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# State of Utah

DEPARTMENT OF NATURAL RESOURCES  
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September 6, 1991

**TO:** Daron Haddock, Permit Supervisor

**FROM:** Rick P. Summers, Senior Hydrologist 

**RE:** Review Emergency Spillway Designs, Amendment 007/019-91A, (Received May 31, 1991), Andalex Resources, Inc., Centennial Project, ACT/007/019, Folder #2, Carbon County, Utah

## SUMMARY:

The above referenced proposal was submitted in order to comply with the requirements of R614-301-742.223 for sedimentation pond C at the Centennial Mine. The existing spillway system at pond C consists of a single drop inlet spillway. The operator is proposing to install an open channel emergency spillway in order to comply with the requirement that the pond has a combination of principal and emergency spillways.

The design flow value proposed for this spillway is the 25 yr. - 24 hr. event of 38 cfs (p. 152, existing MRP). At this flow, the proposal states the spillway will flow at a depth of 1.1 feet at an elevation of 7056.35 feet (see attached). The top of the embankment is at an elevation of 7056.5 ft. which allows an insignificant amount for freeboard. However, in consideration that the drop inlet spillway will pass approximately an additional 30 cfs, the freeboard actually will be much greater during the design event. It appears that the design is feasible, but additional clarification of the spillway system will be needed for approval. In addition, it should be noted that the design is for the 25 yr. - 24 hr. event. Current R614 rules require a 25 yr. - 6 hr. event. This duration event may have a peak less than the 38 cfs used in the design and allow for additional freeboard.

The following deficiencies must be addressed prior to approval:

1. The designs submitted have not been certified by a registered professional engineer. Plate 12 and pages 152, 152-A, and 184 should be certified and a commitment to submit as-built certified designs of the installation 30 days following completion should be made prior to final approval.

2. At the design flow of 38 cfs, the Division's calculations indicate a head of 1.25 ft. or 7056.25' is needed to pass the event through the 36 in. primary spillway. Plate 12 indicates the elevation of the top of the embankment is 7056.5, which only allows 0.25 ft. freeboard. Additional freeboard will be required. The operator should submit a stage-discharge curve (and calculations) for the spillway system incorporating the primary and emergency spillway flow capacities.
3. Clarify the discrepancy between the narrative on p. 151 which states the 36 in. spillway inlet is 2.5' below the embankment crest, while plate 12 depicts the value as 1.5 feet.
4. The maximum height of overflow line on Plate 12 should be corrected to depict the maximum elevation of water during the design event (i.e. both spillways passing the flow together). This value will be obtained from the stage-capacity curve requested in item #2.
5. Pond C currently does not provide for a decant device as required by R614-301-742.221.34.
6. Pond C needs a sampling access ramp to provide for NPDES sampling and spillway inspection.
7. The proposed design will route water during the 25 yr. - 6 hr. event to Pond E. This design requires the spillway system at pond E to be designed to accommodate any discharge from pond C during the 25 yr. - 6 hr. event. Upon reevaluation of the system (esp. using a 25 yr. - 6 hr. verses a 25 yr. - 24 hr. event), this information may not be required. It is likely that the spillway system at pond C can be modified (possibly by lowering the inlet) such that the entire design event will pass through the 36 in. spillway (i.e. emergency spillway crest at an elevation above the required head for the 36 in. primary spillway).