June 29, 2004

Power Resources, Inc.
ATTN: W. F. Kearney
Manager, Health, Safety
& Environmental Affairs
Smith Ranch-Highland Uranium Project
P.O. Box 1210
Glenrock, Wyoming 82637

SUBJECT: REVIEW OF POWER RESOURCES, INC.'S A-WELLFIELD GROUND WATER RESTORATION REPORT FOR THE SMITH RANCH-HIGHLAND URANIUM PROJECT (TAC LU0032)

Dear Mr. Kearney:

By letter dated January 15, 2004, to the U.S. Nuclear Regulatory Commission (NRC), Power Resources, Inc. (PRI) submitted information related to the completion of ground water restoration of the A-wellfield at the Smith Ranch-Highland Uranium Project. This information was submitted as intended fulfillment of the requirements of License Condition (LC) 10.1.9.b of Source Materials License SUA-1548 that requires the submittal of a wellfield completion report, for NRC review and approval, upon the completion of restoration of each wellfield. The submitted information included the ground water restoration report for the A-wellfield as well as the results of the Wyoming Department of Environmental Quality (WDEQ) review of that report. In this regard, the WDEQ determined that the A-wellfield has been restored to Wyoming statutory and regulatory requirements. However, the WDEQ also determined that additional monitoring of the A-wellfield ground water would be required to validate PRI's model for residual contaminant adsorption, precipitation, and dispersion. In its January 15, 2004, letter, PRI requested that the NRC review the information submitted for the A-wellfield restoration and concur with the WDEQ determination that the restoration meets all regulatory requirements such that decommissioning of the wellfield can commence.

The staff has completed its review of the ground water restoration, stability, and monitoring information provided by PRI and concurs with the WDEQ determination that the A-wellfield has been restored in accordance with applicable regulatory requirements. Additionally, the staff also agrees with WDEQ's determination that additional monitoring of the A-wellfield ground water would be required to validate PRI's ground water model for residual contaminant flow and transport. In this regard, pending completion of the required ground water monitoring plan for the A-wellfield by PRI and WDEQ, decommissioning of the remainder of the A-wellfield can commence. Lastly, the staff agrees that PRI has met LC 10.1.9.b regarding the requirement for submittal of a wellfield completion report upon the completion of restoration of each wellfield. The staff's detailed review of the A-wellfield restoration information is provided in the enclosed Technical Evaluation Report (TER).

If you have any questions regarding this letter or the enclosed TER, please contact Rick Weller, the acting Project Manager for the review of the Smith Ranch-Highland Uranium Project A-wellfield restoration report, at (301) 415-7287 or via e-mail to RMW2@nrc.gov.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter 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.

Sincerely,

/RA/

Gary S. Janosko, Chief
Fuel Cycle Facilities Branch
Division of Fuel Cycle Safety
and Safeguards
Office of Nuclear Material Safety
and Safeguards

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

Enclosure: Technical Evaluation Report
for A-Wellfield Restoration Report

cc: R. Chancellor, WDEQ-LQD
R. Hoy, WDEQ-LQD
J. Corra, WDEQ-LQD

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TECHNICAL EVALUATION REPORT

REVIEW OF POWER RESOURCES INC.'S
A-WELLFIELD GROUND WATER RESTORATION REPORT
FOR THE
SMITH RANCH-HIGHLAND URANIUM PROJECT

DOCKET NO.: 40-8964

LICENSE NO.: SUA-1548

LICENSEE: Power Resources Inc.

FACILITY: Smith Ranch-Highland Uranium Project

PROJECT MANAGER: John Lusher

TECHNICAL REVIEWER: Ron C. Linton

SUMMARY AND CONCLUSIONS:

Power Resources, Inc., (PRI) has requested that the U.S. Nuclear Regulatory Commission (NRC) concur with the Wyoming Department of Environmental Quality (WDEQ) determination that ground water restoration at the A-wellfield of the Smith Ranch-Highland Uranium Project meets regulatory requirements so that decommissioning of the wellfield can commence. In this regard, the WDEQ has determined that the A-wellfield has been restored to Wyoming statutory and regulatory requirements. However, because the post-restoration ground water conditions differ from background water quality and because of the reliance on natural attenuation for the protection of adjacent ground water, the WDEQ has required additional long-term monitoring of the A-wellfield to substantiate ground-water model predictions. The staff has completed its review of the ground water restoration, stability, and monitoring information provided by PRI and concurs with the WDEQ determination that the A-wellfield is restored and endorses the WDEQ decision to require long-term monitoring to assure that natural attenuation is occurring within the A-wellfield. Additionally, the staff agrees that PRI has met License Condition (LC) 10.1.9.b that requires the submittal of a wellfield completion report upon the completion of restoration of each wellfield. Lastly, pending PRI's completion of the A-wellfield monitoring plan requested by WDEQ, decommissioning of the remainder of the A-wellfield can commence.

BACKGROUND:

PRI conducted ground water restoration in the A-wellfield of the Smith Ranch-Highland Uranium Project from July 1991 to October 1998 after *in-situ* leach mining of the wellfield was completed. In a letter dated April 23, 1999, PRI submitted its "A-Wellfield Ground Water Restoration Report" to the WDEQ, requesting concurrence that restoration requirements for the wellfield had been met. From February 1999 to November 2003, PRI provided stability monitoring data for the A-wellfield to the WDEQ.

In a letter dated November 25, 2003, Richard A Chancellor, Administrator, Land Quality Division (LQD), WDEQ, determined that the A-wellfield has been restored to the statutory and regulatory requirements of the State of Wyoming. However, because the post-restoration ground water conditions differ from background water quality and because of the reliance on natural attenuation for the protection of adjacent ground water, the WDEQ specified that additional long-term monitoring will be required to substantiate ground-water model predictions.

By letter dated January 15, 2004, PRI requested that the NRC concur with the WDEQ determination that ground water restoration at the A-wellfield meets regulatory requirements such that decommissioning of the wellfield can commence. PRI submitted several attachments to the letter, including a ground-water restoration report, a ground water stability report, various graphs and charts of ground water trends, monitoring data, and the November 25, 2003, WDEQ letter indicating restoration was deemed complete. LC 10.1.9.b of the NRC Source Materials License SUA-1548 requires the submittal of a wellfield completion report upon the completion of restoration of each wellfield. PRI has submitted the January 15, 2004, letter and its attachments as fulfillment of the requirements of LC 10.1.9.b.

TECHNICAL EVALUATION:

The WDEQ has determined that the A-wellfield has been restored to Wyoming statutory and regulatory requirements. The WDEQ has concluded that PRI has used “Best Practicable Technology” in its restoration efforts in the A-wellfield. More than 15 pore volumes of water have been pumped through the A-wellfield during the ground water sweep, reverse osmosis, and reductant recirculation phases of restoration (PRI, 2004). The restoration results have reached baseline or have become asymptotic, indicating no significant increasing trends for the A-wellfield restoration parameters. Ground water modeling has shown that the ground water outside of the aquifer exemption boundary will be protected and elevated contaminants within the wellfield will naturally attenuate with time. Although all the ground water parameters have not been returned to baseline conditions, the ground water quality is consistent with the “pre-discharge suitability use of the water” (Class IV(A), suitable for industry). This determination is based on the fact that treatment would be required of the premining ground water prior to use because of the elevated background concentrations of radium. The restored ground water in the A-wellfield would require similar treatment before use (WDEQ 2003).

As noted above, the “pre-discharge use suitability of the water” is Class IV(A), suitable for industry use as determined by the WDEQ Water Quality Division (WQD) and the LQD, due to naturally high concentrations (i.e. >5 picocuries per liter (pCi/L)) of radium in the ground water. For the five A-wellfield restoration wells, MP-1 through MP-5, 20 of 35 WDEQ restoration parameters have been returned to baseline concentrations. Eleven have been returned to Class I standards. One has been returned to Class II standards, and one has been returned to Class III standards. Manganese is above the Class II standard, but there is no Class III standard listed for manganese. Radium concentration remains above the average baseline conditions but below the maximum concentration found in the wellfield (WDEQ 2003).

The radium values are exceeded on a baseline average (from 466 pCi/L in MP-1 to 1012 pCi/L in MP-5), however, the original baseline average for the A-wellfield was 675 pCi/L, well above the Class I level of 5 pCi/L. Although the A-wellfield baseline was not achieved for radium, this

concentration does not pose any greater threat to the downgradient ground water than did the original baseline concentration of 675 pCi/L. Concentrations of radium in the A-wellfield downgradient monitor ring wells ranged from 3.7 pCi/L to 9.3 pCi/L. PRI argues that the relative lack of radium at wells downgradient of the ore bearing zones demonstrates that natural attenuation of radium does occur, otherwise the downgradient baseline values would have been much higher (PRI, 2004). This is a plausible argument. A decrease from the original 675 pCi/L in the ore body to less than 10 pCi/L at the monitor well ring indicates that natural attenuation has occurred to reduce radium levels outside of the main ore body and wellfield over time.

The NRC concurs with the WDEQ conclusion, regarding the review of the restoration data presented by PRI, that the A-wellfield has been restored using Best Practicable Technology. Parameters have been restored using the A-wellfield mine unit averages for the 35 restoration parameters as the basis for restoration. This determination is consistent with the ground water restoration and review approach outlined in NUREG-1569.

NUREG-1569, §6.1, paragraph 2, states:

> In conducting these evaluations, the reviewer should consider the technical evaluations conducted by a state or other federal agency with authorities overlapping those of the NRC.

NUREG-1569, §6.1.3 (3), paragraph 4, states:

> Generally, the acceptance criteria for restoration success are based on the ability to meet the predetermined numerical standards of the restoration program and the absence of significant increasing trends of monitored indicator constituent concentration during the stability monitoring period.

NUREG-1569, §6.1.3 (4), states:

> The applicant has the option of determining numerical restoration limits for each monitored constituent on a well-by-well basis, or as a statistical average applied over the entire well field.

As noted in their November 25, 2003, letter the WDEQ will require additional long-term monitoring of the A-wellfield to substantiate ground water model predictions because the ground water conditions at several wells differ from the background water quality and because of the reliance on natural attenuation for the protection of adjacent ground water outside of the aquifer exemption area. The monitoring plan is currently being finalized between PRI and the WDEQ. When finalized, the monitoring plan will become part of the WDEQ permit to mine. The WDEQ will require that PRI provide a bond for monitoring activities at the site (personal communication with R. Hoy, June 1, 2004). This requirement is consistent with the joint LQD and WQD policy adopted November 14, 2001, by the LQD and WQD Advisory Boards for situations in which natural attenuation is being relied on for water quality protection (WDEQ, 2001).

An extended monitoring period after the stability monitoring period is not specified in NUREG-1569. However, this approach is prudent and is consistent with the monitored natural attenuation (MNA) approach used for industries within Wyoming (personal communication with

R. Hoy, June 1, 2004) and consistent with U.S. Environmental Protection Agency guidance on MNA. This approach will allow for discontinued monitoring of a majority of the A-wellfield monitoring wells that are hydraulicly crossgradient or upgradient of the A-wellfield while concentrating on the wells and portions of the wellfield that would show the first sign of contaminant problems with the MNA approach if problems were to arise. This approach also allows for monitoring of specific wells that show elevated levels of certain restoration parameter constituents even though, on a mine unit average, the wellfield meets the restoration criteria.

With the information provided by PRI, including documentation of WDEQ's conclusion that the A-wellfield has been restored, the NRC staff agrees that PRI has met LC 10.1.9.b regarding the requirement for submittal of a wellfield completion report upon the completion of restoration of each wellfield. Further, pending completion of the aforementioned A-wellfield monitoring plan by PRI and WDEQ, decommissioning of the remainder of the A-wellfield can commence.

REFERENCES:

Power Resources, Inc., Smith Ranch-Highland Uranium Project, Docket No. 40-8964, SUA - 1548, A-Wellfield Ground Water Restoration Information, letter from W. Kearney to G. Janosko, January 15, 2004.

U.S. Nuclear Regulatory Commission, Office of Nuclear Material Safety and Safeguards, NUREG-1569, "Standard Review Plan for In Situ Leach Uranium Extraction License Applications," June 2003.

Wyoming Department of Environmental Quality, Restoration of the A-Wellfield, Highland Uranium Project, letter from R. Chancellor to W. Kearney, Permit No. 603, TFN 3 4/261, November 25, 2003.

Wyoming Department of Environmental Quality, Wyoming DEQ In Situ Ground-water Classification and Restoration Policy, DEQ LQD and WQD Advisory Board, November 14, 2001.