

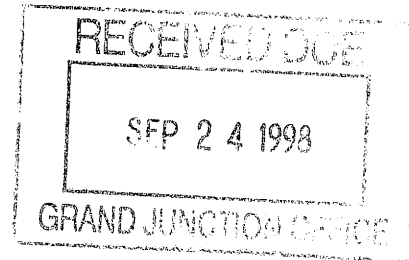


UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

September 18, 1998

RECORD



RECORD

Mr. Ray Plieness
U.S. Department of Energy
Grand Junction Office
2597 B 3/4 Road
Grand Junction, CO 81503

SUBJECT: ACCEPTANCE OF THE FINAL GROUND WATER COMPLIANCE ACTION PLAN
FOR THE INACTIVE URANIUM MILL TAILINGS SITE AT FALLS CITY, TEXAS

Dear Mr. Plieness:

The U.S. Nuclear Regulatory Commission (NRC) staff hereby concurs with the U.S. Department of Energy's (DOE's) Ground Water Compliance Action Plan (GCAP), dated April 8, 1998, for the Uranium Mill Tailings Remedial Action Project site at Falls City, Texas. This action completes the remedial action for the Falls City site under the Uranium Mill Tailings Radiation Control Act of 1978, as amended (UMTRCA).

DOE submitted a final Remedial Action Plan and Site Conceptual Design for Stabilization of the Inactive Uranium Mill Tailings at Falls City, Texas, dated November 1991. The staff reviewed and conditionally concurred with the proposal in August 1992. The conditional concurrence was based on DOE's deferring compliance with the ground-water cleanup provisions of Title 40 Code of Federal Regulations Part 192 (40 CFR 192), Subparts B and C. DOE's final Completion Report dated August 1996, was reviewed by NRC staff and accepted by letter dated April 16, 1997. NRC staff accepted DOE's Long Term Surveillance Plan for the site by letter dated July 8, 1997, and the site was transferred to long-term care under the general license provisions of 10 CFR 40.27.

As discussed in the enclosed Supplemental Technical Evaluation Review (TER), NRC staff has determined that the GCAP and modification of the Falls City Remedial Action Plan satisfies the requirements set forth in the UMTRCA, and the regulations in 40 CFR 192, Subparts B and C for the cleanup of ground-water contamination resulting from the processing of ores for the extraction of uranium.

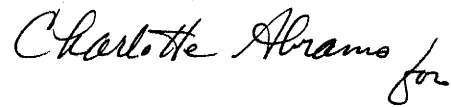
DOE must modify the LTSP to include monitoring of the existing plume for five years (until 2003) in wells 862, 886, 891, 924, and 963 for the protection of beneficial water use. This action completes the remedial action for this site under UMTRCA.

R. Plienness

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If you have any questions concerning this letter, please contact the NRC Project Manager, Elaine Brummett, at (301) 415-6606.

Sincerely,

A handwritten signature in cursive script that reads "Charlotte Abrams for".

Joseph J. Holonich, Chief
Uranium Recovery Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

Enclosure: As stated

cc: D. Metzler, DOE GJPO

**SUPPLEMENTAL TECHNICAL EVALUATION REPORT
TITLE I GROUND WATER REMEDIATION**

DATE: September 9, 1998

FACILITY: Falls City, Texas

PROJECT MANAGER: Elaine Brummett, Uranium Recovery Branch, DWM/NMSS

TECHNICAL REVIEWER: Michael Layton, Uranium Recovery Branch, DWM/NMSS

BACKGROUND:

The U.S. Department of Energy (DOE) submitted a final Remedial Action Plan (RAP) and Site Conceptual Design for the Stabilization of the Inactive Uranium Mill Tailings at Falls City, Texas, dated November 1991, for NRC staff review. The staff reviewed the RAP and conditionally concurred on the proposed remedial action as documented in the August 1992, Technical Evaluation Report (TER). The conditional concurrence was based on DOE's deferring compliance with the ground-water cleanup provisions of Title 40 Code of Federal Regulations Part 192 (40 CFR 192), Subparts B and C. DOE demonstrated that there was no health, safety, or environmental impact from the ground-water situation at the Falls City site. Therefore, DOE proposed to address compliance with these requirements as part of a separate program for ground water cleanup.

DOE's final Completion Report for surface remediation dated August 1996, was reviewed by staff and accepted by letter dated April 16, 1997. The staff accepted DOE's Long-Term Surveillance Plan (LTSP) for the site by letter dated July 8, 1997, and the site was transferred to long-term care under the general license provisions of 10 CFR 40.27.

The ground-water restoration phase of the Uranium Mill Tailings Remedial Action (UMTRA) Project was initiated by DOE's final Programmatic Environmental Impact Statement (PEIS) for the UMTRA Ground Water Project. The final PEIS was approved for distribution on September 19, 1996, and the Record of Decision was approved and published on April 28, 1997.

This supplemental TER documents the staff's review of DOE's Ground Water Compliance Action Plan (GCAP), dated April 8, 1998, for the Falls City Uranium Mill Tailings Remedial Action Project site at Falls City, Texas, and modifies the conditional concurrence in the August 1992 TER.

SUMMARY AND CONCLUSIONS:

Staff has determined that the GCAP and modification of the Falls City RAP satisfy the requirements set forth in the Uranium Mill Tailings Radiation Control Act of 1978, as amended (UMTRCA), and the standards in 40 CFR 192, Subparts B and C for the cleanup of ground-water contamination resulting from the processing of ores for the extraction of uranium. DOE must modify the LTSP to include monitoring of the existing plume for five years (until 2003) in

Enclosure

wells 862, 886, 891, 924, and 963 for the protection of beneficial water use. This action completes the remedial action for this site under UMTRCA.

DESCRIPTION OF DOE's REQUEST:

DOE requested a RAP modification to revise the Aquifer Restoration portion of the Water Resource Protection Strategy. The modification identified DOE's compliance approach for ground-water cleanup, which involves no remediation, based on the uppermost aquifer meeting the limited use classification due to wide-spread ambient contamination unrelated to uranium milling operations at the Falls City site.

TECHNICAL EVALUATION:

DOE submitted the Site Observational Work Plan (SOWP) for the Falls City site to the NRC for an informational and "fatal flaw" review in May 1997, to determine if the approach was technically feasible and consistent with the regulatory requirements. DOE's described compliance approach of no remedial action was based on the uppermost aquifer (Deweesville/Conquista and Dilworth formations) meeting the limited use classification, and no apparent risk to human health or the environment from the contaminated ground water because of no known exposure pathway in the uppermost aquifer. DOE's characterization and analysis showed that there is no discharge of ground water from the uppermost aquifer to deeper aquifers or surface waters, no one is using or projected to use the uppermost aquifer since it meets the limited use classification, and better quality water is readily available from deeper aquifers.

DOE concluded there is no known livestock, domestic, or drinking water wells in the contaminated ground water of the Deweesville/Conquista aquifer. The background ground-water quality is sufficiently poor in this aquifer that it has no historical or current use as a drinking water supply. There is no known current use of the Dilworth aquifer as a drinking water supply within a 3-kilometer (2-mile) radius of the site. Water from this aquifer has historically been considered poor quality. Water from the Dilworth aquifer has been used to water livestock and gardens in the site vicinity. DOE concluded this beneficial use can continue without adverse risk to animals or humans.

DOE indicated that it will monitor the ground water in the uppermost aquifer to ensure that beneficial uses are protected. Wells 862, 886, 891, 924, and 963 will be sampled and analyzed annually for five years (until 2003) to monitor plume movement. At the end of the five-year period, DOE will consult with the NRC and the State of Texas to determine if continued monitoring will be required. This ground-water monitoring commitment is in addition to the disposal cell performance monitoring, consequently, DOE will modify the LTSP to include the additional monitoring.

Staff reviewed the SOWP from an informational perspective and concluded that DOE's approach for complying with the ground-water cleanup provisions in 40 CFR 192, Subparts B and C, had no fatal flaws. Staff's review of the GCAP also concludes that the approach is consistent with requirements in the regulations and DOE's PEIS. Therefore, the staff concurs with the DOE ground-water reclamation for the Falls City site.

REFERENCES:

- U.S. Department of Energy, 1996. Final Programmatic Environmental Impact Statement for the Uranium Mill Tailings Remedial Action Ground Water Project, October 1996. DOE/EIS-0198.
- U.S. Department of Energy, 1997. Final Site Observational Work Plan for the UMTRA Project Site at Falls City, Texas, May 1997. DOE/AL/62350-157 Rev. 1.
- U.S. Department of Energy, 1998. Final (GCAP) Subpart B, Ground Water Compliance Modification to the Remedial Action Plan of the Inactive Uranium Mill Tailings Site at Falls City, Texas. Transmitted by letter dated April 8, 1998.
- U.S. Nuclear Regulatory Commission, 1992. Final Technical Evaluation Report for the Proposed Remedial Action at the Falls City Uranium Mill Tailings Site, Falls City, Texas.
- U.S. Nuclear Regulatory Commission, 1997. Falls City, Texas, Site Observational Work Plan. Letter to Mr. George Rael, DOE/AL from Mr. Joseph Holonich NRC/URB, October 7, 1997.

(GCAP)
March 19, 1998

40 CFR 192 (Subpart B) Ground Water Compliance Modification to the *Remedial Action Plan and Site Design for Stabilization of the Inactive Uranium Mill Tailings Site at Falls City, Texas*

4.0 Cleanup and Control of Existing Contamination

To achieve compliance with Subpart B of 40 CFR 192 (aquifer restoration) at the Falls City, Texas, UMTRA Site, the DOE proposes implementation of the “no ground water remediation strategy.” This determination utilizes a consistent and objective strategy selection framework developed in the final *Programmatic Environmental Impact Statement (PEIS) for the Uranium Mill Tailings Remedial Action Ground Water Project* (October 1996).

The “no ground water remediation strategy” is based on ground water in the uppermost aquifer being classified as limited use, thus providing the basis for the application of Supplemental Standards. The term “limited use” is defined in the final EPA Ground Water Standards (60 FR 2854). Ground water within the uppermost aquifer at the Spook Site contains widespread ambient contamination that could not be cleaned up with methods reasonably employed by public water systems. These characteristics are the result of naturally-occurring conditions (natural uranium mineralization associated with alteration fronts) and from the effects of broad-scale human activity not related to uranium-milling operations (uranium exploration and mining activities). Superimposed on these conditions in the areas near the former site is residual ground water contamination as a result of milling and in-situ leaching during a period starting in 1961 and ending in 1983.

Applying the decision framework developed in the PEIS as the strategy selection process in the *Final Site Observational Work Plan (SOWP) for the UMTRA Project Site, at Falls City, Texas* (May 1997); the DOE has determined that the ground water in the uppermost aquifer was contaminated by uranium processing activities at the Falls City Site, but qualifies for Supplemental Standards based on the limited use conditions. The framework as applied to the Falls City Site consists of 5 evaluative steps that are discussed below.

The first step of the decision framework was an assessment of existing data. The uppermost aquifer consists of the both the Deweesville/Conquista aquifer and the Dilworth aquifer. The Dilworth aquifer was included as part of the uppermost aquifer because of a potential for hydraulic interconnection between the Deweesville/Conquista aquifer and the Dilworth aquifer. The potential interconnection, though unlikely, would have occurred as a consequence of improperly abandoned mineral exploration boreholes in the area. Section 4.0 of the SOWP provides details of the site conditions that includes the site history, sources of existing data, hydrogeologic setting, background ground water

quality, nature and extent of site-related ground water contamination, contaminant fate and transport, and risk evaluation. Evaluation of site data coupled with the Falls City Site conceptual model indicate that sufficient hydrological and ground water contamination characterization data exists to make an appropriate compliance strategy selection.

The second step compares the list of ground water contaminants with MCLs or background ground water quality. The contaminant list includes aluminum, ammonium, cadmium, cobalt, fluoride, iron, nickel, sulfate, uranium, and zinc. Of these, zinc, aluminum, and ammonium are within nutritional ranges or are of low toxic potency and/or high dietary ranges. An additional indicator of process-related contaminated ground water includes pH measurements. Ground water contaminants from the uranium processing operation have seeped into the subsurface and migrated into the ground water system in the uppermost aquifer, creating two plumes: (1) beneath former tailings piles 1, 2, 4, 5, and pond 6; (2) former pile 3.

The third step determines whether the contaminated ground water qualifies for Supplemental Standards based on the classification of ground water as limited use. The conceptual model in the final SOWP describes the regional background ground water quality and the ground water quality of the uranium mineralization belt in the area of the Falls City Site. The widespread ambient contamination and technical impracticability of treating the ground water meet the requirements for Supplemental Standards under Subparts B and C. The concentrations of uranium, and also manganese and sulfate, are found in background ground water associated with the uppermost aquifer that cannot be cleaned up using treatment methods reasonably employed in public water supply systems. A treatability analysis is detailed in the *Remedial Action Plan and Site Design for Stabilization of the Inactive Uranium Mill Tailings Site at Falls City* (1992).

The fourth step determines whether human health and environmental risks that result from applying Supplemental Standards are acceptable. There are no known livestock, domestic, or drinking water wells in the contaminated ground water of the Deweesville/Conquista aquifer. The background ground water quality is sufficiently poor in this aquifer and has no historic or current use as a drinking water supply. There is no known current use of the Dilworth aquifer as a drinking water supply within a 2-mile (3-kilometer) radius of the site. Water from this aquifer historically has been considered to be of poor quality. Water from the Dilworth aquifer has been used to water livestock and gardens in the site vicinity. This beneficial use can continue without adverse risk to animals or humans.

The fifth and final step in the framework selects an appropriate compliance strategy to meet the EPA Ground Water Standards. The selection is to perform no remediation based on the classification of ground water in the uppermost aquifer as limited use, which allows the application of Supplemental Standards. The limited use ground water at the Falls City Site is neither a current nor potential source of drinking water because of widespread ambient contamination that cannot be cleaned up using treatment methods reasonably employed in public water supply systems (40 CFR 192.11(e)).

As a best management practice, the Department of Energy will monitor ground water in the uppermost aquifer to ensure that beneficial uses such as irrigation and stock watering are protected. To ensure beneficial uses are protected and can continue to be used as a resource, and to monitor plume movement, wells 862, 886, 891, 924, and 963 will be sampled annually for 5 years (until 2002). At the end of the 5-year monitoring period, DOE will consult with the NRC, state of Texas, and the public to determine if continued monitoring is required. This ground water monitoring commitment is in addition to disposal cell performance monitoring identified in the *Remedial Action Plan and Site Design for Stabilization of the Inactive Uranium Mill Tailings Site at Falls City*. This monitoring requirement is being performed by the UMTRA Long-Term Surveillance and Maintenance Project.

Details supporting the: (1) regulatory framework requirements; (2) summary of site conditions; and (3) ground water compliance strategy selection can be found in the *Baseline Risk Assessment of Ground Water Contamination at the Uranium Mill Tailings Site Near Falls City, Texas*, (September 1995), *Final Site Observational Work Plan (SOWP) for the UMTRA Project Site, at Falls City, Texas* (May 1997), and the *Final Environmental Assessment of Ground Water Compliance at the Falls City, Texas, Uranium Mill Tailings Site* (March 1998).