



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
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ARLINGTON, TEXAS 76011-8064**

August 27, 2001

Mr. Oscar Paulson
Kennecott Uranium Company
P.O. Box 1500
Rawlins, Wyoming 82301

SUBJECT: NRC INSPECTION REPORT 40-8584/01-01

Dear Mr. Paulson:

On August 14, 2001, the NRC completed an inspection of your Sweetwater Uranium Facility, which continues in a standby status. The enclosed report presents the results of that inspection. No violations or deviations were cited; therefore, no response to this letter is required.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/NRC/ADAMS/index.html> (the Public Electronic Reading Room).

Should you have any questions concerning this inspection, please contact Louis C. Carson II at (817) 860-8221 or Charles L. Cain at (817) 860-8186.

Sincerely,

/RA/

Charles L. Cain, Chief
Nuclear Materials Licensing Branch

Docket No.: 40-8584
License No.: SUA-1350

Enclosure:
NRC Inspection Report
40-8584/01-01

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U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No.:	40-8584
License No.:	SUA-1350
Report No.:	40-8584/01-01
Licensee:	Kennecott Uranium Company
Facility:	Sweetwater Uranium Facility
Location:	Sweetwater County, Wyoming
Dates:	August 13-14, 2001
Inspector:	Louis C. Carson II, Health Physicist Nuclear Materials Licensing Branch
Accompanied By:	Charles L. Cain, Chief Nuclear Materials Licensing Branch
Approved By:	Charles L. Cain, Chief Nuclear Materials Licensing Branch
Attachments:	Supplemental Inspection Information

EXECUTIVE SUMMARY

Sweetwater Uranium Facility NRC Inspection Report 40-8584/01-01

This inspection included a review of site status, management organization and controls, site operation, radiation protection, radioactive waste management, and environmental protection programs. The facility continues to be in a standby status as it has been since 1983.

Management Organization and Controls

- The licensee's organization structure was consistent with the conditions of the license. Adequate oversight had been provided for site activities. Procedures were deemed adequate for the work in progress. The licensee had appropriately implemented the performance-based license and the safety and environmental review panel process (Section 2).

Operations Review and Radioactive Waste Management

- Site activities had been conducted in accordance with the applicable license and regulatory requirements. The mill and other onsite structures were maintained in good condition. Site fences were in good condition. Perimeter postings were appropriate. No significant health or safety concerns were identified during the site tours (Section 3).

Radiation Protection

- The licensee had implemented a radiation protection program as required by 10 CFR Part 20 and the license. Occupational exposures during 2000 and 2001 were below the limits established in 10 CFR Part 20 (Section 4).

Environmental Protection

- The licensee had conducted the environmental and groundwater monitoring programs and the annual land use survey in compliance with license requirements. All reports related to the groundwater and environmental monitoring programs had been submitted to the NRC as required. The reports were thorough and technically accurate. Laboratory documentation demonstrated that releases of radioactive materials to the environment were within regulatory limits from 1999 through the first half of 2001 (Section 5).

Report Details

1 Site Status

The Sweetwater Uranium Facility was built by the Minerals Exploration Company in 1980 and operated until 1983 when the facility was shutdown and placed in a standby mode. Structures in place at the site included the uranium mill, maintenance shop, administrative building, and other miscellaneous structures. A 60-acre tailings impoundment was also located at the site, with approximately 2.5 million tons of tailings being stored.

Site activities included general maintenance and preservation work, groundwater and environmental monitoring oversight, and other license related activities. The licensee has been storing contaminated equipment from the Pathfinder Lucky Mc remediation project. During this inspection, the licensee began disposal of 11e.(2) byproduct material from the Green Mountain Ion Exchange (GMIX) decommissioning project as allowed by License Condition 10.6.

2 Management Organization and Controls (88005)

2.1 Inspection Scope

The organization structure was reviewed to ensure that the licensee had established an organization with defined responsibilities and functions. The site standard operating procedures (SOP) were reviewed.

2.2 Observations and Findings

a. Management Organization

Site staffing requirements are established in License Condition 9.5. Site staffing consisted of four employees, including the facility supervisor, senior facility technician, mill foreman, and office manager. In addition, two contract security guards provided oversight of the facility during non-standard work hours. The site organization and staff were in accordance with the requirements of License Condition 9.5.

b. Management Controls

License Condition 9.6 requires SOPs to be established and implemented for all operational process activities involving radioactive materials that are handled, processed, or stored. SOPs were also required for all aspects of the radiation safety and environmental monitoring programs. Overall, site procedures had been established and were adequate for the work in progress at the site. SOPs had been updated and records indicated that the procedures had been reviewed on an annual basis.

c. Performance-Based License and the Safety and Environmental Review Panel

The licensee was issued a performance-based license (PBL) in July 1999. License Condition 9.3 of the PBL requires the licensee to establish a safety and environmental review panel (SERP). The SERP is required to ensure that changes to the facility and procedures, and tests or experiments which have not been reviewed by the NRC do not have adverse affects on systems, structures, components, and the operation of the facility. The licensee had established a SERP for pre-screening of radiation work permits and proposed changes. The inspector reviewed four safety environmental evaluations (SEE) that had been reviewed by the SERP.

- SEE#1: "Elimination of Alpha Surveys of the Roller Room Floor and Gamma Surveys in the Bin, Roller, and Dryer Room," dated June 13, 2000.
- SEE#2: "Suspension of the Tailings Pond Liner Drip," dated July 24, 2000.
- SEE#3: "Change in Reporting: Project Manager - Green Mountain Mining Venture," Organization Chart Revision," dated May 8, 2001.
- SEE#4: "Adding Ore Pad Material for GMIX 11e.(2)," dated July 11, 2001.

The SERP records and SEEs reviewed were found to be technically adequate. The SERP had made decisions in accordance with the conditions of the performance-based license. The inspector determined that the licensee's implementation of the PBL and SERP was adequate.

2.3 Conclusions

The licensee's organization structure was consistent with the conditions of the license. Adequate oversight had been provided for site activities. Procedures were deemed adequate for the work in progress. The licensee had appropriately implemented the performance-based license and the safety and environmental review panel process.

3 Operations Review (88020) and Radioactive Waste Management (88035)

3.1 Inspection Scope

A facility tour was performed to verify that site activities were being conducted in accordance with applicable regulations and the conditions of the license and to ensure that operational controls were adequate to protect the health and safety of workers and members of the general public.

3.2 Observations and Findings

During the plant tour, site buildings, fences, gates, and operating equipment were observed. Site fences were in good condition and were properly posted in accordance

with License Condition 9.9. Site structures and mill components appeared to have been properly preserved and maintained. Approximately 20,000 pounds of material containing U_3O_8 remained stored in 55-gallon drums and in a tank in the mill. The latter material was being maintained in a slurry form. Access to the material was controlled by the licensee.

The inspector visited the tailings impoundment and noted that the groundwater enhanced evaporation system was in service. The enhanced evaporation system consisted of a drip system and spray lines. The inspector observed that a sufficient amount of freeboard existed between the top of the pond surface and the top of the pond embankments in compliance with the requirements of License Condition 10.3.

The tailings impoundment sprays and evaporation system were placed into service May 1997. Six monitoring pumpback wells were in service in 2000, and a seventh pumpback well was placed into service in May 2001.

License Condition 10.6 allows the licensee to dispose of 10,000 cubic yards of 11e.(2) byproduct radioactive waste from the GMIX decommissioning project. The inspector observed the receipt and placement of three truckloads of the GMIX material into the licensee's tailings impoundment. The licensee reviewed the radioactive material shipping records and weighed each truckload of material on a recently calibrated scale. The inspector observed that each truckload of material was placed in a specific location in the tailings impoundment.

Additionally, the licensee had received and stored, in the main process facility, equipment that had been decommissioned and released from the Pathfinder Lucky Mc Remediation Project. The licensee explained that they had not sought NRC permission to dispose of this material.

3.3 Conclusions

Site activities had been conducted in accordance with the applicable license and regulatory requirements. The mill and other onsite structures were maintained in good condition. Site fences were in good condition. Perimeter postings were appropriate. No significant health or safety concerns were identified during the site tours.

4 **Radiation Protection (83822)**

4.1 Inspection Scope

The licensee's radiation protection program was reviewed for compliance with the requirements established in the license and 10 CFR Part 20 regulations.

4.2 Observations and Findings

a. Personnel Internal and External Exposures

To ensure that site workers had been properly monitored for potential exposures to radioactive materials, the licensee's internal and external monitoring programs were reviewed. The licensee's personnel monitoring program consisted of intermittent air sampling, surface contamination monitoring, and external radiation measurements.

For years 1999 and 2000, the licensee performed a determination that demonstrated that individual monitoring and annual dose calculations were not necessary to demonstrate compliance with the occupational dose limits in 10 CFR 20.1201. The inspector reviewed the licensee dose demonstration reports for the previous 2 years. The maximum individual exposure for 1999 and 2000 was 115 and 184 millirems, respectively. These demonstration results were based on the amount of time personnel spent in the mill and on the tailings impoundment. The demonstration included radiation survey data such as gamma surveys, radon measurements, and airborne particulate results from high volume and breathing zone samplers.

The air sample results indicated that the natural uranium concentrations in the air remained less than one percent of the derived air concentration (DAC) limit listed in 10 CFR Part 20, Appendix B. Radon daughter concentrations remained below 0.018 working levels, or 5 percent or less of the DAC limit of 0.33 working levels. The licensee monitored individuals with breathing zone samplers on a quarterly basis. The natural uranium concentrations in these samples were less than 10 percent of the DAC limit.

Overall, the licensee determined that site employees had received less than 10 percent of the occupational dose limit (5000 millirems) established in 10 CFR 20.1201 from either external or internal exposures.

During the site tour, the inspector measured ambient radiation levels using an NRC-issued microRoentgen meter (Serial Number 15540, calibration due date of November 29, 2001). The NRC did not identify any area that met the 10 CFR 20.1003 definition of a radiation area (greater than 5 millirems per hour). The highest exposure areas measured 1.6 - 2.2 millirems per hour in the central processing facility. Generally, the licensee measured external radiation exposure rates on a semi-annual basis. The inspector reviewed licensee May 2001 exposure rate data from the tailings impoundment. According to licensee survey records, there were no areas in the plant or the tailings impoundment that met the definition of a radiation area.

License Condition 9.5 requires the licensee to obtain air samples and external radiation measurements semiannually in the ore crushing and yellowcake areas of the mill. Air samples were to be analyzed for natural uranium and radon daughter concentrations. Record reviews and observations of personnel during the GMIX 11e.(2) material unloading at the tailings impoundment confirmed that the airborne samples and gamma measurements had been obtained.

b. Bioassay Program

The licensee performed bioassay sampling on a quarterly basis. Personnel tested included contract workers and individuals who were potentially exposed to radioactive materials. During year 2000, only site personnel submitted urine samples for laboratory analysis. Additional bioassay samples had been obtained during the first half of 2001 to include samples collected from workers associated with the GMIX decommissioning project. No sample results exceeded the lowest action level of 15 micrograms of uranium per liter of urine.

c. Employee Training

License Condition 9.5 requires the licensee to conduct initial and annual refresher training for all mill process or maintenance employees as specified by the topics listed in Section 5.3 of the March 1984 renewal application and 10 CFR 19.12. The licensee is required to document employee radiation safety training. The inspector confirmed that the licensee had conducted and documented annual training for all employees in February 2000 and March 2001. Special training had been held for 12 GMIX decommissioning employees on July 9 and August 2, 2001. The radiation safety officer (RSO) had completed the biennial RSO retraining on May 8, 2000. The inspector determined that the licensee was in compliance with License Condition 9.5 and 10 CFR 19.12.

d. Equipment Calibrations

License Condition 9.5 requires the licensee to calibrate all radiation monitoring, sampling, and detection equipment annually or as recommended by the manufacturer, whichever is more frequent. The licensee had established a semi-annual instrument calibration program for all instruments including survey meters, laboratory instruments, and air samplers. A review of selected instrument calibration records from May 1999 to August 2001 revealed that the instruments had been calibrated as required. Additionally, the inspector reviewed the licensee's instrument calibration chart from year 2000 which identified that all radiation instruments had been calibrated at the required intervals.

e. Release of Equipment for Unrestricted Use

License Condition 9.5 requires that the release of equipment or packages from the restricted area be in accordance with the NRC report, "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct or Source Materials," dated September 1984. A review of the licensee's equipment release records indicated that all components had been appropriately released by the licensee during years 2000 and 2001.

f. Annual As Low As is Reasonably Achievable (ALARA) Audit

License Conditions 9.3D and 12.3 requires the licensee to perform an annual ALARA audit. License Condition 12.3 requires the report to be submitted to the NRC. The most

current report, submitted to the NRC on February 21, 2001, was reviewed. The report was thorough and provided relevant information including analysis of trends.

4.3 Conclusions

The licensee had implemented a radiation protection program as required by 10 CFR Part 20 and the license. Occupational exposures during 2000 and 2001 were below the limits established in 10 CFR Part 20. Other program areas deemed satisfactory included the training, equipment calibration, radiation, and ALARA programs.

5 **Environmental Protection (88045)**

5.1 Inspection Scope

The environmental monitoring program was reviewed to assess the effectiveness of the licensee's program and to evaluate the effects, if any, of site activities on the local environment. The groundwater compliance monitoring program was reviewed to verify that the program was consistent with the requirements specified in the license.

5.2. Observations and Findings

a. Environmental Protection

License Condition 11.5 requires the licensee to submit the results of all effluent and environmental monitoring to the NRC on a semi-annual basis. Environmental monitoring program requirements are identified in License Condition 11.5. During mill shutdown, air particulate, radon, and gamma monitoring are required to be conducted downwind of the tailings cell. Also, radon monitoring is required at an upwind location.

The inspector reviewed the licensee's year 2000 and the first half of year 2001 semi-annual effluent reports dated August 9, 2000, and February 21 and August 8, 2001. These reports were found to be thorough and complete. The licensee appeared to have obtained all environmental monitoring samples required by the license, and the results were documented in the reports. The inspector noted that the licensee continues to maintain a computer database for tracking when specific environmental samples are due for analysis. Air samples had been collected at the environmental monitoring sample station No. 4A located downwind of the site. During year 2000 and 2001, the air sample filters were composited and analyzed quarterly for natural uranium, thorium-230, lead-210 and radium-226. Laboratory results indicated that all samples were less than 5 percent of the effluent concentration limits established in 10 CFR Part 20, Appendix B.

Ambient gamma exposure rates were measured at Sample Station No. 4A and at a control location in the administrative building. Data collected during year 2000 and 2001 indicated that Station No. 4A measured near background for the year.

Radon-222 samples were obtained at two sample stations. The highest radon measurement during year 2000 and the first half of year 2001 was obtained at Sample Station No. 2 upwind of the site. The sample measured 6.4 picocuries per liter which was 64 percent of the 10 CFR Part 20, Appendix B, effluent concentration limit. Radon sample results during year 2000 and first half of year 2001 measured 18 to 64 percent of the 10 CFR Part 20, Appendix B, effluent concentration limit for radon-222 with daughters removed.

The inspector's comparison of environmental monitoring data during year 2000 and first half of year 2001 indicated that the results were comparable. No adverse trends were identified in the environmental monitoring program.

b. Groundwater Compliance Monitoring Program

A groundwater compliance monitoring program is required by License Conditions 11.3 and 12.3. The licensee's groundwater compliance program included over 40 tailings monitoring wells and point-of-compliance wells. The program analyzed the wells for chemical and radiological constituents and currently operates six pumpback wells to extract groundwater. The groundwater was discharged into the tailings impoundment which contains an enhanced evaporation system to dispose of the groundwater in the tailings impoundment. The licensee had obtained the samples and operated the pumps and evaporation system as required by the license during 1999 and 2000.

A groundwater corrective action program review is required to be submitted to the NRC on an annual basis in accordance with License Condition 12.3. The licensee's annual corrective action program reports dated, February 21, 2000, and 2001 were briefly reviewed during the inspection. The inspector determined that the licensee had maintained a groundwater corrective action program as required by License Conditions 11.3 and 12.3.

c. Annual Land Use Survey

License Condition 11.2 stipulates that a land use survey be performed annually. The land use survey is required to be submitted to the NRC on an annual basis by License Condition 12.3. The inspector reviewed annual land use survey for years 1999 and 2000. No significant changes in land use within a 5-mile radius of the site were identified.

5.3 Conclusions

The licensee had conducted the environmental and groundwater monitoring programs and the annual land use survey in compliance with license requirements. All reports related to the groundwater and environmental monitoring programs had been submitted to the NRC as required. The reports were thorough and technically accurate. Laboratory documentation demonstrated that releases of radioactive materials to the environment were within regulatory limits from 1999 through the first half of 2001.

6 Exit Meeting Summary

The inspector presented the inspection results to the representatives of the licensee at the conclusion of the inspection on August 14, 2001. Licensee representatives acknowledged the findings as presented. The licensee did not identify any information reviewed during the inspection as proprietary information.

ATTACHMENT

PARTIAL LIST OF PERSONS CONTACTED

Licensee

G. Palochak, Mill Shift Foreman/Alternate Radiation Safety Officer
O. Paulson, Facility Supervisor/Radiation Safety Officer

INSPECTION PROCEDURES USED

IP	83822	Radiation Protection
IP	88005	Management Organization Control
IP	88020	Operations Review
IP	88035	Radioactive Waste Management
IP	88045	Environmental Monitoring

ITEMS OPENED, CLOSED AND DISCUSSED

Opened

None

Closed

None

Discussed

None

LIST OF ACRONYMS USED

ALARA	as low as reasonably achievable
DAC	derived air concentrations
GMIX	Green Mountain Ion Exchange
PBL	performance-based license
RSO	radiation safety officer
SEE	safety environmental evaluations
SERP	safety and environmental review panel
SOP	Standard Operating Procedure