0004

SOLDIER CREEK COAL CO.

Telephone (801) 637-6360

P.O. Box I
Price, Utah 84501

October 21, 1987

Mr. D. Wayne Hedberg
Division of Oil, Gas and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, UT 84180-1203

Re: Water Monitoring Results
Third Quarter - 1987
Soldier Canyon Mine
ACT/007/018

Dear Mr. Hedberg:

I ~~have enclosed~~ the results of our water monitoring program for the third quarter of 1987.

If you have any questions or comments, please feel free to contact me.

Sincerely,

SOLDIER CREEK COAL COMPANY

David G. Spillman
Mine Engineer

DGS:kr
Enclosures

RECEIVED
OCT 23 1987
DIVISION OF
OIL, GAS & MINING

PERMITTEE NAME/ADDRESS (*Include Facility Name/Location if different*)

NAME: Soldier Creek Coal Company
ADDRESS: P.O. Box I
Price, UT 84501

FACILITY: Soldier Canyon Mine
LOCATION: Discharge Pipe (MW-2)

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (*NPDES*)
DISCHARGE MONITORING REPORT (*DMR*)

Form Approved.
OMB No. 2040-0004
Approval expires 9-30-85

(2-16) PERMIT NUMBER: UT-0023680

(17-19) DISCHARGE NUMBER: 003

MONITORING PERIOD

FROM YEAR (20-21)	MO (22-23)	DAY (24-25)	TO YEAR (26-27)	MO (28-29)	DAY (30-31)
87	07	01	87	09	30

NOTE: Read instructions before completing this form.

PARAMETER (32-37)		(3 Card Only) QUANTITY OR LOADING (46-53) AVERAGE	(54-61) MAXIMUM	UNITS	(4 Card Only) QUALITY OR CONCENTRATION (38-45) MINIMUM	(46-53) AVERAGE	(54-61) MAXIMUM	UNITS	NO. EX (62-63)	FREQUENCY OF ANALYSIS (64-68)	SAMPLE TYPE (69-70)
Flow	SAMPLE MEASUREMENT	0.160	0.186	MGD	*	*	*	MGD	0	1/30	Meter
	PERMIT REQUIREMENT	*	*		*	*	*			1/30	Meter
Solids; Total Suspended	SAMPLE MEASUREMENT				8	10	14	MG/L	0	1/30	GR
	PERMIT REQUIREMENT				*	25	70			1/30	GR
Solids; Total Dissolved	SAMPLE MEASUREMENT				720	823	954	MG/L	0	1/30	GR
	PERMIT REQUIREMENT				*	*	1,500			1/30	GR
pH	SAMPLE MEASUREMENT				8.47	8.73	8.87	SU	0	1/30	GR
	PERMIT REQUIREMENT				6.5	*	9.0			1/30	GR
Oil & Grease	SAMPLE MEASUREMENT				1	1	1	MG/L	0	1/30	GR
	PERMIT REQUIREMENT				*	*	10			1/30	GR
Iron; Total	SAMPLE MEASUREMENT				0.22	0.54	0.84	MG/L	0	1/30	GR
	PERMIT REQUIREMENT				*	*	2.0			1/30	GR
	SAMPLE MEASUREMENT										
	PERMIT REQUIREMENT										

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER: David G. Spillman, Mine Engineer (TYPED OR PRINTED)

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN; AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT. SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319. *(Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 years.)*

D. G. Spillman
SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

TELEPHONE: AREA CODE 801, NUMBER 637-6360

DATE: YEAR 87, MO 10, DAY 20

COMMENT AND EXPLANATION OF ANY VIOLATIONS (*Reference all attachments here*)

Note: There was no discharge from point source 001 (MW-1) and 002 (sediment pond).

PERMITTEE NAME/ADDRESS (*Include Facility Name/Location if different*)

NAME Soldier Creek Coal Company

ADDRESS P.O. Box I
Price, UT 84501

FACILITY Banning Siding Loadout

LOCATION Carbon County, UT

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (*NPDES*)
DISCHARGE MONITORING REPORT (*DMR*)

Form Approved.
OMB No. 2040-0004
Approval expires 9-30-85

(2-16) PERMIT NUMBER: UT-0023817

(17-19) DISCHARGE NUMBER: 001

MONITORING PERIOD	YEAR	MO	DAY		YEAR	MO	DAY
FROM	87	07	01	TO	87	09	30
	(20-21)	(22-23)	(24-25)		(26-27)	(28-29)	(30-31)

NOTE: Read instructions before completing this form.

PARAMETER (32-37)		(3 Card Only) (46-53) QUANTITY OR LOADING (54-61) AVERAGE	MAXIMUM	UNITS	(4 Card Only) (38-45) QUALITY OR CONCENTRATION (46-53) MINIMUM	AVERAGE	MAXIMUM	UNITS	NO. EX (62-63)	FREQUENCY OF ANALYSIS (64-68)	SAMPLE TYPE (69-70)
	SAMPLE MEASUREMENT										
	PERMIT REQUIREMENT										
	SAMPLE MEASUREMENT		NO DISCHARGE								
	PERMIT REQUIREMENT										
	SAMPLE MEASUREMENT										
	PERMIT REQUIREMENT										
	SAMPLE MEASUREMENT										
	PERMIT REQUIREMENT										
	SAMPLE MEASUREMENT										
	PERMIT REQUIREMENT										
	SAMPLE MEASUREMENT										
	PERMIT REQUIREMENT										
	SAMPLE MEASUREMENT										
	PERMIT REQUIREMENT										

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER

David G. Spillman
Mine Engineer

TYPED OR PRINTED

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN; AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT. SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319. *(Penalties under these statutes may include fines up to $10,000 and/or maximum imprisonment of between 6 months and 5 years.)*

D. G. Spillman

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

TELEPHONE		DATE		
801	637-6360	87	10	20
AREA CODE	NUMBER	YEAR	MO	DAY

COMMENT AND EXPLANATION OF ANY VIOLATIONS (*Reference all attachments here*)

Soldier Ceek 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 Ceek 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 Ceek 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 Ceek 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 Ceek 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 Ceek 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 Ceek 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 Ceek 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 Ceek 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 Ceek 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 Ceek 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 Ceek 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: same as next page (UG-3N8E)

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

Soldier Ceek 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: same analysis as UG-2N

only 1 sample

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

Soldier Ceek 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 Ceek 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	12/02/87
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	8.60
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	0.17
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	0.77
Manganese (Mn)	0.01	0.01	-0.01	-0.01	0.01	0.01	-0.01	0.02	0.01	0.03	0.01	0.01
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 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												

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

3rd qtr.

Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:

Sample ID: MW-2
Sample Date Time: 07/28/87 07:30

Lab No.: 87-WI/04231
Date Received: 07/30/87

Parameters

Oil and Grease	-1.	mg/l
Solids, total dissolved	794.	mg/l
Solids, total suspended	8.	mg/l
Solids, settleable	-.1	ml/l/hr
Iron, dissolved	.05	mg/l
Iron, total	.22	mg/l
Manganese, total	-.01	mg/l

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

Ralph V. Poulsen, Laboratory Director

Ralph V. Poulsen

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Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:

Sample ID: MW-2
Sample Date Time: 08/18/87 13:18

Lab No.: 87-WI/05114
Date Received: 08/21/87

Parameters

Oil and Grease	-1.	mg/l
Sulfate	198.	mg/l
Solids, total dissolved	954.	mg/l
Solids, total suspended	14.	mg/l
Solids, settleable	-.1	ml/l/hr
Iron, dissolved	.33	mg/l
Iron, total	.34	mg/l
Manganese, total	.02	mg/l

Remarks: Lab filtering required on "white" & "green" bottles #5114 27
Note: Negative sign "-" denotes that the value is less than "<".

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Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:

Sample ID: G-1
Sample Date Time: 08/17/87 14:30

Lab No.: 87-WI/05115
Date Received: 08/21/87

Parameters

Alkalinity as CaCO3	416.	mg/l
✓Bicarbonate as CaCO3	395.	mg/l
✓Calcium, dissolved	20.	mg/l
✓Carbonate as CaCO3	21.	mg/l
✓Chloride	21.	mg/l
✓Hardness as CaCO3	247.	mg/l
Hydroxide as CaCO3	0.	mg/l
✓Magnesium, dissolved	48.	mg/l
✓Oil and Grease	-1.	mg/l
✓Potassium, dissolved	2.	mg/l
SAR in water	3.50	
✓Sodium, dissolved	125.	mg/l
✓Sulfate	78.	mg/l
✓Cations (sum)	10.49	meq/l
✓Anions (sum)	10.55	meq/l
✓Cation-Anion Balance	-.29	%
✓Solids, total dissolved	528.	mg/l
✓Solids, total suspended	26.	mg/l
✓Solids, settleable	-.1	ml/l/hr
✓Iron, dissolved	-.02	mg/l
✓Manganese, dissolved	-.01	mg/l

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

Ralph V. Poulsen, Laboratory Director

Ralph V. Poulsen/S.H.

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Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:

Sample ID: G-2
Sample Date Time: 08/18/87 10:30

Lab No.: 87-WI/05116
Date Received: 08/21/87

Parameters

Alkalinity as CaCO3	247.	mg/l
Bicarbonate as CaCO3	247.	mg/l
Calcium, dissolved	30.	mg/l
Carbonate as CaCO3	0.	mg/l
Chloride	3.	mg/l
Hardness as CaCO3	196.	mg/l
Hydroxide as CaCO3	0.	mg/l
Magnesium, dissolved	30.	mg/l
Oil and Grease	-1.	mg/l
Potassium, dissolved	1.	mg/l
SAR in water	.53	
Sodium, dissolved	17.	mg/l
Sulfate	8.	mg/l
Cations (sum)	4.73	meq/l
Anions (sum)	5.18	meq/l
Cation-Anion Balance	-4.64	%
Solids, total dissolved	248.	mg/l
Solids, total suspended	14.	mg/l
Solids, settleable	-.1	ml/l/hr
Iron, dissolved	-.02	mg/l
Manganese, dissolved	-.01	mg/l

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

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Ralph V. Poulsen /S.H.

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Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:

Sample ID: G-5
Sample Date Time: 08/18/87 12:45

Lab No.: 87-WI/05117
Date Received: 08/21/87

Parameters

Alkalinity as CaCO3	400.	mg/l
Bicarbonate as CaCO3	379.	mg/l
Calcium, dissolved	16.	mg/l
Carbonate as CaCO3	21.	mg/l
Chloride	68.	mg/l
Hardness as CaCO3	233.	mg/l
Hydroxide as CaCO3	0.	mg/l
Magnesium, dissolved	47.	mg/l
Oil and Grease	-1.	mg/l
Potassium, dissolved	13.	mg/l
SAR in water	4.44	
Sodium, dissolved	154.	mg/l
Sulfate	156.	mg/l
Cations (sum)	11.77	meq/l
Anions (sum)	13.18	meq/l
Cation-Anion Balance	-5.85	%
Solids, total dissolved	872.	mg/l
Solids, total suspended	12.	mg/l
Solids, settleable	-.1	ml/l/hr
Iron, dissolved	.16	mg/l
Manganese, dissolved	-.01	mg/l

Remarks: Cation & Anions Retested To Verify CAB
Note: Negative sign "-" denotes that the value is less than "<".

Ralph V. Poulsen, Laboratory Director

Ralph V. Poulsen/S.H.

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Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:

Sample ID: Spring #4
Sample Date Time: 08/18/87 11:00

Lab No.: 87-WI/05118
Date Received: 08/21/87

Parameters

Alkalinity as CaCO3	232.	mg/l
Bicarbonate as CaCO3	232.	mg/l
Calcium, dissolved	27.	mg/l
Carbonate as CaCO3	0.	mg/l
Chloride	5.	mg/l
Hardness as CaCO3	199.	mg/l
Hydroxide as CaCO3	0.	mg/l
Magnesium, dissolved	32.	mg/l
Potassium, dissolved	1.	mg/l
SAR in water	.78	
Sodium, dissolved	25.	mg/l
Sulfate	23.	mg/l
Cations (sum)	5.10	meq/l
Anions (sum)	5.26	meq/l
Cation-Anion Balance	-1.54	%
Solids, total dissolved	236.	mg/l
Iron, dissolved	-.02	mg/l
Manganese, dissolved	-.01	mg/l

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

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Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:

Sample ID: Spring #5
Sample Date Time: 08/17/87 13:30

Lab No.: 87-WI/05119
Date Received: 08/21/87

Parameters

Alkalinity as CaCO3	295.	mg/l
Bicarbonate as CaCO3	295.	mg/l
Calcium, dissolved	43.	mg/l
Carbonate as CaCO3	0.	mg/l
Chloride	7.	mg/l
Hardness as CaCO3	263.	mg/l
Hydroxide as CaCO3	0.	mg/l
Magnesium, dissolved	38.	mg/l
Potassium, dissolved	1.	mg/l
SAR in water	.54	
Sodium, dissolved	20.	mg/l
Sulfate	52.	mg/l
Cations (sum)	6.17	meq/l
Anions (sum)	7.19	meq/l
Cation-Anion Balance	-7.88	%
Solids, total dissolved	328.	mg/l
Iron, dissolved	-.02	mg/l
Manganese, dissolved	-.01	mg/l

Remarks: Cations & Anions Retested To Verify CAB
Note: Negative sign "-" denotes that the value is less than "<".

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Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:

Sample ID: Spring #8
Sample Date Time: 08/18/87 11:10

Lab No.: 87-WI/05120
Date Received: 08/21/87

Parameters

Alkalinity as CaCO3	233.	mg/l
Bicarbonate as CaCO3	284.	mg/l
Calcium, dissolved	23.	mg/l
Carbonate as CaCO3	11.	mg/l
Chloride	3.	mg/l
Hardness as CaCO3	227.	mg/l
Hydroxide as CaCO3	0.	mg/l
Magnesium, dissolved	40.	mg/l
Potassium, dissolved	1.	mg/l
SAR in water	1.11	
Sodium, dissolved	38.	mg/l
Sulfate	29.	mg/l
Cations (sum)	6.23	meq/l
Anions (sum)	6.59	meq/l
Cation-Anion Balance	-2.81	%
Solids, total dissolved	260.	mg/l
Iron, dissolved	.05	mg/l
Manganese, dissolved	-.01	mg/l

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

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Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:

Sample ID: Spring #10
Sample Date Time: 08/17/87 15:00

Lab No.: 87-WI/05121
Date Received: 08/21/87

Parameters

Alkalinity as CaCO3	480.	mg/l
Bicarbonate as CaCO3	478.	mg/l
Calcium, dissolved	26.	mg/l
Carbonate as CaCO3	11.	mg/l
Chloride	9.	mg/l
Hardness as CaCO3	196.	mg/l
Hydroxide as CaCO3	0.	mg/l
Magnesium, dissolved	32.	mg/l
Potassium, dissolved	3.	mg/l
SAR in water	6.97	
Sodium, dissolved	222.	mg/l
Sulfate	130.	mg/l
Cations (sum)	13.77	meq/l
Anions (sum)	12.78	meq/l
Cation-Anion Balance	3.73	%
Solids, total dissolved	664.	mg/l
Iron, dissolved	-.02	mg/l
Manganese, dissolved	-.01	mg/l

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

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Ralph V. Poulsen /S.H.

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Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:

Sample ID: Spring #15
Sample Date Time: 08/18/87 08:30

Lab No.: 87-WI/05122
Date Received: 08/21/87

Parameters

Alkalinity as CaCO3	342.	mg/l
Bicarbonate as CaCO3	342.	mg/l
Calcium, dissolved	58.	mg/l
Carbonate as CaCO3	0.	mg/l
Chloride	3.	mg/l
Hardness as CaCO3	342.	mg/l
Hydroxide as CaCO3	0.	mg/l
Magnesium, dissolved	48.	mg/l
Potassium, dissolved	3.	mg/l
SAR in water	.38	
Sodium, dissolved	16.	mg/l
Sulfate	33.	mg/l
Cations (sum)	7.62	meq/l
Anions (sum)	7.62	meq/l
Cation-Anion Balance	0.00	%
Solids, total dissolved	354.	mg/l
Iron, dissolved	.03	mg/l
Manganese, dissolved	-.01	mg/l

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

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Ralph V. Poulsen/S.H.

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Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:

Sample ID: Spring #18
Sample Date Time: 08/18/87 09:00

Lab No.: 87-W1/05123
Date Received: 08/21/87

Parameters

Alkalinity as CaCO3	342.	mg/l
Bicarbonate as CaCO3	342.	mg/l
Calcium, dissolved	80.	mg/l
Carbonate as CaCO3	0.	mg/l
Chloride	5.	mg/l
Hardness as CaCO3	343.	mg/l
Hydroxide as CaCO3	0.	mg/l
Magnesium, dissolved	47.	mg/l
Potassium, dissolved	7.	mg/l
SAR in water	.26	
Sodium, dissolved	11.	mg/l
Sulfate	33.	mg/l
Cations (sum)	7.02	meq/l
Anions (sum)	7.80	meq/l
Cation-Anion Balance	-1.03	%
Solids, total dissolved	361.	mg/l
Iron, dissolved	.10	mg/l
Manganese, dissolved	-.01	mg/l

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

Ralph V. Poulsen, Laboratory Director
Ralph V. Poulsen/S.H.

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Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:

Sample ID: Spring #21
Sample Date Time: 08/18/87 AM

Lab No.: 87-WI/05124
Date Received: 08/21/87

Parameters

Alkalinity as CaCO3	263.	mg/l
Bicarbonate as CaCO3	263.	mg/l
Calcium, dissolved	32.	mg/l
Carbonate as CaCO3	0.	mg/l
Chloride	2.	mg/l
Hardness as CaCO3	224.	mg/l
Hydroxide as CaCO3	0.	mg/l
Magnesium, dissolved	35.	mg/l
Potassium, dissolved	-1.	mg/l
SAR in water	.47	
Sodium, dissolved	16.	mg/l
Sulfate	23.	mg/l
Cations (sum)	5.15	meq/l
Anions (sum)	5.80	meq/l
Cation-Anion Balance	-5.94	%
Solids, total dissolved	260.	mg/l
Iron, dissolved	-.02	mg/l
Manganese, dissolved	-.01	mg/l

Remarks: Cations & Anions Retested To Verify CAB
Note: Negative sign "-" denotes that the value is less than "<".

Ralph V. Poulsen, Laboratory Director

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Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:

Sample ID: UG-2N
Sample Date Time: 08/19/87 08:13

Lab No.: 87-WI/05125
Date Received: 08/21/87

Parameters

Alkalinity as CaCO3	685.	mg/l
Bicarbonate as CaCO3	674.	mg/l
Calcium, dissolved	24.	mg/l
Carbonate as CaCO3	11.	mg/l
Chloride	32.	mg/l
Hardness as CaCO3	273.	mg/l
Hydroxide as CaCO3	0.	mg/l
Magnesium, dissolved	52.	mg/l
Potassium, dissolved	20.	mg/l
SAR in water	5.86	
Sodium, dissolved	220.	mg/l
Sulfate	101.	mg/l
Cations (sum)	15.86	meq/l
Anions (sum)	16.72	meq/l
Cation-Anion Balance	-3.27	%
Solids, total dissolved	850.	mg/l
Iron, dissolved	.04	mg/l
Manganese, dissolved	.04	mg/l

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

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Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:

Sample ID: UG-8E
Sample Date Time: 08/13/87 08:51

Lab No.: 87-WI/05126
Date Received: 08/21/87

Parameters

Alkalinity as CaCO3	433.	mg/l
Bicarbonate as CaCO3	432.	mg/l
Calcium, dissolved	34.	mg/l
Carbonate as CaCO3	21.	mg/l
Chloride	78.	mg/l
Hardness as CaCO3	245.	mg/l
Hydroxide as CaCO3	0.	mg/l
Magnesium, dissolved	45.	mg/l
Potassium, dissolved	14.	mg/l
SAR in water	5.54	
Sodium, dissolved	187.	mg/l
Sulfate	74.	mg/l
Cations (sum)	13.92	meq/l
Anions (sum)	12.80	meq/l
Cation-Anion Balance	4.18	%
Solids, total dissolved	648.	mg/l
Iron, dissolved	.02	mg/l
Manganese, dissolved	-.01	mg/l

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

Ralph V. Poulsen, Laboratory Director

Ralph V. Poulsen/S.H.

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Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:

Sample ID: UG Shaft
Sample Date Time: 08/19/87 09:22

Lab No.: 87-WI/05127
Date Received: 08/21/87

Parameters

Alkalinity as CaCO3	437.	mg/l
Bicarbonate as CaCO3	437.	mg/l
Calcium, dissolved	82.	mg/l
Carbonate as CaCO3	0.	mg/l
Chloride	17.	mg/l
Hardness as CaCO3	611.	mg/l
Hydroxide as CaCO3	0.	mg/l
Magnesium, dissolved	99.	mg/l
Potassium, dissolved	11.	mg/l
SAR in water	1.58	
Sodium, dissolved	89.	mg/l
Sulfate	266.	mg/l
Cations (sum)	16.42	meq/l
Anions (sum)	15.43	meq/l
Cation-Anion Balance	3.11	%
Solids, total dissolved	870.	mg/l
Iron, dissolved	.02	mg/l
Manganese, dissolved	.03	mg/l

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

Ralph V. Poulsen, Laboratory Director

Ralph V. Poulsen/S.H.

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Client : Soldier Creek Coal Company
Address : P.O. Box 1
Price, Utah 84501
Attn. : Mr. Dave Spillman
P.O. No.:

Sample ID: MW-2
Sample Date Time: 09/15/87 08:30

Lab No.: 87-WI/05838
Date Received: 09/17/87

Parameters

Oil and Grease	-1.	mg/l
Solids, total dissolved	720.	mg/l
Solids, total suspended	8.	mg/l
Solids, settleable	-.1	ml/l/hr
Iron, dissolved	.11	mg/l
Iron, total	.57	mg/l
Manganese, total	.01	mg/l

Remarks:

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

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Ralph V. Poulsen/SH.

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