



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
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November 26, 2001

John Vaselein, Radiation Safety Officer
and Manager
Environmental and Regulatory Services
COGEMA Mining, Inc.
935 Pendell Boulevard
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Mills, Wyoming 82644-0730

SUBJECT: NRC INSPECTION REPORT 40-8502/01-02

Dear Mr. Vaselein:

This refers to the inspection conducted on November 6-8, 2001, at the Irigaray and Christensen Ranch facilities. This inspection consisted of a review of site status, management organization and controls, radiation protection, site operations, radioactive waste management, and environmental protection. The inspection results were provided to members of your staff at the conclusion of the inspection. Overall, the inspection determined that you have continued to operate the in-situ leach facility in a safe and effective manner. The enclosed report presents the results of that inspection.

No violations or deviations were identified during this inspection; 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/reading-rm/adams.html> (the Public Electronic Reading Room).

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

Sincerely,

/RA/

Charles L. Cain, Chief
Nuclear Materials Licensing Branch

Docket No.: 40-8502
License No.: SUA-1341

Enclosure:
NRC Inspection Report
040-08502/01-02

NMED No. 010637

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U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No. 40-8502

License No. SUA-1341

Report No. 40-8502/01-02

Licensee: COGEMA Mining Corporation

Facilities: Irigaray/Christensen Ranch In-Situ Leach Facilities

Location: Johnson and Campbell Counties, Wyoming

Dates: November 6-8, 2001

Inspector: Louis C. Carson II, Health Physicist
Nuclear Materials Licensing Branch

Approved by: Charles L. Cain, Chief
Nuclear Materials Licensing Branch

Attachment: Supplementary Information

EXECUTIVE SUMMARY

Irigaray and Christensen Ranch In-Situ Leach Facilities NRC Inspection Report 40-8502/01-02

This inspection included a review of site status, management organization and controls, in-situ operations, radioactive waste management, radiation protection, environmental protection, and followup of event reports on spills and excursions. Overall, the licensee was operating the facility in a safe and effective manner.

Management Organization and Controls

- The licensee had maintained an organizational structure that agreed with the requirements of the license (Section 2).
- The licensee had correctly implemented the performance-based conditions of the license (Section 2).
- All procedures had been appropriately updated, reviewed, and were being followed as required (Section 2).

In-Situ Operations and Radioactive Waste Management

- Site activities appeared to have been conducted in accordance with applicable license conditions and regulatory requirements. No significant health or safety concern was identified during the tours of the Irigaray and Christensen Ranch sites (Section 3).

Radiation Protection

- The licensee had implemented a radiation program that met the requirements established in 10 CFR Part 20 and the license (Section 4).

Environmental Protection

- The licensee's groundwater monitoring program was determined to be in compliance with license requirements. Both the Irigaray and Christensen Ranch evaporation ponds were in good condition during the inspection (Section 5).

Report Details

1 Site Status

The Irigaray project started commercial in-situ leach (ISL) extraction operations during November 1978. The central processing facility is located at the Irigaray site, while the Christensen Ranch site is a satellite facility for the Irigaray plant. The licensee had submitted a decommissioning plan for NRC approval in May 2000. ISL production operations had ceased at the Christensen facility in June 2000, and all ISL extraction operations had ceased at the Irigaray site.

As a result of groundwater restoration operations, both the Christensen Ranch and Irigaray sites had produced 20,000 pounds of yellowcake slurry in addition to the 20,000 pounds that was in storage during the previous NRC inspection in April 2001. Thus, the licensee had approximately 40,000 pounds yellowcake slurry that they were drying and packaging in November 2001.

On October 4, 2001, the NRC authorized the licensee to produce up to 50,000 pounds of yellowcake per year from restoration fluids. The primary purpose of this inspection was to observe the licensee's yellowcake drying and packaging operations.

2 Management Organization and Controls (88005)

2.1 Inspection Scope

The organization structure was reviewed to ensure that the licensee had maintained an effective organization with defined responsibilities and functions. Also, the implementation of the licensee's performance-based license and standard operating procedures were reviewed.

2.2 Findings and Observations

a. Management Organization

Staffing requirements are provided in License Condition 9.3. This license condition refers to the license renewal application which included an organization chart dated October 30, 1995. At the time of this inspection, the licensee had an onsite staff of 25 employees. The licensee's onsite radiation protection and environmental monitoring staff positions were adequately filled with qualified individuals, and the onsite organizational structure agreed with the license.

b. Performance-Based License Review

License Condition 9.4 states that the licensee may, under certain conditions and without prior NRC approval, make changes in the facility or processes, make changes to procedures, or conduct tests and experiments not presented in the license application.

The licensee's determinations under License Condition 9.4 were made by the safety and environmental review panel (SERP). Since the previous inspection, the licensee had held two SERP meetings. The SERP reviews included changes to wellfield sampling frequencies and a change of the type of chemical used during the groundwater restoration process. The inspector determined that the licensee's implementation of the performance-based license had correctly ensured that changes made under the performance-based license did not negatively impact the licensing basis of the site.

c. Site Procedures

In accordance with License Condition 9.6, standard operating procedures (SOPs) are required to be established and followed for all operational process activities involving radioactive materials that are handled, processed, or stored. Additionally, all written procedures are to be approved in writing and reviewed annually by the radiation safety officer (RSO).

The inspector verified that the RSO had conducted the annual review of SOPs for the year 2001. Further, the inspector observed that operations were being conducted in compliance with established procedures. During this inspection, the inspector reviewed the following procedures:

- E-8 "Emergency Response Telephone Numbers"
- IR-11 "Drypack - Scrubber Calibration"
- IR-12 "Drypack - Yellowcake Drying and Drumming"
- IR-13 "Drypack - Scrubber"
- HP-10 "Equipment or Material Release to Unrestricted Areas"
- HP-11 "Radiation Work Permits" (RWP)
- HP-21 "Respiratory Protection Program"

The licensee's SOPs were determined to be adequate for the activities that were being conducted at the site.

2.3 Conclusions

The licensee had maintained an organization structure that agreed with the requirements of the license. Also, the licensee had correctly implemented the performance-based conditions of the license. All procedures had been appropriately updated, reviewed, and were being followed as required.

3 Operations Review (88020); In-Situ Leach Facilities (89001); Radioactive Waste Management (88035)

3.1 Inspection Scope

The inspector conducted a site tour to verify that site activities were being conducted in accordance with applicable regulations, license conditions, and to ensure that operational controls were adequate to protect the health and safety of the workers and members of the general public.

3.2 Findings and Observations

a. Site Tours

During the plant tours, site buildings, equipment, fences, and gates were observed. Site perimeter postings required by License Condition 9.11 were noted to be in place at all entrances to the site. No significant health or safety concern was identified during the tour. Additionally, License Condition 11.5 requires that the RSO conduct and document a daily walkthrough of the Irigaray facility during yellowcake dryer operations to determine that radiation control practices are being implemented appropriately. The inspector observed the RSO conducting the daily inspection and reviewed the licensee's completed walkthrough records for the period October 29 through November 6, 2001.

b. Process Plant Operations

Licensee Condition 10.1 restricts the licensee from injecting lixiviant into production wells for producing yellowcake. The inspector verified that no lixiviant injection operations had occurred since May 2000. License Condition 10.5, amended on October 4, 2001, authorizes the licensee to produce up to 50,000 pounds of yellowcake per year. As of this inspection, the licensee's production of yellowcake was below the limit specified in the license. The licensee had 40,000 pounds of wet yellowcake in storage in the thickener tank that had been recovered during groundwater restoration operations.

On October 30, 2001, the licensee started yellowcake drying and packaging (drypack) operations at the Irigaray site. The inspector reviewed the licensee activities that had been conducted prior to commencing yellowcake drypack operations. The licensee had implemented RWP 01-07 for opening, inspecting, and cleaning the yellowcake dryer furnace and hearth. The licensee had used RWP 01-08 for implementing maintenance on drypack components. The inspector noted that the licensee had implemented SOP IR-11, "Drypack - Scrubber Calibration," and a contractor had conducted tests on the plant ventilation stack.

The inspector verified that the licensee had assured that the yellowcake drypack effluent control systems were operating in accordance with License Condition 10.8. License Condition 10.8(A) requires that drypack operations be terminated within 1 hour if any of

the emission controls are not within the parameters specified by the State of Wyoming's Air Quality Permit No. OP-254. During this inspection, the inspector verified and observed the following regarding the licensee's compliance with License Condition 10.8:

- The licensee's air quality permit allowed a maximum stack discharge rate of 0.30 pounds/hour of particulates. The results of the stack tests conducted on November 2, 2001, measured 0.07 pounds/hour.
- By Licensee Condition 10.8, the licensee is required to record the following yellowcake drypack operations parameters once every 12 hours: scrubber water flowrate, air pressure, and differential pressure; furnace draft pressure; and test results of the scrubber and furnace alarms. The licensee had duly recorded the above-mentioned parameters from October 29 through November 8, 2001.
- During a weather-related power outage to the plant scrubber fan (an emission controls system) on November 7, 2001, the licensee had terminated drypack operations in less than 1 hour as required by License Condition 10.8.

Based on the inspector's observations, it was concluded that the licensee had been in compliance with License Condition 10.8. Additionally, the inspector observed that dried yellowcake was being loaded into barrels in accordance with SOP IR-12, "Drypack - Yellowcake Drying and Drumming." (The radiation protection steps that the licensee had implemented during the loading of the drums will be further discussed in Section 4.0 of this report.) The inspector noted that there were 40 barrels of dried yellowcake in storage. The drypack operation was filling one drum with yellowcake at least every 5-6 hours, with a nominal weight of 750 pounds per drum.

c. Well Field Operations

License Condition 11.1 limits the process fluid injection pressure to 120 pounds per square inch (psi) at Irigaray and 140 psi at Christensen Ranch. Pressure limitations help minimize above ground spills and below ground excursions. The inspector toured three wellfield module unit buildings at Christensen Ranch and Irigaray. The module unit buildings were properly posted and all operational parameters were within the prescribed limits as established by SOPs. All wells observed were being operated below the license limits.

3.3 Conclusions

Site activities appeared to have been conducted in accordance with applicable license conditions and regulatory requirements. No significant health or safety concern was identified during tours of the Irigaray and Christensen Ranch sites.

4 Radiation Protection (83822)

4.1 Inspection Scope

The purpose of this portion of the inspection effort was to determine if the licensee's radiation protection program was in compliance with requirements established in the license and 10 CFR Part 20 regulations.

4.2 Findings and Observations

a. Personnel Exposures

The inspector reviewed personnel exposure data for year 2001 to determine the licensee's compliance with License Condition 11.7, which requires assessment of personnel exposures in accordance with 10 CFR 20.1502 and Section 5.7 of the license application. To date this year, the highest total effective dose equivalent was 134 millirems. The highest individual committed effective dose equivalent for year 2000 was less than 1 millirem, which included exposure to radon daughters and uranium particulates.

The inspector reviewed this year's airborne particulate and radon progeny air sampling data that were analyzed as required by License Condition 10.10. The licensee had collected and analyzed the air samples on a monthly basis as required by the license. During yellowcake dryer operations and inspections, the licensee was analyzing air samples from each work shift. The inspector reviewed the weekly time weighted radiation dose and intake calculations from air samples. The licensee's derived air concentration (DAC) for yellowcake was $4.7E-10$ microcuries/milliliter. The highest airborne radioactivity measured since yellowcake drying operations resumed was $3.2E-10$ microcuries/milliliter in the dryer furnace area. The inspector noted that the license had issued respiratory protection equipment to all personnel requiring access to the drypack areas.

The inspector determined that the licensee's internal and external exposure determination program was adequate considering that personnel exposures for the year were a small percentage of the allowable limit of 5,000 millirems per year as required by 10 CFR Part 20.

b. Personal and Equipment Contamination Monitoring

License Condition 10.11 states, in part, that employees will monitor themselves with an alpha survey instrument prior to exiting the site restricted areas. The inspector observed that workers routinely conducted personnel contamination surveys before leaving the process areas. The inspector observed workers functionally checking the contamination survey instruments prior to each use. Additionally, the RSO had conducted contamination spot checks on workers since yellowcake drying operations had begun.

License Condition 9.8 stipulates that the release of equipment or packages from the restricted area will be in accordance with the attachment to the license entitled, "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct or Source Materials." The licensee's equipment release records were reviewed for year 2001. The licensee maintained extensive records of equipment that had been released from the site. No item was identified that had been inappropriately released from the site.

c. Bioassay and Respiratory Protection Programs

The bioassay program requirements are listed in License Condition 10.12 which states that the licensee will implement the bioassay program discussed in Regulatory Guide 8.22, Bioassay at Uranium Mills, and in Section 5.7.5, "Bioassay Program," of the approved license application. The licensee's program consisted of urine sampling for uranium content via baseline sampling of all site workers and monthly sampling of process workers assigned to areas where the possibility of yellowcake inhalation existed. Urine samples were being collected on a weekly basis for employees associated with drypack operations. The licensee also obtained blank and spiked samples for quality control purposes. The samples were analyzed by an offsite, third-party laboratory. The licensee's year 2001 records indicated that no individual had exceeded the first action level of 15 micrograms of uranium per liter of urine ($\mu\text{g/l}$).

License Condition 10.18 states that the respiratory protection program will be implemented as described in Section 5.7.4.4, "Respiratory Protection Program," of the approved license application. Section 5.7.4.4 references Regulatory Guide 8.15, Acceptable Programs for Respiratory Protection. The inspector observed licensee personnel use full-face and supplied-air respirators during entries into the yellowcake drum packaging area. Licensee controls of respirators such as storage, inspections, and testing were determined to be proper. The inspector's review of records showed that formal training, fit tests, physical evaluations and practical applications (donning and removing the respirators) had been performed in accordance with SOP HP-21 "Respiratory Protection Program." The licensee met the requirements of License Condition 10.18.

The inspector concluded from the bioassay results that the licensee's respiratory protection and contamination control methods were effective in the prevention of workers' intake of uranium.

d. Radiation Surveys

Licensee procedures require that all radiation survey instruments will be operationally checked before each use. The inspector inspected the licensee's radiation protection instruments for operability. All radiation detection equipment used for personnel scanning and frisking were found properly calibrated and fully functional. Based on the inspector's review of records, each instrument responded correctly when tested with a check source. Radiation survey records and instrument calibration records for this year were found to be acceptable.

Routine ambient gamma exposure rate surveys are required by Section 5.7.2.1 of the license application. Gamma surveys are required to be performed semiannually or more frequently if gamma exposure rate measurements are in excess of 3 millirem/hour. The inspector conducted radiation surveys using an NRC microRoentgen meter (Serial Number 15544, calibration due date November 29, 2001). Radiation survey results taken by the inspector at various locations throughout both facilities were consistent with previous inspection surveys. The inspector's radiation measurements were also consistent with the licensee's routine survey results. Most site gamma exposure rates were less than 3 millirem/hour at Christensen Ranch and at Irigaray. The licensee had identified at least three "Radiation Areas" (5 millirem/hour or more) as defined by 10 CFR 20.1003 within both process facilities. The inspector determined that the radiation areas were appropriately posted as required by 10 CFR Part 20. No health or safety concern was identified during the inspector's tours.

e. Radiation Work Permits

License Condition 10.9 requires the licensee to use radiation work permits (RWP) for all non-routine work where the potential for significant exposure to radioactive material exists and no applicable SOP exists. The inspector reviewed the 8 RWPs that had been issued this year. It was further noted that while the yellowcake drypack procedure had appropriate radiation protection instructions in it for normal operations, the RSO used RWPs for abnormal occurrences that required access into the drypack area. The inspector determined that the licensee had implemented the RWP program adequately.

4.3 Conclusions

The licensee had implemented a radiation program that met the requirements established in 10 CFR Part 20 and the license. The licensee's control of contamination appeared effective. The licensee's bioassay and respiratory protection programs were deemed to be adequate.

5 Environmental Protection (88045)

5.1 Inspection Scope

License Condition 11.3 requires the licensee to implement the effluent and environmental monitoring program specified in Section 5.8 of the license application. At the time of the inspection, the licensee's environmental monitoring program included airborne particulate, radon, stack effluent, surface water, soil, sediment, vegetation, ambient gamma exposure, and groundwater sampling. Portions of the environmental monitoring program were reviewed to assess the effectiveness of the licensee's program and to evaluate the effects, if any, of site activities on the local environment.

5.2 Observations and Findings

a. Groundwater Monitoring Program

License Condition 11.2 states, in part, that all confirmed exceedances of the upper control limits in monitoring well samples will be reported to the NRC by telephone or electronic mail within 48 hours and by written report within 30 days. A review of selected licensee monitoring well data since the previous inspection did not identify any wells in excursion status that had not been previously reported to the NRC. Since the last inspection in April 2001, the licensee had reported the "Quarterly Progress Report of Monitor Wells on Excursion Status," in June and September 2001. These reports had been issued as required by License Condition 12.2 in further support of License Condition 11.2. The June 2001 report stated that 9 wells were in excursion, and the September report stated that 10 wells remained in excursion.

This aspect of the licensee's groundwater monitoring program was determined to be in compliance with the license requirements.

b. Evaporation Impoundment

The physical condition of all lined impoundments at both the Irigaray and Christensen Ranch sites was evaluated. Evaporation Ponds 1, 2A, and 2B at the Irigaray site were being used for evaporation of process waste water from the Irigaray site process facilities. License Condition 10.6 provides upper limits for evaporation pond freeboard. All pond freeboard levels were noted to be within license condition limits, and no pond liners were leaking. Ponds 1, 2, 3, and 4 at the Christensen Ranch site were in good condition, with no visible tears or holes in the liner material.

5.3. Conclusions

The licensee's groundwater monitoring program was determined to be in compliance with license requirements. Both the Irigaray and Christensen Ranch evaporation ponds were in good condition during the inspection.

6 Follow up (92701)

- 6.1 (Closed) Event NMED No. 010637: The licensee reported two spills of restoration fluid to the NRC on May 29, 2001, in accordance with License Condition 12.4. The spills were discovered on May 26 and 27, 2001, and were estimated to be approximately 450 gallons. The spills were caused by hose connection failures which were later repaired. The licensee's investigation and follow-up did not identify any environmental damage. No additional corrective actions are warranted.

6.2 (Closed) Excursion Notification: Irigaray monitoring well M2 had been placed on excursion status three times during year 2001 for exceeding the upper control limits for chloride and conductivity. This well is a perimeter monitoring well for a wellfield where groundwater restoration activities have been completed. The licensee initiated corrective action pumping of the monitoring well and weekly sampling. The well was deemed no longer on excursion on October 7, 2001, which was documented in a letter to the NRC dated October 11, 2001.

7 Exit Meeting Summary

The inspector presented the preliminary inspection results to the representatives of the licensee at the conclusion of the inspection on November 8, 2001. Licensee representatives acknowledged the findings as presented. The licensee did not identify any information reviewed by the inspector as propriety information.

ATTACHMENT

PARTIAL LIST OF PERSONS CONTACTED

Licensee

W. Heili, Manager, Operations
J. Vasein, Radiation Safety Officer
D. Wichers, General Manager, ISL & Reclamation Operations

INSPECTION PROCEDURES USED

83822	Radiation Protection
88005	Management Organization and Controls
88020	Operations Review
88035	Radioactive Waste Management
88045	Environmental Monitoring
89001	In-Situ Leach Facilities
92701	Followup

ITEMS OPENED, CLOSED AND DISCUSSED

Opened

None

Closed

Well M2 Excursion Notification
NMED No. 010637

Discussed

None

LIST OF ACRONYMS USED

CFR	Code of Federal Regulations
ISL	In situ leach
NMED	Nuclear Materials Events Database
µg/l	micrograms per liter
PDR	Public Document Room
RSO	Radiation Safety Officer
RWP	radiation work permit
SERP	Safety and Environmental Review Panel
SOP	Standard Operating Procedure