



**U.S. Department of Energy**

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WM-41

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Thomas H. Essig, Chief  
U.S. Nuclear Regulatory Commission  
Uranium Recovery Branch  
Division of Waste Management  
Office of Nuclear Material Safety and Safeguards  
Mail Stop T7J9  
Washington, D.C. 20555

Subject: Response to U.S. Nuclear Regulatory Commission Request of October 14, 1999, for Additional Information on the Ground Water Compliance Action Plan for the Salt Lake City, Utah, Title I Uranium Mill Tailings Site

Dear Mr. Essig:

The following information is provided in response to the U.S. Nuclear Regulatory Commission letter of October 14, 1999, requesting additional information on the Salt Lake City Ground Water Compliance Action Plan (GCAP). Responses are included for the five comments, along with changes and additions that will become part of the GCAP. When NRC concurs on these changes, the GCAP will be finalized and distributed.

If you have any questions, please contact me at (970) 248-7612.

Sincerely,

Donald R. Metzler  
Technical/Project Manager

Enclosures

cc w/enclosure:  
W. Sinclair, Utah DRC

cc w/o enclosure:  
C. Abrams, NRC  
M. Layton, NRC  
W. Von Till, NRC  
R. Heydenburg, MACTEC-ERS  
S. Marutzky, MACTEC-ERS  
Project File GWSLC1.9 (P. Taylor)

NUMSS08

# **Salt Lake City, Utah GCAP NRC Request for Additional Information (RAI)**

## **Introduction:**

The following information is provided in response to the U.S. Nuclear Regulatory Commission (NRC) letter of 14 October 1999 requesting additional information (RAI) on the Salt Lake City, Utah Ground Water Compliance Action Plan (GCAP) of February 1999.

The first version of the GCAP was transmitted to NRC and the State of Utah on 25 September 1998. The State responded to DOE on 02 November 1998 (NRC received copy of letter) concurring with the proposed application of supplemental standards for the shallow unconfined aquifer, but had concerns about protection of ground water quality in the deep confined aquifer. A meeting was held with the Division of Radiation Control (DRC) on 09 December 1998 and agreement was reached on resolution of their concerns. A letter was sent by DOE to the State on 31 December 1998 along with a copy of the proposed revisions to the GCAP. The State concurred with the revised GCAP as evidenced by their letter to DOE of 12 January 1999 (NRC received copy of letter). These revisions were incorporated into the GCAP which was submitted to the State and NRC on 05 February 1999. Field work was performed in September/October 1999 to install the required monitor wells and also abandon other monitor wells no longer needed for compliance monitoring. The deep Vitro water supply well in the southeast corner of the site was also abandoned per the request of the State and permission from the City of South Salt Lake (owner of the well). DOE is in the process of making final revisions to the GCAP to incorporate results of the field work and to outline the ground water monitoring plan. (Note – NRC reference to DOE correspondence of 27 September 1999 is unknown – perhaps this should reference transmittal of the first version of the GCAP on 25 September 1998 . . .).

The GCAP will be the concurrence document for compliance with Subpart B of 40 CFR Part 192 for the Salt Lake City processing site (see Section 1.0) and will provide details of the required ground water monitoring. The Long-Term Management Plan (LTMP) (in progress) will also contain the information on ground water monitoring as well as specifying all other surveillance activities and reporting requirements necessary for the site (see response to Comment 5).

## **Response to Comments:**

NRC comments are paraphrased below (*in italics*) and DOE responses are provided. The GCAP will be revised to reflect responses to NRC comments.

- *Comment 1: Ground water monitoring at the site.*

Section 3.0 will be revised to include NRC requests regarding monitoring for a minimum period of 5 years and DOE receiving NRC approval prior to the termination of monitoring. See "Insert B" below for revision of Section 3.0 of the GCAP which includes this information.

Monitor well 131 was decommissioned in September 1999 along with other monitor wells at the site no longer determined to be part of the monitoring network. Results of the most recent ground water sampling event (August 1998) indicate that the uranium concentration in monitor well 131 was 0.001 mg/L and the molybdenum concentration was 0.044 mg/L, both of which are well below the respective MCLs (Attachment G).

Per discussions with the Utah DRC in December 1998, it was determined that their primary ground water monitoring concern was possible migration of potentially contaminated ground water in the shallow unconfined aquifer downward into the deeper confined aquifer if the upward vertical hydraulic gradient were to reverse. This will be monitored by measuring ground water levels in pairs of wells completed in the shallow (monitor wells 134 and 144) and deep (monitor wells 143 and 145) aquifers respectively, at two locations onsite and downgradient (see new Figure 2 in the revised GCAP). DOE will also monitor ground water quality annually in the two wells in the shallow unconfined aquifer (monitor wells 134 downgradient and 144 onsite) to ensure that concentrations of site-related constituents continue to decrease. If there is an indication that the vertical hydraulic gradient is reversed, ground water in the confined aquifer will be sampled and analyzed to ascertain that no site-related constituents migrate into the deeper aquifer. Baseline monitoring in October 1999 shows that there is a strong upward vertical hydraulic gradient and that concentrations of uranium and molybdenum in ground water in the deeper confined aquifer are near or below the detection limit.

- *Comment 2: Documentation of abandonment of Vitro water supply well.*

The Vitro water supply well in the southeast corner of the Salt Lake City site was abandoned in accordance with State of Utah Administrative Rule R655-4-12. Documentation will be provided in Attachment H (new Attachment) of the revised GCAP.

- *Comment 3: Potential risk from future on-site ground water pumping/dewatering.*

There is no anticipated risk from on-site ground water pumping/dewatering by the Central Valley Water Reclamation Facility (CVWRF). This activity has been going on for some time and appropriate precautions are taken to prevent any impact to human health and the environment. Concentrations of site-related constituents (uranium and molybdenum) are low and do not constitute a risk for incidental dermal contact (the only reasonable human exposure pathway). Ground water from the

uppermost aquifer is not a current or potential source of drinking water. In reality, ongoing pumping of ground water by CVWRF will promote flushing of elevated concentrations of site-related constituents and will decrease any potential risk.

- *Comment 4: Areal photograph of site showing major water supply wells in vicinity.*

The onsite Vitro water supply well (SSL-8) was decommissioned in September 1999. The nearest water supply wells (SSL-3 and SSL-4) are more than one-half mile from the site in a cross-gradient direction (northeast). A modeling study done in 1996 for the City of South Salt Lake (CH2M HILL 1996) showed the delineation (capture) zone for the onsite Vitro well upgradient to the east, and thus not drawing significant ground water from beneath the site. There should be no problem with the potential pumping areas of influence from the more distant wells having any impact in the area beneath the processing site. Locations of nearby water supply wells are shown on the new Figure 2 in the revised GCAP.

- *Comment 5: Modification of the LTSP based on GCAP.*

Since all contaminated materials and residual radioactive material (RRM) have been removed from the processing site and stabilized offsite, the Long-Term Surveillance Plan (LTSP) required as part of the licensing agreement for disposal sites is not applicable. When DOE moves a site, the original processing site will be cleaned up to meet EPA standards for unrestricted use. NRC will not license these processing sites or require an LTSP (Statements of Consideration for 10 CFR Part 40 – April 30, 1992).

The GCAP will be the concurrence document for compliance with Subpart B of 40 CFR Part 192 for the Salt Lake City processing site (see Section 1.0) and will provide details of the required ground water monitoring. The LTMP (in progress) will also contain the information on ground water monitoring as well as specifying all other long-term surveillance activities and reporting requirements necessary for the site. The LTMP will be a stand-alone document to guide long-term surveillance activities at the Salt Lake City processing site. Other activities will include inspection and maintenance of monitor wells at the site and continuation of the access agreement for sampling and maintenance of the wells.

## Revisions to GCAP:

### Insert A: First paragraph of Section 2.2 on page 3:

The second step compares the COPCs in ground water with MCL or background levels (see Ground Water Quality Data by Parameter in Attachment G). Results of water quality sampling in the shallow unconfined aquifer in August 1998 indicate that concentrations of molybdenum were below the MCL of 0.10 mg/L and concentrations of uranium were

just above the MCL of 0.044 mg/L in monitor wells 134 and 136. Results of water quality sampling in October 1999 indicate that concentrations of molybdenum were just above the MCL in monitor well 144 and concentrations of uranium were just above and below the MCL in monitor wells 134 and 144, respectively. Concentrations of molybdenum and uranium were near or below the detection limit in ground water in the deep confined aquifer (monitor wells 143 and 145). The vertical hydraulic gradient between the two aquifers is upward as indicated by flowing ground water from the two wells in the deep confined aquifer relative to the water table at approximately 10 feet below the surface in the two adjacent wells in the shallow unconfined aquifer.

**Insert B: Section 2.6 on page 5 becomes Section 3.0 and is revised as follows:**

### 3.0 Implementation

Ground water monitoring will be continued at the Salt Lake City site as a best management practice (Table 1 and Figure 2). The primary State concern was possible migration of potentially contaminated ground water in the shallow unconfined aquifer downward into the deeper confined aquifer if the upward vertical hydraulic gradient were to reverse. This will be monitored by measuring ground water levels in pairs of wells completed in the shallow (monitor wells 134 and 144) and deep (monitor wells 143 and 145) aquifers respectively, at two locations onsite and downgradient (Figure 2). DOE will also monitor ground water quality annually in the two wells in the shallow unconfined aquifer (monitor wells 134 downgradient and 144 onsite) to ensure that concentrations of COPCs (molybdenum and uranium) continue to decrease. If there is an indication that the vertical hydraulic gradient is reversed, ground water in the deep confined aquifer will be sampled and analyzed to ascertain that no site-related constituents migrate into the deeper aquifer. Baseline monitoring in October 1999 shows that there is a strong upward vertical hydraulic gradient and that concentrations of uranium and molybdenum in ground water in the deeper confined aquifer are near or below the detection limit (Attachments G and H).

*Table 1. Ground Water Monitoring, Salt Lake City, Utah, Site*

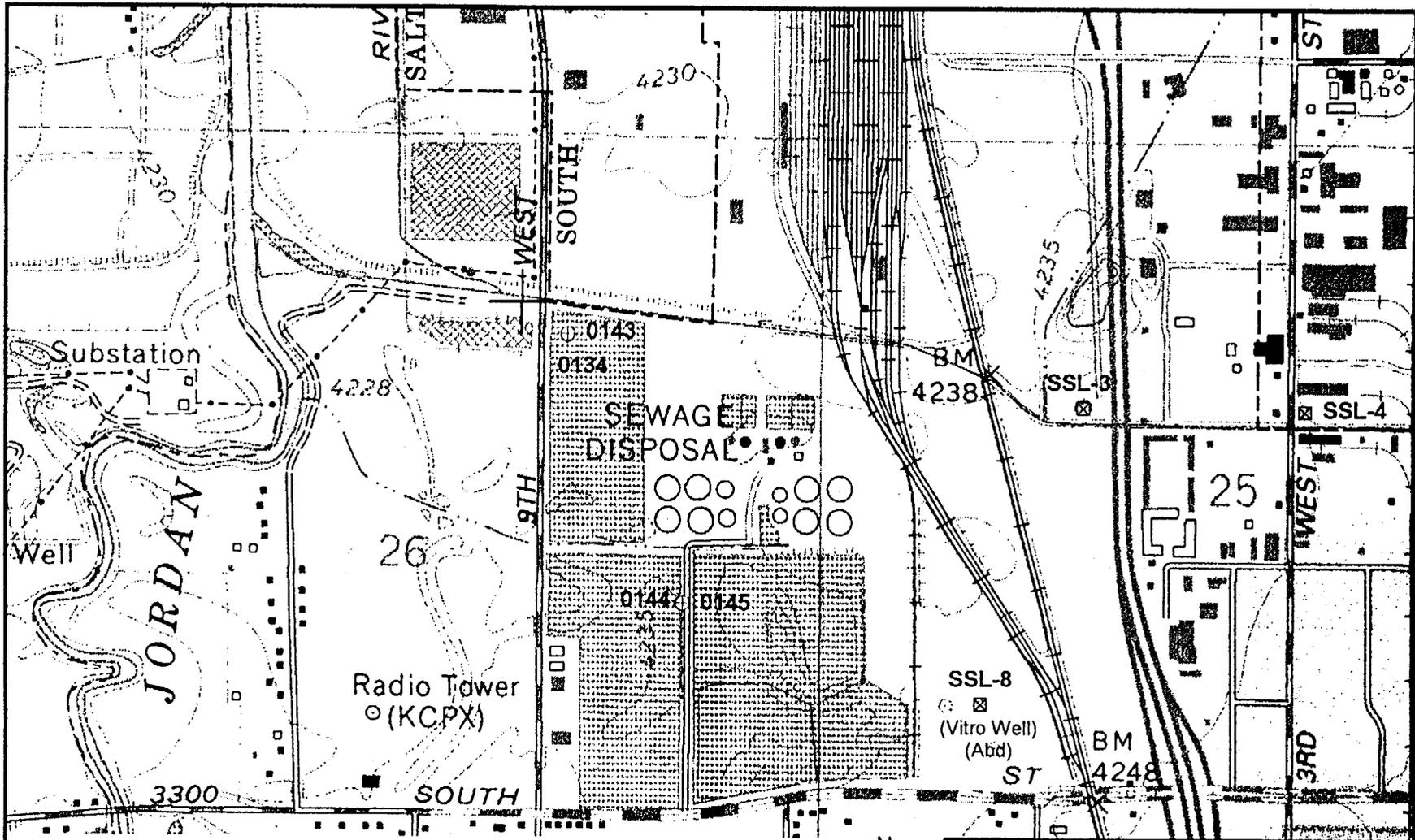
Well	Location	Interval <sup>a</sup>	Analytes	Water Level <sup>b</sup>	Frequency
134	Downgradient	Shallow	U and Mo	Datalogger	Annual
143	Downgradient	Deep	<sup>c</sup>	Manual	<sup>d</sup>
144	Onsite	Shallow	U and Mo	Datalogger	Annual
145	Onsite	Deep	<sup>c</sup>	Manual	<sup>d</sup>

<sup>a</sup> Shallow unconfined aquifer and deep confined aquifer.

<sup>b</sup> Dataloggers in shallow wells will be downloaded quarterly – deeper wells will be observed visually (and water level measured as applicable) at the same time. Dataloggers record water level every 4 hours.

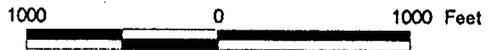
<sup>c</sup> Samples will be analyzed for same constituents if vertical hydraulic gradient reverses.

<sup>d</sup> Wells in deep aquifer will be sampled only if vertical hydraulic gradient reverses.



- ⊕ Monitor Well
- ⊗ Water Supply Well

Source: USGS 7 1/2 Minute Salt Lake City  
South Quadrangle, 1963/1968/1975



		U.S. DEPARTMENT OF ENERGY GRAND JUNCTION OFFICE, COLORADO	
<b>Monitor Well Locations</b> Salt Lake City, UT			
<small>DATE PREPARED</small> January 17, 2000		<small>FILE NAME</small> U0084000-01	

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This monitoring will continue for a minimum period of five years (through 2004). At the end of this period an evaluation will be made in consultation with NRC and the State of Utah to determine the need for future monitoring at the site. Criteria for terminating monitoring will be no significant reversal of the hydraulic gradient and a decrease in COPC concentrations as anticipated. DOE will receive NRC approval prior to termination of monitoring.

As an added precaution against potential contamination of ground water in the deeper aquifer the Vitro water supply well in the southeast corner of the site was decommissioned in September 1999 (Figure 2 and Attachment H). The well has been in place for a number of years and the integrity of the annular seal was unknown. The well belonged to the City of South Salt Lake who was not using the well and had no plans to do so. The City of South Salt Lake granted DOE authorization to decommission the well.

Monitor wells at the site no longer determined to be part of the monitoring network were decommissioned in September 1999. The remaining four monitor wells will be decommissioned upon termination of monitoring as discussed above.

The Long-Term Management Plan (LTMP) (in progress) will also contain the information on ground water monitoring as well as specifying all other long-term surveillance activities and reporting requirements necessary for the site. The LTMP will be a stand-alone document to guide long-term surveillance activities at the Salt Lake City processing site. Other activities will include inspection and maintenance of monitor wells at the site and continuation of the access agreement for sampling and maintenance of the wells.

#### **Attachment C:**

This Attachment will be replaced to include all of the pages in the original document.

#### **Attachment G:**

The *Ground Water Quality Data by Parameter* Table will be replaced to include analytical results for arsenic, molybdenum, and uranium from 1992 through 1999 for monitor wells 130, 131, 132, 133, 134, 136, 143, 144, and 145.

#### **Attachment H:**

This new Attachment will contain the results of 1999 field investigations including: (1) lithologic logs for three new monitor wells, (2) well abandonment information on the Vitro water supply well, and (3) ground water levels measured in the four wells in October 1999 along with datalogger information from monitor wells 134 and 144.