

APPENDIX A

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

Report: 40-6659/82-01

License: SUA-551
Docket: 40-6659

License: Petrotomics Company
P. O. Box 2509
Shirley Basin, WY 82615

Facility: Shirley Basin Uranium Mill

Inspection Conducted: September 28-30, 1982

Inspectors: *N. M. Shopenn*
N. M. Shopenn, Radiation Specialist

November 1, 1982
Date

Robert C. Brown
R. C. Brown, Radiation Specialist

Nov. 3, 1982
Date

Approved: *R. J. Everett*
R. J. Everett, Chief, Materials Radiation
Protection Section

11/8/82
Date

Inspection Summary

Inspection conducted on September 28-30, 1982 (Report 40-6659/82-01)

Areas Inspected: Routine, unannounced inspection of uranium milling operations and radiation safety program including organization, management and training; internal exposure control; external exposure and contamination control; facilities and equipment; tailings management and environmental monitoring; and independent measurements. The inspection involved 22 inspector-hours onsite by two NRC inspectors.

Results: Of the six areas inspected, no violations were identified in these areas. Two significant appraisal findings, identified during the 1981 appraisal, relating to the program to assess contamination levels present on all persons leaving the mill and incorporating mill air sampling procedures in the Radiation Technicians procedures manual remain open.

DETAILS

1. Persons Contacted

- *J. H. Whitman, Manager
- *W. C. Gross, Acting Mill Superintendent
- *S. J. Pfaff, Radiation Coordinator
- *D. A. Dickson, Assistant Radiation Coordinator
- H. G. Cooley, Mill Superintendent
- J. A. Hines, Assistant Radiation Coordinator
- M. Bennett, Environmental Coordinator
- W. Lembke, Safety Coordinator
- D. M. Johnson, Mill Maintenance General Foreman
- D. Sloyer, Mill Shift Foreman
- M. E. Whitney, Mill Shift Foreman
- F. Hamilton, Lead Mill Maintenance Man & OCAW, Local 2-230, Union Representative

The NRC inspectors interviewed two mill workers during the course of the inspection.

*Those present at the exit briefing.

2. Licensee Action on Previous Inspection Findings

(Closed) Infraction (40-6659/80-02) failure to make measurements of airborne radioactive radon-222 from July 1978 to June 1980. The licensee's corrective action has assured that these measurements have been made since July 8, 1980.

(Closed) Infraction (40-6659/80-02) failure to use respiratory protective equipment in accord with Regulatory Guide 8.15, "Acceptable Programs for Respiratory Protection" in that selection was not made to provide a protection factor greater than the multiple by which peak concentrations exceeded the values in Table 1, Column I of Appendix B to 10 CFR 20, and that half mask respirators were not being fit tested with irritant smoke prior to use each time such equipment was donned. The inspector determined that the licensee's corrective actions had resulted in compliance since the last inspection.

(Closed) Infraction (40-6659/80-02) failure to perform formal documented evaluations if urinary uranium concentration exceeds 130 micrograms per liter as required by license amendment. Corrective action had been accomplished, as stated in letter of July 10, 1980. Additional reinforcement to the program has been accomplished with new more comprehensive bioassay forms put into service June 30, 1982.

(Closed) Infraction (40-6659/80-02) failure to collect all forty-eight air samples as required by License Condition 10 of Amendment No. 1 and as specified in licensee's submittals dated December 23, 1975, and March 10, 1976. Corrective action had been accomplished in accordance with the license amendment. There are now 50 sample locations in operation at this time. Records were reviewed during the inspection confirming the sample collections.

(Closed) Infraction (40-6659/80-02) transfer of tailings without specific prior approval of the NRC. Corrective action was completed on June 11, 1980, when a license condition was approved by the NRC.

(Closed) Violation (40-6659/81-01) failure to take corrective action to prevent erosion which had occurred on the upstream face of the dam. Corrective action had been taken to repair the erosion by the September 1981 date, as stated in letter dated December 9, 1981. No significant erosion was evident during this inspection.

(Closed) Violation (40-6659/81-01) failure to have an alpha survey instrument available to enable employees to monitor themselves. Inspectors observed that the company had three alpha detectors available.

(Closed) Violation (40-6659/81-01) yellow cake concentrate building had not been conspicuously posted with signs bearing the radiation caution symbol and the words, "Caution Radiation Area." All sides of the building and the locked gates to the building had been posted with the proper signs.

(Open) Significant Appraisal Finding (40-6659/81-01) failure to establish an effective program for the evaluation of contamination in mill nonproduction areas and to fully implement a program to assess contamination levels present on persons leaving the mill complex. The licensee has instituted weekly routine surveys in these areas on January 9, 1982, for both fixed and removable alpha contamination. The licensee has prepared the procedures for management audit of persons leaving the mill site; however, it will be implemented when the license renewal is issued by the year's end.

(Open) Significant Appraisal Finding (40-6659/81-01) failure to establish documented procedures for most radiation safety function activities. Comprehensive procedures and document control have been established in all areas; however, the mill air sampling methods, though being used, have not been formally incorporated into the manual for health physics technicians.

3. Organization, Management, and Training

a. Organization Structure

The organizational structure of the company as depicted in the application has changed since it was published on January 20, 1982.

The Radiation Coordinator (RSO) still reports to the Resident Manager. A change in the organization was made in February 1982 when the RSO added two positions of Assistant Radiation Coordinators to the staffing and filled these positions. These positions require degrees in science and experience in mill and radiation safety. The radiation safety staff collects all environmental samples and performs all required industrial hygiene surveys as required. This is in addition to all normal radiation safety requirements.

The licensee stated that the mill operates with a staff of 46 personnel. Mill operations personnel operate 24 hours per day, with 4 crews working three 12-hour days and one 6-hour day. The 6-hour day is Wednesday when each shift works six hours. The Radiation Safety section works four 10-hour days with two people working Tuesday through Friday, and one person working Monday through Thursday. The licensee stated that mill throughput averaged 500 tons per day.

b. Procedures

In response to the 1981 mill appraisal, the licensee had initiated the procedures that had been submitted in the license renewal application dated April 1, 1981. The procedures for removable and fixed contamination surveys in worker eating areas and other non-production areas of the complex were modified to cover all nonproduction areas. This was effective on January 19, 1982. The procedure for the assessment of personnel contamination levels of persons leaving the uranium mill complex that is in the license renewal application had not been implemented. Mill air sampling procedures had not been incorporated in the Health Physics Technician Procedures Manual. These items were in the two significant findings listed in the 1981 mill appraisal. All other procedures were reviewed by the NRC inspectors and were determined to be acceptable.

c. Internal Audits

The licensee had not instituted a formal routine for internal audits at the time of the inspection. Members of the radiation safety staff conducted informal audits on a weekly routine. Problems encountered were reported to the resident manager for action. An ALARA report had been prepared annually by the RSO and had been reviewed by management. The NRC inspectors observed that the company is waiting for approval of its license renewal application prior to instituting formal changes. The licensee had been informally initiating new operations procedures from this application. The NRC inspectors observed during the course of the inspection that radiation safety in operations had not been adversely affected by the lack of formally using these procedures. This was in part due to the reduction of personnel and a reduction to one-third output of the production capacity.

d. Radiation Safety Training

The radiation safety training for employees had been taught by the RSO and his staff. Radiation safety training included a separate respirator training course. The training had been given to all mill personnel and contractors in November 1981. Radiation safety training is taught at the same time MSHA training is taught. The NRC inspectors reviewed the lesson plans; however, formal exams were not given. The RSO utilized the shift foreman's "safety huddles" with shift operations personnel as a vehicle for additional radiation safety training. Mill operators and maintenance personnel, interviewed by the NRC inspectors, appeared to have adequate knowledge of radiation safety matters. The RSO stated that he attended outside radiation training meetings during the past year. The two new assistant radiation coordinators hired within the last year have degrees in physical science, have 18 months experience in the uranium industry, and have attended a 40-hour course in radiation safety and a NIOSH course in respiratory protection. The addition of the two new personnel upgrades the level of competence of the radiation safety staff.

The inspectors identified no violations in this area.

4. Internal Exposure Control

a. In-Plant Air Sampling

The licensee had routinely sampled for particulate uranium at 50 locations and for radon daughters at 12 locations monthly. Sample collection had been coordinated to occur during mill operational periods. The air samples were collected using low volume (2 liters/minute) personnel air samplers for both general area and breathing zone samples. All maintenance work in regulated process areas required a breathing zone sample for the duration of the work. Samples were analyzed fluorometrically. Sample techniques appeared to yield results representative of worker breathing zones. The NRC inspectors observed that several areas were posted as airborne radioactivity areas.

Air samplers had been calibrated monthly using the bubble tube method and checked prior to each use. Records of calibration and repair were maintained on each sampler. Laboratory counters were sent out for calibration twice per year. The counters were checked prior to use by running an NBS traceable standard to assure calibration. The fluorometers were calibrated using three standards and a blank prior to monthly runs with quality control checks on special samples from EPA.

b. Exposure Determination

The licensee determined individual exposures to airborne radioactivity by a computer code that used exposure and time card data. Airborne radioactivity data were entered into the computer

monthly and time card data were entered into the computer weekly. The computer program calculated the individual's exposure based upon work assignment, average exposure concentration of airborne ore dust or yellow cake for that work assignment, and the hours each work assignment was performed. Weekly determinations were made and the computer printed the results together with the annual accumulated exposure data. Radon exposures were noted to be routinely less than 10% of the MPC. Weekly, quarterly, and year-to-date data accumulated exposures were available and reviewed weekly. No exposures were found to be in excess of the regulatory limits. New time studies had been completed and these were incorporated into the computer program. There were no overexposures experienced in 1982 as records indicated when reviewed by the NRC inspectors.

c. Respiratory Protection

The NRC inspectors reviewed the respiratory protection program as stated in the January 1980 Respiratory Protection Manual. The licensee has had 6 training sessions in respiratory protection since October 1981. Records were examined and it was determined that fit tests were conducted on respirator users and initial and annual medical exams were given. It was noted that vital capacity checks were not performed by the attending doctor.

The overall use, care, and maintenance of the respirators had been accomplished with emphasis on maintenance, cleaning, and functional checking by the assistant radiation coordinators. Although they had been cleaned, the masks had not been wipe tested to determine if they were free of contamination. This was discussed with the RSO during the inspection. The NRC inspectors determined that the respirator program meets the general criteria in Regulation Guide 8.15 on respiratory protection.

d. Bioassay

The NRC inspectors reviewed the bioassay program and determined that the program of weekly urine collection for mill workers and monthly collection for staff workers had not changed since the last inspection. Baselines were performed prior to the start of work by new hires and at termination. Resampling had been accomplished whenever a sample went up to or over 15 ug uranium/l. Intercomparisons were performed monthly with an outside laboratory. The results were reviewed by the NRC inspectors and the comparisons were acceptable. Measurement sensitivity for urinalysis was still 5 ug uranium/l or lower. Limits for bioassays were not exceeded during the period reviewed.

In-vivo evaluations were performed August 20-24, 1982, for all mill personnel by an outside vendor. One person was recounted for an elevated U-235 count. The recount was normal.

Internal exposure data were maintained in the computer program with a bioassay summary printout listing employee name, social security number, urine sample results, and external dose data. The in-vivo results were maintained in a formal report issued to the licensee by the vendor.

The inspectors identified no violations in this area.

5. External Exposure and Contamination Control

a. External Exposure

The licensee stated that all mill workers wear TLD badge dosimeters. The badges were exchanged monthly. The maximum exposure was 385 millirems/year.

Surveys were conducted monthly at 33 locations for beta gamma. The highest area recorded was in the concentrate storage building with a maximum reading of 9 mR/h. The beta surveys were started in January 1982 as part of the recommendations in the Uranium Mill Appraisal (40-6659/81-01). The concentrate storage building was posted with "Caution Radiation Area" signs on all sides, gates, and doors.

Area dosimeters were located at 10 locations throughout the complex and were exchanged on a quarterly interval. The highest quarterly exposure was 700 mR in the precipitation area.

b. Facility Contamination Control

The NRC inspectors observed that the mill was comparatively clean and free of dust accumulations. The licensee has conducted monthly surveys for fixed and removable contamination at 20 locations weekly. These included the mill offices and eating areas. The licensee stated that any area with significant removable contamination were cleaned and resurveyed. Records of these surveys were reviewed back to January 9, 1982, when they were initiated. This was the result of a finding made during the Uranium Mill Appraisal (40-6659/81-01).

The licensee's survey instrument calibration records were reviewed and found to be adequate. There were three alpha detection instruments calibrated and available at the time of the inspection.

c. Personnel Contamination Control

The NRC inspectors observed that mill workers were wearing issued protective clothing. The change rooms and shower facilities were clean. A calibrated operational alpha detector for personnel monitoring was located outside the change rooms. A shower log was also located at this point. This was discussed with the RSO

when found. All mill personnel do participate in the showering program.

Equipment releases were checked back to the last inspection. Material can only be released by authorization of the RSO. All material was probed and wipe tested for alpha, beta, and gamma contamination prior to release.

The inspectors identified no violations in this area.

6. Facilities and Equipment

The NRC inspectors toured the mill facilities on several occasions during the inspection and found housekeeping efforts to be adequate. Mill entrances and perimeter fences were properly posted and regulatory warning signs were conspicuously located within the mill. The inspectors noted that some of the perimeter signs were fading and will have to be replaced. Mill general ventilation and ore dust suppression appeared to be adequate. The facilities and equipment have not changed since the Uranium Mill Appraisal (40-6659/81-01) was conducted.

The NRC inspectors observed that employee notices required by 10 CFR 19.11 and 21.6 were posted in two locations. Fifty-four Source Material Transfer Forms NRC-741 were reviewed covering the period September 1981 to September 30, 1982. The annual inventory report for October 1981, was reviewed by the inspectors. The NRC inspectors reviewed the fire protection program. There had been two training drills conducted since January 1, 1982. One underwriter's inspection was conducted during 1982. The yellow cake was found to be packaged in strong, tight containers marked "Radioactive LSA."

The inspectors identified no violations in this area.

7. Environmental Monitoring and Tailings Management

The NRC inspectors observed no blowing tailings at the ponds or surrounding area. The licensee is continuing efforts to rehabilitate the area. Parts of old open pit mines have been filled and vegetation propagated. There has been some minor erosion in these areas; however, efforts were being made to reduce and stop such erosion. Any dry tailings areas and ore piles have been sprayed with water to reduce dusting.

The NRC inspectors reviewed, in the regional office, environmental data submitted for calendar year 1981. Data for calendar 1982 year were reviewed at the site. All data required by license conditions were available and below regulatory limits. The reports required by 10 CFR 40.65 and 40 CFR 190 were reviewed. Sediment samples were collected and were found to be at acceptable levels.

The inspectors identified no violations in this area.

8. Independent Measurements

The NRC inspectors performed exposure rate surveys throughout the mill. The highest levels were found to be in the concentrate storage building of 9 mR/h at one foot from the stacked drums. It was noted that this is a locked building with additional locked cyclone fence gates at the truck entrance and with "Caution Radiation Area" signs on all sides.

Air samples were taken in the packaging room and at the primary crusher. The samples will be analyzed by the Idaho Health Services Laboratory and will be compared to the licensee's results of samples taken simultaneously at the same locations.

9. Exit Interview

The NRC inspectors met with licensee personnel referenced in Section 1 on September 30, 1982, and summarized the purpose, scope, and findings of the inspection.

NRC FORM 790-A INSPECTOR'S REPORT (Continuation) Office of Inspection and Enforcement	DOCKET NO. & ID OF LICENSE NO. BY PRODUCT/ISSUE IS		REPORT		MODULE NUMBER						
	04006622		NO.	SEQ.	VIOLATION SEVERITY OR DEVIATION						SITE RELATED
					1	2	3	4	5	6	A
											B
										C	
										D	

VIOLATION OR DEVIATION (Enter up to 2400 characters for each item. If the text exceeds this number, it will be necessary to paraphrase. Limit lines to 50 characters each.)

10 CFR 20.102(e) requires that licensee shall require each individual, prior to first entry into the licensee's restricted area under such circumstances that the individual is likely to receive in any period of one calendar quarter an occupational dose in excess of 25 percent of the standards specified in 20.101(a), to disclose in a written, signed statement, either (1) that the individual had no prior occupational dose during the current calendar quarter, or (2) the nature and amount of any occupational dose which the individual may have received during that specifically identified current calendar quarter from sources of radiation possessed or controlled by other persons.

Contrary to this requirement, signed statements indicating either the individual had no prior occupational dose or the nature and amount of the occupational dose which may have been received were not obtained upon hire for three employees assigned duties in the restricted areas of the uranium mill.

This is a Severity Level I violation (Supplement VII.E)