

ENCLOSURE

U. S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket No.: 40-8907

License No.: SUA-1475

Report No.: 40-8907/96-01

Licensee: United Nuclear Corporation

Facility: Former Church Rock Uranium Mill

Location: McKinley County, New Mexico

Dates: October 7-8, 1996

Inspector: M. Linda McLean, Senior Health Physicist

Approved By: Charles L. Cain, Technical Assistant
Division of Nuclear Materials Safety

Attachment: Partial List of Persons Contacted
List of Items Opened, Closed, and Discussed
List of Inspection Procedures Used
List of Acronyms

EXECUTIVE SUMMARY

Former Church Rock Uranium Mill
NRC Inspection Report 40-8907/96-01

This inspection included a review of site status, management organization and controls, site operations, and the licensee's radiation protection and environmental monitoring programs.

Management Organization and Controls

- No changes had been made to the organizational structure since the last inspection. The site staffing was appropriate for the amount of work in progress at the facility (Section 2).
- Procedures had been established at the site. The procedures were deemed adequate for the work in progress (Section 2).

Operations Review

- Site activities appeared to have been conducted in accordance with applicable license and regulatory requirements. Site fences were in good condition, and perimeter postings were appropriate (Section 2).

Radiation Protection

- The licensee had implemented a radiation protection program that met requirements of 10 CFR Part 20 and the conditions of the license (Section 3).
- Occupational exposures at the site were small fractions of the limits established in 10 CFR Part 20. Program areas deemed satisfactory included the training, equipment release, and radiation work permit programs (Section 3).

Environmental Monitoring

- The licensee's implementation of its environmental monitoring program appeared effective and met applicable regulatory requirements and the conditions of the license (Section 4).
- All reports related to the groundwater and environmental monitoring programs had been submitted to the NRC as required, and the reports were thorough and technically accurate. A review of the reports revealed that releases of radioactive materials to the environment were within regulatory limits during the inspection period (Section 4).

Report Details

1 Site Status

United Nuclear Corporation's (UNC) Church Rock mill site operated between 1977 and 1982. Reclamation of the site began in 1984. The mill was decommissioned in 1992, and the NRC released the mill site and buildings in 1995 by License Amendment 21. At the time of the inspection, the site's restricted area was limited to the tailings area.

Site reclamation activities since the last NRC inspection included placement of the final radon barrier caps on Borrow Pit No. 2 (completed during the summer of 1995) and the South Cell (completed in 1996). With this completed, the licensee has completed covering the entire tailings area (approximately 110 acres) with the final radon barrier. Radon flux measurements were conducted in September 1996. The results of the measurements were pending at the time of the inspection.

By letter dated May 3, 1996, the licensee received NRC approval to modify their approved surface reclamation plan. The modifications consisted of rerouting the lower reach of the North Cell Drainage Channel and construction of the South Drainage Cell Channel prior to completion of the groundwater corrective action program. Construction of the new diversion channel was completed this summer. In addition, construction of a buried jetty was completed during this inspection period.

Two lined evaporation ponds encompassing approximately 17 acres were in use for groundwater remediation. Each pond has the capacity of 7.5 million gallons of water. The licensee was operating enhanced evaporation systems at the evaporation ponds. The licensed activities in progress during this inspection included groundwater monitoring and well maintenance. Site structures consisted only of office buildings and a house trailer.

2 Management Organization and Controls (88005) Operations Review (88020)

a. Inspection Scope

The organizational structure was reviewed to ensure that the licensee had established an organization with defined responsibilities and functions. In addition, the inspector reviewed licensee operations to determine compliance with applicable requirements specified in the license.

b. Observations and Findings

The UNC onsite staff consisted of six full-time and four part-time workers. The general manager was the highest ranking onsite official. The general manager had a

dual role of radiation safety officer (RSO). No significant changes had been made to the organizational structure since the last inspection in January 1995.

A site tour was performed to verify that site activities were being conducted in accordance with applicable regulations and the conditions of the license. During the tour, fences and gates were observed to be in good condition and were properly posted. In addition, the inspector observed the reclamation activities that had been completed since the last inspection. Gamma exposure rate measurements were obtained at several locations around the site property and ranged from 20 to 25 microR per hour. The exposure rates were measured using a microroentgen meter calibrated to a cesium-137 source.

License Condition 16 requires, in part, that the licensee conduct monthly documented tailings area inspections. The inspector reviewed the monthly inspection reports conducted during the inspection period. The inspections, conducted by the RSO or radiation safety technician (RST), included inspections of the fences, air monitoring stations, signs, and gates. No oversights in documentation were noted. Monthly inspections of blown sands and dam seepage were discontinued after the final radon barriers were placed on the tailings.

c. Conclusions

The site staffing was appropriate for the amount of work in progress at the facility. Site activities appeared to have been conducted in accordance with applicable license and regulatory requirements.

3 Radiation Protection (83822)

a. Inspection Scope

The purpose of this portion of the inspection effort was to determine if the licensee's radiation safety program was in compliance with requirements established in the license and 10 CFR Part 20 regulations. Areas inspected included equipment releases, radiation work permits (RWPs), and radiation protection training records.

b. Observations and Findings

License Condition 18 specifies various documents relating to the radiation protection program which must be maintained. A review of records relating to instrument calibrations, personnel training, employee exposures, and equipment releases was performed, and no oversights in documentation were noted. Calibration records for radiological survey instruments were reviewed, and all instrument calibrations were noted to be current.

License Condition 21 requires the use of radiation work permits (RWPs) for work not covered by standard operating procedures in restricted areas or areas where the

potential for exposure to radioactive materials exists. Several RWPs were issued since the last inspection. The inspector reviewed a representative sample of the RWPs issued since the last inspection and concluded that the RWPs adequately addressed safety hazards involved with the associated activities.

Generally, the RWPs were issued for contract workers involved in reclamation activities, such as construction of the new diversion channel and buried jetty. Urine bioassays were required prior to the start of the work and again upon completion. In addition, UNC's mill tailings workers had semiannual urine bioassays performed. No sample exceeded the licensee's action limit of 5 $\mu\text{g/l}$ for natural uranium. Licensee and contract workers working on the mill tailings were provided with thermoluminescent dosimeters which were exchanged semiannually. Dosimetry records showed that exposures were well below regulatory limits. The highest recorded dosimetry result for the first half of 1996 was 16 mrem.

A copy of UNC's ALARA Report was submitted to the NRC by letter dated January 6, 1996, in accordance with License Condition 28. The annual program audit was conducted by the manager of environmental affairs, the RSO, and the RST on December 20, 1995. The report discussed the radiation protection program at the Church Rock site and included a summary of licensed activities at the site. The report satisfied the requirements of Subpart B and Subpart L of 10 CFR Part 20 and the license.

License Condition 11 requires all equipment or packages being released from the restricted area to be surveyed for radioactive contamination prior to release. The inspector reviewed records of equipment released during the inspection period and during the mill decommissioning activities (e.g., a rake shaft and wood staves). After discussion with the personnel who had performed the surveys, the inspector concluded that the surveys conducted to support the release of the rake shaft and other equipment were in accordance with the licensee's procedure, and the levels of contamination recorded were within the guidelines set forth by the NRC.

The inspector confirmed that the licensee had conducted annual training that included all employees. The inspector reviewed training records of contract workers. The training records included copies of written examination results and the topics discussed. In addition, the inspector reviewed training records of the individuals responsible for performing surveys of decontaminated equipment. Records showed that the employees had been trained to conduct in-process radiation surveys. The RSO or RST performed the final radiation surveys on equipment prior to release for unrestricted use. Through interviews with the site staff, the inspector concluded that the training was sufficient to cover current operations.

c. Conclusions

The licensee had implemented a radiation protection program that met the requirements established in 10 CFR Part 20 and the license. Occupational doses appeared consistent with the level of activity in progress at the site.

4 **Environmental Protection (88045)**

a. Inspection Scope

The environmental monitoring program at the site was reviewed to assess the effectiveness of the licensee's program and to evaluate the effects, if any, of the site's activities on the local environment.

b. Observations and Findings

License Condition 12 requires that results of effluent and environmental monitoring must be reported to the NRC on a semiannual basis. The semiannual effluent reports for 1995 and for the first half of 1996 were reviewed. The reports were dated August 23, 1995, February 12, 1996, and August 30, 1996, respectively.

The licensee's environmental monitoring program consisted of air particulate, radon gas, groundwater, and ambient gamma exposure rate measurements. The licensee had four environmental stations around the licensed area. The licensee sampled for natural uranium, thorium-230, radium-226, lead-210 particulates, and radon-222 gas. Results of the particulate sampling for the three monitoring periods were less than 2 percent of the regulatory limits. Radon gas and environmental gamma radiation levels were continuously monitored at the environmental stations. The effluent concentration for radon-222 during these three monitoring periods ranged up to 12 percent of the regulatory limit. (The 10 CFR Part 20, Appendix B, effluent concentration limit for radon-222 is 10 pCi/l.) All data indicated no statistically discernable radon progeny contribution to the environment from site operations.

Groundwater remediation was the primary activity at the Church Rock site during this inspection period. License Condition 30 requires that a groundwater compliance monitoring program and corrective action program be implemented. The groundwater compliance program consisted, in part, of sampling at compliance wells for a number of chemical and radiological constituents. A review of the licensee's and laboratory's documentation revealed that the licensee had obtained all groundwater samples as required by the license.

The inspector concluded that the licensee had effectively implemented the environmental monitoring program in accordance with license and procedural requirements. The area surveillance, air particulate, ambient gamma, ambient radon, and ground water samples had been taken and analyzed at the required frequencies.

c. Conclusions

A review of the licensee's environmental monitoring programs indicated that the licensee was appropriately controlling activities and was in compliance with license requirements.

5 Exit Meeting Summary

The inspector presented the inspection results to the site representatives of the licensee at the conclusion of the inspection on October 3, 1996. Licensee representatives acknowledged the findings as presented.

ATTACHMENT

PARTIAL LIST OF PERSONS CONTACTED

Licensee

Juan R. Velasquez, President & Manager, Environmental Affairs
Edward Morales, General Manager and RSO
Max Chischilly, Radiation Safety Technician

INSPECTION PROCEDURES USED

IP 83822: Radiation Protection
IP 88005: Management Organization and Controls
IP 88045: Environmental Protection
IP 88020: Operations Review

ITEMS OPENED, CLOSED AND DISCUSSED

Opened: None

Closed: None

Discussed: None

LIST OF ACRONYMS USED

ALARA	As low as is reasonably achievable
RSO	Radiation Safety Officer
RST	Radiation Safety Technician
RWP	Radiation Work Permits
UNC	United Nuclear Corporation