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Mine File
J. Whitehead

KAISER COAL

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July 26, 1985

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DIVISION OF OIL
GAS & MINING

Mr. Lowell P. Braxton
Division of Oil, Gas & Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

RE: OSM Concerns, Draft TA
Response to item number 2
Sunnyside Mines, Act/007/007 #2

Dear Mr. Braxton:

Please find enclosed Appendix III-12, post mine drainage designs. Two copies have been provided. Twelve additional copies will be sent on July 30, 1985.

Sincerely yours,

Douglas C Pearce

Douglas C Pearce

enclosures

APPENDIX III-12

Post Mine Drainage Designs

Plans, profiles, and typical cross-sections of the ephemeral stream channels within the Sunnyside Mines permit area (SSSF U Hillside, No. 2 Canyon, and S1/2 Section 5) are found on Plates III-24, III-39, and III-40. Table III-46 shows the expected peak flows for these drainages, and the design data that were used to derive these flows. These data show that the stream velocities in the disturbed area channels are greater than 6 feet per second which could be potentially errosive to these stream beds.

During reclamation activities, Kaiser proposes to construct new drainages within the permit area as illustrated on Plates III-24, III-39, and VII-3, in order to protect the drainage flow patterns after mining is completed. The proposed drainages do not presently exist, and consequently channel conditions could not be measured. Therefore, stream channel reference areas were selected to approximate the conditions that will exist in the area after drainage reconstruction is complete. That is, areas with similar soils, grade, drainage area, and channel cross-sections as those found on the areas to be reconstructed. Three reference area stream channels were sampled utilizing the following methods to determine the percentages of rock, gravel, sand, litter, and vegetation within stable stream channels. One hundred meter transects were located in each stream channel (Plate VII-3), with points sampled at 0.5 meter intervals along the transect. Points are defined as infinately small, as indicated by cross-hairs in a spotting scope projected vertically over the stream. At each point location, the stream channel was examined to determine the percentage of stabilizing material within each category. The categories sampled included rock (4" plus), gravel (1/4"-4"), sand and soil (1/4" minus), litter, and vegetation. Results indicated that the surface materials in all of the stream channels were comprised predominately of sand and soil. Results of the survey are shown on Table III-46.

Data obtained from this survey show that these natural streams are stable, and exhibit relatively little erosion. This is probably due to several stream conditions, including the percentages of rock and other stabilizing materials indicated. Because these undisturbed drainages are stable, the reference areas were also selected to serve as comparison areas for the proposed reconstructed drainages within the permit area. That is, Kaiser proposes that the same approximate percentages of rock, gravel, and soil be constructed within the proposed drainages as that currently found in the stream reference areas (Table III-46).

Following reclamation, these reconstructed drainages will have

the same natural flow, velocity, and erosion potential as the native ephemeral streams found within the permit area.

Head cutting will be prevented by subsurface instalation of 6"x4"x16' concrete walls across the SSSF U Hillside and S1/2 Sect. 5 stream channels below the disturbed areas. The concrete culvert under the railroad tracks crossing No. 2 Canyon wash will remain inplace for the railroad. This structure will prevent head cutting in the wash. Head cutting in Grassy trail Creek was effectively stopped by the installation of culverts under U-123 and the county road in the permit area.

Table III-46.POST MINE DRAINAGE DESIGNS AND REFERENCE AREAS

Drainage Area	Length (ft)	Slope (%)	Curve Number	Area	Peak Flow	Disturbed & Ref. Area Slope	Channel Width	Side Slope	Manning's Number	Velocity (ft/sec)	Depth H_2O Flow (ft)	% Rock (4"+)	% Gravel (¼"-4")	% Sand (¼"-)	% Litter	% Vegetation	Soil Unit (flow area)
SSS U Hillside	2800	35.36	75	60.61	41.59	7.1	13	1v:2h	0.037	6.13	0.48	---	--	---	--	--	IGC
Reference Area 1 Pole Canyon	10800	21.33	60	786.96	35.79	6.0	10	--	0.037	6.00	0.54	13.5	11	59.5	16	0	CIC
No. 2 Canyon	20000	15.20	60	2579.00	83.92	5.8	13	1v:2h	0.038	7.36	0.78	---	--	---	--	--	HBC
Reference Area 2 Pole Canyon	10500	21.33	60	737.37	33.78	4.3	10	--	0.035	5.45	0.55	12	20	57	8.5	2.5	CIC
S½ Section 5	10600	12.64	75	292.92	86.08	3.43	13	1v:2h	0.037	6.38	0.91	--	--	--	--	--	IGC
Reference Area Section 14	8100	4.69	65	138.66	10.28	3.5	4	--	0.030	4.72	0.45	21.5	22	39	16	1.5	IGC