



Department of Energy

Washington, DC 20585

December 20, 2018

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

Subject: U.S. Nuclear Regulatory Commission's Request for Additional Information on Green River, Utah, Disposal Site Groundwater Compliance Action Plan (Docket No. WM – 0068)

To Whom It May Concern:

In response to U.S. Nuclear Regulatory Commission's request, U.S. Department of Energy proposes a due date of April 1, 2019 for submittal of Request for Additional Information (RAI) for the draft "Groundwater Compliance Action Plan (GCAP) for the Green River, Utah, Disposal Site" dated November 28, 2018. The proposed deadline is based on our review of the RAI and our effort required fulfilling the requests.

Please contact me at (970) 248-6621 or Angelita.Denny@lm.doe.gov, if you have any questions. Please address any correspondence to:

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

Sincerely,

Angelita Denny, Site Manager
Office of Legacy Management

Enclosure

cc w/enclosure:
T. Lancaster, NRC
M. Kautsky, DOE-LM (e)
J. Price, Navarro (e)
DOE Read File
File: GRN 0400.02 (records)

Sites\GRN\121918 GRN Due Date for Response to RAI (NRC)

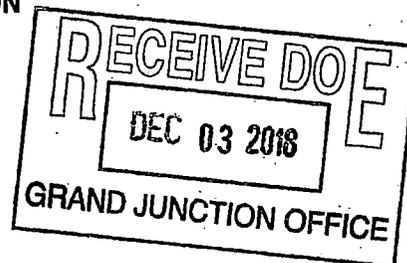
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

November 28, 2018



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

SUBJECT: GREEN RIVER, UTAH, DISPOSAL SITE GROUNDWATER COMPLIANCE
ACTION PLAN REQUESTS FOR ADDITIONAL INFORMATION

Dear Ms. Denny:

The U.S. Department of Energy (DOE) issued its "Groundwater Compliance Action Plan (GCAP) for the Green River, Utah, Disposal Site" in December, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No.: ML12068A089). The report presents DOE's compliance strategy for groundwater restoration and compliance with the U.S. Environmental Protection Agency groundwater protection standards at Title 40 of the *Code of Federal Regulations* Part 192 for the Uranium Mill Tailings Radiation Control Act Title I processing sites. The NRC staff has completed its initial detailed technical review of your GCAP and requests additional information, which is detailed in the enclosure to this letter, to complete its final review and make a determination on concurrence of your plan. We request that you either respond to requests for additional information within 30 days of the date of this letter, or provide a date for your response.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's ADAMS. ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

A. Denny

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If you have any questions, please do not hesitate to contact me via telephone at 301-415-0140 or by email at christopher.grossman@nrc.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Chris Grossman" with a stylized flourish at the end. To the right of the signature, the word "FOR" is written in a smaller, less distinct hand.

Christopher J. Grossman, Project Manager
Low-Level Waste and Projects Branch
Division of Decommissioning, Uranium Recovery,
and Waste Programs
Office of Nuclear Material Safety
and Safeguards

Docket No.: WM-00068

Enclosure:
As Stated

cc: S. Anderson, Utah Division of
Waste Management and Radiation Control

**REQUEST FOR ADDITIONAL INFORMATION
ON THE U.S. DEPARTMENT OF ENERGY'S
REVISED GROUNDWATER COMPLIANCE PLAN
FOR THE
GREEN RIVER, UTAH, DISPOSAL SITE
DOCKET WM-00068**

1. **Comment:** Additional information is needed to justify the U.S. Department of Energy's (DOE) determination that the Browns Wash alluvium is a limited use aquifer.

Basis: In Part 40 of Title 10 of the *Code of Federal Regulations* (10 CFR), the U.S. Nuclear Regulatory Commission (NRC) incorporates the groundwater protection standards imposed by the U.S. Environmental Protection Agency in Subparts D and E of Part 192 of Title 40 of the *Code of Federal Regulations* (40 CFR). The regulations of 40 CFR 192.11(e)(3) define *limited use groundwater*, in part, as groundwater that is not a current or potential source of drinking water because the quantity of water reasonably available for sustained continuous use is less than 150 gallons per day (570 liters per day).

In the 2011 Groundwater Compliance Action Plan (GCAP) for the Green River site (Available in the NRC's Agencywide Documents Access and Management System [ADAMS]¹ at Accession No. ML12068A089), DOE discusses that the groundwater in the Browns Wash alluvium beneath the Green River site appears to have been contaminated by former uranium-ore processing activities. In the 2011 GCAP, DOE states that the compliance strategy for the contamination within the Browns Wash alluvium is:

No further remediation with the application of supplemental standards based on limited yield (sustained continuous flow of less than 150 gallons per day) for groundwater in the Browns Wash alluvium;

In support of its limited yield argument in the 2011 GCAP, DOE refers to the 2002 Final Site Observational Work Plan (SOWP) for the Green River site (DOE, 2002; ADAMS Accession No. ML022810650), which states, "[b]ased on recent observation, the aquifer is relatively dry and is reasonably classified as limited use based on low yield (see Section 5.1.2.1)." In the 2002 SOWP, DOE considers the groundwater in the Browns Wash alluvium as limited use on the basis of low yield (DOE, 2002). Of the eight monitoring wells completed in the Browns Wash alluvium, four were dry, three had pumping rates less than 50 gallons per day (190 liters per day), and one well (Well 0191) yielded approximately 1,500 gallons per day (5,700 liters per day). Based on the disparity between Well 0191 and the remaining alluvial wells, DOE determined that flow rate for this well was not representative of the entire alluvial aquifer. DOE also

¹ ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

discusses in the 2002 SOWP (DOE, 2002) that at the time of the field investigation, the region was experiencing a drought.

It is not clear to NRC staff that the Brown's Wash alluvium, with a well exceeding 1,500 gallons per day (5,700 liters per day) during a regional drought, is consistent with the definition of limited use groundwater based on yield.

Path Forward: Provide additional justification to support DOE's determination that the Browns Wash alluvium should be considered a limited use aquifer in light of Well 0191, which has recorded yields from the Browns Wash alluvium exceeding 150 gallons per day (570 liters per day). Additional justification should include any information regarding well yields from the Browns Wash alluvium, in particular, well yield information during non-drought conditions.

2. **Comment:** Additional information is needed on the assumed point of exposure and institutional controls for the affected or potentially affected properties. In particular, it does not appear that DOE has adequate institutional controls beyond DOE- (or DOE- and Utah-) owned land within the area of concern (AOC), which includes land between the point of exposure and DOE- (or DOE- and Utah-) owned land. The NRC notes that while DOE can protest a proposal to drill a well in neighboring properties that are affected or potentially affected within the AOC, the Utah Division of Water Rights may ultimately permit such use.

Basis: As stated, in part, in 10 CFR 40.27(a),

A general license is issued for the custody of and long-term care, including monitoring, maintenance, and emergency measures necessary to protect public health and safety and other actions necessary to comply with the standards promulgated under section 275(a) of the Atomic Energy Act of 1954, as amended, for disposal sites under title I of the Uranium Mill Tailings Radiation Control Act of 1978, as amended.

The standards promulgated by the U.S. Environmental Protection Agency under Section 275(a) of the Atomic Energy Act of 1954, as amended, are specified in 40 CFR 192. These standards require, per 40 CFR 192.02(c)(3), that control of residual radioactive materials and their listed constituents be designed to provide reasonable assurance that the concentration in groundwater not exceed certain levels beyond the point of compliance. Per the standards, DOE may apply an alternate concentration limit if, after considering remedial or corrective actions to achieve the levels specified, the agency has determined, and the NRC concurred, that the constituent will not pose a substantial present or potential hazard to human health and the environment as long as the alternate concentration limit is not exceeded.

Section 3.0 of NUREG-1724, "Standard Review Plan for the Review of DOE Plans for Achieving Regulatory Compliance at Sites with Contaminated Ground Water Under Title I of the Uranium Mill Tailings Radiation Control Act," Draft Report for Comment (ADAMS Accession No. ML003731007), provides acceptable approaches for demonstrating that the alternate concentration limits proposed by DOE will not pose a substantial present or potential hazard to human health and the environment. The guidance in NUREG-1724, indicates that alternate concentration limits must be protective of human health and the environment at the point of exposure. Regarding the assumed point of exposure, NUREG-1724 states

In most cases, the point of exposure is located at the downgradient edge of land that will be held by either the Federal Government or the State for long-term institutional control.

A distant-point of exposure could be justified, on the basis that land ownership by DOE would ensure that ground water from the contaminated aquifers between the disposal site and the point of exposure would not be used. In some rare instances, a distant-point of exposure may be established without invoking land ownership or long-term custody. Land ownership or long-term custody will not be an issue for establishing a distant point of exposure, if the possibility of human exposure is effectively impossible. When ground water is inaccessible or unsuitable for use, human exposure is considered effectively impossible.

In Section 4.2 of the 2011 GCAP (DOE, 2011) DOE states,

At the request of DOE (with concurrence from the Utah Division of Radiation Control), the State of Utah Division of Water Rights has included into their Area of Concern (AOC) program an area which falls mostly within a circle of approximate 3,000-ft radius and centered on the disposal cell (Figure 2).

The AOC is established to restrict the use of groundwater in the Cedar Mountain Formation and the Green River alluvium within this prescribed area. Specifically, the restriction is that no wells shall be completed in the Cedar Mountain Formation within the area and groundwater extracted from the Green River alluvium shall not be used for domestic purposes. Therefore, by definition, a well drilled outside the AOC becomes a potential POE [point of exposure].

The State of Utah updates the AOC program weekly, if a well permit is filed that falls within this area, both the Utah Division of Radiation Control and the DOE are notified. The Utah Division of Radiation Control and the

DOE will then file a protest with the State engineers' office to deny the well permit application.

Figure 2 in the 2011 GCAP (DOE, 2011) illustrates the AOC, and Figure 3-1 in the 2002 SOWP (DOE, 2002) shows that there is privately-owned land downgradient of the Green River site between the Green River and the land held by the State of Utah that lies within the AOC.

For the Green River Site, it is not clear to NRC staff that filing a protest with the State of Utah's engineer's office to deny the well permit application is both a durable and enforceable institutional control and therefore protective of public health and safety. First, it is not clear to NRC staff that all private property owners will, currently and in the future, file for a well permit with the State of Utah's engineer's office prior to completing a groundwater well. Second, it is not clear to NRC staff what recourse DOE has to enforce denial of the well permit application if the State of Utah's engineer's office elects to permit the well application regardless of DOE's protest.

Path Forward: DOE should provide additional information demonstrating the durability and enforceability of the AOC over the long term as an institutional control that would provide reasonable assurance that human exposure is effectively impossible, and, therefore, will not pose a substantial present or potential hazard to human health and the environment. The information should demonstrate how the filing of a protest can be considered a durable and enforceable institutional control over the long term and include a discussion of DOE's recourse to provide reasonable assurance that human exposure is effectively impossible should the State not deny a well permit application in the AOC.

Alternatively, DOE could assume a point of exposure at the down-gradient edge of land owned by DOE or the State of Utah; acquire affected or potentially affected properties or groundwater rights between the Green River disposal site and the point of exposure; or could demonstrate through an acceptable approach other than the process described for the AOC that land ownership or long-term custody will not be an issue for establishing a distant point of exposure because human exposure is effectively impossible over the long term (i.e., groundwater is inaccessible or unsuitable for use and thus human exposure is considered effectively impossible).

References

DOE, 2002. "Final Site Observational Work Plan for the Green River, Utah, UMTRA Project Site," GJO-2002-356-TAC, U.S. Department of Energy, Office of Legacy Management: Grand Junction, Colorado, September, 2002. ADAMS Package Accession No: ML022810650.

DOE, 2011. "Groundwater Compliance Action Plan for the Green River, Utah, Disposal Site," LMS/GRN/S07892, U.S. Department of Energy, Office of Legacy Management: Grand Junction, Colorado, December, 2011. ADAMS Accession No. ML12068A089.