



## U.S. Department of Energy

200 Grand Avenue  
Grand Junction, CO 81501

November 29, 2010

Ms. Kimberly Conway  
FSME Division of Waste Management and Environmental Protection  
U.S. Nuclear Regulatory Commission  
Mail Stop T8F5  
Washington, DC 20555-0001

Subject: Monitoring Beyond the Toe of the Crescent Junction Disposal Cell, Moab Uranium Mill Tailings Remedial Action (UMTRA) Project

Dear Ms. Conway:

This letter is to notify you of a discrepancy between with the *Remedial Action Plan and Site Design for Stabilization of Moab Title I Uranium Mill Tailings at the Crescent Junction, Utah, Disposal Site* Remedial Action Selection (RAS) Report, Revision 2, dated July 2008 and Addendum A of the Remedial Action Plan (RAP), DOE Responses to Nuclear Regulatory Commission (NRC):

The issue involves monitoring beyond the toe of the cell for leachate and cell performance. The July 2008 **RAS Paragraphs 4 and 5 of Section 7.2.4, Transient Drainage**, states:

In addition to monitoring the standpipes, DOE will monitor for the presence of ground water and tailings fluids at well locations 0202, 0203, 0205 and 0210 (Reference Figure 1, page 4, Attachment 3, Ground Water Hydrology). These wells were drilled in 2006 to a depth of approximately 300 feet as part of the Crescent Junction site characterization. Prior to placing RRM [residual radioactive material] in the disposal cell, DOE will recomplete the four wells mentioned above as monitoring locations. These wells will be used as indicators of tailings cell performance and to determine if cell leakage is occurring and if so, to determine if leakage is occurring as predicted in the RAP model. The recompleted wells will be screened through the weathered Mancos Shale and slightly into the weathered Mancos Shale.

For the first three years following the start of RRM placement DOE will monitor annually for the presence of water in Wells 0202, 0203, 205 and 0210. If water is detected additional chemical analysis will be done on tailings fluid indicator constituents (i.e. uranium, ammonia). After three years following the start of RRM placement DOE will monitor for the presence of water every third year. Chemical analysis will be performed if water is detected.

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Additionally, as documented in the **RAP Addendum A, September 2007 Open Issues Meeting**, the NRC had the following comment on **Section 10 Water Resources Protection**.

10. Points of Compliance: No points of compliance have been established and I don't believe they need to be for chemical concentrations, however, I believe DOE needs to better explain how they will demonstrate cell performance and monitoring for performance. DOE has modeled the expected lateral spreading of contaminants in the weathered Mancos Shale and estimated a 10 year ring, 200 year ring, and 1000 year ring. I would think that if contamination is expected to spread to the 10 year ring, why not monitor for cell performance? If no contamination or fluids occurs at year 10, cell is performing better than anticipated. If it occurs before, DOE should have a plan to install wells at further out to monitor for performance. No chemically, only the presence or absence of cell fluid is needed to monitor performance because the geochemical nature of the Mancos (saline and briny) and its been written off as a source of water. I also believe that DOE should be specific as to how many standpipes are going to be installed to monitor cell performance, at the edge of the cell. In RAP, Attachment 3, Appendix G, page 12, last bullet, states, "Up to three piezometers (standpipes) are recommended to monitor the accumulation of leachate within the footprint of the disposal cell, during the transient drainage period, to verify that bathtubbing dissipates as steady-state conditions are achieved. In addition, the piezometer may be used to monitor subsurface hydrologic condition after steady-state drainage is achieved." However, the RAP, page 4-7 states, "DOE will monitor the accumulation of transient drainage with a standpipe tapping a sump at the down gradient toe of the disposal cell..." And on top of page 9-2, "A temporary standpipe to monitor transient drainage is discussed in Section 4.0 of this document." I take this statement to mean DOE has discarded the recommendation made in the RAP, Attachment 3, Appendix G, page 12.

The above NRC comment continues with the following two concerns.

- 1) DOE should monitor the toe of the cell for leachate and cell performance to make sure they do not have fluids migrating at the unweathered Mancos Shale - Alluvial material interface. I think one locations [*sic*] is not enough for a cell of this size and is contrary to the recommendation in the RAP. These multiple locations should be defined.
- 2) The overall performance of the cell and the disposal strategy of allowing the cell to leak over time needs to be confirmed. DOE has determined that all the fluids will be contained within a defined perimeter around the cell and within the weathered Mancos Shale. They should be required to monitor for this performance for the presence/absence of cell fluids.

In response to the above comment and concerns, DOE gave the below response, as documented in **Appendix A September 2007 Open Issues Meeting, Section 10 Water Resources Protection**

The disposal cell has been designed with four locations for standpipes to monitor the presence/absence of cell fluids (*free water*). The four standpipes are along the down gradient interior boundary of the cell (Addendum C Final Design Drawings) The details of the standpipe are shown on drawing E-02-C-104 in that Addendum. If any water accumulates in the standpipe following closure of the cell it can be removed and stored in a cell water retention pond.

During construction of the cell, the slope of the bottom will promote drainage to a temporary sump in the dirty construction area. This water will either evaporate or will be pumped and used as dust control on contaminated areas within the cell. As the construction continues, the amount of water accumulation at the fresh face of construction can be monitored along with any water in the already installed standpipes. This would also provide information for documentation and for future planning.

A decision on future action to monitor water outside the cell would be developed under an observational approach. If there were indications that a larger volume of (*free*) water than anticipated was accumulating within the cell, there would be studies/modeling performed to ascertain what or if there was an impact and if further action was warranted.

The discrepancy is that DOE did not recomplate the referenced wells as indicated above and; therefore, did not monitor for cell leakage in the soils surrounding the disposal cell prior to or since DOE began placing RRM in the disposal cell in April 2009. DOE requests the referenced monitoring wells not be recompleted until after water is observed in the standpipes to be located in the compacted RRM. DOE does not believe this change compromises its ability to demonstrate cell performance. DOE discussed the prudence of waiting to recomplate monitor wells in its response to NRC comments presented in Addendum A of the RAP.

The cell has been constructed per the specifications including a slight slope to the cell floor which allows any drainage from the RRM or any precipitation water to migrate to a temporary sump located along the southern edge of the cell.

DOE began placing RRM in the cell in April 2009 in the southwest corner. Through observation of the tailings during placement, there is no indication of any leakage from the tailings. All tests of soil moisture of the RRM at placement also indicate that there is no excess water. Because DOE began placing the cover this summer, the creation of any transient drainage is still in the future and would first be observed on the cell floor.

The first standpipe is anticipated to be installed in 2011 or 2012.

DOE would like to revise Section 7.2.4 as indicated below and follow the monitoring approach outlined in Addendum A to read:

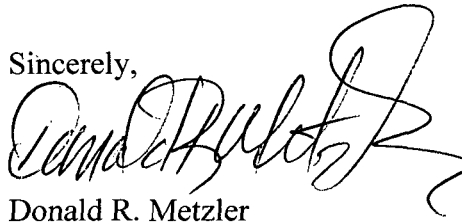
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During construction of the cell, the slope of the bottom will promote drainage to a temporary sump in the dirty construction area. This water will either evaporate or will be pumped and used as dust control on contaminated areas within the cell. As the construction continues, the amount of water accumulation at the fresh face of construction can be monitored along with any water in the already installed standpipes. This would also provide information for documentation and for future planning.

A decision on future action to monitor water outside the cell would be developed under an observational approach. If there were indications that a larger volume of water than anticipated was accumulating within the cell, there would be studies/modeling performed to ascertain what or if there was an impact and if further action was warranted.

Please consider this suggested revision to the RAS and do not hesitate to contact me at (970) 257-2115 if you have any questions.

Sincerely,



Donald R. Metzler  
Moab Federal Project Director

cc:

L. Chang, NRC  
J. Berwick, DOE  
K. Wethington, DOE  
J. Ritchey, TAC  
Project File MOA 2.12 (C. Smith)