UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-4005

September 16, 2005

Mr. Ken Milmine, Manager
Environmental and Regulatory Affairs
Power Resources, Inc.
P.O. Box 1210
Glenrock, Wyoming 82637

SUBJECT: NRC INSPECTION REPORT 040-08964/05-001

Dear Mr. Milmine:

On August 25, 2005, the Nuclear Regulatory Commission (NRC) completed an inspection of your Highland Uranium Project 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, environmental monitoring, and chemical process safety. The inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations of activities in progress. The inspection findings were discussed with you and your staff at the exit briefing on August 25, 2005. 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 2.390 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 Ms. Judith Walker at (817) 860-8299 or the undersigned at (817) 860-8197.

Sincerely,

/RA/

Jack E. Whitten, Chief
Nuclear Materials Licensing Branch

Docket No.: 040-08964
License No.: SUA-1548

Enclosure:
NRC Inspection Report
040-08964/05-001

cc w/enclosure:
Mr. Chuck Foldenauer
Mine Manager, Uranium Operations
Power Resources, Inc.
P.O. Box 1210
Glenrock, Wyoming 82637

Mr. Pat Mackin, Assistant Director
Systems Engineering & Integration
Center for Nuclear Waste Regulatory Analyses
6220 Culebra Road
San Antonio, Texas 78238-5166

Mr. David Finley
Wyoming Department of Environmental Quality
Solid and Hazardous Waste Division
122 West 25th
Cheyenne, Wyoming 82002

Mr. John Wagner
District I Supervisor
Land Quality Division
Herschler Building - Third Floor West
122 West 25th
Cheyenne, Wyoming 82002

Wyoming Radiation Control Program Director

bcc w/enclosure (via ADAMS distrib):
Len Wert
RANelson
Paul Micalack
Steven Cohen
Jim Park
JEWhitten
JLWalker
KEGardin
NMLB
RIV Nuclear Materials File - 5th Floor

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JLWalker	PMichalak	JEWhitten
/RA/	***/RA/ via phone, per JLWalker***	***/RA/***
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ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No.:	040-08964
License No.:	SUA-1548
Report No.:	040-08964/05-001
Licensee:	Power Resources, Inc.
Facility:	Highland Uranium Project Smith Ranch In-Situ Leach Facility
Location:	Converse County, Wyoming
Dates:	August 22-25, 2005
Inspectors:	Judith Walker, Health Physicist Nuclear Materials Licensing Branch Division of Nuclear Materials Safety
	Paul Michalak, Hydrogeologist Uranium Processing Section, Fuel Cycle Facilities Branch Division of Fuel Cycle Safety and Safeguards, NMSS
Accompanied by:	Stephen Cohen, Hydrogeologist Uranium Processing Section, Fuel Cycle Facilities Branch Division of Fuel Cycle Safety and Safeguards, NMSS
	Jim Park, Environmental Reviewer Uranium Processing Section, Fuel Cycle Facilities Branch Division of Fuel Cycle Safety and Safeguards, NMSS
Approved by:	Jack E. Whitten, Chief Nuclear Materials Licensing Branch Division of Nuclear Materials Safety
Attachment:	Supplementary Information

EXECUTIVE SUMMARY

Highland Uranium Project: Smith Ranch In-Situ Leach Facility
NRC Inspection Report 040-08964/05-001

This inspection included a review of site status, management organization and controls, site operations, radiation protection, radioactive waste management, environmental monitoring, and chemical process safety.

Management Organization and Controls

- The inspectors determined that the licensee's organization structure and staffing levels were acceptable for the work in progress at the facility (Section 2).

- The inspectors also determined that the licensee had both the organization and procedures in place to adequately implement the performance-based license (PBL) and staff the Safety and Environmental Review Panel (SERP) (Section 2).

In-Situ Leach Facilities and Operation Review

- 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 by the inspectors in the central processing plant (CPP) or the satellite plants. Plant process parameters were observed by the inspectors to be within license limits (Section 3).

Radiation Protection

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

- Occupational exposures that occurred at the Highland Uranium Project, Smith Ranch in-situ leach (ISL) facility during calendar year (CY) 2004, and to the first quarter of CY 2005 were determined by the inspectors to be well below the NRC's approved annual total effective dose equivalent limit (Section 4).

Environmental Protection and Radioactive Waste Management

- The inspector's review of records and data indicated that no effluents were released to the environment exceeding regulatory limits during CY 2004. Reports related to groundwater and environmental monitoring programs were submitted to the NRC as required (Section 5).

Follow up

- Review of the licensee's system for tracking calibrations of instrumentation (Section 6).

Report Details

1 Site Status

In March 1992, a commercial license was issued to Rio Algom Mining Corporation for recovery of uranium through ISL operations at the Smith Ranch facility. Full scale construction of the CPP began in January 1996 and commercial operations began on June 20, 1997. On July 11, 2002, the NRC issued License Amendment No. 3 that acknowledged the transfer of ownership and control of Smith Ranch facility as part of the Highland Uranium Project to Power Resources, Inc., and issued Power Resources, Inc. a standardized PBL.

The inspectors noted that Wellfields Nos. 1, 2, 3, 4, 4A, D, E, F, H, I and 15 were in production during the inspection. Wellfield I began production in April of 2004 and Wellfield 15 began production in March of 2005. There were four satellite facilities (1, 2, 3, and SR1) which supported all the wellfields. The next phase of Groundwater cleanup activities is scheduled for Wellfield C. Groundwater cleanup in Wellfields A and B was complete. One of the two yellowcake dryers and filter presses was operating during this inspection and the inspectors observed yellowcake product being dried.

2 Management Organization and Controls (88005)

2.1 Observations and Findings

a. Management Organization and Staff

The licensee's approved corporate organization structure is illustrated in Figure 9-1 of the March 12, 2003, application. During this inspection, the licensee's functional organization was compared to the organization chart as referenced in the license application. The inspectors found that the licensee's overall organization structure was in agreement with the license application.

At the time of this inspection, approximately 94 individuals were employed at the site. The general manager remained the licensee's highest ranking official on site and the corporate radiation safety officer (CRSO) continued to report directly to the general manager. The inspectors determined that the licensee had adequately staffed the site to support commercial operations.

b. As Low As is Reasonably Achievable Controls

License Condition 9.7 of the Smith Ranch license requires, in part, that the licensee follow the requirements of Regulatory Guide (RG) 8.31, "Information Relevant to Ensuring that Occupational Radiation Exposures at Uranium Mills will be As Low As is Reasonably Achievable (ALARA)," for the responsibilities and qualifications for the radiation safety officer (RSO) and radiation safety technicians, in addition for performing annual ALARA Audits. During February and March 2005, the licensee had completed personnel qualifications and required refresher training as specified in RG 8.31.

The inspectors reviewed the licensee's 2004 annual ALARA review, which was performed on March 22, 2005. The ALARA audit was found by the inspectors to be thorough and comprehensive.

c. Safety and Environmental Review Panel

The licensee was issued a PBL by NRC on May 8, 2001. License Condition 9.4 of the PBL requires, in part, that the licensee establish a SERP. The SERP is required by the license to ensure that changes to the facility, procedures, and tests or experiments, which have not been reviewed by the NRC, do not have adverse effects on systems, structures, components, and the operation of the facility. The inspectors reviewed the licensee's SERP evaluations performed from CY 2004 through the date of the inspection in CY 2005. The inspectors determined that the licensee's SERP was adequately staffed and functioning properly. The 2005 SERP evaluations covered the following areas:

- 2005-1 Startup of Mine Unit (MU) 15.
- 2005-2 EHS Dept. Staff Changes to the Manager Health, Safety and Environmental Affairs and appointment of Radiation Safety Officer.
- 2005-3 Evaporation Pond Sludge Removal and Liner Replacement.
- 2005-4 Reduction of Inspection Frequency at Satellite No. 1 from Daily to Weekly.

2.2 Conclusions

The inspectors determined that the organization structure and staffing levels were acceptable for the work in progress at the facility. The licensee had both the organization and procedures in place to adequately implement the conditions of PBL and to provide adequate staffing of the SERP.

3 In-Situ Leach Facilities (89001) Operations Review (88020)

3.1 Inspection Scope

3.2 Observations and Findings

b. Site Tour

The inspectors conducted site tours to observe ISL process plant, wellfield, and satellite operations at both the Highland Uranium Project and Smith Ranch sites. During the site tours the inspectors was tasked to verify site activities were being conducted in accordance with applicable regulations and the license. Additionally, the inspectors were also tasked to ensure that operational controls were adequate to protect the health and safety of workers and members of the public. During the site tours the inspectors noted that several wellfields were in production at both the Smith Ranch and Highland Uranium Project facilities. The inspectors also observed the condition of the plant satellites, equipment, fences, and gates.

The inspectors noted that ISL operations and activities at the satellite facilities, CPP, deep well disposal, and wellfield appeared to be conducted in accordance with established licensee procedures.

b. Yellowcake Dryer Area Operations

The inspectors reviewed the standard operating procedure (SOP) No. 2040, "Yellowcake Dryer Area Operations." One of the two yellowcake dryers was operating during this inspection. The inspectors observed dryer operations and confirmed that no yellowcake product spills had occurred since the last inspection in the Smith Ranch CPP. Facility equipment and components were found to be operational and properly maintained. The inspectors noted during the site tour that in the plant control room no equipment misalignments were identified and no process flow, level, or pressure indications were found outside required parameters. The inspectors reviewed the CPP operation checklist records for activities occurring to the date of this inspection in CY 2005. The data sheets validated that the licensee had routinely tested the dryer vacuum alarms and other parameters as required by License Condition 10.1.2(b). License Condition 10.1.1 states, in part, that the annual yellowcake production shall not exceed 5.5 million pounds. The inspectors determined that as of August 2005, yellowcake production was below the 5.5 million pound annual limit.

3.3 Conclusions

Site activities observed during the inspector's tour were being conducted in accordance with applicable PBL and regulatory requirements. No yellowcake product spills were observed by the inspectors in the CPP or at the satellite plant. Plant process parameters were observed by the inspectors to be within license limits.

4 Radiation Protection (83822)

4.1 Inspection Scope

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

4.2 Observations and Findings

a. Routine Ambient Gamma Surveys

Section 9.8 of the license application requires, in part, that the licensee perform quarterly gamma radiation surveys in specific locations in enclosed areas and conduct spot checks in these areas to confirm the adequacy of the gamma radiation monitoring plan. The inspectors reviewed records and verified that the licensee had performed the required routine surveys and spot checks as specified by the license.

Within the CPP, the NRC inspectors performed independent radiological surveys using an NRC-issued Ludlum Model 19 microRoentgen meter (Serial Number 33033, calibration due date of November 10, 2005) and did not observe any areas greater than 5 millirem per hour that the licensee had not previously posted. The inspectors determined that the licensee had posted its radiation areas as required by 10 CFR 20.1003.

b. Airborne Natural Uranium and Personnel Doses

License Condition 9.7 requires, in part, that the licensee perform monthly surveys for natural uranium and radon. Airborne natural uranium sample results were reviewed by the inspectors for CY 2004. The inspectors noted that only the air sample results from the yellowcake dryer and packaging areas routinely had measurable quantities of natural uranium. Most air sample results measured by the licensee were less than 1.0 percent of a derived air concentration (DAC) value for natural uranium. A DAC value of uranium is 5.0E-10 microcurie/milliliter (µCi/ml).

A review of personnel dose records by the inspectors indicated that personnel doses in CY 2004, and to the first quarter of CY 2005, were within the regulatory limits. Dose records maintained by the licensee were based on external radiation, airborne uranium, and radon daughters. The highest total effective dose equivalent for and individual thus far during CY 2005 was 134 millirem, which was well below the 10 CFR 20.1201 occupational dose limit of 5000 millirem.

c. Bioassays

The inspectors reviewed the bioassay program to determine compliance with License Conditions 11.2 and 11.3. Action levels used by the licensee were defined in Table 1 of RG 8.22, “Bioassay at Uranium Mills,” Revision 1. Bioassay procedures require that evaluations be performed by the licensee when bioassay results exceeded any action level specified in RG 8.22 and that pertinent corrective actions be implemented. Bioassay samples taken by the licensee were analyzed by a contract laboratory vendor. All sample shipments provided to a contract laboratory vendor for analysis included blank and spiked samples for quality assurance. The inspectors noted that all process operators and laboratory personnel were sampled by the licensee on a monthly basis while personnel involved in dryer operations were sampled weekly.

In CY 2005, the licensee had 2 bioassay sample results that exceeded the 15 micrograms/liter(µg/L) action level. The first bioassay result measured 17 µg/L. The licensee investigated both occurrences and determined the first result was due to probable contamination due to improper sampling procedures. The second bioassay sample that exceeded the action limit was 61 µg/L. This bioassay sample was an exit sample for a contract worker and the licensee performed an investigation to determine the cause. The licensee concluded that the sample must have been contaminated, but was unable to determine the cause of the contamination.

d. Instrument Calibration

Section 9.6 of the license application requires, in part, 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 inspectors reviewed the licensee's calibration records and determined that survey instruments were calibrated routinely. Also, during the site tour the inspectors observed that instruments in use by the licensee had current calibration stickers affixed. The inspectors reviewed radiation instrument functional check records prepared since the previous inspection and determined that the licensee had complied with the license. The inspectors reviewed the licensee's calibration records for CY 2004 and, to date this inspection 2005, and determined that the licensee had calibrated radiological instrumentation according to the license. Since the last inspection, the licensee implemented the use of a tracking system to determine the calibration due date of all instrumentation used onsite.

4.3 Conclusions

The licensee had implemented a radiation protection program that met the requirements in 10 CFR Part 20 and the license. Occupational exposures that occurred at the Smith Ranch Highland Uranium Project, ISL facility site during CY 2004, and to the date of this inspection in CY 2005, were determined by the inspectors to be well below the NRC's authorized annual total effective dose equivalent exposure limit.

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

5.1 Inspection Scope

The groundwater, environmental, and radioactive waste management programs were reviewed by the inspectors 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. Semiannual Effluent Reports

License Condition 12.2 states, in part, that the results of effluent and environmental monitoring shall be reported to the NRC in accordance with the provisions of 10 CFR 40.65. The semiannual environmental monitoring report for the first half of CY 2004 and the second half of CY 2004 was submitted to the NRC on August 18, 2004, and February 9, 2005, respectively. The semiannual reports were submitted to the NRC in a timely manner and provided relevant data for the facility. The environmental monitoring program had consisted of air particulate, radon, groundwater, surface water, soil, and vegetation sampling. Measurements of ambient gamma exposure rates were also performed. The inspectors determined that all values reported were within acceptable limits.

b. Groundwater and Environmental Water Sampling

The inspectors reviewed groundwater monitoring well and effluent monitoring data. All required data was presented in the reports. Groundwater and surface water monitoring programs were implemented by the licensee in accordance with Chapter 5 of the license application. The groundwater program consisted of the licensee conducting quarterly sampling for natural uranium and radium-226 taken from wells used for livestock or domestic wells located within 1-kilometer of the operating wellfields.

The inspectors reviewed water sampling standard operation procedure (SOP) and observed a groundwater technician performing well sampling at the Highland Mine Unit F, monitoring well FM-12. During the well sampling, the inspectors observed what appeared to be misinterpretations of the established SOPs and the standard ground-water sampling procedures from the American Society for Testing and Materials (ASTM) Guide D 4448 and Environmental Protection Agency (EPA).

The licensee calculated a well volume as the volume of water between the top of the well screen to the water level in the well. Established SOPs and standard ground-water sampling procedures for environmental monitoring define a well volume as the amount of water within the well casing from the bottom of the well to the water level in the well.

Secondly, the licensee purged one well volume prior to sampling. Established SOPs call for purging three to five well volumes prior to well sampling unless the well is defined as a low discharge well. The licensee does not appear to be differentiating between low, medium, and high discharge wells when implementing their sampling procedure.

Lastly, two field parameter readings were performed near the end of the one volume purge (i.e., at 35 and 40 minutes of a 40 minute purge). Established SOPs and standard ground-water sampling procedures call for a minimum of three field parameter readings to establish stability.

The inspectors discussed the above items with the licensee and the Licensee agreed to a two step process: 1) Submit documentation (i.e., historical correspondence with regulatory agencies or detailed sampling and analytical data) that addresses the issue of whether current sampling procedures used in the field at SR-HUP produces representative aquifer samples, and 2) Revise groundwater sampling SOPs based on NRC review and agreement with conclusions of submitted documentation. This item was identified as an Inspector Followup Item (IFI) 040-08964/0005-001.

c. Environmental Air Sampling

The Highland Uranium Project is considered a zero gaseous and particulate effluent release facility based on the design of the CPP and the yellowcake dryer system. However, the licensee had continuously performed air particulate sampling at three locations (five locations when yellowcake processing operations are active at the Highland Central Plant) around the site.

During CY 2004, the licensee had analyzed samples on a quarterly basis for natural uranium, thorium-230, radium-226, and lead-210 concentrations. The licensee's particulate sample results recorded were 3.6 percent or less, of the amounts specified in 10 CFR Part 20, Appendix B, Effluent Concentration Limits table.

Radon-222 was monitored at three locations (five locations when yellowcake processing operations are active at the Highland Central Plant) around the site. The highest sample result was obtained at the back ground monitoring station (Dave's Water Well) during the second half of CY 2004. This sample result was 85 percent of the applicable effluent concentration limit (with radon daughters removed). This result was a significant increase from the previous quarter which was 7 percent of the applicable effluent concentration limit. The licensee could not determine the cause of this increase in radon levels at this background station, except for potential laboratory error.

d. Environmental Exposure Rates

The licensee used environmental thermoluminescent dosimeters (ETLD) to monitor ambient gamma radiation. The ETLDs were routinely placed at three locations (five locations when yellowcake processing operations are active at the Highland Central Plant) as specified in Section 5.3.4 of the license application. These ETLDs were changed on a quarterly frequency. The ETLDs at the background station, referred to as Dave's Waterwell, measured a total of 138 millirem during CY 2004. During CY 2004, the highest ETLD measured 7 millirem with background subtracted at the fence line location. The ETLD data reviewed by the inspectors indicated no upward trend compared to the previous years. The inspectors concluded that potential radiation dose to any member of the public from licensed material for CY 2004 was below the allowed 100 millirem per year annual dose limit to the public.

e. Wellfield Monitoring and Excursions at Highland Uranium Project

License Condition 12.1 requires, in part, that until the license is terminated, the licensee shall maintain documentation on spills of source materials, 11e.(2) byproduct materials, or process chemicals. Also, License Condition 12.1 requires, in part, that the licensee report any wellfield excursions, spills, or pond leaks involving source materials, 11e.(2) by product materials, or process chemicals that may have an impact on the environment. License Condition 12.1 also requires the licensee to report any other incidents or events that the licensee reports to other State or Federal Agencies, and that a report shall be made to the NRC project manager by telephone or electronic mail (e-mail) within 48 hours. The licensee is required to make notification to the NRC in accordance with Licence Condition 9.2. The inspectors reviewed correspondence that the licensee submitted to the NRC for reportable spills. The inspectors determined that the licensee was in compliance with the license for notifying the NRC in accordance with Licence Conditions 9.2 and 12.1.

f. Radioactive Waste Shipments

In CY 2004 and to the date of this inspection in CY 2005, the licensee had 13 and 3 shipments of radioactive waste transported offsite, respectively. The inspectors reviewed container release survey records since the last inspection and determined that the licensee was meeting the established Department of transportation (DOT) limits specified in 49 CFR 173.441.

5.3 Conclusions

A review of records and data by the inspectors indicated that the licensee had not released effluents into the environment exceeding regulatory limits during CY 2004. The inspectors noted that reports related to groundwater and environmental monitoring programs were submitted to the NRC as required.

6 Followup (92701)

6.1 (Closed) Inspector Follow up Item (IFI) 040-08964/001-01**:** Review of licensee's instrument calibration tracking system

During the August 2004 inspection, the inspectors noted that the licensee did not have a formal system to track instrumentations due for calibrations. The inspectors reviewed the licensee's instrument calibration and calibration records from the last inspection and determined that survey instruments were being calibrated routinely as required. The licensee also developed a matrix which captures all instrumentation and their calibration due dates. This IFI is closed.

7 Exit Meeting Summary

The inspectors presented the preliminary inspection results to the licensee's representatives at the conclusion of the onsite inspection on August 25, 2005. Representatives of the licensee acknowledged the findings as presented. During the inspection, the licensee did not identify any information reviewed by the inspectors as propriety.

ATTACHMENT

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

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

ITEMS OPENED, CLOSED, AND DISCUSSED

Open

040-08964/0005-01	IFI	Licensee submittal of documentation that addresses the issue of whether current sampling procedures used in the field at SR-HUP produces representative aquifer samples, and revision groundwater sampling SOPs based on NRC review and agreement with conclusions of submitted documentation.

Closed

040-08964/001-01	IFI	Review of licensees' instrument calibration tracking system to ensure instruments are routinely calibrated at the specified frequencies.

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
CPP	central process plant
CRSO	corporate radiation safety officer
DAC	derived air concentration
ETLD	environmental thermoluminescent dosimeter
ISL	in-situ leach
µCi/ml	microcurie/milliliter
NRC	Nuclear Regulatory Commission
PBL	performance-based license
PDR	Public Document Room
RG	Regulatory Guide
RSO	radiation safety officer
SERP	Safety and Environmental Review Panel
SOP	standard operating procedure