

**STATE OF NEW MEXICO
BEFORE THE WATER QUALITY CONTROL COMMISSION**

_____)
In the Matter of:)
)
)
PROPOSED AMENDMENT)
TO 20.6.2 NMAC (Copper Rule))
)
_____)

No. WQCC 12-01(R)

EXHIBIT SCOTT – D-4

**GUIDE TO PROCESSING A MINE PROJECT APPLICATION UNDER
THE BRITISH COLUMBIA MINES ACT**

MINING AND MINERALS DIVISION

MINISTRY OF ENERGY, MINES AND PETROLEUM RESOURCES

JANUARY 2009



- Introduction*;
- Designer qualifications;
- Climate, precipitation* and flood;
- Geographic setting, topography and watercourses*;
- Surficial geology*;
- Bedrock geology*;
- Purpose and objectives of the impoundment or waste dump;
- Site investigation, surface and subsurface;
- Preliminary design and material estimates;
- Geotechnical soil characterization, description, testing, properties and design parameters;
- Geotechnical bedrock characterization, description, testing, properties and design parameters;
- Geotechnical tailings or waste rock characterization, description, testing properties and design parameters;
- Impoundment or waste dump layout and design sections;
- Method of construction, tailings deposition and waste rock deposition;
- Seepage and groundwater analyses;
- Water balance and water management;
- Stability analyses;
- Chemical and physical characterization of waste materials*;
- Earthquake parameters and analyses;
- Interim spillway designs and conceptual ultimate spillway design for tailings impoundments;
- Failure mode and effects analyses; consequence-based risk analyses;
- Contingency plans;
- Operational and closure monitoring provisions for seepage, surface water and groundwater, deformations and stability;
- Construction specifications;
- Quality control program;
- Plans for an operating and emergency preparedness manual; and
- Assessment of long-term contingencies and bonding requirements for closure (can be filed in a separate confidential report).

* These topics are generally included under Project Setting (see Section 1.8 below), in which case they need not be duplicated under the design of impoundments and waste facilities.

7.3.6.1. Tailings

Plans and sections, done by a suitably qualified professional at an appropriate scale (1:5,000 or better suggested), detailing the proposed tailings impoundment facility and

dam projected over the life of the mine, must be provided. Typical cross-sections of the dam faces are required, with clear descriptions of the characteristics of the surface meter of material (i.e. as a growth medium). In addition to stability, tailings impoundments must be designed to allow for proper placement of salvaged soil materials on the dam faces and upper impoundment surfaces. The MEMPR geotechnical inspector should be contacted for guidance on tailings dam design.

7.3.6.2. Waste Rock

The application must include plans and sections, done by a suitably qualified professional, at an appropriate scale (1:5000 or better suggested), detailing the proposed waste rock dumps projected over the life of the mine. In general, short dump lifts (50 meters or less) are encouraged, as are dump configurations which will be aesthetically consistent with the adjacent landscape (following resloping). Dumps must be designed to accommodate the proposed end land use(s), and to allow for proper placement and retention (through hydraulic and geotechnical management) of salvaged growth media. MEMPR considers resloping to 2:1 or less to generally be a minimum requirement for ensuring that adequate quantities of growth media can be properly placed (resloping of 2.5:1 or 3:1 is preferred for placement of large soil volumes). The MEMPR geotechnical inspector should be contacted for guidance on tailings dam design.

7.3.6.3. Soil Storage

Any soil storage locations, configurations and anticipated volumes must be identified.

7.3.6.4. Additional Mine Site Infrastructure

Any additional mine site structures, including on-site accommodations and offices, must be described in terms of location and construction. Items of particular relevance to the reclamation plan are locations, foundations and nature of construction (e.g. – movable modular units or ‘permanent’ structures).

7.3.6.5. Mine Water Use

The source and use of water required for mine operations must be described, and an overall site water balance provided. Permits under the *Water Act* may be required for water use.

7.3.6.6. Watercourse and Water Quality Protection

A plan for the protection of watercourses and water quality during construction, and designs for water management structures and water treatment facilities, throughout the mine life and following closure, must be provided. This must include prediction of

9.3.2. Land Capability Objectives

Land capability objectives, how they will be achieved, and how reclamation success will be measured, must be provided for each of the specified end land use objectives.

9.3.3. Long-Term Stability

Long-term stability, both physical and chemical, must be adequately addressed for all structures and discharges from the mine site. This must include consideration of future erosion, creep, mass wasting, and compatibility of final land forms with the surrounding landscape.

9.3.4. Treatment of Structures and Equipment

A description of structures and/or equipment to remain in place following mine decommissioning plans for long term post-closure maintenance of facilities, and proposed reclamation treatments are required. For example, specify what concrete slabs will remain; whether or not it would be feasible (or serve any purpose) to blast them, and how they would be covered with soil material.

9.3.5. Waste Dump Reclamation

Proposed waste rock dump reclamation must be described in detail, including anticipated final configurations, proposed resloping, post-closure water management, surface treatment to alleviate compaction, details of soil replacement, a description of proposed revegetation methods, and trace element uptake in vegetation (especially for metal mines). Conceptual post-mine cross-sections must be provided along with a map illustrating section locations. If possible, conceptual three-dimensional views of the final dump configurations should be provided. Creative design of waste dumps to optimize snow/water retention (where appropriate), habitat diversity and aesthetic consistency with the adjacent landscape are encouraged.

9.3.6. Tailings Reclamation

Proposed tailings reclamation must be described in detail, including anticipated final impoundment configuration, any proposed resloping, post-closure water management, (including a spillway), details of soil replacement on tailings dam faces (if not constructed with suitable growth media at surface) and the impoundment surface (if it is to remain dry following closure), and a description of proposed revegetation methods. For metal mines in particular, concerns related to trace element uptake in vegetation must be described. If full or partial flooding is planned for closure, long-term stability and maintenance requirements must be adequately addressed.