0023

Steve - Route to file

A of 1007/004

EarthFax

EarthFax
Engineering Inc.
Engineers/Scientists
7324 So. Union Park Ave.
Suite 100
Midvale, Utah 84047
Telephone 801-561-1555
Fax 801-561-1861

August 9, 1993

Received 8/11/93

Mr. Richard Allison, Jr., P.E.
AMAX Coal West, Inc.
165 South Union Blvd.
Suite 1000
Lakewood, CO. 80228-0219

SUBJECT: Reclamation diversion design, Hardscrabble Canyon, Castle Gate Mine, Carbon County, Utah

Dear Richard:

Pursuant to your request, the three enclosed gradation test reports have been evaluated in conjunction with the riprap and filter blanket designs for reclamation diversion HCRD-1 in Hardscrabble Canyon. The tests were performed on soils sampled from the base material of the diversion, after completion of the rough reclamation grading, at Stations 6+00, 11+00, and 16+00. The purpose of the evaluation was to determine the necessity and gradation for a filter blanket between the base material and the riprap.

Based on the procedures presented in paragraph 7.2-2(6) in Chapter 7 of the Castle Gate Mine permit (No. 007/004) dated January 1993, the filter blanket for permanent reclamation drainage channels must be designed in accordance with the method described by Barfield, et al. (1981). The necessity of a filter layer is determined by comparing the proposed average particle size (D_{50}) of the riprap for that section of the channel with the D_{50} of the base material in that location. If the ratio of these two values exceeds 40, then a filter is necessary to prevent the migration of fine particles from the base material out through the riprap. According to Table 3.3-10 of the permit documents dated January 1993, the largest riprap D_{50} proposed for channel HCRD-1 is 5 inches. Interpolation calculations on the results of the sieve analyses indicate that the smallest D_{50} of the sampled base material is 0.66 inches. Consequently, the largest ratio of riprap D_{50} to the D_{50} of the base material is 7.6. Since this value is significantly less than 40, a filter blanket i
HCRD-1 may be placed directly on the base materia

If you any questions concerning this evaluation, ple

Steve Johnson -
You may replace the
august 4, 1993 letter
with this letter. We
made the alterations we
discussed. The conclusions
remain unchanged.
Bill

Sincerely,

William S. Hendrickson

William S. Hendrickson, P.E.
Civil Engineer

Enclosures
- Commercial Testing & Engineering Compa

cc: Paul Baker (Utah Division of Oil, Gas and Mi

filename: uc150/letters/hcfilter.ltr

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If you any questions concerning this evaluation, please do not hesitate to call.

Sincerely,

William S. Hendrickson

William S. Hendrickson, P.E.
Civil Engineer

Enclosures
- Commercial Testing & Engineering Company test reports (3)

cc: Paul Baker (Utah Division of Oil, Gas and Mining)

filename: uc150/letters/hcfilter.ltr

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 • TEL: 708-953-9300 FAX: 708-953-9306
SINCE 1908
Member of the SGS Group (Société Générale de Surveillance)

PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1020, HUNTINGTON, UT 84528
TEL: (801) 653-2311
FAX: (801) 653-2436

July 28, 1993

AMAX COAL WEST
165 SO. UNION BLVD. SUITE 1000
P.O. BOX 280219
LAKEVIEW, COLORADO 80228

Sample identification by
AMAX COAL WEST

Kind of sample reported to us: Soil

Sample taken at: Station 6 + 00

Sample taken by:

Date sampled: July 22, 1993

Date received: July 22, 1993

Analysis Report No. 59-162316

SIEVE ANALYSIS

Passing	Retained On	% Weight	CUMULATIVE RESULTS % Retained	CUMULATIVE RESULTS % Passing
-----	+3" RD	17.89	17.89	82.11
+3" RD	2" RD	11.93	29.82	70.18
2" RD	1 1/2" RD	7.34	37.16	62.84
1 1/2" RD	3/4" RD	10.55	47.71	52.29
3/4" RD	3/8" RD	9.17	56.88	43.12
3/8" RD	4 MESH	4.13	61.01	38.99
4 MESH	10 MESH	7.34	68.35	31.65
10 MESH	20 MESH	6.42	74.77	25.23
20 MESH	40 MESH	4.13	78.90	21.10
40 MESH	60 MESH	3.21	82.11	17.89
60 MESH	140 MESH	8.26	90.37	9.63
140 MESH	200 MESH	4.13	94.50	5.50
200 MESH	0	5.50	100.00	0.00

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

AMERICAN COUNCIL OF INDEPENDENT LABORATORIES, INC.

OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS, TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIES

-465
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TERMS AND CONDITIONS ON REVERSE

COMMERCIAL TESTING & ENGINEERING CO.
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July 28, 1993

AMAX COAL WEST
165 SO. UNION BLVD. SUITE 1000
P.O. BOX 280219
LAKEVIEW, COLORADO 80228

Sample identification by
AMAX COAL WEST

Kind of sample reported to us: Soil

Sample taken at: Station 11 + 00

Sample taken by:

Date sampled: July 22, 1993

Date received: July 22, 1993

Analysis Report No. 59-162315

SIEVE ANALYSIS

Passing	Retained On	% Weight	CUMULATIVE RESULTS % Retained	CUMULATIVE RESULTS % Passing
-----	+3" RD	25.24	25.24	74.76
+3" RD	2" RD	11.43	36.67	63.33
2" RD	1 1/2" RD	3.81	40.48	59.52
1 1/2" RD	3/4" RD	9.05	49.53	50.47
3/4" RD	3/8" RD	10.00	59.53	40.47
3/8" RD	4 MESH	4.76	64.29	35.71
4 MESH	10 MESH	5.24	69.53	30.47
10 MESH	20 MESH	9.05	78.58	21.42
20 MESH	40 MESH	5.24	83.82	16.18
40 MESH	60 MESH	4.28	88.10	11.90
60 MESH	140 MESH	7.14	95.24	4.76
140 MESH	200 MESH	3.33	98.57	1.43
200 MESH	0	1.43	100.00	0.00

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

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TEL: (801) 653-2311
FAX: (801) 653-2436

July 28, 1993

AMAX COAL WEST
165 SO. UNION BLVD. SUITE 1000
P.O. BOX 280219
LAKEVIEW, COLORADO 80228

Sample identification by
AMAX COAL WEST

Kind of sample reported to us: Soil

Station ~~66 + 00~~ 16+00

Sample taken at

Sample taken by

Date sampled: July 22, 1993

Date received: July 22, 1993

Analysis Report No. 59-162317

SIEVE ANALYSIS

Passing	Retained On	% Weight	CUMULATIVE RESULTS % Retained	% Passing
-----	+3" RD	29.69	29.69	70.31
+3" RD	2" RD	7.81	37.50	62.50
2" RD	1 1/2" RD	8.33	45.83	54.17
1 1/2" RD	3/4" RD	13.54	59.37	40.63
3/4" RD	3/8" RD	13.02	72.39	27.61
3/8" RD	4 MESH	3.65	76.04	23.96
4 MESH	10 MESH	5.21	81.25	18.75
10 MESH	20 MESH	4.17	85.42	14.58
20 MESH	40 MESH	2.60	88.02	11.98
40 MESH	60 MESH	2.60	90.62	9.38
60 MESH	140 MESH	3.13	93.75	6.25
140 MESH	200 MESH	4.69	98.44	1.56
200 MESH	0	1.56	100.00	0.00

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

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