of-entry authorization for mining activities.

If you do not respond to this letter by April 15, 1987, I will assume that you do not want the structures and road left and will modify our reclamation plan accordingly. Please contact Barbara Filas at 486-1861 if you have any questions or problems.

Sincerely,
SUMMIT MINERALS, INC.

John Higgins
President

JH/BAF:b

Enclosure

cc: B.A. Filas

LAW OFFICES

PARSONS, BEHLE & LATIMER

A PROFESSIONAL CORPORATION

185 SOUTH STATE STREET, SUITE 700
POST OFFICE BOX 11898
SALT LAKE CITY, UTAH 84147-0898
TELEPHONE (801) 532-1234
TELECOPIER (801) 532-1234, EXT. 297

1016-16TH STREET, N.W., SUITE 600
WASHINGTON, D.C. 20036
TELEPHONE (202) 659-0862

FORMERLY
DICKSON, ELLIS, PARSONS & McCREA
1882-1959

KEITH E. TAYLOR
JAMES B. LEE
SCOTT M. MATHESON
GORDON L. ROBERTS
F. ROBERT REEDER
WILLIAM L. CRAWFORD
LAWRENCE E. STEVENS
DANIEL M. ALLRED
HOWARD J. MARSH
YAN M. ROSS
DAVID S. DOLOWITZ
KENT W. WINTERHOLLER
BARBARA K. POLICH
RANDY L. DRYER
CHARLES H. THRONSON
DAVID R. BIRD
RAYMOND J. ETCHEVERRY
FRANCIS M. WIKSTROM
DAVID W. TUNDERMANN
JAMES M. ELEGANTE
VAL R. ANTCZAK
PATRICK J. GARVER
SPENCER E. AUSTIN
JOHN B. WILSON
ROBERT C. HYDE

C.C. PARSONS
1907-1968

CALVIN A. BEHLE
1947-

OF COUNSEL
GEORGE W. LATIMER

CRAIG B. TERRY
DAVID A. ANDERSON
KENT O. ROCHE
PATRICIA J. WINMILL
RANDY M. GRIMSHAW
DANIEL W. HINDERT
T. PATRICK CASEY
VALDEN P. LIVINGSTON
D. R. CHAMBERS
BYRON W. MILSTEAD
LOIS A. BAAR
MARK E. RINEHART
MICHAEL L. LARSEN
JONATHAN K. BUTLER
DAVID G. MANGUM
JULIA C. ATTWOOD
DEREK LANGTON
LUCY B. JENKINS
HAL J. POS
W. MARK GAVRE
DAVID J. SMITH
TONI MARIE SUTLIFF
MARK S. WEBBER
RANDAL L. MEEK
JAMES C. HYDE

March 31, 1987

Mr. John Higgins
President
Summit Minerals, Inc.
221 West 2100 South
Salt Lake City, UT 84115

Re: Your Letter of March 23, 1987

Dear Mr. Higgins:

I have been provided a copy of your letter of March 23, 1987, to Mrs. Fern J. Boyer. On behalf of Mrs. Boyer, please be advised of the following matters. First, to the Boyer's knowledge, neither Summit Minerals nor any person associated with mineral development of the land leased from Verl Perry, et al., has a lawful right of access over the existing Chalk Creek bridge or along what you characterize as the "access road." Accordingly, any discussion of the road as part of a Mining and Reclamation Plan is inappropriate. Second, Summit Minerals does not have authority to make any plans that include the use or disposition of the building located on the Boyer property. It is my understanding that the building was originally placed on the Boyer property only by Mr. Cafarelli with their consent and only upon the understanding that it would be turned over to them for their use at the cessation of mining.

Finally, the references in your letter to post-mining land uses of "wildlife habitat" and "grazing" are not appropriate. The Boyers intend to use the property for farming and residential uses as is the case with respect to adjacent lands.

Please be advised that any future correspondence or communications with Mrs. Boyer should be made through this office. Thank you very much.

Very truly yours,

Patrick J. Garver

PJG/asb

cc: Mrs. Fern J. Boyer
Gary Boyer

PROOF OF PUBLICATION

STATE OF UTAH, }
County of Summit, } ss.

I, Shirley B. Phelps being first duly sworn, depose and say that I am the bookkeeper of The Summit County Bee, a weekly newspaper of general circulation, published once each week at Coalville, Utah, that the notice attached hereto and which is a Public Notice - Permits and licenses relating to the reclamation of coal mine

was published in said newspaper for 4 consecutive issues, the first publication having been made on the 30 day of January, 19 87, and the last on the 20 day of February, 19 87, that said notice was published in the regular and entire issue of every number of the paper during the period and times of publication, and the same was published in the newspaper proper and not in any supplement.

Shirley B. Phelps

Subscribed and sworn to before me this 20 day of February, 19 87.

Susan F. Bump
Notary Public

PUBLIC NOTICE

Summit Minerals, Inc., 221 West 2100 South, Salt Lake City, Utah 84115, has made applications for permits and licenses relating to the reclamation of a coal mining site located 12 miles east on State Route 133 of Coalville, Summit County, Utah. The project area is contained in parts of the NE ¼ NE ¼, SW ¼ NE¼, and SE¼ NE¼ Sec. 36, T3N, R6E, SLB&M. The total acreage involved is about 14.

The project area is adjacent to Chalk Creek, a major tributary to the Weber River. The area is shown on the Upton Quadrangle, 7.5 Minute Series (Topographic) map of the U.$. Geological Survey.

The application contains information regarding environmental resources and the proposed reclamation plan. A copy of the application is available for public inspection at the following locations:

County Clerk's Office
Summit County Courthouse
Coalville, Utah 84017

State of Utah — Division of Oil, Gas, and Mining
3 Triad Center, Suite 350
355 West North Temple
Salt Lake City, Utah
84180-1203

Written comments, objections, or requests for informal conferences should be directed to:

Mr. Lowell P. Braxton,
Administrator
State of Utah — Division of Oil, Gas, and Mining
3 Triad Center, Suite 350
355 West North Temple
Salt Lake City, Utah
84180-1203

Published in the Summit County Bee Jan. 30, Feb. 6, 13, and 20, 1987

Mine file
S. Linner

SUMMIT MINERALS, INC.

221 West 2100 South
Salt Lake City, Utah 84115
(801) 486-1861

RECEIVED
MAR 19 1987
DIVISION OF
OIL, GAS & MINING

March 19, 1987

Mr. Lowell P. Braxton, Administrator
State of Utah - Division of Oil, Gas, and Mining
3 Triad Center, Suite 350
355 West North Temple
Salt Lake City, Utah 84180-1203

RE: Public Notice of Reclamation Plan Application, Summit No. 1 Mine, INA/043/001, Summit County, Utah.

Dear Mr. Braxton:

Please find enclosed a proof of publication document from the Summit County Bee for the subject public notice. The notice was also run in the Salt Lake Tribune on those same dates, but proof of publication has not yet been provided from that news agency.

In keeping with the time requirements of UMC Part 782.21, I am providing this proof of publication for inclusion as part of the complete permit application package. The Summit County Bee is a newspaper of general circulation in the locality of the proposed reclamation activities.

Sincerely,
SUMMIT MINERALS, INC.

Barbara A. Filas
Engineer

INITIAL COMPLETENESS REVIEW - SUMMIT NO. 1 MINE
DIRECTIONS FOR PLACEMENT INTO THE RECLAMATION PLAN

Insert Page No.	Remove Page No.	Status	Description
771.23-1	771.23-1	Revised	Revised map references
771.25-1	---	New Page	Documents payment of filing fee
782.13-1	782.13-1	Revised	Discusses surface ownership
782.13-2	782.13-2	New Map	Supercedes Figure 782.13-1 regarding surface ownership
782.14-1,2	782.14-1	Revised	Includes additional compliance information
782.15-1,2	782.15-1	Revised	Includes description of permit area boundary
782.18-1	782.18-1	Revised	Revised insurance information
782.18-2	---	New Page	Includes proof of insurance company acceptance
782.21-1,2	782.21-1,2	Revised	Revised public notice regarding Plan inspection location
783.15-2	783.15-2	Revised	Includes commitment to conduct spring and seep surveys
783.15-3	783.15-3	Revised	Includes additional ground water information from SOAP
783.15-4	783.15-4	Revised	Map: includes pond locations in the general area
783.15-6-11	783.15-6-11	Revised	Updates ground water quality monitoring data
783.16-13-18	---	New Pages	Updates surface water quality monitoring data
783.16-19,20	---	New Pages	Includes graphical representations of seasonal quality data
783.27-2	---	New Page	Includes prime farmland negative declaration
784.11-1	784.11-1	Revised	Includes discussion on sedimentation pond construction, use, and removal
784.13-3	784.13-3	Revised	Addresses potential acid and toxic forming materials, revised veg. reference
RP-i,4,5,20	RP-i,4,5,20	Revised	Includes sedimentation pond reclamation and riprap information
RP-23,24	RP-23,24	New Pages	Includes sedimentation pond reclamation plan
RP-25	RP-25	New Page	Includes riprap bonding evaluation
Reveg - 7	Reveg - 7	Revised	Corrects map reference
784.14-2-4	784.14-2-4	Revised	Revised monitoring plans and commitments
HE-24	---	New Page	Includes grease trap and decant detail for sedimentation pond dewatering
784.16-3	784.16-3	Revised	Includes pond certification commitment
784.23-2	784.23-2	Revised	Map: revised to show reclaimed sedimentation pond and contour elevations
784.23-3	784.23-3	Revised	Map: revised to show temporary sedimentation pond and spoil pile

RESPONSE TO INITIAL COMPLETENESS REVIEW
RECLAMATION PLAN
SUMMIT MINERALS, INC.
SUMMIT NO. 1 MINE
INA/043/001
SUMMIT COUNTY, UTAH

RECEIVED
DEC 23 1986
DIVISION OF
OIL, GAS & MINING

UMC 771.25 Permit Fees

The $5.00 filing fee is included with the cover letter of this revision package. Page 771.25-1 has been included for documentation in the application package.

UMC 782.13 Identification of Interests

(a)(2) Figure 782.13-1 has been replaced with the Summit County Plat map of Section 36, Township 3 North, Range 6 East. The permit area has been superimposed on the plat showing the surface ownership relative to the permit area. The right-of-way on the access road is a 24 foot wide strip which is held by five estates which are discussed on revised page 782.13-1.

UMC 782.14 Compliance Information

(c) Additional compliance information has been provided on revised pages 782.14-1 and -2.

UMC 782.15 Right of Entry and Operation Information

A legal description of the proposed permit area boundary is included on revised pages 782.15-1 and -2.

UMC 782.18 Personal Injury and Property Damage Insurance Information

Page 782.18-1 has been revised to reflect the proof of insurance acceptance, which is provided on page 782.18-2.

UMC 782.19 Other Licenses and Permits

A fugitive dust control plan was included on page 784.26-1 of the original submittal.

Page RP-25 of the Reclamation Plan Appendix has been included to bond for the purchase of riprap material. The appropriate pages of the Reclamation Plan Appendix have also been revised to reflect this revision.

UMC 782.21 Newspaper Advertisement and Proof of Publication

The public notice has been revised to show that the application is available for public inspection both at the Summit County Clerk's Office and at the Division of Oil, Gas, and Mining Office.

UMC 783.15 Ground Water Information

(a)(4) All additional water quality information available from the SOAP project report has been included in the revised pages.

(b) Page 783.15-3 has been revised to include additional information regarding the ground water resources in the reclamation area.

Page 783.15-2 has been revised to include a commitment to do spring and seep surveys in the spring and fall of each year.

UMC 783.16 Surface Water Information

(a) Drawing number 783.15-2 has been revised to show the location of ponds in the general area.

(b) Page 783.16-19 has been included to show a graphical representation of seasonal variations in the water quality of Chalk Creek.

UMC 783.24, UMC 783.25 Maps

Plate numbers 784.23-2 and 784.23-4 have been revised to reflect the deficiencies noted.

UMC 783.27 Prime Farmland Investigation

(b)(1) A copy of the Soil Conservation Service negative determination of prime farmland is included on

page 783.27-2.

UMC 784.11 Operation Plan: General Requirements

(b)(1) Page 784.11-1 has been revised to include a discussion of the construction, use, and removal of the sedimentation pond.

UMC 784.13 Reclamation Plan: General Requirements

(b)(1) The reclamation timetable on page RP-5 has been revised to include the water monitoring period and the final removal/regrading of the sediment ponds and diversions. Further discussion is included on page 784.14-3.

(b)(7) Page 784.13-3 has been revised to address potential acid and toxic forming materials on site.

UMC 784.14 Reclamation Plan: Protection of the Hydrologic Balance

(b)(3) Page 784.14-3 has been revised to propose a construction period monitoring program.

Tables 784.14-1 and -2 have been revised to include flow data collection. Appropriate changes in the text have also been made to reflect this revision.

Page 784.14-3 has been revised to include a commitment to submit all water monitoring data within 90 days of receipt of the sample results.

Page 784.14-3 has been revised to include a discussion of the monitoring locations, frequency, parameters, and instrumentation for drainages entering the sedimentation pond.

UMC 784.16 Reclamation Plan: Ponds, Impoundments, Banks, and Embnakments

(b)(1) The elevations of the dewatering device outlet and proposed maximum sediment volume were shown on the Area-Capacity Curve on page HE-7 of the Hydrologic Evaluation Appendix.

Page 784.16-3 has been revised to include a commitment to submit a certification statement within 30 days following completion of the sedimentation pond.

General Comments

Page 784.13-3 has been revised to refer to UMC 817-111 through 817-117 as appropriate.

Page number 7 of the Revegetation Appendix has been revised to refer to Plate number 784.23-2 as appropriate.

TECHNICAL DEFICIENCIES
RECLAMATION PLAN
SUMMIT MINERALS, INC.
SUMMIT NO. 1 MINE
ACT/043/001
SUMMIT COUNTY, UTAH

UMC 817.11 Signs and Markers

Appropriate signs and markers have been placed to show the permit area boundary, property identification, and stream buffer zones. These signs and markers will remain in place through the bond release period.

UMC 817-133 Postmining Land Use

The Applicant will provide landowner comments as soon as they are available.

The bridge which spans Chalk Creek is believed to be adequate to meet the post mining land use of grazing and wildlife habitat. According to Bruce Rowser, Summit County Engineer - Roads, the County designs bridges in the Creek Area as follows:

1. The June, 1983 storm in the Coalville area is believed to have been a 100 year event.

2 According to the USGS gaging station in Coalville, Chalk Creek had a peak flow of approximately 1410 cfs as a result of the 1983 storm.

3. The Summit County Engineer uses a peak flow of about 1100 cfs for design purposes in engineering structures which will span Chalk Creek in or near the Coalville area.

4. The bridge spanning Chalk Creek on the Boarder Station Road about three miles upstream from Coalville was designed using a 25 year - 1 hour duration storm of 1126 cfs, which was the minimum for meeting Federal Highway Department requirements for matching funds. That bridge was overdesigned and will pass the 100 year storm.

5. To his knowledge, the bridge spanning Chalk Creek at the Blackhawk Mine site was in place during the 1983 storm and passed the runoff.

Using the manning equation with: n = 0.035 for natural channels and n = 0.014 for the concrete footings supporting the bridge (Barfield, Warner, and Haan, 1981), a channel grade of 1.16%, and a width of 37' 5", the bridge will pass 1,417 cfs at a depth of 3.58 feet. This depth is the amount of free clearance between the stream channel and the bottom of the lowest support structure on the bridge.

The bridge is capable of passing the 100 year design storm with a water level lower than the bottom of the lowest structural member on the bridge. Since the design storm for Chalk Creek used by the Summit County Engineer is 1126 cfs and the bridge can pass 1417 cfs, this bridge is adequate to pass the design storm and therefore conforms to the applicable accepted standards for adequate drainage to support the post mining land use.

UMC 800 Bonding

The Reclamation Plan Appendix has been revised to include bonding for riprap material.

RECLAMATION PERMIT APPLICATION

COAL MINING RECLAMATION ACT OF 1978

SUMMIT MINERALS NO. 1 COAL MINE PROJECT

Summit County, Utah

SUBMITTED
November 7, 1986
Summit Minerals, Inc.
221 West 2100 South
Salt Lake City, Utah 84115

CONTENTS

TABLES

ILLUSTRATIONS

PLATES

ILLUSTRATIONS CONTINUED

FIGURES

INTRODUCTION

SUMMIT MINERALS RECLAMATION PROJECT

This Reclamation Permit Application is being filed pursuant to the Order of the Board of Oil, Gas, and Mining issued in Cause No. INA/043/001, Docket No. 85-070, on December 13, 1985.

The format and organization of this Reclamation Application is designed to follow the Regulations Pertaining to Surface Effects of Underground Coal Mining Activities as presented in Chapter I, Coal Mining and Reclamation Permanent Program, Revised September 20, 1982, of the Utah Division of Oil, Gas, and Mining. The application demonstrates compliance with that permanent regulatory program as well as with the permanent program of the U. S. Office of Surface Mining.

The application indicates the environmental resources in the project area as well as presenting the complete reclamation plans developed for the underground coal mine project. The sections of the application are in the same numerical order as Chapter I of the Utah regulations. In those instances where the same information is required or pertinent to different sections, the information or data are repeated so that each section may be read without reference to another part of the application.

LOCATION OF RECLAMATION PROJECT

The Summit Minerals Inc. proposed reclamation area is along the valley of Chalk Creek approximately 12 road miles east of Coalville, Utah (Fig. I-1). Coalville, the County Seat, is located just off of Interstate Highway I-80 about 44 miles east and slightly north of Salt Lake City. Coalville is served by the Echo-Park City Branch of the Union Pacific Railroad which connects with the Union Pacific mainline at Echo six miles north of Coalville. Access to the property is provided by a two lane paved state highway from Coalville that passes the property on the north and which is joined by a graded dirt road from the property. The proposed reclamation area is located on the south side of Chalk Creek, in SE 1/4 NE 1/4 Section 36, T. 3 N., R. 6 E., SLB&M, Summit County, Utah. The area to be reclaimed covers approximately 14 acres.

RECLAMATION BOND

Summit Minerals, Inc. has supplied the Utah Division of Oil, Gas, and Mining with a $ 120,300 reclamation bond which was approved by the Division on June 4, 1986. The cost of reclamation has been estimated at $99,624.00. A detailed analysis of the costs is given in the Appendix to section 784.13(b)(2) on page 784.13-20.

PART UMC 771 - PERMIT APPLICATIONS

UMC 771.23 - GENERAL REQUIREMENTS

UMC 771.23(d) - PERSONS AND ORGANIZATIONS CONSULTED

ORGANIZATION OR GOVERNMENTAL AGENCY	INFORMATION ON
Mary M. Boucek, Consulting Biologist 6877 Emigration Canyon Road Salt Lake City, Utah	Vegetation and Revegetation
Richard S. Kopp Certified Professional Geologist #1226 11336 High Mesa Drive Sandy, Utah 84092	Geology and Soil Samples
Olympus Aerial Surveys, Inc. 50 West 2950 South Salt Lake City, Utah 84115	Topographic and Orthophoto Maps
Soil Conservation Service U. S. Department of Agriculture Coalville, Utah Mr. Tim Watson	Soil Survey Data and Land Use
Summit County Planning Commission Courthouse Coalville, Utah 84017	Land Use Classification
Utah Division of State History Preservation Office 300 Rio Grande Salt Lake City, Utah 84101 Mr. James L. Dykman, Cultural Resource Advisor	Cultural Resources and Sites
Utah State Climatologist Utah State University Logan, Utah 84322 Dr. Gail Bingham Dr. Gaylen Ashcroft	Climatological Data
Utah State University Soil, Plant, & Water Analysis Laboratory Logan, Utah 84322	Soil Analysis and Fertilizer Requirements

UMC 771.23(e) - MAPS AND PLANS

UMC 771.23(e)(2) - Underground Coal Mining Activities

Plate number 783.14-4 is included in section 783.14 of this document which show where past underground coal mining activities have taken place. Based on information obtained to date those activities are as follows:

UMC 771.23(e)(2)(i) - Prior to August 3, 1977

Just west of the permit area, the N. B. Morby Shaft was sunk through 57 feet of gravel and conglomerate in 1879 and drifted on the dip of an 8-foot coal bed (Doelling, 1972). From this entry, additional entries were opened by subsequent operators and developed into the Blackhawk Mine which was intermittently worked until sometime in the mid 1950's. Those openings were buried during the preparation of the face in 1974-75 for the development of entries by Utah Coal and Energy, Inc. in the permit area. For the most part, this last development took place before August 3, 1977, but records are unclear concerning if any coal may have been mined after that date. Plate number 783.14-4 shows the known extent of underground excavations made before and after 1970. The post 1970 works are those made by Utah Coal and Energy, Inc.

UMC 771.23(e)(2)(ii) - After August 3, 1977

Records are unclear concerning possible development and actual coal production by Utah Coal and Energy, Inc. Sample analyses indicate that during the period August 1978 to November 12, 1978, at least "10 loads" of coal were shipped to U & I Sugar Research Center, Moses Lake, Washington. When that coal was mined is not known.

UMC 771.23(e)(2)(iii) - After May 3, 1978

Records are unclear concerning coal production after May 3, 1978. Sample analyses indicate shipments of coal to the U & I Research Center, Moses Lake, Washington, between August 1978 and November 12, 1978. When that coal was mined is not known.

UMC 771.23(e) - MAPS AND PLANS

UMC 771.23(e)(2) - Underground Coal Mining Activities

Maps are submitted with this application which show each of the phases where past underground coal mining activities have taken place. Based on information obtained to date those activities are as follows:

UMC 771.23(e)(2)(i) - Prior to August 3, 1977

Just west of the permit area, the N. B. Morby Shaft was sunk through 57 feet of gravel and conglomerate in 1879 and drifted on the dip of an 8-foot coal bed (Doelling, 1972). From this entry, additional entries were opened by subsequent operators and developed into the Blackhawk Mine (Plate 771.23-1, Randall, 1952) which was intermittently worked until sometime in the mid 1950's. Those openings were buried during the preparation of the face in 1974-75 for the development of entries by Utah Coal & Energy, Inc. in the permit area (Plate 771.23-2). For the most part, this last development took place before August 3, 1977, but records are unclear concerning if any coal may have been mined after that date.

UMC 771.23(e)(2)(ii) - After August 3, 1977

Records are unclear concerning possible development and actual coal production by Utah Coal & Energy. Sample analyses indicate that during the period August 1978 to November 12, 1978, at least "10 loads" of coal were shipped to U & I Sugar Research Center, Moses Lake, Washington. When that coal was mined is not known.

UMC 771.23(e)(2)(iii) - After May 3, 1978

Records are unclear concerning coal production after May 3, 1978. Sample analyses indicate shipments of coal to the U & I Research Center, Moses Lake, Washington, between August 1978 to November 12, 1978. However, just when the coal was mined is not known.

UMC 771.25 PERMIT FEES

A $5.00 filing fee accompanies this application.

SUMMIT MINERALS
221 WEST 2100 SOUTH 801-486-1861
SALT LAKE CITY, UTAH 84115

No 1850

GRANITE PARK OFFICE
VALLEY BANK & TRUST CO.
3620 SOUTH STATE
SALT LAKE CITY, UTAH 84115
97-154/1240

PAY FIVE DOLLARS ONLY

DATE Dec. 19/86 AMOUNT $5.00******

TO THE ORDER OF State of Utah Division of Oil, Gas & Mining

⑈000 1850⑈ ⑆124001545⑆ 11 031808⑈

SP1000 1 C SECURITY PRINTERS, INC.

Revision 1: 12/19/86

UMC 771.27 - VERIFICATION OF APPLICATION

I, the undersigned, say:

I am an Officer of Summit Minerals, Inc., the Applicant herein, and I make this verification as such on behalf of said Applicant.

I declare under penalty of perjury that the following information contained in this application is true and correct to the best of my knowledge and belief.

Executed at Salt Lake City, Utah, this ____th day of November, 1986.

_____
John L. Higgins, President

STATE OF UTAH)
) ss.
__City and__ County of __Salt Lake__)

On this ___6__th____ *day of* _____November_____ *, in the year* __1986__ *, before me,* _____, *a Notary Public in and for said* __City and__ *County, duly commissioned and sworn, personally appeared* _____John L. Higgins_____ *known to me to be the* _____President_____ *of the corporation that executed the within instrument, and to be the person who executed the said instrument on behalf of said corporation therein named, and acknowledged to me that such corporation executed the within instrument pursuant to its by-laws or a resolution of its board of directors.*

SEAL

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal in the __City and__ *County of* __Salt Lake__ *, on the day and year in this certificate first above written.*

_____

My Commission expires ____5-16-90____

PART UMC 782 - LEGAL, FINANCIAL, COMPLIANCE & RELATED INFORMATION

UMC 782.13(a) NAMES AND ADDRESSES OF INTERESTED PARTIES

UMC 782.13(a)(1) - Applicant

The permit Applicant for the Summit Minerals Coal Mine Reclamation Project is:

Summit Minerals, Inc.
221 West 2100 South
Salt Lake City, Utah 84115
(801) 486-1861

UMC 782.13(a)(2) - Surface Owners

The following parties are the legal and equitable owners of all areas within the permit area to be affected by the reclamation project:

Fern J. Boyer, et. al.
5050 Ben Lomond Ave.
Ogden, Utah 84404

Joseph L. Boyer, et. al.
Coalville, Utah 84017

Figure 782.13-1 shows the areas of surface ownership relative to the permit area boundary.

The access road right-of-way, shown on Figure 782.13-1, is a 24 foot wide easement for ingress and egress held by F.J. Boyer, et. al., L.E. Boyer, et. al., J.L. Boyer, et. al., W.L. Boyer et. al., and Ella Boyer, et. al.

UMC 782.13(a)(4) - Purchasers of Record Under Real Estate Contracts

There are no purchasers of record under real estate contracts for lands which are the subject of this application.

BOOK PAGE

SECTION 36
T 3 N - R 6 E

SALT LAKE BASE & MERIDIAN 640.00 AC
SCALE 1" = 400'

25

80.84 CHS N 89° 30' W

(FROM NS-1120)
13.53 AC
NS-1120-A
STATE ASSESSED
JOSEPH LAUREN BOYER
M138-157

STATE HIGHWAY APPROX 18C 312

NS-1159-5
FERN J BOYER
ET AL
M111-368-372

24.13AL

NS-1159-3

NS-1159-3
WILLIAM LEO BOYER
& LORAINE B. BOYER
M136-148 TRUSTEES

NS-1159-4
JOSEPH LAVERN BOYER
ET AL
M138-166
M238-245

55.56AL

20.73AL

NS-1159-2
LYLE E. BOYER
138-195
40.368AL.

NS-1159-3-A
WILLIAM LEO BOYER
& LORAINE B BOYER
M136-148 TRUSTEES
33.32AL

NS-1159-5-A
FERN J. BOYER
ET AL
M111-368-372
34.371AL

31

PERMIT AREA BOUNDARY

NS-1159-2
LYLE E BOYER

34.62AL

45.135AL

NS-1159-5
FERN J BOYER
ET AL
M111-368-372
45.135AL

FIGURE 782.13-1: SURFACE OWNERSHIP OF LAND IN AND ADJACENT TO THE RECLAMATION AREA

782.13-2

SUMMIT COUNTY, UTAH

SCALE
ONE INCH 400
BOOK PAGE

UMC 782.13(a)(5) - Operator

The operator of the proposed reclamation project will be the Applicant.

UMC 782.13(a)(6) - Resident Agent of Applicant

Clayton Timothy, Superintendent
Summit Minerals, Inc.
Chalk Creek Road
Upton, Utah
Telephone (801) 336-2601

UMC 782.13(b) - BUSINESS ENTITY OF APPLICANT

The Applicant is a corporation incorporated under the laws of the State of Utah.

UMC 782.13(b)(1) - Officers of Applicant

Chairman of the Board	:	John L. Higgins 2783 Holiday Ranch Loop Road Park City, Utah 84060
President	:	John L. Higgins 2783 Holiday Ranch Loop Road Park City, Utah 84060
Vice President	:	Ira Ferral 221 West 2100 South Salt Lake City, Utah 84115
Secretary/Treasurer	:	Pamela Higgins 2783 Holiday Ranch Loop Road Park City, Utah 84060
Director	:	Keith Bates 940 Donner Way, #690 Salt Lake City, Utah
Director	:	George F. Bishop 1294 Millbrook Way Bountiful, Utah

Director	:	Steven Ellingson 221 West 2100 South Salt Lake City, Utah 84115
Director	:	Earl Gritton 2470 South 15th East Salt Lake City, Utah 84106
Director	:	Hugh Hintze 140 University Street Salt Lake City, Utah 84102
Director	:	John Margetts 171 3rd Avenue, Terrace Falls Salt Lake City, Utah
Director	:	William Pulsipher 2230 South 22nd East Salt Lake City, Utah 84109
Director	:	Roger Richards 1644 East 10770 South Sandy, Utah 84092

UMC 782.13(b)(2) - Principal Shareholders

The principal shareholders of the Applicant are the Chairman of the Board and the Directors listed in UMC 782.13(b)(1), above.

UMC 782.13(b)(3) - Previous Coal Mining Experience

The Applicant and the principal shareholders have not previously operated underground or surface coal mining activities in the United States within the five (5) years preceding the date of this application.

UMC 782.13(c) - BUSINESS ENTITY OF OTHER OWNERS

Except as noted above, all owners, holders, purchasers, or operators identified under Paragraph (a) of this section are single proprietors to the best of our knowledge and belief.

UMC 782.13(d) - PREVIOUS COAL MINING PERMITS

The Applicant has not held and does not hold any coal mining permits in the United States subsequent to 1970. The Applicant does not have any pending permit applications to conduct underground or surface coal mining activities in the United States.

UMC 782.13(e) - OWNERSHIP OF AREAS CONTIGUOUS TO PERMIT AREA

The owners of record of surface areas contiguous to the proposed reclamation area are shown on the Surface Ownership Map (Figure 782.13-1) and are listed below:

Fern J. Boyer Gerald G. Boyer Gregory J. Boyer Stephen W. Boyer Brent W. Boyer	5050 Ben Lomond Ave. Ogden, Utah 84404
Joseph LaVern Boyer, et al.	Coalville, Utah 84017
William Leo Boyer & Lorene B. Boyer, Trustees	Coalville, Utah 84017

UMC 782.13(f) - MINE IDENTIFICATION

The name of the mine to be reclaimed is:

The Blackhawk Coal Mine.

Mine Safety and Health Administration (MSHA) Identification Number:

42-01284

UMC 782.13(g) - INTERESTS IN LANDS CONTIGUOUS TO PERMIT AREA

The lands, interests, or options held by the Applicant in lands contiguous to the permit area are listed below:

State Lease #27512
Tps. 3 N., Rge. 6 E.

Section 36:	S 1/2 SE 1/4	80.0 acres
	S 1/2 NW 1/4	80.0 acres
	SW 1/4	160.0 acres

UMC 782.14 COMPLIANCE INFORMATION

IMC 782.14(a)(1) - Applicant's Suspended or Revoked Permits in the Last Five Years

The Applicant, its subsidiaries, affiliates or persons controlled by or under common control with the Applicant have not had a Federal or State Mining Permit suspended or revoked in the last five years.

UMC 782.14(a)(2) - Applicant's Forfeiture of Mining Bond

The Applicant, its subsidiaries, affiliates or persons controlled by or under common control with the Applicant have not forfeited a mining bond or similar security which was deposited in lieu of a bond.

UMC 782.14(c) - APPLICANT'S MINING VIOLATION NOTICES

The Applicant has received the following violation notices in connection with purported surface coal mining activities during the 3-year period before the date of this application:

1. Cessation Order C85-1-1-1, dated March 1, 1985, was issued by the Division of Oil, Gas, and Mining for allegedly conducting underground coal mining activities without Division approval. This Order was terminated on September 16, 1985 pursuant to the Applicant's submission of a proposed Exploration Plan.

2. Cessation Order C85-1-2-1, dated August 14, 1985, was issued by the Division of Oil, Gas, and Mining for allegedly failing to abate a notice of violation within the time set for abatement. This Order was terminated on September 16, 1985 pursuant to the Applicant's submission of a proposed Exploration Plan.

3. Cessation Order C85-6-2-1, dated November 4, 1985, was issued by the Division of Oil, Gas, and Mining for allegedly conducting underground coal mining activities without Division approval. This Order was terminated on November 4, 1985 when alleged activities were apparently discontinued.

The following is a chronological listing of any administrative or judicial proceedings concerning violations which occurred within the 3-year period preceeding the application date:

September 9, 1985: The Applicant enters a Petition for Temporary Relief for review by the Board of Oil, Gas, and Mining for relief of the mandatory $750/day inposed pursuant to C85-1-2-1.

September 17, 1985: The Board issues a Temporary Relief Order from the daily $750 penalties conditional upon the Applicant's posting of a reclamation bond.

October 30, 1985: The surface owners file an Application for Review and Request for Hearing with the Board asking for dissolution of the 09/16/85 termination of Cessation Order C85-1-2-1.

November 12, 1985: The Division of Oil, Gas, and Mining petitions Board for enforcement action to be heard at the 12/05/85 hearing.

December 5, 1985: Board hearing Ordering the Applicant to pay penalties for failure to comply with the 09/17/85 Board Order, assume reclamation liability, post a reclamation bond, seal any open mine portals, and enter the property only for security and data acquisition for permitting.

March 1, 1986: District Court Judgement requiring payment of penalties and assigning reclamation liability referenced on 12/05/85.

The Applicant has no outstanding violation notices from State or Federal agencies. The District Court Judgement of 03/01/86 is still outstanding, pending appeal.

UMC 782.15 RIGHT OF ENTRY AND OPERATION INFORMATION

UMC 782.15(a) - Right of Entry Documentation

Figure 782.15-1 and 782.15-2 are the documents which establish right of entry for the Applicant. This right is currently a subject of pending litigation.

UMC 782.15(b) - Surface Mining of Coal

There are no provisions for the surface mining of coal in this permit application.

The following is a description of the permit area with respect to Station 6 shown on drawing number 784.23-1. Station 6 is the northeast corner of Section 36, Township 3 North, Range 6 East, Salt Lake Base and Meridian. Point 1 is located on the highway right-of-way on the fenceline on the east side of the property access road. Subsequent points of the permit area are described in a clockwise direction, ending on the fenceline on the west side of the access road.

From Point	To Point	Direction	Distance more/less	Direction	Distance more/less
Sta 6	1	South	643	West	557
1	2	South	45	East	110
2	3	South	165	East	125
3	4	South	495	East	55
4	5	South	400	East	190
5	6	South	190	West	10
6	7	South	40	West	110
7	8	South	175	West	115
8	9	South	255	East	20
9	10	South	180	West	125
10	11	North	40	West	130
11	12	North	540	West	360
12	13	North	365	West	640
13	14	North	45	East	5
14	15	South	215	East	755
15	16	North	65	East	110
16	17	North	65	East	60
17	18	North	65	East	25
18	19	North	90	East	30

19	20	North	100	West	80
20	21	North	80	East	5
21	22	North	15	East	250
22	23	North	30	East	30
23	24	North	405	West	60
24	25	North	200	West	165
25	1	North	55	East	25

Telephone (801) 359-2928

Law Offices of

C. Van Druenen

Suite 800 Boston Building
Salt Lake City, Utah 84111

November 5, 1986

Mr. Ken May
Assistant Director
Division of Oil, Gas & Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

RE: SUMMIT MINERALS, INC. - No. 1 Mine INA/043/001, Summit County, Utah

Dear Mr. May:

I have been asked to comment on the right of entry and your letter dated October 30, 1986, addressed to Ms. Barbara Filas.

Enclosed herewith please find what we consider to be adequate documentation giving Summit Minerals, Inc., a right of entry to their coal mine. In the above referenced letter you mentioned the lack of complete concurrence on the part of the surface owner that said documentation constitute an uncontested right of access. This lack of concurrence was communicated to the Division in a letter dated December 9, 1985, on behalf of the Boyers through their counsel, Ed Garver. In view of the past record of the Boyers in this matter, this lack of concurrence is understandable.

Your attention is invited to UMC 782-15 Right of Entry and Operation Information, wherein a written agreement between the surface owner and mine operator is not essential when other avenues are open to the mine owner. In any event, it is recommended that the matter be submitted to the Attorney General for his opinion rather than accede to the wishes and demands of the surface owner.

In addition, your attention is invited to Utah Code Annotated, 1953, 78-34-1 which confers on the mine operator the right of condemnation through eminent domain. This statutory power seems to be absolute.

Figure 782.15-1a - Right of Entry Information

It appears that several approaches to obtaining a right of way, if one does not exist, are available to Summit Minerals, Inc., and it would appear to the undersigned that a written concurrence by the surface owner seems to overstate their importance in this matter.

Sincerely,

C. VAN DRUNEN
Attorney at Law

CVD/cn
Enclosures

cc: Mr. Mark Moench

Figure 782.15-1b - Right of Entry Information

ANDREW JOHN BRENNAN
ATTORNEY AT LAW
SALT LAKE CITY, UTAH

September 15, 1977

Mssrs. Joe Lyon, Jr. and George D. Fehr
Phillips Petroleum Building
Salt Lake City, Utah 84101

Re: Blackhawk Mine, Summit County

Gentlemen:

You have requested an opinion regarding the existence, in fact and in law, of a haulage road or right of way to and from the Blackhawk Mine, situated in the South Half of the NorthEast Quarter and the North Half of the South East Quarter, of Section 36 in Township 3 North, Range 6 East, Salt Lake Base Meridian, to and from a state road along Chalk Creek, which road traverses Section 36 as herein mentioned for location of the mine.

Investigation establishes the permanent existence of a right of way of long duration and extensive use, not only for coal haulage and maintenance of the mine but also for the removal of gravel and ranching.

Additional detail may be obtained; however, the following was ascertained through summary examination of old maps and surveys, copying records in the offices of the Summit County Courthouse at Coalville, Utah, and through conversations with old-time residents and by examination of aerial photographs taken some twenty five years ago and of some more recent photos.

A map "Showing Prominent Exposures of Rock Ledges and Associated Coal Seams in the Weber Coal Field, Summit Co. Utah" compiled and drawn from Surveys made by Horace R. Burritt, Mine Inspector, 10th Field Division, General Land Office, June, 1911, has notes in the North East Half of Section 36, "BoyerMine coal 7'-0" at dip 12° at South 75°W" and notes in the South half of the Section 36, "N. B. Morby shaft sunk 57 feet through gravel and conglomerate. Cut 6'10" good coal. drifted 100 feet on dipot seam. Coal 8'0" Sandstone Roof Clay floor. Sunk 1879."

Figure 782.15-2a - Right of Entry Legal Opinion

In the records of the Recorder of Summit County appears a written copy of Coal Certificate No. 81 issued by the General Land Office which recites:

> "Alma Eldridge did on the 12th day of February, 1890, enter and pay for the South half of the NE quarter and the North half of the SE quarter, Section 36, in Township 3 North of Range Six East, embracing 160 acres of land, more or less, as shown in the official survey of said lands returned to the General Land Office by the Surveyor General. The same being Coal Entry No. 81 in the series of said office. **"

In the records of the Recorder of Summit County also appears a written copy of Coal Certificate No. 34 issued by the General Land Office which recites:

> "William Boyer did on the 19th day of November, 1891, enter and pay for the North half of the NE quarter of Section 36 in Township 3 North of Range 6 East, embracing 80 acres of land more or less as shown by survey of said land returned to the General Land Office by the Surveyor General. The same being coal entry No. 34 in the series of said office." And the certificates as here noted, each recites the following conditions:

> "Now Know Ye, That the United States of America, in consideration of the premises and in conformity with said Act of Congress, have given and granted and by these presents do give and grant unto the said Willaim Boyer (or Alma Eldridge as the case may be) the said tract above described--subject to any accrued water rights for mining, agricultural, manufacturing or other purposes, and also subject to the right of the proprietor of a vein or lode to abstract and remove his ore therefrom should the same be found to penetrate or intersect premises hereby granted, as provided by law."

Entry to the Blackhawk Mine is located in the 160 acres covered by the Coal Entry issued to Eldridge and a few feet of the right of way from the mine to the state road crosses the 80 Acrescovered by the Coal Entry issued to Boyer.

Figure 782.15-2b - Right of Entry Legal Opinion

The Morby shaft sunk in 1879 preceded the entry made by Eldridge in February of 1890 and the entry made by Boyer in November of 1891. There were undoubtedly additional mines previously worked in the area which would under the Coal Lands Act of 1873 give an individual right of entry upon not to exceed 160 acres of vacant coal lands of the United States, by legal subdivisions.

The Supreme Court of the United States early decided, in Colorado Coal and Iron Co. v. United States (1887) 123 US 307, that the Act of 1873 removed from the operation of the Preemption Act of 1841 and the later Homestead law only those lands upon which were situated "known mines" of coal. (See American Mining Law Vol 1 pg 213) The Supreme Court of the United States concluded in its opinion: "We hold threfore, that to constitute the exemption contemplates by the preemption act under the heads of 'known mines', there should be upon the land ascertained coal deposits of such an extent and value as to make the land more valuable to be worked as a coal mine, under the conditions existing at the time, than for merely agricultural purposes."

The court continued:

> "The circumstances that there are on the surface indications of the existence of veins of coal does not constitute a mine... If upon the premises at the time there were not actual 'known mines' capable of being profitably worked for their product, so as to make the land more valuable for for mining than for agriculture, a title to them acquired under the preemption act cannot be successfully assailed." (This test so set by the Court was later modi - fied in 1911).

The law and the Supreme Court at the time of the Coal Entries made by Eldrige and Boyer required the existence of a known mine and so it is to be concluded that the predecessor in interest to the present owners relied upon the Blackhawk Mine for qualification and the only right of way for haulage of coal was by use of the way as it appears to-day, with an alignment set for the convenience of all the parties in interest.

Through the mesne conveyances bringing the title to the 80 acres down to its present owners, which will be more particularly discussed, the conveyances uniformly recite: " Subject however to the exceptions, reservations and conditions set forth in the U. S. Patent to

Figure 782.15-2c - Right of Entry Legal Opinion

said land also a reservation of coal underlying the surface of any of said land.

Likewise through mesne conveyances the 160 acres originally entered by Eldridge were transferred to J. C. Penney and the Kimbal Investment Company which Penney controlled.

The files of the Recorder of Summit County also show that by Indenture dated May 12, 1930, J. C. Penney and the Kimball Investment Company sold and conveyed the 160 acres to Josph H. Boyer, and therein reserved to themselves and their successors and assigns "all the oil, gas, coal and minerals in, on or under the surface of said lands and all the rights of ownership therein according to the privileges and customs of the field that may be developed about said land."

Thereafter, Joseph Boyer, by warranty deed dated November 24, 1953, acquired the remaining one-quarter interest in the 80 acres, subject "to any existing right of way, canals, ditches or roads over and across said premises."

It is apparent that the predecessors in title to Joseph Boyer recognized the existance of the right of way.

Residents of the area and people who worked in the mine verify the workings, the formation of tunnels in the mine and the hauling of the coal over the right of way.

Josph Boyer died March 11, 1967 and his wife, Lois R. Boyer passed away on July 8, 1971. Their joint will was probated in the Fourth Judcial District Court of Summit County, State of Utah in probate case number 1770. During the pendancy of the proceedings, two sons, William Leo Boyer and Lyle E. Boyer, managed and operated the Boyer Ranch.

The records of the probate cases in the office of the Summit County Clerk disclose that by Decree of Distribution :

> Pursuant to the terms of paragraph (b) of decedents' Last Will and Testament all of Section 36, T 3 N, R 6 E, SLM, together with other properties was distributed to the following as tenants in common:

Figure 782.15-2d - Right of Entry Legal Opinion

Joseph LaVern Boyer, Lyle E. Boyer, William Leo Boyer, Edison Wilde Boyer and Faye Wilde Boyer.

Following the description of the properties to be so held as tenants in common, the decree further states:

"Any income to be distributed to William Leo Boyer and Lyle E. Boyer, who have operated said ranch during the pendency of this probate proceeding, subject to their paying all expenses incident to said operation, which cost has far exceeded the income."

William and Lyle Boyer, as operators of the Boyer Ranch made an agreement with the Coalville Coal Company placing certain conditions to be observed in the use of the right of way, including the installation and maintenance of an adequate gate and cattle guard at the entrance to the right of way from the state highway, installation of a three foot culvert to accommodate the irrigation canal located inside the gate, leveling for a lambing shed and maintenance of the fencing. The re-alignment and construction of a bridge was also agreed upon.

Both parties have since used the right of way for ingress and egress to the mine location and operations and the haulage of gravel from the area.

There have been no questions between the interested parties, except discussions as to the best location for the cattle guard, until the demand made by one of the Boyers above named, to-wit, Fay Wilde Boyer, who has been presenting demands for an increased rental for use of the right of way and who asserts that William and Lyle Boyer were not authorized by the court or the other heirs to make any agreement.

Fay W. Boyer may be estopped to deny the agreement made by William and Lyle Boyer since the decree under which he claims title recognized the Boyer Ranch had been under the operation of William and Lyle Boyer or that he had any knowledge of the existence of a right of way so apparent and obvious and which his own interests used, as improved, for gravel haulage.

It would needlessly prolong this writing to relate the state-

Figure 782.15-2e - Right of Entry Legal Opinion

ments made by residents of the area and previous workers at the Blackhawk Mine concering the volume of coal taken from the mine all of which was hauled out over the right of way.

The Coalville Coal Company, as lessees and operators of the property, were in position to work out arrangement with the Boyer Ranch for use of the right of way. The leesees were not authorized by David S. Perry, et al., the owners of the mine, to subject them to any agreement purporting to grant and initiate a right of way already owned and held by the Perrys. Counsel for the owners of the mine would join the present operators in resisting the claims of Fay W. Boyer.

In conclusion, it is to be accepted from the records in the Summit County Courthouse that the Boyers as the surface right owners and Perrys as the owners of the mining rights rely upon a chain of title once held by J. C. Penney and the Kimbal Investment Company.

The law is best stated in the language used by one of the recognized legal texts:

> "Where, during the unity of title, an apparently permanent and obvious servitude is imposed on one part of an estate in favor of another part, which servitude is in use at the time of severance and is necessary for the reasonable enjoyment of the other part, on a severance of the ownership a grant of the right to continue such use arises by implication of law."

It is my opinion, as above stated that the right of way in to the Blackhawk Mine has been well established and has been used by both the owners of the mining rights and the owners of the surface rights for ingress and egress from the property and for haulage of machinary and equipment for mining and ranching and for the removal of coal and gravel.

I would be happy to discuss this matter with you at your convenience.

Yours very truly,

Andrew John Brennan

AJB/ im

Figure 782.15-2f - Right of Entry Legal Opinion

UMC 782.16 RELATIONSHIP TO AREAS DESIGNATED UNSUITABLE FOR MINING

The disturbed area has been used to support mining operations for about 100 years. Additional surface disturbances pursuant to underground coal mining activities are not a part of this plan.

UMC 782.17 PERMIT TERM INFORMATION

This permit application is a reclamation plan which does not include provisions for underground mining activities or additional surface disturbances associated with mining activities. The term of this permit will be through the 10 year bond release period.

UMC 782.18· PERSONAL INJURY AND PROPERTY DAMAGE INSURANCE

Summit Minerals, Inc. will carry both public liability and property damage insurance during the term of this permit. The policy will contain a rider requiring the insurer to notify the Division of Oil, Gas, and Mining if the policy is cancelled.

Figure 782.18-1 documents the insurance application and Carrier acceptance. The Applicant will place the binding of coverage prior to permit approval.

BENNETT INSURANCE
Group, Inc.
221 West 2100 South
Salt Lake City, Utah 84115
(801) 486-1861

5 December 1986

Summit Minerals Inc.
221 West 2100 South
Salt Lake City, Utah

Barbara:

You have applied for Comprehensive General Liability Insurance in the amount of $500,000 Combined Single Limits of coverage on the Coal Mine located 12 Miles East on Utah State Road 33 out of Coalville, Utah.

This is to advise that coverage can and will be purchased for you for the amount desired with the Guarantee National Insurance Company or any other substitute ; company depending on the quotes that we get. We have no problem obtaining the insurance when you are ready.

Please advise and we will proceed to place the binding of coverage.

Yours truly,

F. Don Ellsworth

Figure 782.18-1: Proof of Insurance Acceptance

UMC 782.19 - OTHER LICENSES AND PERMITS

Table 782.19-1 lists all of the licenses and permits which are needed by the Applicant in order to conduct reclamation activities at the Blackhawk Coal Mine site.

The addresses of the government agencies listed in Table 782.19-1 are as follows:

Utah Division of Oil, Gas, and Mining
3 Triad Center, Suite 350
355 West North Temple
Salt Lake City, Utah 84180-1203

U. S. Environmental Protection Agency
Region VIII
1 Denver Place
999 18th Street
Denver, Colorado 80202-2413

Utah Division of Environmental Health
P. O. Box 2500
Salt Lake City, Utah 84110

Summit County
Courthouse
Coalville, Utah 84017

The Applicant is aware of the terms, conditions, and requirements of each permit, and presently is and will continue to execute all due diligence to remain in full compliance with each required permit. To assure compliance and to detect deficiencies, the Applicant will maintain all required monitoring equipment and surveillance measures mandated by the applicable licenses or permits. Furthermore, all reporting requirements for data from such monitoring and surveillance sources will be reported in a timely manner to the appropriate regulatory authority.

Table 782.19-1.-List of Federal, State, and Local Agencies Whose Substantive Standards, Ordinances, and Laws are Applicable to the Summit Minerals Reclamation Project.

AGENCY	PERMIT OR LICENSE AND IDENTIFICATION NUMBER	DATE OF APPLICATION	DATE OF ISSUANCE
Utah Division of Oil, Gas, and Mining	Reclamation Permit	11/06/86	
U. S. Environmental Protection Agency	National Pollutant Discharge Elimination System (NPDES)	10/24/86	
Utah Division of Environmental Health	Construction Permit Sedimentation Pond	11/06/86	
Summit County	Business License		
Summit County	Zoning (CE-2)		

UMC 782.20 - LOCATION OF PUBLIC OFFICES FOR FILING APPLICATION

Pursuant to 30 CFR 786.11(d) and UMC 786.11(d), the Applicant has simultaneously filed complete copies of this application with the Summit County Clerk and the Division of Oil, Gas, and Mining. Interested persons may review the application by contacting:

Utah Division of Oil, Gas, and Mining
3 Triad Center, Suite 350
355 West North Temple
Salt Lake City, Utah 84180-1203

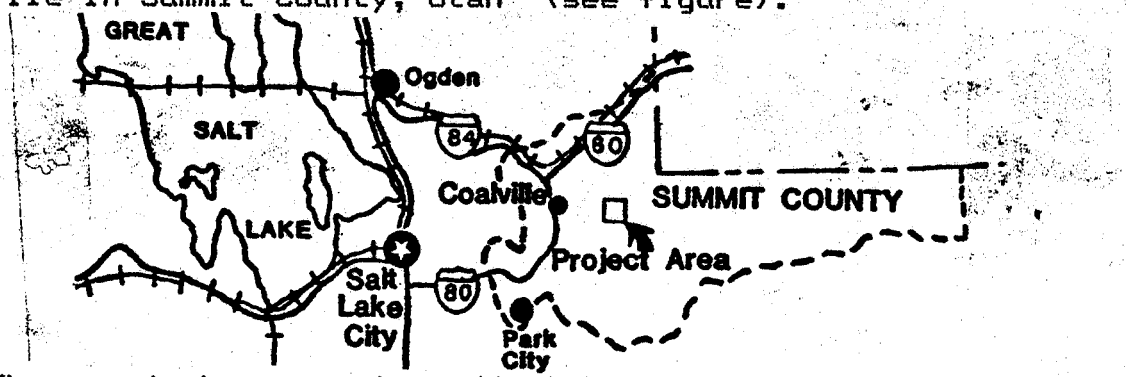
Summit County Clerk
Courthouse
Coalville, Utah 84017

UMC 782.21 NEWSPAPER ADVERTISEMENT AND PROOF OF PUBLICATION

Pursuant to 30 CFR 786.11(a) a newspaper advertisement of this application will be published when the Division of Oil, Gas, and Mining has informed the Applicant that the application is complete. Teh advertisement will be placed at least once a week for four consecutive weeks in the Salt Lake Tribune, the Ogden Standard Examiner, and the Summit County Bee; local newspapers with circulation in Summit, Salt Lake, Davis, and Weber counties sufficient to cover the locality of the Applicant's operations. Proof of such advertisement will be made to the Division of Oil, Gas, and Mining and will be made a part of the complete application. The advertisement will contain the following text:

PUBLIC NOTICE

Summit Minerals, Inc., 221 West 2100 South, Salt Lake City, Utah, 84115, has made applications for permits and licenses relating to the reclamation of a coal mining site east of Coalville in Summit County, Utah (see figure).



The project area is adjacent to Chalk Creek, a major tributary to the Weber River. The area is shown on the Upton Quadrangle, 7.5 Minute Series (Topographic) map of the U. S. Geological Survey.

The application has been filed by Summit Minerals, Inc. with the Utah Division of Oil, Gas, and Mining for a permit to conduct reclamation activities. The proposed permit area contains the following areas:

Township 3 North, Range 6 East, Salt Lake Baseline and Meridian, Section 36, part of SE 1/4 NE 1/4, and part of the NE 1/4 SE 1/4. The total acreage involved is about 14.

The application contains information regarding environmental resources and the proposed reclamation plan. A copy of the application is available for public inspection at the following addresses:

County Clerk's Office
Summit County Courthouse
Coalville, Utah 84017

State of Utah - Division of Oil, Gas, and Mining
3 Triad Center, Suite 350
355 West North Temple
Salt Lake City, Utah 84180-1203

Written comments, objections, or requests for informal conferences should be directed to:

Mr. Lowell P. Braxton, Administrator
State of Utah - Division of Oil, Gas, and Mining
3 Triad Center, Suite 350
355 West North Temple
Salt Lake City, Utah 84180-1203

Mine file
S. Linner

SUMMIT MINERALS, INC.

221 West 2100 South
Salt Lake City, Utah 84115
(801) 486-1861

March 19, 1987

Mr. Lowell P. Braxton, Administrator
State of Utah - Division of Oil, Gas, and Mining
3 Triad Center, Suite 350
355 West North Temple
Salt Lake City, Utah 84180-1203

RE: Public Notice of Reclamation Plan Application, Summit No. 1 Mine, INA/043/001, Summit County, Utah.

Dear Mr. Braxton:

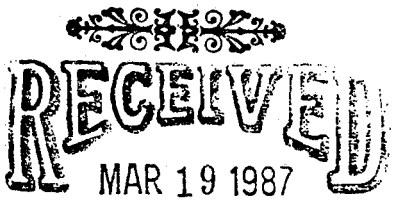
Please find enclosed a proof of publication document from the Summit County Bee for the subject public notice. The notice was also run in the Salt Lake Tribune on those same dates, but proof of publication has not yet been provided from that news agency.

In keeping with the time requirements of UMC Part 782.21, I am providing this proof of publication for inclusion as part of the complete permit application package. The Summit County Bee is a newspaper of general circulation in the locality of the proposed reclamation activities.

Sincerely,
SUMMIT MINERALS, INC.

Barbara A. Filas
Engineer

PROOF OF PUBLICATION



STATE OF UTAH, }
County of Summit, } ss.

DIVISION OF OIL, GAS & MINING

I, Shirley B. Phelps being first duly sworn, depose and say that I am the bookkeeper of The Summit County Bee, a weekly newspaper of general circulation, published once each week at Coalville, Utah, that the notice attached hereto and which is a Public Notice - Permits and licenses relating to the reclamation of coal mine

was published in said newspaper for 4 consecutive issues, the first publication having been made on the 30 day of January, 19 87, and the last on the 20 day of February, 19 87, that said notice was published in the regular and entire issue of every number of the paper during the period and times of publication, and the same was published in the newspaper proper and not in any supplement.

Shirley B. Phelps

Subscribed and sworn to before me this 20 day of February, 19 87.

Susan F. Bump
Notary Public

PUBLIC NOTICE

Summit Minerals, Inc., 221 West 2100 South, Salt Lake City, Utah 84115, has made applications for permits and licenses relating to the reclamation of a coal mining site located 12 miles east on State Route 133 of Coalville, Summit County, Utah. The project area is contained in parts of the NE ¼ NE ¼, SW ¼ NE¼, and SE¼ NE¼ Sec. 36, T3N, R6E, SLB&M. The total acreage involved is about 14.

The project area is adjacent to Chalk Creek, a major tributary to the Weber River. The area is shown on the Upton Quadrangle, 7.5 Minute Series (Topographic) map of the U.$. Geological Survey.

The application contains information regarding environmental resources and the proposed reclamation plan. A copy of the application is available for public inspection at the following locations:

County Clerk's Office
Summit County Courthouse
Coalville, Utah 84017

State of Utah — Division of Oil, Gas, and Mining
3 Triad Center, Suite 350
355 West North Temple
Salt Lake City, Utah
84180-1203

Written comments, objections, or requests for informal conferences should be directed to:

Mr. Lowell P. Braxton,
Administrator
State of Utah — Division of Oil, Gas, and Mining
3 Triad Center, Suite 350
355 West North Temple
Salt Lake City, Utah
84180-1203

Published in the Summit County Bee Jan. 30, Feb. 6, 13, and 20, 1987

PART UMC 783 - INFORMATION ON ENVIRONMENTAL RESOURCES

UMC 783.12 - GENERAL INFORMATION

UMC 783.12(b) - CULTURAL AND HISTORICAL RESOURCES

The immediate area around the reclamation site contains one possible historic mine site, the Morby Shaft sunk in 1879 and which in later years was developed into the Blackhawk Mine. North of the reclamation site, across Chalk Creek and the State Highway, is the Boyer Mine, an historic mine site (42SM 99). A recent archaeological inventory done on the Boyer Mine area found that,

> *"Recent erosion and highway construction have severely impacted the site. Site 42SM 99 is neither significant nor eligible for the National Register of Historic Places."* (Nielson, 1983)

Just west of the proposed reclamation site, the N. B. Morby Shaft was sunk through 57 feet of gravel and conglomerate in 1879 and drifted on the dip of an 8-foot coal bed (Doelling, 1972). From this entry, additional entries were opened by subsequent operators and developed into the Blackhawk Mine (See Plate 771.23-1, Randall, 1952) which was intermittently worked until sometime in the mid 1950's. Those openings were apparently buried during the preparation of the face in 1974-75 for the development of entries by Utah Coal & Energy, Inc. For the most part, this last development took place before August 3, 1977, but records are unclear concerning if any coal may have been mined after that date.

The exact location of the Morby Shaft is not known because subsequent operators opened additional entries. The current proposed reclamation project will not involve any of the original workings of the Morby Shaft.

The Utah Preservation Office, Division of State History, was contacted for information of known cultural or historic sites within the proposed reclamation site. They indicated that they were unable to state conclusively whether any cultural sites exist within the project area. They also stated that their records did not indicate any information on the Morby Shaft or the Blackhawk Mine. A copy of their correspondence is included on page 783.12-3.

Therefore, it is believed that there are no significant sites which would be eligible for the National Register of Historic Places in the proposed reclamation area which would be impacted by the proposed reclamation work.

REFERENCES CITED

Doelling, H. H., 1972, Coalville coal field, *in* Doelling, H. H., and Graham, R. L., Eastern and northern Utah coal fields: Utah Geological and Mineral Survey, Monograph Series no. 2, p.322-354.

Nielson, A. S., 1983, Final Report: An archaeological survey of the Summit Coal Company Mine in Summit County, Utah: Brigham Young University, Department of Anthropology Technical Series no. 83-31.

Randall, A. G., 1952, Areal geology of the Pinecliff area, Summit County, Utah [M. S. thesis]: Salt Lake City, University of Utah, 43 p. 14 plates.

NORMAN H. BANGERTER
GOVERNOR

STATE OF UTAH
DEPARTMENT OF COMMUNITY AND
ECONOMIC DEVELOPMENT

Division of
State History
(UTAH STATE HISTORICAL SOCIETY)

MELVIN T. SMITH, DIRECTOR
300 RIO GRANDE
SALT LAKE CITY, UTAH 84101-1182
TELEPHONE 801 / 533-5755

October 17, 1985

Richard S. Kopp, CPS
11336 High Mesa Drive
Sandy, Utah 84070

RE: Proposed Summit Energy No. 1 Coal Mine

In Reply Please Refer to Case No. I391

Dear Mr. Kopp:

The Utah Preservation Office has reviewed your letter and accompanying maps and information concerning this proposed coal mine located in Summit County. By way of clarification, the responsibility to evaluate and issue formal cultural resource clearances for such activities lies with the appropriate federal agency or their state representative, in this case the Division of Oil, Gas and Mining. The office of the State Historic Preservation Officer provides information on the presence of known cultural or historic sites within proposed project areas. With this in mind, we provide the following information.

An archeological survey was performed in 1973 by BYU of an area across the highway from this proposed project. That report, #904, "An Archeological Survey of the Summit Coal Company Mine," located the cultural sites 42SM99. The project area of the proposed Summit Energy No. 1 Coal Mine has not been surveyed for cultural resources. The area has been disturbed, and has very steep terrain. We are unable to state conclusively whether any cultural sites exist within this project area.

On the subject of the Morby Shaft and the Blackhawk Mine, our records show that we have no information on these two sites.

The above is provided on request as information or assistance. We make no regulatory requirement, since that responsibility rests with the federal agency official. However, if you have questions or need additional assistance, please let us know. Contact Jim Dykman at 533-7039.

Sincerely,

Wilson G. Martin
Deputy State Historic
Preservation Officer

CMS:jrc:I391/2223V

UMC 783.13 - GENERAL GEOLOGY AND HYDROLOGY

This application provides a description of the geology and hydrology, including ground and surface water quality and quantity, on all lands within the reclamation area, the adjacent area, and the general area. The "general area", with respect to hydrology, is defined as that area which is a minimum of one mile from the area to be reclaimed and as shown on the Surface Watersheds Map (Plate 783.15-2).

Past and present exploration and academic research projects in the vicinity of the proposed reclamation area have provided considerable information on the geology of the region. Details on the geology of the reclamation area and adjacent areas are set forth in Section 783.14, Geology Description. Information regarding the hydrology of the reclamation area and adjacent areas is given in Sections 783.15, 783.16, and 783.17.

UMC 783.14 - GEOLOGY DESCRIPTION

UMC 783.14(a) - GENERAL STATEMENT

This section of the permit application describes the geology of the Summit Minerals, Inc. reclamation area, the Coalville Coal Field, and considers how the geology relates to other environmental aspects. The data and information presented here are based on an extensive review of the publications of the Utah Geological and Mineral Survey, the U. S. Geological Survey, the U. S. Bureau of Mines, geology theses written on the area, and articles published by several geological associations and societies such as the Utah Geological Association, the Geological Society of America, and the American Association of Petroleum Geologists. In addition to the published data, information obtained from exploration and earlier mining of the area has been incorporated in order to provide a complete picture of the areas geology. A list of geology references consulted during this investigation is given at the end of this section.

The surface geology of the area is shown on the surface geology map (Pl. 783.14-1). This map shows the rock formations, the strike and dip of surface beds, surface traces of known faults and fold axes, location of oil test holes and wells, and oil fields.

GENERAL GEOGRAPHY COALVILLE-UPTON AREA

The town of Coalville lies in the Weber River Valley east of Salt Lake City at an elevation of about 5,600 feet (1700 m.) above sea level. The valley widens near Coalville and numerous tributaries flow into it from the surrounding mountains and ridges which are generally 2,000 feet (600 m.) or more above the valley floor. One of the main tributaries to the Weber River is Chalk Creek, which enters from the east at Coalville. Almost all of the major coal mines of the Coalville Coal Field are along Chalk Creek where erosion has exposed the coal beds from Coalville east for a distance of over 12 miles (20 km.).

The coal bed(s) mined in the area to be reclaimed are at the east end of the Coalville Coal Field on the south side of Chalk Creek, about one mile upstream from Upton, in Section 36, Township 3 North, Range 6 East.

GENERAL GEOLOGY COALVILLE-UPTON AREA

The rock formations exposed in the Coalville-Upton, Utah area comprise at least 18,000 feet (5,500 m.) of Cretaceous, Tertiary, and Quaternary Strata. The 10,000 feet (3,300 m.) of Cretaceous strata record the deposition and accumulation of terrigenous clastic sediments in alluvial-fan, fluvial, marginal-marine, and nearshore- and offshore-marine environments. Figure 783.14-1 shows the Cretaceous rock formations and members recognized in the Coalville-Upton area, which are briefly discussed below. Figure 783.14-2 is a generalized geologic map of the area that shows the distribution of the Frontier Formation which contains the important coal-bearing strata mined in the region.

STRATIGRAPHY

Kelvin Formation

The base of the exposed stratigraphic section in the Coalville-Upton area is comprised of nonmarine rocks of the Kelvin Formation. The upper 1300 feet (400 m.) of the formation crops out in the core of the Coalville anticline (Fig. 783.14-2). Trexler (1966, p. 10) describes the upper part of the formation as follows:

> *"In the Coalville area the Kelvin consists of interbedded light-gray, reddish-brown, and purplish calcareous claystones becoming silty and sandy in some horizons; light-gray calcareous siltstones; light gray hard to friable usually crossbedded fine-grained sandstones; several thin layers of calcareous siltstones and fine-grained sandstone pebble conglomerate; and at least one bed of dark-gray to black carbonaceous shale."*

Aspen Shale

Dark gray Early Cretaceous marine Aspen Shale is present on the eastern, overturned limb of the Coalville anticline (Fig. 783.14-2, locality 22). The Aspen Shale is a distinctive dark gray to black, splintery, siliceous shale that contains scales of teleost fish. It becomes somewhat silty in its upper part and sandstone is present as an occasional thin bed.

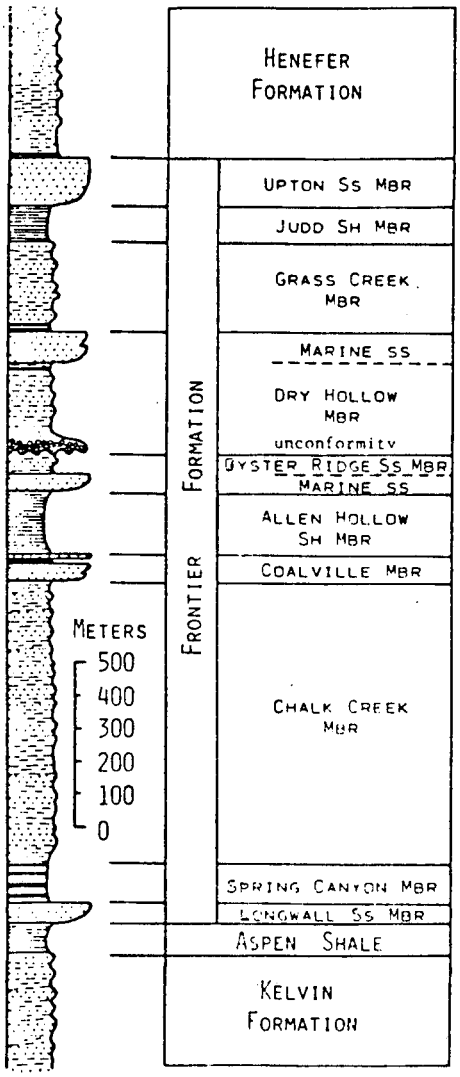


Figure 783.14-1.--Cretaceous stratigraphic section exposed in the Coalville-Upton, Utah area.

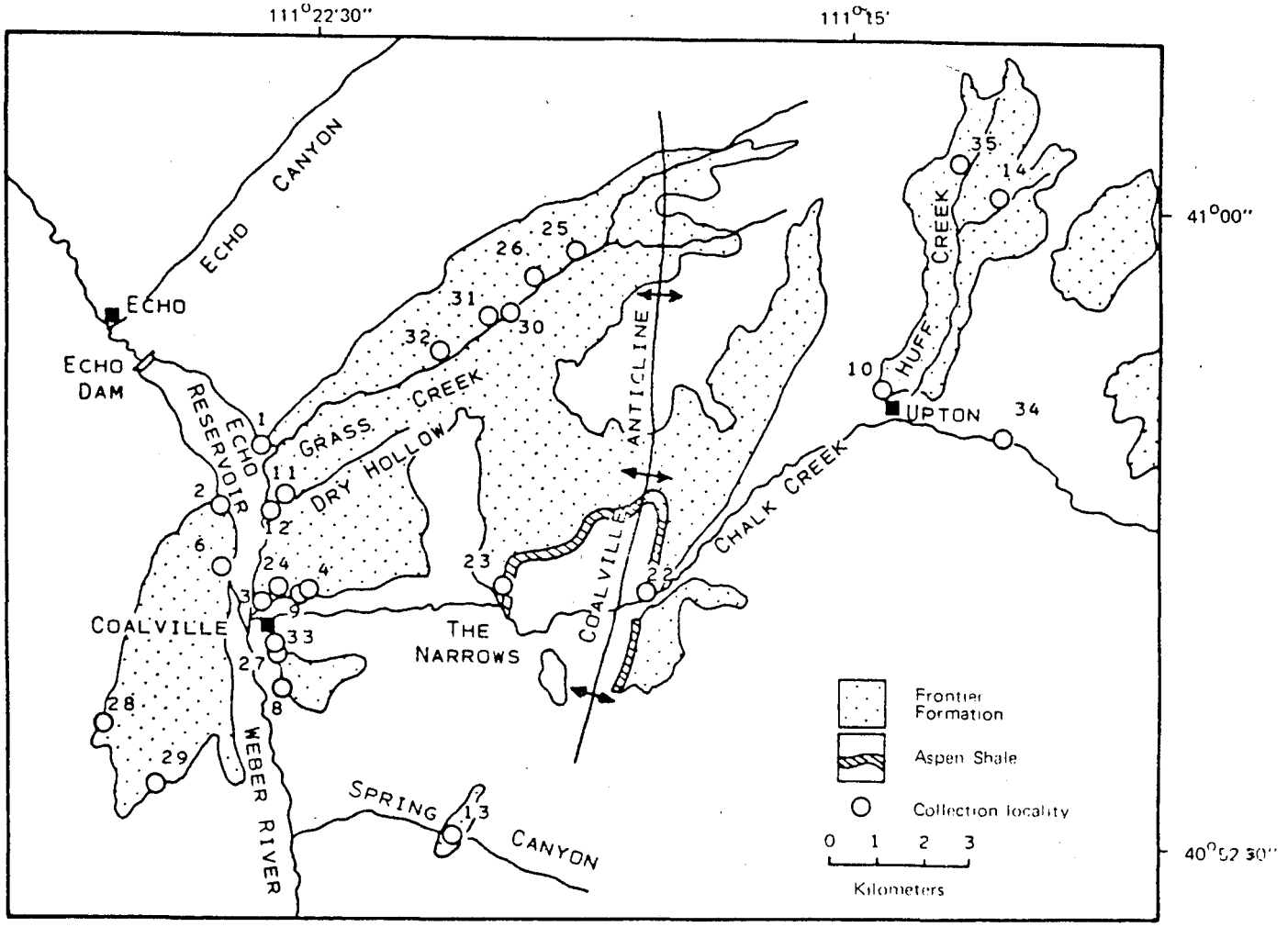


Table 783.14-2.--Generalized geologic map of the Coalville-Upton, Utah area.

Frontier Formation

The Frontier Formation of Early and Late Cretaceous age contains a wide variety of rock types deposited in both marine and nonmarine environments. In the Coalville area the formation is almost 8,000 feet (2360 m.) thick, about four times as thick as it is at the type locality in southwestern Wyoming. Four invasions of the Cretaceous seas are recorded in the rocks of the Frontier Formation in the western part of the Coalville area (Fig. 783.14-2). In the eastern part, near Upton, the upper two marine sequences thicken and merge so that the entire upper half of the formation has a marine character. Near the middle of the formation is an erosional unconformity which is overlain by a thick bed of coarse conglomerate. The Frontier Formation is divided into ten members which contain three coal-bearing zones.

Longwall Sandstone Member. The basal member of the Frontier Formation is the Longwall Sandstone which overlies and is in transitional contact with the marine Aspen Shale. In the Coalville area, the member is an upward-coarsening, shallow-marine sandstone that forms a prominent cliff where exposed. The Longwall Sandstone commonly has a sharply defined upper contact and is overlain by carbonaceous shale and sandstone of the Spring Canyon Member.

Spring Canyon Member. The Spring Canyon Member is composed of carbonaceous black to brown shale; gray siltstone; numerous thin beds of hard, brown, calcareous siltstone; discontinuous beds of sandstone; and, locally, thin beds of coquina comprised mainly of oyster shells. Several beds of coal up to 3.5 feet (1 m.) thick occur in the lower portions of the member. The strata of the member are mainly non-resistant and therefore form poor outcrops.

Chalk Creek Member. The Chalk Creek Member represents a thick sequence of nonmarine beds which are believed to record the lateral migration of river channels. Throughout the greater part of its extent, sandstone, siltstone, and shale occur as upward-fining sequences with erosional bases. Hale (1960, p. 138) described the formation as follows:

> *"The Chalk Creek member is a sequence of gray to tan, medium grained to conglomeratic sandstone alternating with claystone varying in shades of gray, pink, maroon, and green. On the outcrop and in the subsurface, reddish shales predominate. The sandstones commonly have calcareous matrix, are poorly sorted, and generally angular."*

The Chalk Creek Member is 3150 feet (960 m.) thick on the west limb of the Coalville anticline. However, only the lower 800 to 900 feet (240 to 275 m.) are present on the east, overturned limb of the anticline, because most of the member has been cut out by a thrust

fault.

Coalville Member. The Coalville Member consists mainly of very fine to coarse, conglomeratic marine sandstone and gray, silty marine shale. The lower 170 feet (52 m.) is generally gray shale, siltstone, or fine-grained sandstone which is usually overlain by the Wasatch coal bed. Overlying the coal is 30 to 50 feet (10 to 15 m.) of conglomeratic sandstone. The lower part is best exposed near Coalville while the upper part is well exposed on the east limb of the Coalville anticline.

Allen Hollow Shale Member. Two thick dark gray marine shale units of the Frontier Formation crop out in north-central Utah. The lower of these is the Allen Hollow Shale Member which is 780 feet (240 m.) thick north of Coalville and about 590 feet (180 m.) thick on the east limb of the Coalville anticline. The Allen Hollow Shale Member rarely is found in natural outcrops but forms brush-covered valleys between ridges formed by the resistant sandstone strata of the Coalville and Oyster Ridge Sandstone Members. The Allen Hollow Shale becomes silty and sandy in its upper part and grades upward into a thick, ridge-forming marine sandstone unit of the lower part of the Oyster Ridge Sandstone Member.

Oyster Ridge Sandstone Member. The marine sandstone unit in the lower part of the member coarsens upward and locally contains pebbly beds. The sandstone varies in thickness from 65 to 80 feet (20 to 25 m.) northeast of Coalville to about 120 feet (37 m.) on the overturned east limb of the Coalville anticline. Overlying the marine sandstone is 145 to 195 feet (45 to 60 m.) of nonmarine sandstone, siltstone, and silty shale.

Intraformational Unconformity. The upper contact of the Oyster Ridge Sandstone Member is an erosional unconformity within the Frontier Formation. Evidence for the erosional nature of the unconformity consists of a variation in the thickness of the nonmarine, upper part of the Oyster Ridge Sandstone Member and the basal conglomerate of the overlying Dry Hollow Member composed of Paleozoic cobbles and pebbles.

Dry Hollow and Grass Creek Members. The Dry Hollow and Grass Creek Members will be discussed together because the boundary between the two members is not recognizable in the eastern part of the Coalville area.

The Dry Hollow Member is a heterogeneous group of marine and nonmarine strata. At its base, overlying the intraformational unconformity, is a coarse conglomerate composed of sandstone and limestone cobbles and pebbles with a sandy matrix. The conglomerate varies in thickness from 100 feet (30 m.) near Coalville to 20 to 40 feet (6 to 12 m.) on the east limb of the Coalville anticline. Overlying the conglomerate is approximately 975 feet (295 m.) of mainly nonmarine sandstone, siltstone, and shale. The top 88 feet (27 m.) contains up to three coal beds which range in thickness from 1 to 8 feet (0.3 to 2.5 m.). At the top of the Dry Hollow Member are thick, ridge-forming marine sandstone strata which crop out as two distinct

sandstone cliffs separated by a slope of less resistant silty sandstone and siltstone. The total thickness of the Dry Hollow Member is about 1290 feet (390 m.).

Around Coalville the Dry Hollow Member is overlain by a 3.3-foot (1 m.) thick fossilized oyster reef which marks the base of the Grass Creek Member. The reef is in turn overlain by two beds, 26 feet (7.9 m.) and 38 feet (11.6 m) thick of black, carbonaceous to coaly shale. The two beds are separated by 20 feet (6.1 m.) of marine sandstone. Each of the carbonaceous units contains several cycles of rootlet silt-underclay-coal. The remainder of the Grass Creek Member is composed of tan sandstone, gray to brown siltstone, and silty shale which occur in cycles which become finer towards the top of the member.The total thickness of the Grass Creek Member is about 950 feet (290 m.).

In the eastern portion of the area, on the overturned limb of the Coalville anticline, the stratigraphic interval occupied by the Dry Hollow and Grass Creek Members is entirely different from that found around Coalville. On the east limb, the upper, mainly nonmarine portions of the Dry Hollow Member, plus the entire thickness of the Grass Creek Member has been replaced by marine sandstone which contain a few beds of carbonaceous to coaly shale and oyster coquina. Therefore, the contact between the two members cannot be defined.

Judd Shale Member. Near the top of the Frontier Formation is a thick sequence of marine shale which varies from about 295 feet (90 m.) around Coalville to over 700 feet (215 m.) in the eastern part of the Coalville area. Locally the shale is silty and contains laminae and thin beds of sandstone. The contact with the overlying Upton Sandstone Member is gradational.

Upton Sandstone Member. The Upton Sandstone Member is an upward-coarsening, shallow-marine sandstone unit which, with the upper part of the Judd Shale Member, forms a progradational marine sequence. The member is approximately 245 feet (75 m.) thick in the western part of the Coalville area and up to 440 feet (135 m.) in the eastern part.

Henefer Formation

Overlying the Frontier Formation is the Henefer Formation composed of nonmarine and marginal-marine rocks. The formation is about 2500 feet (760 m.) thick and consists of gray to tan sandstone, gray to brown siltstone, and varicolored shale. Locally it becomes pebbly and conglomeratic in the upper portions

Echo Canyon Conglomerate

The Echo Canyon Conglomerate, of Late Cretaceous age, conformably overlies the Henefer Formation and unconformably underlies the Upper Cretaceous and Paleocene Evanston Formation. The Echo Canyon Conglom-erate is mainly reddish brown in color and forms bold cliffs. Although mainly conglomerate, it also includes sandstone and mudstone beds. Fossil marine and brackish-water mollusks from the finer grained rocks indicate that it was deposited in or near a sea. The formation is approximately 1,400 feet (460 m.) thick.

Evanston Formation

The Evanston Formation generally overlies the Echo Canyon Conglomerate with a slight angular discordance. However, locally the angular discordance may be as much as 30 degrees. The formation commonly has a basal conglomerate composed of rounded gray, red, purple, green, and tan quartzite cobbles and small boulders and minor amounts of carbonate cobbles and pebbles. The clasts are generally in a matrix of rounded to angular quartz grains and angular dark-gray chert grains. The conglomerate appears to thin from east to west and tends to be reddish brown in the west and gray to grayish yellow in the eastern outcrops. The conglomerate ranges from about 230 feet (70 m.) thick in the western part of the area to about 500 feet (153 m.) in the eastern portion.

The upper part of the Evanston Formation is finer grained and commonly forms shaly to ledgy slopes. In Echo Canyon and upper Chalk Creek it consists of interbedded conglomeratic grit, gray silty micaceous sandstone, gray mudstone, and minor beds of quartzite conglomerate and carbonaceous shale. Locally, the formation contains thin beds of coal. The upper part is as much as 1,000 feet (305 m.) thick.

Wasatch Formation

In the Coalville-Upton area, the Wasatch Formation is composed of a brown-weathering cobble conglomerate which is overlain by red and yellow interbedded claystone and sandstone. Most of the cobbles are well rounded and consist of sandstone, limestone, dolomite, and quartzite. Most of the quartzite is purple, pink, and green, indicating a probable source from Cambrian and Precambrian quartzites.

Quaternary Rocks

These units are composed of gravels, landslide debris, and alluvial valley fill. The majority of the deposits are eroded products of older units.

STRUCTURAL GEOLOGY

The main structural feature of the Coalville area is a sequence of northerly trending anticlines and synclines. One pair of small folds occur about a mile southeast of Coalville and trend northwest-southeast. Another pair of folds, about five miles east where the South Fork of Chalk Creek joins Chalk Creek, has a general northeast-southwest trend. The later two folds consist of an asymmetrical anticline on the west, called the Coalville anticline, and an asymmetrical syncline on the east, called the Clark Canyon syncline (Pl. 783.14-1). The Coalville anticline has dips on the west limb that range from 15 to 30 degrees west. The east limb of the Coalville anticline, which is also the west limb of the Clark Canyon syncline, is nearly vertical to slightly overturned (Pl. 783.14-2). The east limb of the Clark Canyon syncline has dips which range from 10 to 25 degrees to the west. About six miles further east, just east of the Summit Minerals reclamation project area, the more symmetrical Dry Canyon anticline folds the strata (Pl. 783.14-1 & 783.14-2). The Coalville anticline plunges towards the north while the Dry Canyon anticline plunges south at about 10 degrees. The coal beds have been included in this folding, which, for the most part, preceded the deposition of a thick cover of Eocene deposits that have been eroded in many places to expose the Cretaceous sedimentary rocks.

The area also contains numerous north-south trending faults that have substantially displaced the strata in some locations. At a number of locations, the faulting has resulted in the exposure of coal beds at the surface. A thrust fault cuts the overturned limb of the Coalville anticline and cuts out significant portions of the Chalk Creek Member.

UMC 783.14(a)(2) - Geology Of Surface Lands Within Reclamation Area

The Summit Minerals reclamation area is located near the eastern border of the Coalville Coal Field, about twelve miles east of the town of Coalville, Utah. The deposit is situated on the south side of Chalk Creek, approximately one mile upstream from Upton, in Section 36, Township 3 North, Range 6 East.

STRATIGRAPHY

The surface rocks of the reclamation area are mainly those belonging to the Tertiary Wasatch and Evanston Formations. The best exposures of those rocks in the area are in the canyon of the South Fork of Chalk Creek about four miles from its junction with Chalk Creek. Three distinct units are visible. A lower gray shale containing fresh-water gastropods, a middle cobble conglomerate, and an upper sequence of white and bright red clays. The middle conglomerate

exhibits a peculiar honeycomb weathering which produces monuments and conical pinnacles. The Tertiary beds have very low dips of about 2 degrees towards the southeast.

Extensive alluvial terrace and alluvial fan deposits occur along Chalk Creek. The alluvial terrace deposits are composed of reworked gravel and sand. In many of the smaller canyons the alluvial material has been greatly entrenched by present streams. The numerous intermittent streams in the canyon have built extensive coalescing fans that make up the bulk of the alluvial deposits covering the canyon bottoms. One of those fans cover the coal bed in the area to be reclaimed. A detailed study of the gravels in the fan indicates that it is composed of 52 percent quartzite, 21 percent crystalline igneous rocks, 16 percent pyroclastic rocks, about 7 percent clastic rocks, and close to 4 percent chert.

The only Cretaceous rocks exposed in or near the area to be reclaimed are those of the Henefer Formation and two members of the upper part of the Frontier Formation which crop out in the valley walls of Chalk Creek and the South Fork of Chalk Creek. The Henefer beds generally strike north and dip between 15 and 25 degrees westward on the east limb of the Clark Canyon syncline. Across the axis of the syncline the Henefer beds are overturned and have steep dips up to 85 degrees (Pl. 783.14-1). Trexler (1966) mapped a small outcrop of the Upton Sandstone Member along the South Fork of Chalk Creek about 4 miles up stream from its mouth. Here the Upton Sandstone beds strike northeast and dip about 18 degrees towards the northwest (Pl. 783.14-1). Trexler (1966) also identified the sandstone that crops out near the Boyer Mine across Chalk Creek from the Summit Minerals mine area as the Grass Creek Sandstone Member. This same sandstone has been exposed by development work associated with the old Black Hawk Mine in and adjacent to the Summit Minerals reclamation area. In both locations, the sandstone strikes almost due north and dips between 15 and 17 degrees west. It is believed that the presence of these two Frontier members needs to be considered when one makes an interpretation of the nature of the coal deposits in the mine areas.

Table 783.14-1.--Composite Stratigraphic Section For Summit Minerals Reclamation Project Area.

AGE	FORMATION/ MEMBER NAME	LITHOLOGY	AVERAGE THICKNESS
Early Eocene to Paleocene	Wasatch Formation	1. Predominantly red and yellow clay and sandstone. Locally white and red-tinted sandstones grading upward into reddish fresh-water limestones intermixed with beds of large-boulder conglomerate.	?
		2. Brick-red cobble basal conglomerate grading upward to interbedded reddish-brown conglomerate and sandstone with lenses of limestone and conglomerate. (Probably missing above the Black Hawk mine)	1266 feet in Elkhorn Canyon
---------- ANGULAR UNCONFORMITY ----------			
Paleocene to Late (Lance) Cretaceous	Evanston Formation	1. Interbedded conglomeratic grit, gray silty micaceous sandstone, gray mudstone, and minor beds of quartzite conglomerate and carbonaceous shale. Locally thin coal beds.	As much as 1000 feet
		2. Tan, cobble to boulder quartzitic conglomerate with lenses of tan sandstone; weathers to produce monuments and conical pinnacles.	300 ± feet
---------- ANGULAR UNCONFORMITY ----------			
Late Cretaceous	Echo Canyon Conglomerate	Coarse red to tannish-brown conglomerates; light colored matrix composed of silica sand and calcareous cement with rounded pebbles of quartz and chert. Found mainly north of Coalville; probably not present in the project area. Conformable with underlying Henefer Formation in the Coalville area.	1500 ± feet
Late Cretaceous	Henefer Formation	Brown to gray, cross-bedded, fine- to coarse-grained sandstone and a few lenses of conglomerate. Gradational contact with Upton sandstone.	2400 feet (six miles east of Coalville)
Late Cretaceous	Upton Sandstone Member	Light yellowish to bluish-gray, fine grained, calcareous, well-bedded sandstone; often forms conspicuous hogback. Shallow marine.	450 feet (At Upton)
Late Cretaceous	Judd Shale Member	Gray marine shale.	690-760 feet
Late Cretaceous	Grass Creek Member	Upper: Thin layers of gray shale interbedded with tan thin bedded sandstone.	275-325 feet
		Basal: Lenticular, coarse-grained sandstone and reddish clay shales of fluviatile origin.	600-700 feet
Late Cretaceous	Dry Hollow Member	Top: Prominant white, cliff-forming sandstone.	200 feet
		Carbonaceous coal-bearing rocks; contains three coal beds 1 to 8 feet thick.	90 feet
		Red to brown silty shale, thin brown sandstone and lenses of conglomerate; fluviatile environment.	860 feet
		Basal: Conglomerate composed of Paleozoic cobbles and pebbles.	40-100 feet
---------- UNCONFOMITY ----------			
Late Cretaceous	Oyster Ridge Sandstone Member	Upper: Interbedded green to brown shale and tan sandstone.	150-200 feet
		Basal: White sandstone, medium- to coarse-grained quartz sand with lenses of conglomerate; slightly calcareous matrix.	45-80 feet
Late Cretaceous	Allan Hollow Shale Member	Dark gray marine shale with interbedded thin sandstones at the base and at the top.	780 feet
Late Cretaceous	Coalville Member	Upper: Sandstone, locally conglomeratic.	30-130 feet
		Middle: "Wasatch" coal.	5-13 feet
		Basal: Sandstone, usually well-bedded; contains Inoceramus labiatus	40-80 feet
Late Cretaceous	Chalk Creek Member	Gray to tan, medium-grained to conglomeratic sandstone which alternates with claystone with varying shades of gray, pink, maroon, and green. On the outcrop and in the subsurface, reddish shales predominate. The sandstones are commonly calcareous, poorly sorted and have angular grains.	3150 feet
Early (?) Cretaceous	Spring Canyon Member	Carbonaceous black to brown shale; gray siltstone; numerous thin beds of hard, brown calcareous siltstone; discontinuous sandstone and locally thin beds of oyster coquina. Contain up to five beds of coal ranging from one foot to 3.5 feet thick.	350-375 feet
Early (?) Cretaceous	Longwall Sandstone Member	Medium light gray to white, medium- to coarse-grained quartz sandstone. To the south of Coalville, shows repeated interbedding with carbonaceous shale, gray siltstone, and fine sandstone.	70-250 feet
Early Cretaceous	Aspen Shale	Dark gray shale and tan sandstone with interbedded light grey shale containing Teleost fish scales	210 feet
Early Cretaceous	Kelvin Formation	Nonmarine redbeds: shale and sandstone, lenses of conglomerate.	2500 + feet

STRUCTURAL GEOLOGY

Less than a mile east of the Summit Minerals reclamation area the axis of the Dry Canyon anticline crosses Chalk Creek. North of Chalk Creek the axis has a general north-south trend. However, south of Chalk Creek the axis probably curves to the southwest and cuts across the mine area. At Chalk Creek the axis of the anticline probably is plunging about 10 degrees to the south.

South of the South Fork of Chalk Creek, outside of the project area, is the Lodgepole Oil Field. A major northeast trending thrust fault bisects the oil field and structure contours indicate two anticlinal folds associated with two branches of the thrust fault. The thrust fault trends northeast across the South Fork of Chalk Creek and probably continues northeast to the Elkhorn Ridge Field, which in turn is probably related to the Pineview Oil Field trend further to the northeast. Just how the thrusting may effect the bed(s) in the project area is unknown.

UMC 783.14(a)(2) - Geology of Coal Bed

STRATIGRAPHY

The coal bed present in the Summit Minerals No. 1 Coal Mine is commonly called the Wasatch Coal bed. Throughout the Coalville Coal Field this bed varies in thickness from 5 to 14 feet. However, based on the small outcrop of the Upton Sandstone Member found by Trexler (1966) along the South Fork of Chalk Creek and Trexler's identification of the Grass Creek Sandstone Member near the Boyer Mine north of the permit area, it would seem very possible that the coal bed is Dry Hollow coal. Assuming a simple structure, then the coal probably trends slightly west of south from the project area. Baring structural complexities (such as thrusting), one could expect to find the coal at depths of less than 2,000 feet under the central portion of the property. If the Dry Canyon anticline trends as indicated above, then the Wasatch coal should be closest to the surface along the axis of the fold. On either side of the Dry Canyon axis, the Wasatch Coal would be encountered at depths of about 2,000 feet. However, it is possible that a fault along Chalk Creek may have brought up the Coalville Member and the coal exposed at the surface is the Wasatch coal bed.

The coal in the vicinity of the Summit Minerals No. 1 mine area ranges in thickness from 6 to 9 feet. The coal bed is usually solid with no partings except for an occasional thin clay parting a few inches thick near the base of the bed. Locally, the coal has been partially washed out and replaced with sand, silt, or clay. However, those channel-like features are usually narrow and very infrequent throughout the areas mined to date. Channel sands can cause problems in mining such as reducing coal bed height and causing roof problems.

The roof rocks of the coal bed are mainly thinly laminated sandstone with some interbedded siltstones and shales. The sandstones are very fine grained and light colored.

A hole drilled in Section 6, Township 2 North, Range 7 East, just east of the projected axis of the Dry Canyon Anticline, found 5.6 feet of coal with 3.5 feet of splits between 1400 to 1410 feet. An oil well drilled by Amoco on the axis of the Dry Canyon anticline in Section 30, Township 3 North, Range 7 East, found five beds of coal 2 to 8 feet thick in the top 576 feet, an 8-foot bed at 1818 feet, and 30 to 35 feet of coal in four beds (one 14 feet thick) between 4425 and 4464 feet.

STRUCTURAL CONSIDERATIONS

The Summit Minerals reclamation area is on the west limb and crest of the symmetrical Dry Canyon anticline. Dips on the limb of the anticline range from 10 to 25 degrees. The coal bed and beds immediately adjacent to the coal, have surface dips toward the west which range between 11 and 17 degrees. An underground mine map of the old Blackhawk Coal Mine made by Randall (1952; Pl. 771.23-1) shows a number of elevations in the mine on the coal bed. Using those elevations, a number of three-point problems were solved to determine the dip of the coal bed in the mine. Plates 783.14-3 and 783.14-4 show a plan map and cross sections which indicate that the dips of the coal bed decrease towards the west with dips as low as 7 and 9 degrees.

The steep dips found in some areas can have an effect on the mining of the coal; such as, producing steep grades for men and equipment to negotiate, difficult roof and floor conditions, and the possible danger of rib-rolls or face-turnovers along the upper side. Another possible structural effect on mining the coal is the possibility of faulting in the mine area. Both normal and thrust faults are known to be in the general area and could be encountered during mining.

COAL QUALITY

The coal which has been mined from the old Black Hawk Coal Mine next to the site of the Summit Minerals No. 1 coal mine ranges from 7 to 9 feet in thickness and dips 18 degrees south 75 degrees west. The coal is rather massive, although a close-spaced cleavage system permits it to be easily broken and sized. North of Chalk Creek, in the Boyer Mine, the coal is reported to vary from 6 to 7 feet in thickness. The Black Hawk coal is a high quality subbituminous coal with very low sulphur content, low ash content, and clean burning with a 10,000 to 13,000 BTU range. Table 783.14-2 shows the quality of the coal shipped from the old Black Hawk Coal Mine and the coal found in the Boyer Mine.

Table 783.14-2.--Quality of Coal Shipped From the Old Black Hawk Mine and Coal From the Boyer Mine.

Sample Identification	% Moisture	% Ash	% Volatile Matter	% Fixed Carbon	B.T.U.	% Sulphur
BLACK HAWK COAl MINE:						
Shipped 11-12-78 U & I	8.79	9.54	----	----	12,612	0.742
Shipped 09-01-78 U & I	12.20	7.38	----	----	11,833	0.783
Shipped 08-18-78 U & I	11.98	7.62	----	----	12,136	----
Shipped 08-12-78 U & I	9.64	7.26	----	----	11,110	----
University of Utah Engineering Experiment Station 02-15-72	----	5.1	----	----	10,909	0.55
CT & E Company 10-02-71	11.27	3.37	38.91	46.45	11,106	0.64
U. S. Steel Corp. 1950	1.12	4.06	45.2	51.7	13,100	0.55
U. S. Steel Corp. 1950	----	4.8	46.9	48.3	------	0.61
BOYER COAL MINE:						
Core BC-1	10.1	12.7	33.3	43.9	10,520	1.43
Core BC-2	8.4	22.1	31.9	37.6	9,044	1.82
Core BC-3	9.4	13.9	33.9	42.8	10,516	1.48
Core BC-4	10.1	6.3	34.3	49.3	10,869	0.33
COALVILLE FIELD:						
From Doelling, 1972*	12.0	4.4	38.4	44.7	10,728	1.32

* Summary of 54 analyses, all Wasatch Coal Bed.

See Appendix for Coal Analysis Reports

UMC 783.14(a)(2)(i) - Location of Subsurface Water

Ground water has not been encountered during exploration of the coal deposits in and around the Summit Minerals reclamation area. Mining in the Black Hawk Coal Mine has no record of producing water which caused any problems.

UMC 783.14(a)(2)(ii) - Overburden

Plate 783.14-5, Overburden Profile and Geologic Cross Section of Portal No. 1, Utah Coal and Energy's Black Hawk Coal Mine, shows the relation between the coal bed and the overburden. At that location, the coal is overlain by up to 17 feet of shale which in turn is overlain by about 30 feet of sandstone. The section is capped by conglomerate which is probably at least 100 feet thick.

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GEOLOGY APPENDIX

COAL ANALYSIS REPORTS

INTEGRATED RESEARCH CENTER

MOSES LAKE, WASHINGTON

DATE: Samples Shipped _____; Samples Received 11-20-78; Analyses Completed 11-30-78

REPORT DATE: 11-30-78

SAMPLE IDENTIFICATION

Shipper	Coal Type	Shipper Number	Car Numbers
Garland Factory Coalville 11-12-78	3 loads Week ending 11-12-78		

ANALYTICAL DATA:

Sample	Shipper Analysis			U & I Analysis		
		Air Dry	Inherent	Total	Air Dry	Inherent	Total
	Moisture:				3.86	4.93	8.79
		As Rec'd	Dry Basis		As Rec'd	Dry Basis
	Ash:				8.70	9.54
		As Rec'd	Dry Basis		As Rec'd	Dry Basis
	BTU/lb.				11,504	12,612
	Sulfur	Other		Sulfur	Other	
				.742%		

REMARKS: _____

Signed Peter M. Weiss, Supervisor of Anal. Services 11-30-78

CC: General Chemist
Purchase Dept.
Factory Chemist

FORM OP-39

MOSES LAKE, WASHINGTON

TE: Samples Shipped _____; Samples Received 9-18-78; Analyses Completed 9-22-78

REPORT DATE: 9-22-78

SAMPLE IDENTIFICATION

Shipper	Coal Type	Shipper Number	Car Numbers
Coalville to Garland Factory, Sept. 1, 1978 2 loads			

ANALYTICAL DATA:

Sample	Shipper Analysis			U & I Analysis		
		Air Dry	Inherent	Total	Air Dry	Inherent	Total
	Moisture:				2.11	10.09	12.20
		As Rec'd	Dry Basis		As Rec'd		Dry Basis
	Ash:				6.48		7.38
		As Rec'd	Dry Basis		As Rec'd		Dry Basis
	BTU/lb.				10,389		11,833
	Sulfur		Other		Sulfur		Other
					.783		--

REMARKS: _____

Signed Peter M. Wicks
Supervisor of Anal. Services 9-2[illegible]

CC: General Chemist
Purchase Dept.
Factory Chemist

FORM C

U & I INCORPORATED RESEARCH CENTER

MOSES LAKE, WASHINGTON

SEP 8 1978

CTT ___ VHK ___ SW ___
YH ___ NK ___

DATE: Samples Shipped -- ; Samples Received 8-28-78 ; Analyses Completed 9-6-78

REPORT DATE: 9-6-78

SAMPLE IDENTIFICATION

Shipper	Coal Type	Shipper Number	Car Numbers
Coalville Week ending 8-18-78 5 Loads			

ANALYTICAL DATA:

Sample	Shipper Analysis			U & I Analysis		
	Air Dry	Inherent	Total	Air Dry	Inherent	Total
Moisture:				2.13	9.85	11.98
		As Rec'd	Dry Basis		As Rec'd	Dry Basis
Ash:					6.71	7.62
		As Rec'd	Dry Basis		As Rec'd	Dry Basis
BTU/lb.					10,682	12,136
	Sulfur	Other		Sulfur		Other

REMARKS: _____

Signed Peter M. Rick
Supervisor of Anal. Services

CC: General Chemist

U & I INCORPORATED RESEARCH CENTER

MOSES LAKE, WASHINGTON

DATE: Samples Shipped _____; Samples Received 8-22-78; Analyses Completed 8-24-78

REPORT DATE: 8-24-78

SAMPLE IDENTIFICATION

Shipper	Coal Type	Shipper Number	Car Numbers
Garland	from Coalville	8-(7-11)	

ANALYTICAL DATA:

Sample	Shipper Analysis			U & I Analysis		
		Air Dry	Inherent	Total	Air Dry	Inherent	Total
	Moisture:				--	9.64*	9.64
			As Rec'd	Dry Basis		As Rec'd	Dry Basis
	Ash:					6.56	7.26
			As Rec'd	Dry Basis		As Rec'd	Dry Basis
	BTU/lb.					10,044	11,11
	Sulfur		Other		Sulfur		Other

REMARKS: * This sample was not air dried so the inherent moisture is also the total moisture.

Signed Peter M. Hicks

Supervisor of Anal. Services

UTAH ENGINEERING EXPERIMENT STATION
University of Utah
Salt Lake City, Utah 84112
Tele: 581-6348

Test No. 6131

P.O. No. _____

Type of Test Coal Analysis

Submitted by Mr. Joe Lyon
600 East Capitol Street
Salt Lake City, Utah 84103

Specimen Coal sample

Address _____

Date Rec'd 2/14/72

Date Completed 2/15/72

Tested by Dr. R. E. Wood
Fuels Engineering

TEST DATA

% Sulfur:	0.55
% Ash:	5.1
Btu/lb:	10,909

Carl Ruscetta, Asst. Director

CT&E Co.

A DIVISION OF COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES 330 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 • AREA CODE 312 726-8494

October 2, 1971

MAIL ADDRESS
2180 EAST 40TH AVENUE
DENVER, COLORADO 80205
PHONE 303 255-3371

COALVILLE COAL COMPANY
640 Continental National Bank Bldg.
Englewood, Colorado 80110

Sample identification by Coalville Coal Co.

Blackhawk Mine
Sec 36 T3N R6E
Summit County, Utah

Kind of sample reported to us: Coal

Sample taken at: XXXXX

Sample taken by: Coalville Coal Co.

Date sampled: XXXXX

Analysis report no. 72-8811

PROXIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	11.27	XXXXX
% Ash	3.37	3.80
% Volatile	38.91	43.85
% Fixed Carbon	46.45	52.35
	100.00	100.00
Btu	11106	12517
% Sulfur	0.64	0.72

ULTIMATE ANALYSIS

	As Received	Dry Basis
% Moisture	11.27	XXXXX
% Carbon	64.64	72.85
% Hydrogen	4.60	5.28
% Nitrogen	1.15	1.30
% Chlorine	0.00	0.00
% Sulfur	0.64	0.72
% Ash	3.37	3.80
% Oxygen (diff.)	14.33	16.15
	100.00	100.00

Respectfully submitted,

CT&E Co.

LWT/jc

L.W. TAYLOR, District Manager

Charter Member

Columbia-Geneva Steel
Division
United States Steel Corporation
120 Montgomery Street, San Francisco 6
Sutter 1-2500

January 13, 1961

Mr. James B. Dexter
1080 South 450 East
Orem, Utah

Dear Mr. Dexter:

Black Hawk Coal

We acknowledge receipt of the questionnaire on the above property. In 1950 we tested samples of coal from this property and found the coal to be non-coking and therefore of no value to us.

For your information, I will repeat the analyses we obtained at that time.

Proximate Analysis		Ultimate Analysis	
Vol. Matter	46.9%	Carbon	74.25
Fixed Carbon	48.3	Hydrogen	5.22
Ash	4.8	Oxygen	13.58
Sulphur	0.61	Nitrogen	1.54
		Sulphur	0.61
		Ash	4.80

We wish to thank you for submitting your property for our consideration and regret that we are unable to give you a more encouraging reply at this time.

Very truly yours,

S. G. Sargis
Assistant Manager - Exploration

SGS:lm

1: Coal Analysis: Ash..... 4.06%
Volatile Combustible Matter..... 45.20%
Fixed Carbon..... 51.7%
Sulfur..... 0.55%
B.T.U. 13,100
Note: * Moisture as received..... 1.12%
(* Sample taken from under tipple)

SUMMIT MINERALS #1
SUMMIT MINERALS COMPANY
ACT/043/001

Map Number:

VOLUME 1 - 1986
784.13 - Existing Sedimentation Pond Reclamation Plan
784.23 - Existing Contours

VOLUME 1 - 1987
S1-1008 - Existing Contour
S1-1009 - Reclaimed Contour
S1-1025 - Slope Map

CONVULSION CANYON
SOUTHERN UTAH FUEL COMPANY
ACT/041/002

Map Number:

Volume 10 - Map 8.1 - Vegetation Map

BOYER MINE
SUMMIT COAL COMPANY
ACT/043/008

Map Number:

Volume 2 - Plate 7.1

CENTENNIAL PROJECT
ANDALEX RESOURCES
ACT/007/019

Map Number:

VOLUME 2
Plate #32 - Pinnacle Mine Current Mine Plan
Plate #33 - Apex Mine Current Mine Plan
Plate #38 - Cross Sections and Volumes of Substitute Topsoil

UMC 783.15 GROUND WATER INFORMATION

UMC 783.15(a) - GENERAL DESCRIPTION OF GROUND WATER HYDROLOGY

Chalk Creek appears to be a gaining stream in the vicinity of its confluence with the Weber River. Approximately three miles east of Coalville however, Chalk Creek is apparantly above the water table and from that point upstream is probably recharging the alluvium (Gates, et al, 1984).

Ground water occurs primarily in the alluvium and older semi-consolidated and consolidated units of the Frontier formation in the Chalk Creek area. Drainage of ground water in the area generally follows the flow of surface waters toward the Weber River (Gates, et al). To the east of the reclamation site is the Dry Creek Anticline, which probably serves as the hydrogeologic divide for the area. Beds in the reclamation area generally dip westerly at about 15 degrees. This is further substantiated by the westerly dip of the coal bed based on surveys of old mine workings (reference Section 783.14 of this document).

Gates, et al describes the water bearing characteristics of the hydrologic units as follows:

> Lithology and Occurrence: Marine and nonmarine sandstone, marine shale, and continental conglomerate. Includes Kelvin Formation, Bear River Formation, Aspen Shale, and Frontier and Wanship Formations. Frontier Formation is about 2,100 feet thick and the Wanship Formation is about 5,000 feet thick in the Coalville area. Crops out on lower mountain slopes adjacent to Henefer Valley, around Coalville and in the Chalk Creek drainage basin, and in the southern East Canyon drainage.
>
> Water Bearing Characteristics: Yields 7-300 gallons per minute of fresh to slightly saline water (235-3000 milligrams per liter of dissolved solids) to wells around Coalville. Water is under artesian pressure locally.

UMC 783.15(a)(1) - Depth and Extent of Aquifers

Several water wells have been drilled in the vicinity of the reclamation area. Drill logs for these wells are presented in cross section showing the surface topography, static water level (when recorded), and depth to water bearing zone (when

recorded) on drawing number 783.15-1. It should be noted when reviewing this drawing that drill log information is used only for interpreting characteristics associated with ground water. Log descriptions reflect the interpretation of the driller, and may or may not be geologically correct.

It is expected that the water bearing zone is continuous along the Chalk Creek drainage valley. The uphill extent of the waterbearing member is unknown. Previous underground workings in the general area are not noted to be great water producers.

UMC 783.15(a)(2) - Lithology and Thickness of Aquifers

Drill logs for the water wells are shown on drawing number 783.15-1.

UMC 783.15(a)(3) - Uses of Subsurface Water

Ground water in the area is appropriated for irrigation, stockwatering and domestic use (Table 783.15-1).

UMC 783.15(a)(4) - Quality of Subsurface Water

Ground water quality of wells in the reclamation are currently being monitored by Earth Fax Engineering/Summit Coal Company in conjunction with the Division of Oil, Gas, and Mining as a part of the Small Operators Assistance Program (SOAP). Available ground water quality data from the Earth Fax draft report is included on Table 783.15-2.

UMC 783.15(b) - RECHARGE, STORAGE, AND DISCHARGE

"Alluvium is believed to be the most important hydrogeologic unit... because it is the most permeable and commonly contains fresh water." Precipitation and surface migration of runoff, together with groundwater contributions such as springs and seeps constitute the flow in Chalk Creek. Recharge of the alluvial aquifer in and near the valley floor is from seepage and underflow of the creek. Recharge from the higher elevations is primarily from infiltration of snowmelt. (Gates, et al)

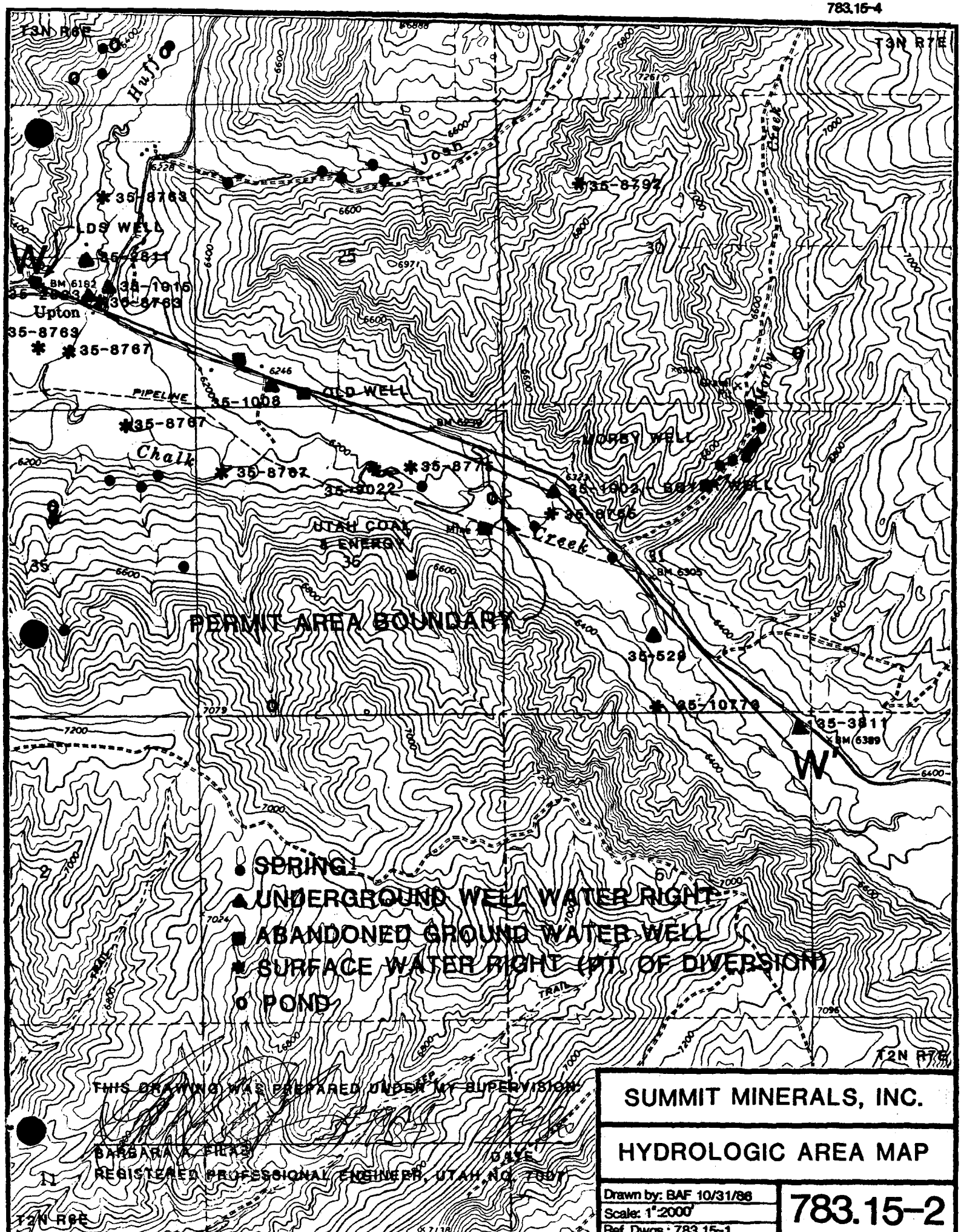
Ground water movement generally follows the surface topography and flows toward the Weber River. Although several surface discharges of groundwater are present on the northern side of the Chalk Creek drainage valley, very few are noted on the south side. Drawing number 783.15-1 shows the recorded

springs and seeps in the area. The Operator will conduct a spring and seep survey of the area in the spring and fall of each year to identify seasonal variations in these ground water sources.

The storage and hydraulic characterists of the local groundwater aquifer is currently being evaluated under the SOAP program at the adjacent Boyer Mine. Through the SOAP program, a pumping test and slug test were conducted on the abandoned Old Well (drawing number 783.15-1) and resulted in transmissivity values for the aquifer penetrated by the well which range from 0.8 sq ft/day to 2.5 sq ft/day. The transmissivity of the Boyer well was calculated to be 0.5 sq ft/day based on pumping test information recorded on the drillers log. These values appear to be typical for low yielding wells in this type of stratum (U. S. Bureau of Reclamation, 1977).

The SOAP study includes the monitoring of water levels in the Old Well over the 1986 water year. A graphical representation of this information is included on pate 783.16.20 and is compared to the surface flow measurements in Chalk Creek over the same period. The results show that the ground water levels do not fluctuate appreciably, implying that the ground water recharge is approximately equal to the discharge. Ground water elevation fluctuations in this well do not appear to be directly related to the flow in Chalk Creek.

A detailed discussion of the tests done and conclusions drawn pursuant to the SOAP study is included in Earth-Fax Engineering, Inc.'s report to the Division of Oil, Gas, and Mining titled "Results of Overburden and Hydrologic Investigations of the Boyer Mine, Summit County, Utah", dated November 1986.



THIS DRAWING WAS PREPARED UNDER MY SUPERVISION:

BARBARA A. FILAS
REGISTERED PROFESSIONAL ENGINEER, UTAH NO. 7007

DATE

SUMMIT MINERALS, INC.

HYDROLOGIC AREA MAP

Drawn by: BAF 10/31/86	**783.15-2**
Scale: 1"=2000'	
Ref. Dwgs.: 783.15-1	

TABLE 783.15-1

WATER RIGHTS

Sec.,T-N,R-E	Ref. No.	Owner of Record	Source	Flow	Purpose *
25,3,6	35-1008	Staley, Claud S.	U.G. Well	0.015 cfs	I,D
26,3,6	35-8767	Chalk Creek Irrig. Co., Mutual Assoc.	Chalk Creek	6.28 cfs	I,S,D
26,3,6	35-4717	Clark, David	Spring	0.045 cfs	S,D
26,3,6	35-2823	Clark, Walter	U.G. Well	0.022 cfs	S,D
26,3,6	35-8763	Harris Ditch Co., Mutual Assoc.	Huff Creek	2.9 cfs	I,S,D
26,3,6	35-1015	Jacobson, Alonzo	U.G. Well	0.015 cfs	S,D
26,3,6	35-4720	Jacobson, Alonzo	Springs	0.045 cfs	S,D
26,3,6	35-4718	LDS Church, Upton Ward	Springs	0.045 cfs	S,D
26,3,6	35-4719	Orgill, Merrill	Springs	0.045 cfs	S,D
26,3,6	35-2811	Saxton, W. B.	U.G. Well	0.002 cfs	S,D
26,3,6	35-4736	Upton Waterworks Company	Springs	0.045 cfs	S,D
36,3,6	35-8775	Boyer Ditch Co., Mutual Assoc.	Chalk Creek	0.41 cfs	I,S,D
36,3,6	35-9022	Boyer, Lyle E.	Chalk Creek	0.0126 cfs	I
31,3,7	35-10773	Staley, Elmer D. and Richard S.	Chalk Creek	1.72 cfs	I,S,D
31,3,7	35-529	Jones, G. Allen	U.G. Well	0.015 cfs	D
31,3,7	35-1002	Boyer, Fern J.	U.G. Well	0.015 cfs	I,S,D
31,3,7	35,8765	Boyer Ditch Co., Mutual Assoc.	Chalk Creek	5.14 cfs	I,S,D
6,2,7	35-8773	Staley, Elmer D. and Richard S.	Chalk Creek	1.72 cfs	I,S,D
6,2,7	35-3811	Potter, G. W.	U.G. Well	0.012 cfs	S,D

* I - Irrigation; S - Stockwatering; D - Domestic

TABLE 783.15-2a

GROUND WATER QUALITY ANALYSES
BOYER WELL

	08/03/85	10/12/85	07/04/86	10/17/86
Field Measurements				
Temperature (degrees C)	12.0	10.0	12.0	9.8
pH	7.30	7.28	7.74	8.75
Specific Conductance (umhos/cm at 25 degrees C)	580	560	450	450
Laboratory Measurements				
Aluminum (mg/l)	<0.05	<0.05	<0.05	<0.1
Ammonia (mg/l)	0.21	0.52	0.14	1.46
Arsenic (mg/l)	0.012	0.012	0.001	<0.01
Barium (mg/l)	0.05	0.05	0.11	<0.01
Bicarbonate (mg/l)	235	212	314	250
Boron (mg/l)	0.08	<0.05	<0.05	0.133
Cadmium (mg/l)	0.002	<0.001	0.002	0.017
Carbonate (mg/l)	0	0	0	29.6
Calcium (mg/l)	7	8	14	5.6
Chloride (mg/l)	15.4	7.6	20.6	23
Chromium (mg/l)	0.003	<0.005	<0.005	<0.01
Copper (mg/l)	0.064	0.024	0.074	<0.01
Fluoride (mg/l)	0.050	0.070	0.80	0.64
Hardness (mg/l CaCO3)	25	20	60	39
Iron (mg/l)	0.79	0.57	0.07	0.025
Lead (mg/l)	0.013	0.014	0.014	<0.01
Magnesium (mg/l)	4	4	5	3.6
Manganese (mg/l)	0.014	0.032	0.015	<0.01
Mercury (mg/l)	<0.0001	<0.0001	<0.0001	<0.0002
Molybdenum (mg/l)	<0.05	<0.05	<0.05	<0.01
Nickel (mg/l)	0.006	0.024	0.014	0.030
Nitrate (mg/l as N)	0.09	<0.01	0.10	0.764
Nitrite (mg/l as N)	0.01	<0.01	<0.01	0.0087
Phosphate (mg/l)	0.07	0.06	0.03	<0.01
Potassium (mg/l)	3	5	5	3.7
Selenium (mg/l)	0.006	0.004	0.009	<0.002
Sodium (mg/l)	120	115	108	126
Solids, Dissolved (mg/l)	380	395	245	369
Sulfate (mg/l)	42.0	32.3	38.3	30.2
Sulfide (mg/l)	<0.002	<0.002	<0.01	<0.1
Zinc (mg/l)	0.072	0.147	0.082	<0.01

Revision 1: 12/19/86

TABLE 783.15-2b

CHARGE / TDS BALANCE
BOYER WELL

	08/03/85		10/12/85		07/04/86		10/17/86	
	mg/l	meq/l	mg/l	meq/l	mg/l	meq/l	mg/l	meq/l
Calcium	7.00	0.35	8.00	0.40	14.00	0.70	5.62	0.28
Iron	0.79	0.04	0.57	0.03	0.07	0.00	0.03	0.00
Magnesium	4.00	0.33	4.00	0.33	5.00	0.41	3.60	0.30
Potassium	3.00	0.08	5.00	0.13	5.00	0.13	3.70	0.09
Sodium	120.00	5.22	115.00	5.00	108.00	4.70	126.00	5.48
Sum of Cations		6.02		5.89		5.94		6.15
Bicarbonate	235	3.85	259.00	4.25	314.00	5.15	250.00	4.10
Carbonate	0	0.00	0.00	0.00	0.00	0.00	29.60	0.99
Chloride	15.4	0.43	7.60	0.21	20.60	0.58	23.00	0.65
Fluoride	0.50	0.03	0.70	0.04	0.80	0.04	0.64	0.03
Sulfate	42.0	0.87	32.30	0.67	38.30	0.80	30.20	0.63
Sum of Anions		6.04		5.17		6.57		6.40
Charge Balance (%)		(0.18)		6.52		(5.02)		(1.93)

Laboratory TDS	380	395
Calculated TDS	309	278
TDS Balance (%)	10.3	17.4

$$\text{Charge Balance (\%)} = \frac{\text{Cations} - \text{Anions}}{\text{Cations} + \text{Anions}} \times 100$$

$$\text{TDS Balance (\%)} = \frac{\text{Laboratory} - \text{Calculated}}{\text{Laboratory} + \text{Calculated}} \times 100$$

Revision 1: 12/19/86

TABLE 783.15-3a

GROUND WATER QUALITY ANALYSES
MORBY WELL

	08/03/85	10/12/85	07/04/86
Field Measurements			
Temperature (degrees C)	10.0	13.0	12.0
pH	6.95	7.43	7.11
Specific Conductance (umhos/cm at 25 degrees C)	1820	1610	1900
Laboratory Measurements			
Aluminum (mg/l)	<0.05	<0.05	<0.05
Ammonia (mg/l)	0.28	0.16	0.11
Arsenic (mg/l)	0.008	0.006	0.001
Barium (mg/l)	0.12	0.04	0.22
Bicarbonate (mg/l)	648	702	468
Boron (mg/l)	0.07	<0.05	<0.05
Cadmium (mg/l)	0.002	0.002	0.002
Carbonate (mg/l)	0	0	0
Calcium (mg/l)	130	91	210
Chloride (mg/l)	57.1	39.2	67.9
Chromium (mg/l)	0.006	<0.005	<0.005
Copper (mg/l)	0.011	0.002	0.037
Fluorine (mg/l)	0.40	0.78	0.33
Hardness (mg/l CaCO3)	924	660	816
Iron (mg/l)	0.19	<0.03	0.21
Lead (mg/l)	0.025	0.029	0.010
Magnesium (mg/l)	50	47	87
Manganese (mg/l)	0.034	0.040	0.030
Mercury (mg/l)	0.0001	0.0001	<0.0001
Molybdenum (mg/l)	<0.05	<0.05	<0.05
Nickel (mg/l)	0.015	0.008	0.019
Nitrate (mg/l as N)	0.30	0.31	3.40
Nitrite (mg/l as N)	0.02	<0.01	<0.01
Phosphate (mg/l)	0.05	0.04	0.04
Potassium (mg/l)	4	8	6
Selenium (mg/l)	0.013	0.006	0.008
Sodium (mg/l)	125	195	128
Solids, Dissolved (mg/l)	1030	1005	1385
Sulfate (mg/l)	321.3	418.0	591.6
Sulfide (mg/l)	0.031	<0.002	<0.01
Zinc (mg/l)	0.315	0.003	0.592

Revision 1: 12/19/86

TABLE 783.15-3b

CHARGE / TDS BALANCE
MORBY WELL

	08/03/85		10/12/85		07/04/86	
	mg/l	meq/l	mg/l	meq/l	mg/l	meq/l
Calcium	130.00	6.49	91.00	4.54	210.00	10.48
Iron	0.19	0.01	0.00	0.00	0.21	0.01
Magnesium	50.00	4.11	47.00	3.87	87.00	7.16
Potassium	4.00	0.10	8.00	0.20	6.00	0.15
Sodium	125.00	5.44	195.00	8.48	128.00	5.57
Sum of Cations		16.15		17.10		23.37
Bicarbonate	791.00	12.96	856.00	14.03	468.00	7.67
Carbonate	0.00	0.00	0.00	0.00	0.00	0.00
Chloride	57.10	1.61	39.20	1.11	67.90	1.92
Fluoride	0.40	0.02	0.78	0.04	0.33	0.02
Sulfate	321.30	6.69	418.00	8.70	591.60	12.32
Sum of Anions		21.29		23.88		21.92
Charge Balance (%)		(13.71)		(16.55)		3.20

Laboratory TDS	1030	1005
Calculated TDS	1010	1149
TDS Balance (%)	1.0	(6.7)

$$\text{Charge Balance (\%)} = \frac{\text{Cations} - \text{Anions}}{\text{Cations} + \text{Anions}} \times 100$$

$$\text{TDS Balance (\%)} = \frac{\text{Laboratory} - \text{Calculated}}{\text{Laboratory} + \text{Calculated}} \times 100$$

Revision 1: 12/19/86

T A B L E 7 8 3 . 1 5 - 4 a

GROUND WATER QUALITY ANALYSES
OLD WELL

	05/12/85	04/04/86	10/21/86
Field Measurements			
Temperature (degrees C)	4.3	10.9	11.7
pH	7.35	7.00	7.20
Specific Conductance (umhos/cm at 25 degrees C)	3820	5420	3000
Laboratory Measurements			
Aluminum (mg/l)	<0.05	<0.05	<0.1
Ammonia (mg/l)	1.44	1.65	1.12
Arsenic (mg/l)	0.005	0.008	0.018
Barium (mg/l)	<0.01	0.02	0.062
Bicarbonate (mg/l)	602	288	420
Boron (mg/l)	0.41	0.52	0.209
Cadmium (mg/l)	0.004	0.010	0.017
Carbonate (mg/l)	0	0	0
Calcium (mg/l)	60	305	225
Chloride (mg/l)	980.5	564.4	466
Chromium (mg/l)	0.021	0.036	<0.01
Copper (mg/l)	0.011	0.011	<0.01
Fluorine (mg/l)	0.21	0.32	0.91
Hardness (mg/l CaCO3)	2867	1440	1500
Iron (mg/l)	2.61	4.50	1.44
Lead (mg/l)	0.082	0.065	0.10
Magnesium (mg/l)	239	185	175
Manganese (mg/l)	0.065	0.130	0.078
Mercury (mg/l)	0.0003	0.0002	<0.0002
Molybdenum (mg/l)	<0.05	<0.05	<0.01
Nickel (mg/l)	0.025	0.029	0.030
Nitrate (mg/l as N)	0.05	1.47	0.096
Nitrite (mg/l as N)	<0.01	0.03	0.0097
Phosphate (mg/l)	0.06	<0.01	<0.01
Potassium (mg/l)	12	12	13.4
Selenium (mg/l)	0.012	0.012	0.0038
Sodium (mg/l)	370	427	320
Solids, Dissolved (mg/l)	2100	295	2870
Sulfate (mg/l)	115.0	1160.0	1040
Sulfide (mg/l)	<0.002	0.005	<0.1
Zinc (mg/l)	1.350	0.480	0.36

Revision 1: 12/19/86

TABLE 783.15-4b

CHARGE / TDS BALANCE
OLD WELL

	12/05/85		04/04/86		10/21/86	
	mg/l	meq/l	mg/l	meq/l	mg/l	meq/l
Calcium	365.00	18.21	355.00	17.71	225.00	11.23
Iron	2.61	0.14	4.50	0.24	1.44	0.08
Magnesium	239.00	19.67	185.00	15.55	175.00	14.40
Potassium	12.00	0.31	0.32	0.01	13.40	0.34
Sodium	370.00	16.10	427.00	18.57	320.00	13.92
Sum of Cations		54.42		51.76		39.97
Bicarbonate	429.00	7.03	351.00	5.75	420.00	6.88
Carbonate	0.00	0.00	0.00	0.00	0.00	0.00
Chloride	494.40	13.95	472.80	13.34	466.00	13.15
Fluoride	0.21	0.01	0.32	0.02	0.91	0.05
Sulfate	1248.40	25.99	1160.00	24.15	1040.00	21.65
Sum of Anions		46.98		43.26		41.73
Charge Balance (%)		7.34		8.95		(2.16)

Laboratory TDS	2100	295
Calculated TDS	2078	2800
TDS Balance (%)	0.5	---

$$\text{Charge Balance (\%)} = \frac{\text{Cations} - \text{Anions}}{\text{Cations} + \text{Anions}} \times 100$$

$$\text{TDS Balance (\%)} = \frac{\text{Laboratory} - \text{Calculated}}{\text{Laboratory} + \text{Calculated}} \times 100$$

Revision 1: 12/19/86

H Y D R O L O G Y A P P E N D I X

WATER RIGHTS AND WELL INFORMATION

RECEIVED
OCT 0 [illegible] 1980

LDS (Abandoned)

Form 113—534—12-60

Examined OCT. 17, 1980 KET
Recorded: R. C. ____ T. B. ____
Inspection Sheet ____
Copied ____

REPORT OF WELL DRILLER
STATE OF UTAH
WATER RIGHTS

35-4718
Application No. 01-2952
Claim No. 22989
Coordinate No. (C 3N-6E) 26 c a a

GENERAL STATEMENT: Report of well driller is hereby made and filed with the State Engineer, in accordance with the laws of Utah. (This report shall be filed with the State Engineer within 30 days after the completion or abandonment of the well. Failure to file such reports constitutes a misdemeanor.)

(1) WELL OWNER:
Name L.D.S. Upton 2 Ward Church
Address Coalville Utah

(2) LOCATION OF WELL:
County ____ Ground Water Basin ____ (leave blank)

North 2150 feet, East 2650 feet from S.E. Corner
South West

of Section 26 T. 3 N. R. 6 E SLBM (strike out words not needed) W USM

(3) NATURE OF WORK (check):
New Well ☒ Replacement Well ☒ Deepening ☐ Repair ☐ Abandon ☐
If abandonment, describe material and procedure: ____

(4) NATURE OF USE (check):
Domestic ☒ Industrial ☐ Municipal ☐ Stockwater ☐
Irrigation ☐ Mining ☐ Other ☐ Test Well ☐

(5) TYPE OF CONSTRUCTION (check):
Rotary ☒ Dug ☐ Jetted ☐
Cable ☒ Driven ☐ Bored ☐

(6) CASING SCHEDULE:
Threaded ☐ Welded ☒
8" Diam. from 0 feet to 55 feet Gage 250
" Diam. from ____ feet to ____ feet Gage ____
" Diam. from ____ feet to ____ feet Gage ____
New ☐ Reject ☐ Used ☐

(7) PERFORATIONS:
Perforated? Yes ☐ No ☒
Type of perforator used ____
Size of perforations ____ inches by ____ inches
____ perforations from ____ feet to ____ feet
____ perforations from ____ feet to ____ feet
____ perforations from ____ feet to ____ feet
____ perforations from ____ feet to ____ feet
____ perforations from ____ feet to ____ feet

(8) SCREENS:
Well screen installed? Yes ☐ No ☒
Manufacturer's Name ____
Type ____ Model No. ____
Diam. ____ Slot size ____ Set from ____ ft. to ____
Diam. ____ Slot size ____ Set from ____ ft. to ____

(9) CONSTRUCTION:
Was well gravel packed? Yes ☐ No ☒ Size of gravel: ____
Gravel placed from ____ feet to ____ feet
Was a surface seal provided? Yes ☐ No ☐
To what depth? ____ feet
Material used in seal: ____
Did any strata contain unusable water? Yes ☐ No ☐
Type of water: ____ Depth of strata ____
Method of sealing strata off: ____

Was surface casing used? Yes ☒ No ☐
Was it cemented in place? Yes ☐ No ☐

(10) WATER LEVELS:
Static level ____ feet below land surface Date ____
Artesian pressure ____ feet above land surface Date ____

RECEIVED:

(11) FLOWING WELL:
Controlled by (check) Valve ☐
Cap ☐ Plug ☐ No Control ☐
Does well leak around casing? Yes ☐ No ☐

(12) WELL TESTS:
Drawdown is the distance in feet the water level is lowered below static level.
Was a pump test made? Yes ☐ No ☐ If so, by whom? ____
Yield: ____ gal./min. with ____ feet drawdown after ____ hours
" ____ " ____ " ____ "
" ____ " ____ " ____ "
Bailer test ____ gal./min. with ____ feet drawdown after ____ hours
Artesian flow ____ g.p.m. Date ____
Temperature of water ____ Was a chemical analysis made? No ☐ Yes ☐

(13) WELL LOG:
Diameter of well 6" inches
Depth drilled 517' feet. Depth of completed well ____ feet.

NOTE: Place an "X" in the space or combination of spaces needed to designate the material or combination of materials encountered in each depth interval. Under REMARKS make any desirable notes as to occurrence of water and the color, size, nature, etc., of material encountered in each depth interval. Use additional sheet if needed.

DEPTH From	DEPTH To	MATERIAL: Clay	Silt	Sand	Gravel	Cobbles	Boulders	Hardpan	Conglomerate	Bedrock	Other	REMARKS
0	5					X						
5	55						X					
55	517										X	Blue Shale Never changed
												Completely dry hole

Work started Nov 25, 1979 Completed Sept 5, 1980

(14) PUMP:
Manufacturer's Name ____
Type: ____ H. P. ____
Depth to pump or bowls ____ feet

Well Driller's Statement:
This well was drilled under my supervision, and this report is true to the best of my knowledge and belief.

Name TER-RAY DRILLERS INC. (Person, firm, or corporation) (Type or print)
Address 7813 W. 925 S. Weeds Cross, Utah 84087
(Signed) Terry D. Olsen (Well Driller)
License No. 455 Date Sept 25, 1980

USE OTHER SIDE FOR ADDITIONAL REMARKS

Dominic (35)

BOYER-2

Form 113—5M—12-60

Examined

Recorded: B. C. T. B.

Inspection Sheet

Copied

REPORT OF WELL DRILLER

STATE OF UTAH

Application No.

Claim No.

Coordinate No.

GENERAL STATEMENT: Report of well driller is hereby made and filed with the State Engineer, in accordance with the laws of Utah. (This report shall be filed with the State Engineer within 30 days after the completion or abandonment of the well. Failure to file such reports constitutes a misdemeanor.)

(1) WELL OWNER:

Name W. L. Boyer

Address

(2) LOCATION OF WELL:

County ____ Ground Water Basin (leave blank)

(North) South 161 feet, East (West) 1815 feet from ¼ Corner

of Section 24, T. 3 (N) S, R 6 (E) W (SLBM) USM (strike out words not needed)

(3) NATURE OF WORK (check):

New Well ☐ Replacement Well ☑ Deepening ☐ Repair ☐ Abandon ☐

If abandonment, describe material and procedure

(4) NATURE OF USE (check):

Domestic ☑ Industrial ☐ Municipal ☐ Stockwater ☐

Irrigation ☐ Mining ☐ Other ☐ Test Well ☐

(5) TYPE OF CONSTRUCTION (check):

Rotary ☑ Dug ☐ Jetted ☐

Cable ☐ Driven ☐ Bored ☐

(6) CASING SCHEDULE: Threaded ☐ Welded ☐

6" Diam. from 0 feet to 16 feet Gage

" Diam. from feet to feet Gage

" Diam. from feet to feet Gage

New ☐ Reject ☐ Used ☐

(7) PERFORATIONS: Perforated? Yes ☐ No ☑

Type of perforator used

Size of perforations ____ inches by ____ inches

perforations from feet to feet

perforations from feet to feet

perforations from feet to feet

perforations from feet to feet

perforations from feet to feet

(8) SCREENS: Well screen installed? Yes ☐ No ☑

Manufacturer's Name

Type ____ Model No.

Diam. ____ Slot size ____ Set from ____ ft. to

Diam ____ Slot size ____ Set from ____ ft. to

(9) CONSTRUCTION:

Was well gravel packed? Yes ☐ No ☑ Size of gravel:

Gravel placed from ____ feet to ____ feet

Was a surface seal provided? Yes ☐ No ☐

To what depth? ____ feet

Material used in seal

Did any strata contain unusable water? Yes ☐ No ☐

Type of water ____ Depth of strata

Method of sealing strata off:

Was surface casing used? Yes ☑ No ☐

Was it cemented in place? Yes ☐ No ☑

(10) WATER LEVELS:

Static level 140 feet below land surface Date 11-1-76

Artesian pressure ____ feet above land surface Date

LOG RECEIVED: DEC 11 1976

(11) FLOWING WELL:

Controlled by (check) Valve ☐

Cap ☐ Plug ☐ No Control ☐

Does well leak around casing? Yes ☐ No ☐

(12) WELL TESTS:

Drawdown is the distance in feet the water level is lowered below static level.

Was a pump test made? Yes ☑ No ☐ If so, by whom?

Yield: ____ gal./min. with ____ feet drawdown after ____ hours

Bailer test ____ gal./min. with ____ feet drawdown after ____ hours

Artesian flow ____ g.p.m. Date

Temperature of water Cold Was a chemical analysis made? No ☑ Yes ☐

(13) WELL LOG:

Diameter of well ____ inches

Depth drilled ____ feet. Depth of completed well ____ feet

NOTE: Place an "X" in the space or combination of spaces needed to designate the material or combination of materials encountered in each depth interval. Under REMARKS make any desirable notes as to occurrence of water and the color, size, nature, etc., of material encountered in each depth interval. Use additional sheet if needed.

DEPTH From	DEPTH To	Clay	Silt	Sand	Gravel	Cobbles	Boulders	Hardpan	Conglomerate	Bedrock	Other	REMARKS
0	6			✓	✓							
6	12	✓	✓									
12	35		✓	✓								Damp light [illegible]
35	38					✓						Dry
38	150										✓	Grey Shell
150	155				✓			✓				Water
155	155									✓		[illegible] Grey Shell

Work started 11-4, 1976 Completed 11-4, 1976

(14) PUMP:

Manufacturer's Name

Type: ____ H. P.

Depth to pump or bowles ____ feet

Well Driller's Statement:

This well was drilled under my supervision, and this report is true to the best of my knowledge and belief.

Name [illegible] Drilling "D" [illegible] (Person, firm, or corporation) (Type or print)

Address

(Signed) [illegible] (Well Driller)

License No. 364 Date [illegible], 1976

USE OTHER SIDE FOR ADDITIONAL REMARKS

ORGILL

2823

Form 113—SM—12-60

Examined 12-20-66 V.E.O.

Recorded: B. C. 12-20-66 V.E.O. T. B. V.E.O.

Inspection Sheet 12-20-66 E.M.

Copied 1-3-67 RL

REPORT OF WELL DRILLER
STATE OF UTAH

Application No.

Claim No. 12253 35-2823

Coordinate No. (1-S-4) 26 d b 2

GENERAL STATEMENT: Report of well driller is hereby made and filed with the State Engineer, in accordance with the laws of Utah. (This report shall be filed with the State Engineer within 30 days after the completion or abandonment of the well. Failure to file such reports constitutes a misdemeanor.)

(1) WELL OWNER:

Name Frieda J Orgill

Address R F D Coalville Utah

(2) LOCATION OF WELL:

County Summit Ground Water Basin (leave blank)

North / South s 640 feet, East / West w 1838 feet from E1/4 Corner

of Section 26 T 3N N / S, R 6E E SLBM (strike out words not needed) W USM

(3) NATURE OF WORK (check):

New Well X Replacement Well X Deepening ☐ Repair ☐ Abandon ☐

If abandonment, describe material and procedure:

(4) NATURE OF USE (check):

Domestic X Industrial ☐ Municipal ☐ Stockwater ☐

Irrigation ☐ Mining ☐ Other ☐ Test Well ☐

(5) TYPE OF CONSTRUCTION (check):

Rotary ☐ Dug ☐ Jetted ☐

Cable X Driven ☐ Bored ☐

(6) CASING SCHEDULE:

Threaded ☐ Welded X

6 " Diam. from 0 feet to 160 feet Gage

" Diam. from feet to feet Gage

" Diam. from feet to feet Gage

New X Reject ☐ Used ☐

(7) PERFORATIONS:

Perforated? Yes ☐ No ☐

Type of perforator used torch

Size of perforations 1/16 inches by 6" inches

60 perforations from 140 feet to 160 feet

perforations from feet to feet

perforations from feet to feet

perforations from feet to feet

perforations from feet to feet

(8) SCREENS:

Well screen installed? Yes ☐ No ☐

Manufacturer's Name

Type Model No.

Diam. Slot size Set from ft. to

Diam. Slot size Set from ft. to

(9) CONSTRUCTION:

Was well gravel packed? Yes ☐ No X Size of gravel:

Gravel placed from feet to feet

Was a surface seal provided? Yes ☐ No ☐

To what depth? feet

Material used in seal:

Did any strata contain unusable water? Yes ☐ No ☐

Type of water: Depth of strata

Method of sealing strata off:

Was surface casing used? Yes ☐ No ☐

Was it cemented in place? Yes ☐ No ☐

(10) WATER LEVELS:

Static level 90 ft feet below land surface Date Oct 29

Artesian pressure feet above land surface Date

LOG RECEIVED: RECEIVED DEC 19

(11) FLOWING WELL:

Controlled by (check) Valve ☐

Cap ☐ Plug ☐ No Control ☐

Does well leak around casing? Yes ☐ No ☐

(12) WELL TESTS:

Drawdown is the distance in feet the water level is lowered below static level.

Was a pump test made? Yes ☐ No X If so, by whom?

Yield: gal./min. with feet drawdown after hours

" " " " "

" " " " "

Bailer test gal./min. with feet drawdown after hours

Artesian flow g.p.m. Date

Temperature of water Was a chemical analysis made? No ☐ Yes ☐

(13) WELL LOG:

Diameter of well 6" inches

Depth drilled 160 feet. Depth of completed well 160 feet.

NOTE: Place an "X" in the space or combination of spaces needed to designate the material or combination of materials encountered in each depth interval. Under REMARKS make any desirable notes as to occurrence of water and the color, size, nature, etc., of material encountered in each depth interval. Use additional sheet if needed.

DEPTH From	DEPTH To	Clay	Silt	Sand	Gravel	Cobbles	Boulders	Hardpan	Conglomerate	Bedrock	Other	REMARKS
0	15											tp soil
15	21						X					
21	137											shale
137	138			x								hard
138	145											shale
145	160											shale with hard sandy streaks

Work started septbr 29 66, 19 Completed oct 10 66, 19

(14) PUMP:

Manufacturer's Name jet pump Jacussi

Type: jet H. P. 3/4

Depth to pump or bowles 95 ft feet

Well Driller's Statement:

This well was drilled under my supervision, and this report is true to the best of my knowledge and belief.

Name Intermiountain Drilling Corp (Person, firm, or corporation) (Type or print)

Address 2838 Wamwright Road S L C.

(Signed) (Well Driller)

License No. Date , 19

USE OTHER SIDE FOR ADDITIONAL REMARKS

4 111 9-55 1500

OLD STALEY WELL
(ABANDONED)
1008

PHOTOSTATED Oct 6-17-58
[illegible]
Exam. & Recorded May 19 1958 ACT
Exam. for filing May 19 1958 ACT
Final Copy checked
Indexed 5-19-58
Well No. (A3-6)25 ccb

PAGE ....
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Report No. 13278
Filed Mar 31 1958
Rec. By A.C.T.
Ret'd

Report of Well and Tunnel Driller
STATE OF UTAH

(Separate report shall be filed for each well or tunnel)

GENERAL INFORMATION: D-65-126-[illegible]

Report of well or tunnel driller is hereby made and filed with the State Engineer, in accordance with the laws of Utah. (This report shall be filed with the State Engineer within 30 days after the completion or abandonment of well or tunnel. Failure to file such reports constitutes a misdemeanor.)

1. Name and address of ~~person, company or corporation~~ boring ~~or~~ drilling well ~~or tunnel~~.
(Strike words not needed)
[illegible]

2. Name and address of owner of well ~~or tunnel~~ [illegible] Staley
(Strike Words not needed)
[illegible]

3. Source of supply is in [illegible] County;
.... drainage area ; .... artesian basin
(Leave blank) (Leave blank)

4. The number of approved application to appropriate water is 29724

5. Location of well or ~~mouth of tunnel~~ is situated at a point N. 260 ft. + East 475 ft. [illegible]
[illegible] Sec. 25, T3 N, R. 6 E. SLB&M
(Describe by rectangular co-ordinates or by one course and distance with reference to U. S. Government Survey Corner — Copy description from well owner's approved application.)

6. Date on which work on well ~~or tunnel~~ was begun March 11 1958
(Strike words not needed)

7. Date on which work on well ~~or tunnel~~ was completed ~~or abandoned~~ March 12 1958
(Strike words not needed)

8. Maximum quantity of water measured as ~~flowing, pumped~~ or [illegible] on completion of well ~~or tunnel~~ in sec. ft. ....; or in gals. per minute 2 Date March 12 1958
(Strike words not needed)

DETAIL OF COLLECTING WORKS:

9. **WELL:** It is drilled, ~~dug, flowing or~~ pump well. Temperature of water 45 °F.
(Strike words not needed)

(a) Total depth of well is 76 ft. below ground surface.

(b) If flowing well, give water pressure (hydrostatic head) above ground surface .... ft.

(c) If pump well, give depth from ground surface to water surface before pumping [illegible]
........; during pumping [illegible]

(d) Size and kind of casing [illegible]
(If only partially cased, give details)

(e) Depth to water-bearing stratum ....
(If more than one stratum, give depth to each)

(f) If casing is perforated, give depth from ground surface to perforations ....

(g) Log of well 35 ft [illegible]
32 ft [illegible]
7 ft [illegible]

(h) Well was equipped with cap, valve, or .... to control flow.
(Strike words not needed)

(Over)

OLD WELL
(ABANDONED)

34 111 9-55 1500

PHOTOSTATED 7/21/58

Exam. & Recorded 7-16-58 ACT

Exam. for filing 7-16-58 ACT

Final Copy checked

Indexed 7-18-58

Well No. (D-3-6) 25cdc

Report No. 13485

Filed 7-16-58, 19

Rec. By ACT

Ret'd

PAGE (Leave Blank)

Report of Well and Tunnel Driller

STATE OF UTAH

(Separate report shall be filed for each well or tunnel)

GENERAL INFORMATION: D-65-30

Report of well or tunnel driller is hereby made and filed with the State Engineer, in accordance with the laws of Utah. (This report shall be filed with the State Engineer within 30 days after the completion or abandonment of well or tunnel. Failure to file such reports constitutes a misdemeanor.)

1. Name and address of person, company or corporation boring or drilling well or tunnel. (Strike words not needed) Lige Perkins Star Route 2 Evanston Wyo.

2. Name and address of owner of well ~~or tunnel~~ (Strike Words not needed) J. H. Boyer Star Route Coalville Utah

3. Source of supply is in Summit County;
 (Leave blank) drainage area; (Leave blank) artesian basin

4. The number of approved application to appropriate water is Leg. No. 29674

5. Location of well or mouth of tunnel is situated at a point N. 290 feet & West 792 feet from the S¼ Cor. Sec. 25, T3N, R6E.
 (Describe by rectangular co-ordinates or by one course and distance with reference to U. S. Government Survey Corner — Copy description from well owner's approved application)

6. Date on which work on well ~~or tunnel~~ was begun (Strike words not needed) April 14 1958

7. Date on which work on well or tunnel was completed ~~or abandoned~~ (Strike words not needed) April 17 1958

8. Maximum quantity of water measured as flowing, pumped ~~or~~ Bailed on completion of well ~~or tunnel~~ (Strike words not needed) in sec. ft. ; or in gals. per minute 10 Date

DETAIL OF COLLECTING WORKS:

9. **WELL:** It is drilled, dug, ~~flowing or pump well~~ (Strike words not needed) Temperature of water 45 °F.

 (a) Total depth of well is 120 ft. below ground surface.

 (b) If flowing well, give water pressure (hydrostatic head) above ground surface ft.

 (c) If pump well, give depth from ground surface to water surface before pumping 60 ft; during pumping bailing

 (d) Size and kind of casing 6 in. New (If only partially cased, give details)

 (e) Depth to water-bearing stratum (If more than one stratum, give depth to each)

 (f) If casing is perforated, give depth from ground surface to perforations

 (g) Log of well 57 ft Light Clay
 57 ft [illegible]
 5 ft Sandstone carrying water

 (h) Well was equipped with cap, valve, or to control flow. (Strike words not needed)

(Over)

RECEIVED JUL 16 1958 STATE ENGINEER'S OFFICE

CLARK WELL

Form 111 9-55 1500

PHOTOSTATED nt 6-17-58
Exam. & Recorded May 19, 1958 AT.
Exam. for filing May 19, 1958 AT.
Final Copy checked
Indexed Kg 5-19-58
Well No. (A-9-6)27ddd

PAGE........ (Leave Blank)

Report No. 13277
Filed April 2, 1958
Rec. By G.C.T.
Ret'd

Report of Well and Tunnel Driller

STATE OF UTAH

(Separate report shall be filed for each well or tunnel)

GENERAL INFORMATION: (0-65-122) Total

Report of well or tunnel driller is hereby made and filed with the State Engineer, in accordance with the laws of Utah. (This report shall be filed with the State Engineer within 30 days after the completion or abandonment of well or tunnel. Failure to file such reports constitutes a misdemeanor.)

1. Name and address of person, ~~company or corporation~~ boring or drilling well ~~or tunnel~~. (Strike words not needed)
   [illegible] Star Route 2 Evanston Wyo.
2. Name and address of owner of well ~~or tunnel~~ (Strike Words not needed) [illegible] Clark
   Star Route [illegible] Utah
3. Source of supply is in [illegible] County;
   .... (Leave blank) drainage area; .... (Leave blank) artesian basin
4. The number of approved application to appropriate water is 29723
5. Location of well ~~or mouth of tunnel~~ is situated at a point North 3620 ft from [illegible] West 645.0 feet from the S.E. Cor. Sec. 27 – T3N – R6E SLB&M
   (Describe by rectangular co-ordinates or by one course and distance with reference to U. S. Government Survey Corner — Copy description from well owner's approved application)
6. Date on which work on well ~~or tunnel~~ was begun March 6 1958 (Strike words not needed)
7. Date on which work on well ~~or tunnel~~ was completed ~~or abandoned~~ March 21 1958 (Strike words not needed)
8. Maximum quantity of water measured as ~~flowing~~, Bailed ~~pumped or~~ Bailed on completion of well ~~or tunnel~~ in sec. ft. ....; or in gals. per minute 12 Date March 21 1958 (Strike words not needed)

DETAIL OF COLLECTING WORKS:

9. **WELL:** It is drilled, dug, ~~flowing or pump~~ well. Temperature of water 45 °F. (Strike words not needed)
   - (a) Total depth of well is 45 ft. below ground surface.
   - (b) If flowing well, give water pressure (hydrostatic head) above ground surface........ft.
   - (c) If pump well, give depth from ground surface to water surface before ~~pumping~~ bailing 12 ft ....; during ~~pumping~~ bailing [illegible]
   - (d) Size and kind of casing [illegible] Casing (If only partially cased, give details)
   - (e) Depth to water-bearing stratum........ (If more than one stratum, give depth to each)
   - (f) If casing is perforated, give depth from ground surface to perforations........
   - (g) Log of well 7 ft Yellow Clay
     34 ft Cobble rock & Clay
     7 ft Conglomerate with [illegible]
     Water
   - (h) Well was equipped with cap, valve, or........to control flow. (Strike words not needed)

(Over)

on well record LM 6-23-50
by counties
LM 6-23-50
& Recorded MV 5-25-50
for filing
Copy checked vgh 6-23-50
& No Assigned
vgh 6-20-50
ed well
set Bt.
(A-3-7)31dab-1

JONES
529

Report No. 7582
Filed Mar. 16, 1950
Rec. By MV
Ret'd

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Report of Well and Tunnel Driller

STATE OF UTAH

(Separate report shall be filed for each well or tunnel)

GENERAL INFORMATION:

Report of well or tunnel driller is hereby made and filed with the State Engineer, in compliance with Sec. 100-3-22, Utah Code Annotated, 1943. (This report shall be filed with the State Engineer within 30 days after the completion or abandonment of well or tunnel. Failure to file such report constitutes a misdemeanor.)

1. Name and address of person, ~~company or corporation boring or~~ drilling well ~~or tunnel~~. (Strike words not needed)

   Michael A. Gale Coalville, Utah

2. Name and address of owner of well ~~or tunnel~~ G. Allen Jones Coalville, Utah (Strike Words not needed)

3. Source of supply is in Summit County; drainage area (Leave blank); artesian basin (Leave blank)

4. The number of approved application to appropriate water is 21430

5. Location of well ~~or mouth of tunnel~~ is situated at a point W 2990 ft. & N 1161 ft. from SE cor. Sec. 31, T3N, R7E, SLB&M

   (Describe by rectangular co-ordinates or by one course and distance with reference to U. S. Government Survey Corner — Copy description from well owner's approved application)

6. Date on which work on well ~~or tunnel~~ was begun Mar. 11, 1950 (Strike words not needed)

7. Date on which work on well ~~or tunnel~~ was completed ~~or abandoned~~ Mar. 16, 1950 (Strike words not needed)

8. Maximum quantity of water measured ~~as flowing, pumped~~ or bailed (Strike words not needed) on completion of well ~~or tunnel in sec. ft.~~ ; or in gals. per minute 30 Date Mar. 16

DETAIL OF COLLECTING WORKS:

9. **WELL:** It is drilled, ~~dug, flowing~~ or pump well. Temperature of water 46 °F. (Strike words not needed)

   (a) Total depth of well is 58 ft. below ground surface.

   (b) If flowing well, give water pressure (hydrostatic head) above ground surface ft.

   (c) If pump well, give depth from ground surface to water surface before pumping 10 ft. no draw down ; during pumping

   (d) Size and kind of casing c2 6" standard cased entire depth (If only partially cased, give details)

   (e) Depth to water-bearing stratum 58 ft. first water 15' 6" (If more than one stratum, give depth to each)

   (f) If casing is perforated, give depth from ground surface to perforations none

   (g) Log of well from surface to 28 ft gravel at 28 ft hit soap stone or lime shale at 55 ft hit a small amount of coal possibly 6 in. then a black sand and at 55 ft hit gravel and water. A small amount of water in gravel at 75 ft. 6 in.

   (h) Well was equipped with cap, valve, or to control flow. (Strike words not needed)

(Over)

BOYER WELL
1002

Form 113—5M—12-60

Examined MAY 20 1981 DH

Recorded: B. C. _____ T. B. _____

Inspection Sheet _____

Copied _____

REPORT OF WELL DRILLER
STATE OF UTAH

Application No. a-11370

Claim No. (35-1002)

Coordinate No. 33N-7E-31bcb

GENERAL STATEMENT: Report of well driller is hereby made and filed with the State Engineer, in accordance with the laws of Utah. (This report shall be filed with the State Engineer within 30 days after the completion or abandonment of the well. Failure to file such reports constitutes a misdemeanor.)

(1) WELL OWNER:

Name Fern L. Boyer

Address 5050 BenLomond Av. Ogden Ut. 84403

(2) LOCATION OF WELL:

County Summit Ground Water Basin (leave blank)

1400 feet South, 650 feet East from N. W. Corner of Section 31, T. 3 N, R. 7 E SLBM (strike out words not needed) 12 Miles East of Coalvill Ut

(3) NATURE OF WORK (check): New Well ☐ Replacement Well ☒ Deepening ☐ Repair ☐ Abandon ☐

If abandonment, describe material and procedure: Mrs Boyer said she understood she was responsible to take care of old well.

(4) NATURE OF USE (check):

Domestic ☒ Industrial ☐ Municipal ☐ Stockwater ☒ Irrigation ☒ Mining ☐ Other ☐ Test Well ☐

(5) TYPE OF CONSTRUCTION (check):

Rotary ☐ Dug ☐ Jetted ☐ Cable ☒ Driven ☐ Bored ☐

(6) CASING SCHEDULE: Threaded ☐ Welded ☒

6 " Diam. from +2 feet to 110 feet Gage .254

5 " Diam. from 107 feet to 170 feet Gage .254

" Diam. from feet to feet Gage

New ☒ Reject ☐ Used ☒

(7) PERFORATIONS: Perforated? Yes ☒ No ☐

Type of perforator used Torch

Size of perforations 8 inches by 1/8 inches

63 perforations from 110 feet to 128 feet

24 perforations from 128 feet to 170 feet

perforations from feet to feet

perforations from feet to feet

perforations from feet to feet

(8) SCREENS: Well screen installed? Yes ☐ No ☒

Manufacturer's Name

Type Model No.

Diam. Slot size Set from ft. to

Diam. Slot size Set from ft. to

(9) CONSTRUCTION:

Was well gravel packed? Yes ☐ No ☒ Size of gravel:

Gravel placed from feet to feet

Was a surface seal provided? Yes ☒ No ☐

To what depth? 18 + feet

Material used in seal: Puddling Clay

Did any strata contain unusable water? Yes ☒ No ☐

Type of water: CoalOil & Sulfer Depth of strata 85'87'

Method of sealing strata off: Sealed off with casing

Was surface casing used? Yes ☐ No ☒

Was it cemented in place? Yes ☐ No ☐

(10) WATER LEVELS:

Static level 20 feet below land surface Date 18April81

Artesian pressure feet above land surface Date

LOG RECEIVED: RECEIVED MAY 20 1981

(11) FLOWING WELL:

Controlled by (check) Valve ☐ Cap ☐ Plug ☐ No Control ☐

Does well leak around casing? Yes ☐ No ☐

(12) WELL TESTS: Drawdown is the distance in feet the water level is lowered below static level.

Was a pump test made? Yes ☐ No ☒ If so, by whom?

Yield: _____ gal./min. with _____ feet drawdown after _____ hours

" _____ " _____ " _____ " _____ "

" _____ " _____ " _____ " _____ "

Bailer test 4.64 gal./min. with 110 feet drawdown after 1½ hours

Artesian flow g.p.m. Date 12 April 1981

Temperature of water 55° Was a chemical analysis made? No ☒ Yes ☐

(13) WELL LOG: Diameter of well 6 inches

Depth drilled 172 feet. Depth of completed well 170 feet.

NOTE: Place an "X" in the space or combination of spaces needed to designate the material or combination of materials encountered in each depth interval. Under REMARKS make any desirable notes as to occurrence of water and the color, size, nature, etc., of material encountered in each depth interval. Use additional sheet if needed.

DEPTH From	DEPTH To	MATERIAL: Clay	Silt	Sand	Gravel	Cobbles	Boulders	Hardpan	Conglomerate	Bedrock	Other	REMARKS
0	27	X										Easy Drilling
27	---			X	X							Water that apers to contain
---	38			X	X							CoalOil.
38	85	X										Had to Blast at 45'&49'(Har
85	---			X								Water that apers to contain
---	---			X								Sulfer (smells) with
---	---			X								Artesian presure of 10' abo
---	---			X								land surface with less than
---	87			X								1/8 G.P.M. Flow.
87	88										XX	Had to Blast (Coal) 88'
88	102	X										Bentonite Clay Drilling har
102	---	X		X								Water in layers of hard san
---	---	X		X								Blasts at 103'107'104'109'
---	114	X		X								and Hard Bentonite Clay
114	138	X										Bentonite Very hard clay
138	140	X										Soft Brown Clay
140	172	X										Bentonite Very Hard

Note: This Bentonite Clay has been Super Hard, light to dark gray in color with pebbles of hard clay, of Black and Blue-Green color. It has been next to imposib to Drive the casing down. I has taken spccial time cons uming procedures to inlarge the hole under the Shoe so the casing would go down.

Work started 4 Oct 19 80 Completed 18 April 19 81

(14) PUMP: Pump was not installed at this time.

Manufacturer's Name

Type: H. P.

Depth to pump or bowles feet

Well Driller's Statement:

This well was drilled under my supervision, and this report is true to the best of my knowledge and belief.

Name Paul Frandsen & Spraycar & Son's Drilling (Person, firm, or corporation) (Type or print)

Address Lava Hot Springs Ida. -2285W. 5950S. Roy Ut. 84067

(Signed) Paul Frandsen & Spraycar (Well Driller)

License No. 410--497 Date 22 April, 19 81

USE OTHER SIDE FOR ADDITIONAL REMARKS

1039-2

Form 113—534—12-60

Examined JAN 26 1978 TK

Recorded: B. C. ..... T. B. .....

Inspection Sheet .....

LAPSED

REPORT OF WELL DRILLER

STATE OF UTAH

Application No. .....

Claim No. .....

Coordinate No. .....

GENERAL STATEMENT: Report of well driller is hereby made and filed with the State Engineer, in accordance with the laws of Utah. (This report shall be filed with the State Engineer within 30 days after the completion or abandonment of the well. Failure to file such reports constitutes a misdemeanor.)

(1) WELL OWNER:

Name UTAH Coal & ENERGY

Address .....

(2) LOCATION OF WELL:

County ..... Ground Water Basin ..... (leave blank)

North ..... feet, East ..... feet from ..... Corner

South ..... West .....

of Section 36, T 3 N, R 6 E SLBM (strike out words not needed)

(3) NATURE OF WORK (check):

New Well ☒ Replacement Well ☐ Deepening ☐ Repair ☐ Abandon ☐

If abandonment, describe material and procedure: Test Hole

(4) NATURE OF USE (check):

Domestic ☐ Industrial ☐ Municipal ☐ Stockwater ☐

Irrigation ☐ Mining ☒ Other ☐ Test Well ☐

(5) TYPE OF CONSTRUCTION (check):

Rotary ☒ Dug ☐ Jetted ☐

Cable ☐ Driven ☐ Bored ☐

(6) CASING SCHEDULE:

Threaded ☐ Welded ☒

7⅝" Diam. from 0 feet to 325 feet Gage ¼" wall

..... " Diam. from ..... feet to ..... feet Gage .....

..... " Diam. from ..... feet to ..... feet Gage .....

New ☐ Reject ☐ Used ☐

(7) PERFORATIONS:

Perforated? Yes ☐ No ☐

Type of perforator used Tourel

Size of perforations ½" inches by 6" inches

30' perforations from 295 feet to 325 feet

..... perforations from ..... feet to ..... feet

..... perforations from ..... feet to ..... feet

..... perforations from ..... feet to ..... feet

..... perforations from ..... feet to ..... feet

(8) SCREENS:

Well screen installed? Yes ☐ No ☒

Manufacturer's Name .....

Type ..... Model No. .....

Diam. ..... Slot size ..... Set from ..... ft. to .....

Diam. ..... Slot size ..... Set from ..... ft. to .....

(9) CONSTRUCTION:

Was well gravel packed? Yes ☒ No ☐ Size of gravel: ½"

Gravel placed from 03 feet to 325 feet

Was a surface seal provided? Yes ☒ No ☐

To what depth? 3 feet

Material used in seal: CEMENT

Did any strata contain unusable water? Yes ☐ No ☐

Type of water: ..... Depth of strata .....

Method of sealing strata off: .....

Was surface casing used? Yes ☐ No ☒

Was it cemented in place? Yes ☒ No ☐

(10) WATER LEVELS:

Static level ..... feet below land surface Date .....

Artesian pressure ..... feet above land surface Date .....

LOG RECEIVED: NOV 1 19[illegible]

(11) FLOWING WELL:

Controlled by (check) Valve ☐

Cap ☐ Plug ☐ No Control ☐

Does well leak around casing? Yes ☐ No ☐

(12) WELL TESTS:

Drawdown is the distance in feet the water level is lowered below static level.

Was a pump test made? Yes ☒ No ☐ If so, by whom? .....

Yield: ..... gal./min. with ..... feet drawdown after ..... hours

" ..... " ..... " ..... "

" ..... " ..... " ..... "

Bailer test ..... gal./min. with ..... feet drawdown after ..... hours

Artesian flow ..... g.p.m. Date .....

Temperature of water ..... Was a chemical analysis made? No ☒ Yes ☐

(13) WELL LOG:

Diameter of well 9⅞ inches

Depth drilled 325 feet. Depth of completed well 325 feet.

NOTE: Place an "X" in the space or combination of spaces needed to designate the material or combination of materials encountered in each depth interval. Under REMARKS make any desirable notes as to occurrence of water and the color, size, nature, etc., of material encountered in each depth interval. Use additional sheet if needed.

DEPTH From	DEPTH To	MATERIAL Clay	Silt	Sand	Gravel	Cobbles	Boulders	Hardpan	Conglomerate	Bedrock	Other	REMARKS
0	57'									X		
57'	62'										X	COAL
62'	300'							X		X		
300	325										X	SANDSTONE

Work started ....., 19.... Completed ....., 19....

(14) PUMP:

Manufacturer's Name .....

Type: ..... H. P. .....

Depth to pump or bowles ..... feet

Well Driller's Statement:

This well was drilled under my supervision, and this report is true to the best of my knowledge and belief.

Name Double "D" Air Drilling (Person, firm, or corporation) (Type or print)

Address Box 169 VERNAL, UTAH

(Signed) Eugene D Pond (Well Driller)

License No. ..... Date ....., 19....

USE OTHER SIDE FOR ADDITIONAL REMARKS

SM - STEVENS & WALLIS - 2-50

Copied JS 6/14/56 DN 10-22-52
Exam. & Recorded M.V. 10-15-52
Exam. for filing M.V. 10-15-52
Final Copy checked
Indexed
Well No. (A-2-7) 6aaa-1

PAGE (Leave Blank)

Report No. 9476
Filed Oct. 9 1952
Rec. By M.V.
Ret'd

Report of Well and Tunnel Driller
STATE OF UTAH

(Separate report shall be filed for each well or tunnel)

GENERAL INFORMATION:

Report of well or tunnel driller is hereby made and filed with the State Engineer, in compliance with Sec. 100-3-22, Utah Code Annotated, 1943. (This report shall be filed with the State Engineer within 30 days after the completion or abandonment of well or tunnel. Failure to file such report constitutes a misdemeanor.)

1. Name and address of person, ~~company or corporation boring or drilling~~ repairing well or ~~tunnel~~. (Strike words not needed)
Michael A Gale Coalville Utah

2. Name and address of owner of well ~~or tunnel~~ (Strike Words not needed)
G W Patten Coalville Utah

3. Source of supply is in Summit County; ..... drainage area; ..... artesian basin
(Leave blank) (Leave blank)

4. The number of ~~approved application to appropriate~~ underground water claim water is 20958

5. Location of well ~~or mouth of tunnel is situated~~ at a point S 2585 ft N & W 1035 ft from N E cor Sec 6 T 2 ~~N~~ S R 7 E S L B & M
(Describe by rectangular co-ordinates or by one course and distance with reference to U. S. Government Survey Corner — Copy description from well owner's approved application)

6. Date on which work on well or ~~tunnel was~~ begun July 19 1952 (Strike words not needed)

7. Date on which work on well ~~or tunnel was~~ completed ~~or abandoned~~ Sept 5 1952 (Strike words not needed)

8. Maximum quantity of water measured as ~~flowing, pumped~~ or bailed on completion of (Strike words not needed)
well ~~or tunnel in sec. ft.~~ ; or in gals. per minute 30 Date July 2 6

DETAIL OF COLLECTING WORKS:

9. WELL: It is ~~drilled,~~ dug, ~~flowing or~~ pump well. Temperature of water 44° °F. (Strike words not needed)

(a) Total depth of well is 46 ft. below ground surface.

(b) If flowing well, give water pressure (hydrostatic head) above ground surface ..... ft.

(c) If pump well, give depth from ground surface to water surface before pumping 32 ; during pumping no draw down

(d) Size and kind of casing 12" Standard Blk. *(See remar (If only partially cased, give details)

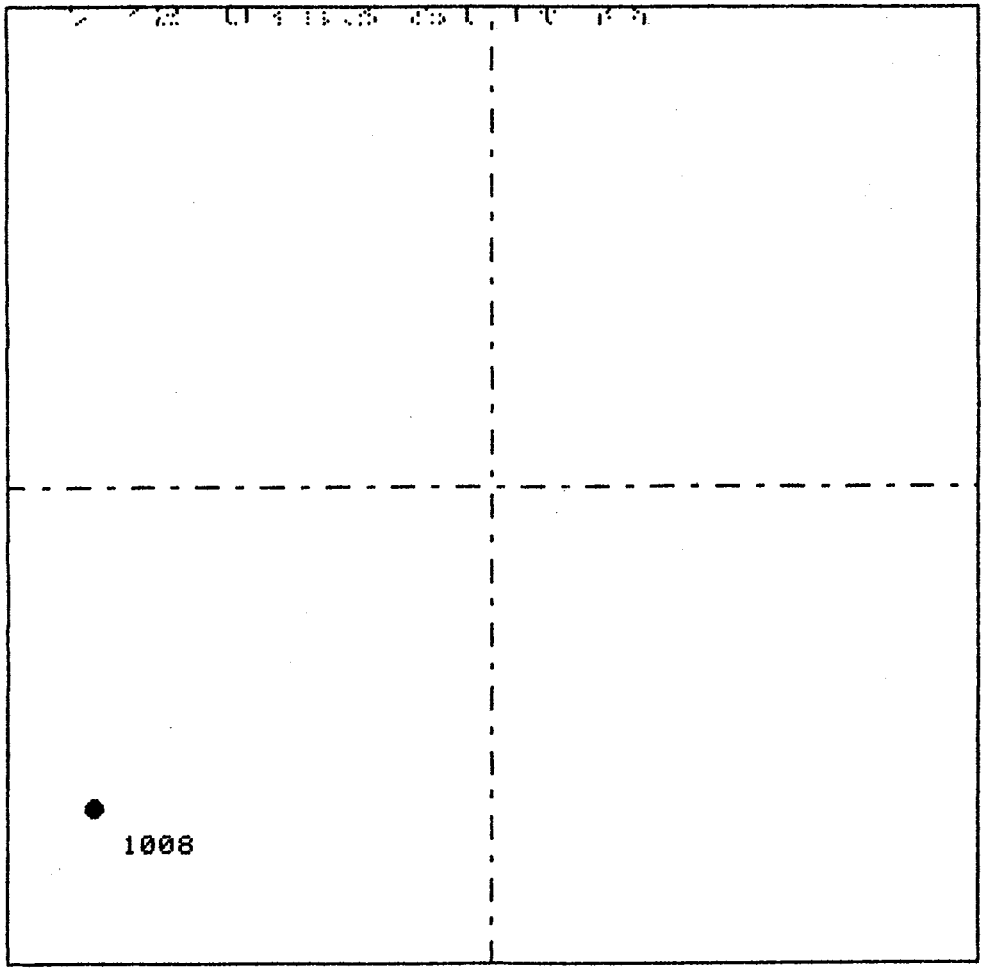
(e) Depth to water-bearing stratum 46 (If more than one stratum, give depth to each)

(f) If casing is perforated, give depth from ground surface to perforations 36

(g) Log of well Well was Dug to 46 ft. Through Clay and at 46 ft Fine Gravel & Water on top of Soap Stone

(h) Well was equipped with cap, valve, or ..... to control flow. (Strike words not needed)

(Over)



5280 feet

	UNAPPROVED		APPROVED		PERFECTED	
UGW	○	0	⊗	0	●	1
SUR	◇	0	◈	0	◆	0
SPRING	✧	0	✧	0	✦	0
REDIV	□	0	⊠	0	■	0
PTP	△	0	▲	0	▲	0

0 CLAIM NUMBERS DID NOT DISPLAY

SECTION 25 TOWNSHIP 3N RANGE 6E BASE SL

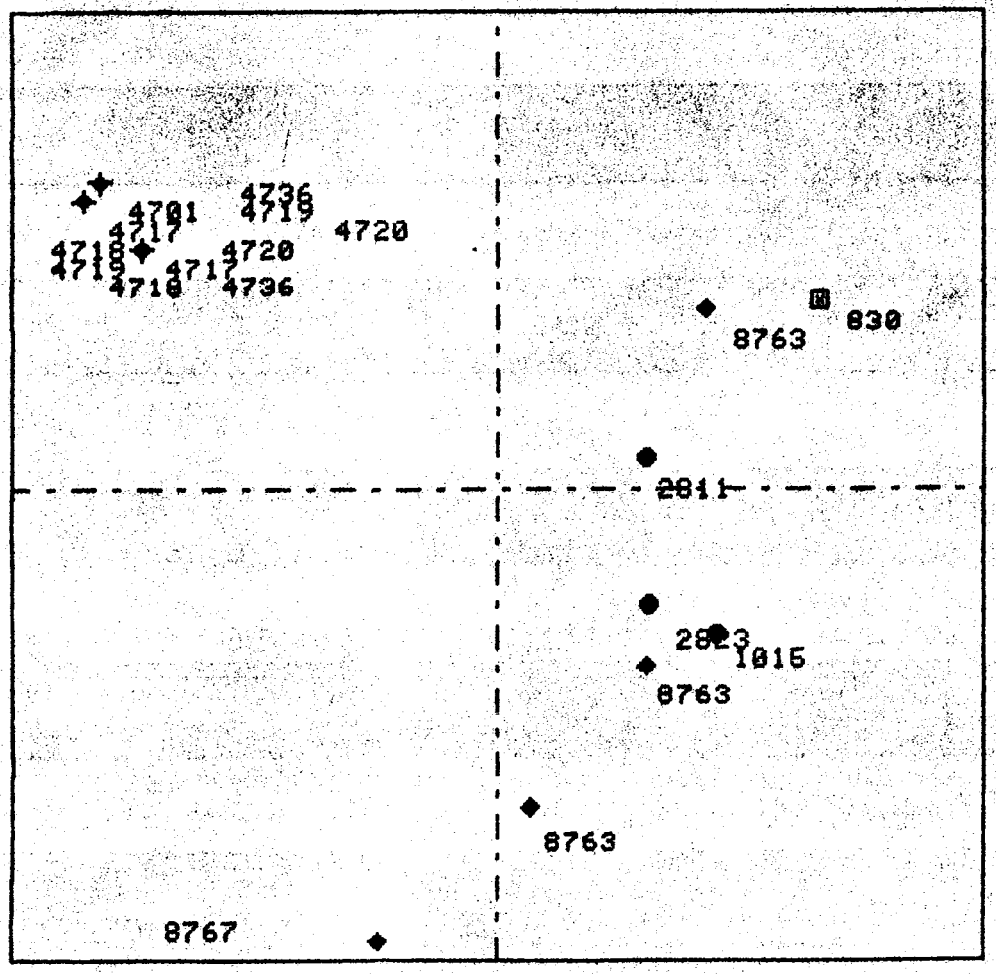
ENTIRE SEC.

ENTER COMMAND

DATE PRINTED 09/16/86

AREA 35

[redacted]



	UNAPPROVED		APPROVED		PERFECTED
UGW	○	0	⊗	0	● 3
SUR	◇	0	◈	0	◆ 4
SPRING	✧	0	✦	0	✦ 11
REDIV	□	0	▣	1	■ 0
PTP	△	0	▲	0	▲ 0

0 CLAIM NUMBERS DID NOT DISPLAY

SECTION 26 TOWNSHIP 3N RANGE 6E; BASE SL

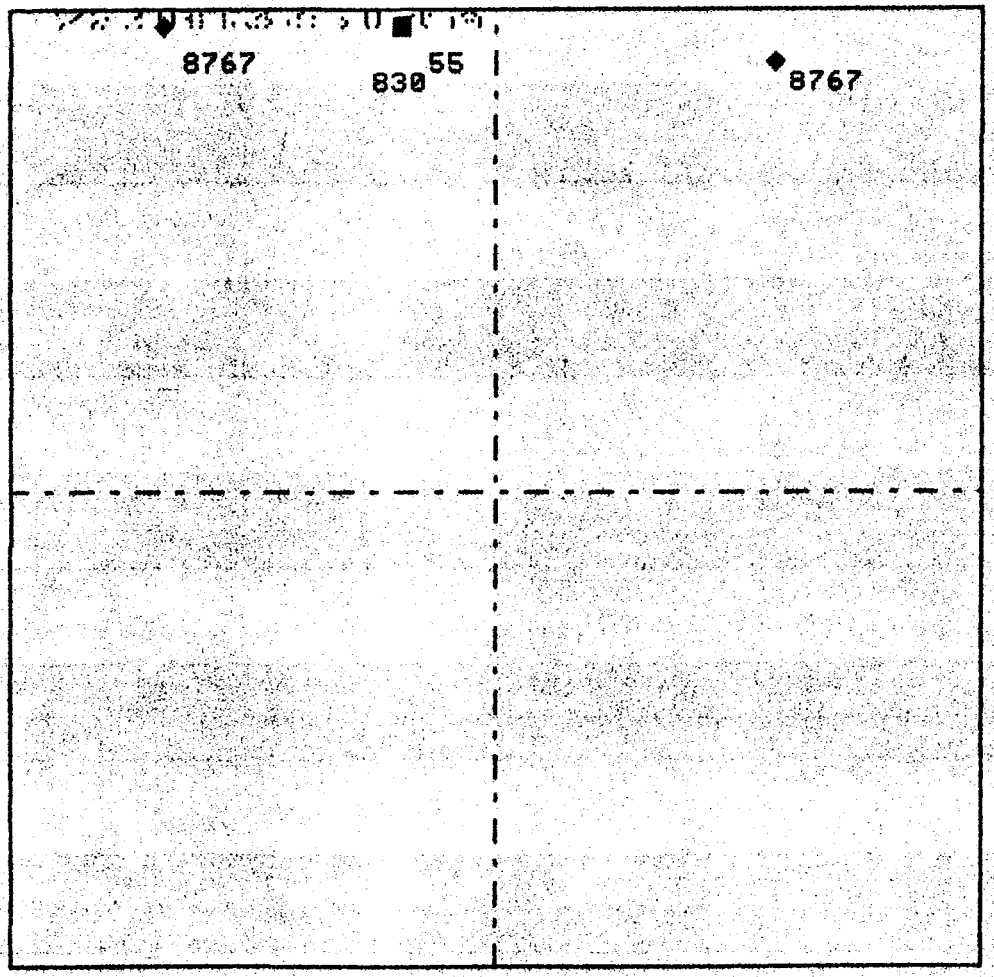
ENTIRE SEC.

ENTER COMMAND

DATE PRINTED 09/16/86

AREA 35

[redacted]



5280 feet

	UNAPPROVED		APPROVED		PERFECTED	
UGW	○	0	⊗	0	●	0
SUR	◇	0	◈	0	◆	2
SPRING	✧	0	✦	0	✦	0
REDIV	□	0	▣	1	■	1
PTP	△	0	▲	0	▲	0

0 CLAIM NUMBERS DID NOT DISPLAY

SECTION 35 TOWNSHIP 3N RANGE 6E BASE SL

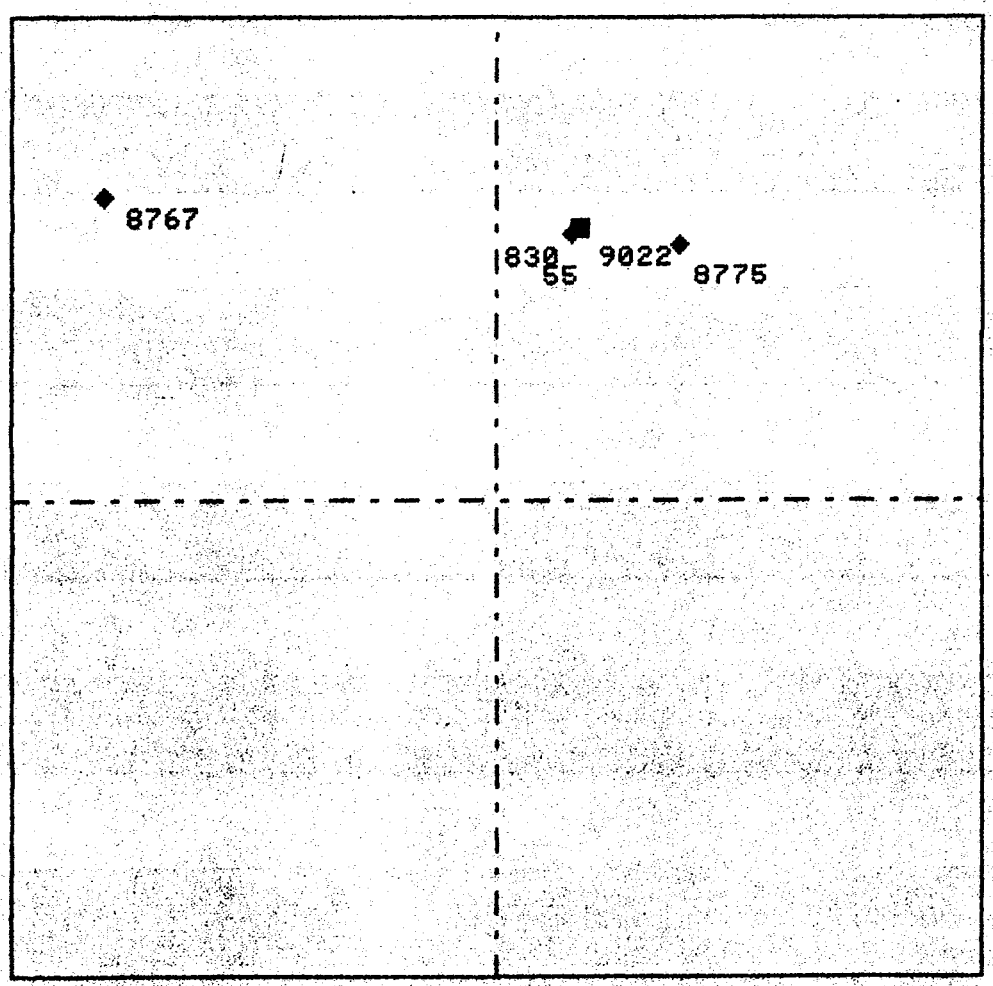
ENTIRE SEC.

ENTER COMMAND

DATE PRINTED 09/16/86

AREA 35

[redacted]



	UNAPPROVED		APPROVED		PERFECTED	
UGW	○	0	⊗	0	●	0
SUR	◇	0	◈	0	◆	3
SPRING	✧	0	✦	0	✦	0
REDIV	□	0	▣	1	■	1
PTP	△	0	▲	0	▲	0

0 CLAIM NUMBERS DID NOT DISPLAY

SECTION 36 TOWNSHIP 3N RANGE 6E BASE SL

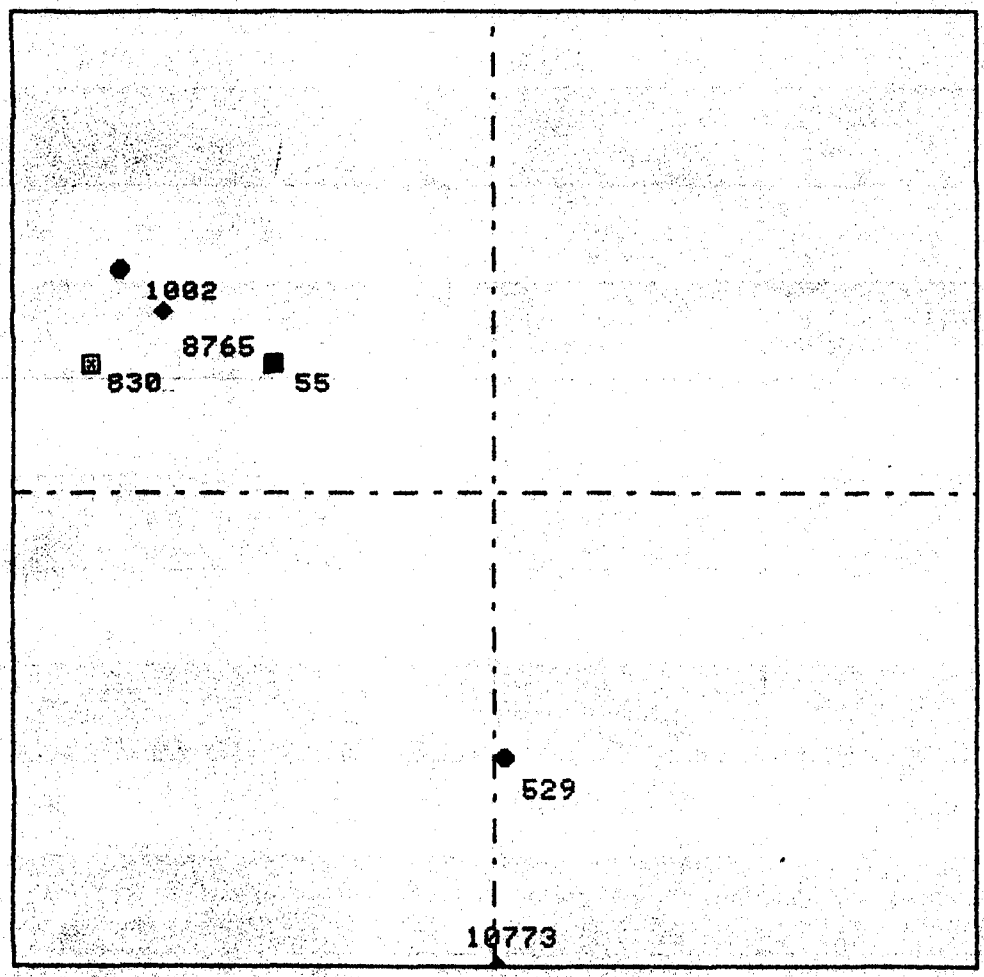
ENTIRE SEC.

ENTER COMMAND

DATE PRINTED 09/16/86

AREA 35

[redacted]



5280 feet

	UNAPPROVED		APPROVED		PERFECTED	
UGW	○	0	⊗	0	●	2
SUR	◇	0	◈	0	◆	2
SPRING	✧	0	✦	0	✦	0
REDIV	□	0	▣	1	■	1
PTP	△	0	▲	0	▲	0

0 CLAIM NUMBERS DID NOT DISPLAY

SECTION 31 TOWNSHIP 3N RANGE 7E BASE SL

ENTIRE SEC.

ENTER COMMAND

DATE PRINTED 09/16/86

AREA 35

[redacted]

WUCNO: 35-1008 APPLICATION/CLAIM NO.: A29724 CERT. NO.:

OWNERSHIP***

NAME: Staley, Claud S. INTEREST:
ADDRESS: Star Route
CITY: Coalville STATE: UT ZIP CODE: 84017

LAND OWNED BY APPLICANT?

DATES, ETC.***

Filing: 02/15/1958 Priority: 02/15/1958 Advertise Paper: Date: 00/00/0000 Protested? Approval: 04/09/1958

Proof Due: 00/00/0000 Ext Filed: 00/00/0000 Elec/Proof: Filed: 00/00/0000 Cert. or WUC Issued: 00/00/0000

Rej, Etc.: 00/00/0000

PD Book No. Status/Type of Right: NPR Source of Info: APPL Map: Date Verified: 00/00/0000 Initials:

PD REMARKS REFERENCE -- Name: Interest: Flow: Type of Right: Priority: Source:

LOCATION OF WATER RIGHT***

FLOW: 0.015 cfs SOURCE: Underground Water Well

TRIBUTARY 1: TRIBUTARY 2:

COUNTY: Summit COMMON DESCRIPTION: DRAINAGE AREA: Weber River

POINT OF DIVERSION -- UNDERGROUND:
(1) N 860 ft. E 475 ft. from SW corner, Section 25, T 3N, R 6E, SLBM Diameter of Well: 6 ins. Depth: 80 to ft.

USES OF WATER RIGHT***

CLAIMS USED FOR PURPOSE DESCRIBED: 1008
Referenced To: Claims Groups: Type of Reference -- Claims: Purpose: Remarks:

```
 ###IRRIGATION          *---NORTH EAST QUARTER--*---NORTH WEST QUARTER--*---SOUTH WEST QUARTER--*---SOUTH EAST QUARTER--*  Section
Tot Irr. Acrg.:    0.25*  NE    NW    SW    SE *  NE    NW    SW    SE *  NE    NW    SW    SE *  NE    NW    SW    SE *  Totals
 Sec 25 T  3N R  6E SLBM *     :     :     :     *     :     :     :     *     :     :  0.25:     *     :     :     :     *    0.25
        or a Total of .25 acres.       Sole Supply:          acres  Diversion Limit:            PERIOD OF USE: 04/01 TO 11/01
 ###DOMESTIC: 1 Family                                              Diversion Limit:            PERIOD OF USE: 01/01 TO 12/31
```

WUCNO: 35-2823 APPLICATION/CLAIM NO.: U12253 CERT. NO.:

OWNERSHIP**

NAME: Clark, Walter INTEREST:
ADDRESS:
CITY: Upton STATE: UT ZIP CODE:

LAND OWNED BY APPLICANT?

DATES, ETC.**

Filing: 03/23/1936 Priority: 00/00/1880 Advertise Paper: Date: 00/00/0000 Protested? Approval: 00/00/0000

Proof Due: 00/00/0000 Ext Filed: 00/00/0000 Elec/Proof: Filed: 00/00/0000 Cert. or WUC Issued: 00/00/0000

Rej, Etc.: 00/00/0000

PD Book No. Status/Type of Right: UGWC Source of Info: UGWC Map: Date Verified: 00/00/0000 Initials:

PD REMARKS REFERENCE -- Name: Interest: Flow: Type of Right: Priority: Source:

LOCATION OF WATER RIGHT**

FLOW: 0.022 cfs SOURCE: Underground Water Well

TRIBUTARY 1: TRIBUTARY 2:

COUNTY: Summit COMMON DESCRIPTION: DRAINAGE AREA: Weber River

POINT OF DIVERSION -- UNDERGROUND:
(1) S 640 ft. W 1838 ft. from E4 corner, Section 26, T 3N, R 6E, SLBM Diameter of Well: 6 ins. Depth: 160 to ft.

PLACE OF USE OF WATER RIGHT**

	NORTH-EAST4 NE NW SW SE	NORTH-WEST4 NE NW SW SE	SOUTH-WEST4 NE NW SW SE	SOUTH-EAST4 NE NW SW SE
Sec 26 T 3N R 6E SLBM	* : : : *	* : : : *	* : : : *	* X: X: X: X*

USES OF WATER RIGHT**

CLAIMS USED FOR PURPOSE DESCRIBED: 2823
Referenced To: Claims Groups: Type of Reference -- Claims: Purpose: Remarks:

###STOCKWATERING: 20 Equivalent Livestock Units Diversion Limit: PERIOD OF USE: 01/01 TO 12/31

###DOMESTIC: 3 Persons Diversion Limit: PERIOD OF USE: 01/01 TO 12/31

00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000

WUCNO: 35-8763 APPLICATION/CLAIM NO.: CERT. NO.:

OWNERSHIP**

NAME: Harris Ditch Co., Mutual Assoc. INTEREST: 100
ADDRESS:
CITY: STATE: UT ZIP CODE:

LAND OWNED BY APPLICANT? Yes

DATES, ETC.***

Filing: 00/00/0000 Priority: 01/01/1862 Advertise Paper: Date: 00/00/0000 Protested? Approval: 00/00/0000

Proof Due: 00/00/0000 Ext Filed: 00/00/0000 Elec/Proof: Filed: 00/00/0000 Cert. or WUC Issued: 00/00/0000

Rej, Etc.: 00/00/0000

PD Book No. Status/Type of Right: DEC Source of Info: Map: Date Verified: 00/00/0000 Initials:

PD REMARKS REFERENCE -- Name: Interest: Flow: Type of Right: Priority: Source:

LOCATION OF WATER RIGHT***

FLOW: 2.9 cfs SOURCE: Huff Creek

TRIBUTARY 1: Weber River TRIBUTARY 2:

COUNTY: Weber COMMON DESCRIPTION: DRAINAGE AREA: Weber River

POINTS OF DIVERSION -- SURFACE:
(1) N 1650 ft. W 1850 ft. from SE corner, Section 26, T 3N, R 6E, SLBM
Diverting Works: Harris #2 Ditch Source: Huff Creek
(2) N 860 ft. W 2475 ft. from SE corner, Section 26, T 3N, R 6E, SLBM
Diverting Works: Harris #3 Ditch Source: Huff Creek
(3) S 1655 ft. W 1520 ft. from NE corner, Section 26, T 3N, R 6E, SLBM
Diverting Works: Harris, # 1 Ditch Source: Huff Creek

PLACE OF USE OF WATER RIGHT***

NORTH-EAST4	NORTH-WEST4	SOUTH-WEST4	SOUTH-EAST4
NE NW SW SE	NE NW SW SE	NE NW SW SE	NE NW SW SE

USES OF WATER RIGHT***

CLAIMS USED FOR PURPOSE DESCRIBED: 763,765,769,775,
Referenced To: Claims Groups: Type of Reference -- Claims: Purpose: Remarks:

###IRRIGATION *---NORTH EAST QUARTER--*---NORTH WEST QUARTER--*---SOUTH WEST QUARTER--*---SOUTH EAST QUARTER--* Section
Tot Irr. Acrg.: 72.60* NE NW SW SE * NE NW SW SE * NE NW SW SE * NE NW SW SE * Totals
or a Total of .00 acres. Sole Supply: acres Diversion Limit: PERIOD OF USE: 03/01 TO 11/01

See Prop. Det. #202a,b. Pg. 62 for acreage, owners, etc.

###STOCKWATERING: 10 Equivalent Livestock Units Diversion Limit: PERIOD OF USE: 01/01 TO 12/31

###DOMESTIC: 9 Persons Diversion Limit: PERIOD OF USE: 01/01 TO 12/31

OTHER COMMENTS**

Weber River Decree No. 763
Not for official use
Harris Ditch Co., Mutual Assoc: Walter Clark 41.8 ac; Sarah Saxton 15.5 ac;
Peter Jacobson 13.0 ac; W.B. Saxton 2.3 ac; Total acreage 72.6 .
Proposed Determination No. 202a,b/ Pg. 62.

000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000

WUCNO: 35-8767 APPLICATION/CLAIM NO.: CERT. NO.:

OWNERSHIP**********

NAME: Chalk Creek Irrig. Co., Mutual Assoc. INTEREST: 100
ADDRESS:
CITY: STATE: UT ZIP CODE:

LAND OWNED BY APPLICANT? Yes

DATES, ETC.**********

Filing: 00/00/0000 Priority: 01/01/1868 Advertise Paper: Date: 00/00/0000 Protested? Approval: 00/00/0000
Proof Due: 00/00/0000 Ext Filed: 00/00/0000 Elec/Proof: Filed: 00/00/0000 Cert. or WUC Issued: 00/00/0000
Rej, Etc.: 00/00/0000

PD Book No. Status/Type of Right: DEC Source of Info: Map: Date Verified: 00/00/0000 Initials:
PD REMARKS REFERENCE -- Name: Interest: Flow: Type of Right: Priority: Source:

LOCATION OF WATER RIGHT**********

FLOW: 6.28 cfs SOURCE: Chalk Creek
TRIBUTARY 1: Weber River TRIBUTARY 2:
COUNTY: Weber COMMON DESCRIPTION: DRAINAGE AREA: Weber River

POINTS OF DIVERSION -- SURFACE:
(1) N 100 ft. W 660 ft. from S4 corner, Section 26, T 3N, R 6E, SLBM
Diverting Works: Unnamed Ditch Source: Chalk Creek
(2) S 1771 ft. E 300 ft. from N4 corner, Section 34, T 3N, R 6E, SLBM
Diverting Works: Judd Bros #2 Ditch Source: Chalk Creek
(3) S 200 ft. W 50 ft. from NE corner, Section 34, T 3N, R 6E, SLBM
Diverting Works: Judd, Clark & Saxton #2 Ditch Source: Chalk Creek
(4) S 2600 ft. W 675 ft. from N4 corner, Section 34, T 3N, R 6E, SLBM
Diverting Works: Robinson Ditch Source: Chalk Creek
(5) S 300 ft. W 1150 ft. from NE corner, Section 35, T 3N, R 6E, SLBM
Diverting Works: Bailey Ditch Source: Chalk Creek
(6) S 100 ft. E 825 ft. from NW corner, Section 35, T 3N, R 6E, SLBM
Diverting Works: Judd, Clark & Saxton #1 Ditch Source: Chalk Creek
(7) S 1000 ft. E 500 ft. from NW corner, Section 36, T 3N, R 6E, SLBM
Diverting Works: Judd Bros. #1 Ditch Source: Chalk Creek

PLACE OF USE OF WATER RIGHT**********

NORTH-EAST4				NORTH-WEST4				SOUTH-WEST4				SOUTH-EAST4			
NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE

USES OF WATER RIGHT**********

CLAIMS USED FOR PURPOSE DESCRIBED: 767,970,766, See Right 970 for seepage right
Referenced To: Claims Groups: Type of Reference -- Claims: Purpose: Remarks:

###IRRIGATION *---NORTH EAST QUARTER---*---NORTH WEST QUARTER---*---SOUTH WEST QUARTER---*---SOUTH EAST QUARTER---* Section
Tot Irr. Acrg.: 156.90* NE NW SW SE * NE NW SW SE * NE NW SW SE * NE NW SW SE * Totals
or a Total of .00 acres. Sole Supply: acres Diversion Limit: PERIOD OF USE: 03/01 TO 11/01

See Prop. Det. #198 a,b,c. Pg. 60 for acreage, owners, etc.Salt water to be prorated to the owners of the right to the use thereof for period of time in proportion as their respective acreage under each ditch bears to the total acreage under each ditch.

###STOCKWATERING: 135 Equivalent Livestock Units Diversion Limit: PERIOD OF USE: 01/01 TO 12/31

###DOMESTIC: 30 Persons Diversion Limit: PERIOD OF USE: 01/01 TO 12/31

WUCNO: 35-1015 APPLICATION/CLAIM NO.: A29768 CERT. NO.:

OWNERSHIP**********

NAME: Jacobsen, Alonzo INTEREST:
ADDRESS: Star Route
CITY: Coalville STATE: UT ZIP CODE: 84017

LAND OWNED BY APPLICANT?

DATES, ETC.**********

Filing: 03/11/1958 Priority: 03/11/1958 Advertise Paper: Date: 00/00/0000 Protested? Approval: 05/20/1958

Proof Due: 00/00/0000 Ext Filed: 00/00/0000 Elec/Proof: Filed: 00/00/0000 Cert. or WUC Issued: 00/00/0000

Rej, Etc.: 00/00/0000

PD Book No. Status/Type of Right: NPR Source of Info: APPL Map: Date Verified: 00/00/0000 Initials:

PD REMARKS REFERENCE -- Name: Interest: Flow: Type of Right: Priority: Source:

LOCATION OF WATER RIGHT**********

FLOW: 0.015 cfs SOURCE: Underground Water Well

TRIBUTARY 1: TRIBUTARY 2:

COUNTY: Summit COMMON DESCRIPTION: DRAINAGE AREA: Weber River

POINT OF DIVERSION -- UNDERGROUND:
(1) S 805 ft. W 1460 ft. from E4 corner, Section 26, T 3N, R 6E, SLBM Diameter of Well: 6 ins. Depth: 25 to 100 ft.

REMARKS:

Water will also be used for incidental irrigation purposes.

PLACE OF USE OF WATER RIGHT**********

	NORTH-EAST4 NE NW SW SE	NORTH-WEST4 NE NW SW SE	SOUTH-WEST4 NE NW SW SE	SOUTH-EAST4 NE NW SW SE
Sec 26 T 3N R 6E SLBM	* X: X: X: X*	* X: X: X: X*	* X: X: X: X*	* X: X: X: X*

USES OF WATER RIGHT**********

CLAIMS USED FOR PURPOSE DESCRIBED: 1015

Referenced To:	Claims Groups:	Type of Reference -- Claims:	Purpose:	Remarks:
###STOCKWATERING:	15 Equivalent Livestock Units	Diversion Limit:	PERIOD OF USE: 01/01 TO 12/31	
###DOMESTIC:	1 Family	Diversion Limit:	PERIOD OF USE: 01/01 TO 12/31	

WUCNO: 35-4720 APPLICATION/CLAIM NO.: DIL 2954 CERT. NO.:

OWNERSHIP**

NAME: Jacobson, Alonzo INTEREST: 25.0
ADDRESS:
CITY: Coalville STATE: UT ZIP CODE: 84017

LAND OWNED BY APPLICANT?

DATES, ETC.**

Filing: 08/02/1974 Priority: 00/00/1899 Advertise Paper: Date: 00/00/0000 Protested? Approval: 00/00/0000

Proof Due: 00/00/0000 Ext Filed: 00/00/0000 Elec/Proof: Filed: 00/00/0000 Cert. or WUC Issued: 00/00/0000

Rej, Etc.: 00/00/0000

PD Book No. Status/Type of Right: DIL Source of Info: DIL Map: Date Verified: 00/00/0000 Initials:

PD REMARKS REFERENCE -- Name: Interest: Flow: Type of Right: Priority: Source:

LOCATION OF WATER RIGHT**

FLOW: 0.045 cfs SOURCE: Springs (located in Randall Hollow)

TRIBUTARY 1: TRIBUTARY 2:

COUNTY: Summit COMMON DESCRIPTION: DRAINAGE AREA: Weber River

POINTS OF DIVERSION -- SURFACE:
(1) S 1320 ft. E 695 ft. from NW corner, Section 26, T 3N, R 6E, SLBM
Diverting Works: Pipe Line Source:
(2) S 1055 ft. E 381 ft. from NW corner, Section 26, T 3N, R 6E, SLBM
Diverting Works: Pipe Line Source:

USES OF WATER RIGHT**

CLAIMS USED FOR PURPOSE DESCRIBED: 4720
Referenced To: Claims Groups: Type of Reference -- Claims: Purpose: Remarks:

###STOCKWATERING: 34 Equivalent Livestock Units Diversion Limit: PERIOD OF USE: 01/01 TO 12/31

###DOMESTIC: 4 Persons Diversion Limit: PERIOD OF USE: 01/01 TO 12/31

OTHER COMMENTS***

Maximum capacity of reservoir is listed as 6000 gallons.

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WUCNO: 35-4718 APPLICATION/CLAIM NO.: DIL 2952 CERT. NO.:

OWNERSHIP***

NAME: LDS Church, Upton Ward INTEREST: 25.0
ADDRESS:
CITY: Coalville STATE: UT ZIP CODE: 84017

LAND OWNED BY APPLICANT?

DATES, ETC.***

Filing: 08/02/1974 Priority: 00/00/1899 Advertise Paper: Date: 00/00/0000 Protested? Approval: 00/00/0000

Proof Due: 00/00/0000 Ext Filed: 00/00/0000 Elec/Proof: Filed: 00/00/0000 Cert. or WUC Issued: 00/00/0000

Rej, Etc.: 00/00/0000

PD Book No. Status/Type of Right: DIL Source of Info: DIL Map: Date Verified: 00/00/0000 Initials:

PD REMARKS REFERENCE -- Name: Interest: Flow: Type of Right: Priority: Source:

LOCATION OF WATER RIGHT***

FLOW: 0.045 cfs SOURCE: Springs (located in Randall Hollow)

TRIBUTARY 1: TRIBUTARY 2:

COUNTY: Summit COMMON DESCRIPTION: DRAINAGE AREA: Weber River

POINTS OF DIVERSION -- SURFACE:
(1) S 1320 ft. E 695 ft. from NW corner, Section 26, T 3N, R 6E, SLBM
Diverting Works: Pipe Line Source:
(2) S 1055 ft. E 381 ft. from NW corner, Section 26, T 3N, R 6E, SLBM
Diverting Works: Pipe Line Source:

USES OF WATER RIGHT***

CLAIMS USED FOR PURPOSE DESCRIBED: 4718
Referenced To: Claims Groups: Type of Reference -- Claims: Purpose: Remarks:

###STOCKWATERING: 34 Equivalent Livestock Units Diversion Limit: PERIOD OF USE: 01/01 TO 12/31

###DOMESTIC: 4 Persons Diversion Limit: PERIOD OF USE: 01/01 TO 12/31

OTHER COMMENTS**

Maximum capacity 9of reservoir is listed as 6000 gallons.

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