UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 EAST LAMAR BOULEVARD
ARLINGTON, TEXAS 76011-4511

October 7, 2021

Lance Hauer
Legacy Site Team Leader
General Electric Co.
c/o Angelica Todd
1 River Road
Bldg. 5, 7th Floor West
Schenectady, NY 12345-6000

SUBJECT: NRC INSPECTION REPORT 040-08907/2021-001

Dear Mr. Hauer:

This letter refers to the U.S. Nuclear Regulatory Commission (NRC) inspection conducted September 16, 2021, at your former United Nuclear Corporation Church Rock uranium mill in McKinley County, New Mexico. This inspection was an examination of activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel.

The inspection findings were presented to you and your staff at the conclusion of the onsite inspection. The enclosed report presents the results of this inspection. No violations were identified, and no response to this letter is required.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter, its enclosure, and your response, if you choose to provide one, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

Should you have any questions concerning this inspection, please contact Dr. Robert Evans, Senior Health Physicist, at 817 200-1234, or the undersigned at 817-200-1156.

Sincerely,

Signed by Gepford, Heather
on 10/07/21

Heather J. Gepford, PhD, CHP, Chief
Materials Licensing & Decommissioning Branch
Division of Nuclear Materials Safety

Docket No. 040-8907
License No. SUA-1475

Enclosure:
NRC Inspection Report 040-08907/2021-001

cc:
R. Spitz, Site Project Manager
R. Santiago, Bureau Chief, NMED
B. Tsosie, DOE

NRC INSPECTION REPORT 040-08907/2021-001 – DATED OCTOBER 7, 2021

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ADAMS ACCESSION NUMBER: ML21269A003

■ SUNSI Review By: RJE | ADAMS: ■ Yes ☐ No | ☐ Non-Publicly Available ■ Publicly Available | ■ Non-Sensitive ☐ Sensitive | Keyword: NRC-002

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U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket:	040-08907
License:	SUA-1475
Report:	040-08907/2021-001
Licensee:	UNC Mining and Milling Division of United Nuclear Corporation
Facility:	Former Church Rock uranium mill
Location:	McKinley County, New Mexico
Date:	September 16, 2021
Inspector:	Robert J. Evans, PhD, PE, CHP, Senior Health Physicist Materials Licensing and Decommissioning Branch Division of Nuclear Materials Safety
Accompanied by:	Stephen Poy, Project Manager State Agreement and Liaison Programs Branch Division of Materials Safety, Security, State, and Tribal Programs Office of Nuclear Material Safety and Safeguards Randall Fedors, Senior Hydrogeologist Reactor Decommissioning Branch Division of Decommissioning, Uranium Recovery, and Waste Programs Office of Nuclear Material Safety and Safeguards
Approved by:	Heather J. Gepford, PhD, CHP, Chief Materials Licensing and Decommissioning Branch Division of Nuclear Materials Safety
Attachment:	Supplemental Inspection Information

Enclosure

EXECUTIVE SUMMARY

UNC Mining and Milling, a Division of United Nuclear Corporation
NRC Inspection Report 040-08907/2021-001

This U.S. Nuclear Regulatory Commission (NRC) inspection was a routine, announced inspection of decommissioning activities being conducted at the former Church Rock mill in McKinley County, New Mexico. In summary, the licensee was conducting decommissioning activities in accordance with license and regulatory requirements.

Management Organization and Controls

- The licensee maintained adequate staffing commensurate with current site activities to ensure compliance with license and regulatory requirements. The licensee's contractor conducted routine site inspections to ensure that adverse conditions were identified and corrected. The contractor also conducted annual audits and land use surveys in accordance with regulatory and license requirements. (Section 1.2)

Radiation Protection

- The licensee's contractor implemented its radiation protection program in accordance with license and regulatory requirements. The contractor's records indicated that no workers were assigned an occupational exposure since the last inspection, all workers had received required training, and no contamination problems were identified. (Section 2.2)

Radioactive Waste Processing, Handling, Storage and Transportation

- The licensee's contractor managed radioactive wastes in accordance with license requirements. The contractor continued to control access to the licensed and radiologically restricted areas using gates, fences, locks, and postings. (Section 3.2)

Effluent Control and Environmental Protection

- The licensee conducted groundwater monitoring and groundwater corrective actions in accordance with license requirements. The licensee continued to report the results in semi-annual monitoring and annual corrective action reports to the NRC. (Section 4.2)

Report Details

Site Status

United Nuclear Corporation's uranium mill operated from 1977-1982. The mill processed ore primarily from two nearby mines. The mill was decommissioned in 1984-1992. The mill site was released from the license for unrestricted use in 1995.

An estimated 3.5 million tons of tailings were disposed in the tailings impoundment. The impoundment consists of three areas—the north cell, central cell, and south cell. A radon barrier was completed over the tailings material in 1996, except for the south cell where two lined evaporation ponds are located. The ponds are used for evaporation of potentially contaminated groundwater extracted from the Zone 3 remedial action target area. The licensee also continued to monitor the status of groundwater plumes in the Southwest Alluvium and Zone 1 target areas. In addition, the licensee continued to conduct routine site maintenance, and license compliance activities.

On March 29, 2013, the U.S. Environmental Protection Agency (EPA) issued a Record of Decision for the disposition of mine waste at the nearby Northeast Church Rock mine site (Agencywide Documents Access and Management System [ADAMS] Accession No. ML13095A352). The EPA's selected remedy was to remove approximately one million cubic yards of waste material from the mine site and dispose of the material at the NRC-regulated tailings impoundment. Between November 2013 and November 2016, EPA contractors collected samples from the mine site and tailings impoundment to support the development of a remedial design plan.

By letter dated September 24, 2018, the licensee requested an amendment to its NRC license to revise its reclamation plan on order to construct a repository for non-11e.(2) byproduct material mine waste on top of the 11e.(2) byproduct material tailings disposal area (ADAMS Accession No. ML18267A235). At the time of this inspection, NRC staff continued to review this request. By letter dated June 29, 2021 (ADAMS Accession No. ML21172A239), the NRC indicated that it planned to issue a decision on the proposed amendment by June 2022.

License Condition 25 provides the financial assurance requirements. By letter dated March 31, 2020 (ADAMS Accession No. ML20091J376), the licensee transmitted its annual surety update to the NRC. The NRC subsequently approved the revised decommissioning cost estimates and updated surety via Amendment 55 to License SUA-1475 dated January 12, 2021 (ADAMS Accession Nos. ML20345A335 and ML20345A339).

1 Management Organization and Controls (IP 88005)

1.1 Inspection Scope

The inspector reviewed the licensee's oversight and control of licensed activities.

1.2 Observations and Findings

The licensee's onsite staff consisted of five contractors. The organizational requirements are provided in the contractor's radiation protection program manual. The highest-ranking official was the site project manager. This individual reported to the contractor's manager of radiological services and engineering and the licensee's Legacy

Site team leader. Other onsite staff included the assistant project manager/environmental technician, radiation safety officer (RSO), environmental technician, and project administrator. These contractors conducted site maintenance, operated the groundwater extraction wells, and collected groundwater samples. In summary, the licensee had sufficient staff for the limited amount of work in progress and to maintain compliance with license and regulatory requirements.

The RSO conducted monthly site inspections to verify the condition of the radiologically restricted areas. The monthly inspections included visual observation of site fences, evaporation ponds, and weather-related damage. The RSO documented adverse conditions when identified as well as corrective actions needed to resolve these adverse conditions. The site staff also conducted weekly evaporation pond inspections. Access to the tailings impoundment was controlled with signs, gates, and fences as required by License Condition 11.

The RSO conducted an annual As Low As Reasonably Achievable (ALARA) audit in accordance with Title 10 to the *Code of Federal Regulations* (10 CFR) 20.1101(c). The most recent audit was submitted to the NRC by letter dated January 27, 2021 (ADAMS Accession No. ML21029A236). Based on the licensee's review, all license and regulatory requirements were fulfilled since the previous audit. The inspector concluded that the ALARA audit met the requirements of 10 CFR 20.1101(c).

License Condition 31 requires the licensee to conduct an annual survey of land use (grazing, residence, wells, etc.) within two miles of the facility and submit a report of this survey to the NRC. By letter dated March 25, 2021, the licensee submitted the annual land use survey to the NRC for 2020 (ADAMS Accession No. ML21091A101). During 2020, the licensee identified no new residential occupied homes. The current total number of occupied homes remains at 34 within a two-mile radius of the facility. In addition, no new monitoring wells had been drilled in 2020. The inspector reviewed the 2020 annual land use survey and concluded that it met license requirements.

1.3 Conclusions

The licensee maintained adequate staffing commensurate with current site activities to ensure compliance with license and regulatory requirements. The licensee's contractor conducted routine site inspections to ensure that adverse conditions were identified and corrected. The contractor also conducted annual audits and land use surveys in accordance with regulatory and license requirements.

2 Radiation Protection (IP 83822)

2.1 Inspection Scope

The inspector reviewed the licensee's radiation protection and training programs to verify compliance with 10 CFR Part 20 and license requirements.

2.2 Observations and Findings

The licensee maintained a radiation protection program commensurate with the limited amount of work in progress at the site. License Condition 20 specifies that written procedures for radiation protection shall be established. The licensee established

procedures for radiation protection and environmental monitoring. The inspector verified that these site procedures were reviewed annually by the RSO.

Although the licensee does not monitor routinely for occupational radiation exposure, due to historical exposures of less than 10 percent of the NRC limits, they maintain procedures and equipment in place to initiate monitoring for internal and external exposures if needed.

Equipment release surveys and personnel contamination surveys were conducted as needed to support site activities. Since the previous inspection, no radiation work permits had been initiated since no non-routine work was conducted.

Radiation safety training was provided annually to all site workers. Visitors were provided safety and health training before being allowed to access areas other than the administration building. Staff who prepare samples for shipment to laboratories for analysis received U.S. Department of Transportation Hazardous Materials training every three years. The inspector reviewed a selection of training documents and found them to be adequate.

The contractor maintained radiation protection instrumentation available for use. The site had 10 radiation protection instruments in inventory including micro-Roentgen meters, standard ratemeters with Geiger-Mueller pancake probes, and standard scalers with alpha, beta, or gamma scintillation probes. These meters were used for equipment and material release surveys and surveys of onsite conditions. The inspector reviewed a selection of the survey records generated since the last inspection as well as the instrument calibration records. These records are required to be maintained per License Condition 18. The inspector concluded that the appropriate instrument was used for each type of survey conducted, and all instruments were calibrated at the time of use.

2.3 Conclusions

The licensee's contractor implemented its radiation protection program in accordance with license and regulatory requirements. The contractor's records indicated that no workers were assigned an occupational exposure since the last inspection, all workers had received required training, and no contamination problems were identified.

3 Radioactive Waste Processing, Handling, Storage and Transportation (IP 88035)

3.1 Inspection Scope

The inspector conducted a site tour, interviewed licensee representatives, and reviewed applicable records to determine if the licensee had established and maintained an effective program for managing radioactive wastes.

3.2 Observations and Findings

The inspector conducted a site tour, in part, to observe the status of the licensed area. The three tailings disposal cells appeared to be in good condition with little observed erosion. The existing radiologically restricted areas included the two evaporation ponds, waste disposal area, and contaminated equipment yard. The two evaporation ponds were designed to hold a total of ten million gallons of water. The contractor used

herbicide as needed to control the deep-rooted plants near the evaporation ponds. License Condition 32 allows the licensee to use an enhanced evaporation system. At the time of the inspection, the enhanced evaporation system was not in service, in part, due to low extraction water flow conditions.

During the site tour, extracted groundwater was being pumped from several Zone 3 extraction wells. Due to low extraction flow rates, less than a gallon per minute, the contractor supplemented this flow with fresh water at approximately 45 gallons per minute, in part, to help maintain the minimum water depth (0.5 feet) in the two evaporation ponds. The inspector also observed the status of the contaminated equipment storage areas. The inspector noted that the contractor continued to control access to the licensed and radiologically restricted areas using signs, gates, and fences. All signs, gates, and fences were in good condition.

The inspector walked down portions of the Pipeline Arroyo area, an area that has experienced significant erosion in the last few years. A plan is being developed to conduct stabilization work in the arroyo, to address potential future undercutting near the existing tailings impoundment. Although the arroyo erosion currently has no impact on the tailings cells, improvements are necessary to ensure that the tailings cells are not impacted in the future.

3.3 Conclusions

The licensee's contractor managed radioactive wastes in accordance with license requirements. The contractor continued to control access to the licensed and radiologically restricted areas using gates, fences, locks, and postings.

4 Effluent Control and Environmental Protection (Inspection Procedure 88045)

4.1 Inspection Scope

The inspector reviewed the licensee's effluent and environmental protection programs to ensure compliance with license and regulatory requirements.

4.2 Observations and Findings

License Condition 30 provides the requirements for the groundwater monitoring and corrective action program. The program consists of groundwater extraction, groundwater sampling, and water level measurements in three target remediation areas. The target remediation areas include Zone 1, Zone 3, and the Southwest Alluvium. License Condition 30.A references 53 wells in the compliance monitoring program. Thirty-two wells require quarterly groundwater sampling and water level measurements, and the remaining 21 wells require only quarterly water level monitoring. License Condition 30.B lists the 16 wells that must comply with the groundwater protection standards as specified in the license.

The groundwater monitoring network and corrective action program include additional wells that are referred to as extraction (RW wells), pumping (NW barrier wells), supplemental, and sentinel wells. These wells are not listed in the license; although, the licensee provides the results of water sampling and water level measurements from these wells, as appropriate, in the semi-annual and annual reports.

The licensee organized its reporting of groundwater data into three types of reports:

- Semi-annual groundwater and environmental monitoring reports
- Annual corrective action reports
- Semi-annual quality assurance reports

The inspector reviewed the data provided in the last two semi-annual monitoring reports. These reports include the “Semi-Annual Ground Water and Environmental Monitoring Report, Second Half of 2020,” dated February 22, 2021 (ADAMS Accession Nos. ML21067A067 and ML21067A068), and the “Semi-Annual Ground Water and Environmental Monitoring Report, First Half of 2021,” dated August 25, 2021 (ADAMS Accession No. ML21245A300).

The inspectors also reviewed the most recent groundwater corrective action report entitled, “Annual Performance Review Report: 2020 Corrective Action,” dated January 29, 2021 (ADAMS Accession No. ML21048A132). The licensee provided descriptions, summaries, data analysis, and figures of the groundwater data in the annual corrective action reports.

The licensee provided the quality assurance records in separate semi-annual reports, which for the past year included the “Semi-Annual Ground Water Quality Assurance Report, Second Half of 2020,” dated February 22, 2021 (ADAMS Accession Nos. ML21067A067 and ML21067A069), and the “Semi-Annual Ground Water Quality Assurance Report, First Half of 2021,” dated August 25, 2021 (ADAMS Accession No. ML21245A301). These reports contain the field and laboratory data sheets including information on field blanks and duplicates, chain of custody, and laboratory quality control and performance. The quality assurance program included requirements for data evaluation. Data evaluation was conducted by the RSO using a checklist. After the RSO confirmed flagged instances of data exceedances, out-of-range values, and significant increases or decreases in the data, the results were incorporated and discussed in the annual corrective action report.

License Condition 12 provides the requirement for reporting the results of the environmental monitoring program. Specifically, License Condition 12 cites guidance entitled, "Sample Format for Reporting Monitoring Data," which could not be located during the inspection. However, the licensee’s documentation was generally consistent with the reporting guidance provided in Regulatory Guide 4.14, Revision 1, Radiological Effluent and Environmental Monitoring at Uranium Mills.

The inspectors noted one significant change in the groundwater monitoring results within the past year. This change involved the expansion of the contaminant plume in Zone 3 towards the northern property boundary, despite decreasing groundwater water levels. The contaminant impacted area was associated with a low pH plume emanating from the North tailings cell. Supplemental monitoring well MW-7, which is less than 200 feet from the northern property boundary, became an impacted well over the past year. A well is designated impacted if one or more of the groundwater protection standards are exceeded. There are two wells to the north of MW-7, and both are situated along the property boundary. The results for these two wells (0142 and 0143) were not reported in the corrective action report. Additionally, sentinel wells on the Navajo land bordering the site to the north were constructed in December 2019 and January 2020, but access to

the wells has not yet been granted due to the ongoing pandemic. Thus, the inspectors were unable to confirm if the expanded plume remains onsite or has migrated north of the property line.

A confounding factor in terms of the adequacy of the corrective action program is that the total extraction of groundwater from all extraction wells in Zone 3 continues to decline and has dropped below 0.2 gallon/minute as reported in the 2020 corrective action report. The RSO described slow recovery (i.e., flux of groundwater into the wellbore) in the extraction wells that was insufficient to maintain continuous pumping. Besides lower water table levels, slow recovery in the extraction wellbores could also be caused by clogging, especially considering that pumping associated with the corrective action program has continued for more than 30 years. Well re-conditioning was last executed in 2004 and 2005 to improve well yields according to Table 1 of the corrective action report. The inspectors discussed with licensee representatives whether the corrective action program needed to be reassessed for efficacy in ensuring contamination has or does not migrate offsite.

The inspector reviewed the implementation of groundwater protection standards specified in License Condition 30.B. The inspector identified two inconsistencies:

- Reversal of groundwater protection standards for Zone 1 and Zone 3 in the corrective action report (pages 5 and 6)
- A pending 2018 license amendment request (ADAMS Accession No. ML18149A131) that identified errors in the groundwater protection standards as listed in License Condition 30.B

For the first inconsistency, the RSO provided a checklist entitled “Groundwater Protection Standards for All Zones,” that was used as part of the data analysis process. The inspector reviewed the checklist and confirmed that the correct groundwater protection standards provided in License Condition 30.B were used to identify exceedances prior to documentation in the annual corrective action report.

For the second inconsistency, a review of a pending 2018 license amendment request identified one potentially impactful error in the groundwater protection standards. The current version of License SUA-1475 was Amendment 55 dated January 12, 2021 (ADAMS Accession Nos. ML20345A335 and ML20345A339). In the 2018 license amendment request, the value for lead was listed as 0.07 milligrams per liter (mg/L) instead of the 0.7 mg/L value provided in License Condition 30.B. Another typographical error was identified for uranium; however, the correct value noted in the 2018 license amendment request was larger, and thus less restrictive. The inspectors note that the RSO’s checklist, “Groundwater Protection Standards for All Zones,” which is used by the licensee for data analysis, has the more restrictive value of 0.07 mg/L for lead. In addition, the inspectors reviewed data tables in the 2020 corrective action report for instances of lead values above 0.07 mg/L, but below 0.7 mg/L, and found none. Hence, there is no impact for 2020 groundwater results due to the typographical error in the groundwater protection standard. These typographical errors and other existing groundwater corrective action program attributes are expected to be modified in the future as part of the proposal to place mine wastes on top of the NRC-licensed tailings material.

4.3 Conclusions

The licensee conducted groundwater monitoring and groundwater corrective actions in accordance with license requirements. The licensee continued to report the results in semi-annual monitoring and annual corrective action reports to the NRC.

5 Exit Meeting Summary

The inspector presented the inspection results to the licensee's representatives at the conclusion of the onsite portion of the inspection on September 16, 2021. During the inspection, the licensee did not identify any information reviewed by the inspector as proprietary.

SUPPLEMENTAL INSPECTION INFORMATION

Partial List of Persons Contacted

Licensee
L. Hauer, Legacy Site Team Leader
M. Chischilly, Radiation Safety Officer
R. Spitz, Project Manager

Inspection Procedures Used

IP 83822	Radiation Protection
IP 88005	Management Organization and Controls
IP 88035	Radioactive Waste Processing, Handling, Storage and Transportation
IP 88045	Effluent Control and Environmental Protection

Inspection Procedures Not Used

IP 88010	Operator Training//Retraining (Reviewed under IP 83822)
IP 88025	Maintenance and Surveillance of Safety Controls (Reviewed under IP 83822)
IP 88050	Emergency Preparedness (Not applicable, since no formal program)
IP 86740	Transportation of Radioactive Materials (Reviewed under IP 83822)

Items Opened, Closed, and Discussed

Opened

None

Closed

None

Discussed

None

List of Acronyms Used

ADAMS	Agencywide Documents Access and Management System
ALARA	As Low As is Reasonably Achievable
CFR	Code of Federal Regulations
EPA	U.S. Environmental Protection Agency
IP	Inspection Procedure
mg/L	milligrams per liter
NRC	U.S. Nuclear Regulatory Commission
RSO	radiation safety officer