



Department of Energy

Washington, DC 20585

October 31, 2013

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Stop T8F5
Washington, DC 20555-0001

Subject: Notification to Terminate Groundwater Monitoring at the Naturita, Colorado, Uranium Mill Tailings Radiation Control Act (UMTRCA), Title I, Site

To Whom It May Concern:

The purpose of this letter is to inform the U.S. Nuclear Regulatory Commission (NRC) that monitoring requirements at the Naturita, Colorado, UMTRCA, Title I Disposal Site, formerly known as the Upper Burbank disposal cell, have been met and that the U.S. Department of Energy (DOE) no longer considers groundwater monitoring to be necessary at the site. This letter documents the basis for DOE's decision to terminate groundwater monitoring activities at the Naturita disposal cell. As discussed below, geologic conditions provide sufficient isolation of the disposed materials to protect the uppermost aquifer. In addition, the wastes contained in the disposal cell are not considered a significant contaminant source. The cell contains only subpile soils and windblown material; the actual mill tailings from the Naturita processing site were removed for reprocessing and subsequent disposal at the Durita, Colorado, disposal site.

Requirements for groundwater monitoring of the Naturita disposal site are presented in the *Long-Term Surveillance Plan for the Upper Burbank Disposal Cell, Uravan, Colorado* (LTSP) (DOE, 1999). NRC accepted this LTSP by letter dated August 25, 1999. Three water-level monitoring wells (BR95-1, BR95-2, and BR95-3; Figure 1) were completed in late 1995 at the contact of the Salt Wash Member of the Morrison Formation and the underlying Summerville Formation. The Summerville Formation is an aquitard between the Salt Wash Member and the uppermost aquifer, the Wingate Sandstone. The purpose of the BR-series wells was primarily to monitor water levels to evaluate if seepage was occurring from the cell. According to the LTSP, water-level monitoring was to occur during the first, third, and fifth year after licensing. The need for continued monitoring was to be evaluated based on these results. Additionally, if water levels were adequate, water samples would also be collected and analyzed for indicator constituents: arsenic, molybdenum, and uranium. This monitoring was proposed as a *best-management practice* to provide early warning of possible migration of contaminants through the unsaturated zone and into the basal portion of the Salt Wash Member.

The LTSP also stated that geologic isolation would prevent the downward migration of groundwater to the Wingate Sandstone. In 1997, a water sample was collected from the point of compliance (POC) well CM93-2, which is completed in the Wingate Sandstone. Sample results showed that the concentrations of three indicator parameters, arsenic, molybdenum, and uranium were either very low or non-detectable (Table 1).



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These results demonstrated the geologic isolation afforded by the Summerville Formation (i.e. naturally elevated indicator parameters in the Salt Wash Member remain isolated from the Wingate Sandstone through geologic time).

DOE also installed a standpipe in the Naturita cell to monitor water content of the cell during and after cell construction. The cell was designed to prevent lateral migration of seepage; seepage was directed downward and out the bottom of the cell. The LTSP called for monitoring of the standpipe until water levels appeared static or declining. Water level measurements collected from the standpipe between August 1998 and November 2000 showed declining water levels, indicating that the cell was performing as expected. DOE informed NRC and the Colorado Department of Public Health and the Environment that water levels in the standpipe met decommissioning criteria in the LTSP and the standpipe was decommissioned in 2002.

Water levels in the BR-series showed minor fluctuation during the first, third and fifth years after licensing, the period during which transient drainage would have occurred, and minor fluctuation since then (Figure 2). Because there was little change in water levels in the BR-series wells, no added driving force, beyond what occurs under natural conditions, could cause vertical leakage of tailings pore fluid across the Summerville Formation.

Sufficient water was available in the BR-series wells to conduct best-management-practice groundwater sampling, primarily for the indicator constituents. Results of this monitoring have been sent to NRC since licensing and are summarized in Figures 3 through 5. The results show that arsenic has been at or below detection limits, molybdenum has been detected at approximately an order of magnitude below the Maximum Contaminant Level (MCL) of 0.1 milligram per liter (mg/L), and the MCL for uranium was exceeded in wells BR-1 and BR-2.

Naturally occurring uranium in the groundwater from the Salt Wash Member of the Morrison Formation is not unexpected because this formation is the source of ore-grade uranium in this area. It crops out upgradient of the disposal site and former mines exist in the Salt Wash Member within a few hundred yards of the disposal site. There are no other site-specific chemistry data for the Salt Wash Member; however, Phoenix (1959) indicated that the uranium concentration in groundwater samples from the Henry Clay Mine, in the Salt Wash Member near Uravan, Colorado ranges from 0.2 to 0.6 mg/L.

Concentrations of uranium in the groundwater at the BR-2 and BR-3 wells are below the levels reported by Phoenix; however, they exceed the UMTRCA MCL and are assumed naturally elevated because of the uranium mineralization in the Salt Wash Member. Based on past monitoring of the Naturita Disposal Cell, there is no evidence that contamination from the cell is impacting uranium concentrations in groundwater in the Salt Wash Member.

In conclusion, geologic isolation provided by the Summerville Formation, exemplified by the vertical distance between the Salt Wash Member and the Wingate Sandstone, effectively protects the point of exposure in the uppermost aquifer. Materials in the disposal cell are not considered

a significant contaminant source. Monitoring conducted since the general license was issued indicates that no discernible leakage of effluent has occurred from the disposal cell, and concentrations of uranium in the Salt Wash member have not impacted the uppermost aquifer during geologic time because baseline monitoring of groundwater from the Wingate Sandstone shows the uranium is below the detection level of 0.001 mg/L.

Based on the monitoring that DOE has conducted, the disposal cell has been performing as expected, and the water levels and chemistry in the shallow monitoring wells are stable. Additional monitoring of groundwater in the Salt Wash Member would likely provide little, if any, useful data for evaluating cell performance. To reduce future costs associated with long-term surveillance and maintenance at the site, DOE intends to discontinue water level and groundwater monitoring. All other requirements detailed in the LTSP will remain in effect (e.g., annual inspections, reporting) to ensure continued protectiveness of the Naturita disposal site. If a response to this notification is not received from NRC within 45 days of receipt of this letter, it will be assumed that NRC has concurred with this decision. Accordingly, DOE will revise the LTSP and abandon the existing monitor wells at the site in accordance with relevant state requirements, as budget allows.

Please contact me at (970) 248-6018 should you have any questions or require additional information. Please send correspondence to:

U.S. Department of Energy
Office of Legacy Management
2597 Legacy Way
Grand Junction, CO 81503

Sincerely,



Mark Kautsky
Site Manager

Enclosure

cc w/enclosure:

J. Shepherd, NRC

W. Naugle, DCPHE

C. Carpenter, Stoller (e)

D. Traub, Stoller (e)

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References

DOE (U.S. Department of Energy), 1999. *Long-Term Surveillance Plan for the Upper Burbank Disposal Cell, Uravan, Colorado*. DOE/AL/62350-250, Rev. 1 July.

Phoenix, David A. 1959. *Occurrence and Chemical Character of Ground Water in the Morrison Formation in Geochemistry and mineralogy of the Colorado Plateau Uranium Ores*. U.S. Geological Survey Professional Paper 320, Robert M Garrels and Esper @ Larsen III, eds.

Table 1. Monitoring data for well CM93-2

Analyte	Date	Concentration (mg/L)
Arsenic	5/20/1997	0.0059
Molybdenum	5/20/1997	0.0015
Uranium	5/20/1997	0.0010 U

U = analytical result below detection limit

Figure 1. Site Location Map

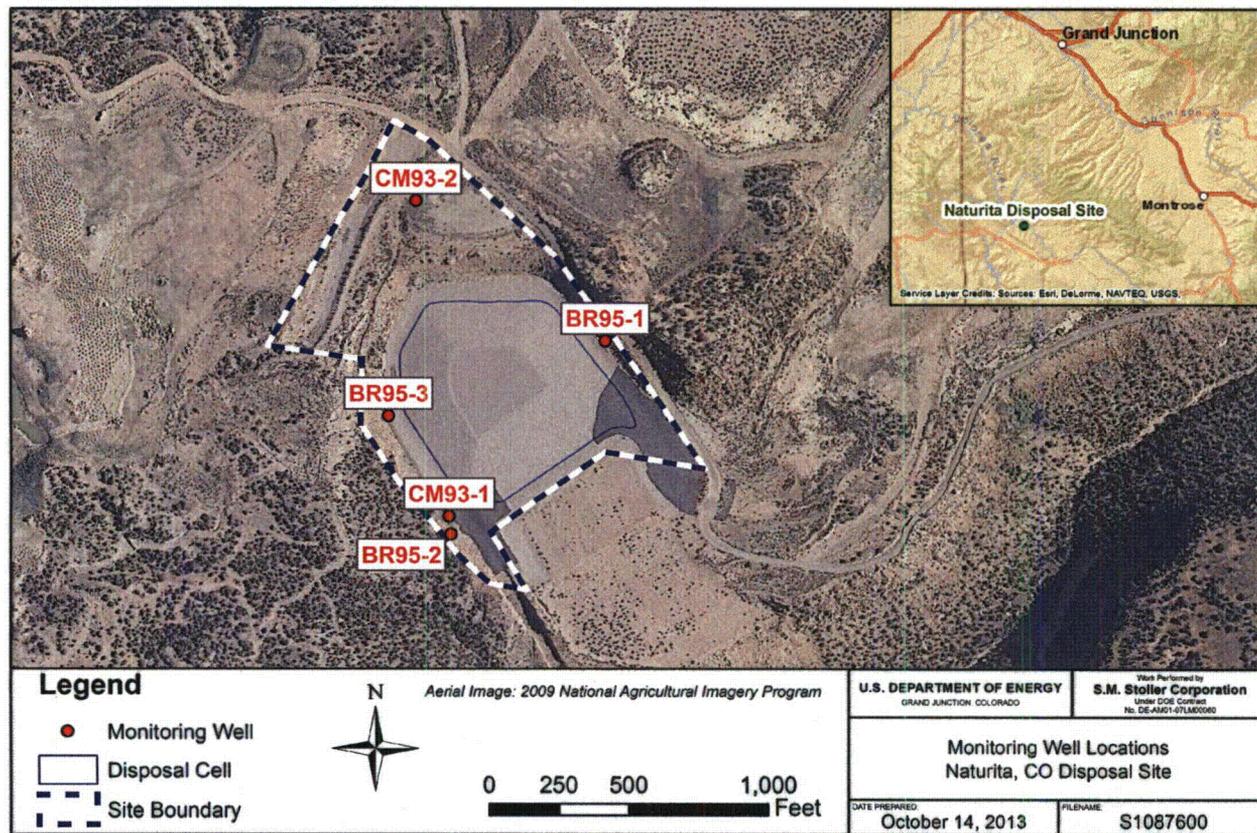


Figure 2. Hydrograph for Wells BR95-1, BR95-2, and BR95-3

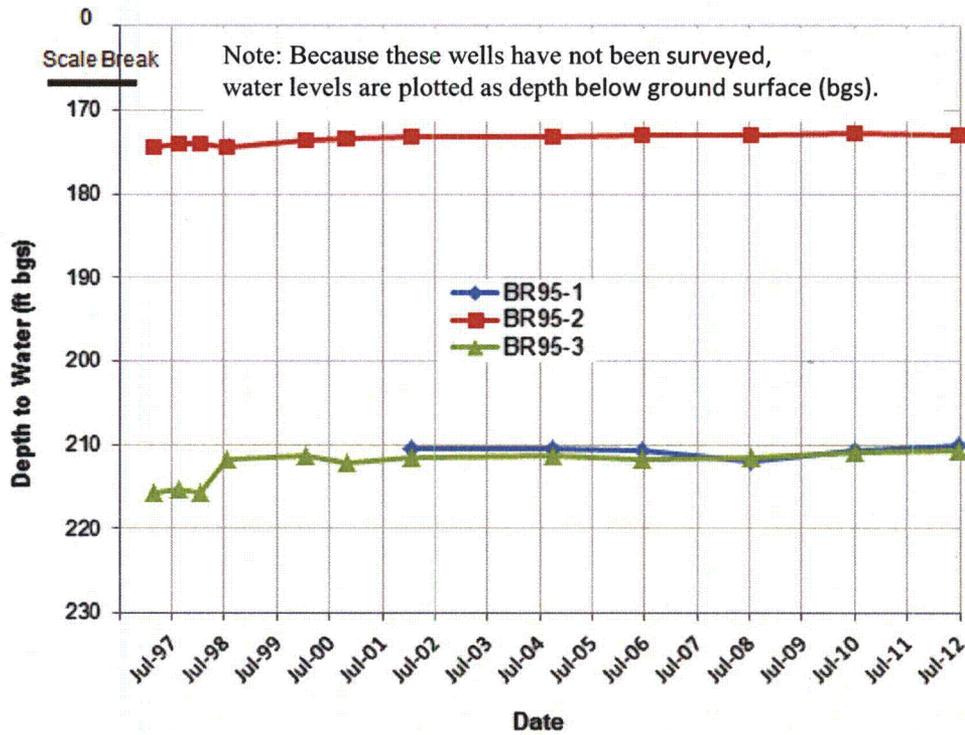


Figure 3. Arsenic Time-Concentration Plot

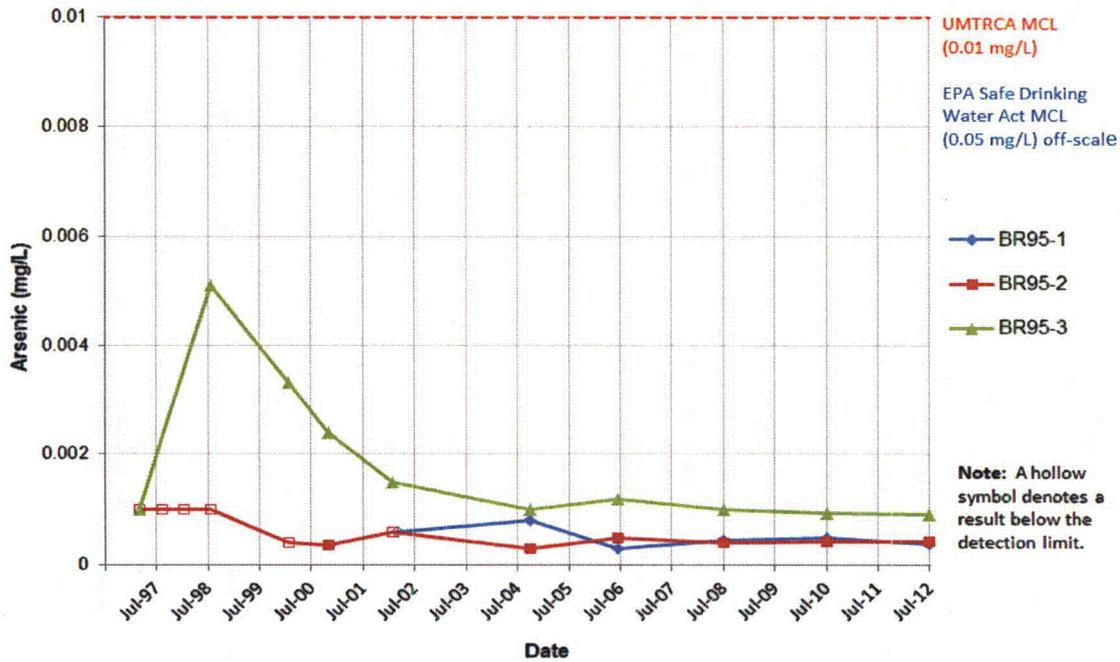


Figure 4. Molybdenum Time-Concentration Plot

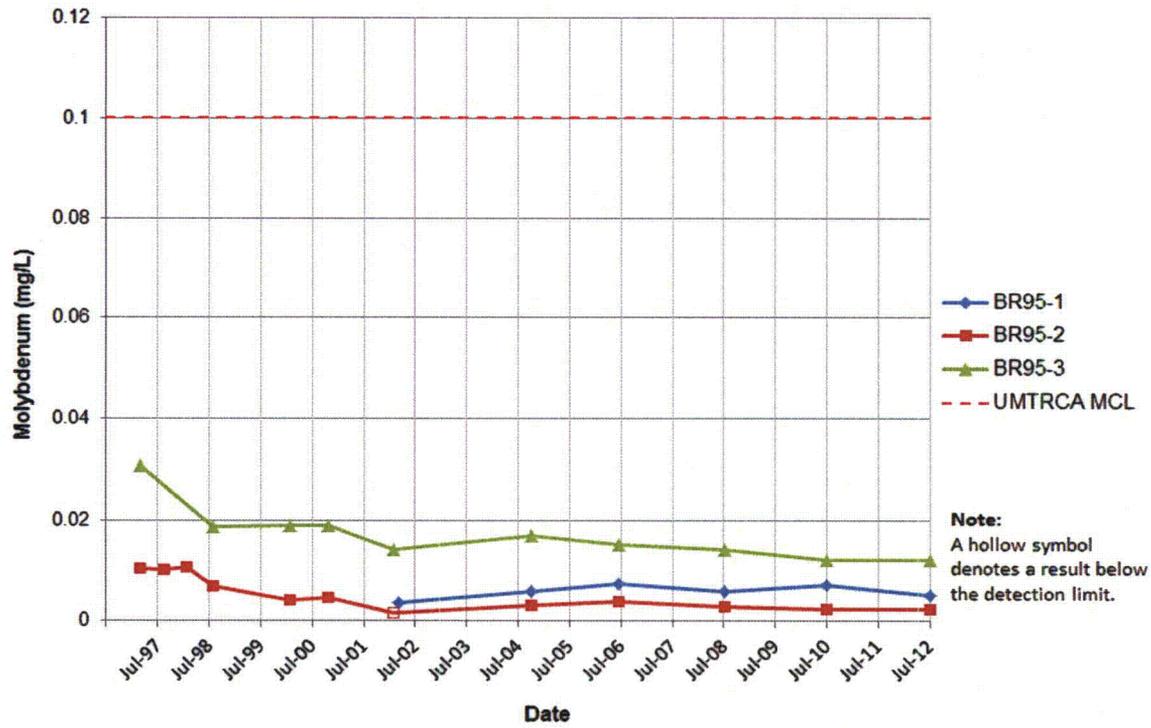
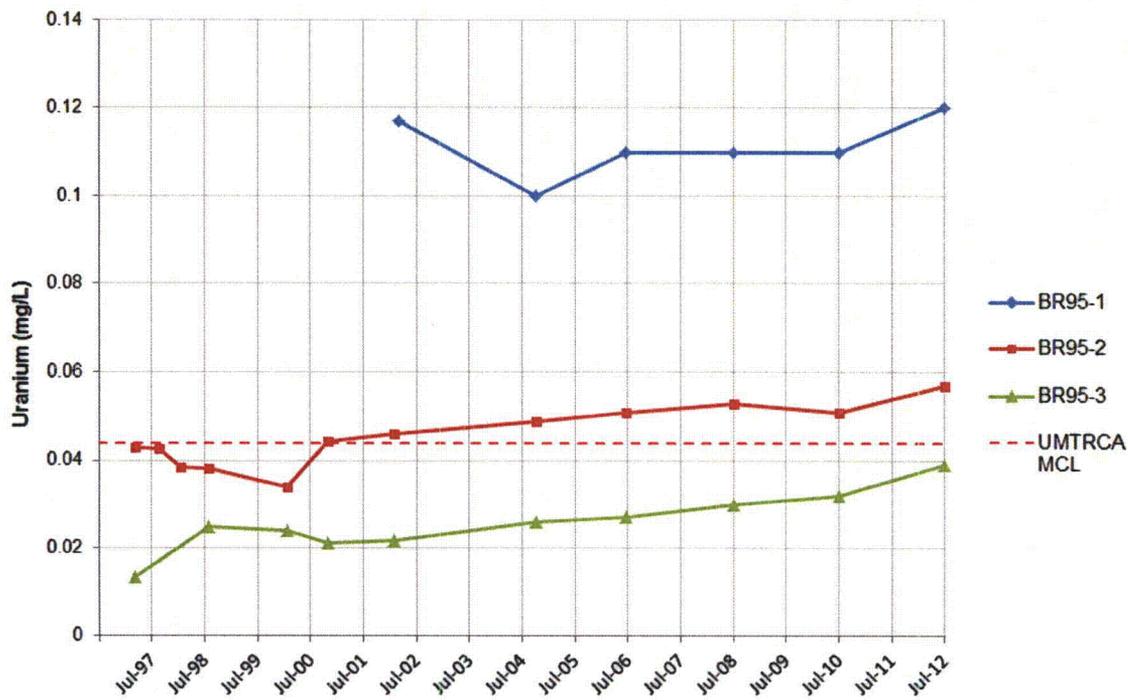


Figure 5. Uranium Time-Concentration Plot



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