State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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October 25, 1993

Mr. Gary Gamble
Hecla Mining Company
6500 Mineral Drive
Coeur d'Alene, Idaho 83814

Dear Mr. Gamble;

Re: 2nd Tentative Approval, Amendment to Tailings Impoundment Reclamation Plan, Hecla Mining Company, Escalante Silver Mine, M/021/004, Iron County, Utah

The Division has reviewed your company's May 14, 1993, proposal to change the capping design for the Escalante Silver Mine Tailings Impoundment. Hecla now proposes to construct a capillary barrier instead of a clay cap as a means of reclaiming the impoundment area.

The Division has received review comments from the BLM, dated October 4, 1993, and the Utah Division of Water Quality, dated July 14, 1993. We have incorporated the basic context of their comments into this review letter. Copies of their review letters have also been attached for your reference. Please accept our apology for the unanticipated delay in responding to your latest request.

The two reclamation proposals are summarized/contrasted below:

***CAPILLARY BARRIER/COVER***

The currently proposed design includes:

1. initial mechanical surface compaction of the tailings surface to produce a permeability of 1.0 E-6 cm/sec.;
2. a 10-inch waste rock (capillary) layer applied over the compacted tailings;
3. an 8-inch subsoil layer applied over the capillary barrier; and
4. a 6-inch topsoil layer applied over the subsoil.

***CLAY CAP/COVER***

The original clay cap design (tentative DOGM approval - May 12, 1993), was to include:

1. a 6-inch clay barrier over the tailings material;
2. a 14-inch subsoil layer applied over the clay cap; and
3. a 4-inch topsoil layer applied over the subsoil.

The Division is prepared to grant its tentative approval of this proposal providing Hecla accepts/agrees to the following conditions:

***TENTATIVE APPROVAL CONDITIONS:***

1. The Division supports the BLM and DWQ's recommended changes to the capillary barrier design. The capillary/subsoil/topsoil cover should be revised to reflect the following depths:

   a. capillary barrier - increase average thickness from 10 to 12 inches (assuming sufficient material exists);
   b. subsoil layer - increase from 8 to 18-inch depth;
   c. topsoil layer - will remain at proposed 6-inch depth.

   This will provide a 24-inch rooting medium for the plants, which will allow greater rooting depth for the plants and increases soil moisture retention. The 12-inch depth of capillary material will provide a better buffer against water infiltration into the tailings material, and prevent capillary rise of plant growth inhibiting materials back up into the rooting zone.

2. The capillary barrier must meet certain criteria to ensure that sodium salts (or other harmful constituents) do not migrate up through it and contaminate the plant rooting medium/zone. This would involve a piping ratio (PR) of less than 4 where PR = Coarse material (particle size)/fine material (particle size). In this situation, the coarse material will be the material making up the capillary barrier, and the fine material will be the material making up the subsoil layer. Also, the material making up the capillary barrier should have traits which inhibit capillary movement, which include: coarse texture, reduction of water movement across the capillary zone interfaces, high permeability, low clay content, and low water retention.

Please describe the characteristics and relationship of the proposed capillary barrier (waste rock) material, to the subsoil material, to demonstrate their ability to achieve/meet these design considerations.

3. The BLM has requested basic analytical information describing the chemistry of the waste rock material proposed for use as the capillary barrier.

4. Your proposed schedule for *commencing* reclamation of the tailings impoundment is acceptable (March-April 1994). However, delaying the application of the subsoil and topsoil layers until 1995 may not be acceptable. Unless confirmed surface stability problems, weather constraints, or other reasonable delays are substantiated, impoundment reclamation should be completed by late fall/early winter of 1994. The schedule should be revised to complete the scheduled reclamation (including reseeding) as soon as onsite conditions are favorable.

We have adjusted the May 12, 1993 reclamation estimate to reflect the latest proposed design changes. The estimate reflects the conditions as outlined in this letter. The estimate has been calculated in 1993 base dollars and escalated 5 years into the future. The revised surety amount totals **$826,000** in 1998 dollars (copy of estimate attached).

Again we thank you for your continued cooperation and patience in completing this permitting action. Please feel free to contact me, Holland Shepherd or Tony Gallegos of my staff, if you have questions or concerns regarding the requirements outlined in this letter.

Sincerely,

D. Wayne Hedberg

D. Wayne Hedberg
Permit Supervisor
Minerals Regulatory Program

jb
Attachments
cc: Larry Mize, DWQ
Arthur L. Tait, BLM, Beaver River RA
Lowell Braxton, DOGM
Minerals team (route)
M021004.ltr

RECLAMATION ESTIMATE

**DRAFT**

Hecla Mining Company

Escalante Silver Mine - Mill Tailings Facility

Iron County

M/021/004

last revision 10/19/93

Prepared by Utah State Division of Oil, Gas & Mining

Reclamation Details

-All structures and equipment to be removed from the site (1.5 acre EST)

**-Revised tailings cover: 12" capillary, 18" subsoil, 6" topsoil (65 acres)**

-Hay incorporated into tailings subsoil & topsoil caps (2-3,000 lb/acre)

-Road to tailings reduced via ripping & seeding(5,800' x 12'= 1.6 acre)

-Impoundment runoff ditch constructed around tailings cap (7,200')

-Subsoil borrow areas ripped, topsoiled & seeded (DOGM ESTIMATED 36 acres)

-Surface layer of tailings to be compacted (ASSUME with a dozer)

-Rip topsoil stockpile area & drill seed (9 acre ESTIMATE)

-Monitor groundwater wells for 4 years after reclamation (quarterly)

-Fence maintenance 3 years (7,900 + ~10,000 LF, quarterly)

-Areas revegetated via drill seeding unless impractical (=>hand seeding)

-Disturbed acreage = office+tailings+borrow+roads+stockpile= **113**

| Description | Amount | | $/Unit | Cost-$ |
|---|---|---|---|---|
| Structure demolition/removal | sum-ASSUMED | | 5,000 | 5,000 |
| Compaction of tailings surface(0.60 MPH)* | 65 | acre | 407 | 26,455 |
| Waste rock capillary barrier 12" * | 104,867 | CY | 2.46 | 257,972 |
| Tailings subsoil cap 18" * | 157,300 | CY | 1.51 | 237,523 |
| Tailings topsoil cap 6" * | 52,433 | CY | 1.55 | 81,272 |
| Disc hay into tailings soils * | 65 | acre | 250 | 16,250 |
| Ripping tailings road (0.40 mph) ** | 1.6 | acre | 603 | 965 |
| Runoff ditch construction ** | 7,200 | ft | 0.32 | 2,304 |
| Ripping borrow areas (0.60 mph) ** | 36 | acre | 407 | 14,652 |
| Rip topsoil stockpile area** | 9.0 | acre | 407 | 3,663 |
| Reseed all disturbed areas | 113 | acre | 290 | 32,770 |
| Monitor groundwater (quarterly) | 4 | yr | 1,200 | 4,800 |
| Fencing-borrow areas(LF estimated) | 10,000 | LF | 1.00 | 10,000 |
| Mobilization | 5 | units | 1,000 | 5,000 |
| Fence maintenance (quarterly) | 3 | yr | 400 | 1,200 |
| | SUBTOTAL | | | 699,825 |
| | + 10% CONTINGENCY | | | 69,983 |
| | SUBTOTAL | | | 769,808 |
| | +5yr ESCAL (1.42%) | | | 56,231 |
| | TOTAL | | | 826,039 |
| | **ROUNDED TOTAL IN 1998-$** | | | **$826,000** |

* Phase I Reduction

** Phase II Reduction

*Average cost per acre =* *7,310 $/acre*