FROM:
Soldier Creek Coal Co.

P.O. Box I Price, Utah 84501

SOLDIER CANYON MINE
ACT/007/013 #6

1987 Annual Report

SOLDIER CREEK COAL CO.

Telephone (801) 637-6360

P.O. Box I
Price, Utah 84501

April 27, 1988

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

RE: Annual Report for 1987
Soldier Canyon Mine
ACT/007/018

Dear Mr. Braxton:

Enclosed is the 1987 annual report for the Soldier Canyon Mine.

Please contact me if you have any questions. Your cooperation concerning this submittal has been appreciated.

Sincerely,
Soldier Creek Coal Company

David G. Spillman

David G. Spillman
Mine Engineer

DGS/lss
Enclosure

SOLDIER CREEK COAL COMPANY

Soldier Canyon Mine

1987 Annual Report

April 1988

TABLE OF CONTENTS

[Revised January 1988]

COAL MINING AND RECLAMATION OPERATIONS FOR 1987
(Authority UMC 784)

(Must be submitted to the Division by March 31, 1988)

State of Utah
Department of Natural Resources
Division of Oil, Gas and Mining
3 Triad Center, Suite 350
355 West North Temple
Salt Lake City, UT 84180-1203
(801) 538-5340

Operator: SOLDIER CREEK COAL COMPANY

Mine Name: SOLDIER CANYON MINE

Mailing Address: P.O. BOX I, Price, UT 84501

Company Representative: Mr. R.W. Olsen, President

Permit Number: ACT/007/018

Date of Most Recent Permanent Program Permit: February 3, 1987

Quantity of Coal Mined (tonnage) 1987: 468,465

Attach Updated Mine Sequence Map.

All monitoring activities during the report period must be submitted with this report (including, but not limited to):

A. Summarized Water Monitoring Data

B. Precipitation or Other Climatological Data

C. Subsidence Monitoring Report

D. Vegetation Data (test plots) or Revegetation Success Monitoring (includes interim and final)

E. Permit Stipulation Status

jr
1426R/1

WATER MONITORING DATA

All water monitoring activities during 1987 were conducted in accordance with the approved five year permit. The complete summarized results for each point monitored follows in this section. Sample site location maps are contained in the map section.

The total ground water consumption for 1987, due to mining activities is estimated as follows:

1. Water added to coal produced . . . . . 3,257,000 Gallons

   1987 coal production - 468,465 tons
   Inherent moisture - 4%
   Run-of-Mine moisture - 6.9%

2. Water evaporation . . . . . 4,539,000 Gallons

   Average humidity of intake air - 46%
   Average humidity of exhaust air - 74%
   Mine ventilation - 720,000 cfm

3. Water discharged from mine . . . . . 54,444,000 Gallons

Total	62,240,000 Gallons
	(191 acre-ft)

The areas of mine development for 1987 are shown on map D 235. The occurrence of ground water within this development was limited.

Ground water inflow into the Third North Third West, Third North First East and Third North Tenth East developments was negligible. The Fifth East Fifth North and Fifth North Second East developments did, however, intersect some ground water. Inflow generally occurred as floor seeps and typically advanced with development. Mining operations in this area were suspended in July due to low seam heights and the quantity of ground water intersected was not considered significant.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1987

Sample Site ID: G-1 (Upper Soldier Creek)

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	Site Not Accessible	06/04/87	08/17/87	11/11/87
Field Measurements				
Flow, gpm		126	54	482
pH, units		8.47	8.71	8.91
Conductivity, us/cm		736	912	917
Temperature, Water°F		60.0	76.0	45.5
Temperature, Air °F		62.0	74.0	48.0
Dissolved Oxygen, ppm		8.7	3.1	6.2
Laboratory Analyses, mg/l				
Total Dissolved Solids		494	528	594
Total Suspended Solids		40	26	158
Total Settleable Solids/hr		-0.2	-0.1	-0.2
Total Hardness		327	247	291
Carbonate (CO_3^{-2})		0	21	0
Bicarbonate (HCO_3-)		365	395	402
Calcium (Ca)		44	20	28
Chloride (Cl-)		15	21	9
Iron-Dissolved (Fe)		0.02	-0.02	-0.02
Magnesium (Mg)		53	48	54
Manganese (Mn)		0.01	-0.01	0.01
Potassium (k)		1	2	2
Sodium (Na)		78	125	103
Sulfate (SO_4^{-2})		76	78	115
Oil & Grease		-1	-1	-1
Cations meq/l		10.00	10.49	10.41
Anions meq/l		9.32	10.55	10.71
Cation/Anion Balance (%)		3.52	-0.29	-1.42

Note: Negative Sign "-" denotes that value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1987

Sample Site ID: G-2 (Upper Pine Creek)

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	Site Not Accessible	06/04/87	08/18/87	11/10/87
Field Measurements				
Flow, gpm		283	36	N/A
pH, units		8.61	8.56	9.25
Conductivity, us/cm		549	496	526
Temperature, Water°F		54.0	50.8	34.5
Temperature, Air °F		75.0	67.0	40.0
Dissolved Oxygen, ppm		7.2	3.0	7.5
Laboratory Analyses, mg/l				
Total Dissolved Solids		272	248	282
Total Suspended Solids		12	14	8
Total Settleable Solids/hr		-0.2	-0.1	-0.4
Total Hardness		253	198	213
Carbonate (CO_3^{-2})		0	0	0
Bicarbonate (HCO_3-)		240	247	241
Calcium (Ca)		52	30	41
Chloride (Cl-)		-1	3	3
Iron-Dissolved (Fe)		-0.02	-0.02	0.09
Magnesium (Mg)		30	30	27
Manganese (Mn)		-0.01	-0.01	0.01
Potassium (k)		-1	1	1
Sodium (Na)		12	17	10
Sulfate (SO_4^{-2})		21	8	19
Oil & Grease		-1	-1	1
Cations meq/l		5.56	4.73	4.73
Anions meq/l		5.21	5.19	5.30
Cation/Anion Balance (%)		3.25	-4.64	-5.68

Note: Negative Sign "-" denotes that value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1987

Sample Site ID: G-5 (Lower Soldier Creek)

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	02/26/87	06/05/87	08/18/87	11/11/87
Field Measurements				
Flow, gpm	N/A	718	350	1086
pH, units	8.37	8.95	8.84	8.98
Conductivity, us/cm	855	651	1211	1036
Temperature, Water°F	42.0	54.9	63.3	45.9
Temperature, Air °F	52.0	65.0	71.0	54.0
Dissolved Oxygen, ppm	N/A	7.8	4.9	8.3
Laboratory Analyses, mg/l				
Total Dissolved Solids	506	358	672	606
Total Suspended Solids	62	6	12	26
Total Settleable Solids/hr	-0.4	-0.2	-0.1	-0.2
Total Hardness	339	275	233	322
Carbonate (CO_3^{-2})	0	0	21	0
Bicarbonate (HCO_3-)	352	265	379	390
Calcium (Ca)	47	41	16	37
Chloride (Cl-)	22	12	68	29
Iron-Dissolved (Fe)	0.05	0.04	0.16	0.25
Magnesium (Mg)	54	42	47	56
Manganese (Mn)	0.06	0.01	-0.01	0.06
Potassium (k)	2	1	13	6
Sodium (Na)	91	34	154	140
Sulfate (SO_4^{-2})	134	70	156	144
Oil & Grease	-1	-1	-1	-1
Cations meq/l	10.83	7.02	11.77	12.76
Anions meq/l	10.47	7.11	13.18	11.64
Cation/Anion Balance (%)	1.69	-0.64	-5.65	4.59

Note: Negative Sign "-" denotes that value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1987

Sample Site ID: Spring #3

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	Site Not Accessible	06/04/87	08/17/87	11/11/87
Field Measurements				
Flow, gpm		No Flow	No Flow	No Flow
pH, units				
Conductivity, us/cm				
Temperature, Water°F				
Temperature, Air °F				
Laboratory Analyses, mg/l				
Total Dissolved Solids				
Total Hardness				
Carbonate (CO_3^{-2})				
Bicarbonate (HCO_3-)				
Calcium (Ca)				
Chloride (Cl-)				
Iron-Dissolved (Fe)				
Magnesium (Mg)				
Manganese (Mn)				
Potassium (k)				
Sodium (Na)				
Sulfate (SO_4^{-2})				
Cations meq/l				
Anions meq/l				
Cation/Anion Balance (%)				

Note: Negative Sign "-" denotes that value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1987

Sample Site ID: Spring #4

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	Site Not Accessible	06/04/87	08/18/87	11/10/87
Field Measurements				
Flow, gpm		4.0	1.7	2.5
pH, units		8.92	8.85	9.17
Conductivity, us/cm		542	469	565
Temperature, Water°F		72.0	58.0	40.6
Temperature, Air °F		75.0	67.0	42.0
Laboratory Analyses, mg/l				
Total Dissolved Solids		262	236	258
Total Hardness		232	199	235
Carbonate (CO_3^{-2})		0	0	0
Bicarbonate (HCO_3-)		230	232	235
Calcium (Ca)		42	27	40
Chloride (Cl-)		7	5	5
Iron-Dissolved (Fe)		-0.02	-0.02	0.05
Magnesium (Mg)		31	32	33
Manganese (Mn)		-0.01	1	-0.01
Potassium (k)		2	-0.01	1
Sodium (Na)		14	25	24
Sulfate (SO_4^{-2})		25	23	21
Cations meq/l		5.31	5.10	5.79
Anions meq/l		5.32	5.26	5.28
Cation/Anion Balance (%)		-0.09	-1.54	4.61

Note: Negative Sign "-" denotes that value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1987

Sample Site ID: Spring #5

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	Site Not Accessible	06/04/87	08/17/87	Site Not Accessible
Field Measurements				
Flow, gpm		50.0	20.0	
pH, units		8.79	8.32	
Conductivity, us/cm		1,071	516	
Temperature, Water°F		61.0	69.0	
Temperature, Air °F		67.0	79.0	
Laboratory Analyses, mg/l				
Total Dissolved Solids		284	328	
Total Hardness		245	263	
Carbonate (CO_3^{-2})		0	0	
Bicarbonate (HCO_3-)		225	295	
Calcium (Ca)		39	43	
Chloride (Cl-)		9	7	
Iron-Dissolved (Fe)		0.02	-0.02	
Magnesium (Mg)		36	38	
Manganese (Mn)		-0.01	-0.01	
Potassium (k)		1	1	
Sodium (Na)		18	20	
Sulfate (SO_4^{-2})		41	52	
Cations meq/l		5.72	6.17	
Anions meq/l		5.61	7.19	
Cation/Anion Balance (%)		0.97	-7.63	

Note: Negative Sign "-" denotes that value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1987

Sample Site ID: Spring #8

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	Site Not Accessible	06/04/87	08/18/87	11/10/87
Field Measurements				
Flow, gpm		10.2	2.7	8.3
pH, units		8.92	8.69	9.03
Conductivity, us/cm		572	532	650
Temperature, Water°F		63.0	59.8	45.3
Temperature, Air °F		73.0	67.0	42.0
Laboratory Analyses, mg/l				
Total Dissolved Solids		268	266	266
Total Hardness		247	227	234
Carbonate (CO_3^{-2})		0	11	0
Bicarbonate (HCO_3-)		255	284	247
Calcium (Ca)		38	25	28
Chloride (Cl-)		5	3	3
Iron-Dissolved (Fe)		-0.02	0.05	0.10
Magnesium (Mg)		37	40	40
Manganese (Mn)		-0.01	-0.01	0.01
Potassium (k)		1	1	-1
Sodium (Na)		20	38	27
Sulfate (SO_4^{-2})		27	29	21
Cations meq/l		5.84	6.23	5.84
Anions meq/l		5.81	6.59	5.47
Cation/Anion Balance (%)		0.26	-2.81	3.27

Note: Negative Sign "-" denotes that value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1987

Sample Site ID: Spring #10

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	Site Not Accessible	06/04/87	08/17/87	11/11/87
Field Measurements				
Flow, gpm		Minimal	Minimal	Minimal
pH, units		7.90	8.06	8.23
Conductivity, us/cm		1,071	973	885
Temperature, Water°F		61.0	68.8	50.3
Temperature, Air °F		67.0	74.0	48.0
Laboratory Analyses, mg/l				
Total Dissolved Solids		632	664	584
Total Hardness		171	196	154
Carbonate (CO_3^{-2})		0	11	0
Bicarbonate (HCO_3-)		425	479	445
Calcium (Ca)		21	26	19
Chloride (Cl-)		12	9	9
Iron-Dissolved (Fe)		-0.02	-0.02	0.02
Magnesium (Mg)		29	32	26
Manganese (Mn)		0.04	-0.01	0.01
Potassium (k)		6	3	2
Sodium (Na)		197	222	188
Sulfate (SO_4^{-2})		84	130	49
Cations meq/l		12.25	13.77	11.41
Anions meq/l		10.60	12.78	10.18
Cation/Anion Balance (%)		7.22	3.73	5.70

Note: Negative Sign "-" denotes that value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1987

Sample Site ID: Spring #15

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	Site Not Accessible	06/04/87	08/18/87	Site Not Accessible
Field Measurements				
Flow, gpm		20.0	1.8	
pH, units		8.52	8.99	
Conductivity, us/cm		592	651	
Temperature, Water°F		61.2	45.2	
Temperature, Air °F		72.0	51.0	
Laboratory Analyses, mg/l				
Total Dissolved Solids		324	354	
Total Hardness		281	342	
Carbonate (CO_3^{-2})		0	0	
Bicarbonate (HCO_3-)		275	342	
Calcium (Ca)		50	58	
Chloride (Cl-)		1	3	
Iron-Dissolved (Fe)		0.02	0.03	
Magnesium (Mg)		38	48	
Manganese (Mn)		-0.01	-0.01	
Potassium (k)		1	3	
Sodium (Na)		17	16	
Sulfate (SO_4^{-2})		21	33	
Cations meq/l		6.39	7.62	
Anions meq/l		5.97	7.62	
Cation/Anion Balance (%)		3.40	0.00	

Note: Negative Sign "-" denotes that value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1987

Sample Site ID: Spring #18

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	Site Not Accessible	06/04/87	08/18/87	Site Not Accessible
Field Measurements				
Flow, gpm		15.0	10.0	
pH, units		8.68	8.69	
Conductivity, us/cm		563	637	
Temperature, Water°F		79.0	46.6	
Temperature, Air °F		77.0	65.0	
Laboratory Analyses, mg/l				
Total Dissolved Solids		294	364	
Total Hardness		303	342	
Carbonate (CO_3^{-2})		0	0	
Bicarbonate (HCO_3-)		260	342	
Calcium (Ca)		62	60	
Chloride (Cl-)		6	5	
Iron-Dissolved (Fe)		0.03	0.10	
Magnesium (Mg)		36	47	
Manganese (Mn)		0.01	-0.01	
Potassium (k)		1	7	
Sodium (Na)		9	11	
Sulfate (SO_4^{-2})		16	39	
Cations meq/l		6.47	7.52	
Anions meq/l		5.70	7.80	
Cation/Anion Balance (%)		6.33	-1.83	

Note: Negative Sign "-" denotes that value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1987

Sample Site ID: Spring #21

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	Site Not Accessible	06/04/87	08/18/87	11/10/87
Field Measurements				
Flow, gpm		50.0	10.0	10.3
pH, units		8.06	7.56	9.60
Conductivity, us/cm		564	531	525
Temperature, Water°F		59.1	45.0	39.5
Temperature, Air °F		78.0	65.0	40.0
Laboratory Analyses, mg/l				
Total Dissolved Solids		262	260	268
Total Hardness		236	224	236
Carbonate (CO_3^{-2})		0	0	0
Bicarbonate (HCO_3-)		235	263	220
Calcium (Ca)		45	32	42
Chloride (Cl-)		4	2	2
Iron-Dissolved (Fe)		0.02	-0.02	0.09
Magnesium (Mg)		30	35	32
Manganese (Mn)		-0.01	-0.01	0.01
Potassium (k)		-1	-1	-1
Sodium (Na)		15	16	11
Sulfate (SO_4^{-2})		14	23	16
Cations meq/l		5.34	5.15	5.18
Anions meq/l		5.11	5.80	4.79
Cation/Anion Balance (%)		2.20	-5.94	3.91

Note: Negative Sign "-" denotes that value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1987

Sample Site ID: UG-2N (In-Mine Ground Water)

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	02/13/87	06/01/87	08/19/87	11/12/87
Field Measurements				
Flow, gpm	30.0	38.5	35.7	37.5
pH, units	7.43	7.26	6.79	7.01
Conductivity, us/cm	1,496	1,395	1,404	1,380
Temperature, Water°F	62.1	62.4	62.5	62.3
Temperature, Air °F	57.0	52.0	57.0	58.0
Laboratory Analyses, mg/l				
Total Dissolved Solids			850	
Total Hardness			273	
Carbonate (CO_3^{-2})			11	
Bicarbonate (HCO_3-)			674	
Calcium (Ca)			24	
Chloride (Cl-)			32	
Iron-Dissolved (Fe)			0.04	
Magnesium (Mg)			52	
Manganese (Mn)			0.04	
Potassium (k)			20	
Sodium (Na)			220	
Sulfate (SO_4^{-2})			101	
Cations meq/l			15.66	
Anions meq/l			16.72	
Cation/Anion Balance (%)			-3.27	

Note: Negative Sign "-" denotes that value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1987

Sample Site ID: UG-3N8E (In-Mine Ground Water)

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	02/13/87	06/01/87	08/19/87	11/12/87
Field Measurements				
Flow, gpm	15.0	23.8	38.5	14.3
pH, units	7.55	8.02	8.24	8.04
Conductivity, us/cm	1,024	1,400	1,113	888
Temperature, Water°F	50.0	53.1	54.9	54.2
Temperature, Air °F	49.1	52.0	54.0	57.0
Laboratory Analyses, mg/l				
Total Dissolved Solids			850	
Total Hardness			273	
Carbonate (CO_3^{-2})			11	
Bicarbonate (HCO_3-)			674	
Calcium (Ca)			24	
Chloride (Cl-)			32	
Iron-Dissolved (Fe)			0.04	
Magnesium (Mg)			52	
Manganese (Mn)			0.04	
Potassium (k)			20	
Sodium (Na)			220	
Sulfate (SO_4^{-2})			101	
Cations meq/l			15.66	
Anions meq/l			16.72	
Cation/Anion Balance (%)			-3.27	

Note: Negative Sign "-" denotes that value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1987

Sample Site ID: UG-Shaft (In-Mine Ground Water)

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Date	02/26/87	06/01/87	08/19/87	11/12/87
Field Measurements				
Flow, gpm	4.1	5.8	2.9	4.8
pH, units	6.83	7.11	6.59	6.79
Conductivity, us/cm	1,292	1,384	1,262	1,270
Temperature, Water°F	46.1	47.3	48.6	47.2
Temperature, Air °F	44.0	47.0	50.0	49.0
Laboratory Analyses, mg/l				
Total Dissolved Solids			870	
Total Hardness			611	
Carbonate (CO_3^{-2})			0	
Bicarbonate (HCO_3-)			437	
Calcium (Ca)			82	
Chloride (Cl-)			17	
Iron-Dissolved (Fe)			0.02	
Magnesium (Mg)			99	
Manganese (Mn)			0.03	
Potassium (k)			11	
Sodium (Na)			89	
Sulfate (SO_4^{-2})			296	
Cations meq/l			16.42	
Anions meq/l			15.43	
Cation/Anion Balance (%)			3.11	

Note: Negative Sign "-" denotes that value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1987

Scheduled Sample Month	Feb	May	Aug	Nov
Sample Site ID: 5-1 (Well)				
Sample Date	Site Not Accessible	06/04/87	08/18/87	11/10/87
Water Level Measurement, ft.		299.0	301.0	303.3
Sample Site ID: 10-2 (Well)				
Sample Date	Site Not Accessible	06/05/87	08/18/87	11/10/87
Water Level Measurement, ft.		716.0	716.1	716.1

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1987

Sample Site ID: MW-2 (Mine Water Discharge)

Scheduled Sample Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sample Date	01/27/87	02/26/87	03/23/87	04/28/87	06/01/87	06/29/87	07/28/87	08/18/87	09/15/87	10/15/87	11/11/87	12/02/
Field Measurements												
Flow, gpm	295	320	313	300	310	310	295	325	275	635	298	250
pH, units	8.83	7.80	8.85	8.55	8.11	8.90	8.87	8.50	8.47	8.65	8.06	8.6
Conductivity, us/cm	1,417	1,235	1,319	1,283	1,334	1,900	1,344	1,485	1,150	1,409	1,197	1,185
Temperature, Water °F	51.9	60.0	50.8	50.5	55.0	55.0	55.0	57.6	54.8	55.9	54.9	51.0
Temperature, Air °F	38.0	52.0	49.0	52.0	75.0	75.0	62.0	71.0	45.0	41.0	47	24.0
Laboratory Analyses, mg/l												
Total Dissolved Solids	826	818	792	780	768	1,022	794	954	720	882	810	752
Total Suspended Solids	6	10	2	6	8	2	8	14	8	10	-2	2
Total Settleable Solids/hr		-0.2	-0.3	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	-0.5	-0.2	-0.1
Iron, Dissolved (Fe)		0.08	-0.02	0.06	0.13	0.02	0.05	0.33	0.11	0.77	0.27	0.1
Iron, Total (Fe)	0.41	0.14	0.35	0.45	0.32	0.29	0.22	0.84	0.57	1.25	0.72	0.7
Manganese (Mn)	0.01	0.01	-0.01	-0.01	0.01	0.01	-0.01	0.02	0.01	0.03	0.01	0.0
Oil & Grease	6	-1	-1	-1	-1	-1	-1	-1	-1	2	-1	-1

Note: Negative sign "-" denotes that the value is less than.

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1987

Sample Site ID: MW-1 (Mine Water Discharge)

Scheduled Sample Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sample Date	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Dischar
Field Measurements												
Flow, gpm												
pH, units												
Conductivity, us/cm												
Temperature, Water °F												
Temperature, Air °F												
Laboratory Analyses, mg/l												
Total Dissolved Solids												
Total Suspended Solids												
Total Settleable Solids/hr												
Iron, Dissolved (Fe)												
Iron, Total (Fe)												
Manganese (Mn)												
Oil & Grease												

Note: Negative sign "-" denotes that the value is less than.

Subsidence Monitoring

The 1987 subsidence monitoring was carried out in accordance with the approved mining and reclamation plan. This monitoring involved the resurveying of existing control points when possible, and establishing new subsidence monitoring stations when necessary. Visual observations were also made during routine surface activities. These visual checks failed to identify any surface irregularities which could be attributed to subsidence.

Direct ground surveys were accomplished by utilizing the traverse method of surveying, with elevations being determined trigonometrically. All traverses were extended from existing survey monuments located well beyond the extent of any expected subsidence. The horizontal and vertical control of these existing survey monuments were established during previous higher order surveys.

All 1987 subsidence monitoring was completed by Soldier Creek Coal Company personnel, under the supervision of J.T. Paluso, a registered professional engineer in the State of Utah.

The location of all subsidence points monitored in 1987 is shown on the mine progress map contained in the map section. Also the 1987 subsidence monitoring summary follows in this section, identifying all stations with their respective horizontal and vertical control (horizontal control is oriented to the State Plane Coordinate System, Lambert Projection, Central Zone).

As detailed on the summary sheet, points 14 SS, 43 SS, 50 SS, 54 SS, 109 SS and 110 SS showed the most change in elevation. The slight decrease in elevation for these points averaged only 0.24 feet, with the maximum decrease for any one point being 0.30 feet. Since all of these points are associated with areas of secondary mining, actual surface subsidence is likely. The slight changes in elevation monitored are, however, within the

expected survey accuracy limits, therefore, the occurrence of actual surface subsidence is not 100 percent verified.

The change in elevations determined for points 15 SS, 36 SS, 106 SS, 3044, 3046 and 3055 are well within the expected survey accuracy limits and are considered negligible. Points 87-0 SS, 87-1 SS, 87-2 SS and 87-47 SS were established during 1987 for future subsidence monitoring.

1987 SUBSIDENCE MONITORING SUMMARY

Station	ORIGINAL ESTABLISHED CONTROL				1987 SURVEY CONTROL				
	Date Established	Coordinates North	Coordinates East	Elevation	Date Resurveyed	Coordinates North	Coordinates East	Elevation	Change In Elevation
14 SS	1979	501,618.43	2,246,766.22	8,019.76	10/20/87	500,619.23	2,246,765.58	8,019.50	-0.26
15 SS	1979	499,046.40	2,250,498.62	6,877.08	10/07/87	499,046.41	2,250,498.67	6,877.09	+0.01
36 SS	1979	504,721.47	2,251,483.38	6,999.88	10/08/87	504,722.08	2,251,483.98	6,999.89	+0.01
43 SS	1979	502,867.80	2,245,882.39	7,911.52	10/21/87	502,868.32	2,245,882.18	7,911.26	-0.26
50 SS	1979	502,045.93	2,248,432.01	8,041.24	10/20/87	502,046.22	2,248,431.85	8,040.96	-0.28
54 SS	1979	505,413.97	2,245,528.85	7,955.33	10/28/87	505,414.94	2,245,528.65	7,955.03	-0.30
106 SS	1979	502,400.01	2,251,238.02	6,864.11	10/07/87	502,400.39	2,251,238.38	6,864.04	-0.07
109 SS	1979	497,675.57	2,245,618.24	7,874.96	10/20/87	497,675.95	2,245,617.51	7,874.82	-0.14
110 SS	1979	499,385.67	2,245,776.57	7,874.05	10/20/87	499,385.73	2,245,775.79	7,873.83	-0.22
3044	1983	503,050.26	2,251,423.30	6,930.90	10/07/87	503,050.86	2,251,423.83	6,930.97	+0.07
3046	1983	503,896.61	2,254,502.54	8,052.60	11/10/87	503,897.33	2,254,502.24	8,052.65	+0.05
3055	1983	505,967.71	2,248,349.81	8,095.30	11/11/87	505,968.26	2,248,348.59	8,095.33	+0.03
87-0 SS	1987	-	-	-	10/07/87	500,243.55	2,250,582.43	6,776.05	-
87-1 SS	1987	-	-	-	10/07/87	501,367.65	2,251,073.81	6,873.89	-
87-2 SS	1987	-	-	-	11/11/87	504,562.64	2,246,925.65	8,238.56	-
87-47 SS	1987	-	-	-	11/10/87	502,184.61	2,254,071.70	7,480.42	-

Vegetation Monitoring

Vegetation monitoring for 1987 consisted of monitoring all three established field trial study sites. Details of the methodology used are presented below and the summarized results follow in this section.

- During mid-July all sites were systematically sampled along 10 permanent transects of 10 m length. These permanent transects are marked with No. 4 rebar driven into the ground at each end of each transect.

- Cover by species was determined by placing a 10 point optical frame along each transect at 1 m intervals. Readings through an optical scope (with fine crosshairs), identified 100 point-intercepts per transect. In this manner, 1,000 point-intercepts were recorded for each trial site. The resultant data gives total cover by species, total floral cover, litter cover, rock cover and bare ground exposure.

- Woody plant density was determined by totally enumerating all plants within the field trial site.

- The site productivity, in pounds per acre, was estimated by the Soil Conservation Service. Their letter is contained in the correspondence section.

1987 FIELD TRIAL MONITORING DATA

SEWAGE LAGOON FIELD TRIAL SITE

Ground Cover 7/21/87

Bare Ground Exposure	68.0%	
Litter	4.8%	
Rock	0.6%	
	73.4%	Percent Relative Composition
Crested Wheatgrass	18.6%	69.92%
Ranger Alfalfa	2.8%	10.52%
Fourwing Saltbush	5.2%	19.56%
Total Plant Cover	26.6%	100.00%

Shrub Density (35' x 45' area)
Fourwing Saltbush - 41 stems

Estimated Productivity (SCS)
500 lbs/acre

TOPSOIL STORAGE FIELD TRIAL SITE

Ground Cover 7/21/87

Bare Ground Exposure	19.7%	
Litter	33.0%	
Rock	3.0%	
	55.7%	Percent Relative Composition
Intermediate Wheatgrass	37.0%	83.52%
Ranger Alfalfa	6.3%	14.22%
Curlycup Gumweed	1.0%	2.26%
Total Plant Cover	44.3%	100.00%

Shrub Density
Rubber Rabbitbrush - 4 stems
Fringed Sagebrush - 1 stem

Estimated Productivity (SCS)
2,000 lbs/acre

1987 FIELD TRIAL MONITORING DATA
(continued)

NEW FAN FIELD TRIAL SITE

Ground Cover 7/21/87

Bare Ground	26.4%	
Litter	17.6%	
Rock	5.3%	
	49.3%	
		Percent Realtive Composition
Ladak Alfalfa	38.3%	75.54%
Crested Wheatgrass	5.6%	11.05%
Curlycup Gumweed	1.8%	3.55%
Rubber Rabbitbrush	2.2%	4.34%
Lewis Flax	0.2%	0.39%
Poverty Sumpweed	0.2%	0.39%
Squirreltail	0.4%	0.79%
Yellow Sweetclover	0.4%	0.79%
Unknown	1.6%	3.16%
	50.7%	100.00%

Shrub Density
Rubber Rabbitbrush - 9 stems

Estimated Productivity (SCS)
1,700 lbs/acre

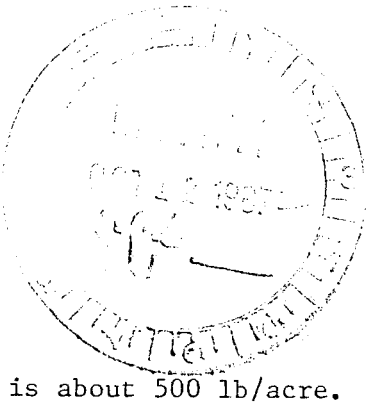
PERMIT STIPULATION STATUS

On February 3, 1987, the Division of Oil, Gas and Mining (DOGM) approved a new five year permit, with stipulations. Soldier Creek Coal Company has subsequently responded to all permit stipulations. DOGM has found this response adequate to meet the requirements of all permit stipulations. A copy of DOGM's May 5, 1987 and October 30, 1987 approval letters are contained in the correspondence section.

Correspondence

United States Department of Agriculture
Soil Conservation Service
350 North 4th East
Price, Utah 84501

October 8, 1987



Chris Allen
Soildier Creek Mining Co.
Box 1
Price, Utah 84501

Dear Mr. Allen:

The production of the area by the lower evaporation pond is about 500 lb/acre. It is hard to tell on this area because of the heavy use by wildlife and stock.

The production of the topsoil pile below the storage area south of the mine office is 2,000 lbs. This area has really increased in cover and production.

The production of the area above the fan is about 1,700 lbs. The alfalfa on the site has increased.

Those three sites are seeded and a range condition is not given on seeded sites.

The production on the Banning loadout site is about 800 lbs/acre. The site is in high fair condition.

George S. Cook
Range Conservationist
Price, Utah

STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

Norman H. Bangerter, Governor
Dee C. Hansen, Executive Director
Dianne R. Nielson, Ph.D., Division Director

355 W. North Temple • 3 Triad Center • Suite 350 • Salt Lake City, UT 84180-1203 • 801-538-5340

May 5, 1987

Mr. Tom Paluso
Soldier Creek Coal Company
P. O. Box I
Price, Utah 84501

Dear Mr. Paluso:

Re: Review of April 6, 1987 Response to Five Year Permit Conditions, Soldier Canyon Mine, Soldier Creek Coal Company, ACT/007/018, Folder No. 2 and 4, Carbon County, Utah

The Division has reviewed information submitted by Soldier Creek on April 6, 1987 in response to the February 4, 1987 conditional permit approval. Soldier Creek's reponse to stipulations UMC 817.42-(1)-DC, UMC 817.113-(1)-LK, and UMC 817.160-.166-(1)-JRH have been reviewed and found to be adequately addressed. Soldier Creek has accepted stipulations UMC 817.46-(2)-DC and UMC 817.116-(1)-LK.

The Division approves the 60 day extension for a response to UMC 817.43-(1-2)-DC and UMC 817.46-(1-2)-DC. The operator has sufficiently justified a variance from the requirements of UMC 817.160-.166 and has adequately supplied the information for the R.E.I. Storage Area and the No. 2 Exhaust Fan Site. The attached review document discusses the stipulation review for further clarification.

Thank you for your cooperation. Please contact me or Susan Linner if you have any questions.

Sincerely,

Lowell Braxton
Administrator
Mineral Resource Development
and Reclamation Program

jvb
cc: P. Rutledge
S. Linner
R. Team
0534R-90

April 14, 1987

TO: File

FROM: Lynn Kunzler, Reclamation Biologist

RE: Review of April 3, 1987 Response to Permit Conditions, Soldier Canyon Mine, Soldier Creek Coal Company, ACT/007/018, Folder #2, Carbon County, Utah

Soldier Creek Coal Company's response to permit conditions submitted April 3, 1987 was reviewed and found to adequately address condition UMC 817.113-(1)-LK .

0463R/63
cc: J. Leatherwood

April 16, 1987

TO: Technical File

FROM: Dave Cline, Reclamation Hydrologist DJC

RE: Response to Stipulation UMC 817.42-(1)-DC, Five Year Permit, Soldier Creek Coal Company, Soldier Canyon Mine, ACT/007/018, Carbon County, Utah

On February 4, 1987 Soldier Creek Coal Company (SCCC) was granted a Five Year Permit by the Division. The permit also included several conditions that SCCC must comply with. On April 6, 1987 SCCC submitted their response to several of the conditions. The response to stipulation UMC 817.42-(1)-DC has been reviewed and found to be acceptable.

Stipulation UMC 817.42-(1)-DC required that SCCC submit additional information on the two small area exemptions. Specifically, this stipulation required that SCCC submit the following information for the R.E.I. Storage Area and the No. 2 Exhaust Fan Site:

a. The exact size of each area in acres;

b. The volume of expected runoff from the design precipitation event;

c. The alternative sediment control method with a demonstration that the method has potential to treat drainage to meet effluent limitations;

d. The location of and depiction of the alternative sediment control method on a map;

e. Maintenance methods and schedule and a monitoring plan to demonstrate compliance with limitation standards.

SCCC has included the above information for both areas in the April 6, 1987 submittal. Additionally, the Division has found the information to be adequate to satisfy the stipulation.

jvb
cc: Sue Linner
James Leatherwood
Rick Summers
7000R-56

James

April 24, 1987

TO: Technical File

FROM: Randy Harden, Reclamation Engineer

RE: Special Permit Conditions, Five Year Permit, Soldier Canyon Mine, Soldier Creek Coal Company, ACT/007/018, Carbon County Utah

In a response sent to the Division dated April 3, 1987, and received by the Division on April 6, 1987, the operator has adequately addressed stipulation UMC 817.160-166-(1)-JRH. Comments regarding the submittal are as follows:

UMC 817.160-166 Roads: Class II - JRH

Existing Environment and Applicant's Proposal

The operator has addressed this section of the regulation in part 4.2 of the mining and reclamation plan. Revised pages of the plan, which are dated April 3, 1987, have been received by the Division and replaced in the plan.

The applicant states that the No. 1 exhaust fan, two ventilation slopes, water tank, and access road are located directly northwest of the main mine facilities as reference to Exhibit 4.1.1. These facilities, including the access road, were constructed in 1975-1976 and are incorporated into the operator's existing mining and reclamation plan.

Initial construction of the access road did not comply with the regulations pertaining to the design and construction of of a Class II road as specified in this section of the regulations. The operator considers the access road to be adequate for the following reasons:

1. All runoff from the road is conveyed directly to the central facilities sedimentation pond. This sedimentation pond provides the best available runoff treatment to prevent additional contributions of suspended solids to the natural drainage.

2. Adequate drainage and erosion controls have been constructed and maintained by the Applicant (Section 4.2.8).

3. The horizontal and vertical alignment of the road has provided acceptable access while minimizing the area disturbed. Alternative alignments were very limited due to the extreme rugged terrain of the area.

4. Road cuts and embankments constructed in 1975-1976 have demonstrated adequate stability.

5. Final reclamation for the site has been addressed and approved (see PAP, Part 5, Reclamation).

Compliance

The operator is considered to be in compliance with the requirements of this section. The operator has taken into consideration the performance requirements under Subchapter K of the regulations. Due to the location and orientation of the road, the Division concurs with the operator that modification to the road in order to comply with the horizontal and vertical alignment requirements of the regulations would require significant additional surface disturbance. Figure 4.2-1a indicates the orientation and the location of the access road. Due to the tight canyon in which the facilities are located, the existing configuration of the road appears to be prudent with accepted design standards. Traffic on the access road is limited to mine personnel only and is primarily used for the inspection of the ventilation fan.

Drainage for the access road has been incorporated into the disturbed area reporting to the sediment pond. This drainage control and sediment control is more stringent than the standards and requirements for these section of the regulations.

Road cuts and embankments of the access road are and have been maintained by the operator to minimize erosion and prevent failure. Minor slope failure that have occurred in the past along the road have been dressed and so as to minimize further potential failure.

The operator is considered to be in compliance with the requirements of this section and has sufficiently justified a variance from the requirements of this section and has sufficiently addressed the requirements of this stipulation.

cc: S. Linner
1010R - 106

STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

Norman H. Bangerter, Governor
Dee C. Hansen, Executive Director
Dianne R. Nielson, Ph.D., Division Director

355 W. North Temple • 3 Triad Center • Suite 350 • Salt Lake City, UT 84180-1203 • 801-538-5340

October 30, 1987

Mr. J. T. Paluso
Chief Engineer
Soldier Creek Coal Company
P. O. Box I
Price, Utah 84501

Dear Mr. Paluso:

Re: Permit Stipulations, Soldier Canyon Mine, ACT/007/018, Folder No. 2, Carbon County, Utah

The Division has reviewed Soldier Creek Coal Company's response to five year permit stipulations UMC 817.43-(1-2)-DC, and UMC 817.46-(1)-DC, received August 3, 1987. The response has been found to be adequate to meet the requirements of these three stipulations (see attached technical review memo). Soldier Creek has now met the requirements of all the permit stipulations.

Please submit eight (8) additional copies of the stipulation responses for distribution to other agencies.

Sincerely,

Susan C. Linner
Reclamation Biologist/
Permit Supervisor

jvb
Attachment
cc: L.Braxton
J. Leatherwood
K. Wheeler
0028R-38

October 21, 1987

TO: File

FROM: Kent Wheeler, Reclamation Hydrologist

RE: Technical Review of Stipulation Response from Soldier Creek Coal Co. (received Aug. 3, 1987), ACT/007/018, Folder No. 2, Carbon County, Utah

SUMMARY

This response was directed towards three stipulations to Soldier Creeks five year permit. The three stipulations were:

1) UMC 817.43-(1 and 2)-DC

These stipulations dealt with the diversion ditches that conveyed flow to and around the sediment pond. The applicant has to show that the diversion ditches are adequately sized and stable. Approval to use a 10yr - 6hr design storm event had been previously granted by DOGM administration with the following stipulation. If this design storm event has not been approved for use in the regulations by the Mid-Term Permit Review the applicant will have to show that the diversion can convey the design storm that is in the regulations at that time.

2) UMC 817.46-(1)-DC

This stipulation required the applicant to show that the sediment pond complies with the performance standards as set forth in this section of the regulations. The 10yr - 24 hr storm event had to be contained and the 25yr - 6hr storm had to be passed by the primary and emergency spillway. Since the seciment pond uses a decant device the design flows must be entirely conveyed by the emergency spillway.

ANALYSIS

See attached notes for the actual calculations.

DESIGN EVENTS

	Precip Event	DOGM values	APPLICANTS used
Diversion Ditches	10yr - 6hr precip	1.52 in	1.52 in
Emergency Spillway	25yr - 6hr precip	1.61 in*	1.76 in
Pond Containment	10yr - 24hr precip	2.08 in	2.08 in

* Value from NOAA Rainfall Intensity Atlas

WATERSHED INFORMATION TABLE
Salient information for the diversion ditchs and sediment pond designs.

DRAINAGE 1 and 2	DOGM	Applicants
Area (acres)	135	128
Hydraulic Length (ft)	3800	4080
Slope (%)	73	74
T_c (hr)	0.21	0.21
CN	75	75
Q_p (10yr-6hr)(cfs)	10.8	6.69

DRAINAGE 3	DOGM	Applicants
Area (acres)	6.5	6.8
Hydraulic Length (ft)	850	860
Slope (%)	107	80
T_c (hr)	0.05	0.05
CN	75	75
Q_p (10yr-6hr)(cfs)	0.82	0.97
Q_p (25yr-6hr)(cfs)	1.07	N.A.

DRAINAGE 4	DOGM	Applicants
Area (acres)	9.1	9.4
Hydraulic Length (ft)	900	855
Slope (%)	97	84
T_c (hr)	0.06	0.06
CN	75	75
Q_p (10yr-6hr)(cfs)	1.10	1.35
Q_p (25yr-6hr)(cfs)	1.45	N.A.

DRAINAGE 5	DOGM	Applicants
Area (acres)	3.1	3.0
Hydraulic Length (ft)	600	525
Slope (%)	72	63
T_c (hr)	0.05	0.04
CN	75	75
Q_p (10yr-6hr)(cfs)	0.39	0.43
Q_p (25yr-6hr)(cfs)	0.51	N.A.

DRAINAGE 6	DOGM	Applicants
Area (acres)	2.3	2.1
Hydraulic Length (ft)	850	860
Slope (%)	5	2.8
T_c (hr)	0.15	0.15
CN	88	88
Q_p (10yr-6hr)(cfs)	1.23	1.13
Q_p (25yr-6hr)(cfs)	1.37	N.A.

DRAINAGE 7	DOGM	Applicants
Area (acres)	3.5	3.2
Hydraulic Length (ft)	1350	1325
Slope (%)	39	12
T_c (hr)	0.08	0.10
CN	90	90
Q_p (10yr-6hr)(cfs)	2.30	2.23
Q_p (25yr-6hr)(cfs)	2.56	N.A.

DRAINAGE 8	DOGM	Applicants
Area (acres)	0.9	0.9
Hydraulic Length (ft)	300	220
Slope (%)	70	52
T_c (hr)	0.02	0.02
CN	80	75
Q_p (10yr-6hr)(cfs)	0.25	0.12
Q_p (25yr-6hr)(cfs)	0.30	N.A.

DRAINAGE 9	DOGM	Applicants
Area (acres)	1.5	1.4
Hydraulic Length (ft)	1100	1200
Slope (%)	3	3
T_c (hr)	0.14	0.17
CN	90	90
Q_p (10yr-6hr)(cfs)	0.95	0.89
Q_p (25yr-6hr)(cfs)	1.05	N.A.

DRAINAGE 10	DOGM	Applicants
Area (acres)	0.4	0.5
Hydraulic Length (ft)	50	100
Slope (%)	40	43
T_c (hr)	0.01	0.02
CN	75	75
Q_p (10yr-6hr)(cfs)	N.A.	N.A.
Q_p (25yr-6hr)(cfs)	0.07	N.A.

SEDIMENT POND DESIGNS

	DOGM values used	APPLICANTS values used
Sediment Storage ac-ft	0.76	0.71*
R.O. Containment Vol. ac-ft	1.47	1.43
Total Containment ac-ft	2.23	2.14
Q_p (25yr - 6hr) (cfs)	8.40	10.39
Available Head	1.10	1.10
Head Required	0.95	1.50

* Since the sediment pond has excess dead storage, the cleanout elevation was increased to 6647.8 ft allowing 0.76 ac-ft of sediment to be stored before cleanout. This still maintains the required 2 ft of elevation between the top of the sediment and the decant pipe elevation. The pond can still easily contain the 10yr - 24hr precipitation event and the increased sediment volume.

The slope, area, and hydraulic lengths in the WATERSHED INFORMATION TABLE was derived from Drawing D-213 and Figure 8 in the Vaughn Hansen report. Time of Concentration, CN, were checked using the applicants methods and the peak flows were generated using the SCS TR-55 methodology. As is shown on the Watershed Information Table the applicant and the Divisions values are similar, the main differences are in the calculated slope with the applicant often having significantly flatter slopes.

The drainage system is shown on Drawing E-026, it consists of four types of lined channels. These channels are shown in Drawing B-134. The applicant routed all flows through the drainage system using the SEDIMONT II hydrology program. Since the drainage area and channel lengths are so small the Division felt that the changes due to routing were within acceptable error and therefore did not route its calculated flows. The designs show that the diversions are capable of passing the 10yr - 6hr storm event with the required 0.3 ft of freeboard (see attached calculations) without routing the flows.

Since the applicants flatter slopes did not change the peak flows enough to affect the carrying capacity of the drainage system, they will be acceptable for this submittal, however future submittals may be affected by the flatter slope calculations. These slope values should be checked before being used for other calculations.

A Stage-Volume curve was generated using Drawing D-202 and the elevations of the spillway, height of the riser, length of culverts, and H' were taken from Drawing B-127. A Stage-Discharge Curve was derived from data found on these two drawings. The applicant has calculated that the 25yr - 6hr peak flows to the sediment pond are 10.39 cfs. Using the Stage Discharge from the sediment pond the pond is not capable of passing the 25yr - 6hr storm event and have the necessary 1.0 ft of freeboard. However the applicant uses precipitation data from Soldier Creek Summit, this is a conservative estimate when compared to the NOAA Rainfall Intensity Atlas for the Soldier Creek Canyon area. The division calculated the peak flows (8.4 cfs) using the NOAA Atlas and found that the emergency spillway could pass the expected peak flows with the necessary freeboard (see attached calculations).

RECOMMENDATIONS

The applicant has shown that all of the diversion ditches and the sediment pond meets the criteria established as permanent performance standards in the respective sections of UMC 817.43 and UMC 817.46. Therefore, the Division finds that the applicant has adequately addressed Stipulations UMC 817.43 (1 and 2)-DC and UMC 817.46 (1)-DC of the current five year permit.

cc: J. Leatherwood
S. Linner
R. Summers
1239R-73

Maps

Water Monitoring Locations, E 037

1987 Mine Progress Map, D 235