UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
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October 3, 2002

William F. Kearney, Manager
Environmental and Regulatory Affairs
Power Resources, Inc.
P.O. Box 1210
Glenrock, Wyoming 82637

SUBJECT: NRC INSPECTION REPORT 40-8964/02-02

Dear Mr. Kearney:

This refers to the routine inspection conducted on September 9-11, 2002, at your Smith Ranch in-situ uranium processing facility in Converse County, Wyoming. The inspection consisted of a routine review of management organization and controls, site operations, radiation protection, radioactive waste management, and environmental monitoring. The inspection findings were discussed with you and your staff at the exit briefing on September 11, 2002. The enclosed report presents the results of that inspection.

Overall, the inspection determined that you had continued to operate the uranium production facility in a safe and effective manner. 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 enclosure will be 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 Jacqueline D. Cook acting for/

Charles L. Cain, Chief
Nuclear Materials Licensing Branch

Docket No.: 40-8964
License No.: SUA-1548

Enclosure:
NRC Inspection Report
40-8964/02-02
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ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No.:	40-8964
License No.:	SUA-1548
Report No.:	40-8964/02-01
Licensee:	Power Resources, Inc.
Facility:	Smith Ranch In-Situ Leach Facility
Location:	Converse County, Wyoming
Dates:	September 9-11, 2002
Inspector:	Louis C. Carson II, Health Physicist Nuclear Materials Licensing Branch
Approved By:	Charles L. Cain, Chief Nuclear Materials Licensing Branch

EXECUTIVE SUMMARY

Smith Ranch In-Situ Leach Facility
NRC Inspection Report 40-8964/02-02

This inspection included a review of site status, management organization and controls, in-situ leach operations, environmental protection, radioactive waste management programs, and radiation protection.

Management Organization and Controls

- The organization structure and staffing levels were determined to be acceptable for the work in progress at the facility (Section 2).

- Details associated with the licensee's performance-based license and Safety and Environmental Review Panel review of the radiation levels at Wellfield No. 4 were turned over to the Uranium Processing Section at NRC Headquarters for further review. The licensee needed to conduct a 10 CFR 20.1101(b) As Low As is Reasonably Achievable evaluation of Wellfield No. 4 headerhouses' radiological conditions. This matter will be considered an inspection followup item (IFI) 40-8964/02-01 (Section 2).

In-Situ Leach Facilities

- Site activities observed during the inspector's tour were being conducted in accordance with applicable license and regulatory requirements. No yellowcake product spills were observed in the central processing plant or the satellite plant. Plant process parameters were within license limits. (Section 3).

Radiation Protection

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

Environmental Protection and Radioactive Waste Management

- A review of records and data indicated that no effluents were released into the environment exceeding regulatory limits. Reports related to groundwater and environmental monitoring programs had been submitted to the NRC as required (Section 5).

Report Details

1 Site Status

In March 1992, a commercial license was issued to Rio Algom Mining Corporation for recovery of uranium through in-situ leach operations at the Smith Ranch facility. Full scale construction of the central processing plant began in January 1996, and commercial operations began on June 20, 1997. In July 2002, the ownership of the Smith Ranch facility was transferred to Power Resource Incorporated. On July 11, 2002, the NRC issued License Amendment 3 that acknowledged the transfer of ownership of Smith Ranch and issued a standardized Performance-Based License (PBL).

Wellfields Nos. 3 and 4 were in service during the inspection. Both yellowcake dryers and filter presses were operating for drying and packaging the yellowcake product during this inspection. Wellfield No. 3 was originally placed into operation on August 10, 1998, with eight operating mine units in service. Wellfield No. 4 began production on September 10, 1999, and currently has 12 operating mine units (wellfield headerhouses). A satellite facility was completed in August 1998, which supports mining operations from both wellfields. The satellite facility has sufficient capacity to support all mine units in Wellfields Nos. 3 and 4.

2 Management Organization and Controls (88005)

2.1 Scope

The organization structure was reviewed to ensure that the licensee had maintained an organization with defined responsibilities and functions. The site Safety and Environmental Review Panel (SERP) and PBL process was reviewed to evaluate the effectiveness of the licensee's control of site activities.

2.2 Observations and Finding

a. Organization and Staff

During the previous inspection, the licensee’s organization structure was illustrated in the September 27, 2000, license application. The licensee’s current organization was compared to the organization chart as referenced in the license application. As of August 1, 2002, the Rio Algom Mining Corporation positions of president, executive vice president, and manager, radiation safety, regulatory compliance, and licensing were eliminated for Power Resources Incorporated (PRI) equivalent positions. Approximately 77 individuals, including well drillers, remained employed as of a result of PRIs acquisition of Smith. The current site organization has a general manager, operations and an individual who is the corporate radiation safety officer (CRSO) and manager, health, safety, & environmental affairs. Both individuals reported to the senior vice president, operations in Denver, Colorado. The inspector determined that the licensee’s decision to not include the latest organization changes in the SERP process was acceptable. The licensee had included the changes in their license amendment request dated June 19, 2002, which resulted in the current license. Consequently, the NRC had approved the reorganization of the Smith Ranch site on July 11, 2002, with the issuance of the current license.

In summary, the licensee had maintained a site staff that adequately supported commercial operations and met license requirements.

b. Safety and Environmental Review Panel

The licensee was issued a standardized PBL in July 2002. License Condition 9.4 of the PBL requires the licensee to establish a SERP process. The licensee had established an operational review committee (ORC) for pre-screening of work orders/radiation work permits, and to determine if SERP action is required for proposed changes. The inspector reviewed six work orders that had been reviewed by the ORC, since the previous inspection. The inspector further reviewed three work orders and determined that a SERP review was required to be conducted. In general, the inspector determined that the licensee's implementation of the PBL and SERP was adequate.

However, the inspector raised concerns about ORC-513 regarding the SERP review and evaluation of risk associated with public access to headerhouses in Wellfield No. 4. Using the new expanded PBL criteria, the SERP is required to ensure that changes to the facility, procedures, and tests or experiments, which have not been reviewed by the NRC, do not have adverse affects on systems, structures, components, and the operation of the facility. In summary, a description of the change to the facility that the licensee evaluated was as follows:

> The licensee's ORC-513 investigation dosimetry and radiation surveys conclusively measured that several of the Wellfield 4 headerhouses had radiation levels in excess of 5 mR/hr. The licensee further evaluated that a member of the public could receive a dose in access of the 10 CFR 20.1301 annual limit of 100 millirem and could be exposed to the 10 CFR 20.1302 dose limit of 2 millirems in an hour. The licensee had posted all 12 headerhouses in Wellfield No. 4 as "Radiation Areas" and placed "No Trespassing" signs on each headerhouse. The licensee decided not to control the access to each headerhouse by locking the doors due, in part, to the low population and traffic density in the area, a low likelihood that individual workers or members of the public would occupy one of the headerhouses for an extended period, and for convenience for operators.

The licensee's SERP-PBL screening process asks 12 questions for making determinations that a facility change or condition requires further review by the NRC. The licensee answered "no" on all 12 questions regarding the Wellfield No. 4 radiation level issue. For instance, Question 1 of the licensee's SERP evaluation form asked, "Does the proposed change, test, and/or experiment conflict with the [As Low As is Reasonably Achievable] ALARA principle?" The licensee answered "no". The inspector disagreed for the following reasons:

- The licensee did not evaluate radiation source reduction methods such as shielding the source of radiation in the headerhouses.

- The licensee chose a passive means (i.e. radiation area and no trespassing signs) of controlling access to the headerhouses instead of an active means (i.e. locked)

- According to 10 CFR 20.1101(b), the licensee shall use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to the public that are ALARA.

Question No. 12 of the licensee's SERP evaluation form asked, "Does the proposed change, test, and/or experiment result in the departure from the method of evaluation described in the license application used in establishing the Final Safety Evaluation Report, the Environmental Assessment, Technical Evaluation Reports, or other analyses, and evaluations. The licensee answered "no" to this question. The inspector disagreed with the licensee's assessment on this question for the following reasons:

- The licensee and the NRC had not previously considered that wellfield headerhouses at Smith Ranch would be "Radiation Areas" requiring access controls for radiation workers and members of the public.

- It was not previously considered by the licensee or the NRC that wellfield headerhouses should be part of the site's "Restricted Area."

The inspector asked the licensee what type of guidance they had used as basis for answering each SERP question. The inspector found that the license did not have any regulatory guidance for appropriately answering the 12 SERP-PBL screening questions. The inspector determined that the details of this matter would be turned over to the Uranium Processing Section at NRC Headquarters for further review. The licensee needed to conduct a 10 CFR 20.1101(b) ALARA evaluation of Wellfield No. 4 headerhouses' radiological conditions. Additionally, NRC project management needed to review the adequacy of the licensee's SERP process regarding this radiological safety issue. This matter will be considered an inspection followup item (IFI) 40-8964/02-01.

2.3 Conclusions

The organization structure and staffing levels were determined to be acceptable for the work in progress at the facility. The new performance-based license and Safety and Environmental Review Panel were being implemented satisfactorily. However, the details associated with the licensee's SERP review of the radiation levels at wellfield No. 4 were turned over to the Uranium Processing Section at NRC Headquarters for further review.

3 In-Situ Leach Facilities (89001)

3.1 Inspection Scope

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

3.2 Observations and Findings

During the site tour it was noted that Wellfields 3, 4, and 4A were in production, and the condition of plant facilities, equipment, fences, and gates were observed. The inspector reviewed the following operations and activities: satellite facility, central processing plant,

deep well disposal, and site construction. Each activity appeared to be conducted in accordance with established licensee procedures.

The inspector reviewed the SOP No. 2040, "Yellowcake Dryer Area Operations." Both yellowcake dryers were operating during this inspection. The inspector observed the dryer operations and confirmed that no yellowcake product spills had occurred in the central processing plant. Facility equipment and components were found to be operational and properly maintained. Within the plant control room, no equipment misalignments were identified, and no process flow, level, or pressure indications were found outside required parameters. The inspector reviewed completed "Yellowcake Filter Press/Dryer Data Sheet" for year 2002. These data sheets validated that the dryer vacuum alarms had been tested routinely as required by License Condition 10.2. License Condition 10.1 states that the annual yellowcake production shall not exceed 3.5 million pounds. The inspector determined that as of September 2002, yellowcake production was below the 3.5 million pound limit.

3.3 Conclusions

Site activities observed during the inspector's tour were being conducted in accordance with applicable license and regulatory requirements. No yellowcake product spills were observed in the central processing plant or the satellite plant. Plant process parameters were within license limits.

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 Observations and Findings

a. Routine Ambient Gamma Surveys

Section 9.11 of the license application requires the licensee to perform specified quarterly gamma radiation surveys in enclosed areas and to conduct spot checks to confirm the adequacy of the gamma radiation monitoring plan. The inspector's review of records verified that the licensee had performed the required routine surveys and spot checks as specified by the license. During the site tours, ambient radiation levels were measured by the inspector using an NRC microRoentgen meter (Serial Number 33542, calibration due date December 10, 2002). Radiation survey results taken within the satellite facility, central process plant and the yellowcake drum storage area were consistent with the results from previous inspections. No radiation areas, as defined by 10 CFR 20.1003, were identified in these facilities.

b. Airborne Natural Uranium and Personnel Exposures

License Condition 11.7 states that the licensee shall perform monthly surveys for natural uranium and radon. Airborne natural uranium sample results were reviewed for the period May to September 2002. Only the air sample results from the yellowcake dryer and packaging areas routinely had measurable natural uranium. Most air sample results measured less than 10 percent of a derived air concentration (DAC) value for natural uranium (5.0E-10 µCi/ml).

A review of personnel exposure records indicated that exposures during 2002 were within the regulatory limits. Exposure records were based on external radiation, airborne uranium, and radon daughters. The highest total effective dose equivalent was 431 millirems as of August 2002, which was well below the 10 CFR 20.1201 occupational dose limit of 5000 millirems.

c. Bioassays

The bioassay program was reviewed to determine compliance with License Conditions 11.2 and 11.3. Action levels were defined in accordance with Table 1 of Regulatory Guide 8.22, "Bioassay at Uranium Mills," Revision 1. Evaluations were performed when bioassay results exceeded any action level and pertinent corrective actions were implemented. Bioassay samples were analyzed by a vendor laboratory. All sample shipments included blank and spiked samples for quality assurance. All process operators and laboratory personnel were sampled on a monthly basis, while personnel involved in dryer operations were sampled weekly. Since the last inspection, one worker's bioassay sample measured at the lowest action level of 15 µg/l. The inspector noted that the licensee had adequately investigated the causes of the elevated bioassays and had implemented corrective actions. The investigation identified the possibility that loose contamination caused the elevated bioassay result. However, the inspector found that the license had not updated the SOP No. 2040, "Yellowcake Dryer Area Operations," based on the investigation results. Upon completion of yellowcake packing operations it seemed necessary to add a procedure step to assure that the dryer area does not have any loose yellowcake contamination on equipment prior to removing the "Airborne Radioactivity Area" postings. The CRSO stated that they would determine if they should include additional contamination control steps in the SOP.

d. Instrument Calibration

Section 9.6 of the license application requires that all radiation monitoring, sampling, and detection equipment be recalibrated after each repair as recommended by the manufacturer, or at least annually, whichever is more frequent. The inspector reviewed the licensee's calibration records and determined that survey instruments had been calibrated routinely. Also, it was observed that instruments in use had current calibration stickers affixed. The inspector reviewed radiation instrument functional check records prepared since the previous inspection and determined that the licensee had complied with the license.

4.3 Conclusions

The licensee had implemented a radiation protection program that met the requirements in 10 CFR Part 20 and the conditions of the license.

5 Radioactive Waste Management (88035) Environmental Monitoring (88045)

5.1 Inspection Scope

The groundwater, environmental, and radioactive waste management programs were reviewed to assess the effectiveness of the licensee to control waste and monitor the effects of site activities on the local environment.

5.2 Observations and Findings

a. Semi-annual Effluent Reports

License Condition 12.2 states that the results of effluent and environmental monitoring shall be reported to the NRC in accordance with 10 CFR 40.65. The semi-annual environmental monitoring report for the first half of 2002 was submitted to the NRC on August 23, 2002, and reviewed during this inspection. The semi-annual report was submitted to the NRC in a timely manner and provided relevant data for the facility. The environmental monitoring program consisted of air particulate, radon, groundwater, surface water, soil, and vegetation sampling. Measurements of ambient gamma exposure rates were also performed. All values reported were within acceptable limits.

b. Groundwater and Environmental Water Sampling

The inspector reviewed groundwater monitoring well and effluent monitoring data. All required data were presented in the reports. Groundwater and surface water monitoring programs were found to have been implemented in accordance with Table 5.3 of the license application. The groundwater program consisted of sampling livestock or domestic wells within 1-kilometer of operating wellfields on a quarterly basis for natural uranium and radium-226.

The inspector's review of data for the first and second quarters of 2002 indicated that the concentrations of natural uranium and radium-226 were below the 10 CFR Part 20, Appendix B, effluent concentration limits of 3.0 E-7 microcuries per milliliter(µCi/ml) and 6.0 E-8 µCi/ml for uranium and radium, respectively.

c. Environmental Air Sampling

This facility is considered a zero gaseous and particulate effluent facility based on the design of the central process plant and the yellowcake dryer system. However, the licensee had continuously performed air particulate sampling at three locations around the site so far in 2002. The samples were analyzed on a quarterly basis for their natural uranium, thorium-230, radium-226, and lead-210 concentrations. The air sample results indicated that these radionuclide concentrations were fractions of the 10 CFR Part 20, Appendix B, effluent concentration limits so far in 2002.

d. Environmental Exposure Rates

The licensee used environmental thermoluminescent dosimeters to monitor ambient gamma readings. The dosimeters were placed at seven locations as specified in Table 5.3 of the license application and were changed out quarterly. During the first half of year 2002, the highest ambient reading measured was 2.5 µR/hr above background at the fence line restricted area boundary. The background station, Dave's Waterwell, measured 12.9-16.8 µR/hr during the first half of year 2002. All data indicated no upward trend compared to the previous years.

5.3 Conclusions

A review of records and data indicated that no effluents were released into the environment exceeding regulatory limits. Reports related to groundwater and environmental monitoring programs had been submitted to the NRC as required.

6 Exit Meeting Summary

The inspector presented the inspection results to the representatives of the licensee at the conclusion of the inspection on September 11, 2002. Licensee representatives acknowledged the findings as presented. The licensee did not identify any material reviewed as proprietary.

ATTACHMENT

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

P. Drummond, Manager, Plant Operations
W. Kearney, Environmental & Regulatory Affairs /Corporate Radiation Safety Officer, Manager
R. Knode, General Manager, Uranium Operations
J. McCarthy, Radiation Safety Officer
T. McCullough, Radiation Safety Technician

ITEMS OPENED, CLOSED, AND DISCUSSED

Open

40-8964/02-01	IFI	The Wellfield No. 4 headerhouses' radiological conditions need a 10 CFR 20.1101(b) ALARA evaluation by the licensee and review by NRC project management for adequacy of the licensee's SERP review of this matter.

Closed

None

Discussed

None

INSPECTION PROCEDURES USED

IP 83822	Radiation Protection
IP 88005	Management Organization and Control
IP 88035	Radioactive Waste Management
IP 88045	Environmental Monitoring
IP 89001	In-Situ Leach Facilities

LIST OF ACRONYMS USED

ALARA	As Low As is Reasonably Achievable
CFR	Code of Federal Regulations
CRSO	Corporate Radiation Safety Officer
DAC	Derived Air Concentration
µCi/ml	microcuries/milliliter
µR/hr	microRoentgen per hour
ORC	Operational Review Committee
PBL	Performance-Based License
PDR	Public Document Room
RSO	Radiation Safety Officer
SERP	Safety and Environmental Review Panel
SOP	standard operating procedure
UPS	Uranium Processing Section