

0004

# SUMMIT MINERALS, INC.

*Mine file*  
Summers

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

December 4, 1986

**RECEIVED**  
DEC 08 1986

**DIVISION OF  
OIL, GAS & MINING**

Mr. Rick Summers, Reclamation Hydrologist  
State of Utah - Division of Oil, Gas, and Mining  
3 Triad Center, Suite 350  
355 West North Temple  
Salt Lake City, UT 84180-1203

RE: Quarterly Surface Water Monitoring Report - Summit No. 1 Coal  
Mine, INA/043/001, Summit County, Utah.

Dear Mr. *Rick* Summers:

Please find enclosed the water quality and charge balance information for sampling locations both upstream and downstream from the subject mine property for the fourth quarter of 1986. Sampling locations are located on maps submitted in the Reclamation Plan for this property.

Should there be any questions or problems with this information, please give me a call.

Sincerely,

*Barbara A. Filas*  
Barbara A. Filas  
Engineer

cc: J. L. Higgins

SURFACE WATER QUALITY ANALYSES  
CHALK CREEK - UPSTREAM

10/09/86

Field Measurements

Temperature (degrees C)	NA
Flow (cfs)	NA
pH	NA
Specific Conductance (umhos/cm at 25 degrees C)	NA

Laboratory Measurements (mg/l)

Acidity as CaCO <sub>3</sub> , SM402Y	<0.10
Alkalinity as CaCO <sub>3</sub> , SM403	150
Aluminum as Al, SM303C	<0.01
Ammonia as NH <sub>3</sub> -N, SM417F	0.39
Arsenic (dis) as As, SM304	<0.001
Arsenic (tot) as As, SM304	<0.001
Barium (dis) as Ba, SM303A	0.13
Barium (tot) as Ba, SM303A	0.17
Bicarbonate as HCO <sub>3</sub> , SM403	173.20
Boron (dis) as B, SM404A	<0.001
Boron (tot) as B, SM404A	<0.001
Cadmium (dis) as Cd, SM304	<0.001
Cadmium (tot) as Cd, SM304	<0.001
Calcium as Ca, SM303A	52.80
Carbonate as CO <sub>3</sub> , SM403	4.80
Chloride as Cl, SM407A	86.0
Chromium (dis) as Cr, SM303A	<0.001
Chromium (tot) as Cr, SM303A	<0.001
Copper (dis) as Cu, SM303A	<0.01
Copper (tot) as Cu, SM303A	<0.01
Fluoride as F, SM413B	0.12
Hardness as CaCO <sub>3</sub> , SM314B	202
Iron (dis) as Fe, SM303A	<0.01
Iron (tot) as Fe, SM303A	0.09
Lead (dis) as Pb, SM303A	<0.001
Lead (tot) as Pb, SM303A	0.005
Magnesium (dis) as Mg, SM313B	24.97
Magnesium (tot) as Mg, SM313B	25.50
Manganese (dis) as Mn, SM303A	<0.01
Manganese (tot) as Mn, SM303A	<0.01

Mercury (dis) as Hg, SM32	<0.0002
Mercury (tot) as Hg, SM320A	<0.0002
Molybdenum (dis) as Mo, SM303A	<0.001
Molybdenum (tot) as Mo, SM303C	<0.001
Nickel (dis) as Ni, SM249.2	<0.01
Nickel (tot) as Ni, SM249.2	<0.01
Nitrate as NO <sub>3</sub> -N, SM418C	<0.01
Nitrite as NO <sub>2</sub> -N, SM419	<0.01
Phosphate as PO <sub>4</sub> -P, SM424G	0.05
Potassium as K, SM303A	2.30
Selenium as Se, SM304	<0.001
Settleable Solids, SM209F	<0.1
Sodium as Na, SM303A	20.70
Sulfate as SO <sub>4</sub> , SM426D	6
Sulfide as S, EPA9030	<0.10
Suspended Solids, SM209D	2.0
Total Dissolved Solids, SM209B	360
Zinc as Zn, SM303A	<0.005

CHARGE BALANCE  
CHALK CREEK - UPSTREAM

10/09/86  
mg/l      meq/l

Acidity	0.000	0.000
Ammonia	0.390	0.028
Calcium	52.800	2.635
Iron (dis)	0.000	0.000
Magnesium	25.500	2.097
Potassium	2.300	0.059
Sodium	20.700	0.900
Sum of Cations		5.719
Bicarbonate	173.200	2.840
Carbonate	4.800	0.160
Chloride	86.000	2.426
Nitrate	0.000	0.000
Sulfate	6.000	0.125
Sum of Anions		5.551
Charge Balance (%)		1.49

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

SURFACE WATER QUALITY ANALYSES  
CHALK CREEK - DOWNSTREAM

10/09/86

Field Measurements

Temperature (degrees C)	NA
Flow (cfs)	NA
pH	NA
Specific Conductance (umhos/cm at 25 degrees C)	NA

Laboratory Measurements (mg/l)

Acidity as CaCO <sub>3</sub> , SM402Y	<0.10
Alkalinity as CaCO <sub>3</sub> , SM403	196
Aluminum as Al, SM303C	<0.01
Ammonia as NH <sub>3</sub> -N, SM417F	1.71
Arsenic (dis) as As, SM304	<0.001
Arsenic (tot) as As, SM304	<0.001
Barium (dis) as Ba, SM303A	0.12
Barium (tot) as Ba, SM303A	0.17
Bicarbonate as HCO <sub>3</sub> , SM403	190.30
Boron (dis) as B, SM404A	<0.001
Boron (tot) as B, SM404A	<0.001
Cadmium (dis) as Cd, SM304	<0.001
Cadmium (tot) as Cd, SM304	<0.001
Calcium as Ca, SM303A	54.40
Carbonate as CO <sub>3</sub> , SM403	24.00
Chloride as Cl, SM407A	58.0
Chromium (dis) as Cr, SM303A	<0.001
Chromium (tot) as Cr, SM303A	<0.001
Copper (dis) as Cu, SM303A	<0.01
Copper (tot) as Cu, SM303A	<0.01
Fluoride as F, SM413B	0.13
Hardness as CaCO <sub>3</sub> , SM314B	228
Iron (dis) as Fe, SM303A	<0.01
Iron (tot) as Fe, SM303A	0.10
Lead (dis) as Pb, SM303A	<0.001
Lead (tot) as Pb, SM303A	<0.001
Magnesium (dis) as Mg, SM313B	24.01
Magnesium (tot) as Mg, SM313B	25.10
Manganese (dis) as Mn, SM303A	<0.01
Manganese (tot) as Mn, SM303A	<0.01

Mercury (dis) as Hg, SM32	<0.0002
Mercury (tot) as Hg, SM320A	<0.0002
Molybdenum (dis) as Mo, SM303A	<0.001
Molybdenum (tot) as Mo, SM303C	<0.001
Nickel (dis) as Ni, SM249.2	<0.01
Nickel (tot) as Ni, SM249.2	<0.01
Nitrate as NO <sub>3</sub> -N, SM418C	0.09
Nitrite as NO <sub>2</sub> -N, SM419	<0.01
Phosphate as PO <sub>4</sub> -P, SM424G	0.08
Potassium as K, SM303A	2.20
Selenium as Se, SM304	<0.001
Settleable Solids, SM209F	<0.1
Sodium as Na, SM303A	19.40
Sulfate as SO <sub>4</sub> , SM426D	10
Sulfide as S, EPA9030	<0.10
Suspended Solids, SM209D	<1.0
Total Dissolved Solids, SM209B	375
Zinc as Zn, SM303A	<0.005

