ACT/041/002

0008

March 28, 1988

TO: File

FROM: Kent Wheeler, Reclamation Hydrologist

RE: Technical Deficiencies Review, Southern Utah Fuel Company, Convulsion Canyon Mine, Waste Rock Disposal Site, ACT/041/002, Sevier County, Utah

SUMMARY:

In a letter from the Division to Southern Utah Fuel Company (SUFCO), dated February 2, 1988, the Division noted six problems with SUFCO's permit application as it currently exists. In a subsequent meeting with company officials, it was agreed to determine this submittal complete enough to publish public notification when the company had submitted the requested baseline information. Further review finds no other major problems which would hinder this agreement. The above-referenced document was reviewed and found to be sufficiently complete. A technical review was also done concurrently with the Determination of Completeness. There were a few problems which have been identified in the analysis.

TECHNICAL ANALYSIS:

UMC 783.13 Description of Hydrology and Geology: General Requirements -KW

This section will be complete at the end of the baseline monitoring period. As agreed upon in the meeting with SUFCO officials, baseline water quality monitoring will proceed through June with monthly water quality measurements. The parameters that will be monitored shall include all of the parameters found in the Division's Water Quality Monitoring Guidelines. At that time it may be necessary to add, or acceptable to delete, some parameters from the Mining and Reclamation Plan's (MRP) water monitoring parameters list.

UMC 783.25 Cross sections, Maps and Plans -KW

Map 3 was submitted showing the watershed boundaries. This map is sufficient to determine the pertinent watershed characteristics. Map 2 has the information necessary to size the disturbed area ditches and the sediment pond.

Deficiencies Requiring Responses:

1. The two monitoring wells drilled in February need to be located on Map 2.

UMC 784.14 Reclamation Plan: Protection of the Hydrologic Balance - KW

Figure 2 shows the final waste rock area configuration. This is sufficient to determine the pertinent characteristics of the area.

Deficiencies Requiring Responses:

1. The cross-section labeled "G" in Figure 2 appears to correspond to Cross-section F on Map 2. This discrepancy should be rectified.

TECHNICAL REVIEW:

UMC 817.42 Hydrologic Balance: Water Quality Standards and Effluent Limitations -KW

The Division accepts the applicant's decision not to install the rain gauge. However, the applicant should be warned that meteorological data from the mine site will not be acceptable for justifying any non-compliance with the performance standards. The 40 CFR, Part 434, specifically states that the operator shall have the burden of proof that any non-compliance was caused by an event greater than the applicable precipitation event.

The waste rock disposal is located in an area where summer storms are typically high intensity and spatially limited in extent. Therefore, the Division will not accept measurements made six miles as proof of a storm exceeding the design event.

UMC 817.43 Hydrologic Balance: Diversions and Conveyance of Overland Flow, Shallow Ground Water, and Ephemeral Streams - KW

The applicant has corrected most of the deficiencies found in the original review document. However, there are still deficiencies which will require revision.

Undisturbed Diversions

The applicant proposes leaving all of the undisturbed diversions in as permanent diversions. This requires designs for the 100yr - 24hr precipitation event. Although the present channels are designed for the 10yr - 24hr event, some of the designs will safely pass the 100yr - 24hr event. The following table outlines the salient features of each channel design and shows which channels are acceptable.

Table 1

WATERSHED CHARACTERISTICS

	Drainage Area (ac)		T_c		CN		Precip (in)	
	DOGM	MRP	DOGM	MRP	DOGM	MRP	DOGM	MRP
Diversion #1	120	121	0.32	0.16	55	55	3.0	2.1
Diversion #2	78	78	0.26	0.10	55	55	3.0	2.1
Diversion #3	0.6	0.6	0.07	NA	90	NA	3.0	2.1

Table 2

PEAK DISCHARGE
(cfs)

	Peak Flow (cfs)	
	DOGM	MRP
Diversion #1	6.9	3.3
Diversion #2	5.2	2.4
Diversion #3	1.2	0.4

Diversion #1 is sized so that the expected peak flows as calculated by the Division will be passed by the culvert and the grassed swale without causing erosion.

The culvert and the splash basin are acceptable for Diversion #2. However, the channel below the culvert will require additional designs. The Division's calculations show that this channel must be 1.3 feet deep to contain the design event.

The designs for Diversion #3 are acceptable except for at the point where the diversion runs down the road bank to the splash basin. This section will require riprap protection.

Deficiencies requiring responses:

1. The reclamation plan needs to address the removal of the culvert extension on Watershed #1. This culvert needs to be removed and the runoff restored to its original channel. Since this channel will not be disturbed during the operation of the waste rock area, no designs of the reclaimed channel will be required.

2. Diversion #2 below the splash basin must be redesigned to pass expected peak flow from Watershed 2 and Diversion #3 from a 100yr - 24hr precipitation event.

3. The applicant needs designs for riprapping the section of Diversion #3 where it moves off the road bank down to the splash basin at the top of Diversion #2. Division calculations show riprap with a D_{50} of 0.5 ft and 1 foot of filter blanket material (3/4 in minus road base) should be sufficient.

DISTURBED AREA DIVERSIONS:

The following are the characteristics and peak flows from the disturbed area. Both ditches must be designed to this criteria.

Table 3

WATERSHED CHARACTERISTICS

	Area (ac)		T_c		CN		Precip (in)	
	DOGM	MRP	DOGM	MRP	DOGM	MRP	DOGM	MRP
Disturbed Area	7.02	7.93	0.12	0.42	809	81	2.1	2.1

Table 4

PEAK DISCHARGE
(cfs)

Peak Flow (cfs)

DOGM	MRP
4.59	4.42

As the preceding tables show, the Division's calculations and the applicant's are similar. The applicant has submitted calculations and details for riprapping of Ditch 1 and 2 at all slopes over 4%. These designs are complete and satisfactory. The Division recommends the use of 3/4 inch minus road base as the filter blanket material. Since the ditches are temporary and will be removed during reclamation, the filter fabric does not need to be used if there is a commitment to using 6 inches of the road base gravel.

TERRACE DIVERSIONS:

The reclaimed waste rock area will have small diversions which will keep overland flow from running off the reclaimed areas onto the working area. These diversions will gradually fill with soil and vegetation and naturally heal. Since they are not an integral part of the reclaimed diversion system, they will be sized to convey the 10yr -24hr precipitation event. Tables 5 and 6 show the calculations for runoff from the largest of the four terraces. All of the terrace diversions will be sized to accommodate this flow.

Table 5

WATERSHED CHARACTERISTICS

	Area (ac)		T_c		CN		Precip (in)	
	DOGM	MRP	DOGM	MRP	DOGM	MRP	DOGM	MRP
Largest Disturbed Area	2.2	2.1	0.08	0.32	90	80	2.1	2.1

Table 6

PEAK DISCHARGE
(cfs)

Peak Flow (cfs)

	DOGM	MRP
Terrace Diversions	1.3	1.2

The Division's values for peak flow are similar to the MRP. The terrace diversions follow the contours of the waste rock; therefore, a slope of 0.01 is assumed. The diversion designs are acceptable using this slope.

SEDIMENTATION POND:

In talking with Wes Sorenson of SUFCO, it was noted that the elevations of the sediment pond were not correct. However, a technical analysis was completed and the following values were found to be acceptable:

Table 7

SEDIMENT POND DESIGNS

Containment Volume Needed 10yr - 24hr event + 3 Years Sediment Volume.....	25,000 ft^3
Minimum Height Above Pond Bottom for Primary Spillway.....	4.5 ft
Minimum Height Above Pond Bottom for Emergency Spillway.....	5.5 ft
Peak Flow for 25yr - 24hr event.....	7.0 cfs
Depth of Flow in Emergency Spillway for 25yr - 24hr Event.....	0.1 ft
Minimum Height Above Pond Bottom for Top of Embankment.....	6.6 ft

Most of the above values are correct in the MRP, with the exception of the distance between the primary and the emergency spillway.

The designs for the riprap, and stilling basins for the primary and emergency spillway, are acceptable.

Deficiencies requiring responses:

1. The elevations shown in Figure 1 need to be corrected to show a minimum of 1 ft between the primary and the emergency spillway.

WATER MONITORING PROGRAM:

The applicant has submitted a preliminary water monitoring program. This program commits to monitoring 17 parameters for a minimum of two (2) years on a quarterly basis. Since no baseline data has been submitted to date, the Division cannot evaluate the proposed program. The final list of parameters may be modified, depending upon the results of the baseline monitoring. Furthermore, any changes in monitoring frequency or parameters must be approved before the change is made.

Deficiencies requiring responses:

1. The applicant needs to add static water level to the parameters that will be monitored in the field.

2. The MRP needs a commitment to submit the results of the monitoring within ninety (90) days of the end of each quarter.

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cc: S. Linner
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