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DIVISION OF
OIL, GAS & MINING

September 1, 1993

Mr. Tom Munsen
Department of Oil Gas & Mining
State of Utah
3 Triad Center Suite 350
355 West N. Temple
Salt Lake City, Utah 84180\

RE: J. B. KING MINE RECLAMATION
CHANNELS

Dear Tom:

Thank you for meeting with us on August 30. We greatly appreciated your counsel. The background information which you provided with the photograph history was very helpful. This letter summarizes our understanding of the counsel provided and presents criteria for re-construction of the channels across the J.B. King Mine site. Excerpted pertinent DOGM regulations are included in italics. The channels to be reclaimed are classified as ephemeral streams (only flowing in response to a precipitation event).

Design flow: R645 Coal Mining Rules indicate that the design capacity for an ephemeral channel should provide for "*combination of channel, bank and floodplain configuration ... adequate to pass safely the peak runoff of ... 10-year, 6-hour precipitation event for a permanent diversion*" (742.333). In consultation with DOGM and Western States Minerals Corporation (WSMC), it has been decided to provide channel capacity for predicted runoff from the 100-year 6-hour storm event, which is greater than that required in the regulations.

Channel profile and alignment: "*All diversions will be designed to minimize adverse impacts to the hydrologic balance within the permit and adjacent areas, to prevent material damage outside the permit area and to assure the safety of the public.*"(742.311) A permanent diversion or a stream channel reclaimed after the removal of a temporary diversion will be designed and constructed so as to restore or approximate the premining characteristics of the original stream channel including the natural riparian vegetation to promote the recovery and the enhancement of the aquatic habitat"(742.313).

Examination of natural channels in the area reveals the following characteristics. Channel alignments have very little sinuosity. Channel profiles are concave in shape with upper reaches controlled by sandstone cliff formations. Large blocks and rocks have accumulated in channels at the base of cliffs (as a result of rockfall and the slab-failure processes) forming natural plunge pools which dissipate energy. Lower channel reach slopes are controlled by the Mancos shales which are somewhat resistant to erosion. Channel cross sections are narrow and tend to be deeply incised. Typical erosion processes in Mancos shale include the weathering of the exposed surface of the shale followed by erosion of the weathered material during a thunderstorm runoff event exposing unweathered shales to weathering. Thus the rate of channel degradation in the Mancos shales is controlled by the

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rate of weathering of the exposed shale and upon the frequency with which new surfaces of shale are exposed to weathering by thunderstorm runoff events. Natural channels in the vicinity are very poorly vegetated with a vegetation cover of less than 5%.

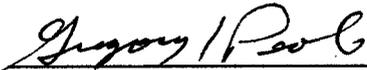
The proposed reclaimed channel system through the J. B. King mine site will utilize the same features as the surrounding undisturbed channels. 1) The existing sandstone cliffs will form the control for the upper end of the channels. 2) Riprap lined plunge pools will be formed in the channels at the base of the existing sandstone cliffs to provide energy dissipation. 3) Channels across the J. B. King mine site will be excavated to form a concave profile utilizing as much as possible existing sandstone ledges and shales for grade control. Areas of stable low channel gradient just above the sediment pond will be left as is. Construction of the channels will take place in two phases. During Phase I the exploratory excavation will take place along the proposed channel alignments. The desire will be to expose the surface of the underlying sandstone and shale formations. Phase II of the construction will utilize the information exposed during Phase I to modify the proposed channel profile to fit natural grade control features.

Please call if there are questions or if you have any suggestions.

Sincerely,

HANSEN, ALLEN & LUCE, INC.

By:



Gregory J. Poole, P.E.
Project Engineer

CC: Mr. Buzz Gerick, Western States Minerals Corporation