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COAL MINING AND RECLAMATION OPERATIONS FOR 1991

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**COAL MINING AND RECLAMATION OPERATIONS FOR 1991
SOLDIER CREEK COAL COMPANY
SOLDIER CANYON MINE**

PERMITTEE: Soldier Creek Coal Company

MINE NAME: Soldier Canyon Mine

MAILING ADDRESS: P.O. Box 1, Price, UT 84501

COMPANY REPRESENTATIVE: Mr. R.W. Olsen, President

RESIDENT AGENT: Mr. R.W. Olsen, President

PERMIT NUMBER: ACT/007/018

MSHA ID NUMBER: 42-00077

DATE OF INITIAL PERMANENT PROGRAM PERMIT: June 10, 1985 revised February 3, 1987

DATE OF PERMIT RENEWAL: February 3, 1997

QUANTITY OF COAL MINED (TONNAGE) 1991: 1,060,996

SUMMARIZED WATER MONITORING DATA:

All water monitoring activities during 1991 were conducted in accordance with the approved Mining and Reclamation Plan. The complete summarized results for each point monitored and sample site location maps are enclosed.

The total ground water consumption for 1991 due to mining activities is estimated as follows:

1. Water added to coal produced 4,697,000 Gallons
1991 coal production - 1,060,996 tons
Inherent moisture - 4.40%
Run-of-mine moisture - 6.28%
 2. Water evaporation 14,855,000 Gallons
Average humidity of intake air - 46%
Average humidity of exhaust air - 67%
Mine ventilation - 1,151,000 cfm
 3. Water discharged from mine 302,059,000 Gallons
- Total 321,611,000 Gallons
(987 acre-ft)

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In Cl. 007, 018, Internal

For additional information

The areas of active mining and water monitoring points for 1991 are shown on the attached maps. The following table shows the status of the underground water monitoring points.

MONITORING POINT	MONITORED	NOT MONITORED
UG-MN3W	X	
UG-2N		X
UG-2N2E		X
UG-SHAFT		X
UG-3N		X
UG-3N8E		X
UG-3NBELT		X
UG-10E	X	
UG-11E	X	
UG-1N SS SEAM	X	

SUBSIDENCE MONITORING DATA:

The 1991 subsidence monitoring was carried out in accordance with the approved Mining and Reclamation Plan. This monitoring involved the resurveying of existing control points, as well as the establishment of additional control points. Visual observations were also made during routine surface activities. These visual checks failed to identify any surface irregularities which could be attributed to subsidence.

The 1991 subsidence monitoring was completed by Soldier Creek Coal Company personnel, utilizing the traverse method of surveying. Individual traverses were extended from existing survey monuments, located beyond the expected limits of any subsidence. The horizontal survey control has been oriented to the State Plane Coordinate System, Lambert Projection, Central Zone and all elevations were determined trigonometrically.

Two new subsidence monitoring points were established during 1991. The location of all the monitoring points are shown on the enclosed 1991 Mine Progress Maps. The data on each point is shown on the 1991 Subsidence Monitoring Summary. All surface owners and/or occupants of surface property have been given proper notification prior to mining. This includes the Bureau of Land Management, Utah Division of State Lands and Forestry, Carbon County, Questar Pipeline Company, and Mrs. Bernard Iriart.

VEGETATION DATA:

There was no vegetation monitoring for 1991. The next scheduled vegetation monitoring is as follows:

Sewage Lagoons - 1992
Topsoil Site (Field Trial) - 1992
New Fan Site (No. 2) - 1994

RECLAMATION AND REVEGETATION ACTIVITIES:

Revegetation activities for 1991 included the revegetation of the cut slopes involved with the county road relocation. The seeds in these areas were hydraulically applied using a tackifier. The tackifier insured that the seeds would stay in place on the steep side slopes. The seeded slopes were then covered with an erosion control matting.

The topsoil site located approximately 2.5-miles below the mine was also revegetated in 1991. The side slopes in this area were pock marked and then the total area was hyroseeded. As of April 8, 1992, the side slopes are showing good signs of revegetation success.

ANNUAL IMPOUNDMENT CERTIFICATION:

The sewage lagoon and sediment pond were inspected each quarter in 1991. No significant problems were detected that would have an affect on stability. Enclosed are the 1991 pond inspection reports.

ANNUAL OVERBURDEN, SPOIL, REFUSE, ROOF, FLOOR AND MID-SEAM DATA:

Enclosed are the annual toxicity results. The values are based on 130,692.7 tons of coal which were shipped during April, May, and June.

PERMIT STIPULATIONS AND DEFICIENCIES:

Presently, we are working on the Technical Deficiencies Review Permit Renewal dated January 27, 1992.

SOLDIER CREEK COAL COMPANY
HYDROLOGIC MONITORING PROGRAM
SUMMARIZED RESULTS FOR 1991

NPDES results were submitted to the Division on the following dates:

1st Quarter	April 22, 1991
2nd Quarter	July 18, 1991
3rd Quarter	October 23, 1991
4th Quarter	January 21, 1992

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1991

Sample Site I.D. G-1 (upper Soldier Creek)

<u>Scheduled Sample Month</u>	<u>Feb</u>	<u>May</u>	<u>Aug</u>	<u>Nov</u>
<u>Sample Date</u>	Site Not Accessible	5/14/91	8/21/91	11/25/91 Frozen

Field Measurements

Flow, gpm		67.32	6.7
pH, units		8.88	8.72
Conductivity, us/cm		1073	1097
Temperature, Water °F		54.8	77.3
Temperature, Air °F		56.0	88.3
Dissolved Oxygen, ppm		5.2	6.0

Laboratory Analyses, mg/l

Total Dissolved Solids		576	598
Total Suspended Solids		84	90
Total Settleable Solids/hr		-.2	-.2
Total Hardness		279	294
Carbonate (CO ₃ ²⁻)		16	56
Bicarbonate (HCO ₃ ⁻)		378	354
Calcium (Ca)		33	34
Chloride (Cl ⁻¹)		22	28
Iron-Dissolved (Fe)		-.02	-.05
Magnesium (Mg)		48	51
Manganese (Mn)		-.01	-.01
Potassium (k)		2.0	7.0
Sodium (Na)		115	121
Sulfate (SO ₄ ²⁻)		119	506
Oil & Grease		-1.0	-1.0
Cations meq/l		10.70	11.39
Anions meq/l		11.00	11.41
Cation/Anion Balance (%)		-1.38	-.09
Nitrate, Dissolved		-.02	-.02
Nitrite, Dissolved		-.01	-.01
Alkalinity		394	410

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

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1991

Sample Site I.D. G-2 (upper Pine Creek)

<u>Scheduled Sample Month</u>	<u>Feb</u>	<u>May</u>	<u>Aug</u>	<u>Nov</u>
<u>Sample Date</u>	Frozen	5/14/91	8/21/91	11/26/91

Field Measurements

Flow, gpm	1.0		Dry	Site Not Accessible
pH, units	7.92			
Conductivity, us/cm	482			
Temperature, Water °F	58.3			
Temperature, Air °F	55			
Dissolved Oxygen, ppm	5.4			

Laboratory Analyses, mg/l

Total Dissolved Solids	242
Total Suspended Solids	2
Total Settleable Solids/hr	-.2
Total Hardness	247
Carbonate (CO ₃ ²⁻)	0
Bicarbonate (HCO ₃ ⁻)	222
Calcium (Ca)	61
Chloride (Cl ⁻)	2
Iron-Dissolved (Fe)	-.02
Magnesium (Mg)	23
Manganese (Mn)	-.01
Potassium (k)	2.0
Sodium (Na)	12.0
Sulfate (SO ₄ ²⁻)	37.0
Oil & Grease	1.0
Cations meq/l	5.52
Anions meq/l	5.27
Cation/Anion Balance (%)	2.32
Nitrate, Dissolved	-.02
Nitrite, Dissolved	-.01
Alkalinity	222

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

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1991

Sample Site I.D. G-5 (lower Soldier Creek)

<u>Scheduled Sample Month</u>	<u>Feb</u>	<u>May</u>	<u>Aug</u>	<u>Nov</u>
<u>Sample Date</u>	02/20/91	05/15/91	8/21/91	11/26/91
<u>Field Measurements</u>				
Flow, gpm	776	817	1243	839
pH, units	8.85	8.98	8.75	8.73
Conductivity, us/cm	2100	1670	1790	1728
Temperature, Water °F	54	57.5	70.4	53.8
Temperature, Air °F	42	56	830	35
Dissolved Oxygen, ppm	8.5	8.1	6.4	8.5
<u>Laboratory Analyses, mg/l</u>				
Total Dissolved Solids	1196	904	998	936
Total Suspended Solids	82	42	20	42
Total Settleable Solids/hr	-0.02	-.2	-.2	-.2
Total Hardness	166	180	209	252
Carbonate (CO ₃ ²⁻)	0.0	44	192	292
Bicarbonate (HCO ₃ ⁻)	620	608	544	406
Calcium (Ca)	27	18	18	27
Chloride (Cl ⁻¹)	180	54	192	59
Iron-Dissolved (Fe)	0.44	-.02	-.02	-.02
Magnesium (Mg)	24	33	40	45
Manganese (Mn)	0.04	-.01	-.01	-.01
Potassium (k)	15.0	14.0	19.0	18
Sodium (Na)	357	294	269	251
Sulfate (SO ₄ ²⁻)	80	115	82	105
Oil & Grease	-1.0	1.0	-1.0	4
Cations meq/l	19.42	16.91	16.51	16.55
Anions meq/l	19.12	16.97	18.07	17.82
Cation/Anion Balance (%)	0.78	-.18	-4.57	-3.70
Nitrate, Dissolved	0.19	0.66	-0.02	.59
Nitrite, Dissolved	0.10	0.06	1.05	.10
Alkalinity	620	652	736	698

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

Soldier Creek Coal Company
 Hydrologic Monitoring Program
 Summarized Results for 1991

Sample Site I.D. Spring #3

<u>Scheduled Sample Month</u>	<u>Feb</u>	<u>May</u>	<u>Aug</u>	<u>Nov</u>
<u>Sample Date</u>	Frozen	Dry	8/22/91	11/25/91

Field Measurements

Flow, gpm			Dry	Dry
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 (%)
Nitrate, Dissolved
Nitrite, Dissolved

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

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1991

Sample Site I.D. Spring #4

<u>Scheduled Sample Month</u>	<u>Feb</u>	<u>May</u>	<u>Aug</u>	<u>Nov</u>
<u>Sample Date</u>	Site Not Accessible	Dry	8/21/91	11/26/91

Field Measurements

Flow, gpm			Dry	Site not Accessible
pH, units				
Conductivity, us/cm				
Temperature, Water °F				
Temperature, Air °F				

Laboratory Analyses, mg/l

Total Dissolved Solids
Total Hardness
Carbonate (CO₃²⁻)
Bicarbonate (HCO₃⁻)
Calcium (Ca)
Chloride (Cl⁻¹)
Iron-Dissolved (Fe)
Magnesium (Mg)
Manganese (Mn)
Potassium (k)
Sodium (Na)
Sulfate (SO₄²⁻)
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 1991

Sample Site I.D. Spring #5

<u>Scheduled Sample Month</u>	<u>Feb</u>	<u>May</u>	<u>Aug</u>	<u>Nov</u>
<u>Sample Date</u>	Site Not Accessible	5/14/91	8/21/91	11/26/91
<u>Field Measurements</u>				
Flow, gpm		1.0	1.0	Site not Accessible
pH, units		8.87	8.03	
Conductivity, us/cm		445	731	
Temperature, Water °F		64.3	63.3	
Temperature, Air °F		50	83	
<u>Laboratory Analyses, mg/l</u>				
Total Dissolved Solids		290	422	
Total Hardness		233	304	
Carbonate (CO ₃ ²⁻)		4.0	36	
Bicarbonate (HCO ₃ ⁻)		202	278	
Calcium (Ca)		44	66	
Chloride (Cl ⁻)		9.0	8	
Iron-Dissolved (Fe)		-.02	-.02	
Magnesium (Mg)		30	34	
Manganese (Mn)		-.01	-.01	
Potassium (k)		3.0	1.0	
Sodium (Na)		25	35	
Sulfate (SO ₄ ²⁻)		70	49	
Cations meq/l		5.84	7.65	
Anions meq/l		5.84	7.53	
Cation/Anion Balance (%)		0	.79	
Nitrate, Dissolved		-.02	-.02	
Nitrite, Dissolved		-.01	-.01	

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

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1991

Sample Site I.D. Spring #8

<u>Scheduled Sample Month</u>	<u>Feb</u>	<u>May</u>	<u>Aug</u>	<u>Nov</u>
<u>Sample Date</u>	Site Not Accessible	5/15/91	8/21/91	11/26/91
<u>Field Measurements</u>				
Flow, gpm		2.5	1.0	Site not Accessible
pH, units		8.79	8.63	
Conductivity, us/cm		523	542	
Temperature, Water °F		57.4	78	
Temperature, Air °F		56	83	
<u>Laboratory Analyses, mg/l</u>				
Total Dissolved Solids		280	284	
Total Hardness		227	190	
Carbonate (CO ₃ ²⁻)		8.0	28.0	
Bicarbonate (HCO ₃ ⁻)		238	214	
Calcium (Ca)		40	30	
Chloride (Cl ⁻)		3.0	5.0	
Iron-Dissolved (Fe)		-.02	.03	
Magnesium (Mg)		31	28	
Manganese (Mn)		-.01	-.01	
Potassium (k)		1.0	1.0	
Sodium (Na)		34	34	
Sulfate (SO ₄ ²⁻)		37	16	
Cations meq/l		6.06	5.32	
Anions meq/l		5.78	5.32	
Cation/Anion Balance (%)		2.36	0.0	
Nitrate, Dissolved		.07	-.02	
Nitrite, Dissolved		-.01	-.01	

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

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1991

Sample Site I.D. Spring #10

<u>Scheduled Sample Month</u>	<u>Feb</u>	<u>May</u>	<u>Aug</u>	<u>Nov</u>
<u>Sample Date</u>	Frozen	5/14/91	8/21/91	11/25/91

Field Measurements

Flow, gpm		1.0	1.0	<1.0
pH, units		7.91	7.76	7.84
Conductivity, us/cm		1070	1093	1118
Temperature, Water °F		55.7	62.3	47
Temperature, Air °F		56	83	35

Laboratory Analyses, mg/l

Total Dissolved Solids		614	668	726
Total Hardness		170	132	144
Carbonate (CO ₃ ²⁻)		0	32	0
Bicarbonate (HCO ₃ ⁻)		442	422	372
Calcium (Ca)		27	15	15
Chloride (Cl ⁻)		17	38	12
Iron-Dissolved (Fe)		-.02	-.02	.03
Magnesium (Mg)		25	23	26
Manganese (Mn)		-.01	-.01	.01
Potassium (k)		3.0	3.0	3.0
Sodium (Na)		188	187	189
Sulfate (SO ₄ ²⁻)		123	74	161
Cations meq/l		11.75	10.94	11.28
Anions meq/l		11.90	11.70	11.16
Cation/Anion Balance (%)		-.63	-3.36	.53
Nitrate, Dissolved		-.02	.03	.03
Nitrite, Dissolved		-.01	-.01	-.01

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

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1991

Sample Site I.D. Spring #15

<u>Scheduled Sample Month</u>	<u>Feb</u>	<u>May</u>	<u>Aug</u>	<u>Nov</u>
<u>Sample Date</u>	Site Not Accessible	Dry	8/21/91	11/26/91

Field Measurements

Flow, gpm			Dry	Site not Accessible
pH, units				
Conductivity, us/cm				
Temperature, Water °F				
Temperature, Air °F				

Laboratory Analyses, mg/l

Total Dissolved Solids
Total Hardness
Carbonate (CO₃²⁻)
Bicarbonate (HCO₃⁻)
Calcium (Ca)
Chloride (Cl⁻)
Iron-Dissolved (Fe)
Magnesium (Mg)
Manganese (Mn)
Potassium (k)
Sodium (Na)
Sulfate (SO₄²⁻)
Cations meq/l
Anions meq/l
Cation/Anion Balance (%)
Nitrate, Dissolved
Nitrite, Dissolved

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

Soldier Creek Coal Company
 Hydrologic Monitoring Program
 Summarized Results for 1991

Sample Site I.D. Spring #18

Scheduled Sample Month

Feb

May

Aug

Nov

Sample Date

Site Not
Accessible

Dry

8/21/91

11/26/91

Field Measurements

Flow, gpm

pH, units

Conductivity, us/cm

Temperature, Water °F

Temperature, Air °F

Dry

Site not
Accessible

Laboratory Analyses, mg/l

Total Dissolved Solids

Total Hardness

Carbonate (CO₃²⁻)

Bicarbonate (HCO₃⁻)

Calcium (Ca)

Chloride (Cl⁻)

Iron-Dissolved (Fe)

Magnesium (Mg)

Manganese (Mn)

Potassium (k)

Sodium (Na)

Sulfate (SO₄²⁻)

Cations meq/l

Anions meq/l

Cation/Anion Balance (%)

Nitrate, Dissolved

Nitrite, Dissolved

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

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1991

Sample Site I.D. Spring #21

<u>Scheduled Sample Month</u>	<u>Feb</u>	<u>May</u>	<u>Aug</u>	<u>Nov</u>
<u>Sample Date</u>	Site Not Accessible	Dry	8/21/91	11/26/91
<u>Field Measurements</u>				
Flow, gpm			1.0	Site not
pH, units			8.38	Accessible
Conductivity, us/cm			543	
Temperature, Water °F			62.2	
Temperature, Air °F			83	
<u>Laboratory Analyses, mg/l</u>				
Total Dissolved Solids			304	
Total Hardness			266	
Carbonate (CO ₃ ²⁻)			0	
Bicarbonate (HCO ₃ ⁻)			238	
Calcium (Ca)			59	
Chloride (Cl ⁻)			4	
Iron-Dissolved (Fe)			-.02	
Magnesium (Mg)			29	
Manganese (Mn)			-.01	
Potassium (k)			1.0	
Sodium (Na)			19	
Sulfate (SO ₄ ²⁻)			62	
Cations meq/l			6.19	
Anions meq/l			6.17	
Cation/Anion Balance (%)			.16	
Nitrate, Dissolved			.07	
Nitrite, Dissolved			-.01	

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

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1991

Sample Site I.D. UG-1N (In-mine Ground Water)

<u>Scheduled Sample Month</u>	<u>Feb</u>	<u>May</u>	<u>Aug</u>	<u>Nov</u>
<u>Sample Date</u>	02/21/91	05/15/91	8/20/91	11/21/91

Field Measurements

Flow, gpm	NA	NA	NA	NA
pH, units	8.40	8.13	8.32	8.16
Conductivity, us/cm	1428	1296	1322	1331
Temperature, Water °F	57.5	60.8	63.8	58.4
Temperature, Air °F	58	58	58	55

Laboratory Analyses, mg/l

Total Dissolved Solids	764
Total Hardness	230
Carbonate (CO ₃ ²⁻)	80
Bicarbonate (HCO ₃ ⁻)	482
Calcium (Ca)	41
Chloride (Cl ⁻)	43
Iron-Dissolved (Fe)	.03
Magnesium (Mg)	31
Manganese (Mn)	-.01
Potassium (k)	17.0
Sodium (Na)	171
Sulfate (SO ₄ ²⁻)	58
Cations meq/l	12.56
Anions meq/l	13.66
Cation/Anion Balance (%)	-4.20
Nitrate, Dissolved	-.02
Nitrite, Dissolved	-.01

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

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1991

Sample Site I.D. UG-3W (In-mine Ground Water)

Scheduled Sample Month Jul Aug Sep Oct Nov Dec

Sample Date 11/12/91 12/20/91

Field Measurements

Flow, gpm	50	65
pH, units	8.05	
Conductivity, us/cm	1917	
Temperature, Water °F	62.8	
Temperature, Air °F	52	

Laboratory Analyses, mg/l

Total Dissolved Solids	904
Total Hardness	219
Carbonate (CO ₃ ⁻²)	72
Bicarbonate (HCO ₃ ⁻)	546
Calcium (Ca)	22
Chloride (Cl ⁻)	82
Iron-Dissolved (Fe)	-.02
Magnesium (Mg)	40
Manganese (Mn)	-.01
Potassium (k)	20
Sodium (Na)	285
Sulfate (SO ₄ ⁻²)	158
Cations meq/l	17.44
Anions meq/l	17.97
Cation/Anion Balance (%)	-1.50
Nitrate, Dissolved	.29
Nitrite, Dissolved	-.01

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

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1991

Sample Site I.D. UG-10E (In-mine Ground Water)

<u>Scheduled Sample Month</u>	<u>Feb</u>	<u>May</u>	<u>Aug</u>	<u>Nov</u>
<u>Sample Date</u>	02/21/91	5/15/91	8/20/91	11/21/91

Field Measurements

Flow, gpm	NA	NA	NA	NA
pH, units	8.38	8.51	8.33	8.39
Conductivity, us/cm	1571	1262	1189	1163
Temperature, Water °F	58.4	60.3	62.2	58.2
Temperature, Air °F	59	61	61	59

Laboratory Analyses, mg/l

Total Dissolved Solids			662	
Total Hardness			215	
Carbonate (CO ₃ ²⁻)			0	
Bicarbonate (HCO ₃ ⁻)			460	
Calcium (Ca)			27	
Chloride (Cl ⁻)			34	
Iron-Dissolved (Fe)			.04	
Magnesium (Mg)			36	
Manganese (Mn)			-.01	
Potassium (k)			15	
Sodium (Na)			166	
Sulfate (SO ₄ ²⁻)			107	
Cations meq/l			12	
Anions meq/l			12.4	
Cation/Anion Balance (%)			-1.64	
Nitrate, Dissolved			-.02	
Nitrite, Dissolved			.02	

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

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1991

Sample Site I.D. UG-11E (In-mine Ground Water)

<u>Scheduled Sample Month</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>
<u>Sample Date</u>	01/16/91	02/21/91	03/20/01	04/15/91	05/13/91	06/26/91

Field Measurements

Flow, gpm	495	337	319	453	332	229
pH, units	8.45	8.84	8.40	8.70	8.42	8.50
Conductivity, us/cm	2200	2480	2170	2200	2100	2080
Temperature, Water °F	63.5	65.6	68.2	66.1	64.5	66.3
Temperature, Air °F	50	55	55	54	53	55

Laboratory Analyses, mg/l

Total Dissolved Solids
Total Hardness
Carbonate (CO₃²⁻)
Bicarbonate (HCO₃⁻)
Calcium (Ca)
Chloride (Cl⁻)
Iron-Dissolved (Fe)
Magnesium (Mg)
Manganese (Mn)
Potassium (k)
Sodium (Na)
Sulfate (SO₄²⁻)
Cations meq/l
Anions meq/l
Cation/Anion Balance (%)
Nitrate, Dissolved
Nitrite, Dissolved

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

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1991

Sample Site I.D. UG-11E (In-mine Ground Water) cont'd

<u>Scheduled Sample Month</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
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<u>Sample Date</u>	7/30/91	8/20/91			11/21/91	
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Field Measurements

Flow, gpm	246	260			215	
pH, units	8.42	8.57			8.56	
Conductivity, us/cm	2120	2060			2030	
Temperature, Water °F	70.1	66.6			63.3	
Temperature, Air °F	60	61			58	

Laboratory Analyses, mg/l

Total Dissolved Solids	1194
Total Hardness	66
Carbonate (CO ₃ ²⁻)	68
Bicarbonate (HCO ₃ ⁻)	930
Calcium (Ca)	10
Chloride (Cl ⁻)	55
Iron-Dissolved (Fe)	-.02
Magnesium (Mg)	10
Manganese (Mn)	-.01
Potassium (k)	15
Sodium (Na)	440
Sulfate (SO ₄ ²⁻)	58
Cations meq/l	21.07
Anions meq/l	22.72
Cation/Anion Balance (%)	-3.77
Nitrate, Dissolved	-.02
Nitrite, Dissolved	-.01

*- Completed
After Grouting?*

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

Soldier Creek Coal Company
 Hydrologic Monitoring Program
 Summarized Results for 1991

<u>Scheduled Sample Month</u>	<u>Feb</u>	<u>May</u>	<u>Aug</u>	<u>Nov</u>
<u>Sample Site ID: 5-1 (Well)</u>	Site Not Accessible	05/15/91	8/21/91	Site Not Accessible
<u>Sample Date</u>				
<u>Water Level Measurement, ft.</u>		333.2	334.6	
<u>Sample Site ID: 10-2 (Well)</u>	Site Not Accessible			Site Not Accessible
<u>Sample Date</u>		05/14/91	8/21/91	
<u>Water Level Measurement, ft.</u>		719.4	720.0	
<u>Sample Site ID: 6-1 (Well)</u>	Site Not Accessible			Site Not Accessible
<u>Sample Date</u>		05/14/91	8/21/91	
<u>Water Level Measurement, ft.</u>		420.4	425.3	
<u>Sample Site ID: 32-1 (Well)</u>				
<u>Sample Date</u>	02/20/91	05/15/91	8/21/91	11/25/91
<u>Water Level Measurement, ft.</u>	311.3	310.3	311.4	312.0

Hydromon/

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1991

Sample Site ID: NPDES 003 (MW-2 Mine Water Discharge)

Scheduled Sample Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sample Date	01/16/91	02/20/91	03/19/91	04/15/91	05/13/91	06/11/91	7/2 7/9	8/6 8/14	9/11 9/17	10/1 10/3	11/5 11/13	12/3 12/4

Field Measurements

Flow, gpm	670	700	720	612	585	197	449 175	298 282	522 276	649 484	627 661	481 577
pH, units	8.33	8.90	8.81	8.45	8.05	8.15	8.02 7.40	8.50 8.08	8.32 8.45	8.50 8.41	7.97 8.05	7.93 7.87
Conductivity, us/cm	1790	2100	1952	1830	1850	1780	1913 1569	1813 1820	1780 1695	1710 1661	1747 1917	1736 1804
Temperature, Water °F	63.9	64.4	63.4	62.1	65.3	64.4	64 63	63.2 64	64 63.1	64.8 64.9	63.5 62.8	63.3 63.7
Temperature, Air °F	33	42	45	55	63	82	77 72	79 58	65 46	75 78	51 48	620 620

Laboratory Analyses, mg/L

Total Dissolved Solids	1014	1172	1120	1038	1092	1158	1108 918	1106 1048	1042 1054	1064 1016	1100 1080	1012 1048
Total Suspended Solids	8	38	12	46	4.0	32	32 10	20 8	10 12	-2 -2	14 10	4 2
Total Settleable Solids/hr	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-.2 -.2	-.2 -.2	-.2 -.2	-.2 -.2	-.2 -.2	-.2 -.2
Iron, Dissolved (Fe)	0.02	0.07	-0.02	0.05	-0.02	-0.02	.06 .09	.10 -.02	-.02 -.02	-.02 -.02	-.02 -.02	-.02 .06
Iron, Total (Fe)	0.12	0.39	0.22	0.34	0.11	0.09	.62 .28	.14 .09	.11 .27	.06 .07	.15 -.02	.08 .13
Manganese (Mn)	-0.01	0.02	0.02	0.04	0.01	-0.01	.02 .02	-.01 -.01	.02 .02	.10 .03	.02 .02	.03 .02
Oil Grease	-1.0	-1.0	2.0	1.0	1.0	-1.0	4.0 1.0	-1.0 1.0	2.0 7.0	3.0 1.0	4.0 -1.0	1.0 -1.0
Nitrate, Dissolved	0.02	-0.02	-0.02	-0.02	0.52	0.10	.30 .01	.19 .10	.57 .10	.33 .11	.08 .26	.06 .20
Nitrite, Dissolved	0.04	0.03	-0.01	0.02	0.49	0.53	.14 -.02	.07 .07	.43 .04	.09 .01	.14 -.01	.02 .08

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

Hydmonit/

Soldier Creek Coal Company
 Hydrologic Monitoring Program
 Summarized Results for 1991

Sample Site ID: NPDES 002 (Mine Facilities Sediment Pond)

Scheduled Sample Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sample Date	No Discharge											

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

Nitrate, Dissolved

Nitrite, Dissolved

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

Hydmonit/

Soldier Creek Coal Company
Hydrologic Monitoring Program
Summarized Results for 1991

Sample Site ID: NPDES 001 (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	03/23/91	04/22/91	05/13/91	No Discharge	No Discharge	8/21/91	9/10/91	10/3/91	No Discharge	12/13/91

Field Measurements

Flow, gpm			200	200	200			200	200	200		200
pH, units			8.68	8.43	8.47			8.48	8.50	8.54		8.22
Conductivity, us/cm			1846	1890	1930			1767	1780	1739		1535
Temperature, Water °F			62.8	64.1	55.6			63	64	64.8		61
Temperature, Air °F			40	48	63			75	65	78		28

Laboratory Analyses, mg/L

Total Dissolved Solids			1026	1130	1120			1066	1090	1074		928
Total Suspended Solids			6	6	2			38	12	4.0		16
Total Settleable Solids/hr			-0.2	-0.2	-0.2			-.2	-.2	-.2		-.4
Iron, Dissolved (Fe)			-0.2	.10	-0.02			-.02	-.02	-.02		.08
Iron, Total (Fe)			0.25	.50	.31			.32	.11	.23		.72
Manganese (Mn)			0.01	0.01	0.02			.02	.02	.01		.05
Oil & Grease			1.0	-1.0	1.0			1.0	2.0	3.0		3.0
Nitrate, Dissolved			0.03	-0.02	0.11			.24	2.19	.17		.04
Nitrite, Dissolved			0.02	0.02	0.05			.90	.90	.07		.10

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

Hydmonit/

Soldier Creek Coal Company
 Hydrologic Monitoring Program
 Summarized Results for 1991

Sample Site ID: NPDES 004 (MW-3 Mine Water Discharge)

Scheduled Sample Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sample Date	No Discharge											

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

Nitrate, Dissolved

Nitrite, Dissolved

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

Hydmonit/

SUBSIDENCE MONITORING DATA

1991 SUBSIDENCE MONITORING SUMMARY

ORIGINAL ESTABLISHED CONTROL

1991 SURVEY CONTROL

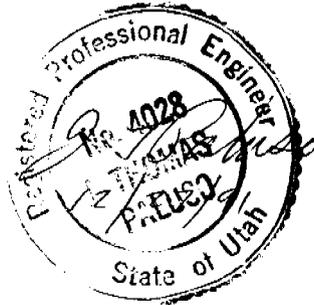
<u>Station</u>	<u>Date</u>	<u>Coordinates</u>			<u>Date</u>	<u>Elevation</u>	<u>Change In</u>
	<u>Established</u>	<u>North</u>	<u>East</u>	<u>Elevation</u>	<u>Resurveyed</u>		<u>Elevation</u>
15 SS	1979	499,046.40	2,250,498.62	6,877.08	12-18-91	6877.06	-0.02
36 SS	1979	504,721.47	2,251,483.38	6,999.88	12-18-91	6999.79	-0.09
106 SS	1979	502,400.01	2,251,238.02	6,864.11	12-18-91	6863.99	-0.12
3044	1983	503,050.26	2,251,423.30	6,930.90	12-18-91	6931.18	+0.28
87-0 SS	1987	500,243.55	2,250,582.43	6,776.05	12-18-91	6676.04	-0.01
87-1 SS	1987	501,367.65	2,251,073.81	6,873.89	12-18-91	6873.89	+0.00
1001	10/14/89	506,470.79	2,252,015.42	7,007.86	06-26-91	7007.50	-0.36
91-1 SS	12/17/91	504,629.65	2,243,590.99	7,841.00			
53 SS	12/17/91*	505,450.34	2,243,510.125	8,142.59			

*Re-surveyed from new control for Subsidence Monitoring.

IMPOUNDMENT CERTIFICATION

INSPECTION CERTIFICATION

I hereby certify that I am experienced in the construction of impoundments; I am qualified and authorized in the state of Utah to inspect and certify the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been constructed and maintained in accordance with the approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.





SOLDIER CREEK COAL CO.

Telephone (801) 637-6360

P.O. Box 1
Price, Utah 84501

QUARTERLY POND INSPECTION

Pond Being Inspected: Sewage Lagoon

Date of Inspection: December 17, 1991

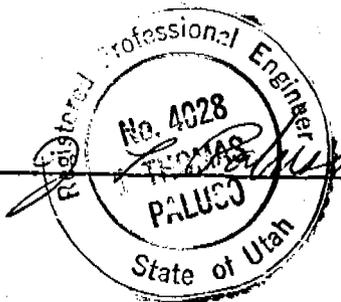
Person(s) Making Inspection: J.T. Paluso

Any Structural Weakness, Erosion and Other Hazardous Conditions Noted: There is no evidence of instability, structural weakness, or other hazardous conditions. Monitoring and instrumentation for stability is not presently required. Water elevation is approximately two feet below maximum. This is normal for this time of year.

Any Routine Maintenance Required: Northwest interior diversion ditch could be cleaned out to increase its carrying capacity.

Comments: _____

APPROVAL: _____



DATE: December 26, 1991



SOLDIER CREEK COAL CO.

Telephone (801) 637-6360

P.O. Box I
Price, Utah 84501

QUARTERLY POND INSPECTION

Pond Being Inspected: Mine Sedimentation Pond

Date of Inspection: December 17, 1991

Person(s) Making Inspection: J.T. Paluso

Any Structural Weakness, Erosion and Other Hazardous Conditions Noted: There is no evidence of instability, structural weakness, or other hazardous conditions. Monitoring and instrumentation for stability is not presently required. There is approximately one foot of impounded water.

Any Routine Maintenance Required: The sediment is still below the clean out level but is nearing maximum capacity.

Comments: The installation of the new decant facilities look good.

APPROVAL:



DATE: December 26, 1991

TOXICITY RESULTS



COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 1918 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 • (708) 963-8300

SINCE 1908

Member of the SGS Group (Société Générale de Surveillance)

PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84620
TELEPHONE: (801) 653-2311
FAX: (801) 653-2479

August 28, 1991

Soldier Creek Coal Co.
P.O. Box I
Price UT 84501

Sample identification by
Soldier Creek Coal Co.

Kind of sample Coal
reported to us

Sample taken at Banning Rail Site

Quarterly Composite
April, May, & June 1991
130,692.7 Tons

Sample taken by CT&E

Date sampled -----

Date received July 9, 1991

Analysis report no. 59-133892

SOIL ANALYSIS

pH	7.5 units
Conductivity	0.6 mmhos/cm
Saturation %	25.8

Sodium Adsorption Ratio	2.09
-------------------------	------

Nitrate-nitrogen	0.38%
Non-Sulfate Sulfur	0.45%
Total Organic Sulfur	0.39%
Calcium carbonate	2.06%

ACID BASE POTENTIAL

Neutralization potential	36.9 tons CaCO ₃ / 1000 tons
Maximum Acid Potential	14.1 tons CaCO ₃ / 1000 tons
Net Acid Base Potential	22.8 tons CaCO ₃ / 1000 tons

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

W U
Manager, Huntington Laboratory



COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 • (708) 953-9300

SINCE 1908

Member of the SGS Group (Société Générale de Surveillance)

PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TELEPHONE: (801) 653-2311
FAX: (801) 653-2470

August 28, 1991

Soldier Creek Coal Co.
P.O. Box I
Price UT 84501

Sample identification by
Soldier Creek Coal Co.

Kind of sample Coal
reported to us

Sample taken at Banning Rail Site

Quarterly Composite
April, May, & June 1991
130,692.7 Tons

Sample taken by CT&E

Date sampled -----

Date received July 9, 1991

Analysis report no. 59-133892

TRACE ELEMENTS, WATER EXTRACTABLE

Arsenic, As	<2 ppb	Lead, Pb	<50 ppb
Barium, Ba	<30 ppb	Mercury, Hg	<2 ppb
Boron, B	16.4 ppb	Molybdenum, Mo	<50 ppb
Cadmium, Cd	<5 ppb	Selenium, Se	<2 ppb
Copper, Cu	<10 ppb	Zinc, Zn	<10 ppb

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

U U
Manager, Huntington Laboratory