



UNITED STATES
NUCLEAR REGULATORY COMMISSION

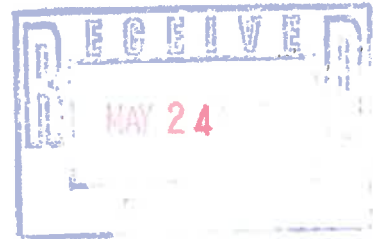
REGION IV

611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064

May 12, 1995

ML16113A380

Quivira Mining Company
ATTN: Bill Ferdinand
6305 Waterford Blvd., Suite 325
Oklahoma City, Oklahoma 73118



SUBJECT: NRC INSPECTION REPORT 40-8905/95-01

This refers to the routine, announced inspection conducted by Mr. Louis C. Carson, II of this office, on April 6, 1995. The inspection included a review of activities authorized for the former Ambrosia Lake Uranium Mill in McKinley County, New Mexico, under NRC Source Material License SUA-1473. At the conclusion of the inspection, the findings were discussed with you and those members of your staff identified in the enclosed report.

Areas examined during the inspection are identified in the report. Within these areas the inspection consisted of selective examinations of procedures and representative records, interviews of personnel, independent measurements, and observation of activities in progress.

No violations or deviations were identified; 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 and its enclosures will be placed in the NRC Public Document Room.

Should you have any questions concerning this letter, please contact the inspectors identified above at (817) 860-8100.

Sincerely,

Samuel J. Collins, Director
Division of Radiation Safety
and Safeguards

Docket: 40-8905
License: SUA-1473

Enclosure:
NRC Inspection Report
40-8905/95-01

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Quivira Mining Company

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cc w/enclosure:
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New Mexico Radiation Control Program Director

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DATE	5/11/95	5/11/95	5/12/95	5/12/95

ENCLOSURE

**U.S. NUCLEAR REGULATORY COMMISSION
REGION IV**

Inspection Report: 40-8905/95-01

Operating License: SUA-1473

Licensee: Quivira Mining Company
6305 Waterford Blvd., Suite 325
Oklahoma City, Oklahoma 73118

Facility Name: Ambrosia Lake Mill

Inspection At: McKinley County, New Mexico

Inspection Conducted: April 6-7, 1995

Inspector: Louis C. Carson II, Health Physicist
Fuel Cycle and Decommissioning Branch

Approved:

Charles L. Cain
Charles L. Cain, Chief
Fuel Cycle and Decommissioning Branch

5/11/95
Date

Inspection Summary

Areas Inspected: Routine, announced inspection regarding uranium mill operations, tailings reclamation, and site decommissioning at the Ambrosia Lake Mill including management and organization controls, radioactive waste management, environmental monitoring, and radiation protection.

Results:

- The licensee's organization and management controls complied with the requirements of the license. The onsite staffing level was appropriate for the work in progress, and procedures were determined to be of sufficient quality for the activities in progress (Section 2).
- The radioactive waste management of the mill tailings area had been conducted in accordance with license requirements (Section 3).
- The licensee's effluent monitoring reports required by 10 CFR 40.65 were reviewed and found to be in compliance with the license and applicable portions of 10 CFR Part 40. The licensee's annual Land Use Survey was reviewed and found to be adequate. The environmental monitoring program had been conducted in accordance with license requirements (Section 4).

- The licensee had implemented an effective radiation protection program that was in compliance with the license and applicable portions of 10 CFR Part 20 (Section 5).

Summary of Inspection Findings:

No violations or deviations were identified by the inspector for the areas reviewed.

Attachment:

Persons Contacted and Exit Meeting

DETAILS

1 SITE STATUS

Milling operations at the Ambrosia Lake facility continue to be on standby. The licensee continues to produce uranium yellowcake by processing contaminated water through the mill ion exchange (IX) building. At the time of this inspection no mill tailings reclamation work was being conducted. Mill tailings on Tailings Pond No. 1 were covered with an interim radon barrier. In 1994 the third and fourth layers of the radon barrier were placed on Tailings Pond No. 1. In the first quarter of 1995 the licensee worked on the flood control and diversion channel around the base of Tailings Pond No. 1 and placed the fifth layer on the pond. Placement of the final radon barrier layer was scheduled to resume May 1, 1995, which will be followed by the installation of the protective soil and rock layers for erosion protection. Quivira plans to turn its reclamation attention to the much smaller Tailings Pond No. 2 later in 1995.

2 MANAGEMENT ORGANIZATION AND CONTROLS (88005)

2.1 Management Organization

The General Manager was the highest ranking official at the site. The supervisor for Radiation Safety and Environmental Affairs also served as the Radiation Safety Officer (RSO) and reported directly to the general manager. The RSO had two technicians on staff. There were 37 employees on site, which included 7 personnel involved in uranium IX operations and 12 personnel involved in tailings reclamation work.

Although Quivira has no specific regulatory requirements for site security, the inspector observed security guards controlling access and traffic into the site. Security guards were on duty at the site gate around-the-clock. The inspector noticed that visitors and contract workers had to sign logbooks to gain access to the site.

The inspector concluded that the licensee's staff and organization was appropriate and in accordance with license requirements.

2.2 Management Controls

The inspector reviewed the licensee's compliance with the following license conditions (LC) to determine the effectiveness of management controls:

- LC Nos. 14 and 16 require that written procedures be established and reviewed by the RSO at least annually for non-operational and surveillance activities including environmental and radiation monitoring, instrument calibrations, and bioassays. The inspector reviewed each procedure in the RSO's controlled procedure volume and

found that the RSO had performed the annual 1994 procedure review as validated by the RSO's signature and date of review.

- LC No. 20 requires that the licensee document the results of personnel monitoring, surveys, calibrations, sampling, audits, inspections, meetings, training sessions, investigations, and corrective actions. The inspector reviewed licensee records for 1994 and 1995 and found that the licensee's program adequately met the requirements.

2.3 Conclusion

The organizational structure and staffing levels were determined to be acceptable for the work in progress at the facility. The licensee's organization and management controls met the requirements of the license.

3 **RADIOACTIVE WASTE MANAGEMENT (88035) AND OPERATIONS REVIEW (88020)**

3.1 Discussion

The inspector toured the Ambrosia Lake facility. Milling operations at the facility were on standby, except for the operation of the IX system. LC Nos. 10, 13 and 33 detail the operation of the IX mine water uranium recovery treatment system. Yellowcake was produced by cleaning up contaminated mine water and extracting the uranium during the IX process. In 1995 the licensee planned to produce 15,000 pounds of yellowcake per month. The inspector observed maintenance operations in the IX facility. The inspector concluded that the licensee adequately met LC Nos. 10, 13, and 33.

LC No. 21 requires the licensee not to make changes to the retention system without specific prior approval by the NRC. Similarly, LC 26 requires the licensee not to engage in any activity not previously assessed and approved by the NRC when an environmental evaluation suggests that an adverse impact exists. Additionally, LC Nos. 27 and 37 specify requirements for an interim tailings stabilization program and tailings retention system. The inspector reviewed the following licensee program change requests that required NRC approval under LC Nos. 21, 26, 27, and 37:

- Request for Alternate Concentration Limits
- Request for Deleting Density Meter Testing
- Request for Radon Barrier Cover Thickness Change

The inspector found no indications of implementing the above requested programs and facility changes without NRC approval. It was noted that on January 27, 1995, the NRC approved the licensee's request to change the radon barrier thickness. The inspector concluded that the licensee was in compliance with ~~both~~ LC Nos. 21, 26, 27, and 37.

LC No. 24 requires the licensee to have a contingency plan for responding to unexpected releases of radioactive material from Ambrosia Lake operations and shipment activities. The inspector reviewed the licensee's current contingency plan and concluded that it adequately met the intent of LC No. 24.

LC Nos. 31 and 32 allow the licensee to receive, process, and dispose of 11e.(2) byproduct materials from the Sequoyah Fuels Corporation and other past milling operations. The inspector determined that the licensee has not received any byproduct material from other facilities since the last inspection.

3.2 Conclusion

The inspector concluded that the licensee's radwaste management program adequately complied with the license requirements. No deficiencies were identified by the inspector during the tour of the radwaste management facilities.

4 ENVIRONMENTAL MONITORING (88045)

4.1 Discussion

The inspector reviewed the licensee's environmental monitoring program to determine compliance with applicable requirements specified in the license.

The NRC inspector toured the site including the Main Tailings Impoundment and Land Borrow Area. Radiation surveys taken by the inspector on top of the Main Tailings Impoundment and around the site perimeter measured 20-75 microRoentgen/hour (μ R/hr).

The inspector observed the operation of three environmental monitoring stations. Each station contained a continuous air particulate sampler, a radon monitor, and an environmental thermoluminescent dosimeter (TLD).

LC No. 19 requires the licensee to submit a semiannual report of radiological effluent, environmental data, and annual effective dose equivalent to the public pursuant to 10 CFR 40.65. The inspector reviewed the licensee's 10 CFR 40.65 report that was submitted to the NRC on February 28, 1995, for the period of July 1 to December 31, 1994. The inspector found that the licensee submitted the semiannual report in a timely manner, in the required format, and with no unexplained anomalous data. The inspector concluded that the licensee met the requirements of LC No. 19 and that the data was in compliance with 10 CFR Part 20 as applicable.

LC No. 34 requires the licensee to implement a groundwater Corrective Action Plan (CAP) and to annually submit a report on the CAP progress. Quivira submitted the annual CAP report on July 29, 1994. The inspector toured some of the CAP groundwater compliance monitoring wells and reviewed the results of the licensee's groundwater remediation efforts. The licensee showed the inspector trended data and charts that indicated the progress in groundwater

remediation. The inspector concluded that the licensee was in compliance with LC No. 34.

LC No. 39 requires the licensee to conduct an annual survey of land use in areas within two miles of the mill and submit a report to the NRC by July of each year. The Land Use Survey Report describes significant land use changes by industries, businesses, residents, and farmers. The inspector reviewed the licensee's 1994 "Land Use Survey Report" that was submitted to the NRC on June 28, 1994. The licensee identified the previously unoccupied Berryhill Ranch house as now occupied. This was the only noteworthy change resulting from the 1994 Land Use Survey. The inspector concluded that the licensee's 1994 Land Use Survey Report met the intent of LC No. 39.

4.2 Conclusion

The inspector concluded that the licensee's environmental management controls were in accordance with the license conditions. Environmental and effluent monitoring data was submitted to NRC in accordance with 10 CFR 40.65, 10 CFR 20 and license conditions. No deficiencies were identified by the inspector during the tour of the facilities.

5 RADIATION PROTECTION (83822) AND OPERATOR TRAINING/RETRAINING (88010)

5.1 Discussion

The inspector reviewed the licensee's radiation protection program to determine compliance with the license application and revised 10 CFR Part 20.

All licensee and contractor employees working on the mill tailings project were issued TLDs that were evaluated every quarter. The highest TLD exposures reported in 1993 and 1994 were less than 10 percent of the 10 CFR Part 20 limits.

Reclamation of the mill tailings and the mill being placed on standby has significantly reduced the potential exposure to airborne radioactivity. However, Quivira continued to perform occupational exposure calculations on personnel associated with the mill tailings reclamation work and the IX facility operation. A review of the calculated internal exposures for 1993 and 1994 disclosed that exposures were less than 10 percent of the allowable limits.

The inspector reviewed the 1993 and 1994 bioassay records. The licensee's bioassay program required routine urine testing for natural uranium on employees working in the restricted area and on contract workers involved with the mill tailings reclamation project. Bioassay samples were analyzed by a vendor laboratory. All sample shipments included blank and spiked samples for quality assurance. The licensee used an action level of 15 micrograms per liter ($\mu\text{g/l}$).

5.2 Radiation Controls

LC No. 10 requires the licensee to perform an annual ALARA audit based on commitments contained in the licensee's Health Physics and Environmental Programs Manual. The inspector reviewed the 1994 annual ALARA audit conducted by Quivira's ALARA Committee on January 25, 1995, to determine if it represented a useful tool for Quivira management to assess the health physics program. This review was also conducted to determine if the licensee's ALARA program was consistent with commitments detailed in the licensee's August 1990 submittal to the NRC and with industry practices. The ALARA Committee members consisted of corporate and site management, including the RSO. The audit consisted of appropriate topics regarding radiation protection activities on site, including specific details, analyses, and trends of the personnel exposure data.

The inspector concluded that the ALARA audit met the intent of LC No. 10 and represented a useful management tool which thoroughly demonstrated the success of Quivira's ALARA program and policy based on analysis of 1994 radiological data.

LC No. 15 requires that the licensee use a Radiation Work Permit (RWP) for all work or nonroutine maintenance jobs where the potential for significant exposure to radioactive material exists, and for which no standard written procedure exists. The inspector reviewed eight RWPs written in 1994 and 1995 for nonroutine operations. LC No. 15(A) requires the licensee's RWP to describe the scope of the work to be performed. The inspector found that the licensee's RWPs did not thoroughly detail the scope of work being performed. For example, the licensee wrote RWP-0492 on March 3, 1995, which described the work scope needed to be performed as follows:

- Need to go in the IX Mill area MS-1 and unplug piping.
- Clean out tank in work area IX MS-1.

The RSO explained that workers were briefed on the work scope of the job, which included the radiological hazards of opening a radioactive system to clean out pipes, filters, pumps, and tanks. The inspector was concerned that the RWP did not describe the work scope of the job from a radiation protection perspective. The RSO stated that Quivira would improve the RWP program in this regard.

The inspector concluded that the licensee's RWP program adequately met the intent of LC No. 15.

LC No. 17 requires the licensee to perform and document all occupational exposure calculations within one week of the end of each regulatory period and document airborne radioactivity sample results in a timely manner. The inspector's review of selected Quivira personnel exposure and airborne sample calculation records for 1994 and 1995 revealed that the licensee's program was

adequate in this area. The inspector concluded that the licensee complied with LC No. 17.

LC No. 25 requires the licensee to release equipment or packages from the restricted area in accordance with "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct or Source Material," dated September 1984. The inspector reviewed Quivira's surface contamination procedures and records on all equipment and vehicles that were monitored for gamma and alpha radiation contamination before being released from Quivira in 1994. Discussions with workers revealed they were aware of their responsibility for decontaminating vehicles and equipment, and that radiation protection representatives had to perform equipment release surveys before leaving the site. The inspector concluded that the licensee met the requirements of LC No. 25.

5.3 Radiation Surveys

The inspector reviewed site radiation and surface contamination data. The highest area radiation found on-site was 150 μ R/hr in the IX facility. The licensee's survey records for the general site area and Main Tailings Pond No. 1 indicated a radiation level of 35 μ R/hr. The radiation level in areas and facilities around the site boundary was 15-30 μ R/hr. During the inspector's site tour, radiation surveys with a micro-R-meter were conducted, and the results were not in close agreement with licensee records initially. The inspector conducted a performance based comparison of the NRC's survey meter to the licensee's survey meter using the licensee's instrument functional check procedure and a radium-226 check source. The inspector determined that the licensee's instrument calibration program was adequate.

A review of personnel and surface area contamination records for 1994 revealed that alpha radiation contaminations were generally less than 100 disintegrations per minute, and only a few workers had measured any personal contamination.

The inspector concluded that Quivira's radiation and contamination survey programs were adequate.

5.4 Conclusions

The licensee had implemented an effective radiation protection program that was in compliance with the license and applicable portions of 10 CFR Part 20.

ATTACHMENT

1 PERSONS CONTACTED

1.1 Licensee Personnel

B. Ferdinand, Manager, Radiation Safety, Licensing & Regulatory Affairs
*T. Fletcher, General Manager
*P. Luthiger, Radiation Safety Officer

1.4 NRC Personnel

*L. C. Carson II, Health Physicist

* Denotes personnel that attended the exit meeting

2 EXIT MEETING

An exit meeting was conducted on April 6, 1994. During this meeting, the inspectors reviewed the scope and findings of the inspection. The licensee did not identify as proprietary any information provided to or reviewed by the inspector.