

# **An Effectiveness Assessment of Current and Proposed Ground Water Remediation at the Moab, Utah USA Uranium Processing Site.**

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The Moab, Utah USA Uranium Processing site contains a 30-meter high, 52-hectare unlined tailings facility. Seepage from the tailings facility has resulted in ammonium and uranium contamination of naturally occurring saline ground water in alluvium adjacent to the Colorado River. Ground water pumping is performed from the alluvium to prevent deleterious effects on the habitat of the Colorado Minnow in the river. The pumping rate from the alluvium of 6.3 liters per second is limited to the amount of water that can be evaporated from ponds and from sprinklers.

The current metric for evaluating remedial effectiveness is the mass of contaminants removed from ground water. An evaluation of remedial effectiveness recommended performing synoptic water level measurements to determine potentiometric influence of pumping. The evaluation also recommended monitoring for general chemistry and using trilinear diagrams to determine mixing proportions of ground water and surface water and investigating vertical head compared to river stage and land surface elevations in a transect perpendicular to the river at various times during the year to determine the potential for ground water discharge.

In 2009, tailings will begin to be excavated and relocated. During the course of excavation the evaporation pond and sprinklers will be eliminated requiring a new method of treatment. Ammonia stripping with pH adjustment is being considered along with ion exchange to remove uranium.

An alternative includes additional wells for ground water extraction and injection along the axis of the plume to reduce the travel time to the point of treatment. Recirculating wells and conventional wells will be evaluated with modeling and pilot tests to determine their efficacy. A second option includes direct push injection of sodium hydroxide with in situ air sparging. Ultimately, the U.S. Department of Energy will select the final corrective action method.