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File #2

Coastal
The Energy People

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OCT 26 1995
DIV. OF OIL, GAS & MINING

October 25, 1995

Daron R. Haddock
Permit Supervisor
Division of Oil, Gas & Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

Re: Revision of 1994 Annual Report for Skyline Mine, ACT/007/005

Dear Mr. Haddock:

In your letter to Ken Payne dated September 19, 1995, you state that,

"Utah Fuel Company will submit an analysis of the 1994 Annual Water Report to explain the diminished water quality of Eccles Creek, downstream from the Skyline Mine facilities area."

Attached is the revised section of the Skyline Mine 1994 Annual Report which deals with water monitoring. This revision is our response to the above assignment. With your approval please replace the water monitoring section of the 1994 Annual report which was submitted previously with this revised section.

Thank you for your help with this matter. If there are any questions, please contact me.

Very truly yours,

Barry Barnum

Utah Fuel Company
A SUBSIDIARY OF THE COASTAL CORPORATION
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B. Water Monitoring Data:

Water Monitoring data for the Skyline Mine area are contained on the diskettes located in this section of the report. The data are presented in Lotus format. Required water monitoring parameters are listed in Tables 2.3.7-1 and 2.3.7-2 on pages 2-36 and 2-37 of the M&RP. Water monitoring locations are shown on Map 2.3.6-1 also contained in the M&RP.

Discharges from the Skyline Mine operation are monitored under UPDES Permit No. UT-0023540 which was approved October 1, 1994, and is effective until September 1999.

Concern has been expressed by Steve Johnson of the Division of Oil, Gas & Mining that Eccles Creek below the mine has been degraded. The following is information relating to this issue and its resolution.

Production began from Skyline Mine #3 in 1981. In that same year monitoring of Eccles Creek below the mine site was initiated at Station CS-2. The yearly average TDS concentrations measured at Station CS-2 are shown in Table 1 below.

TABLE 1. TDS CONCENTRATIONS

MEASURED TOTAL DISSOLVED SOLIDS CONCENTRATIONS (mg/l)			
Year	Station		
	CS-2 Below Mine	CS-12 Mine #3	CS-14 Mine #1
1981	288		
1982	269		
1983	301	383	
1984	374	468	
1985	306	372	
1986	351	490	
1987	479	570	
1988	552	709	
1989	630	676	1133
1990	652	621	919

MEASURED TOTAL DISSOLVED SOLIDS CONCENTRATIONS (mg/l)			
Year	Station		
	CS-2 Below Mine	CS-12 Mine #3	CS-14 Mine #1
1991	1433	1180	1169
1992	1023	1507	741
1993	865	1136	1201
1994	959	1023	956

The monitoring of discharge from Mine #3 was begun in 1983 at Station CS-12. Mine #1 was opened in 1986 and monitoring of this discharge at Station CS-14 was begun in 1989. The yearly average TDS concentrations measured at these stations are also shown in Table 1. These mine discharges are released into Eccles Creek after flowing through the sedimentation pond located at the mine site.

It appears from the data in Table 1 that the increasing TDS in Eccles Creek is correlated to the increasing TDS in the mine discharge, especially the discharge from Mine #3 (Station CS-12).

Prior to March 1991 gypsum ($CaSO_4 \bullet xH_2O$) rock dust was used in the mines. It was hypothesized that mine water was dissolving some of the gypsum rock dust, thereby increasing the TDS in the mine discharges, and that over time as more mining areas were opened more water came into contact with gypsum resulting in a trend of increasing TDS concentrations.

To test this hypothesis monitoring data were examined to determine if there are increasing trends in the concentrations of any of the constituents of gypsum. One of the constituents of gypsum which has been monitored is sulfate (SO_4).

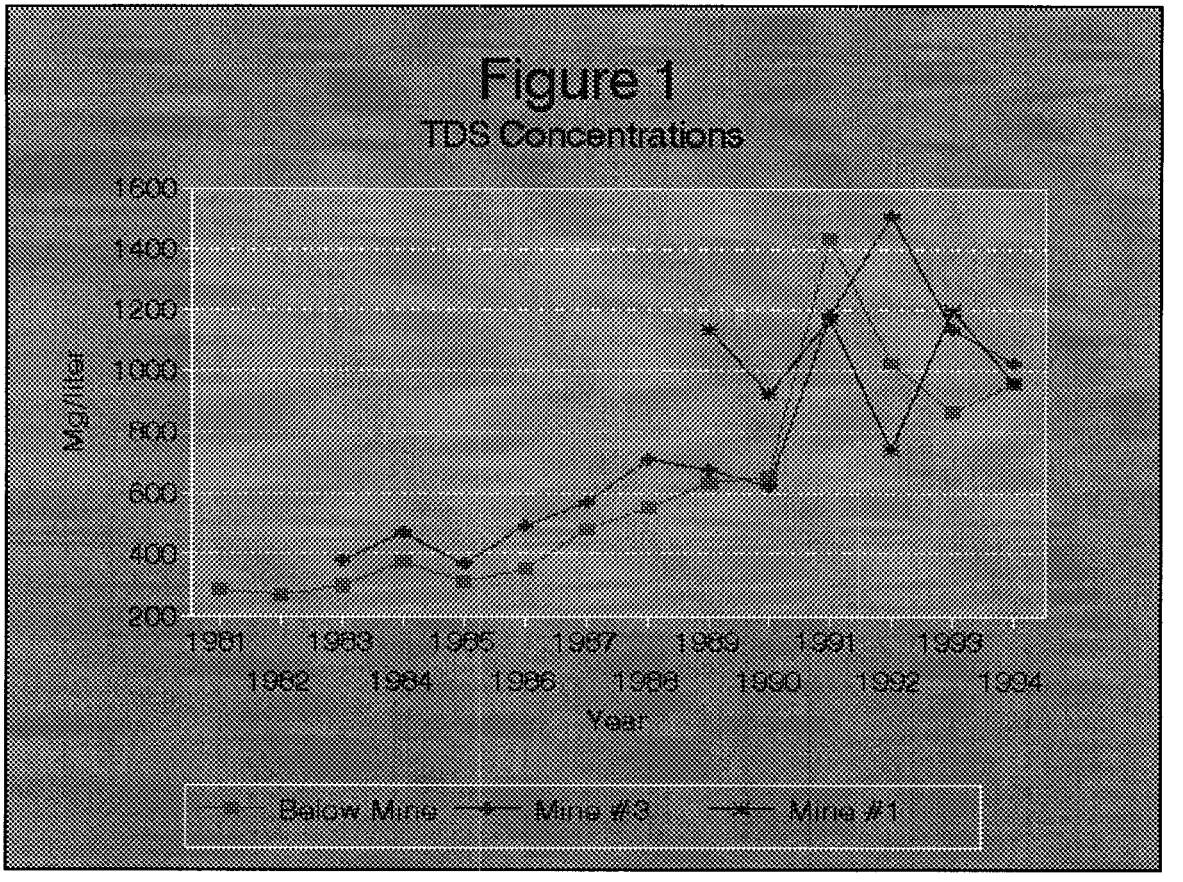
Sulfate concentrations which have been measured at Stations CS-2, CS-12, and CS-14 are shown in Table 2.

TABLE 2. SULFATE CONCENTRATIONS

MEASURED SULFATE CONCENTRATIONS (mg/l)			
Year	Station		
	CS-2 Below Mine	CS-12 Mine #3	CS-14 Mine #1
1981	19		
1982	22		
1983	35	51	
1984	78	150	
1985	69	128	
1986	106	216	
1987	178	259	
1988	222	353	
1989	291	319	609
1990	310	302	469
1991	479	586	760
1992	501	747	320
1993	367	482	609
1994	432	380	452

The relationships of these data are graphically represented below in Figures 1 and 2. Figure 1 shows the relationship between TDS concentrations below the mine and in the mine discharges. Figure 2 shows the relationship between sulfate concentrations below the mine and in the mine discharges.

Based on the correlation of these data the hypothesis was confirmed and the use of gypsum rock dust was suspended in 1991. As a result the trend of increasing TDS concentrations was eventually stopped. The concentrations of TDS and sulfate in the discharges are still above normal because mine water is still in contact with gypsum rock dust in some of the old areas of the mines and this water is still being discharged. However, it appears at this time that there may be the beginnings of down trends in the concentrations of TDS and sulfate in the discharges.



Discharge into Eccles Creek is regulated by UPDES Permit No. UT0023540 issued by the Utah Division of Water Quality. This permit currently allows a maximum TDS of 1446 mg/l. The Utah Division of Water Quality determined that if the TDS in the discharge from the Skyline Mines remained at or below 1446 mg/l, the water quality in Mud Creek will meet the quality requirements for its first beneficial use downstream from the mines. The only time the UPDES permit limitations are exceeded is during upset conditions which are rare, unpredictable, and beyond reasonable control. The standard practice and intent at the Skyline Mines is to fully comply with the current UPDES Permit.

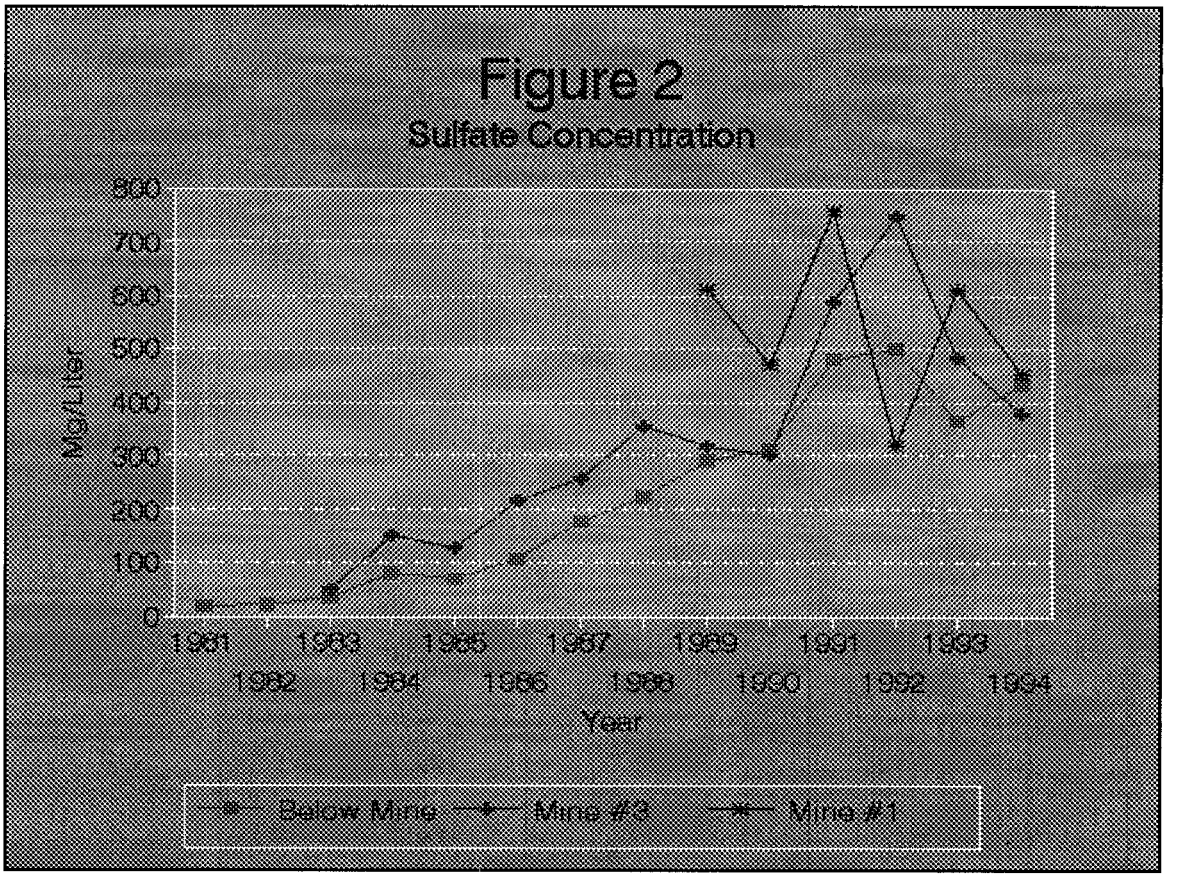


Figure 2
Sulfate Concentration
800
700
600
500
400
300
200
100
0
Mg/Liter
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
Year
Below Mine
Mine #2
Mine #1