

40-8674

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AUDIT REPORT
PLATEAU RESOURCES LIMITED
BLANDING ORE BUYING STATION
SUA-1326

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SUMMARY

The department heads in areas affected by radiation safety at the Blanding Ore Buying Station (BOBS) conducted audits in March and April 1985 of radiological and environmental monitoring trends, the ALARA principle, and compliance with laws and regulations as required by License Condition #19, Amendment Nos. 5 and 10 to SUA-1326. This report summarizes the findings of the audits and provides suggested corrective actions.

License Condition #19 requires that this report be submitted to corporate management which is responsible for instituting any necessary corrective actions. This report is being submitted to the Vice President and to the General Manager.

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1. INTRODUCTION

Prior to April 12, 1985 License Condition #19 of Source Material License SUA-1326 Docket No. 40-8674 required, in part, that an audit and formal report be prepared annually which covered radiation safety, environmental monitoring and an assessment of the as low as reasonably achievable (ALARA) program for the Blanding Ore Buying Station (BOBS). An audit was conducted in March to address C.Y. 1984. On April 12, 1985 License Condition #19 was amended to require an audit during decommissioning. To meet this requirement, the March audit was supplemented by one conducted in April. This report was prepared to meet the license requirements, assure the continued radiation safety of the workers, review the environmental monitoring trends, and discuss compliance with applicable laws and regulations.

The audits, on which this report is based, demonstrated that activities at the BOBS are substantially in compliance with the laws, regulations, and other formal requirements of the U.S. Nuclear Regulatory Commission. The data reviewed for the audit show (not unexpectedly) that concentrations of sampled parameters are very low and reflect the non-operational status of this facility. Several instances of situations that require attention were noted during the audit, e.g., failure to keep adequate calibration records on two radiation detection instruments, failure to conduct an audit or prepare a report annually as required by License Condition #19 for 1983, and failure to document several of the quarterly walk-through inspections. In addition, one of the authors of this report was not fully satisfied with the decontamination and sanitation facilities available to the workers assigned to decommissioning.

Corrective actions have been proposed or implemented for all of the problem areas listed.

The audit was conducted over a period of several days in March and again in April. This time was chosen as it allowed for inclusion in the audit of monitoring data obtained from the effluent monitoring reports for the second half of 1984.

Because there have been no personnel assigned to the BOBS since it was shut down and Plateau's low staffing levels, it was decided that the audit team would be comprised of two members: the Director of Regulatory Affairs and the Maintenance Supervisor. The RSO assisted the audit team, but was not a member.

License Condition #19 read as follows prior to April 12, 1985:

The licensee shall conduct a radiation safety program and assure operation of the Ore Buying Station in keeping with the as low as reasonably achievable (ALARA) philosophy. During normal operations (when crushing, receiving, sampling, and shipping takes place), the RSO shall conduct and document weekly inspections of work practices, procedures, whether or not license conditions are being met, and safety practices affecting radiological safety. These inspections shall be done quarterly when ore storage is the only operation taking place.

An audit shall be conducted semi-annually by the Environmental Radiation Health Supervisor (ERHS) and all department heads in the areas affected by radiation safety at the Ore Buying Station. Following this audit, a formal report shall be prepared and submitted to Manager - Process Operations to institute any necessary actions. Any change in the present management structure which affects this radiation safety program must first be submitted to the NRC for approval. This report shall address the following: (1) any deviation from the principles of ALARA and a determination if effluents may be lowered under the ALARA concept; (2) any upward trends in personnel exposures or effluent releases; (3) all unusual discharges; (4) an

License Condition #19 continued:

evaluation of all personnel and environmental monitoring data; (5) items of regulatory noncompliance; (6) other problem areas with the radiation safety program including a determination if equipment for effluent control and exposure control is being properly used, maintained and inspected, and, finally; (7) recommendations for necessary corrective actions. This formal report shall also address whether license conditions are being met. During periods when ore storage is the only operation at the Ore Buying Station (when no receiving, crushing, sampling, or shipping is taking place), the audit mentioned above shall be conducted and documented annually. In addition, formal audit reports shall include verification of a weekly walk-through inspection by the RSO and an evaluation of the radiation safety program's overall effectiveness. All reports and documentation shall be signed by the RSO and maintained for at least five (5) years unless otherwise specified in NRC regulations.

As currently written, License Condition #19 reads:

The licensee shall perform a radiation safety program to assure that operation of the ore buying station is in accordance with the ALARA philosophy. During inactive periods or when ore storage is the only operation taking place, the ERHS shall perform and document quarterly inspections of the facility. These inspections shall include work practices, noncompliance with operating procedures, assurance that license conditions are being met, and work practices that affect radiological safety. During decommissioning of the ore buying station, the radiation protection and environmental programs specified in the approved decommissioning plan (Amendment No. 8) shall be implemented.

At least once during the decommissioning and reclamation of the ore buying station, the licensee shall perform a formal ALARA audit of the radiation protection program in accordance with Regulatory Guide 8.31, Section 2.3.3. The licensee shall submit a report detailing the results of the audit to the NRC, Uranium Recovery Field Office, within sixty (60) days after the audit. In addition to the eleven items outlined in Regulatory Guide 8.31, the report shall specifically address the following:

- (1) Explanation for any deviation from the principles of ALARA;
- (2) All unusual discharges or effluent releases;
- (3) An evaluation of all personnel and environmental monitoring data;

- (4) Items of regulatory noncompliance; and
- (5) Verification of all on-site inspections.

All reports and documentation shall be maintained by the licensee for at least (5) years, unless otherwise specified in NRC regulations.

2. CURRENT STATUS AND PROPOSED SCHEDULE

Plateau Resources Limited constructed and subsequently obtained a license from the U.S. Nuclear Regulatory Commission (NRC) for the Blanding Ore Buying Station in the late 1970's with the goal of purchasing and stockpiling uranium ore from mines in the Paradox Basin District for subsequent shipment to the Shootaring Canyon Uranium Processing Facility for milling and concentration of yellowcake. The BOBS operated for approximately 2.5 years and stockpiled approximately 76,000 tons of uranium ore before being shut down for what was hoped to be a temporary period in March 1980 due to the depressed market for yellowcake. The stockpiled ore was traded to Energy Fuels Nuclear's White Mesa Mill in exchange for some of the ore at its Hanksville Ore Buying Station. Energy Fuels completed shipment of the ore to their mill in August 1981.

Because Plateau planned to reopen the BOBS, no major amendments to source material license SUA-1326 have been proposed during the shut-down period except for Amendment No. 3 (authorized Plateau to adopt an interim environmental monitoring program as of December 1, 1981) which reduced some of the monitoring requirements. However, as time progressed and the market for yellowcake continued to decline, it became apparent that the BOBS should be permanently closed, decommissioned and delicensed. Once the decision to decommission this facility was made in mid-1984, the NRC was notified verbally and then Plateau submitted a revised decommissioning and reclamation plan which formed the basis for Amendment No. 8. On October 23, 1984 the NRC amended SUA-1326 to extend the license expiration date

from September 30, 1984 to September 30, 1985 to allow Plateau sufficient time to decommission and decontaminate the BOBS.

From the time permission to proceed with decommissioning and decontamination was received from the NRC to the present, Plateau has conducted further planning, soil sampling, and initiated some preliminary dismantling of structures and equipment in preparation for full-scale decommissioning operations. The status at the time of writing is as follows: 1) a schedule for decommissioning has been finalized, 2) soil samples required by 40 CFR 192 and Regulatory Guide 4.14 were collected and sent to Alpha-Nuclear Laboratory for analysis, 3) analysis of the soil samples shows that approximately a one-foot depth of soil must be removed, 4) formal decommissioning was started on March 6, 1985 and the decommissioning radiological safety and environmental monitoring programs went into effect as of that date, and 5) the scales, conveyor belt, and several other structures have been dismantled and moved to a holding area awaiting transportation or have been hauled to the Shootaring Canyon Uranium Processing Facility.

Following dismantling of the salvageable structure and determination of the contaminated soil locations, the contaminated soils will be removed and hauled to the White Mesa Mill for disposal in its tailings area. Removal of contaminated soil and structures and decontamination of the remaining structures and equipment to or below the required criteria is scheduled to be completed by June 30, 1985, and will be followed by reclamation and a request to the NRC for delicensing of the facility. At that time Plateau will also request the NRC's permission to discontinue all

monitoring programs. Termination of SUA-1326 may take from 6 months to 2 years after notification of the NRC that decommissioning has been completed.

3. RESULTS OF AUDIT

The summarized findings of the audit team are presented in this section. Wherever possible the order of the items discussed follows that in License Condition #19. The major exceptions to this are the recommendations for corrective actions (when needed); they follow immediately after the discussion of the item rather than as a group at the end of this section.

3.1 Requirement: Obtain NRC's approval for any changes in the management structure which affects the radiation safety program. (License Condition #19)

Discussion: Although the present management structure is similar to the one previously approved by the NRC, the lay-off of PWTooker (Manager of Personnel, Safety and Health) changed the reporting responsibility of the ERHS and his staff. The NRC was notified by letter dated January 28, 1985 with a follow-up letter on March 22, 1985 that the organizational chart had been revised. On April 12, 1985 Amendment No. 10 was promulgated by the USNRC to approve the changes as requested.

Corrective Action: Not required.

3.2 Requirement: Discuss any deviation from the principles of ALARA and make a determination if effluents may be lowered under the ALARA concept.

Discussion: No personnel are currently assigned as full-time BOBS employees. Personnel assigned to the Shootaring Canyon Uranium Project visited the site weekly to inspect it, calibrate the air particulate samplers and change filters. During decommissioning, designated, trained personnel will be temporarily assigned to the BOBS. The radiological safety program designed specifically for decommissioning has been implemented (see Amendment No. 8).

There have been no deviations from ALARA concept in 1984.

One incident occurred in spring 1984, i.e., irrigation ditch overflow which is summarized in the FWGerdeman/JWDavis report dated July 17, 1984.

The physical location of the Ore Buying Station, north of the White Mesa Uranium Mill does impact the environmental monitoring for the BOBS. The magnitude of impact depends on the White Mesa Mill operational status at the time. When the White Mesa Mill is operating, the values increase enough to be detectable, but not truly significant.

During decommissioning strong efforts are being made to ensure adherence to good ALARA practices. For example, the sample tower was completely washed down with high pressure water, even though smear tests before the washdown showed the level of radioactive contamination was below release criteria. Washdown of equipment is also a standard practice prior to shipment even if it already meets the release criteria.

Corrective Action: Not required.

3.3 Requirement: Discuss any upward trends in personnel exposures or effluent releases.

Discussion: The remaining ore (soil with ore contamination) at the Blanding Ore Buying Station is of such low grade (less than 14/100's) that there is very little chance of a personnel exposure incident. Monitoring to-date has confirmed this observation repeatedly. However, the implementation of the Radiological Safety Program is and will continue to be on the conservative side. Material that meets Appendix A criteria for release is treated as contaminated material and is transported as such.

Personnel have been instructed to regard ore handling equipment piles as radiation sources and limit their exposure to such sources. There have been no observable upward trends for personnel as there have been no effluent release.

Every effort will be made to insure that those personnel assigned to the decommissioning work forces adhere to the ALARA concept with the goal of zero exposure.

Corrective Action: Not required.

3.4 Requirement: Discuss all unusual discharges.

Discussion: Although it proved to be of no consequence, an incident occurred and was investigated in which an irrigation ditch bank west of the restricted area was breached. The ditch water flowed across the restricted area and then exited on the east. JWDavis supervised the reconstruction of the ditch bank and conducted a survey to determine whether or not any radioactive material (ore contaminated soil) had been discharged. The results of his analyses showed that no release above limits had occurred and that this was not a reportable incident. A complete description of Mr. Davis' assessment is in Central Files.

Corrective Action: Not required for compliance, but a good practice would be to have someone check the ditch in early-April to look for obstructions.

3.5 Requirement: Evaluate all personnel and environmental monitoring data.

Discussion: Personnel Monitoring data: Since shutdown there have been no data upon which to comment. With decommissioning underway, all personnel assigned have been issued TLD Badges and Routine Air Sampling (Particulate and Radon progeny) implemented. Airborne Sampling shows exposure in the <19% MPC Range and Radon in the .001 WLM Range. TLD results (quarterly) are still in processing. Basing gamma exposure on data collected during the initial decommissioning area survey, no measurable exposures are expected.

Environmental Data: No significant variations are expected (see discussion under ALARA requirements Page 3-2).

Corrective Action: Every effort will be made to insure and enhance the ALARA concept. However, at present and expected exposure and environmental data levels no action will be required.

3.6 Requirement: Address items of regulatory noncompliance and compliance with license conditions.

3.6.1 Discussion: 10 CFR 19.11 requires that each licensee post copies of the following documentation "in a sufficient number of places to permit individuals engaged in licensed activities to observe them on the way to or from any particular licensed activity location to which the document applies, shall be conspicuous, and shall be replaced if defaced or altered": (1) 10 CFR Parts 10 and 20, (2) the license, license condition, or documents incorporated into a license by reference, and amendments thereto, and (3) the operating procedures applicable to licensed activities, and (4) NRC Form 3. The above documents were posted on-site.

Corrective Action: Not required.

3.6.2 Discussion: License Condition #10: See discussion under Sec. 3.1

3.6.3 Discussion: License Condition #11 requires that removal of equipment or packages from the restricted area be in accordance with Annex C. During the audit on March 11, 1985 no material was being shipped, but some dismantled equipment including the truck scales were in a holding area

ready for shipment. BKReaveau has promulgated written procedures on transportation specific to the BOBS decommissioning project. If followed as written, there should be no problems in removal or transportation of equipment from the BOBS.

Corrective Action: Not required.

3.6.4 Discussion: License Condition #12: not applicable to current status.

3.6.5 Discussion: License Condition #13 requires that all entrances to the BOBS be posted in accordance with 10 CFR 20.203(e)(2) and with the words, "Any Area Within This Ore Buying Station May Contain Radioactive Material". The signs were posted as required. It is suggested that "Keep Out" signs be placed on both sides of the barbed wire gate during decommissioning to keep out curious onlookers from the general public.

Corrective Action: Not required.

3.6.6 Discussion: License Condition #14: Not applicable to current status.

3.6.7 Discussion: License Condition #15: Not applicable to current status.

3.6.8 Discussion: License Condition #16 requires that each employee at

the Ore Buying Station shall have: (1) radiation safety training before beginning work, (2) have a refresher course yearly, and (3) participate in quarterly safety meetings. All of the employees assigned to BOBS decommissioning received radiation safety training in November, 1984 and a quarterly safety meeting was held on February 28, 1985. The next meeting is due during the second calendar quarter of 1985.

Corrective Action: Not required.

3.6.9 Discussion: License Condition #17 requires that a qualified RSO be on site during operations or when maintenance activities which could pose radiation safety problems are undertaken. Until dismantling of equipment began, this license condition has not been applicable to the BOBS since ore haulage ceased in August 1981. At present, the RSO or a member of his staff are scheduled to be on-site during decommissioning, as needed, when potential personnel exposure to ore and ore dust warrant. This will require careful coordination and scheduling between the decommissioning crews and the RSO to ensure that personnel do not engage in potentially hazardous work without prior notification.

Corrective Action: Not required.

3.6.10 Discussion: License Condition #18: Not applicable to current status.

3.6.11 Discussion: License Condition #19 requires quarterly walk-through

inspections and an annual audit and report on radiation safety and environmental monitoring. Contrary to this, no annual report could be found for 1983. Also, reports of the quarterly walk-through inspections were found for the first and fourth quarters of 1984 and the first quarter of 1985. However, no reports were found for the second and third quarters of 1984. Although there is evidence that the third quarter 1984 inspection was made, no report could be found.

Corrective Action: The corrective actions for this have been implemented. A new RSO was hired on August 27, 1984 and has conducted the inspections.

3.6.12 Discussion: License Condition #20 requires written operating procedures that are approved by the RSO. The RSO had approved the operating procedures for the decommissioning activities.

Corrective Action: Not required.

3.6.13 Discussion: License Condition #21: See Section 3.6.21.

3.6.14 Discussion: License Condition #22: Not applicable to current status.

3.6.15 Discussion: License Condition #23 requires an archaeological survey of any additional land disturbed. No surface disturbance has occurred since the BOBS was constructed. A preliminary survey was conducted in late 1984. Unless the soil samples taken outside the

restricted area show contamination levels above the 40 CFR 192 criteria, no additional land disturbance will be needed for decommissioning, unless topsoil is needed.

Corrective Action: Not required.

3.6.16 Discussion: License Condition #24: Not applicable to current status.

3.6.17 Discussion: License Condition #25 requires NRC's approval before engaging in any activity not already approved. There are no plans for any activities that are not already approved by NRC.

Corrective Action: Not required.

3.6.18 Discussion: License Condition #26 requires that Plateau decommission the BOBS in accordance with the August 29, 1984 submittal and that it continue the surety on the site until the license is terminated. Plateau proposed a surety increase to \$ 191,176.00 by letter dated January 7, 1985. This amount was accepted, and BOFisher submitted the revised letter of credit.

PRL proposed a radiological safety program for the decommissioning program containing the following elements which have been reviewed by NRC and incorporated into the procedures:

1. Worker training.
2. Personnel dosimetry program - dosimeters to be exchanged quarterly.
3. Representative monthly air and lapel particulate sampling with sample analyzed for natural uranium.
4. Monthly sampling for radon progeny utilizing the Modified Kusnetz Method.
5. Monthly surface contamination surveys (fixed and removable alpha) of lunchrooms, offices and change facilities.

Additionally, PRL proposed an environmental monitoring program to consist of the following elements which is also underway.

1. Continuous airborne particulate sampling at two downwind sites, one upwind site, and the nearest residence. Filters to be changed weekly, composited and analyzed monthly for natural uranium and radium-226.
2. Continuous radon monitoring at the same locations identified in (1) above.
3. Quarterly ground-water samples from the domestic water well to be analyzed for natural uranium.

4. Quarterly sampling of a former stock pond located outside the restricted area when water is available. Samples will be analyzed for natural uranium, radium-226 and thorium-230.

5. Direct gamma radiation will be monitored at the locations identified in (1) above utilizing thermoluminescent dosimeters (TLD's). The TLD's will be exchanged quarterly and read for gamma exposure rate.

Corrective Actions: Not required.

3.6.19 Discussion: License Condition #27: Not applicable to current status.

3.6.20 Discussion: License Condition #28 requires an inspection and maintenance program for all in-plant and environmental radiological monitoring equipment, and maintenance of a standardized source for checking radiation detection instrumentation prior to its use. The environmental radiological monitoring equipment is calibrated.

No calibration records could be found for either the Ludlum detector (s/n #PR0675) or the Eberline Pulse Rate Meter (s/n 2560).

3.6.21 Discussion: License Condition #29 requires that Plateau implement the interim environmental monitoring program. All of the required effluent

monitoring reports have been submitted and approved by the NRC, except for the last half of 1984 which is still under NRC review.

3.7 Requirement: Address problem areas with the radiation safety program including a determination if equipment for effluent controls and exposure control is being properly used, maintained, and inspected.

Discussion: See Section 3.6.20. Personnel assigned to the BOBS decommissioning have been instructed to leave their work boots and coveralls (both are required to be worn) in the restricted area each night and are not to wear them off the property unless they are transporting material to the White Mesa Mill. The coveralls are to be returned to the Shootaring Canyon Uranium Processing Facility at the end of each 8-day work period for laundering. This is considered to be a good ALARA practice.

One of the authors of this report felt that the decontamination (showering) and sanitation facilities available on site were inadequate. While it is agreed that the chances of the personnel becoming contaminated with radioactive materials on this project to the extent of requiring decontamination is remote, the facilities on site are not considered adequate.

Corrective Action: The RSO recalled the Ludlum and the Eberline instruments, calibrated them and returned both to the BOBS. Both instruments have been labelled with a tag stating the date the instrument goes out of calibration. The shower and sanitation facilities that have been modified are now considered to be adequate considering the short-term nature of this project.

3.8 Requirement: Verification of quarterly walk-through inspections by the RSO.

Discussion: See Section 3.6.11.

Corrective Action: See Section 3.6.11.

3.9 Requirement: Evaluation of the radiation safety programs overall effectiveness.

Discussion: With minimum manning, the data thus far indicate an effective Radiation Safety Program. During equipment salvage operations no exposure greater than background (Blanding, Utah 30-40 μ R/HR 1982) have been measured. The personnel residing in Blanding proper have exposure 50% in excess of those working at the GBS.

With soil clean-up operations about to be started (\approx April 24, 1985) there could be an increase in gamma exposure. This will depend on whether the work is performed manually or with heavy equipment (shielding from the equipment) and the degree of dusting. Earthwork will be done under wetted conditions as much as possible to control dusting. Lapel sampling will be used along with urine-bioassay analysis to monitor the workers.

Corrective Action: Monitoring and Control Activities will be implemented as the situation dictates. The R.S.O. will be on site and can take corrective action as warranted.

4. THIS REPORT HAS BEEN PREPARED BY THE FOLLOWING INDIVIDUALS:

Fred W. Gerdeman, Director of Regulatory Affairs

Date

William H. Collins, Maintenance Supervisor

Date