

June 15, 2000

Mr. Donald R. Metzler
U.S. Department of Energy
Grand Junction Office
2597 B 3/4 Road
Grand Junction, CO 81503

SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION CONCURRENCE OF THE
GROUNDWATER COMPLIANCE ACTION PLAN FOR THE SALT LAKE CITY,
UTAH, UMTRA SITE

Dear Mr. Metzler:

The U.S. Department of Energy (DOE) submitted a Groundwater Compliance Action Plan (GCAP) for the Salt Lake City, Utah, Uranium Mill Tailings Remedial Action (UMTRA) Project Site by cover letter dated September 25, 1998. DOE submitted replacement pages to the September 25, 1998, report in a letter dated February 5, 1999. U.S. Nuclear Regulatory Commission (NRC) staff reviewed the GCAP and sent a Request for Additional Information (RAI) by letter dated October 14, 1999. DOE submitted a Revised GCAP by letter dated May 31, 2000, which addressed NRC's concerns. NRC staff has reviewed the above information and concurs with the GCAP. The compliance strategy proposed in the GCAP will achieve compliance with Subpart B of 40 CFR 192.21(g) through the application of Supplemental Standards based on *limited use groundwater*.

The staff has determined that the GCAP for the Salt Lake City site satisfies the requirements set forth in the Uranium Mill Tailings Control Act of 1978, as amended (UMTRCA), and the standards in 40 CFR 192, for the cleanup of groundwater contamination resulting from the processing of ores for the extraction of uranium.

The staff's Technical Evaluation Report has been enclosed for your information. DOE should revise the Long-Term Surveillance Plan to be consistent with the GCAP.

If you have any questions concerning this subject, please contact the NRC Project Manager, Mr. Harold Lefevre, at (301) 415-6678, or by e-mail at hel@nrc.gov.

Sincerely,
/RA/

Philip Ting, Chief
Fuel Cycle Licensing Branch
Division of Fuel Cycle Safety
and Safeguards
Office of Nuclear Material Safety
and Safeguards

Enclosure: Technical Evaluation Report

cc: W. Sinclair, Utah Division of Radiation Control

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**TECHNICAL EVALUATION REPORT
TITLE I GROUNDWATER REMEDIATION
GROUNDWATER COMPLIANCE ACTION PLAN FOR THE SALT LAKE CITY, UMTRA
PROJECT SITE**

DATE: June 13, 2000

TECHNICAL REVIEWER: William von Till

SUMMARY AND CONCLUSIONS:

The U.S. Department of Energy (DOE) submitted a Groundwater Compliance Action Plan (GCAP) for the Salt Lake City, Utah, Uranium Mill Tailings Remedial Action (UMTRA) Project Site by cover letter dated September 25, 1998. DOE submitted replacement pages to the September 25, 1998, report in a letter dated February 5, 1999. U.S. Nuclear Regulatory Commission (NRC) staff reviewed the GCAP and sent a Request For Additional Information (RAI) by letter dated October 14, 1999. DOE submitted a Revised GCAP by letter dated May 31, 2000, which addressed NRC's concerns. Therefore, the staff concurs with the proposed action. The compliance strategy proposed in the GCAP will achieve compliance with Subpart B of 40 CFR 192.21(g) through the application of Supplemental Standards based on *limited use groundwater*. DOE proposed no additional remediation with continued groundwater monitoring. NRC concurs with the GCAP based on the following:

- 1) The selected strategy is protective of current and future human health and the environment.
- 2) Background groundwater contamination from other sources has degraded the quality of the upper most aquifer which satisfies the definition of *limited use groundwater* per Subpart B of 40 CFR part 192.11.
- 3) DOE has removed the source of the groundwater contamination by the removal of 2,798,000 cubic yards (yrd³) (2,139,000 cubic meters [m³]) of tailings which occurred from 1985 to 1987.
- 4) Contaminant concentrations should continue to decrease over time through natural attenuation. DOE will monitor groundwater to observe future groundwater constituent concentrations and to assure that hydraulic conditions, between the uppermost aquifer and the confined aquifer below, do not change.

Staff has determined that the GCAP satisfies the requirements set forth in the Uranium Mill Tailings Radiation Control Act of 1978, as amended UMTRCA, and the standards in 40 CFR 192, for the cleanup of groundwater contamination resulting from the processing of ores for the extraction of uranium.

BACKGROUND:

Regulatory Framework:

The UMTRA Project regulations provide several ways to comply with the groundwater protection standards for Subpart B of 40 CFR Part 192.12(c). These include meeting the provisions of 40 CFR 192.02(c)(3) or a supplemental standard established under 40 CFR 192.22.

Criteria for applying supplemental standards is detailed in 40 CFR Part 192.21 and 192.22. Supplemental standards can be requested if the groundwater meets the criteria of *limited use groundwater* 40 CFR Part 192.11(e). The definition of *limited use groundwater*, per 40 CFR Part 192.11(e), is defined as:

groundwater that is not a current or potential source of drinking water because (1) the concentration of total dissolved solids is in excess of 10,000 mg/l, or (2) widespread, ambient contamination not due to activities involving residual radioactive materials from a designated processing site exists that cannot be cleaned up using treatment methods reasonably employed in public water systems, or (3) the quantity of water reasonably available for sustained continuous use is less than 150 gallons per day. The parameters for determining the quantity of water reasonably available shall be determined by the Secretary with the concurrence of the Commission.

Site Description:

The DOE Salt Lake City facility is located 4 miles (mi) (6 kilometers [km]) south-southwest of the center of Salt Lake City, in the vicinity of South Salt Lake. The site has been used since 1941 starting as a large smelting operation. In May 1951, the plant began processing uranium ore. Operations ceased and the plant was dismantled in 1970.

Remedial action at the site occurred from January, 1985, to March, 1987. A total of 2,798,000 cubic yards (yd³) (2,139,000 cubic meters [m³]) of tailings was removed from the site and stabilized in a disposal cell at Clive, Utah, located 85 mi (140 km) west of Salt Lake City. This is the current location of the Envirocare of Utah waste disposal facility.

The Jordan River, the main drainage for the Salt Lake City valley, flows to the north approximately 1500 feet (ft) (500 meters [m]) west of the site. Mill Creek flows westerly across the northern border to the site. The groundwater at the site is characterized by two aquifers: a shallow, unconfined system and a deeper, confined system. The two aquifers are separated by interbedded layers of clays and silts. The shallow unconfined aquifer has static water levels at 5 to 10 feet (1.5 to 3 m) below ground surface and extends down to 50 ft (15 m). The confined aquifer begins approximately 70 ft (20 m) below ground surface and extends to depths of 500 to 800 ft (150 to 240 m). The confined aquifer is under artesian pressure and this creates a vertical pressure gradient into the unconfined aquifer. The confined aquifer is used as a drinking water supply in the area. Groundwater has been influenced by dewatering activities by the Central Valley Water Reclamation Facility (CVWRF) in the northwestern corner of the site. Dewatering was initiated in January, 1995, to construct an additional clarifier unit at the plant and pumping rates exceeded 300 gallons per minute. According to the Utah Department of Environmental Quality (UDEQ) the pumping has ceased. This pumping caused a cone of depression for years and probably helped reduce contamination. The pumped water was treated by the CVWRF by routing the water through the

plant. Another feature that effects groundwater flow at the site is a highway drain at the southeastern corner of the site. Water enters the drain and is then pumped out onto the head of the South Vitro Ditch. A cone of depression has also formed in this area. To address NRC concerns, DOE agreed to sample this ditch as part of the long term monitoring plan.

Sources of ambient contamination include historical landfills, lead smelters, cement kilns, chemical plants, and other active and inactive industrial sites spread throughout the valley. Seiler and Waddell (1984) found that arsenic tended to be the most widely dispersed in the shallow aquifer and that the sources tended to be landfills and tailings areas. They observed average concentrations of arsenic in the wells they sampled to be 0.048 mg/l and up to 360 mg/l. Other contaminants were found in the shallow aquifer such as mercury, iron, cadmium, copper, lead, selenium, and organic constituents. Arsenic concentrations were detected in background well 006 at concentrations ranging from 0.063 to 0.132 mg/l which exceed the UMTRA maximum concentration limits (MCL) (40 CFR Part 192) and the EPA primary drinking water standard.

TECHNICAL EVALUATION:

DOE has proposed, based on the Programmatic Environmental Impact Statement (PEIS) for Uranium Mill Tailings Remedial Action Groundwater Project (DOE, 1996), no remediation in conjunction with the application of supplemental standards based on limited use groundwater. Groundwater in the uppermost aquifer is not a current or potential source of drinking water because widespread, ambient contamination, not due to activities involving radioactive materials from the designated processing site, exists that cannot be cleaned up using treatment methods reasonably employed in public water systems.

DOE will monitor groundwater quality annually in two wells in the shallow unconfined aquifer (monitoring wells 136 and 134) to ensure that concentrations of site related constituents continue to decrease. To demonstrate that the upward vertical gradient is maintained between the confined and unconfined aquifers with no potential migration of contamination downward, DOE will install two new wells in the confined aquifer offsetting the two existing wells in the shallow aquifer. This will result in a nesting of wells in which the vertical gradient can be measured. If there is an indication that the vertical gradient has changed, DOE will sample the confined aquifer to determine if contamination migration has occurred. This monitoring will continue for a minimum of 5 years. At the end of this period DOE, NRC, and the state of Utah will evaluate the results and the compliance strategy, and determine the need for ongoing activities. A water supply well which belonged to the City of Salt Lake City has been decommissioned and plugged to prevent cross contamination.

REFERENCES:

U.S. Department of Energy (DOE), 1998. Revised Groundwater Compliance Action Plan for the Salt Lake City, Utah, UMTRA Project Site, May 31, 2000.

DOE, 1998. Groundwater Compliance Action Plan for the Salt Lake City, Utah, UMTRA Project Site, September 25, 1998.

DOE, 1999. Replacement pages for the September Groundwater Compliance Action Plan for the Salt Lake City, Utah, UMTRA Project Site, February 5, 1999.

DOE, 1996. Final Programmatic Environmental Impact Statement for the Uranium Mill Tailings Remedial Action Ground Water Project, DOE/EIS-0198, October, 1996.

U.S. Nuclear Regulatory Commission, 1999. Request for Additional Information on the Groundwater Compliance Action Plan for the Salt Lake City, Utah, UMTRA Project Site, October 14, 1999.