1930496 - R8 SEMS

SW-10 85-96

twin city testing corporation

Business Phone 605-341-7284
Hours 8:00 — 5:00 — M-F

COAL — ORES — ENVIRONMENTAL WATERS — FEEDS — SOILS

1854 Lombardy Dr
Rapid City, South Dakota 57701

Job # 6110-89-13

JAMES H. TRAVIS
Laboratory Manager

REPORT DATE: 10/5/89

COMPANY: Brohm Mining Co. Scott Wanstedt

ADDRESS: PO Box 485

CITY-STATE: Deadwood, S.D. 57732

SAMPLE #: SW 10

SAMPLE DATE-TIME: 8/30/89

DATE RECEIVED: 8/31/89

LABORATORY #: 4822

	PARAMETER -- Minerals	RESULT
	Alkalinity (CaCO3), mg/l	144
	Bicarbonate (HCO3), mg/l	176
	Carbonate (CO3), mg/l	0
	Chloride (C1), mg/l	
	Fluoride (F), mg/l	
	Sulfate (SO4), mg/l	11
	Calcium (Ca), mg/l	
	Magnesium (Mg), mg/l	
	Potassium (K), mg/l	
	Sodium (Na), mg/l	4
	Major Anions, MEQ/L	
	Major Cations, MEQ/L	
	Cation - Anion Balance, %	
	PARAMETER -- MISCELLANEOUS	
	pH, Units	7.99
	Conductivity, umhos/cm	247
	Cyanide, Total, mg/l	
	Cyanide, WAD, mg/l	
	Cyanide, Free, mg/l	
	Hardness (CaCO3), GPG: mg/l	
	Oil & Grease, mg/l	
	Solids, Dissolved, mg/l	170
	Solids, Suspended, mg/l	7
	Turbidity, NTU	
	REVIEWED BY J. Kl...	

	METALS: Tot X Tot Rec ___ Diss ___ EP Tox ___	
	Antimony (Sb), mg/l	
	Aluminum (A1), mg/l	
	Arsenic (As), mg/l	<0.005
	Barium (Ba), mg/l	
	Beryllium (Be), mg/l	
	Boron (B), mg/l	
	Cadmium (Cd), mg/l	<0.0005
	Chromium (Cr), mg/l	
	Cobalt (Co), mg/l	
	Copper (Cu), mg/l	<0.005
	Gold (Au), mg/l	
	Iron (Fe), mg/l	
	Lead (Pb), mg/l	
	Lithium (Li), mg/l	
	Manganese (Mn), mg/l	
	Mercury (Hg), mg/l	
	Molybdenum (Mo), mg/l	
	Nickel (Ni), mg/l	
	Selenium (Se), mg/l	<0.002
	Silicon (Si), mg/l	
	Silver (Ag), mg/l	
	Strontium (Sr), mg/l	
	Vanadium (V), mg/l	
	Zinc (Zn), mg/l	0.03
	PARAMETER --Nutrients	
	Nitrogen, Ammonia, mg/l	
	Nitrogen, Nitrate, mg/l	<0.10
	Nitrogen, Nitrite, mg/l	
	Nitrogen, Total Kjeldahl, mg/l	
	Phosphorus, Ortho, mg/l	
	Phosphorus, Total, mg/l	

RECEIVED
OCT 11 1989
BROHM MINING CO.

twin city testing corporation

Business Phone 605-341-7284
Hours 8:00 — 5:00 — M-F

COAL — ORES — ENVIRONMENTAL WATERS — FEEDS — SOILS

1854 Lombardy Dr.
Rapid City, South Dakota 57701

Job # 6110-89-13

JAMES H. TRAVIS
Laboratory Manager

REPORT DATE: 10/5/89

COMPANY: Brohm Mining Co. Scott Wanstedt

ADDRESS: PO Box 485

CITY-STATE: Deadwood, S.D. 57732

SAMPLE #: SW 10

SAMPLE DATE-TIME: 8/30/89

DATE RECEIVED: 9/1/89

LABORATORY #: 4858

	PARAMETER -- Minerals	RESULT
	Alkalinity (CaCO3), mg/l	
	Bicarbonate (HCO3), mg/l	
	Carbonate (CO3), mg/l	
	Chloride (C1), mg/l	
	Fluoride (F), mg/l	
	Sulfate (SO4), mg/l	
	Calcium (Ca), mg/l	
	Magnesium (Mg), mg/l	
	Potassium (K), mg/l	
	Sodium (Na), mg/l	3
	Major Anions, MEQ/L	
	Major Cations, MEQ/L	
	Cation - Anion Balance, %	
	PARAMETER -- MISCELLANEOUS	
	pH, Units	
	Conductivity, umhos/cm	
	Cyanide, Total, mg/l	
	Cyanide, WAD, mg/l	
	Cyanide, Free, mg/l	
	Hardness (CaCO3), GPG: mg/l	
	Oil & Grease, mg/l	
	Solids, Dissolved, mg/l	
	Solids, Suspended, mg/l	
	Turbidity, NTU	
	REVIEWED BY	

METALS:
Tot ____ Tot Rec ____ Diss X EP Tox ____

	Antimony (Sb), mg/l	
	Aluminum (A1), mg/l	
	Arsenic (As), mg/l	<0.005
	Barium (Ba), mg/l	
	Beryllium (Be), mg/l	
	Boron (B), mg/l	
	Cadmium (Cd), mg/l	<0.0005
	Chromium (Cr), mg/l	
	Cobalt (Co), mg/l	
	Copper (Cu), mg/l	<0.005
	Gold (Au), mg/l	
	Iron (Fe), mg/l	
	Lead (Pb), mg/l	
	Lithium (Li), mg/l	
	Manganese (Mn), mg/l	
	Mercury (Hg), mg/l	
	Molybdenum (Mo), mg/l	
	Nickel (Ni), mg/l	
	Selenium (Se), mg/l	<0.002
	Silicon (Si), mg/l	
	Silver (Ag), mg/l	
	Strontium (Sr), mg/l	
	Vanadium (V), mg/l	
	Zinc (Zn), mg/l	<0.005
	PARAMETER --Nutrients	
	Nitrogen, Ammonia, mg/l	
	Nitrogen, Nitrate, mg/l	
	Nitrogen, Nitrite, mg/l	
	Nitrogen, Total Kjeldahl, mg/l	
	Phosphorus, Ortho, mg/l	
	Phosphorus, Total, mg/l	

RECEIVED
OCT 11 1989
BROHM MINING CO.

SURFACE WATER SAMPLING FORM

FIELD MEASUREMENTS

Date 01/23/89

Time 16:20

Sampler SW
(Initials)

Sampling Station Number..... SW-10

Temperature (degrees C)..... .2

pH..... 7.85

Conductivity (umhos/cm) 273..... -44 mV .273 mS/cm

Flow (gpm).....

Water Sample (Yes/No).....

Filtered Metals (Yes/No).....

Number/Type Bottles..... 4

Comments.....

staff gauge @ .49

SURFACE WATER STREAM GAUGING - FIELD FORM

Date: 4/19/89

Sampler: SW

Station No.: SW-10

Gauge Height: .51

Meter Used: floating chip

Stream Width: .90

Total Flow: 82 gpm .183 ft³/sec

	Interval	Midpoint	Width	Depth	Area (sft)	Velocity (fps)	Qcfs
upstream	A 1		.85	.10	.11		
	2			.13			
	3			.15			
	4			.15			
	5			.13			
	B 1		.85	.13	.13		
	2			.15			
	3			.15			
	4			.14			
	5			.10			
	C 1		.95	.09	.12		
	2			.11			
	3			.15			
	4			.15			
	5			.13			
down-stream	D 1		.95	.08	.13		
	2			.14			
	3			.14			
	4			.15			
	5			.16			
					mean .1225 ft²		
						TOTAL	.183 ft³/sec

82 gpm

Comments: too shallow for pygmy meter

sec 1.26 1.41 1.46
1.32 1.47 1.51
1.49 1.28
1.41 1.31

mean 1.39 sec

length = 2.60 ft

2.60 ft / (1.39 sec) × .1225 ft² × .8 = .1833 ft³/sec

Boomer Gulch

SURFACE WATER SAMPLING FORM

FIELD MEASUREMENTS

Date 4 / 19 /89

Time 10:50

Sampler SW
(Initials)

Sampling Station Number..... SW-10

Temperature (degrees C)..... 3.4

pH..... 7.95

Conductivity (umhos/cm)..... 229

Flow (gpm)..see data sheet..... 82gpm .183 cfs

Water Sample (Yes/No)..... Yes

Filtered Metals (Yes/No)..... Yes

Number/Type Bottles..... 4 short bottles (CN)

Comments.....

staff gauge @ .51

SURFACE WATER SAMPLING FORM

FIELD MEASUREMENTS

Date 5 / 31 /8 9

Time 10:50

Sampler SW
(Initials)

Sampling Station Number..... SW-10

Temperature (degrees C)..... 9.3

pH..... 8.02

Conductivity (umhos/cm)..... 231

Flow (gpm).....

Water Sample (Yes/No).....

Filtered Metals (Yes/No).....

Number/Type Bottles.....

Comments.....

Boomer Gulch

SURFACE WATER STREAM GAUGING - FIELD FORM

Date: 6/1/89

Sampler: SW

Station No.: SW-10

Gauge Height: .52

Meter Used: floating chip

Stream Width:

Total Flow: 113 gpm

Interval	Midpoint	Width	Depth	Area (sft)	Velocity (fps)	Qcfs
A 1		.95	.13		1.07	
2			.18		1.11	
3			.19		1.09	
4			.15		1.06	
					1.24	
B 1		.86	.19		1.40	
2			.23		1.06	
3			.12		1.06	
4			.15		1.16	
					1.10	
C 1		1.00	.1.9			
2			.2.0			
3			.1.3			
4			.1.3			
		A-C = 2.3'				
		mean seconds = 1.135				
		mean x sec area .155075 ft 2				
		volume .155 x 2.3 = .35667 ft 3				
		.35667 / 1.135 = .314248 ft 3/sec x .8 =				
					TOTAL	.2514

Comments:

112.8 gpm

~~GROUND~~-WATER SAMPLING FORM

Surface

FIELD MEASUREMENTS

Date 8 / 30 / 89

Time 10:00

Sampler MA
(Initials)

Sampling Station Number..... SW-10

Temperature (degrees C)..... 12.3

pH..... 7.00

Conductivity (umhos/cm)..... 285

Depth to Water (ft)..... ~~72.1 gpm~~ 66.2 gpm SW

Water Sample (Yes/No)..... (Yes)

Filtered Metals (Yes/No)..... (No)

Number/Type Bottles..... 4

Comments.....

staff - .45

SURFACE WATER STREAM GAUGING - FIELD FORM

Date: 9-1-89 9:30

Meter Used: chip

Sampler: MA.

Stream Width: 1.17'

Station No.: SW-10

Total Flow: ~~72.1 gpm~~ 66.2 gpm

Gauge Height: ~~.5~~ .44

Interval	Midpoint	Width	Depth	Area (sft)	Velocity (fps)	Qcfs
					speeds	
0 A		1.0	.9, 1.0, 1.7	.12	2.52	
1.5 B		1.1	1.6, 1.8, 1.7	.187	2.35	
3.0 C		1.4	.7, 1.5, .7	.1358	2.61	
					2.21	
				.4428	2.81	
depth A -	.09 .10	.17 $\bar{x}$	.12		1.99	
B -	.16 .18	.17 $\bar{x}$	.17	$\bar{x}$ = .1476	2.31	
C	.07 .15	.07 $\bar{x}$	.097		2.32	
					2.01	
					2.83	
				$\bar{x}$ = 2.40		
				1.25 fps × .8 = 1.0 fps		
				1.0 × .1476 = .1476 cfs		
					TOTAL	.1476

Comments:

~~72.1 gpm~~

66.2

SURFACE WATER SAMPLING FORM

FIELD MEASUREMENTS

Date 8 / 27 / 90

Time 10:15

Sampler mt.
(Initials)

Sampling Station Number..... SW-10

Temperature (degrees C).....

pH..... 7.24

Conductivity (umhos/cm).....

Flow (gpm).....

Water Sample (Yes/No).....

Filtered Metals (Yes/No).....

Number/Type Bottles..... MIN DISS Jt

Comments.....

O-1

30" Length

		Depth	
	A 11"	1.5	1.74
		1.5	3.09
		2.0	2.02
		1.75	2.11
Downstream 15	B 10"	1.8	1.94
		1.8	2.10
		1.8	1.79
		1.6	1.80
30"	C 12"	2.1	1.91
		2.6	2.00
		2.0	1.82
		1.8	2.01
			1.96
			1.91

Staff Gauge
= 4/4

SURFACE WATER SAMPLING FORM

FIELD MEASUREMENTS

Date 8 / 25 / 8 90

Time

Sampler mt
(Initials)

Sampling Station Number..... SW-10

Temperature (degrees C)..... 22

pH..... 7.5

Conductivity (umhos/cm)..... 293

Flow (gpm).....

Water Sample (Yes/No).....

Filtered Metals (Yes/No).....

Number/Type Bottles.....

Comments.....

GROUND-WATER SAMPLING FORM

FIELD MEASUREMENTS

Date 6 / 4 / 90

Time _____

Sampler mt
(Initials)

Sampling Station Number..... SW-10

Temperature (degrees C)..... 23

pH..... 7.2

Conductivity (umhos/cm)..... 238

Depth to Water (ft)..... _____

Water Sample (Yes/No)..... _____

Filtered Metals (Yes/No)..... _____

Number/Type Bottles..... _____

Comments..... _____

SURFACE WATER SAMPLING FORM

FIELD MEASUREMENTS

Date 4 / 16 / 90

Time 13:50

Sampler MA MB MK
(Initials)

Sampling Station Number..... SW-10

Temperature (degrees C).....

pH..... 6.97

Conductivity (umhos/cm)..... 151

Flow (gpm).....

Water Sample (Yes/No).....

Filtered Metals (Yes/No).....

Number/Type Bottles..... CN MIN DISS TOT.

Comments.....

SURFACE WATER STREAM GAUGING - FIELD FORM

Date: 5-9-90

Meter Used: Floating Chip

Sampler: mt.

Stream Width: 5'

Station No.: SW-10

Total Flow: 2.04

Gauge Height: _____

Interval	Midpoint	Width	Depth	Area (sft)	Velocity (fps)	Qcfs
0-1	.5	1	.3	.3	1.2	.36
1-2	1.5	1	.3	.3	1.2	.36
2-3	2.5	1	.4	.4	1.3	.52
3-4	3.5	1	.5	.5	1.6	.8
4-5	4.5	1	.3	.3	0	0

MID-CONTINENT
TESTING LABORATORIES, INC.
HIGH TECHNOLOGY OIL ANALYSIS
AND ENVIRONMENTAL TESTING

2100 S. 7th, Suite 211 • P.O. Box 3388 • Rapid City, SD 57709
(605) 348-0111

SAMPLE NAME: SW-10
SAMPLE DATE: 04/16/90
SAMPLE TIME:

LAB NUMBER: 19900417110
REPORT DATE: 04/19/90

MARTY TALLEY
BROHM MINING CORP.
P.O. BOX 485
DEADWOOD, SD 57732

PHYSICAL PROPERTIES	VALUE
Conductivity, umhos/cm	201.
Hardness	.
PH	7.66
Solids, Dissolved, mg/l	136.
Solids, Suspended, mg/l	7.
Turbidity, NTU	.

INORGANIC & NONMETALLIC	VALUE
Alkalinity	90.0
Bicarbonate	109.8
Carbonate, mg/l	0.
Chloride, mg/l	.50
Cyanide, Total, mg/l	.0019
Cyanide, WAD, mg/l	.0027
Cyanide, Free, mg/l	.
Flouride, mg/l	.
Nitrogen, Ammonia, mg/l	.
Nitrogen, Nitrate, mg/l	<.050
Nitrogen, Nitrite, mg/l	.
Sulfate, mg/l	24.0

METALS mg/l	DISSOLVED	TOTAL
Antimony	.	.
Aluminum	.	.
Arsenic	<.001	<.001
Barium	.	.
Beryllium	.	.
Boron	.	.
Cadmium	<.001	.001
Calcium	26.4	27.7
Chromium	.	.
Cobalt	.	.
Copper	.016	.014
Gold	<.001	<.001
Iron	.	.
Lead	.	.
Lithium	.	.
Manganese	.	.
Magnesium	5.24	5.99
Mercury	.	.
Molybdenum	.	.
Nickel	.	.
Potassium	1.75	1.70
Selenium	<.001	<.001
Silicon	.	.
Silver	.	.
Sodium	4.16	4.12
Strontium	.	.
Vanadium	.	.
Zinc	<.005	.035

Dean Durand
4-19-90

MID-CONTINENT TESTING LABORATORIES, INC.
HIGH TECHNOLOGY OIL ANALYSIS AND ENVIRONMENTAL TESTING

2100 S. 7th, Suite 211 • P.O. Box 3388 • Rapid City, SD 57709
(605) 348-0111

SAMPLE NAME: SW-10
SAMPLE DATE: 04/16/90
SAMPLE TIME:

LAB NUMBER: 19900417110
REPORT DATE: 04/19/90

MARTY TALLEY
BROHM MINING CORP.
P.O. BOX 485
DEADWOOD, SD 57732

PHYSICAL PROPERTIES	VALUE
Conductivity, umhos/cm	201.
Hardness	.
PH	7.66
Solids, Dissolved, mg/l	136.
Solids, Suspended, mg/l	7.
Turbidity, NTU	.

INORGANIC & NONMETALLIC	VALUE
Alkalinity	90.0
Bicarbonate	109.8
Carbonate, mg/l	0.
Chloride, mg/l	.50
Cyanide, Total, mg/l	.0019
Cyanide, WAD, mg/l	.0027
Cyanide, Free, mg/l	.
Flouride, mg/l	.
Nitrogen, Ammonia, mg/l	.
Nitrogen, Nitrate, mg/l	<.050
Nitrogen, Nitrite, mg/l	.
Sulfate, mg/l	24.0

METALS mg/l	DISSOLVED	TOTAL
Antimony	.	.
Aluminum	.	.
Arsenic	<.001	<.001
Barium	.	.
Beryllium	.	.
Boron	.	.
Cadmium	<.001	.001
Calcium	26.4	27.7
Chromium	.	.
Cobalt	.	.
Copper	.016	.014
Gold	<.001	<.001
Iron	.	.
Lead	.	.
Lithium	.	.
Manganese	.	.
Magnesium	5.24	5.99
Mercury	.	.
Molybdenum	.	.
Nickel	.	.
Potassium	1.75	1.70
Selenium	<.001	<.001
Silicon	.	.
Silver	.	.
Sodium	4.16	4.12
Strontium	.	.
Vanadium	.	.
Zinc	<.005	.035

Dean Aurand
4-19-90

MID-CONTINENT
TESTING LABORATORIES, INC.
HIGH TECHNOLOGY OIL ANALYSIS
AND ENVIRONMENTAL TESTING

2100 S. 7th, Suite 211 • P.O. Box 3388 • Rapid City, SD 57709
(605) 348-0111

SAMPLE NAME: SW-10
SAMPLE DATE: 06/04/90
SAMPLE TIME:

LAB NUMBER: 19900605106
REPORT DATE: 06/07/90

MYRON ANDERSEN
BROHM MINING CORP.
P.O. BOX 485
DEADWOOD, SD 57732

PHYSICAL PROPERTIES	VALUE
Conductivity, umhos/cm	225.
Hardness	.
PH	7.83
Solids, Dissolved, mg/l	150.
Solids, Suspended, mg/l	1.0
Turbidity, NTU	.

INORGANIC & NONMETALLIC	VALUE
Alkalinity	108.0
Bicarbonate	131.8
Carbonate, mg/l	0.0
Chloride, mg/l	.
Cyanide, Total, mg/l	.
Cyanide, WAD, mg/l	.
Cyanide, Free, mg/l	.
Flouride, mg/l	.
Nitrogen, Ammonia, mg/l	.
Nitrogen, Nitrate, mg/l	<.050
Nitrogen, Nitrite, mg/l	.
Sulfate, mg/l	11.1

METALS mg/l	DISSOLVED	TOTAL
Antimony	.	.
Aluminum	.	.
Arsenic	<.001	.001
Barium	.	.
Beryllium	.	.
Boron	.	.
Cadmium	<.001	<.001
Calcium	.	.
Chromium	.	.
Cobalt	.	.
Copper	<.001	.016
Gold	.	.
Iron	.	.
Lead	.	.
Lithium	.	.
Manganese	.	.
Magnesium	.	.
Mercury	.	.
Molybdenum	.	.
Nickel	.	.
Potassium	.	.
Selenium	<.001	<.001
Silicon	.	.
Silver	.	.
Sodium	3.82	.
Strontium	.	.
Vanadium	.	.
Zinc	.008	.008

Mary M. Powell 06-07-90

MID-CONTINENT TESTING LABORATORIES, INC.
HIGH TECHNOLOGY OIL ANALYSIS AND ENVIRONMENTAL TESTING

2100 S. 7th, Suite 211 • P.O. Box 3388 • Rapid City, SD 57709
(605) 348-0111

SAMPLE NAME: SW-10
SAMPLE DATE: 06/04/90
SAMPLE TIME:

LAB NUMBER: 19900605106
REPORT DATE: 06/07/90

MYRON ANDERSEN
BROHM MINING CORP.
P.O. BOX 485
DEADWOOD, SD 57732

PHYSICAL PROPERTIES	VALUE
Conductivity, umhos/cm	225.
Hardness	.
PH	7.83
Solids, Dissolved, mg/l	150.
Solids, Suspended, mg/l	1.0
Turbidity, NTU	.

INORGANIC & NONMETALLIC	VALUE
Alkalinity	108.0
Bicarbonate	131.8
Carbonate, mg/l	0.0
Chloride, mg/l	.
Cyanide, Total, mg/l	.
Cyanide, WAD, mg/l	.
Cyanide, Free, mg/l	.
Flouride, mg/l	.
Nitrogen, Ammonia, mg/l	.
Nitrogen, Nitrate, mg/l	<.050
Nitrogen, Nitrite, mg/l	.
Sulfate, mg/l	11.1

METALS mg/l	DISSOLVED	TOTAL
Antimony	.	.
Aluminum	.	.
Arsenic	<.001	.001
Barium	.	.
Beryllium	.	.
Boron	.	.
Cadmium	<.001	<.001
Calcium	.	.
Chromium	.	.
Cobalt	.	.
Copper	<.001	.016
Gold	.	.
Iron	.	.
Lead	.	.
Lithium	.	.
Manganese	.	.
Magnesium	.	.
Mercury	.	.
Molybdenum	.	.
Nickel	.	.
Potassium	.	.
Selenium	<.001	<.001
Silicon	.	.
Silver	.	.
Sodium	3.82	.
Strontium	.	.
Vanadium	.	.
Zinc	.008	.008

Mary M. Powell 06-07-90

MID-CONTINENT
TESTING LABORATORIES, INC.
HIGH TECHNOLOGY OIL ANALYSIS
AND ENVIRONMENTAL TESTING

2100 S. 7th, Suite 211 • P.O. Box 3388 • Rapid City, SD 57709
(605) 348-0111

SAMPLE NAME: SW-10
DESCRITPION:
SAMPLE DATE: 08/29/90
SAMPLE TIME:

ACCOUNT NUMBER: W1000
LAB NUMBER: 19900831104
REPORT DATE: 08/31/90

MYRON ANDERSEN
BROHM MINING CORP.
P.O. BOX 485
DEADWOOD, SD 57732

PHYSICAL PROPERTIES	VALUE
Conductivity, umhos/cm	270.
Hardness	.
PH	7.77
Solids, Dissolved, mg/l	180.
Solids, Suspended, mg/l	2.50
Turbidity, NTU	.

INORGANIC & NONMETALLIC	VALUE
Alkalinity	142.
Bicarbonate	173.
Carbonate, mg/l	0.0
Chloride, mg/l	.
Cyanide, Total, mg/l	.
Cyanide, WAD, mg/l	.
Cyanide, Free, mg/l	.
Flouride, mg/l	.
Nitrogen, Ammonia, mg/l	.
Nitrogen, Nitrate, mg/l	<.050
Nitrogen, Nitrite, mg/l	.
Sulfate, mg/l	<5.00

METALS mg/l	DISSOLVED	TOTAL
Antimony	.	.
Aluminum	.	.
Arsenic	<.001	<.001
Barium	.	.
Beryllium	.	.
Boron	.	.
Cadmium	.001	.004
Calcium	.	.
Chromium	.	.
Cobalt	.	.
Copper	.009	.006
Gold	.	.
Iron	.	.
Lead	.	.
Lithium	.	.
Manganese	.	.
Magnesium	.	.
Mercury	.	.
Molybdenum	.	.
Nickel	.	.
Potassium	.	.
Selenium	<.001	<.001
Silicon	.	.
Silver	.	.
Sodium	3.10	.
Strontium	.	.
Vanadium	.	.
Zinc	.030	.032

08-31-90

MID-CONTINENT TESTING LABORATORIES, INC.
HIGH TECHNOLOGY OIL ANALYSIS AND ENVIRONMENTAL TESTING

2100 S. 7th, Suite 211 • P.O. Box 3388 • Rapid City, SD 57709
(605) 348-0111

SAMPLE NAME: SW-10
DESCRITPION:
SAMPLE DATE: 08/29/90
SAMPLE TIME:

ACCOUNT NUMBER: W1000
LAB NUMBER: 19900831104
REPORT DATE: 08/31/90

MYRON ANDERSEN
BROHM MINING CORP.
P.O. BOX 485
DEADWOOD, SD 57732

PHYSICAL PROPERTIES	VALUE
Conductivity, umhos/cm	270.
Hardness	.
PH	7.77
Solids, Dissolved, mg/l	180.
Solids, Suspended, mg/l	2.50
Turbidity, NTU	.

INORGANIC & NONMETALLIC	VALUE
Alkalinity	142.
Bicarbonate	173.
Carbonate, mg/l	0.0
Chloride, mg/l	.
Cyanide, Total, mg/l	.
Cyanide, WAD, mg/l	.
Cyanide, Free, mg/l	.
Flouride, mg/l	.
Nitrogen, Ammonia, mg/l	.
Nitrogen, Nitrate, mg/l	<.050
Nitrogen, Nitrite, mg/l	.
Sulfate, mg/l	<5.00

METALS mg/l	DISSOLVED	TOTAL
Antimony	.	.
Aluminum	.	.
Arsenic	<.001	<.001
Barium	.	.
Beryllium	.	.
Boron	.	.
Cadmium	.001	.004
Calcium	.	.
Chromium	.	.
Cobalt	.	.
Copper	.009	.006
Gold	.	.
Iron	.	.
Lead	.	.
Lithium	.	.
Manganese	.	.
Magnesium	.	.
Mercury	.	.
Molybdenum	.	.
Nickel	.	.
Potassium	.	.
Selenium	<.001	<.001
Silicon	.	.
Silver	.	.
Sodium	3.10	.
Strontium	.	.
Vanadium	.	.
Zinc	.030	.032

08-31-90

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BROHM MINING CO.

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HIGH TECHNOLOGY OIL ANALYSIS
AND ENVIRONMENTAL TESTING

2100 S. 7th, Suite 211 • P.O. Box 3388 • Rapid City, SD 57709
(605) 348-0111

SAMPLE NAME: SW-10
DESCRITPION:
SAMPLE DATE: 01/17/91
SAMPLE TIME:
SAMPLED BY:

MYRON ANDERSEN
BROHM MINING CORP.
P.O. BOX 485
DEADWOOD, SD 57732

ACCOUNT NUMBER: W1000
LAB NUMBER: 19910118301
DATE RECEIVED: 01/18/91
TIME RECEIVED: 01:45 PM
REPORT DATE: 01/21/91

PHYSICAL PROPERTIES	VALUE
Conductivity, umhos/cm	315.
Hardness	.
PH	7.49
Solids, Dissolved, mg/l	213.
Solids, Suspended, mg/l	2.5
Turbidity, NTU	.

INORGANIC & NONMETALLIC	VALUE
Alkalinity	94.0
Bicarbonate	115.
Carbonate, mg/l	0.0
Chloride, mg/l	.
Cyanide, Total, mg/l	.
Cyanide, WAD, mg/l	.
Cyanide, Free, mg/l	.
Flouride, mg/l	.
Nitrogen, Ammonia, mg/l	.
Nitrogen, Nitrate, mg/l	<.050
Nitrogen, Nitrite, mg/l	.
Sulfate, mg/l	16.7

METALS mg/l	DISSOLVED	TOTAL
Aluminum	.	.
Antimony	.	.
Arsenic	<.001	<.001
Barium	.	.
Beryllium	.	.
Boron	.	.
Cadmium	.001	.002
Calcium	.	.
Chromium	.	.
Cobalt	.	.
Copper	.002	.005
Gold	.	.
Iron	.	.
Lead	.	.
Lithium	.	.
Magnesium	.	.
Manganese	.	.
Mercury	.	.
Molybdenum	.	.
Nickel	.	.
Potassium	.	.
Selenium	<.001	<.001
Silicon	.	.
Silver	.	.
Sodium	3.89	.
Strontium	.	.
Vanadium	.	.
Zinc	.040	.039

APPROVED BY: Greg M. Pagel

DATE: 01-21-91

MID-CONTINENT TESTING LABORATORIES, INC.
HIGH TECHNOLOGY OIL ANALYSIS AND ENVIRONMENTAL TESTING

2100 S. 7th, Suite 211 • P.O. Box 3388 • Rapid City, SD 57709
(605) 348-0111

SAMPLE NAME: SW-10
DESCRITPION:
SAMPLE DATE: 01/17/91
SAMPLE TIME:
SAMPLED BY:

MYRON ANDERSEN
BROHM MINING CORP.
P.O. BOX 485
DEADWOOD, SD 57732

ACCOUNT NUMBER: W1000
LAB NUMBER: 19910118301
DATE RECEIVED: 01/18/91
TIME RECEIVED: 01:45 PM
REPORT DATE: 01/21/91

PHYSICAL PROPERTIES	VALUE
Conductivity, umhos/cm	315.
Hardness	.
PH	7.49
Solids, Dissolved, mg/l	213.
Solids, Suspended, mg/l	2.5
Turbidity, NTU	.

INORGANIC & NONMETALLIC	VALUE
Alkalinity	94.0
Bicarbonate	115.
Carbonate, mg/l	0.0
Chloride, mg/l	.
Cyanide, Total, mg/l	.
Cyanide, WAD, mg/l	.
Cyanide, Free, mg/l	.
Flouride, mg/l	.
Nitrogen, Ammonia, mg/l	.
Nitrogen, Nitrate, mg/l	<.050
Nitrogen, Nitrite, mg/l	.
Sulfate, mg/l	16.7

METALS mg/l	DISSOLVED	TOTAL
Aluminum	.	.
Antimony	.	.
Arsenic	<.001	<.001
Barium	.	.
Beryllium	.	.
Boron	.	.
Cadmium	.001	.002
Calcium	.	.
Chromium	.	.
Cobalt	.	.
Copper	.002	.005
Gold	.	.
Iron	.	.
Lead	.	.
Lithium	.	.
Magnesium	.	.
Manganese	.	.
Mercury	.	.
Molybdenum	.	.
Nickel	.	.
Potassium	.	.
Selenium	<.001	<.001
Silicon	.	.
Silver	.	.
Sodium	3.89	.
Strontium	.	.
Vanadium	.	.
Zinc	.040	.039

APPROVED BY: [signature]

DATE: 01-21-91

MID-CONTINENT
TESTING LABORATORIES, INC.
HIGH TECHNOLOGY OIL ANALYSIS
AND ENVIRONMENTAL TESTING

2100 S. 7th, Suite 211 • P.O. Box 3388 • Rapid City, SD 57709
(605) 348-0111

SAMPLE NAME: SW-10
DESCRITPION:
SAMPLE DATE: 04/23/91
SAMPLE TIME:
SAMPLED BY:

MYRON ANDERSEN
BROHM MINING CORP.
P.O. BOX 485
DEADWOOD, SD 57732

ACCOUNT NUMBER: W1000
LAB NUMBER: 19910424110
DATE RECEIVED: 04/24/91
TIME RECEIVED: 01:00 PM
REPORT DATE: 04/25/91

PHYSICAL PROPERTIES	VALUE
Conductivity, umhos/cm	219.
Hardness	.
PH	7.97
Solids, Dissolved, mg/l	146.
Solids, Suspended, mg/l	<5.0
Turbidity, NTU	.

INORGANIC & NONMETALLIC	VALUE
Alkalinity	90.0
Bicarbonate	110.
Carbonate, mg/l	0.0
Chloride, mg/l	.
Cyanide, Total, mg/l	.
Cyanide, WAD, mg/l	.
Cyanide, Free, mg/l	.
Flouride, mg/l	.
Nitrogen, Ammonia, mg/l	.
Nitrogen, Nitrate, mg/l	<.050
Nitrogen, Nitrite, mg/l	.
Sulfate, mg/l	11.1

METALS mg/l	DISSOLVED	TOTAL
Aluminum	.	.
Antimony	.	.
Arsenic	.003	.002
Barium	.	.
Beryllium	.	.
Boron	.	.
Cadmium	<.001	.002
Calcium	.	.
Chromium	.	.
Cobalt	.	.
Copper	.002	.003
Gold	.	.
Iron	.	.
Lead	.	.
Lithium	.	.
Magnesium	.	.
Manganese	.	.
Mercury	.	.
Molybdenum	.	.
Nickel	.	.
Potassium	.	.
Selenium	<.005	<.005
Silicon	.	.
Silver	.	.
Sodium	2.79	.
Strontium	.	.
Vanadium	.	.
Zinc	<.050	.063

APPROVED BY: Dean Lunand

DATE: 4/25/91